Emission Watch

Status Assessment of SO_2 Emissions and FGD Installation for Coal-Based Power Plants in West Bengal

December 2022

CREA
Centre for Research on Energy and Clean Air

CREA is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution.

About CREA

Centre for Research on Energy and Clean Air (CREA) is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution. CREA uses scientific data, research and evidence to support the efforts of governments, companies and campaigning organizations worldwide in their efforts to move towards clean energy and clean air, believing that effective research and communication are the key to successful policies, investment decisions and advocacy efforts.

For more information:
www.energyandcleanair.org

Emission Watch – Status assessment of SO_2 emissions and FGD Installation for coal-based power plants in West Bengal

December 2022

Design
Penmi Rungsung

Key Messages

- Not a single coal-based power station in West Bengal has installed SO_2 control technology in the seven years since the notification was published in December 2015
- More than 40% of the state's coal-based power generation capacity hasn't taken any significant action to reduce pollution at source, as they haven't even awarded the bids for Flue-gas desulfurization (FGD) installations
- None of the remaining 60% capacity has retrofitted SO_2 control measures within the stipulated frame, which have already been extended three times in the last seven years
- SO_2 emissions from power plants can be reduced by up to 86% in some units
- Power stations operated by the private sector are the worst when it comes to retrofitting technologies to mitigate SO_2 emissions. None of them have awarded the bids since 2015
- The coal consumption for grid-connected power generation in West Bengal has increased by 23% - from 44 million tonnes (MT) in 2015 to 54 MT in 2021
- Data on emissions from power plants from the Online Continuous Effluent/Emission Monitoring System (OCEMS) is not available in the public domain and is even restricted to the West Bengal Pollution Control Board (WBPCB)

Contents

Key messages
03

Contents
04

Overview
05

Major coal burning clusters in West Bengal
06

Story of delays and dilutions: December 2015 emission standard notification for coal-based power stations
08

De-So_x technology (i.e., FGD) installation status and SO_2 emissions in West Bengal
10

Non-availability of Online Continuous Effluent/Emission Monitoring System (OCEMS) data on the website of the WBPCB Power generation company
16

Tracking compliance reports submitted to WBPCB by TPPs as compliance with Environmental Clearance (EC) conditions for emission data
18

Power demand and supply scenario
19

Way forward
21

Overview

Air pollution is a global health hazard resulting in more than 4.2 million deaths just because of exposure to outdoor $PM_{2.5}$ pollution[1]. Toxic air kills six times the number dying of Malaria and four times the deaths attributed to Acquired immunodeficiency syndrome (AIDS)[2]. Poor air quality also leads to reduced work efficiency, increased hospital visits, and ultimately reduced people's contribution to the region's economic development. Studies estimate that air pollution cumulatively resulted in losses worth $95 billion, about 3% of India's Gross domestic product (GDP) in 2019[3]. Burning fossil fuels from the transport sector, industries, and coal-fired power stations contribute substantially to poor air quality in a region throughout the year. A lancet countdown report on Health and Climate Change estimated that more than 330,000 deaths in India are linked to particulate matter emissions from burning fossil fuels[4]. The major pollutants from the combustion of fossil fuels include particulate matter (PM), sulphur dioxide (SO_2), nitrogen oxides (NO_x), and mercury (Hg). While PM emissions are visible as deposits in the immediate vicinity of fossil fuel combustion facilities, SO_2 and NO_x are reactive gases that transform into secondary particulate matter and spread to other regions over time. Secondary particulates formed from precursor gasses (SO_2 and NO_x) are a significant source of air pollution from coal-based power stations. A 2021 study revealed that secondary particulates form more than 96% of the total particulate pollution load in the Delhi-NCR region[5]. Such significant contribution from secondary particulates leads to incremental health hazards and economic loss to the region, highlighting the urgency needed to regulate emissions. Taking cognizance of the severity of the issue, the Union Ministry of Environment, Forest and Climate Change (MoEF&CC) released emission standards for coal-based power plants in December 2015[6]. This was India's first attempt to regulate emissions from coal-fired power plants, setting limits for sulfur dioxide (SO_2), nitrous oxides (NO_x), and Mercury (Hg) emissions, as well as water consumption limits for a source of pollution (MoEF&CC, 2015) while tightening the particulate matter emissions (PM).

In this report, we compiled data to understand the steps taken by authorities in regulating SO_2 emissions from coal-fired power stations across West Bengal. The report also analyses the status of the installation of De-SO_x technologies at individual power units.

[1]Hindustan Times, (2022). Air pollution cause of additional 1.5 million premature deaths annually: Study. [News Article] *https://www.hindustantimes.com/environment/air-pollution-cause-of-additional-1-5-million-premature-deaths-annually-study-101668071197785.html*
[2]Faranak Bakhtiari, (2022). Air pollution kills more than AIDS and malaria [News Article]. Tehran Times. *https://www.tehrantimes.com/news/478827/Air-pollution-kills-more-than-AIDS-and-malaria*
[3]Swagata Dey, (2021). Air pollution in India has caused losses of up to Rs 7 lakh crore annually [News Article]. Down To Earth. *https://www.downtoearth.org.in/blog/air/air-pollution-in-india-has-caused-losses-of-up-to-rs-7-lakh-crore-annually-76616#:~:text=Overall%2C%20air%20pollution%20losses%20culminate,are%20only%20the%20direct%20impacts*
[4]Chetan Bhattacharji, (2022). More Than 1 Death Every 2 minutes In India Due To Fossil Fuel Use: Study [News article]. NDTV. *https://www.ndtv.com/india-news/more-than-1-death-every-2-minutes-in-india-due-to-fossil-fuel-use-study-3462735*
[5]Dahiya, S. and Myllyvirta, L. (2021). Health and Economic Impacts of Unabated Coal Power Generation in Delhi-NCR. *https://energyandcleanair.org/wp/wp-content/uploads/2021/03/Health-and-economic-impacts-of-unabated-coal-power-generation-in Delhi-NCR_Report-22nd-March-2021_Final-Report.pdf*
[6]Ministry of Environment Forest and Climate Change (2015). Environment (Protection) Amendment Rules, 2015. *https://moef.gov.in/wp-content/uploads/2017/08/Thermal_plant_gazette_scan.pdf*

