

Ministry of Power, Energy
and Mineral Resources

ARTICLE 16 OF CONSTITUTION

The State shall adopt effective measures to bring about a radical transformation in the rural areas through the promotion of an agricultural revolution, **the provision of rural electrification**, the development of cottage and other industries, and the improvement of education, communications and public health, in those areas, so as progressively to remove the disparity in the standards of living between the urban and the rural areas.

Introduced in Bangladesh Constitution by Father of the Nation Bangabandhu Sheikh Mujibur Rahman





“

No house will be left in dark by Mujib Borsho. We will light every house in order to build a poverty-free country as electricity creates scope for job employment.

”

Sheikh Hasina

Prime Minister
Government of the People's Republic of Bangladesh

100

'100', in many ways, denotes just more than a number. This year, '100' indicates a story - a story that started in 1920 in Tungipara, a remote village overlooking the fertile green plains in the Southern Bangladesh. There were many unexpected turn of events full of shocks and aspirations in the story. But even against the most perilous possible outcomes, the protagonist always came out victorious. But in 1975, when the story was not even at its apex, a tsunami of darkness engulfed everything. It was a time of despair. However, gradually, the darkness is withered and light shone in. And as the word delineates, the story came full circle in 2020.

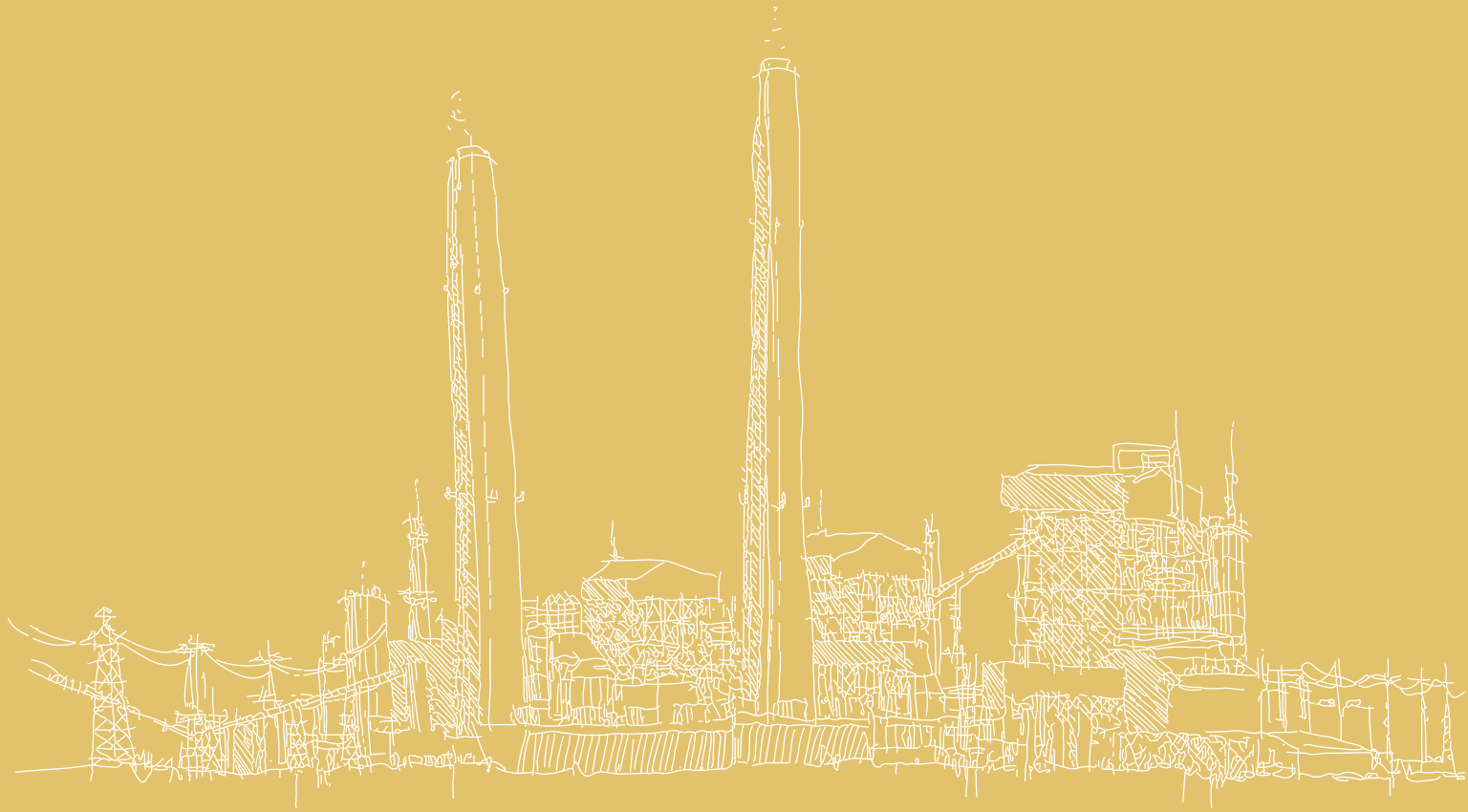
This is the story of the greatest Bangali of all times - the Father of the Bangali Nation Bangabandhu Sheikh Mujibur Rahman and '100' depicts his Birth Centenary which we celebrate this year as the 'Mujib Year'. While we owe our freedom to the long arduous struggle and valiant, self-sacrificing leadership of Bangabandhu, his immortal soul keeps guiding this nation. Bangladesh draws inspiration from the legacy he left behind. This journey now continues with his daughter Sheikh Hasina at the helm of Bangladesh.

Like every sector of Bangladesh, the sprawling growth in power and energy sector we experience today traces its foundation in the vision of Bangabandhu. This is a tribute to his undying contribution to this country, particularly in the power and energy sector.





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HISTORY OF POWER AND ENERGY SECTOR

1901

First electric bulb lighted at Dhaka's Ahsan Manjil

1948

First power department set up by government.

1970

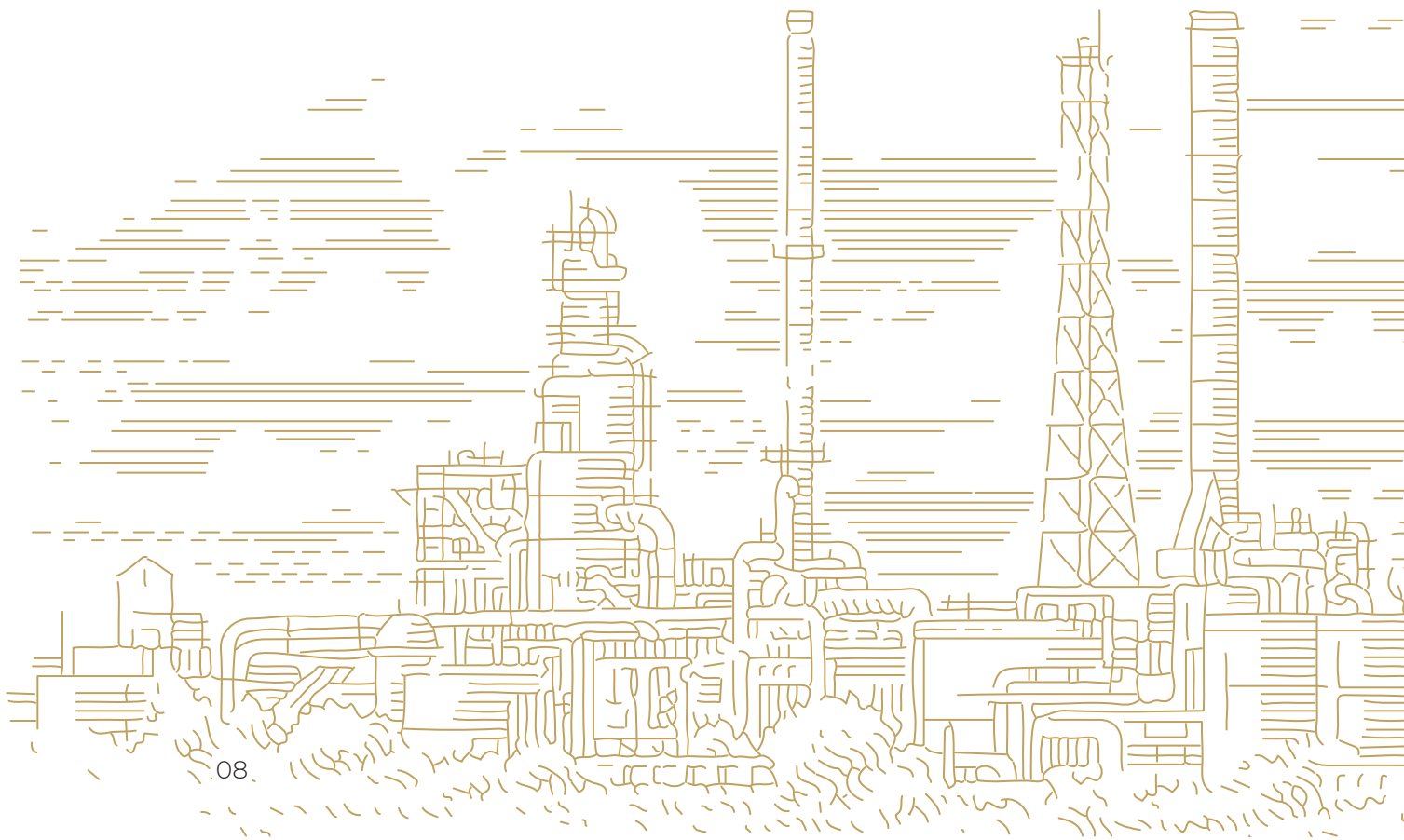
First time electricity coverage was a part of the electoral campaign

