Energy Scenario of Bangladesh
2024-25

Hydrocarbon Unit
Energy and Mineral Resources Division

Preface

Report on Energy Scenario, Bangladesh was prepared and published by Hydrocarbon Unit for the first time in October 2009. The present one is the issue of Energy Scenario, Bangladesh for the period of July 2024 to June 2025. In this report, Energy Scenario of Bangladesh has been reflected. Daily average gas production rate has been included in the report as well. Moreover, Share of Primary and Commercial energy, Sector-wise Liquid fuel consumption, Historical Gas production and Net Energy Generation along with the graphical presentation have been depicted.

This report has been prepared based on the data available from the Monthly Reserve and Gas Production Report of HCU and Monthly Information System (MIS) of Petrobangla. Bangladesh Petroleum Corporation (BPC), Bangladesh Power Development Board (BPDB), National Board of Revenue (NBR) etc.

It is expected that the report will be helpful as reference book and elements of interest for the concerned.

The report will also be available at HCU's website: www.hcu.gov.bd.

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Table of Contents

List of Tables

List of Figures

1.1 Introduction

Bangladesh is categorized as a mid-income nation, exhibiting one of the highest GDP growth rates globally. For any nation, development serves as a fundamental prerequisite for sustained GDP growth. The primary catalyst for the country's development is energy. Effective energy management is crucial to satisfy the increasing energy requirements and to transition from a mid-income status to that of a developed nation.

Approximately 40 percent of energy needs are fulfilled by natural gas, including biomass in Bangladesh. Other energy sources such as oil, coal, and biomass also play significant roles. Although the country possesses substantial coal reserves, its production and utilization remain limited. Conversely, while the natural gas reserves are not extensive, its production and consumption are the highest among the available resources. Additionally, energy demands are supplemented through the importation of oil and liquefied petroleum gas (LPG). The government has also commenced the importation of liquefied natural gas (LNG) to address the rising gas demand. Biomass constitutes a significant portion of the energy mix, and electricity is also imported from India to meet energy demand.

The global transition from fossil fuels such as gas, coal, and oil to renewable energy sources is underway and is crucial for achieving sustainable development while mitigating environmental impact through the reduction of carbon emissions. Numerous countries, including Sweden, Germany, China, and the United States, are currently integrating renewable energy into a substantial portion of their energy consumption. Although Bangladesh is also adopting renewable energy, its current utilization falls short of what is necessary. The government has implemented several initiatives aimed at enhancing the adoption of renewable energy in the future, including the solar home system, solar irrigation system, and the Rooppur nuclear project.

1.2 Bangladesh Energy Resources

Bangladesh, with a population of 173.92 million, ranks among the most densely populated nations globally. Historically, agriculture served as the primary income source for its citizens. Nevertheless, the Gross Domestic Product (GDP) for Bangladesh is projected at 3.49% for the fiscal year 2024-25, compared to 4.22% for the fiscal year 2023-24. [Source: BBS] The combination of rapid urbanization and industrialization, driven by consistent economic growth, has resulted in a significant increase in energy demand.

Energy is widely recognized as a crucial factor in alleviating poverty, fostering economic growth, developing sustainable infrastructure, and ensuring the security of any nation. To sustain ongoing economic development, it is essential to utilize the country's indigenous natural resources.

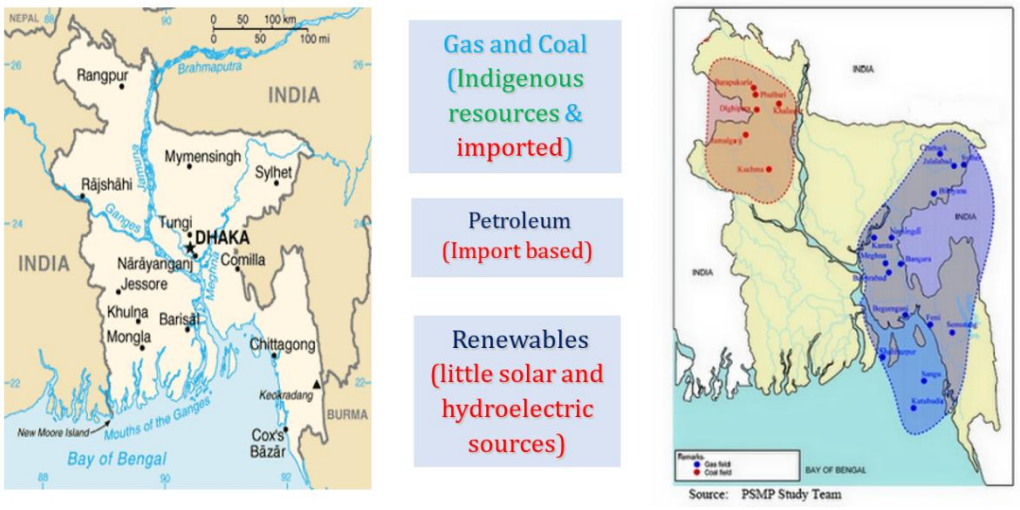


Figure 1: Bangladesh Energy Resources

The northeastern folded basin is particularly rich in the indigenous natural gas of Bangladesh, while the northwestern basin is enriched in coal and hard rock resources.

1.3 Energy Sectoral Mechanisms

The main indigenous energy resources of Bangladesh are Natural Gas and Coal. To elaborate Energy sectoral mechanism, we can delineate it among-

- Upstream
- Midstream
- Downstream

In the following figure, the energy (fuel) value chain is represented briefly-

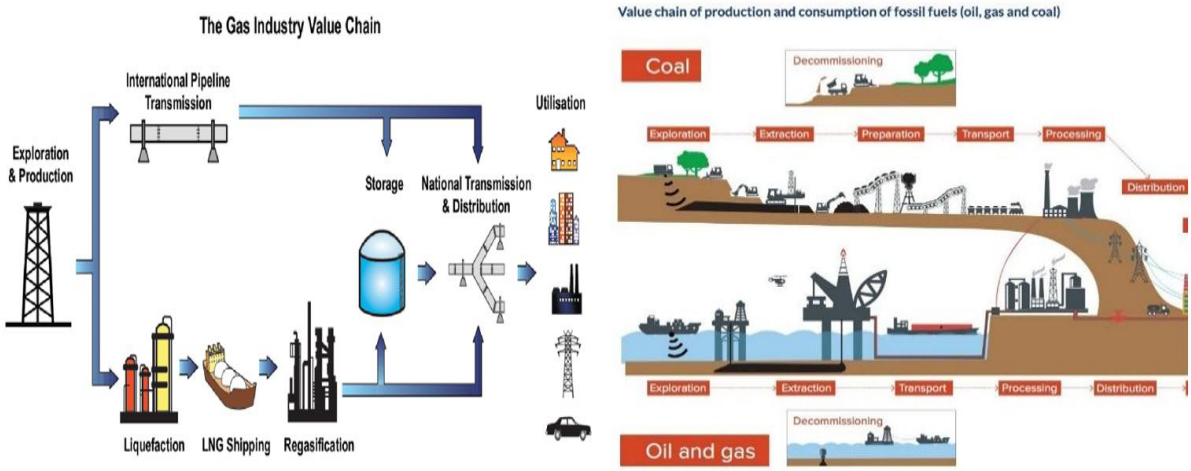


Figure 2: Energy Value Chain

2.1 Current Position of Energy Resources

Primary energy resources in Bangladesh include indigenous natural gas, coal, imported oil, LPG, imported LNG, imported electricity, solar, wind and hydro-electricity. Biomass accounts for about 23% of the primary energy and the rest 77% is being met by the rest of the components of primary energy. Natural gas accounts for about 38% of the primary energy (with imported LNG).[1] Imported oil accounts for the lion's share of the rest. In this tenure, Bangladesh imports about 6.86 million metric ton of crude and refined Petroleum Products.

Moreover, power is also generated by capitalizing Solar Home System (SHS) in on-grid and off grid areas. The amount of Renewable Energy (Solar+ wind) is currently about 1403.93 MW. The amount of power generation from such plants is currently about 0.69 MW. Generation of electricity by Bio-Mass Gasification Method is 0.4 MW in the country.[2]

Per capita consumption of energy in Bangladesh is on an average 349 kgoe (Kilogram Oil Equivalent) and per capita generation of electricity is 661 kWh (Source: Annual Report of BPDB 2024-25) including captive and off-grid renewable energy in the FY 2024-25.

2.2 Primary Energy

Estimated total primary energy in the FY 2024-25 of Bangladesh is approx. 60.36 MTOE. Here, natural gas & LNG plays combined 38% share, biomass 23%, coal 20%, petroleum oil 11% and rest is others (coal, LPG, RE, electricity import) of the total primary energy.[3]

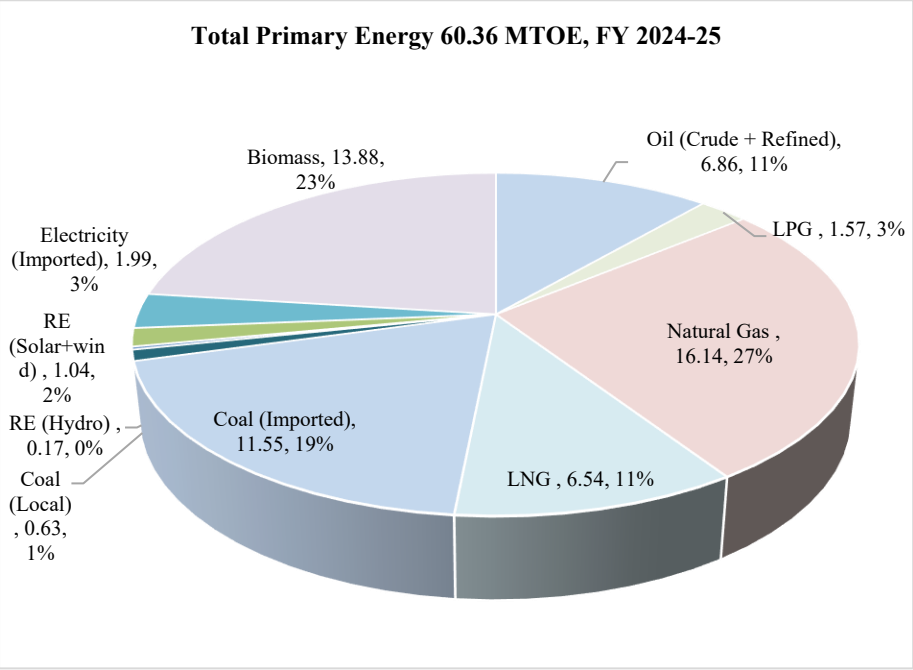


Figure 3: Share of Total Primary Energy of Bangladesh (FY 2024-25)

[1] Source: Energy Data Center, Hydrocarbon Unit
[2] Source: http://www.renewableenergy.gov.bd/
[3] Source: Energy Data Center, Hydrocarbon Unit