Major Coal Burning Clusters in West Bengal

The coal consumption for grid-connected coal-based power generation has increased by 23% since 2015, from 44 MT in 2015 to 54 MT in 2021, indicating increased emission load and a greater contribution to air pollution from the power sector.

Figure 1: Coal consumption by grid-connected coal-based power stations in West Bengal (000'T)

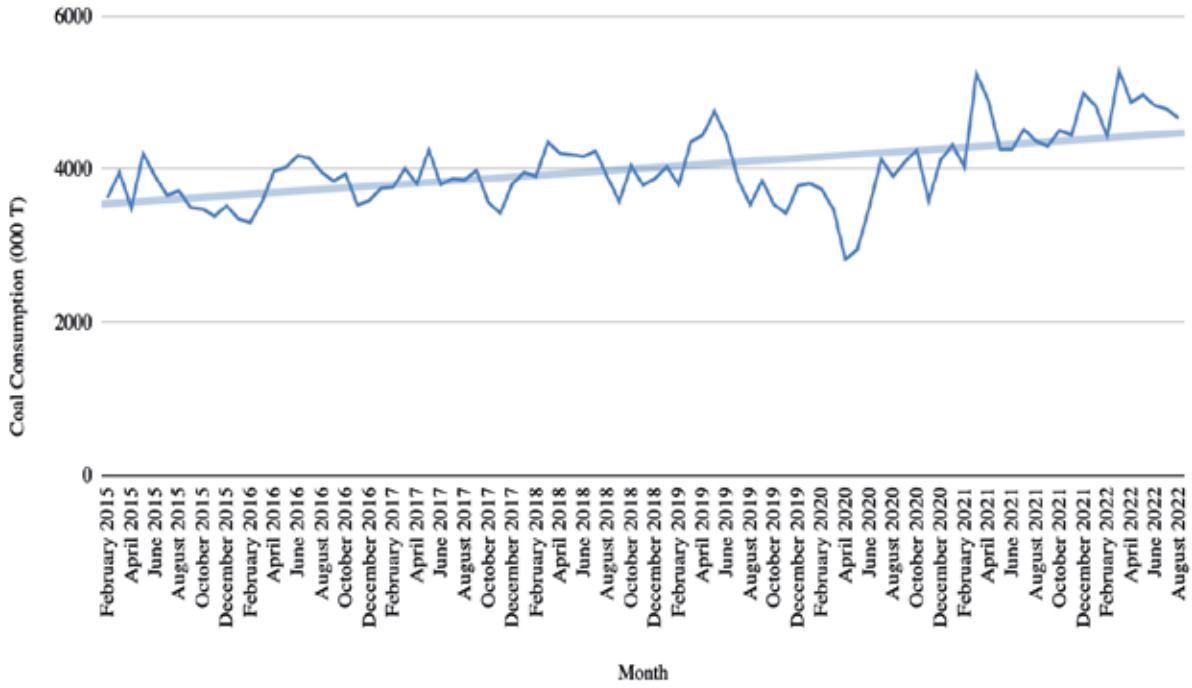


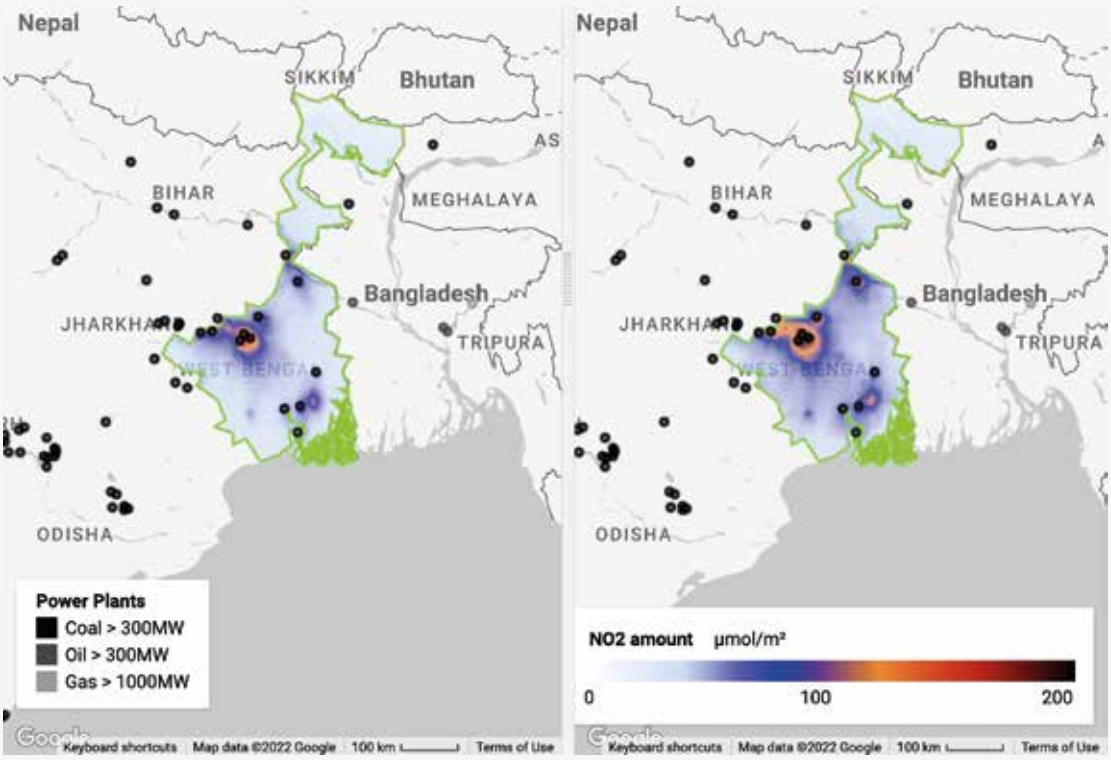
Table 1: District-wise coal consumption by grid-connected coal-based power generation stations in West Bengal in 2015 and 2021 (000'T)