1972

Electricity was included in Bangladesh's constitution as a right for the people

1974

Bangladesh Petroleum Act enacted



1975

Government acquired five major gas fields and power sector development included in the national five year plan

1996

First private power generation policy adopted

2001

First commercial oil facility established
First IPP started commercial operation in Bangladesh

2010

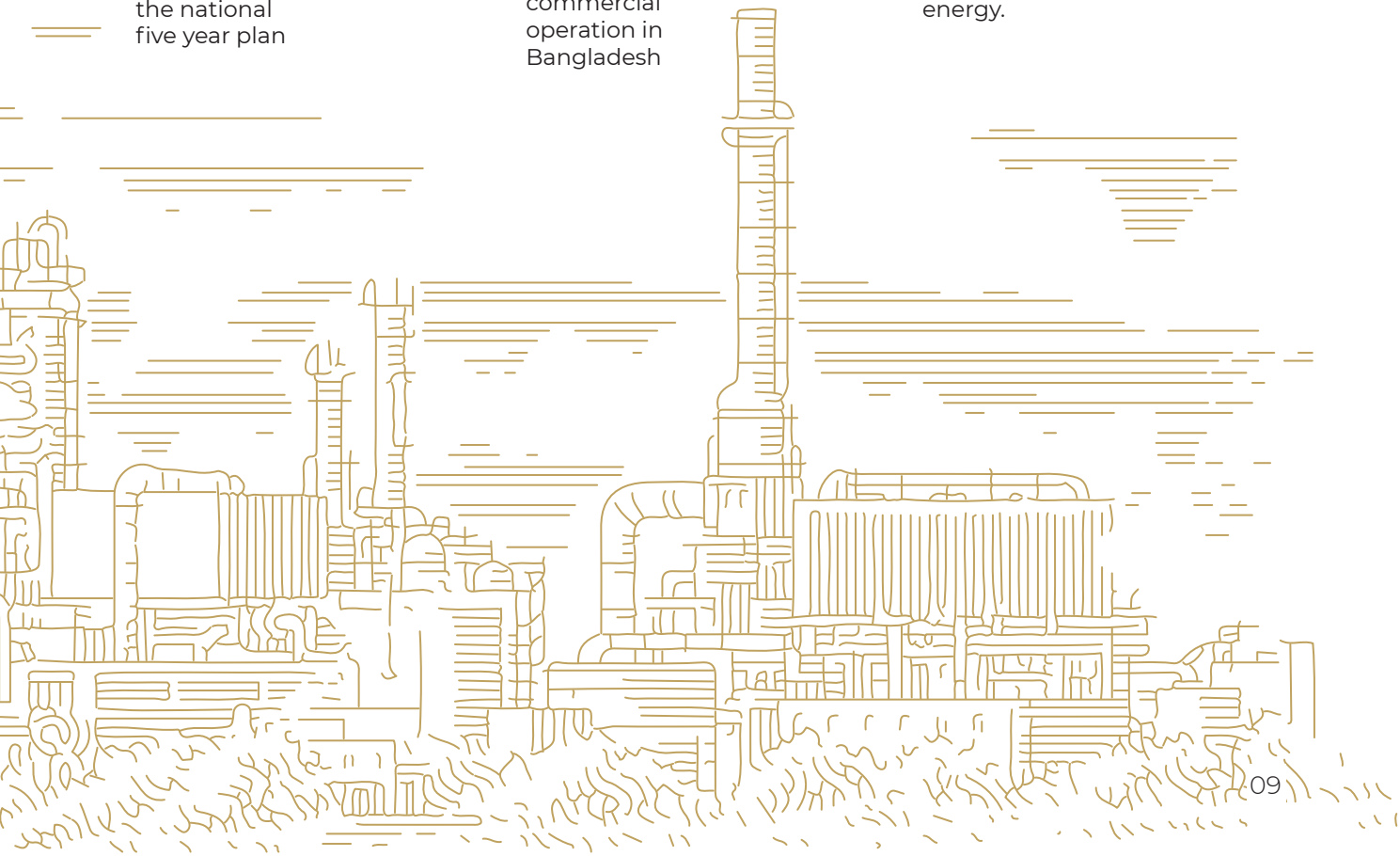
The Speedy Supply of Power and Energy (Special Provision) Act has been enacted

2012

SREDA created as a nodal agency to promote, facilitate and disseminate sustainable energy.

2015

BEPRC created for conducting research in Power and Energy Sector





POWER SECTOR

OVERVIEW

Bangladesh has been making an effort to balance the primary energy mix for power generation. The government intends to increase its power generation capacity to 24,000 MW by 2021. Within 2030, the government plans to increase power generation capacity to 40,000 MW. The current power generation capacity (installed) in the country stands at 24,982 MW using natural gas, liquid fuel, coal, renewable and import sources.

The government of Bangladesh has taken a comprehensive action plan for the development of power sector to ensure affordable electricity for all. The activity in the sector is centered on the mission to ensure reliable electricity for all by 2021 through integrated development of generation, transmission and distribution system. As a result, the rise in economic growth, the growth in the industrial sector, and rapid progress in urbanization has been achieved. As a result, Bangladesh's power sector has been recognized as one of the fastest growing in South Asia. What was achieved between 1971-2009, has been tripled in the last ten years by the Awami League government.



Number of Power Plants

144

in 2021

27 in 2009



Power Generation Capacity

24,982

MW in 2021

4,942 MW in 2009



Per capita generation

512 KWh in 2020

220 KWh in 2009



System loss in distribution

14.33% in 2009

7.91%

in 2021 (till January)



Electricity coverage

47% in 2009

99%

in 2021



Transmission Line



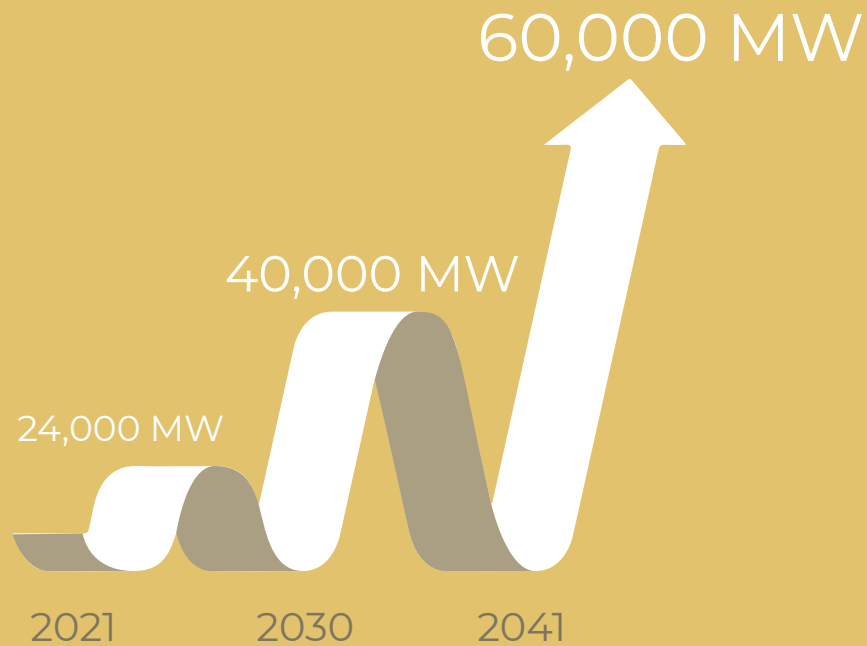
8,000

ckt.km in 2009

12,692

ckt.km in 2020

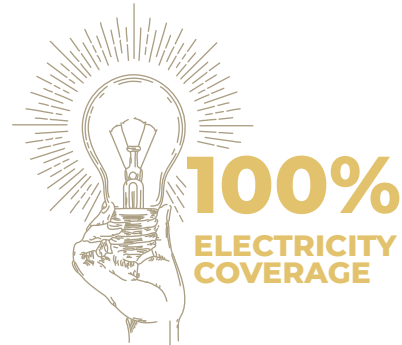
FUTURE POWER GENERATION GOALS



Power System Master Plan (PSMP)

