Campaign for Just & Equitable Transition In Bangladesh



# DO WE NEED MORE POWER PLANTS TO MEET THE DEMAND OF 2030?

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## **KEY FINDINGS**



The peak hour demand and annual demand of electricity may reach **23.5 GW** and **137 TWh** by 2030, respectively, if demands increase at the current rate.



Bangladesh's power sector is currently facing **11.6 GW (70%)** of overcapacity than peak hour supply and **60% overcapacity** than annual demand.

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With current and 'under construction' capacity, the reserve margin will reach **44%** in 2030 which is quite safe.



Every MW of Solar Power saves **BDT 2.8 Crore** from fuel import (i.e., HFO) annually. Annually BDT **14,000 crore** could be saved by installing only **5,000 MW** of Solar by 2030.



Bangladesh's current installed capacity is 28.59 GW, which will be increased to 35.16 GW, considering the existing and committed power plants in the 'under construction' stage.



Capacity Charges of the private thermal power plants was **BDT 28,000 crore** in 2023-24. It may reach **BDT 50,000 crore** in 2029-30 with current capacity. Any more power plant will only increase the capacity charges.



Capacity addition in renewable energy does not have any 'capacity charge' which may help the country to reduce pressure on **Forex reserve**.



Due to the difficulties in land acquisition, the government should prioritize Hub-based RE, Rooftop Solar, Solar Irrigation, Agrivoltaics and Solar Charging Station, along with Solar Parks.

## PEAK HOUR DEMAND



\* Note: 2023-24: Actual Source: Compiled by CLEAN Team based on BPDB Annual Reports.

In Gigawatt (GW)

The peak hour demand has been increased at 5.3% in 2023-24 than the earlier year. The IEPMP estimated it at 5.5% annually since 2021 and gradually decrease to 5% after 2030. On average, the peak hour demand may increase at 6% annually in between 2024-25 and 2029-30. Based on the increasing rate, the peak hour demand target may reach 23,510 MW by 2030. A total of 28,210 MW of installed capacity should be enough keeping 20% (4,700 MW) reserve

for emergency.

### ANNUAL DEMAND



\* **Note:** 2023–24: Actual **Source:** Compiled by CLEAN Team based on the BPDB Daily Generation Report

In the last decade, the annual demand for electricity has been increasing at 6.2% per year, which is going down at 25% from earlier year annually. The IEPMP estimated average demand as 5.5% in this decade, while it could be increased to 6% maximum. At this rate, the annual demand

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for electricity may reach 112.60 TWh in 2027 and 137.22 TWh by 2030.

In Terawatt-hour (TWh)

# **INSTALLED CAPACITY BY 2030**



\* Note: 2023-24: Actual Source: BPDB Monthly Progress Report

#### In Gigawatt (GW)



\* Note: 2023-24: Actual Source: BPDB Monthly Progress Report

From current installed capacity of 28.59 GW, some 2.49 GW will be phased out in between 2024 and 2030. At the same time, 20 power plants, with an additional capacity of 9,450 MW, will start commercial operation which are under construction now.

# **GROSS GENERATION CAPACITY 2030**



\* Note: 2023-24: Actual Source: Analysis of CLEAN Team based on Maximum Plant Factor

Generation Capacity at Maximum Plant Factor (TWh)

Generation Capacity at Optimum Plant Factor (TWh)



\* Note: 2023-24: Actual Source: Analysis of CLEAN Team based on IEPMP targeted Plant Factor

With a typical average Plant Load Factor (PLF), the current (in operation + under construction) power plants will be able to generate 143 TWh electricity in 2027 and 146 TWh by 2030

### **ENERGY MIX IN 2030**



#### Energy Mix(%)

As the base load could be fulfilled by Coal, Nuclear and fossil Gas-based CCPP, Petroleum-based power plants could be phased out earlier. If there is a gap in supplying peak load, Gas Turbines of CCPP could be run to meet the additional demand.

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Nuclear Power (2.4 GW) will add to grid in December 2025 as a base load power plant. So, base load pressure on CCPP will be reduced. On the other hand, initiating battery to supply peak load will be cheaper than HFO power plants.

# PEAK HOUR DEMAND-SUPPLY



#### In Gigawatt (GW)

With current trend, the power sector will suffer 24% (total 44%) overcapacity in 2030, even after keeping 20% reserve.