DISTRICT	ANNUAL COAL CONSUMPTION FOR YEAR (000'T)	
	2015	2022
Bankura	7760	9815
Birbhum	4817	5032
Hooghly	811	1330
Kolkata	511	147
Murshidabad	11041	15383
North 24 Parganas	671	0
Purba Bardhaman	5241	6610
Purba Medinipur	7327	5834
Purulia	2561	6704
South 24 Parganas	3433	3279
TOTAL	44173	54134

Source: Monthly coal consumption reports by Central Electricity Authority

Increasing coal consumption at grid-connected power generation stations across districts in West Bengal, as recorded in the table above, is also visible through visualisations of TROPOspheric Monitoring Instrument (TROPOMI) satellite NO_X emissions data[7]. Increased Coal consumption coupled with inadequate emission controls at power plants have intensified the emission hotspots for air pollutants.

Figure 2: NO_X emissions in West Bengal between 2019 and 2021 depicting coal combustion hotspots increasing in intensity of emissions over the period



[7]Centre for Research on Energy and Clean Air (CREA).
https://portal.energyandcleanair.org/tropomi/no2

Story of delays and dilutions: December 2015 emission standard notification for coal-based power stations

The 2015 notification gave two years – till December 7, 2017, for coal-based power plants across the country to retrofit emission control technologies. However, almost none have managed to comply with the regulations. The non-compliance of power stations in December 2017 was awarded with staggered extensions running till December 2022 rather than the penalties for their inaction. This gave most power plants in West Bengal five years - till 2022 - to retrofit the SO_2 control technologies. Despite the extension, not a single power plant in the state has shown any progress worth mentioning, apart from central sector-owned units by National Thermal Power Corporation Limited (NTPC) and Damodar Valley Corporation (DVC). Most of these had awarded the bids for FGD installation. The power stations were then given new timelines on March 31, 2021 - staggered from December 31, 2022, to December 31, 2024. The third and the latest extension was provided on September 5, 2022, pushing the deadlines for these power plants till December 2026. Apart from delaying the entire process, the repeated extensions gave leeway even to those who had already awarded bids to slow down further.

Along with the delay in the implementation of SO_2 emission norms for water consumption and NO_x emissions were diluted in May 2018 and October 2020, respectively. The NO_x norms were diluted in October 2020 when the emission limit for coal-based power stations installed between 2003-2016 was diluted from 300 mg/Nm^3 to 450 Nm^3.

Sequential extensions and dilutions also send a signal to the polluting industry that their inactions and non-compliance will not be penalised, but rather they will keep getting such extensions till the point when these emission standards will either be diluted, or most of the operational power stations reach a time for their retirements over the next decade.

Figure 3: Timeline of Emission Standard notification, its dilutions, and extensions for coal-based power stations over the past seven years

2015

Original Notification issued by MoEF&CC, 7th December 2015

Regulation to set limits for PM, SO_2, NO_2 & Hg emissions and water consumption limits for coal based power plants.

2017

First lapse of SO_2 compliance timeline - Central Pollution Control Board (CPCB) issued directions under section 5 of EPA Act 1986, December 2017; staggered timeline till December 2022 granted to coal-based power plants across the country.

2018

Dilution of Water Consumption Norms, 28th June 2018

Water consumption limit for new power plants commissioned after 1st January 2017 were increased from 2.5 to 3 m^3/MWh.

2019

Second lapse of SO_2 compliance by coal based power plants in 300 km radius of Delhi-NCR, 7th December 2019

2020

Direction issued by CPCB for deposit of fines for illegal operation of power plants in 300 km radius of Delhi-NCR in absence of SO_2 emission controls

Emission norms for NO_x for power plants installed between 2003-2016 diluted

Extension of timeline for Delhi-NCR plants by CPCB in October 2021

2021

New extension for SO_2 compliance granted to power plants, Amendment to the original notification by MoEF&CC on 31st March 2021. Timeline extension till December 2025

2022

New extension for SO_2 compliance granted to power plants, Amendment to the original notification by MoEF&CC on 5th September 2022.