The Power System Master Plan (PSMP) was formulated first in 2010. This was revised in 2016 as 'PSMP 2016' with focus on extensive energy and power development up to the year 2041, covering energy balance, power balance, and tariff strategies. The PSMP covers all major challenges and includes feasible proposals and action plans for Bangladesh to implement. It also covers the best pathway to attain the sustainability of the energy and power sectors in the economic growth. To that end, the priorities identified include: development of energy and power infrastructure, facing up to the depletion of domestic gas supply, improvement of power quality for the forthcoming high-tech industries, and ensuring discipline of operation and maintenance for power plants.

POWER SECTOR PRIORITIES



NOTABLE POWER HUBS


Matarbari


Maheshkhali


Payra

IMPORTANT POWER SECTOR PROGRAMS

- Increasing the share of Clean and Green Energy in Power Generation
- Modernizing and Strengthening Transmission System
- Underground Distribution Network
- Introduction of SCADA System and Smart Pre-payment Metering

NOTABLE POWER SECTOR PROJECTS

Matarbari 2x600 MW Ultra Super Critical Coal Fired Power Project

- Project completion: 2022-23 FY
- Project cost: 35984.46 crore BDT (GOB – 4926.66 crore BDT)
- Development partner: JICA
- Installed capacity: 1200 MW
- Important features:
The net plant efficiency will be 41.29% which is even higher than the average efficiency (36%) of coal fired power plants of USA (2005).
- Surface water of the nearby sea will be used for cooling and steam generation.
- NOx, SOx and PPM emission will be less than the emission from similar coal fired power plants in developed countries.

Rupsha 800 MW Combined Cycle Power Plant Project

- Project completion: 2021-22 FY
- Project cost: 8498.65 crore BDT
- Development partner: ADB
- 2x440 MW Combined Cycle Power Plant
- 230kV (29 km) Double Circuit Transmission Line
- 12km (diameter 24") gas distribution pipeline
- ERP software for NWPGL Management

Expansion and Strengthening of Power System Network under DPDC Area

- Project completion: 2023-24 FY
- Project Cost: 20468.42 Crore BDT (GOB- 7441.02 crore)
- Development Partner: China G2G.
- Power distribution capacity will rise to 5330 MVA at 132 kV level and 4680 MVA at 33 kV
- New substations: 132/33/11 kV Grid substations - 14
- 33/11 kV substations- 26
- Reinforced, Renovated & Augmented (RRA) substations:
- 132/33 kV substations: 08
- 33/11 kV substations: 04
- Underground transmission line: Total 451 circuit km
132 kV 218 circuit km
33kV 233 circuit km
- New overhead distribution Network: 582 circuit km
- Underground distribution Network: 115 circuit km 11/0.4 kV (Dhanmondi Area)

Dhaka Underground Substation Construction Project at Karwanbazar under DPDC

- Project completion: **2023-24 FY**
- Project cost: 950.40 crore BDT (324.22 crore BDT)
- Development Partner: JICA
- Installation of 132/33 KV GIT (Gas Insulated Transformer): 03 (120 MVA each)
- Installation of 33/11 KV GIT (Gas Insulated Transformer): 03 (50 MVA each)
- Installation of 132 KV GIS (Gas Insulated Switchgear), 33 KV GIS (Gas Insulated Switchgear) and 11 KV Switchgear
- Installation of 132 KV Underground Transmission Line: Approximate 1.61 km (Route Length)

Distribution Network Expansion for 100% Rural Electrification

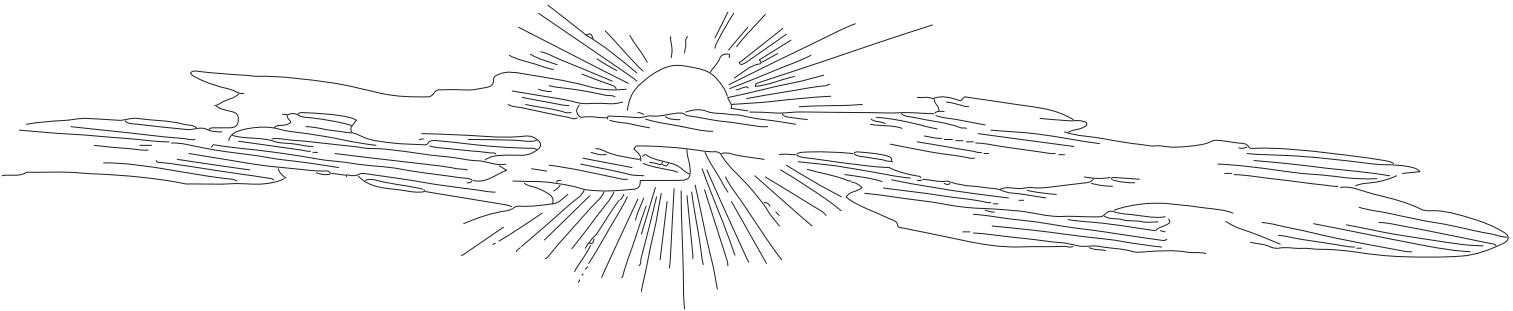
- Project completion: 2020-21 FY
- Project cost: Total – 16,734.91 crore (GOB – 16,708.56 crore)
- Electrification of 468 off grid villages under 72 PBS
- 34 lacs new consumers
- 96,095 km new lines
- 124 new 33/11 substations (1520 MVA)
- Augmentation of capacity to 535 MVA of 56 existing 33/11 kV substations
- Augmentation of capacity to 995 MVA of 100 existing 33/11 kV substations
- 101 set river crossing tower

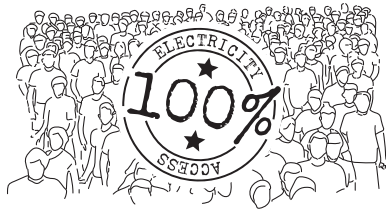
Power Grid Network Strengthening Project Under PGCB

- Project completion: 2023-24 FY
- Project Cost: 14326.30 Crore BDT (GOB- 5920.73 crore)
- Development Partner: China G to G.
- New transmission line: 100 km 400 kV line
330.20 km 230 kV line
334.50 km 132 kV
- Renovation of Existing 225 km 132 kV line.
- Construction of a new 400/132/33 kV substation.
- Construction of 12 new 230/132 kV substations.
- Construction of 28 new 132/33 kV substations.
- Extension of 1 existing 400 kV substation.
- Extension of 3 existing 230/132 kV substations
- Extension of 14 existing 132/33 kV substations.
- Renovation of 5 existing 132/33 kV substations.
- Capacity upgradation of 7 existing 230/132 kV substations.
- Capacity upgradation of 28 existing 132/33 kV substations.