Table 1: Total Primary Energy FY 2024-25 in MTOE (Million Ton Oil Equivalent)

Name	*Unit*	*Amount*	*MTOE*
Oil (Crude + Refined)	K ton	6,864.87	6.86
LPG	K ton	1,569.14	1.57
Natural Gas	Bcf	696.10	16.14
LNG	Bcf	281.89	6.54
Coal (Imported)	K ton	18,264.61	11.55
Coal (Local)	K ton	988.86	0.63
RE (Hydro)	MW	230.00	0.17
RE (Solar+ wind)	MW	1,404.00	1.04
Electricity (Imported)	MW	2,696.00	1.99
Biomass			13.88
Total Primary Energy			60.36

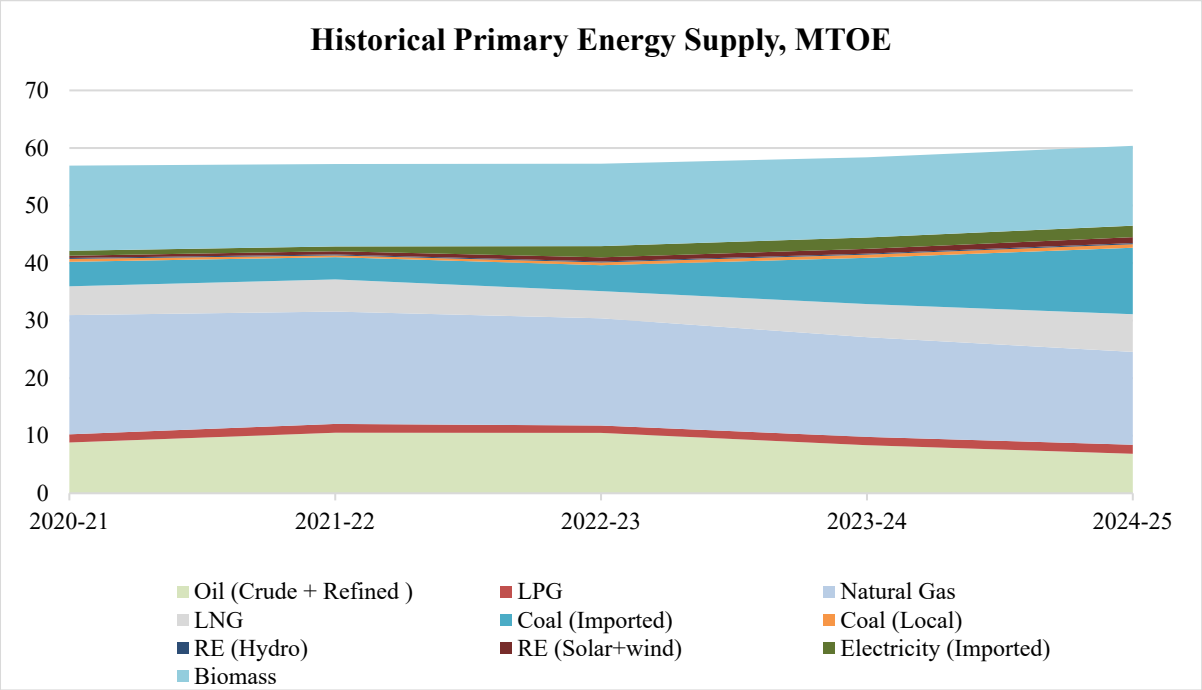


Figure 4: Historical Primary Energy Supply, FY 2024-25

Bangladesh's Total Primary Energy Supply (TPES) has shown a gradual upward trajectory during the period from FY 2020-21 to FY 2024-25. Over these five years, TPES increased from 56.94 to 60.36, reflecting an overall growth of about 6 percent and an average annual

increase of roughly 1.5 percent.[4] Growth remained relatively modest until FY 2022-23, after which a marked acceleration became evident from FY 2023-24 onward. This recent rise in TPES has largely been driven by increased reliance on imported energy, particularly coal, LNG, and cross-border electricity, amid the steady decline in domestic natural gas production.

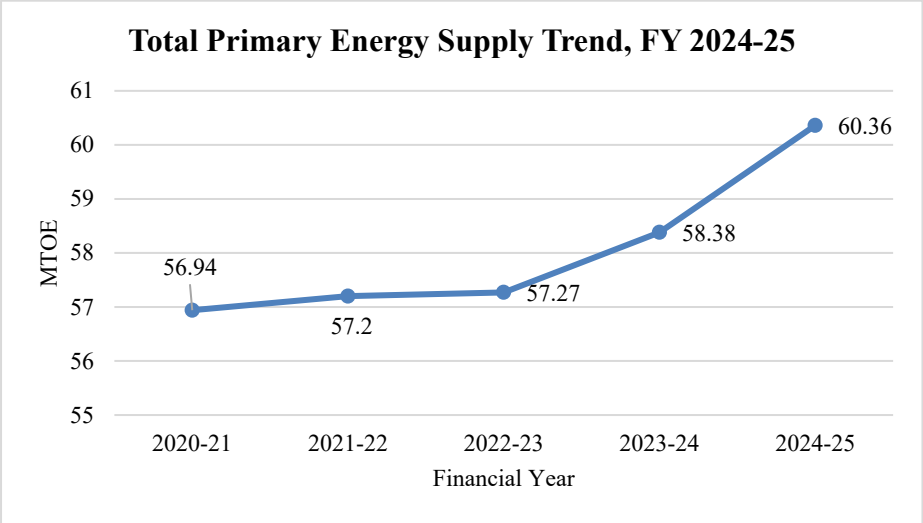


Figure 5: Total Primary Energy Supply Trend, FY 2024-25

The observed trend indicates rising energy demand accompanied by growing import dependence, underscoring the importance of targeted policy measures to enhance energy efficiency, diversify the energy mix, and expedite the development of indigenous and renewable energy resources to ensure long-term energy security.

3.1 Natural Gas

3.1.1 Organizational Structure

Bangladesh Oil, Gas, and Mineral Corporation, short named Petrobangla, under the Energy and Mineral Resources Division of the Ministry of Power, Energy and Mineral Resources is entrusted with the responsibility of exploration of oil and gas, and production, transmission and marketing of natural gas in the country.

3.1.2 Natural Gas Reserve

Since first discovery in 1955 as of today 29 gas fields have been discovered in the country. Of them 20 gas fields are in production, one offshore gas field have depleted after 14 years of production while other offshore field has not been viable for production due to small reserve. The estimated proven plus probable and recoverable reserve was 40.09 Tcf (GIIP) and 2P reserve was 29.93. As of June 2025, a total of 21.77 Tcf gas has already

[4] Source: Energy Data Center, Hydrocarbon Unit

been produced leaving only 8.15 TCF recoverable reserve in proven plus probable category. Some key information about the natural gas sector is presented in the Table 2.

Table 2: Natural Gas Sector at a Glance, FY 2024-25[5]

Description	***Amount***
Total number of gas fields	*29*
Number of gas fields in production	*20*
Number of producing wells	*111*
Present gas production capacity	*2000+ MMcfd*
Re-gasified LNG supply capacity	*1100 MMcfd*
Highest Production (6th May, 2015)	*2785.80 MMcfd*
Total recoverable (Proven + Probable) reserve	*40.09 Tcf*
Recoverable reserve (2P)	*29.93*
Cumulative Production (June,2024)	*21.77 Tcf*
Annual Production by NOC	*277.67 Bcf (40%)*
Annual Production by IOC	*418.42 Bcf (60%)*
Remaining Reserve (Proven + Probable)	*8.15 Tcf*
Present Demand	*3500+ MMcfd*
Number of Customer	*43 Lakh (Appx.)*

3.1.3 Historical Gas Production:

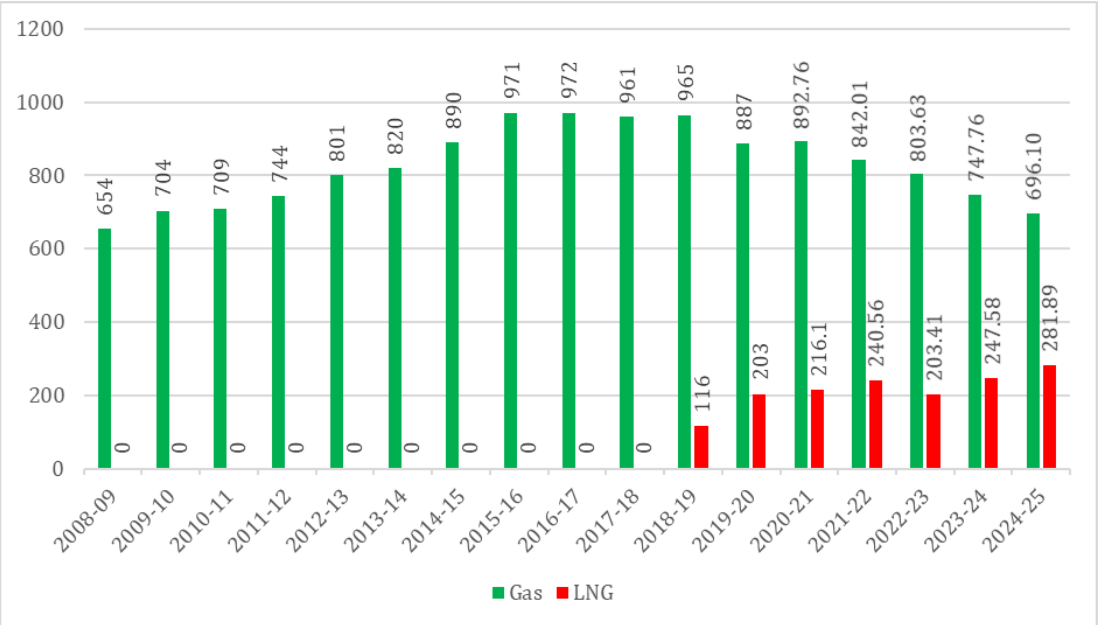


Figure 6: Historical Gas Production in Bangladesh (2008 – 2025)

[5] Source: MIS Report June 2025, Petrobangla and Energy Data Center, HCU

From the above Figure 6, it is very clear that natural gas production is declining after the FY 2016-17. Simultaneously, LNG import introduced from 2018.[6] Due to the rapid industrial growth, to meet energy demand, LNG import is increasing. Hence, GoB has taken immediate initiatives to expedite national gas exploration activities and gas augmentation activities.