Timeline extension till December 2027

De-SO_X technology (i.e., FGD) installation status and SO_2 emissions in West Bengal

Not a single major power plant connected to the state's power grid - with a capacity of 13686[8] MW, has installed Flue-Gas Desulphurisation (FGD) or Direct Sorbent Injection (DSI) technology. These technologies are crucial to mitigating SO_2 emissions.

As of publishing this report, 7,480 MW capacity have awarded the bids to install these technologies. Power plants – with a combined capacity of 510 MW – are to be retired in the next few years and are exempt from the new regulations. The remaining 40% of the capacity (5,695 MW) hasn't taken any serious steps in the last seven years.

According to the latest extension, dated September 5, 2022, the implementation timeline is extended to December 2026 for 10,650 MW capacity across the state. This means a 9-year delay in installing the required pollution control technology compared to the initial timeline communicated in December 2015 for December 2017.

According to the emission standard notification, two power generation units (300 MW) at Hiranmaye TPP are expected to limit SO_2 emissions under 100 mg/Nm^3, whereas 5,700 MW units at Sagardighi Thermal Power Plant (TPP), Durgapur Steel thermal Power Station (TPS), Farakka Super Thermal Power Station (STPS), Mejia TPS, and Raghunathpur have to limit their emissions under 200 mg/Nm^3. The remaining 7,686 MW have a relatively relaxed limit of 600 mg/Nm^3 based on their size and commissioning year.

The latest emission data accessed through RTIs and compliance reports submitted by the power station to the pollution control boards shows that the existing emissions are higher than the prescribed limits as depicted in the following table.

[8]One 12 MW Dishgarh TPP units which is connected to grid, is not included in FGD list

Table 2: Unit-wise FGD implementation status, emission limits and latest actual emissions from coal-based power stations in West Bengal

S. No.	Power Station	Sector	Capacity (MW)	Commissioning Year	Age as of December 2022 (Years)	Category as per Notification (March 2021 & September 2022)	SO_2 emission norms (mg/nm³)	Deadline for SO_2 Compliance as per section 5 of EPA Act 1986, December 2017	Deadline for SO_2 Compliance as per 31.03.2021 Notification	Deadline for SO_2 Compliance as per 05.09.2022 Notification	Latest SO_2 Emissions	FGD Status (September 2022)	RTI Response by TPP/Parent Company/WBPCB	Minimum Possible SO_2 reduction after compliance to the Emission Standards notified on December 7, 2015 (Assuming Average emission after FGD installation being 85% of the emission limit)*
1	Bakreswar TPS Unit 1	State Sector	210	1999	23	C	600	NA	31.12.2024	31.12.2026	857	Bid Opened		40%
2	Bakreswar TPS Unit 2	State Sector	210	2000	22	C	600	NA	31.12.2024	31.12.2026	867	Bid Opened		41%
3	Bakreswar TPS Unit 3	State Sector	210	2001	21	C	600	NA	31.12.2024	31.12.2026	724	Bid Opened		30%
4	Bakreswar TPS Unit 4	State Sector	210	2007	15	C	600	NA	31.12.2024	31.12.2026	1103	Bid Opened		54%
5	Bakreswar TPS Unit 5	State Sector	210	2009	13	C	600	NA	31.12.2024	31.12.2026	1000	Bid Opened To be		49%
6	Bandel TPS Unit 2	State Sector	60	1965	57	C	600	31.12.2020	31.12.2024	31.12.2026	1057	Decommissioned		52%
7	Bandel TPS Unit 5	State Sector	210	1982	40	C	600	31.12.2020	31.12.2024	31.12.2026	933	Bid Opened		45%
8	D.P.L. TPS Unit 7	State Sector	300	2008	14	B	600	30.06.2022	31.12.2023	31.12.2025		Bid Opened		
9	D.P.L. TPS Unit 8	State Sector	250	2014	8	B	600	31.03.2022	31.12.2023	31.12.2025		Bid Opened Bid		
10	Kolaghat TPS Unit 3	State Sector	210	1984	38	C	600	30.09.2021	31.12.2024	31.12.2026		Awarded	Award for DSI given on August 22 2022, civil work started on September 9 2022	
11	Kolaghat TPS Unit 4	State Sector	210	1995	27	C	600	31.03.2022	31.12.2024	31.12.2026		Bid Awarded	Award for DSI given on August 22, 2022; civil work started on September 9, 2022	
12	Kolaghat TPS Unit 5	State Sector	210	1991	31	C	600	30.06.2021	31.12.2024	31.12.2026		Bid Awarded	Award for DSI given on August 22, 2022; civil work started on September 9, 2022	
13	Kolaghat TPS Unit 6	State Sector	210	1994	28	C	600	31.12.2021	31.12.2024	31.12.2026		Bid Awarded	Award for DSI given on August 22, 2022; civil work started on September 9, 2022	
14	Sagardighi TPS Unit 1	State Sector	300	2007	15	C	600	31.12.2020	31.12.2024	31.12.2026	523	Bid Opened		2%
15	Sagardighi TPS Unit 2	State Sector	300	2008	14	C	600	31.03.2021	31.12.2024	31.12.2026	558	Bid Opened		9%
16	Sagardighi TPS Unit 3	State Sector	500	2015	7	C	200	31.03.2022	31.12.2024	31.12.2026	537	Bid Opened		68%