RENEWABLE ENERGY

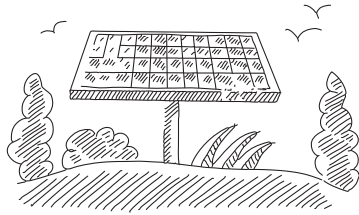
Technology	Off-grid (MW)	On-grid (MW)	Total (MW)
Solar	346.70	185.99	532.69
Wind	2.00	0.90	2.90
Hydro	0	230.00	230.00
Biogas to Electricity	0.69	0	0.69
Biomass to Electricity	0.40	0	0.40
Total	349.79	416.89	766.68





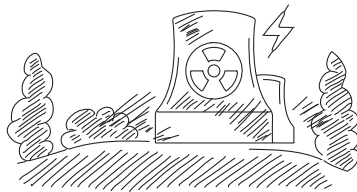
100%

Access to
Electricity by
Mujib Year



**5.8
MILLION**

Solar Home
System already
installed Since
2009



767 MW

Capacity of
renewable energy
installations



533 MW
Solar



2.9 MW
Wind



230 MW
Hydro

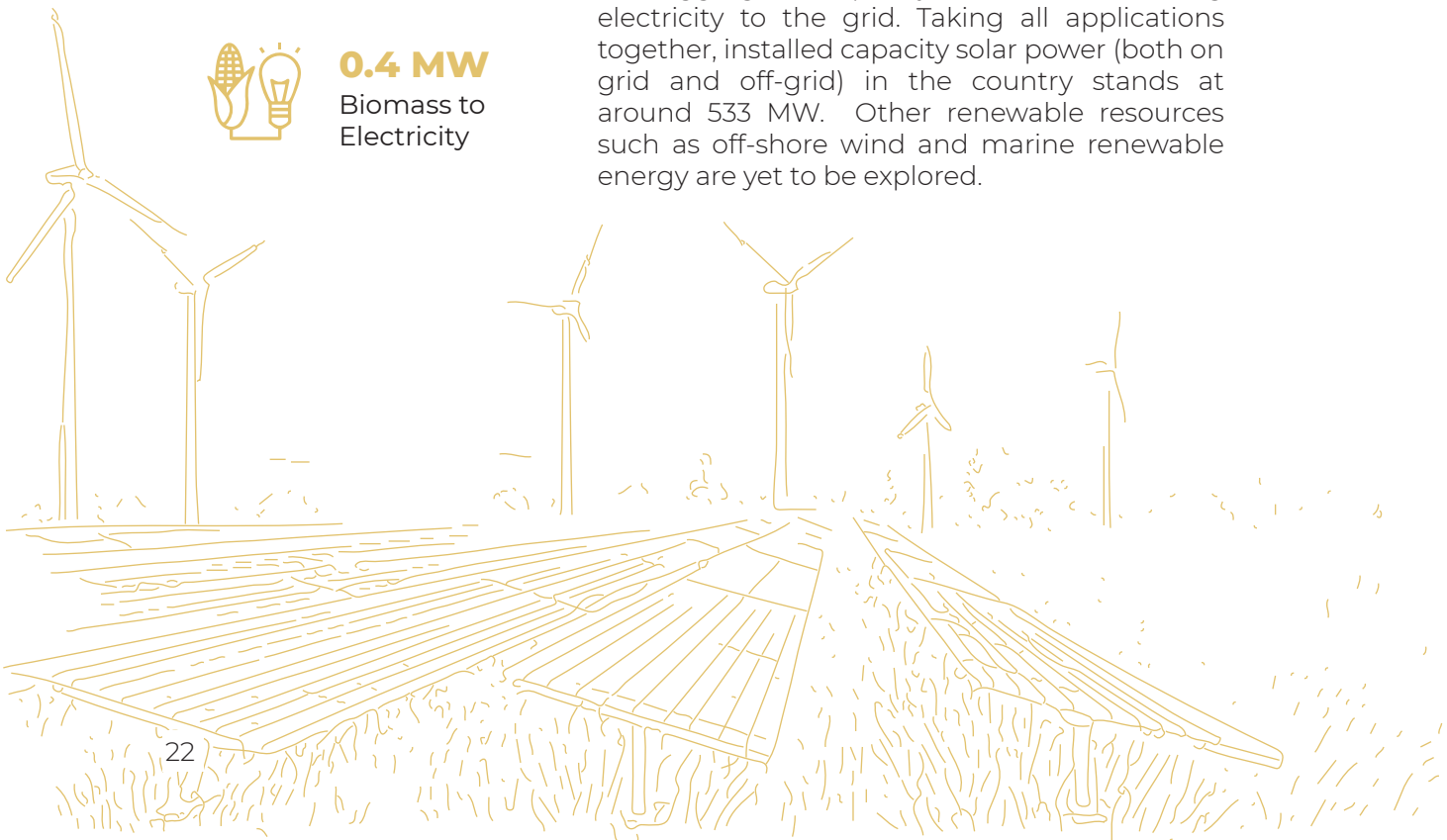


0.69 MW
Biogas to
Electricity



0.4 MW
Biomass to
Electricity

Given limited resources and insignificant carbon footprint, Bangladesh has made all out efforts to scale up renewable energy. To date, capacity of renewable energy installations is around 767 MW including 230 MW hydropower and 2.9 mw wind power. Most of the capacity addition is from Solar Home Systems (SHSs). Until recently, installation of SHSs reaches 5.8 million providing electricity to over 20 million people outside the grid network. In addition to SHSs, 26 mini-grids are now providing grid quality power in off-grid areas. A total of 2130 solar irrigation systems are now in operation reducing significant amount of diesel consumption. As of now, 7 solar parks with aggregated capacity of 130 MW are feeding electricity to the grid. Taking all applications together, installed capacity solar power (both on grid and off-grid) in the country stands at around 533 MW. Other renewable resources such as off-shore wind and marine renewable energy are yet to be explored.



INTERNATIONAL AND REGIONAL COOPERATION



Bangladesh cross-border electricity trade



Bhutan and Nepal

Bangladesh played a key role in the signing of the South Asian Association for Regional Cooperation (SAARC) deal for regional power grid at Kathmandu, Nepal. Bangladesh plans to invest \$1 billion in a mega hydroelectricity project in Bhutan. It is expected that Bangladesh



International and Regional Organizations

will have the largest share of the power produced by the hydroelectricity plant. The Government expects to get 1,000MW from the project. Bangladesh has a similar plan of investing in a hydroelectricity plant in Nepal as well, for which feasibility studies are currently taking place.

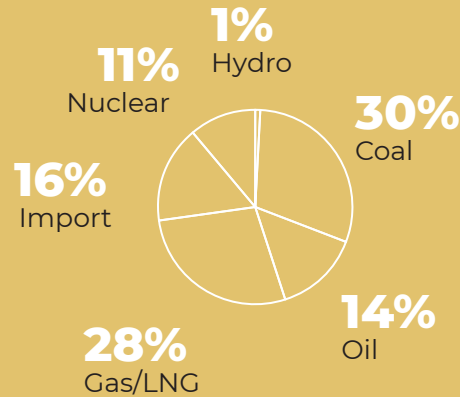
India

During last ten years Bangladesh and India power cooperation has opened up a new chapter on an unprecedented scale. Tripura has been supplying 160 MW of electricity to Bangladesh since March 23, 2016, in addition to the 500 MW the country is receiving from West Bengal since 2013.

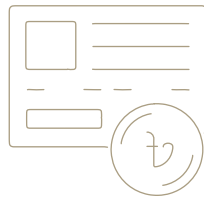
In June 2015, an MoU and a Sale Purchase Agreement were signed between Numaligarh Refinery Ltd (NRL) of India and Bangladesh Petroleum Corporation (BPC) for construction of a pipeline from Siliguri, India to Parbatipur, Bangladesh for supply of High-Speed Diesel to Bangladesh. The two Prime Ministers directed the officials of both countries to quickly finalize the terms for establishment of the Joint Venture Company which will construct and operate the pipeline. Currently, a joint feasibility study is being conducted by the two countries for the construction of a 129-kilometer cross-country petroleum pipeline.

In January 2016, the Adani Group and Reliance ADAG announced their intent to invest around \$11 billion in power, LNG and ports sectors in Bangladesh. Reliance Power intends to generate 3,000 MW in Bangladesh using LNG from a Floating Storage Regasification Unit (FSRU) to be installed by it. The first phase of this project for generation of 700 MW in Meghnaghat has been approved. The Adani Group intends to supply power using dedicated transmission lines to Bangladesh from the two 660 MW plants to be set up in Jharkhand.

2030 TARGET ENERGY MIX IN POWER GENERATION



NOTABLE POWER SECTOR TECHNOLOGIES



Pre-payment Metering System

Pre-payment metering system has been introduced nationwide aimed at ensuring easier bill payment with hundred percent collection of electricity bill. About 800,000 pre-payment meters have been installed. After installation of these pre-payment meters there would be no accounts receivable of pre-payment consumers. Moreover, due to introduction of pre-payment meters, system loss has been reduced significantly.



High Voltage DC (HVDC)

The first ever 400kV - HVDC line has been established to import 500 MW power from Baharampur, India through Bheramara, Bangladesh Grid Interconnection. The 54.7 ckt-km 1113 MCM double circuit line has been established in 2013 to transmit electricity by converting into high voltage DC from AC and then converted into 230 kV AC at the Bheramara station. Augmentation of this 400 kV HVDC line is going on to make it double.