So, there is no need to approve anymore fossil fuel power plant to meet the demand of 2030.

Any new power plant will only increase the overcapacity and burden of capacity charges.

### ANNUAL DEMAND-SUPPLY



#### In Terawatt-hour (TWh)

With current trend, the power sector will be able to supply total annual demand of 2027 and 2030 at only 43% to 47% PLF only.

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Even if the annual demand increases, the power sector will be able to cope with the situation by increasing the PLF level.

Additional every unit of electricity generated from fossil fuels will require additional foreign currency. It is cheaper to supply additional demand by renewable sources.

Capacity Addition by Year (GW)

Energy Source	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Hub-based Solar	_	0.20	0.40	0.60	0.60	0.70	2.50
Hub-based Wind	_	0.05	0.05	0.05	0.10	0.10	0.35
Solar Power Plant (IPP)	0.30	0.40	0.50	0.60	0.60	0.60	3.00
Wind Power Plant (IPP)	_	0.05	0.05	0.05	0.10	0.10	0.35
Residential Rooftop	0.10	0.20	0.30	0.40	0.50	0.50	2.00
Industrial Rooftop	0.10	0.20	0.20	0.30	0.40	0.60	1.80
Solar Irrigation Pump	0.02	0.02	0.03	0.03	0.05	0.05	0.20
Agrivoltaics	_	0.02	0.05	0.10	0.20	0.24	0.44
Solar Charging Station	0.01	0.02	0.04	0.04	0.04	0.04	0.19
Total	0.53	1.16	1.62	2.17	2.59	2.94	11.00



ANNEX 1 CURRENT PLANT LOAD FACTOR



Source: Compilation of CLEAN Team based on BPDB Daily Generation Reports

ANNEX 2 EXPECTED PLF BY YEAR



The IEPMP expects to achieve 80% PLF of USC and CCPP, while 70% PLF of SCPP and RECIP Power Plants. PLF of other power plants are estimated based on their earlier track record.

Note: 2023-24: Actual Source: IEPMP 2023 and BPDB Annual Reports

ANNEX 3

# TENURE OF POWER PLANTS

Energy Source	Technology	SOPP	Public	IPP	SIPP	СОРР	RPP	<b>QRPP</b>	Import
Coal	Any	25	25	25	_	-	-	-	25
Fossil Gas	SCPP/RECIP	25	20	15	15	30	15	3-5	_
Fossil Gas	CCPP	25	22	22	_	_	_	-	15
HF0/HSD	Any	25	20	15	15	_	_	3-5	_
Nuclear	Any	_	60	_	_	_	_	_	_
Hydro	Any	80	_	_	_	_	_	_	_
Solar	Any	20	20	20	_	_	_	_	_
Wind	Any	20	20	20	_	_	_	_	_
WTE	Incineration	_	_	20	_	_	_	_	_

Source: CLEAN Team Analysis based on the Power Purchase Agreements (PPA)

ANNEX 4

# ANNUAL POWER DEMAND RATE

Year	Peak Hour Demand	Annual Demand
2023-24	5.30%	5.8%
2024-25	7.21%	6.8%
2025-26	6.40%	5.8%
2026-27	6.20%	5.5%
2027-28	5.70%	6.1%
2028-29	5.60%	5.8%
2029-30	5.50%	5.2%

Source: CLEAN Team Analysis based on Annual Demand FY 2015-16 to 2023-24

# ANNEX 6 ACRONYMS

BPDB	Bangladesh Power Development Board	PPA	Power Pu
CCPP	Combined Cycle Power Plant	QRPP	Quick Rer
COD	Commercial Operation Date	RPP	Rental Po
COPP	Commercial Power Plant	SCPP	Simple Cy
GWh	Gigawatt-hour	SIPP	Small Inde
HFO	Heavy Fuel Oil	SOPP	State-ow
HSD	High-speed Diesel	TW	Terawatt
IEPMP	Integrated Energy and Power Master Plan	TWh	Terawatt-
IPP	Independent Power Producer	USC	Ultra-sup
MW	Megawatt		
PLF	Plant Load Factor		

Power Purchase Agreement
Quick Rental Power Plant
Rental Power Plant
Simple Cycle Power Plant
Small Independent Power Producer
State-owned Power Plant
Terawatt
Terawatt-hour
Ultra-supercritical

#### REFERENCES

ANNEX7

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# THANK YOU

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