S. No.	Power Station	Sector	Capacity (MW)	Commissioning Year	Age as of December 2022 (Years)	Category as per Notification (March 2021 & September 2022)	SO_2 emission norms (mg/nm³)	Deadline for SO_2 Compliance as per section 5 of EPA Act 1986, December 2017	Deadline for SO_2 Compliance as per 31.03.2021 Notification	Deadline for SO_2 Compliance as per 05.09.2022 Notification	Latest SO_2 Emissions	FGD Status (September 2022)	RTI Response by TPP/Parent Company/WBPCB	Minimum Possible SO_2 reduction after compliance to the Emission Standards notified on December 7, 2015 (Assuming Average emission after FGD installation being 85% of the emission limit)*
17	Sagardighi TPS Unit 4	State Sector	500	2016	6	C	200	31.03.2020	31.12.2024	31.12.2026	604	Bid Opened		72%
18	Santaldih Tps Unit 5	State Sector	250	2007	15	C	600	31.03.2021	31.12.2024	31.12.2026	1067	Bid Opened	No records available at this end. Nothing has been done yet regarding the FGD installation	52%
19	Santaldih Tps Unit 6	State Sector	250	2011	11	C	600	31.12.2021	31.12.2024	31.12.2026	938	Bid Opened	No record available at this end. Nothing has been done yet regarding the FGD installation	46%
20	Budge Budge Tps Unit 1	Private Sector	250	1997	25	C	600	31.12.2022	31.12.2024	31.12.2026		Bid Opened		
21	Budge Budge Tps Unit 2	Private Sector	250	1999	23	C	600	31.12.2022	31.12.2024	31.12.2026		Bid Opened		
22	Budge Budge Tps Unit 3	Private Sector	250	2010	12	C	600	31.12.2022	31.12.2024	31.12.2026		Bid Opened		
23	Haldia Tpp Unit 1	Private Sector	300	2015	7	B	600	31.12.2022	31.12.2023	31.12.2025	1462	Bid Opened		65%
24	Haldia Tpp Unit 2	Private Sector	300	2015	7	B	600	31.12.2022	31.12.2023	31.12.2025	1533	Bid Opened		67%
25	Hiranmaye Tpp Unit 1	Private Sector	150	2017	5	B	100	NA	31.12.2023	31.12.2025		Feasibility Study Started		
26	Hiranmaye Tpp Unit 2	Private Sector	150	2017	5	B	100	NA	31.12.2023	31.12.2025		Feasibility Study Started		
27	Southern Repl. Tps Unit 1	Private Sector	68	1990	32	A	600	31.03.2022	31.12.2022	31.12.2024		Feasibility Study Completed		
28	Southern Repl. Tps Unit 2	Private Sector	68	1990	32	A	600	31.12.2021	31.12.2022	31.12.2024		Feasibility Study Completed		
29	Titagarh TPS Unit 1	Private Sector	60	1983	39	A	600	31.12.2020	31.12.2022	31.12.2024		To be Decommissioned		
30	Titagarh TPS Unit 2	Private Sector	60	1983	39	A	600	31.12.2020	31.12.2022	31.12.2024		To be Decommissioned		
31	Titagarh TPS Unit 3	Private Sector	60	1984	38	A	600	31.12.2020	31.12.2022	31.12.2024		To be Decommissioned		
32	Titagarh TPS Unit 4	Private Sector	60	1985	37	A	600	31.12.2020	31.12.2022	31.12.2024		To be Decommissioned		

S. No.	Power Station	Sector	Capacity (MW)	Commissioning Year	Age as of December 2022 (Years)	Category as per Notification (March 2021 & September 2022)	SO_2 emission norms (mg/nm³)	Deadline for SO_2 Compliance as per section 5 of EPA Act 1986, December 2017	Deadline for SO_2 Compliance as per 31.03.2021 Notification	Deadline for SO_2 Compliance as per 05.09.2022 Notification	Latest SO_2 Emissions	FGD Status (September 2022)	RTI Response by TPP/Parent Company/WBPCB	Minimum Possible SO_2 reduction after compliance to the Emission Standards notified on December 7, 2015 (Assuming Average emission after FGD installation being 85% of the emission limit)*
33	Durgapur Steel TPS Unit 1	Central Sector	500	2011	11	B	200	30.06.2021	31.12.2023	31.12.2025	897	Bid Awarded	Feasibility study completed in May 2018 Notice inviting tender issued on September 12, 2018 Bid opened on March 6, 2019 Bid awarded on July 15, 2019	81%
34	Durgapur Steel TPS Unit 2	Central Sector	500	2012	10	B	200	30.06.2021	31.12.2023	31.12.2025	522	Bid Awarded	Feasibility study completed in May 2018 Notice inviting tender issued on September 12, 2018 Bid opened on March 6, 2019 Bid awarded on July 15, 2019	67%
35	Durgapur TPS Unit 4	Central Sector	210	1982	40	B	600	31.12.2020	31.12.2023	31.12.2025		To be Decommissioned		
36	Farakka STPS Unit 1	Central Sector	200	1986	36	C	600	31.12.2022	31.12.2024	31.12.2026	1043	Bid Awarded	Bid awarded on May 27, 2020	51%
37	Farakka STPS Unit 2	Central Sector	200	1986	36	C	600	31.12.2022	31.12.2024	31.12.2026	1086	Bid Awarded	Bid awarded on May 27, 2020	53%
38	Farakka STPS Unit 3	Central Sector	200	1987	35	C	600	31.12.2022	31.12.2024	31.12.2026	1069	Bid Awarded	Bid awarded on May 27, 2020	52%
39	Farakka STPS Unit 4	Central Sector	500	1992	30	C	200	31.12.2022	31.12.2024	31.12.2026	1229	Bid Awarded	Bid awarded on May 27, 2020	86%
40	Farakka STPS Unit 5	Central Sector	500	1994	28	C	200	31.12.2022	31.12.2024	31.12.2026	1205	Bid Awarded	Bid awarded on May 27, 2020	86%
41	Farakka STPS Unit 6	Central Sector	500	2011	11	C	200	31.12.2022	31.12.2024	31.12.2026	1243	Bid Awarded	Bid awarded on May 27, 2020	86%
42	Mejia TPS Unit 1	Central Sector	210	1996	26	C	600	31.12.2022	31.12.2024	31.12.2026	716	Bid Awarded	Feasibility study completed in May 2019 Notice inviting tender issued on October 31, 2019 Bid opened on June 26, 2020 Bid awarded on February 2, 2021	29%