Technology in Power Sector

In order to establish good governance through increasing the quality of customer service, increasing efficiency, transparency and accountability, the Power Division has taken and implemented digitalization of the sector. In addition to online application system for electricity connection, bill payment system, complaint management system, a broad-based Enterprise Resource Planning (ERP) solutions has been implemented across the power sector. A comprehensive website of the Ministry of Power, Energy and Mineral Resources has been developed, which is playing important role in social communication and promotion.



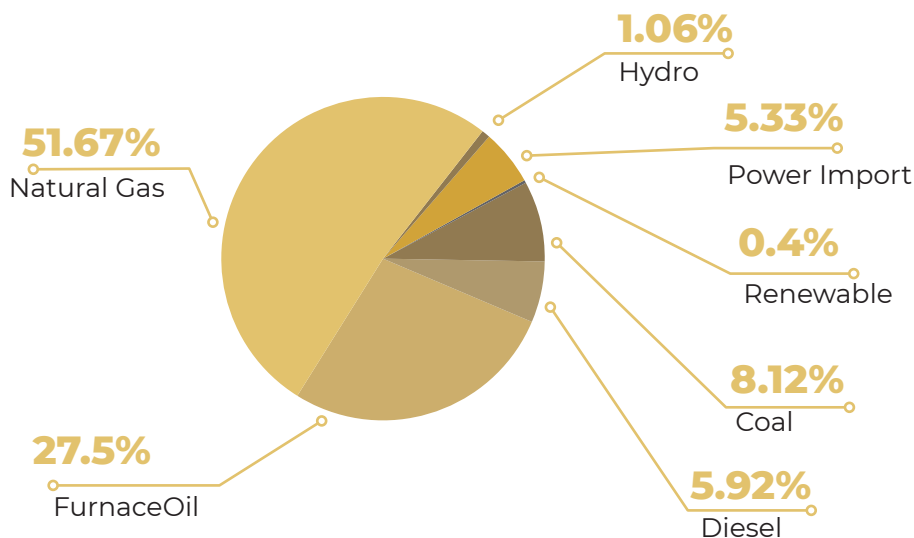
Underground System

Government has decided to develop underground distribution system in major cities of the country. The aim is to provide the facility of modern cities with an advance electricity supply system. The government owned power distribution companies have adopted several plans to establish underground distribution substations and supply lines to switch to modern underground power-distribution system



ENERGY SECTOR

SOURCE OF ENERGY: PRESENT AND FUTURE



■ Fuel Mix at Present

LNG and LPG

Imported Liquefied Natural Gas (LNG) constitutes about 20% of total gas supply currently and it is estimated that it would increase about 70% by 2041. Two Floating Storage & Re-gasification Unit (FSRUS) were installed in deep sea at Moheshkhali, Cox's Bazar to re-gasify imported LNG which started their commercial operation in 2018 and 2019 respectively. Of 3250 mmcf/d total gas supply, around 700 mmcf/d Re-gasified Natural Gas (RLNG) is supplying from the installed two FSRUs having capacity to supply 500 mmcf/d of RLNG each. Government has taken decision to build a Land-Based LNG terminal with a re-gas capacity of 1000 mmcf/d at Matarbari,

Cox's Bazar which is expected to be commissioned in 2026/2027 as well. Bangladesh is trying to replace its dependence on natural gas with LPG and LNG given the depleting indigenous natural gas reserves and the sustainability of import prospects for the latter two. To that end, household pipeline gas is being replaced by LPG gradually.

Industrial sector contributes 30% of Bangladesh's GDP. The government has also undertaken the monumental task of setting up 100 economic zones to further expedite economic growth. The Government has pledged uninterrupted

power and gas supply in these zones. LNG has been earmarked for being the primary source of energy in these zones.

To promote LPG instead of natural gas, all household gas supply will be replaced with LPG. Currently, one of the primary sources of fuel for road transports like bus, cars, 3-wheeler taxis is Compressed Natural Gas (CNG). This will be replaced with autogas.

Coal

Bangladesh is a developing country. To make resourceful developed Bangladesh by 2041, Govt. has prepared a Power System Master Plan. According to Master Plan, power generation will be 40,000 MW and 60,000 MW in 2030 and 2040 respectively. In Bangladesh, Power demand growth is about 9-10%. Bangladesh are using different fuel mix such as natural gas, liquid fuel, nuclear hydro LNG and coal for power generation. To implement the Master Plan, Govt. took initiative to establish 22 coal based power plants by which the coal based generation would be 19,668 MW.

Environment and climate is changing day by day. This is why the world is shifting towards other fuel based power generation from coal and Bangladesh is a part of this change. So the Govt. has decided not to implement 10 of the 22 coal based power plants by which coal based generation will be reduced by 8451 MW. Moreover, the government has decided not to establish any new coal based power plant in future. As a result the coal based generation will be decreased gradually.

Clean Cook Stoves

In 2013, Power Division Launched 'Country Action Plan for Clean Cookstoves' to promote clean cooking in Bangladesh. The target was 'Clean Cooking for All by 2030'. A project titled 'Household Energy Platform Programme in Bangladesh' has been working under SREDA to coordinate and facilitate clean cooking sector activities.

In continuation of the Country Action Plan, SREDA has come up with a Draft 'National Action Plan for Clean Cooking' that suggests adoption of various clean cook stoves and clean fuels putting milestones to achieve government's target to bring 100% cooking systems within the perview of clean cooking by 2030.

It's a concerted effort of the Government, academia development partners, financial institutions and NGOs. The success depends mainly on the willingness and ability of the end users to change their habit to clean cooking systems.

Let's say NO to the cooking system that is unclean, unhealthy and unfriendly to nature & environment.

ENSURING ENERGY SECURITY

Commercial energy consumption comes mostly from natural gas (around 66%), followed by oil, hydropower, and coal.

Non-commercial energy sources, such as wood fuel, and crop residues account for over half of the country's energy consumption.

Bangladesh is currently using or looking into the following primary energy sources: Liquefied Natural Gas (LNG), Liquefied Petroleum Gas (LPG), coal and liquid fuel.

Gas is the predominant source of energy supplying 62% impetus for power production. The demand is about 3,600 mmcf and the supply is 3,250 mmcf.

Bangladesh is aiming to diversifying the sources to ensure: capacity to absorb external shocks, reduce dependency and mitigate risks of manipulation.

The government is strictly monitoring and enforcing implementation of updated legal frameworks for cutting down on waste and promote energy efficiency.

The aims is to increase power generation efficiency from 38% to 45% and save gas usage from urea manufacturing by 75%.

By promoting cogeneration and regeneration in captive industries, energy efficiency is expected to increase from 20% to 60%.

POLICIES AND INITIATIVES FOR ENERGY EFFICIENCY

Formulating the Energy Efficiency and Conservation Master Plan up to 2030.

- Action Plan for Energy Efficiency and Conservation 2016,
- Energy Efficiency and Conservation Rules 2016.
- The draft of Energy Audit Regulation.

Making provisions for energy efficiency and conservation in the Bangladesh National Building Code.

Formulating policy for giving preferential loans to environmentally friendly and green industries through Bangladesh Bank.

Providing soft loans for energy efficient equipment in industries, buildings and houses through the Energy Efficiency and Conservation Promotion Project.

Re-financing scheme for 51 energy efficient products in commercial banks.

Introducing waste heat recovery and co-generation activities in 50 industrial institutions involved with captive power generation.

Introducing energy efficient LED street lamps in various city corporations and municipal corporations.