3.1.4 Gas Production by Companies:

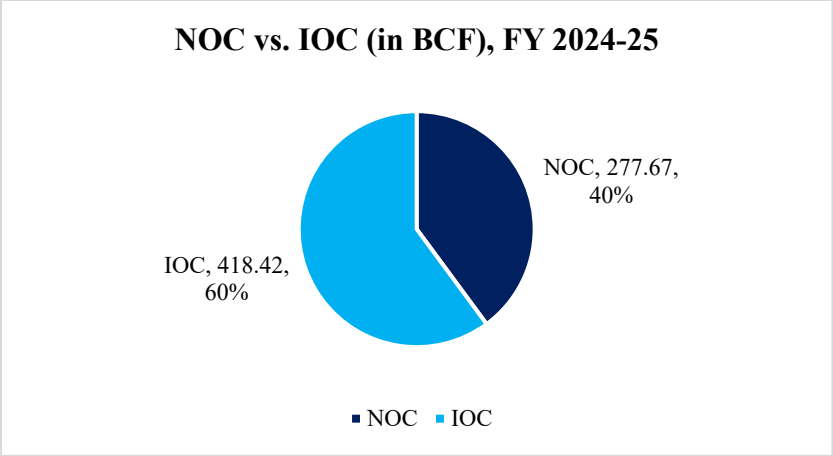


Figure 7: Gas Production in Bangladesh NOC vs. IOC (FY 2024-25)

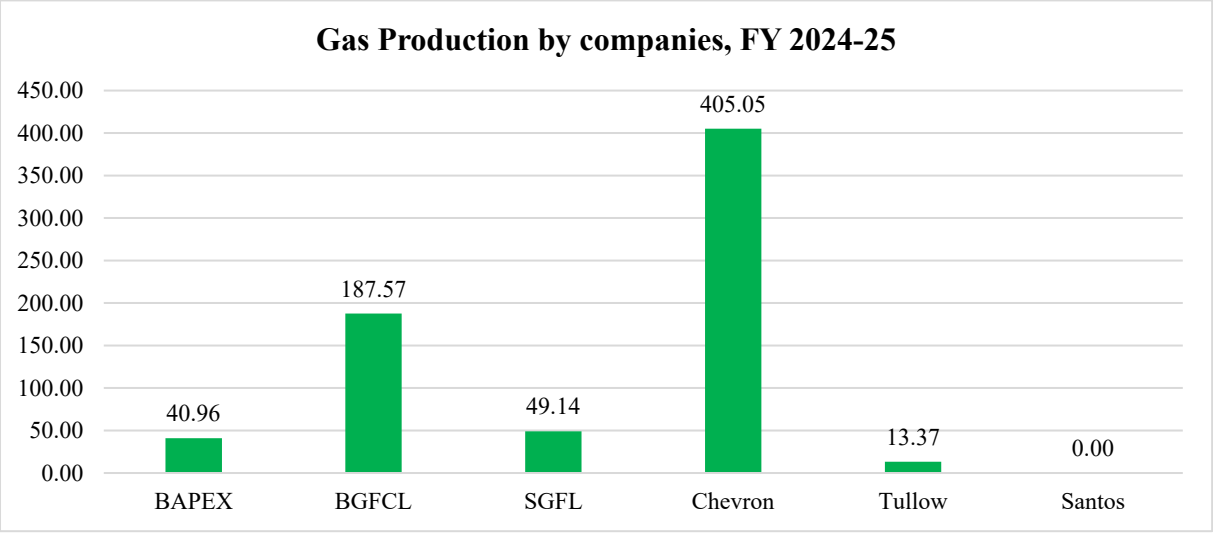


Figure 8: Gas Production by companies, FY 2024-25

In the FY 2024-25, gas production by National Oil companies (NOC) i.e. Bapex, BGFCL, SGFL is 277.67 BCF.[7] In the same time, International Oil Companies (IOC) i.e. Chevron,

[6] Source: Petrobangla and Energy Data Center, Hydrocarbon Unit
[7] Source: Petrobangla and Energy Data Center, Hydrocarbon Unit

Tullow produce 418.42 BCF which is approx. 60% of the total national gas production.

3.1.5 Natural Gas Consumption

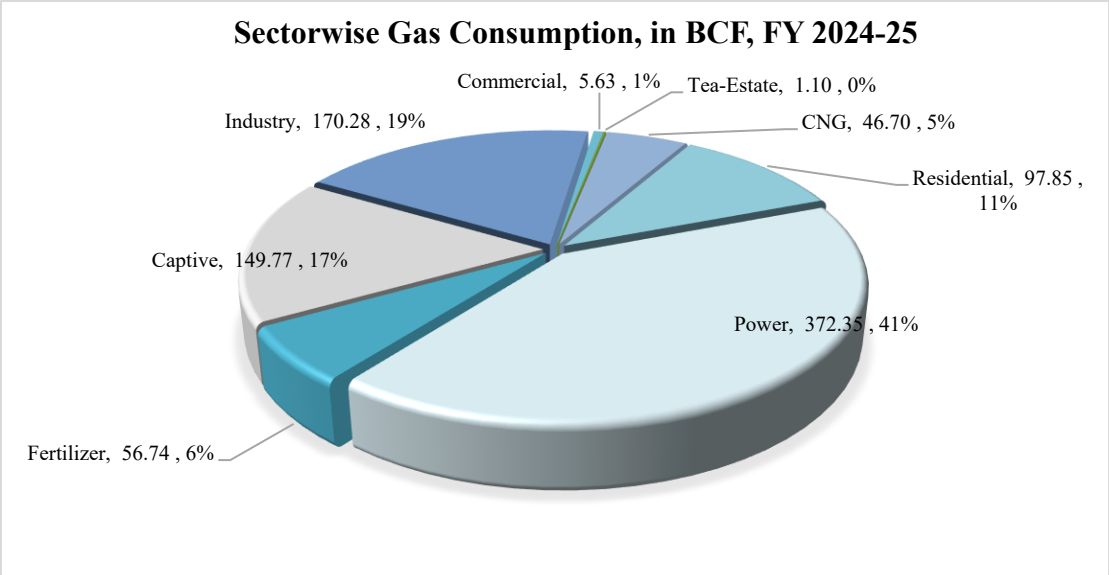


Figure 9: Sector wise Gas Consumption in Bangladesh (2024-25)

In the FY 2024-25, a total of 696.10 billion cubic feet (BCF) of natural gas was produced, alongside the importation of LNG was 281.89 BCF. Sector wise gas consumption was as follows: power generation accounted for 41%, industrial use 19%, captive power 17%, domestic consumption 11%, fertilizer production 6%, compressed natural gas (CNG) 5%, and other uses, including commercial and tea estates, represented 1%.[8] Natural gas contributed to 41% of grid electricity generation, and all seven urea fertilizer plants rely on natural gas as their feedstock. This resource has significantly supported industrial growth in the country, serving as a cost-effective fuel for heating and captive power generation. While the entire nation has reaped the benefits of this resource, approximately 13% of the population has directly benefited from the use of natural gas pipeline for household applications.

3.2 LNG

To ensure the national energy security, GoB has devised a plan to import LNG, addressing the current and growing demand for gas within the country. Under the supervision of Petrobangla, RPGCL is executing all essential tasks related to the development of LNG infrastructure, the importation of LNG, and the supply of RLNG to the national gas grid. The commencement of LNG operations in 2018 marks a significant strategic initiative aimed at bolstering the energy security of Bangladesh.

[8] Source: Petrobangla MIS Report June, 2025

3.2.1 LNG Scenario:

Table 3: LNG Scenario, FY 2024-25[9]

Total LNG Import in June 2025	***26.76***	***Bcf***
LNG Import from July 2024 to June 2025	***281.89***	***Bcf***
Cumulative LNG import from August 2018 to June 2025	***1,508.31***	***Bcf***

In the FY 2024-25, 281.89 BCF LNG has been imported in Bangladesh. Cumulative LNG import from August 2018 to June 2025 becomes 1,508.31 BCF.

3.3 Oil (Petroleum) Sector

3.3.1 Organizational Structure

Bangladesh Petroleum Corporation (BPC), operating under the Energy & Mineral Resources Division of the government, serves as the primary organization in the petroleum sector. Its responsibilities encompass the importation of crude oil and petroleum products, as well as the refining and marketing of finished petroleum goods. The sole crude oil refinery, located in Chittagong, is operated by a single refining company, while four oil marketing firms are tasked with distributing the finished products throughout the nation. Until 1997, the oil industry was a government monopoly, but that year marked the entry of a private company into the fractionation of gas condensate sourced from gas fields. Currently, gas condensates are fractionated by small-scale plants operated by Petrobangla, BPC, and private entrepreneurs. Additionally, there are two private sector petrochemical plants that import condensate for use as feedstock.

3.3.2 Supply and Consumption of Oil

The majority of liquid fuel consumption in Bangladesh is met through imports. In FY 2024–25, Bangladesh's petroleum supply remained heavily dependent on imports, with a total import and domestic production volume of about 6.86 million metric tons. The country imported 3.11 million metric tons of refined oil, 1.88 million metric tons of furnace oil, and 1.49 million metric tons of crude oil, while domestic condensate production contributed around 0.38 million metric tons.

[9] Source: RPGCL and HCU

Table 4: Petroleum Sector at a Glance (FY 2024-25)[10]

Product	FY 2024-25 (in Metric Ton)
Import of refined oil	3,113,927.04
Import of furnace oil	1,880,604.56
Import of crude oil	1,494,451.85
Production of Condensate	375,891.13
Total Import & Production	6,864,874.57
Production of Naptha	153,529.00
Storage Capacity of BPC	1,358,000.00
Refining Capacity of ERL	1,570,000.00
LPG Production (Local)	20,386.00
LPG import (private)	1,548,757.13

The Eastern Refinery Limited (ERL) has a refining capacity of 1.57 million metric tons, supported by BPC's storage capacity of 1.36 million metric tons. Additionally, 153,529 metric tons of naphtha were produced locally. In the LPG sector, domestic production remained limited at 20,386 metric tons, while private sector LPG imports reached about 1.55 million metric tons, highlighting growing dependence on imported energy.