S. No.	Power Station	Sector	Capacity (MW)	Commissioning Year	Age as of December 2022 (Years)	Category as per Notification (March 2021 & September 2022)	SO_2 emission norms (mg/nm³)	Deadline for SO_2 Compliance as per section 5 of EPA Act 1986, December 2017	Deadline for SO_2 Compliance as per 31.03.2021 Notification	Deadline for SO_2 Compliance as per 05.09.2022 Notification	Latest SO_2 Emissions	FGD Status (September 2022)	RTI Response by TPP/Parent Company/WBPCB	Minimum Possible SO_2 reduction after compliance to the Emission Standards notified on December 7, 2015 (Assuming Average emission after FGD installation being 85% of the emission limit)*
43	Mejia TPS Unit 2	Central Sector	210	1998	24	C	600	31.12.2022	31.12.2024	31.12.2026	593	Bid Awarded	Feasibility study completed in May 2019 Notice inviting tender issued on October 31, 2019 Bid opened on June 26, 2020 Bid awarded on February 2, 2021	14%
44	Mejia TPS Unit 3	Central Sector	210	1999	23	C	600	31.12.2022	31.12.2024	31.12.2026	641	Bid Awarded	Feasibility study completed in May 2019 Notice inviting tender issued on October 31, 2019 Bid opened on June 26, 2020 Bid awarded on February 2, 2021	20%
45	Mejia TPS Unit 4	Central Sector	210	2005	17	C	600	31.12.2022	31.12.2024	31.12.2026	748	Bid Awarded	Feasibility study completed in May 2019 Notice inviting tender issued on October 31, 2019 Bid opened on June 26, 2020 Bid awarded on February 2, 2021	32%
46	Mejia TPS Unit 5	Central Sector	250	2008	14	C	600	31.12.2022	31.12.2024	31.12.2026	552	Bid Awarded	Feasibility study completed in May 2019 Notice inviting tender issued on October 31, 2019 Bid opened on June 26, 2020 Bid awarded on February 2, 2021	8%
47	Mejia TPS Unit 6	Central Sector	250	2008	14	C	600	31.12.2022	31.12.2024	31.12.2026	584	Bid Awarded	Feasibility study completed in May 2019 Notice inviting tender issued on October 31, 2019 Bid opened on June 26, 2020 Bid awarded on February 2, 2021	13%

S. No.	Power Station	Sector	Capacity (MW)	Commissioning Year	Age as of December 2022 (Years)	Category as per Notification (March 2021 & September 2022)	SO_2 emission norms (mg/nm³)	Deadline for SO_2 Compliance as per section 5 of EPA Act 1986, December 2017	Deadline for SO_2 Compliance as per 31.03.2021 Notification	Deadline for SO_2 Compliance as per 05.09.2022 Notification	Latest SO_2 Emissions	FGD Status (September 2022)	RTI Response by TPP/Parent Company/WBPCB	Minimum Possible SO_2 reduction after compliance to the Emission Standards notified on December 7, 2015 (Assuming Average emission after FGD installation being 85% of the emission limit)*
48	Mejia TPS Unit 7	Central Sector	500	2010	12	C	200	30.09.2021	31.12.2024	31.12.2026	672	Bid Awarded	Feasibility study completed in October 2018 Notice inviting tender issued on October 4, 2018 Bid opened on April 2, 2019 Bid awarded on July 15, 2019	75%
49	Mejia TPS Unit 8	Central Sector	500	2011	11	C	200	30.09.2021	31.12.2024	31.12.2026	691	Bid Awarded	Feasibility study completed in October 2018 Notice inviting tender issued on October 4, 2018 Bid opened on April 2, 2019 Bid awarded on July 15, 2019	75%
50	Raghunathpur TPP Unit 1	Central Sector	600	2014	8	C	200	31.03.2022	31.12.2024	31.12.2026	740	Bid Awarded	Feasibility study completed in October 2018 Notice inviting tender issued on October 4, 2018 Bid opened on April 2, 2019 Bid awarded on July 15, 2019	77%
51	Raghunathpur TPP Unit 2	Central Sector	600	2016	6	C	200	31.03.2022	31.12.2024	31.12.2026	790	Bid Awarded	Feasibility study completed in October 2018 Notice inviting tender issued on October 4, 2018 Bid opened on April 2, 2019 Bid awarded on July 15, 2019	78%