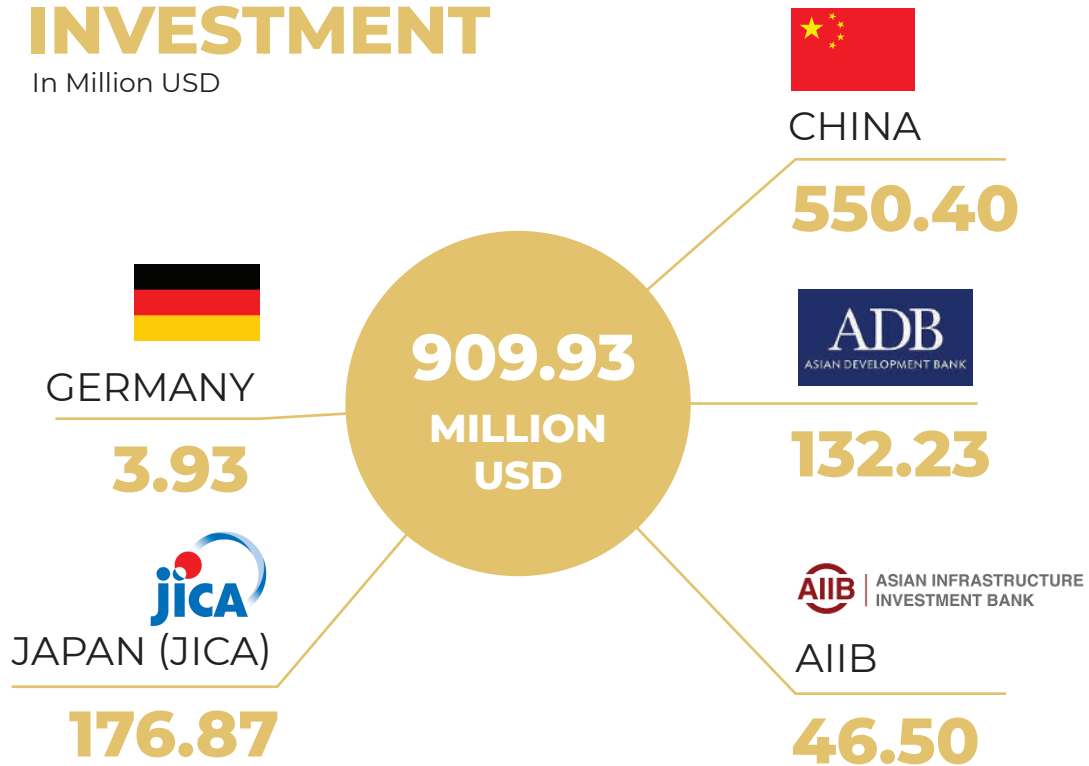
Innovating 7 different models of energy saving cook stoves and distributing 29,31,000 units.

Setting up 75 energy efficient Improved Rice Parboiling System

Draft Labelling Regulation for Electrical Appliances

ENERGY SECTOR INVESTMENT

In Million USD



INFORMATION ABOUT BPC PROJECTS

Installation of Single Point Mooring (SPM) with Double Pipeline

At present, import of petroleum oil faces some difficulties due the low draft of Karnaphuli river. Large vessels cannot enter this channel and are not capable to operate and therefore unloading is done through lighterage vessels. To overcome this issue and to ensure safe, fast and cost-effective import of petroleum oil, a project titled "Installation of Single Point Mooring (SPM) with Double Pipeline" has been taken by the Government. The proposed SPM will be installed in Bay of Bengal at west side of Maheshkhali, Cox's Bazar. It will be used as a node to pump crude oil and High Speed Diesel (HSD) from mother vessel directly to storage tanks through two separate pipelines. After that, crude oil and HSD will be pumped to Eastern Refinery Limited (ERL) and main installation at Patenga, Chattogram through two separate pipelines.

- Project completion
2021-2022 FY
- Yearly savings
BDT 800 crore
- Pipeline length
220 km (offshore
146 km, onshore
74 km)
- 3 crude oil tanks
(each 50,000 m³)
- 3 HSD Tanks
(each of net capacity
30,000 m³)
SCADA

Installation of Eastern Refinery Limited (ERL) Unit 2

Eastern Refinery Limited (ERL), is the only state-owned refinery. Every year 1.3 million metric tons of crude oil is processed by ERL. To meet increasing demand, as well as to reduce the import dependency of petroleum products, government taken a project to install 'ERL Unit-2' with a processing capacity of 3 million metric ton crude oil per year.

- Project completion
2024-2025 FY
- Yearly savings
BDT 2400 crore
- Capacity
3.0 million MT

Pipeline for Transportation of Petroleum Oil from Chattogram to Dhaka

Currently, the transmission network of diesel (having 70% share of petroleum oil demand) is mostly based on the waterways distributed around the country. This poses some challenge in ensuring energy security, especially during dry season when the navigability of the rivers is low. To overcome this challenge a project titled "Pipeline for Transportation of Petroleum Oil from Chattogram to Dhaka" has been undertaken for transportation of HSD from Chattogram to Godnail and Fatullah depot at Narayanganj. This project will also ensure seamless, environment-friendly and efficient transportation by eliminating the transportation losses.

- Project completion
DEC 2022
- Yearly savings
BDT 237 crore
- Pipeline length
250 km
- Tank capacity
22300 MT
- Implementor
24 ECB,
Bangladesh Army

Jet-A-1 Pipeline from Kanchan Bridge, Pitalgonj to Kurmitola Aviation Depot (KAD) Depot, Dhaka

To ensure uninterrupted, reliable, risk-free and loss-free supply of fuel (Jet A-1) for aircrafts to KAD, Bangladesh Petroleum Corporation (BPC) has undertaken this project that includes jetty, storage tanks and pumping facilities at Pitalgonj near Kanchan Bridge at Rupgonj, Narayanganj and an underground pipeline from there to KAD.

Land based LPG Terminal

Annual Capacity
1-1.2 million MT

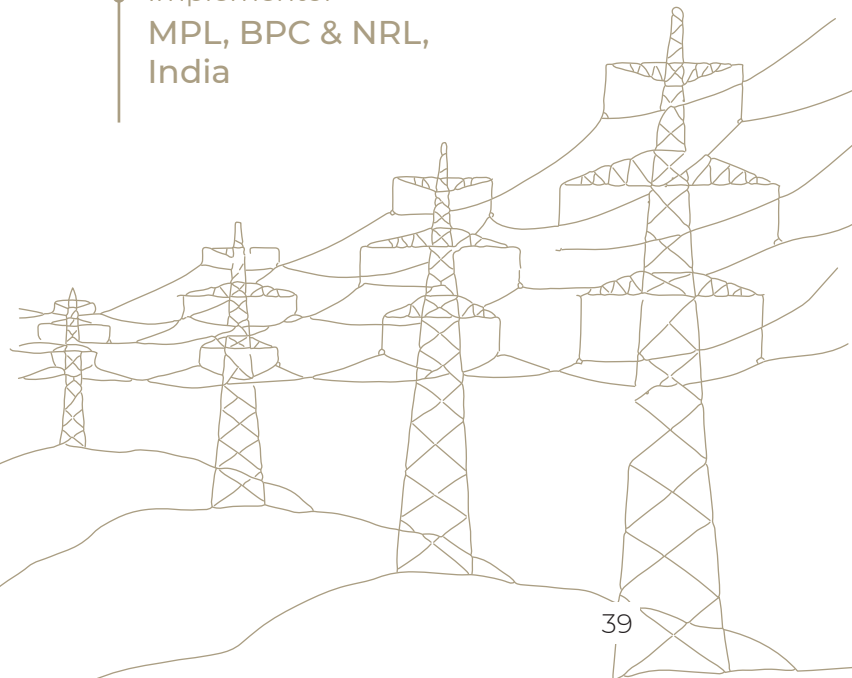
At present an extremely low share of LPG can be provided from domestic sources like Eastern Refinery Ltd & Gas fields. Major volume of LPG are sourced from abroad by private operators. This import of LPG faces challenges due to lack of navigability of large LPG vessels in Karnaphuli and other inland channels. To overcome this issue as well as to meet the increasing demand and ensuring consumers' rights and privileges, BPC has decided to establish a land base LPG terminal in Moheskhal, Matarbari Area, Cox'sbazar. Annual operational capacity will be 1 - 1.2 million metric tons.

- Project completion
2021-2022 FY
- Yearly savings
BDT 23.0 crore
- Pipeline length
16 km
- Storage tank number
3
- Tank capacity
9,000 MT
- Implementor
NKFTCL,
Bangladesh
Navy

India-Bangladesh Friendship Pipeline (IBFPL) from Shiliguri, India to Parboatipur, Dinajpur, Bangladesh

In order to ensure efficient, loss-free, cost-effective and reliable transportation of petroleum oil round the year (including the irrigation season) in the northern part of the country, BPC has initiated this project to import Gas Oil (HSD) from Numaligarh Refinery Limited (NRL), India. NRL has agreed to supply the same from its Siliguri Marketing Terminal (SMT) on mutually agreed terms and conditions to Parbatipur, Dinajpur. Completion of the project will make the oil supply chain more robust, uninterrupted and cohesive.

- Project completion
2021-2022 FY
- Pipeline length
**131.5 km (BD
126.5 km and
India 5 km)**
- Pipeline capacity
1.0 MMTPA
- Storage tank capacity
28,800 MT
- Implementor
**MPL, BPC & NRL,
India**



INFORMATION ABOUT PETROBANGLA ACTIVITIES

Five coal fields

- Barapukuria-390 MT
(present production level at about 1 MT/Year)
- Dighipara-706 MMT
- Jamalganj-5450 MMT
- Khalashpir-685 MMT
- Phulbari-572 MMT
- Total potential deposit 7803 million tons(MMT) (equivalent to 184.00 TCF of natural gas)

Deposit of Granite Rock

Maddhapara,
Dinajpur District

- Rock reserve
174 million metric ton (MMT)
- Mine 1
Area: 1.2 square kilometer
Production rate: 1.65 MMT/year (5,500 MT/ day)
- Prospective Mine 2
Area:
2.25 square kilometer

Production capacity:
3.3 MMT/ year (11,000 MT/ day).