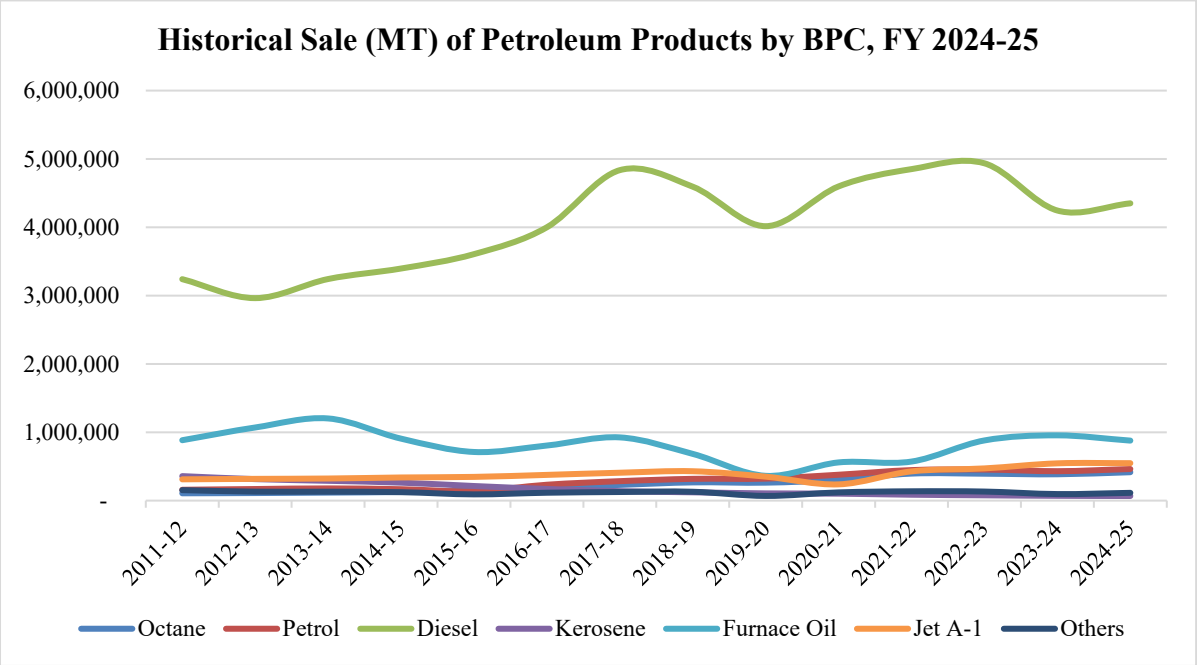


Figure 10: Historical Sale of Petroleum Products by BPC in MT, FY 2024-25

[10] Source: NBR, BPC and HCU Data Bank

The historical sales pattern of petroleum products by Bangladesh Petroleum Corporation (BPC) indicates a consistent increase in national energy demand over the last decade, closely linked with Bangladesh's economic growth, urbanization, growing transportation and industrial activities. Total petroleum sales rose from approximately 3.2 million metric tons (MT) in FY2011–12 to more than 4.3 million MT in FY2024–25, with some fluctuations during certain years.[11] Diesel remains the dominant fuel in the overall consumption structure due to its extensive use in transportation, agriculture, power generation, and infrastructure development, making it a critical component of the country's energy supply. Demand for Jet A-1 fuel has also shown gradual growth, reflected the expansion of the aviation sector and increased international connectivity, although a temporary decline was observed during the COVID-19 period. Furnace oil consumption demonstrates notable variability, largely influenced by policy shifts in the power generation sector and the gradual transition toward alternative fuels such as natural gas and LNG. Meanwhile, petrol and octane consumption have increased moderately with the rise in motorcycle and private vehicle ownership, while kerosene use has declined significantly as rural electrification and access to modern energy services have expanded. Overall, these trends highlight Bangladesh's increasing dependence on imported petroleum while also indicating gradual structural changes in the energy mix, underscoring the need for stronger energy security, diversification toward cleaner fuels, and improved efficiency in fuel use.

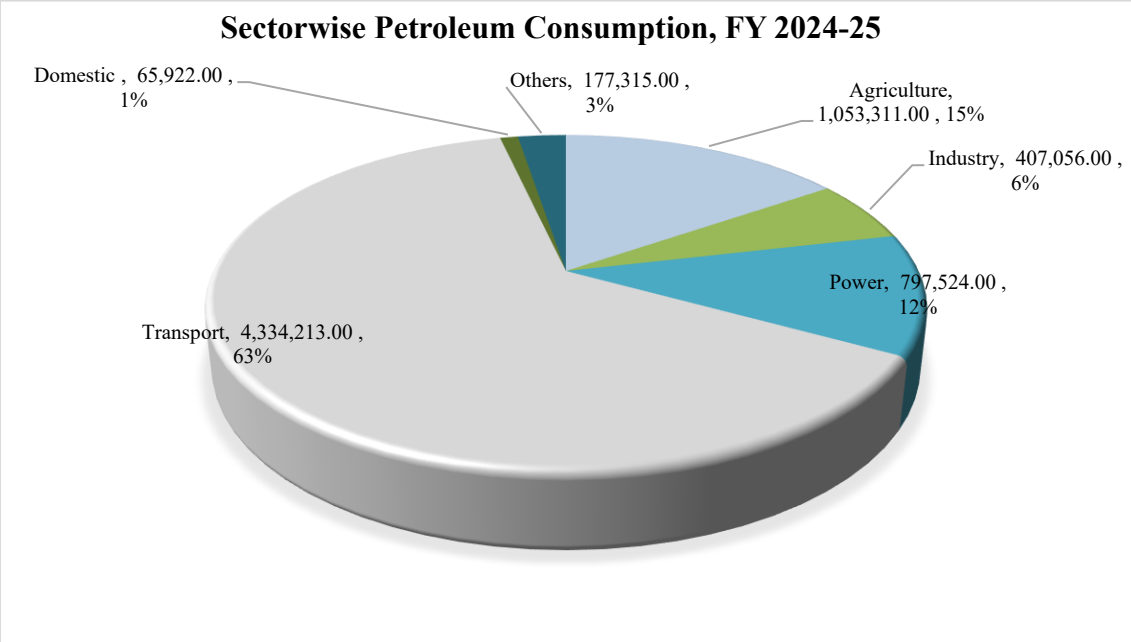


Figure 11-Sector wise Liquid Fuel Consumption in Bangladesh (2024-25)

In FY 2024–25, Bangladesh's petroleum consumption was heavily dominated by the transport sector, accounting for about 63% of total use. The agriculture sector consumed 15%, followed by power generation (12%) and industry (6%). Other sectors accounted

[11] Source: BPC Website and Annual Report 2024-25

for 3%, while domestic use remained minimal at about 1%. This pattern highlights the strong dependence of transportation and agriculture on liquid fuels.

3.3.3 Petroleum Refinery:

Bangladesh's only operational crude oil refinery is Eastern Refinery Limited (ERL), located in Chattogram (formerly Chittagong) and established in 1968. The refinery has an annual processing capacity of approximately 1.57 million metric tons of crude oil. ERL operates several key processing units, including a Crude Distillation Unit (CDU) with a capacity of about 1.5 million metric tons per year, a Catalytic Reforming Unit (CRU) with an annual capacity of roughly 700,000 metric tons, and a Hydrodesulphurization Unit, which has later been converted into a mild hydrocracking unit to improve product quality and refining efficiency.

To strengthen domestic refining capacity and reduce reliance on imported refined petroleum products, the government has approved a project to establish a second refinery unit (ERL Unit-2) at the existing facility, with a planned refining capacity of approximately 3 million metric tons per year. In parallel, the government has allowed private sector participation through the development of Condensate Fractionation Plants, which will process Natural Gas Condensate (NGC) sourced from domestic gas fields as well as imported condensate.

Currently, Bangladesh has a nationwide petroleum storage capacity of about 1.35 million metric tons across different grades of petroleum products. In line with the national energy security policy, the country aims to maintain strategic petroleum reserves equivalent to approximately 60 days of national consumption to ensure supply stability and resilience against global energy market disruptions.

However, at present BPC is able to maintain 35 to 40 days' stock of petroleum products due to lack of storage capacity as well as involvement of huge amount money for procuring petroleum. BPC has completed a project for construction of **Mongla Oil Installation** as 2nd main installation to enhance 0.10 million metric tons with 14 oil storage tanks.

Table 5: Historical Processing (Last Five years) by ERL in MT, FY 2024-25[12]

Product	2020-21	2021-22	2022-23	2023-24	2024-25
LPG	11,583	12,516	13,879	12,520	16,187
Naphtha	143,561	101,602	118,327	124,410	153,529
Octane	-	-	247	2,270	0
Petrol	94,199	85,624	79,704	42,227	59,150
Diesel	731,088	638,129	672,746	578,601	732,230
Kerosene	72,956	56,018	53,682	59,026	648,612
MTT	-	-	-	-	0
Jet A-1	-	2,437	72	-	0
JBO	8,587	10,172	7,681	12,074	8,079
Furnace Oil	447,518	357,418	389,714	350,945	386,229
Bitumen	52,786	54,999	63,026	49,505	57,414
Gas+ Loss	38,654	23,216	35,224	30,977	25,831
Total Processed	1,600,932	1,342,131	1,434,302	1,279,080	1,533,140

Single Point Mooring (SPM) with double pipeline will enable BPC to receive Crude Oil and Diesel from large size vessels of 120,000 metric tons carrying capacity through subsea pipeline, from near Kutubdia of the Bay of Bengal, within 48 hours instead of previous required time of 9/10 days.

Figure 12: Single Point Mooring (SPM) with Double Pipeline

Construction of Storage facility 0.24 million metric tons, for crude oil 0.15 million metric tons and for diesel 0.09 million tons, at Maheshkhali under SPM Project is going to be a new dimension to ensure energy security in the petroleum sector of Bangladesh. Operational flexibility will improve amazingly after completion of the SPM project.

Demand for Petroleum Products

The demand for petroleum products is rising at an annual rate of 2 to 4%. Should this trend persist, the demand for oil is projected to reach approximately 15 million tons by the year 2030. The Government of Bangladesh has committed to enhance regional connectivity with neighboring countries such as India, Nepal, and Bhutan. The India–Bangladesh Friendship Pipeline (IBFP) is a landmark cross-border energy infrastructure project designed to strengthen fuel supply security and regional cooperation between

[12] Source: Bangladesh Petroleum Corporation (BPC)

India and Bangladesh. The 131.5 km pipeline, extending from Numaligarh in Assam, India, to Parbatipur in Dinajpur, Bangladesh. The pipeline has an annual capacity to transport approximately 1 million metric tons of high-speed diesel from India's Numaligarh Refinery to Bangladesh, primarily for the northern region. Previously, diesel was transported by rail and road tankers, which was costlier and less efficient. The pipeline therefore significantly reduces transportation costs, delivery time, and logistical risks.

Source Countries for Imported Oils

Bangladesh primarily sources its oil imports from Saudi Arabia and the United Arab Emirates. These imports occur annually through agreements with the respective companies from these nations. The payment for the oil is determined by the prevailing world market price on the day of shipment. The Bangladesh Petroleum Corporation (BPC) receives crude oil from ADNOC of the UAE and Saudi Aramco of Saudi Arabia, while finished petroleum products are procured from 13 National Oil Companies (NOCs) across various countries.

3.4 Liquefied Petroleum Gas (LPG)

The demand for Liquefied Petroleum Gas (LPG) in Bangladesh is significantly high. In the public sector, a total of 20,386 MT was produced during the fiscal year 2024-25, while private entities imported 1,548,757 MT. Consequently, the combined efforts of both the public and private sectors resulted in the marketing of 1.57 million MT of LPG in 2024-25, fulfilling a portion of the country's LPG demand.