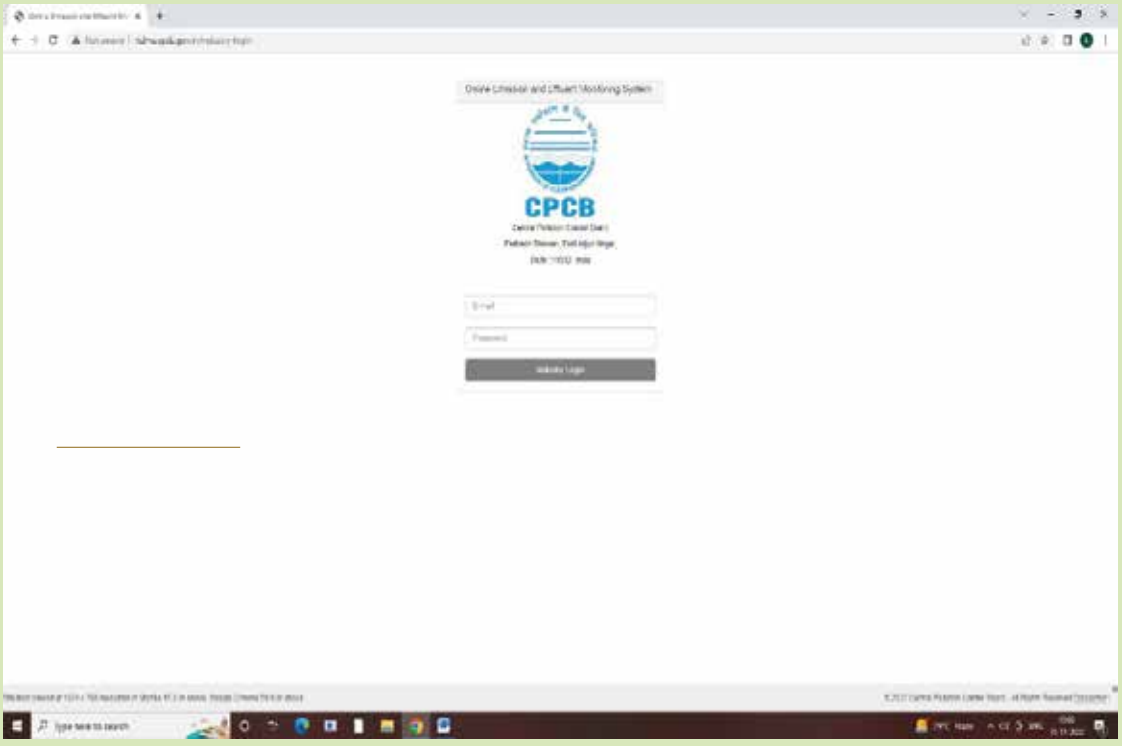
Non-availability of Online Continuous Effluent/Emission Monitoring System (OCEMS) data

Online Continuous Effluent/Emission Monitoring System data is unavailable on WBPCB, CPCB, and on power company's websites. As part of ongoing litigation on transparent sharing of emission data from polluting industries such as coal-based power stations, the West Bengal Pollution Control Board, in its affidavit dated August 29, 2022, stated that they are uploading data on a regular basis on the servers. The affidavit further stated that:

WBPCB uploads the compliance status of 55 nos. of Grossly Polluting Industries on a quarterly basis, and data relating to severely Polluting Industries, Common Effluent Treatment Plants, and Sewage Treatment Plants is uploaded to the Central Pollution Control Boards E-Portal on a monthly basis. Furthermore, it has been stated that OCEMS are maintained by CPCB. The industries upload their real-time data into the system. WBPCB can access the same through URL and password only when provided by the industries; otherwise, WBPCB has no access.

The authors of this report checked the CPCB e-portal on November 15, 2022 to check the availability and accessibility of OCEMS. However, the website was password protected. The screenshot of the same is provided below:

Figure 4: Screenshot of inaccessible OCEMS data on the Central Pollution Control Board (CPCB) website



If the data cannot even be accessed by the state pollution regulator, its availability for transparent accountability through monitoring by affected communities and citizens is a distant dream.

It is crucial to make the pollutant emission data publicly available so that the installation and effective use of pollution control technology such as FGD can be monitored and the polluter's accountability is fixed by the state regulator, researchers, and citizens at large. In the absence of public data disclosure, there is no efficient way to ensure the functioning of FGD or any other similar technology, even if it has been installed at these polluting power stations.

Tracking compliance reports submitted to WBPCB by TPPs as compliance with EC conditions for emission data

WBPCB, individual power stations, and the power company websites were checked for the availability of six monthly compliance reports submitted by the power generation stations across the state. The inferences drawn are summarised here:

- **West Bengal Power Development Corporation (WBPDCL) -** Six-monthly compliance reports for power stations under WBPDCL are available on the website (https://wbpdcl.co.in/environment). Monthly average emissions data is available for Barkeshwar units 1-5, Bandel units 2 & 5, Santaldih units 5 & 6, and Sagardighi TPP.
- **Haldia Energy Limited -** While the old six monthly compliance reports are available, the past six monthly reports aren't uploaded yet on https://haldiaenergy.co.in/ec-compliance-report.php
- **DVC -** Six-monthly compliance reports not available on the company's website, https://www.dvc.gov.in/dvcwebsite_new1/
- **NTPC -** Six-monthly compliance reports are unavailable on the company's website, https://www.ntpc.co.in/
- **Durgapur Projects Ltd (DPL) -** Six-monthly compliance reports are unavailable on the company's website, http://thedpl.in/industry/index.jsp
- **Calcutta Electric Supply Corporation (CESC) -** Six monthly compliance reports available only for Budge Budge TPP and not for Southern and Titagarh TPP. https://www.cesc.co.in/eCCompliance Reports
- **HIRANMAYE Energy Limited -** Six-monthly compliance reports not available on the company's website, http://www.hiranmayeenergy.com/