Iron Ore Deposit

Iron ore deposit was discovered at Hakimpur Upozila, Dinajpur District in 2019 by Geological Survey of Bangladesh (GSB). Extension of Iron ore body is about 10 square Kilometer and deposited in Basement Rock. Primary data suggested that the iron ore has 60% Iron Oxides. In world scenario, 50% Iron Oxides in iron ore is economically viable for extraction. Subject to positive outcome of feasibility study, the extract may be used to earn foreign currency after meeting the domestic demand.

Gas Sector Master Plan (GSMP), 2017

Projection of Gas demand-supply based on long-run marginal cost of supply

- *Regional gas development and integration of Bangladesh gas system with neighboring countries;*
- *Optimising expansion of gas supply and transmission infrastructure in the medium- and long term;*
- *Investment Plan*
- *Recommendations on changes to the policy, legal, regulatory and institutional framework required to support long-term gas development.*

Important Directives

- Assessment of Oil & Gas exploration possibilities and development of a road map for enhancement of Gas reserve
- Gas field development to meet the growing demand considering the flow patterns from various gas fields to the demand centers using the existing infrastructure
- Projection of LNG imports
 - 1200 mmcfd in 2020-21
 - 2123 mmcfd in 2025-26
 - 1383 mmcfd in 2030-31
 - 3059 mmcfd in 2035-36
 - 5755 mmcfd in 2040-41



FLAGSHIP POWER AND ENERGY PROJECTS

Building New Power Plants

Between Jan 2009 and June 2020, the Government has signed deals for 151 new power plant projects with a combined generation capacity worth 30,928 MW. During that same period, production has been started in 128 new power plants with a combined total capacity of 15,901 MW. 44 more power plants would come into operation between July 2020 to June 2027 adding 15,924 MW to the national grid which are now under construction. Tender process (LOI/NOA/Tender Invite) has been initiated for another 18 power plants having a total capacity of 3,435 MW. These plants are expected to start operation between 2021 to 2023.

The government has also a plan to construct 16 power plants with a total capacity of 19,100 MW.

Government has also taken initiative to import power from Neighboring country . All ready importing 1160 MW from India. Another 1496 MW will import from India by 2022 is now under construction.

Rooppur Nuclear Power Plant



1st nuclear power plant of Bangladesh

1.4 million households can be supplied

11.55% national power demand expected to meet

Vision to generate 4,000 MW nuclear energy by 2030

Rooppur Nuclear Power Plant is the first nuclear power plant of Bangladesh, currently under construction with financial and technical support from Russia. The nuclear power plant (NPP) includes two units namely Rooppur Unit-1 and Rooppur Unit-2 with a capacity of 1.2GW each.

Rooppur Unit-1 is scheduled to commence operations in 2023, while Rooppur Unit-2 is due to come online in 2024. This power plant is expected to generate 2,400 MW, supplying 11.55% of the total national power demand.

This project is considered to be a milestone, making Bangladesh the third country in South Asia to acquire civil nuclear facility.

Moheshkhali Floating liquefied natural gas (LNG) terminal

1st LNG floating terminal in Bangladesh

660MW
electricity generation capacity

Moheshkhali floating liquefied natural gas (LNG) terminal has been developed offshore, at the Moheshkhali Island in the Bay of Bengal, Bangladesh. This is the country's first LNG import terminal and is expected to help secure the future provision of energy in the country. The terminal features a base-load capacity of 500 million standard cubic feet of gas a day (MMscf/d). The project has jointly been developed by Excelerate Energy and Petrobangla on a build, own and operate basis. The LNG

terminal will include a floating storage and regasification unit (FSRU) along with a subsea buoy system and pipeline, which connects the terminal to an onshore pipeline system. The terminal's offshore subsea buoy system will be used for mooring and will also serve as a conduit to transfer natural gas onshore. The new terminal will enable Petrobangla to import LNG from international gas markets and increase natural gas supply in Bangladesh by approximately 20%.

It will also help diversify Bangladesh's fuel sources and provide the country with access to clean energy. Additionally, the development is expected to provide sufficient natural gas to support power generation of up to 3,000MW, which is essential to promote power reliability, industrial development and the creation of jobs in the country.

Payra Power Plant

Prime Minister Sheikh Hasina has undertaken this project in consideration of the people in southern Bangladesh. The first unit of Payra Ultra Super-Critical Coal Power Plant went into operation on January

1,320 MW

eco-friendly power plant
with clean coal technology

2020. The plant would be an eco-friendly one with clean coal technology and is expected to help achieve excellence in the country's power and energy sector. The units will feature a plan for installing another coal-fired power plant having the same capacity and technology, a 100 MW solar plant, and a 50MW wind power plant. Ultra super-critical technology will be used to build the imported coal-based power plant. Initiatives have also been taken to prevent possible damage to the environment at Payra. The project is being implemented with 30% national resources of the total costs and mobilizes the remaining 70% from international sources. The government is also working on three major power generation hubs in the division including at Payra in Patukhali, and Maheshkhali and Matarbari in Cox's Bazar, where several coal and LNG-based power plants will be installed.