Table 6: LPG Summary, FY 2024-25 (MT)[13]

LPG Production in Patenga (ERL/LPGL)	16,187
LPG Production from Kailashtila Fractionation Plant	4,199
LPG import (private)	1,548,757
Total	1,569,143

[13] Source: Bangladesh Petroleum Corporation (BPC), NBR and HCU Data Bank

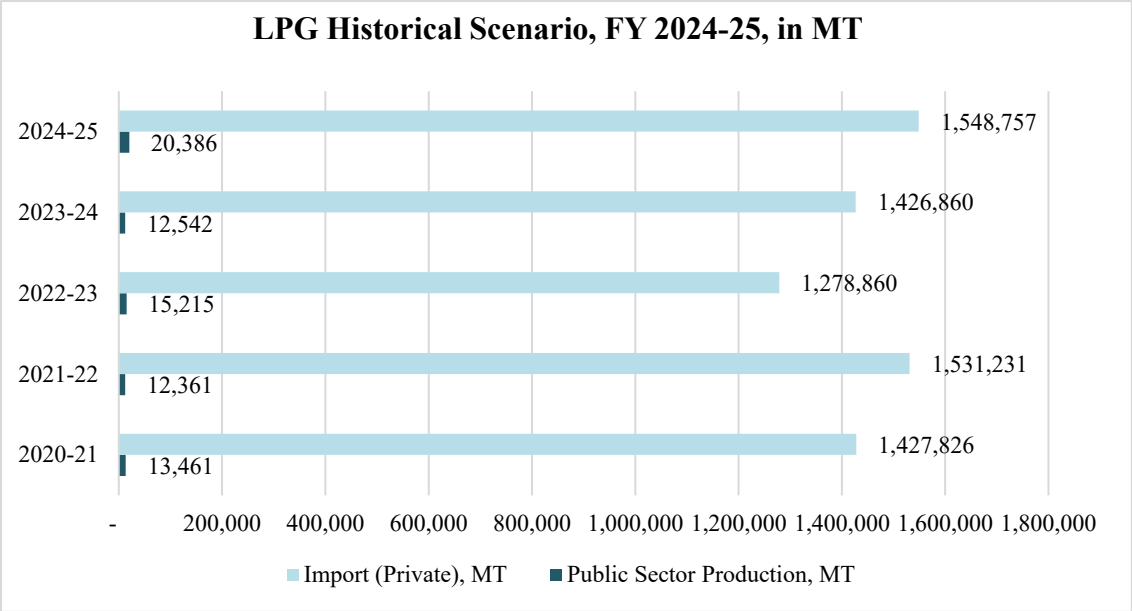


Figure 13: LPG Scenario in Last 5 years in Bangladesh

The historical scenario of LPG over the past five years is illustrated in Figure 13. The LPG supply in Bangladesh has increased significantly over the past decade, which turns nearly 1.57 million MT in 2024–25. This growth is largely driven by private sector imports, while public sector production remains relatively small. The trend highlights Bangladesh's increasing reliance on imported LPG to meet rising household, commercial and industrial energy demand.

3.5 Coal

Energy serves as a crucial indicator of a nation's economic growth and is a fundamental component of the infrastructure necessary for socio-economic development. Currently, natural gas stands as the primary indigenous energy source in Bangladesh. Research indicates that the domestic production of natural gas is expected to decline significantly in the near future. Given the uncertainties surrounding the sustainable supply of primary energy, it is essential to diversify the country's energy sources. In this context, domestic coal presents a viable alternative to enhance the nation's energy security. At present, around 26% of electricity is generated from both domestic and imported coal.

Five coal fields have been identified to date: Barapukuria, Khalaspir, Phulbari, Jamalganj, and Dighipara. Should exploration efforts be expanded nationwide, there is significant potential for the discovery of additional coal mines. Currently, coal can be extracted from four of the identified deposits, which range in depth from 118 to 509 meters. However, the extraction of coal from the Jamalganj deposit may not be feasible with contemporary technology due to its considerable depth.

Table 7: Coal Fields of Bangladesh

Place/Field (Discovery Year)	Depth (Meter)	Reserve (Million Ton)	Calorific Value (BTU/lb.)
Barapukuria, Dinajpur (1985)	118-509	410	11,040
Khalaspir, Rangpur (1989)	239-485	685	12,700
Phulbari, Dinajpur (1997)	150-270	572	11,900
Jamalganj, Jaipurhat (1962)	640-1158	1,053.9	11,000
Dighipara, Dinajpur (1995)	320-506	706	13,090
		Total = 3,426.9	

Coal might be the alternative fuel to natural gas. These coals can conveniently meet the energy needs of Bangladesh for 50 years. It is notable that the coal of Bangladesh is considered to be high quality in terms of its high level of heat generation capacity as well as low Sulphur content.

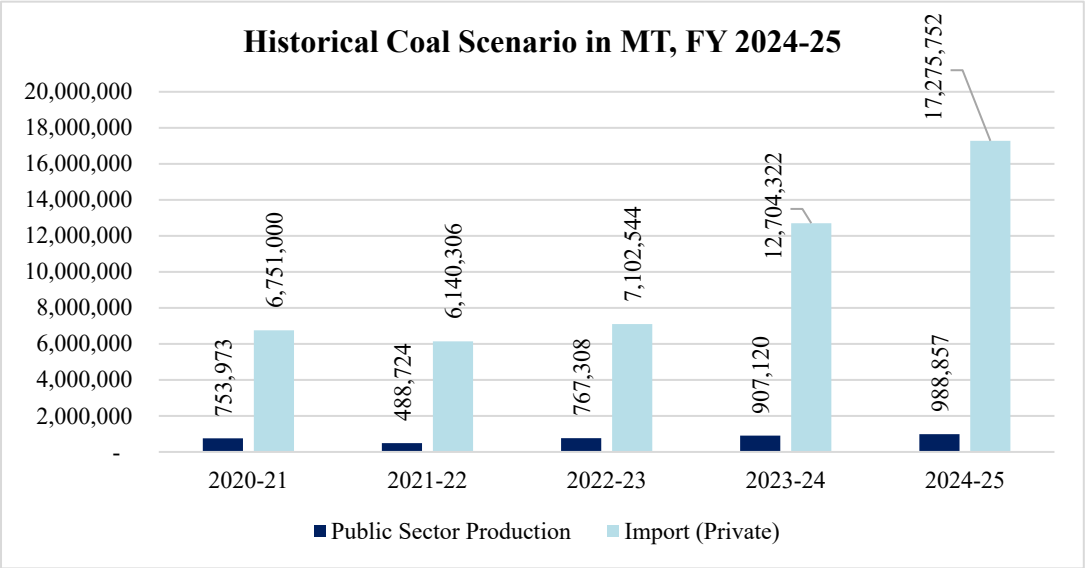


Figure 14: Historical (last 5 year) Coal scenario

Commercial coal production began in September 2005, starting with an annual capacity of approximately 1 million metric tons from the Barapukuria Coal Mining Company Limited. Presently, the daily production rate fluctuates between 2,500 and 3,000 metric tons. The data shows a rapid increase in overall supply, rising from 7.5 million units in 2020–21 to about 18.26 million units in 2024–25.[14] This growth is mainly driven by a sharp expansion in the imports, while domestic production has increased steadily. The trend indicates strongly rising demand and growing dependence on external supply, highlighting the need for development of indigenous coal fields of Bangladesh.

[14] Source: HCU Data Bank

3.6 Peat

The peat deposits of Bangladesh are located in the low-lying areas of the alluvial plain which are generally submerged under water for a large period each year. Peat occurs in Baghia-Chanda beel under Madaripur and Gopalganj district, Kola Mouza of Khulna district, Chatal beel area of Moulavibazar district, Pagla, Dirai and Shalla area of Sunamganj district, Chorkai area of Sylhet district, Brahmanbaria Sadar upazila of Brahmanbaria district and Mukundapur area of Habiganj district. It has a carbon content of 50-60% and has a calorific value between 5500 Btu/lb. and 7000 Btu/lb. The peat occurs at the surface or at shallow depths below the surface. The total peat reserve (dry peat) discovered in Bangladesh is 146.36 million tons. There is no commercial utilization of peat in Bangladesh at present. Peat can be conveniently used in the form of briquette, ovoid and compressed tablets as an alternative fuel to household work, in brick and lime industries and in small capacity thermal power plant (10 MW) in rural areas. Three exploration licenses of peat is granted in Rajoir Upazila of Madaripur and Kotalipara Upazila of Gopalganj district.

3.7 Condensate and Natural Gas Liquids (NGL)

Some of the gas fields located in the north-eastern part of Bangladesh contain high concentrations of liquid hydrocarbons or condensate. This condensate has been processed in refineries and turned into petrol, diesel and kerosene since the beginning.

In the FY 2024-25, the gas fields managed by national gas production companies and production sharing contracts (PSCs) have produced a total of 2,676,639 barrels of condensate as byproducts of gas production. During this period, the production of natural gas liquids (NGL) has been approximately 123,893 barrels. (Source: MIS Report June 2025, Petrobangla).

In 2018, a fractionation plant of 4,000-barrel capacity was established in Rashidpur by SGFL to process the condensate produced. Moreover, in 2021 a catalytic reforming unit (CRU) with 3,000 barrels of capacity has been established by SGFL.

4.0 Power Generation

4.1 Primary Energy Mix for Power Generation

Bangladesh's electricity sector comprises 136 power plants with a total installed capacity of 27,414 MW. However, the highest generation recorded as of 30 June 2025 was 16,603 MW (10 May 2025), indicating a substantial gap between installed capacity and actual output, likely due to fuel supply limitations. Per capita electricity generation, including captive production, stands at 661 kWh, while electricity access has reached 100%, including off-grid renewable sources.

4.2 Power Sector at a Glance

Table 8: Bangladesh's Power Sector: At a Glance (2024-25)[15]

Types	Amount
Number of Power Plants	136
Installed Capacity (MW)	27,414
Maximum Generation (MW)	16,603
Total Consumers (in Millions)	49.5
Transmission Lines (km)	17,923
Distribution Lines (km)	655,422
Grid Substation Capacity (MVA)	86,951
Per Capita Generation (including Captive)	661 Kwh
Access to Electricity (Including Off-Grid Renewable)	100%
Overall System Loss (%)	5.93

The sector's installed capacity is distributed among public (44%), private (36%), joint ventures (9%), and imports (10%), with Bangladesh currently importing about 2,696 MW of electricity from India. Overall system loss is relatively low at 5.93%.