Barring the West Bengal Power Development Corporation, no power company has provided comprehensive emissions data through public disclosure of their six monthly compliance reports, which must be uploaded in the public domain according to environmental clearance conditions. Public disclosure of the emission data on the power generation company website and a common portal by WBPCB through uploading compliance reports and the real-time availability of OCEMS data will enhance monitoring and compliance with stipulated norms.

Power Demand and Supply Scenario

West Bengal's total grid-connected coal-based installed electricity generation capacity as of November 2022 is 13,697 MW (4,810 with the state sector, 2,037 with private, and the remaining 6850 with central sector companies, like NTPC and DVC.) Including other sources such as hydro, solar, etc., the state has a total of more than 16,000 MW of installed power generation capacity. Out of this, 9,695 MW[9] is allocated as state share to West Bengal. This leaves the remaining capacity for captive use or to be sold to other states and distribution companies through Inter State Generation Stations (ISGS).

The state also has power purchase agreements for 1,436 MW with Inter-State Generation Stations located outside the state, including 484 MW from thermal power stations, i.e., Titagarh Thermal Power Station, Adhunik Power, and Maithon Power Limited, and remaining as imports from Bhutan.

The table on the next page presents the electrical energy demand and peak demand projected by the 19th and the 20th Electric Power Survey of India (EPS) published in January 2017 and November 2020, respectively, against the actual demand over the past six years. The data suggests a significant over projection of the demand - more than 25% for peak demand and 19% for total electrical energy demand for the year 2021-22, which was a post-pandemic year registering a surge in demand across the country.

The state has nearly 10% buffer for peak capacity requirement with a total capacity (11,131 MW) allocated to West Bengal.

However, in total energy terms, the state required only 55,881 MUs in 2021-22, translating to 57% Plant Load Factor (PLF) utilisation of the generation capacity annually. The sub-optimal utilisation of the available assets, availability of grid flexibility, reasonable IEX prices, and lowering costs of renewable energy make a strong case for the state to not invest any new finances in building new coal capacity. Doing so will turn them into stranded assets, further burdening the distribution companies, state, and the public while resulting in greater air pollutant and greenhouse gas (GHG) emissions.

[9]West Bengal Pollution Control Board (2021). State of Environment Report - II WEST BENGAL 2021. *https://www.wbpcb.gov.in/files/Fr-09-2021-09-10-01SoE%20Report%20VOL%2002.pdf*

Table 3: Power Demand projections for West Bengal through the 19th and 20th Electric Power Survey Vs. actual demand

		2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025	2025 - 2026	2026 - 2027	2027 - 2028	2028 - 2029	2029 - 2030	2030 - 2031	2031 - 2032
Electrical Energy Consumption (MU) at Power Bus Bars	19th EPS	57342	59148	61485	63979	66634	69361	72222	75264	78463	81915	85590					
	20th EPS						54020	60163	63567	67518	71820	76352	81182	86018	91771	95599	99443
	Actual	52379	54777	54563	55846	53837	55881										
	% Difference	-9%	-7%	-11%	-13%	-19%	-19%										
T&D Losses (%)		22.03	21.26	20.52	19.76	19.03	18.33	17.62	16.94	16.22	15.55	14.89					
Peak Demand (MW) at Power Bus Bars	19th EPS	10383	10817	11267	11724	12191	12688	13318	13873	14435	15065	15680					
	20th EPS						9090	10150	10726	11395	12123	12891	13708	14530	15507	16164	16824
	Actual	8750	8878	8896	9432	8949	9108	9905									
	% Difference	-16%	-18%	-21%	-20%	-27%	-28%										

Way Forward

While the energy transition unfolds in the state, it is also crucial to reduce the existing power plants' environmental footprint and health burden. This can be ensured by installing state-of-the-art pollution control technologies such as FGD for SO_2 and Selective catalytic reduction (SCR) /Selective noncatalytic reduction (SNCR) for NO_x and operating them efficiently to ensure emissions are captured at the source. While these technologies are being installed, it is also essential to strengthen the data monitoring, data transparency, and law enforcement protocols to efficiently utilize the installed pollution control technology. Based on the information analysed for this report, power plant operators and West Bengal Pollution Control Board need to reduce the pollution footprint from the coal-based power plants and move forward towards helping achieve breathable air across polluted geographies.

The suggested actions based on our analysis can be summarised as follows:

- Ensure the FGD and NO_x reduction technologies are installed at all operational coal-based power generation units in the state
- Ensure installation, operation, and calibration of the OCEMS at all operational coal-based power generation units in the state
- Ensure data quality and data transparency of the data collected through OCEMS and manual monitoring at coal-based power plant units in the public domain to enhance compliance and operation of the pollution control devices
- Rationalise power generation sources
- Stop further investments in building new coal-based power infrastructure
- Rationalise the power purchase agreements to reduce fixed cost burdens