**TARGETS FOR
THE 'MUJIB YEAR'
2020-2021**

100% Electricity coverage

19,000 KM circuit transmission lines instalment

24,000 MW power generation capacity to be reached

Start operation of new power plants with

6,000 MW capacity

Attract further private investment

Cut all illegal gas connection by 2021

Cut system loss to **single digit**

Call block lease for offshore bidding rounds

Promoting public awareness campaigns on energy sector

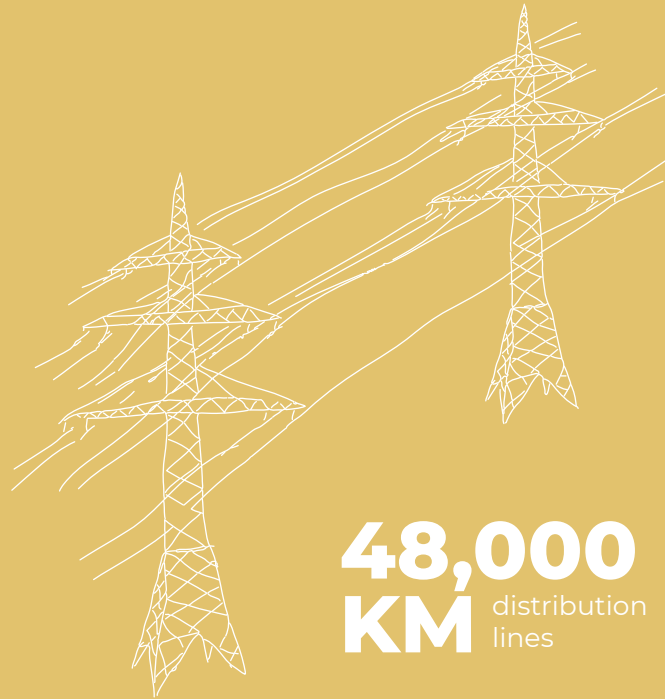
48,000 KM distribution lines

3,500 MW power import from regional grid

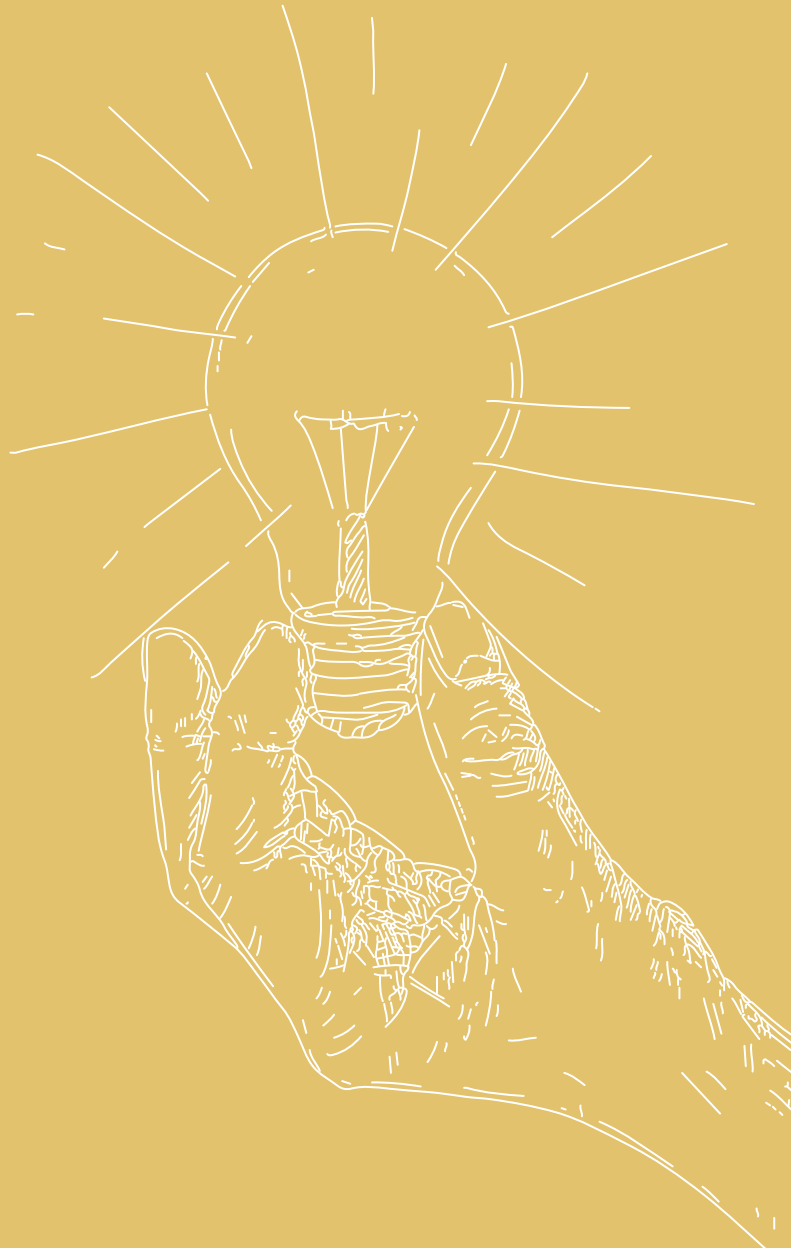
Ensure

MEGA PROJECT

financing and primary fuel supply



100%
access to
electricity



REMAINING CHALLENGES

Domestic Gas Depletion

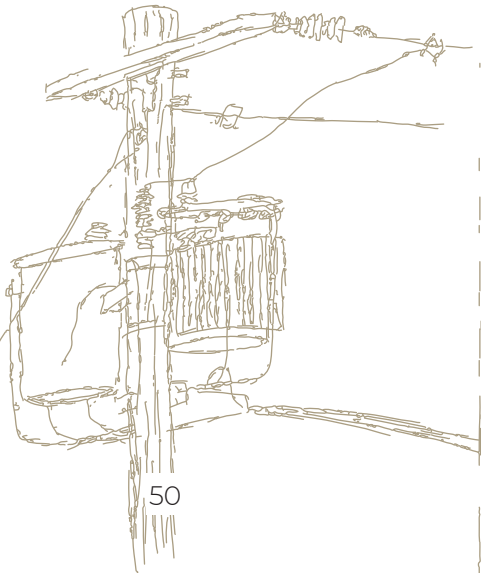
Bangladesh was largely dependent on domestic gas for electricity generation while almost 90% generation was from gas in 2009.

Grid Stability

Transmission capacity in Bangladesh is not growing fast enough to cope up with power generation, resulting in supply bottlenecks in important commercial corridors (such as Chittagong and Comilla). Unexpected outages, perpetuate concerns about the security and stability of the country's power grid. Power system frequency in Bangladesh varies routinely on normal days between 48.9-51.2 Hz and can go as low as 48.7 Hz and as high as 51.5 Hz under contingency. This is a major impediment to system reliability and also causes a severe economic loss.

Distribution Bottleneck

The present capacity of distribution lines in Bangladesh is about 420 thousand kilometres and sub-station capacity is about 20 thousand MVA. Although remarkable success has been achieved during last decade, the present distribution infrastructure is not sufficient to ensure quality, uninterrupted and reliable electricity for all by 2021. A large number of distribution lines and substations are required. Currently, project financing, upgradation of existing infrastructure, timely implementation of project, conversion of overhead system into underground system, implementation of smart grid and prepaid metering system are the major challenges for distribution.

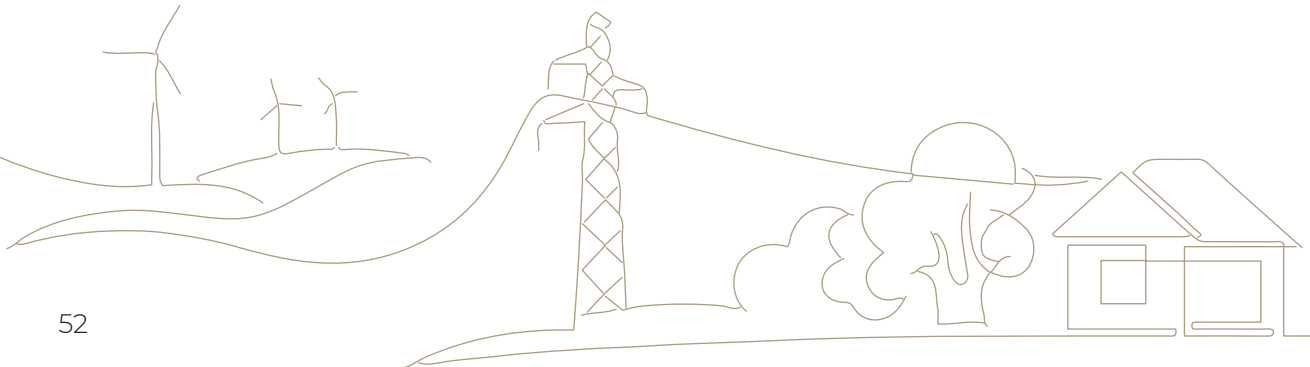


Land Availability

A key constraint in Bangladesh electricity generation development is land availability, be it for coal mining, utility-scale solar or hydroelectricity. Bangladesh has one of the highest population densities in the world. The World Bank estimates 59% of Bangladesh's total land is arable, and 11% is forested. With 66% of the population still based in rural areas, land availability remains a key constraint that requires careful management.

Off-grid Electrification

The vision of the government is to ensure quality and reliable electricity supply for all by 2021 but the main challenge for achieving this target is the electrification of off-grid areas of Bangladesh, where expansion of national grid is highly expensive and time consuming. To overcome this barrier government has taken initiatives to electrify the off-grid rural areas, remote islands and hill tracts by the development of renewable energy resources.



STEPS TO OVERCOME THE CHALLENGES

Fuel diversification

Natural gas is the main fuel for power generation in Bangladesh. But the natural gas is depleting day by day. Recognizing the importance of primary fuel for generation of electricity, the government of Bangladesh has diversified the fuel mix for power generation. Government has a plan to gradually use coal, LNG and other available fuel for power generation besides gas. To ensure energy security, government has prepared the Power System Master Plan 2016 considering gas, coal, LNG, liquid fuel, dual fuel, nuclear and renewable energy

resources. The government has also taken initiatives to import power from neighbouring countries.

Augmentation in distribution

To ensure reliable, quality and uninterrupted electricity for the people of Bangladesh, a strong distribution network is essential. The present capacity of distribution lines and substations are not adequate enough to provide uninterrupted electricity supply to the consumers. Therefore, augmentation and modernization of existing distribution system is required.

Conclusion

Whether through initiation of million-dollar infrastructure projects or improving the living standard of the individual household, the power and energy sector is the lifeline of any economy. Thus, the Awami League led government continues its policy prioritising the development of the power and energy sectors considering their co-dependency in the overall development of the country. Furthermore, the government has increased the number and quality of infrastructure of power and energy and improved its transmission and distribution capacity. Per capita power generation has increased along with national and regional connectivity to meet national demands. The country now has the highest rate of solar home system installations in the world, while still working on energy efficiency programs and exploring new energy sources. With the backup of a thriving and reliable power and energy governance, Bangladesh now looks forward to continue its strong economic growth and development in the near future.

“

In Bangladesh, power is
empowering people.
And employment creates
equality. Power is the great
social equalizer.

”

Nasrul Hamid, MP

State Minister
Ministry of Power, Energy and Mineral Resources
Government of the People's Republic of Bangladesh





Ministry of Power, Energy
and Mineral Resources
Government of the People's Republic of Bangladesh

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