4.3 Power Generation Capacity

As of June 2025, the overall installed power generation capacity, categorized by sector, stands at 27,414 MW. The contributions from various sectors include 12,140 MW from the public sector, 2,478 MW from joint ventures, 9,970 MW from private entities, 130 MW from rural electrification boards, and 2,696 MW from imports.[16]

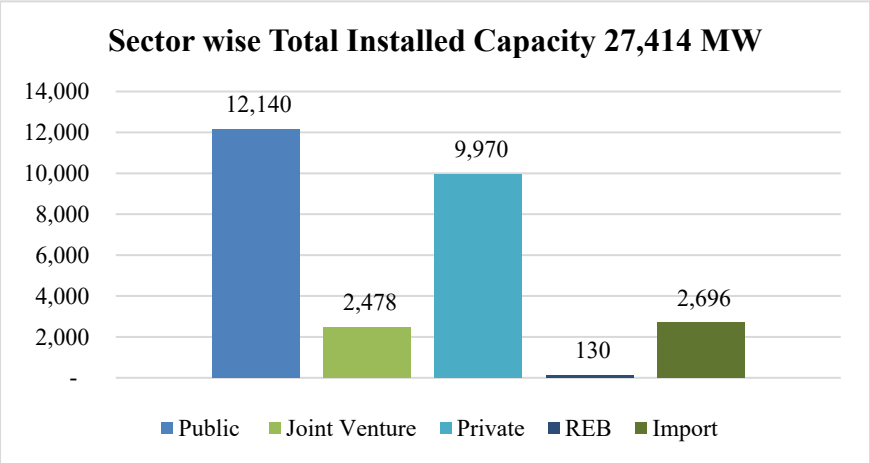


Figure 15: Grid wise Total Installed Capacity (FY 2024-25)

[15] Source: Power Division and BPDB Annual Report 2024-25
[16] Source: BPDB Annual Report 2024-25

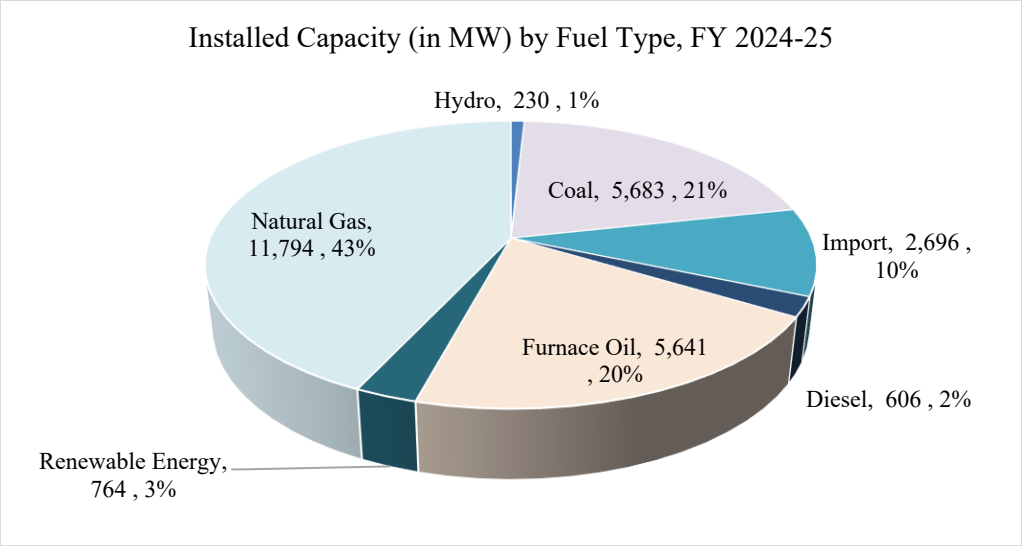


Figure 16: Installed Capacity (in MW) by Fuel Type, FY 2024-25

Bangladesh's total installed electricity generation capacity stands at 27,414 MW, with natural gas remaining the dominant fuel source, contributing 11,794 MW (43.02%) of the total capacity. Coal and furnace oil account for significant shares, providing 5,683 MW (20.73%) and 5,641 MW (20.58%), respectively. Additionally, 2,696 MW (9.83%) is imported from neighboring countries. Contributions from renewable energy (764 MW, 2.79%), diesel (606 MW, 2.21%), and hydropower (230 MW, 0.84%) remain relatively limited. Overall, the current generation mix indicates a strong reliance on fossil fuels and natural gas, highlighting the need for diversification and increased investment in cleaner and more sustainable energy sources.[17]

4.4 Net Power Generation

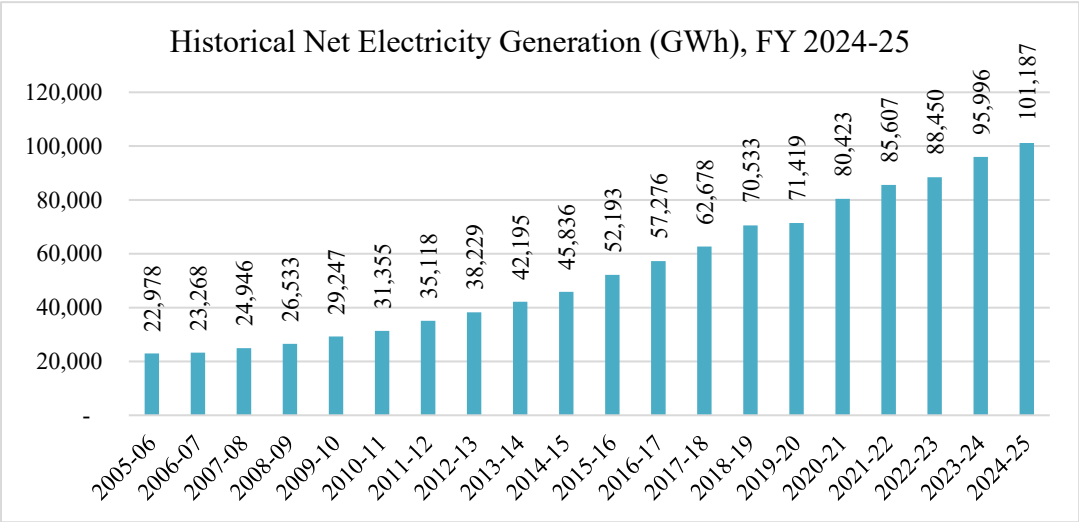


Figure 17: Historical Net Electricity Generation (GWh) in Bangladesh

Bangladesh's net electricity generation has experienced steady and substantial growth

[17] Source: BPDB Annual Report 2024-25

over the past two decades. Power generation increased from 22,978 GWh in FY2005–06 to 101,187 GWh in FY2024–25, representing more than a fourfold rise in electricity production.[18] The trend indicates consistent expansion in generation capacity and growing demand driven by economic development, industrialization, and urbanization. Particularly rapid growth is observed after FY2015–16, with generation surpassing 80,000 GWh by FY2020–21 and continuing to rise thereafter. This upward trajectory underscores the importance of sustained investment in energy infrastructure, diversification of the energy mix, and improved efficiency to ensure long-term energy security and reliability.

4.5 Power Generation by Fuel Type

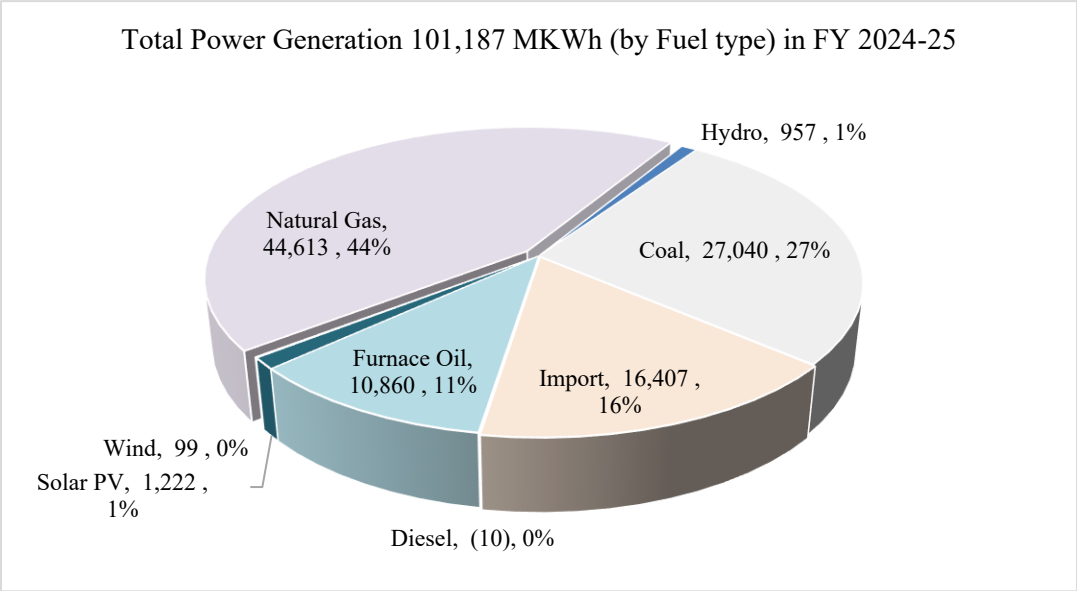


Figure 18: Power Generation 101,187 GWh (by Fuel Type), FY 2024-25

In FY2024–25, Bangladesh generated approximately 101,187 GWh of electricity, with natural gas remaining the largest contributor, producing 44,613 GWh (44%) of total generation. Coal is the second-largest source at 27,040 GWh (27%), followed by electricity imports contributing 16,407 GWh (16%).[19] Furnace oil accounts for 10,860 GWh (11%) of generation. Contributions from renewables remain limited, with solar PV generating 1,222 GWh (1%), hydropower 957 GWh (1%), and wind 99 GWh (<1%), while diesel-based generation is negligible. Overall, the generation mix highlights a strong dependence on fossil fuels and imported electricity, emphasizing the need for diversification and accelerated renewable energy setting out for long-term energy security.

[18] Source: BPDB Annual Report 2024-25
[19] Source: BPDB Annual Report 2024-25

4.6 Power Consumption

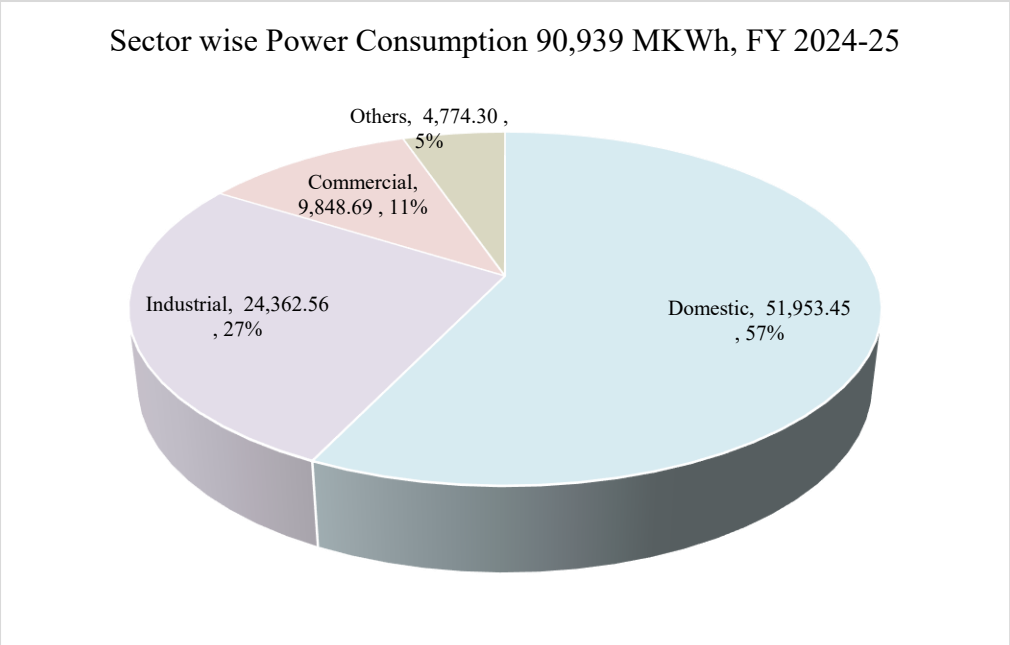


Figure 19: Sector wise Power consumption Pattern (in GWh), FY 2024-25

In FY2024–25, Bangladesh's total electricity consumption reached 90,939 GWh, with the domestic sector accounting for the largest share at 51,953 GWh (57%). The industrial sector is the second-largest consumer, using 24,363 GWh (27%), reflecting the role of electricity in supporting manufacturing and economic activity. Commercial establishments consume 9,849 GWh (11%), while other sectors, including agriculture and public services, account for 4,774 GWh (5%).[20] The consumption pattern highlights strong household demand alongside growing industrial use, indicating the need for policies that enhance supply reliability, improve energy efficiency, and support sustainable electricity demand management.

5.1 Renewable Energy

Renewable energy has considerable potential to strengthen Bangladesh's energy security while reducing reliance on natural gas. In many rural areas where access to natural gas and grid electricity remains limited, households depend largely on biomass for cooking. At present, biomass represents the largest renewable energy source, contributing about 23% of the country's primary energy supply. Bangladesh also has promising prospects for solar power generation, reflecting the growing global transition toward renewable energy due to the depletion of fossil fuel resources and increasing environmental con-

[20] Source: BPDB Annual Report 2024-25

cerns. Renewable energy resources in Bangladesh can broadly be grouped into three categories: traditional biomass, conventional hydropower, and modern renewables such as solar, wind, and biogas.

5.1.1 Renewable Energy (Installed Capacity) in Bangladesh

Renewable energy as per installed capacity in the FY 2024-25 is listed in the following table.

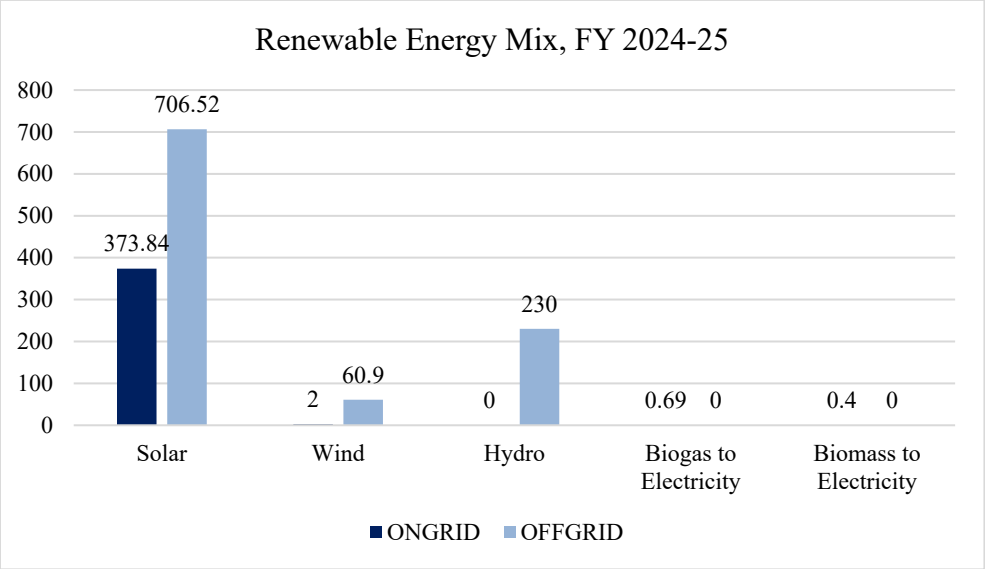


Figure 20: Renewable energy mix of Bangladesh (in MW), FY 2024-25

Bangladesh's renewable electricity capacity totals 1,635.02 MW, consisting of both off-grid (380.14 MW) and grid-connected (1,254.88 MW) systems. Solar energy dominates the renewable mix, contributing 1,341.03 MW, with 377.05 MW from off-grid installations and 963.98 MW connected to the national grid. Hydropower provides 230 MW, entirely grid-based, while wind power contributes 62.9 MW, mostly through grid-connected projects. Smaller contributions come from biogas (0.69 MW) and biomass-based electricity (0.4 MW), both operating off-grid.[21] The data highlights the central role of solar power in Bangladesh's renewable portfolio and indicates opportunities to expand other renewable technologies to diversify the clean energy mix.

6.0 Alternate Fuels

6.1 Hydrogen as energy source

Since the beginning of the 1990s, hydrogen generation has been studied as a method for decarbonizing the mix of energy sources. Hydrogen is demanded by energy-consuming sectors like industry, transport, commercial, residential, etc. Besides, hydrogen is greatly

[21] Source: National Database of Renewable Energy, SREDA

demanded as a feedstock for many industrial processes such as the production of ammonia and methanol, glass making, food processing, petroleum refining, and metal treatment. According to the International Energy Agency (IEA)[22], hydrogen demand reached 94 million tons (Mt) in 2021 (40 Mt in the refineries and rest in other H2 consuming industries) and containing energy equal to about 2.5% of global final energy consumption. Most of the increase came from traditional uses in refining and industry, though demand for new applications grew to about 40 thousand tons (up 60% from 2020, albeit from a low base). Considering policies and measures that governments around the world have already put in place, Hydrogen demand could reach 115 Mt by 2030. This is the high time to explore the Hydrogen potential in Bangladesh.

Among the different colors of hydrogen, we envisage that the production of Blue Hydrogen would be at the forefront of the decarbonizing scheme entrusted by the world communities. Blue Hydrogen is derived from fossil fuels, with integrated carbon capture and storage (CCS). Globally, approximately 95% of all hydrogen is produced by the Steam Methane Reforming (SMR) process.
Hydrogen energy can be produced from methane (CH4) through SMR reaction.

$$CH_4 + H_2O \rightarrow CO + 3H_2$$

Also, there is promising prospect of Green hydrogen production using bio-gasification (other than electrolysis powered by RE sources), e.g., Biomass gasification with CO2 capture will give an energy conversion system with negative CO_2 emissions. Probable way forward on Hydrogen Energy: Being a new technology, following task could be carried out to analyze the viability and readiness of Hydrogen Energy in Bangladesh.

- Task 1: Feasibility assessment of domestic hydrogen market (industry/off takers), supply and demand analysis
- Task 2: Feasibility of piloting hydrogen energy in Bangladesh, mainly blue hydrogen and green hydrogen (bio-gasification, not electrolysis through RE sources)
- Task 3: Hydrogen policy formulation mechanism.
- Task 4: Capacity building through knowledge and technology transfer.

6.2 Ammonia

Ammonia is considered to be a potential medium for hydrogen storage, facilitating CO2-free energy systems in the future. Its high volumetric hydrogen density, low storage pressure and stability for long-term storage are among the beneficial characteristics of ammonia for hydrogen storage.

Ammonia production includes the currently adopted Haber–Bosch, electrochemical and

[22] Global Hydrogen Review 2022, IEA

thermochemical cycle processes. Furthermore, in this study, the utilization of ammonia is focused mainly on the possible direct utilization of ammonia due to its higher total energy efficiency, covering the internal combustion engine, combustion for gas turbines and the direct ammonia fuel cell.[23]

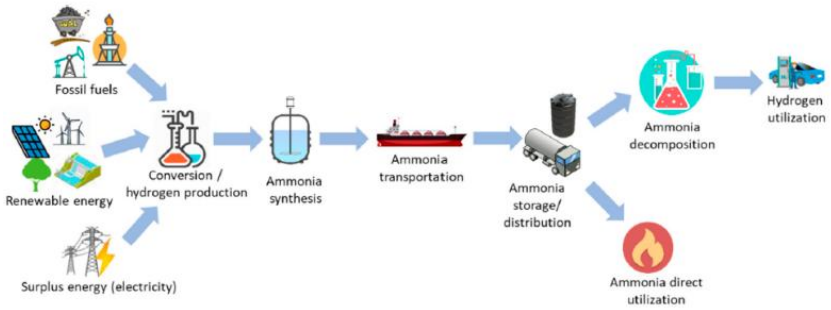


Figure 21: Production and utilization routes of ammonia in the energy sector

Ammonia is produced from hydrogen and is currently used directly as a fertilizer and chemical feedstock, although it can also serve as an energy carrier. It is considered as a "low-carbon fuel" because it does not result in direct carbon emissions when combusted.

- Grey ammonia is derived from hydrogen produced by fossil gas or coal. More than 99% of ammonia produced today falls within this category.
- Blue ammonia is also derived from fossil fuels, with integrated carbon capture and storage (CCS). Less than 1% of ammonia is produced in this way.
- Green ammonia is produced through water electrolysis powered by renewable electricity. Only 0.01% of ammonia was produced with renewable power in 2021.[24]

Bangladesh is able to produce only 30% of the demand whereas the rest 70% is imported from countries such as Russia, China, Saudi Arabia, Qatar, United Arab Emirates (UAE).[25] To address low carbon pathway, it is the high time to explore Ammonia market's feasibility and piloting Ammonia co-firing in Bangladesh.

- Task 1: Feasibility of production potential of Ammonia and its preferred production method along with available feedstock in Bangladesh
- Task 2: Feasibility of potential Ammonia market (end-users/ industries)
- Task 3: Feasibility of Piloting Ammonia co-firing in coal-based power plants in Bangladesh
- Task 4: Formulation of Ammonia Policy
- Task 5: Knowledge Transfer and Technology Transfer through capacity Building.

[23] Aziz, Muhammad et. al., Ammonia as Effective Hydrogen Storage: A Review on Production, Storage and Utilization, Energies 2020, 13, 3062; doi:10.3390/en13123062.
[24] https://www.e3g.org/news/explained-why-ammonia-co-firing-with-coal-in-southeast-asia-is-a-risky-approach/#:~:text=The%20%E2%80%9Cco%2Dfiring%20ratio%E2%80%9D,serve%20as%20an%20energy%20carrier.

[25] https://theconfluence.blog/bangladesh-opens-southeast-asias-largest-fertilizer-factory/

6.3 Municipal waste to clean energy/fuel

Being a founding member of the Global Biofuel Alliance (GBA), Bangladesh bears the responsibility to achieve various UN Sustainable Development Goals (SDG), in particular, SDG-7 (provide access to affordable, reliable, sustainable, and modern energy for everyone).

- With growing GDP of Bangladesh, resource consumption is increasing. As a result, everywhere from villages to cities, waste generation has increased manifold. If this increased waste cannot be disposed of, the country's overall environment will be destroyed.
- The country has already taken steps to promote waste to electricity. Waste-to-energy plant being built in Aminbazar at a cost of $300 million. The biopower project is planned to commence commercial operation by 2026. Municipal solid waste will be used as a feedstock to power the project. In December 2021, BPDB, Dhaka North City Corporation (DNCC) and Chinese firm CMEC (China Machinery Engineering Corporation) signed an agreement for the country's first ever waste-based power plant in Dhaka with electricity generation capacity 42.5MW from the garbage in the capital. In September 2022, another contract was signed among BPDB, Narayanganj City Corporation (NCC) and Chinese firm U&D to develop the country's second waste-based power plant (at Jalkuri) which will generate 6MW of electricity from garbage of Narayanganj city and adjoining areas.

6.4 Biomass gasification to Biomethane and biofuel

In Bangladesh, bio-fuel can be a better alternative because a 30 percent blend of bio-fuel can be used along with our diesel or petrol. Biofuels can help reduce these emissions by substituting fossil fuels in various applications in Bangladesh. For example, bioethanol can be blended with gasoline to power vehicles, biodiesel can be used in diesel engines or generators, biogas can be used for cooking or electricity generation, and solid biomass can be used for heating or industrial processes. Biofuels can also reduce the need for importing fossil fuels, which can save foreign exchange and increase energy security in Bangladesh.

Global Biofuel Alliance (GBA) was announced during 2023 G20 New Delhi summit on 9 September 2023[26] to promote the development and adoption of sustainable biofuels and set relevant standards and certification. Bangladesh joins the Global Biofuels Alliance because it recognizes the potential of biofuels to reduce its dependence on fossil fuels, enhance its energy security, and mitigate its greenhouse gas emissions. Bangladesh is one of the most vulnerable countries to the impacts of climate change, and it has committed to

[26] https://indianexpress.com/article/india/india-clean-energy-g20-global-biofuel-alliance-8932129/

reducing its emissions by 5% by 2030 under the Paris Agreement. Biofuels can help Bangladesh achieve this target by replacing conventional fuels in the transport sector, which accounts for about 18% of its total energy consumption[27]. The World Bank estimates that Bangladesh could raise $12.5 billion in additional financing in the medium term for climate action, including biofuel development. With strong implementation, technology development and uptake, and regional collaboration, Bangladesh can achieve its climate goals and benefit from biofuels.

Potential way forward on Biomass gasification to Biomethane and biofuel: Being a new technology, following task should be carried out to analyze the viability and readiness of Biomass gasification to Biomethane and biofuel in Bangladesh.

- Task 1: Feasibility of potential of "Biomass gasification to Biomethane and biofuel" in Bangladesh
- Task 2: Study to develop policy framework for promoting biofuel production and utilization in Bangladesh
- Task 3: Knowledge Transfer and Technology Transfer through capacity Building.

7.0 Critical/ Emerging Technologies

The global energy landscape is evolving rapidly toward technologies that improve efficiency, strengthen system reliability, and support decarbonization. Bangladesh is well placed to benefit from this transition, particularly through the adoption of advanced gas exploration and recovery methods such as 3D seismic surveys, horizontal drilling, and enhanced gas recovery (EGR) techniques. In addition, emerging solutions like Underground Coal Gasification (UCG) and Carbon Capture, Utilization and Storage (CCUS) offer promising pathways to utilize domestic resources more efficiently while reducing environmental impacts.

Bangladesh has considerable potential to harness both transitional and next-generation energy technologies. However, translating this potential into tangible outcomes will depend on sustained policy commitment, strategic investment, and institutional capacity development. Strengthening collaboration between the public and private sectors will be essential to mobilize resources, adopt modern technologies, and build a resilient and sustainable energy system that can support long-term economic growth.

7.1 UCG to produce hydrogen and biofuel

While surface gasifiers (e.g., fixed-bed gasifier, fluidized bed gasifier, etc.) for coal utilization is very popular in the world for exploiting the resource to produce hydrogen and biofuel, subsurface gasification is further capable of being the instrument which does

[27] https://www.eurasiareview.com/11092023-bangladesh-joins-global-biofuels-alliance-opportunities-and-challenges-for-biofuel-development-analysis/

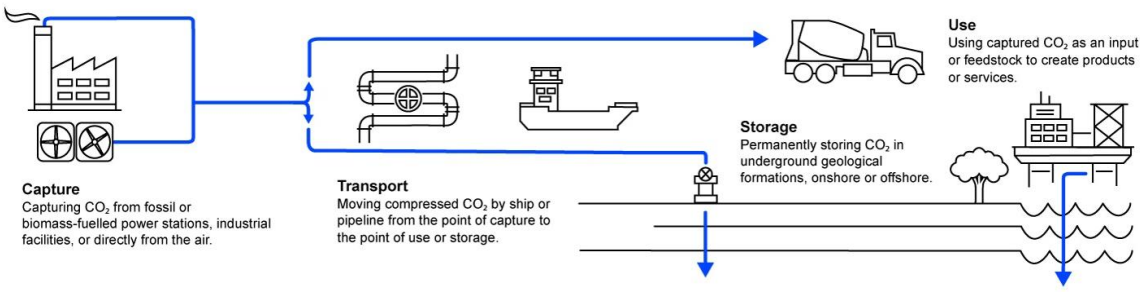
not involve surface coal extraction, handling, transportation, etc. Therefore, Underground Coal Gasification (UCG) has been popularized as an environmentally beneficiary technique and economical way of producing pure energy, by extracting and making use of the vast unmineable coal resources around the world and considered as a clean coal technology (CCT). UCG is advancing to achieve the status of other universally-accepted industrial methods, such as open-cast and underground coal mining, coking, oil refining. UCG can be tested to produce hydrogen and biofuel. Bangladesh can also be benefitted by extracting the resource through this unconventional method as the deepest and largest coalfield of Bangladesh has long been untapped due to the problems of adopting any conventional coal mining method.

Potential way forward UCG to produce hydrogen and biofuel: Being a new technology, following task tasks could be broadly identified-

- Task 1: Feasibility of UCG Technology adoption at Jamalganj coalfield
- Task 2: Feasibility of piloting UCG at Jamalganj coalfield
- Task 3: Feasibility of production efficiency of hydrogen and biofuel through UCG at Jamalganj coalfield
- Task 4: Knowledge Transfer and Technology Transfer through capacity Building

7.2 CCUS (Carbon Capture, Utilization and Storage)

The role of CCUS is pivotal in clean energy transitions for the world. CCUS can be retrofitted to existing power and industrial plants, allowing for their continued operation. It can tackle emissions in hard-to-abate sectors, particularly heavy industries like cement, steel or chemicals. CCUS is an enabler of least-cost low-carbon hydrogen production, which can support the decarbonization of other parts of the energy system, such as industry, trucks and ships. Finally, CCUS can remove CO2 from the air to balance emissions that are unavoidable or technically difficult to abate.



According to the IEA published report entitled “Tracking Clean Energy Progress 2023”, around 40 commercial facilities are already in operation applying carbon capture, utiliza-

[28] https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage

tion and storage (CCUS) to industrial processes, fuel transformation and power generation. CCUS deployment has trailed behind expectations in the past, but momentum has grown substantially in recent years, with over 500 projects in various stages of development across the CCUS value chain. Since January 2022, project developers have announced ambitions for around 50 new capture facilities to be operating by 2030, capturing around 125 Mt CO2 per year. Nevertheless, even at such a level, CCUS deployment would remain substantially below (around a third) the around 1.2 Gt CO2 per year that is required in the Net Zero Emissions by 2050 (NZE) Scenario.[29]

Bangladesh would like to test the CCUS feasibility and want to contribute the world to some extent by joining the cohorts. At the same time, this could be an immensely beneficial project if the CO2 storage is set in the depleted gas fields; this could result in enhanced recovery of our main indigenous resource.

CCUS being an emerging technology, following task tasks could be broadly identified-

- Task 1: Assessment of CCUS potential in Bangladesh (potential CO2 emitting industries, Industrial use potential of CO2, Underground Geological storage potential of CO2 in Bangladesh, etc.)
- Task 2: Feasibility of piloting CCUS in Bangladesh
- Task 3: Knowledge Transfer and Technology Transfer through capacity Building.

[29] https://www.iea.org/reports/tracking-clean-energy-progress-2023

8.0 Overall Discussion and Conclusion

Bangladesh's energy situation in 2024–25 reflects a growing imbalance between domestic supply and rising demand, particularly in the natural gas sector. Daily gas demand now exceeds 4,000 MMSCFD, while domestic production contributes only about 1,800 MMSCFD, supplemented by around 1,050 MMSCFD of imported LNG. This leaves a substantial deficit that has begun to affect power generation and industrial output, especially in energy-intensive sectors such as ready-made garments. At the same time, the country's fuel import bill has surged to a substantial amount, with LNG, petroleum, and coal accounting for the bulk of expenditure. This increasing reliance on imports is placing pressure on public finances and exposing the economy to global price volatility.

In response, the government has taken a combination of short- and long-term measures aimed at strengthening energy security. Efforts to expand domestic gas exploration have intensified, with BAPEX identifying new prospects and applying advanced technologies such as 3D seismic surveys to enhance recovery from existing fields. It is anticipated that by FY 2028–29, drilling of the 19 highest-priority wells will be completed, contributing an additional 280 MMSCFD of gas to the national grid. Upon completion of the broader program—covering the drilling and workover of 150 (50+150) wells—a further 1,500 (648+985) MMSCFD is expected to be added. These new supplies are projected to significantly offset the decline in existing reservoirs and strengthen the country's overall gas production in the coming years, while offshore exploration holds promise for larger discoveries. At the same time, diversification of the energy mix is being pursued through increased use of coal, expansion of LNG infrastructure, and ongoing development projects such as refinery upgrades and maritime energy initiatives. Cross-border energy trade is also gaining traction, reflecting a broader strategy to ensure supply stability.

Looking ahead, the energy sector stands at a critical transition point where policy coherence and implementation efficiency will determine outcomes. Reducing import dependency while sustaining economic growth will require a careful balance between accelerating domestic resource development and optimizing external energy procurement. At the same time, improving energy efficiency in industry and strengthening institutional transparency can help manage costs and enhance system performance. As Bangladesh aligns itself with global decarbonization goals, integrating renewable energy alongside conventional sources will be essential to ensure a resilient, affordable, and sustainable energy future.