Report No 81

Recommended action and schedule for the expeditious implementation of the 7.12.2015 emission standards for thermal power plants (TPPs), which was to be complied within 2 years, that is, by 8.12.2017

February 14, 2018
Environment Pollution (Prevention and Control) Authority for NCR (EPCA)

1. Background

On 7.12.2017, MoEF&CC filed an affidavit in compliance with the order the Hon'ble Court dated 17.11.2017, which had issued notice, based on the application moved by the *Amicus Curie: "Direct the implementation of the 2015 emission standards for power plants as per schedule, i.e. by December 2017.*

The 2015 emission standards for thermal power plants (TPPs) had been notified under the Environment (Protection) Amendment Rules 2015 and had set norms, for the first time, for emissions of SO2, NOx, Mercury and water consumption. The standards had also tightened the emissions from particulates (**Annexure 1**). The revision in this standard has happened after nearly 25 years and so was long over-due.

At the very outset, it is key to note the critical importance of these 2015 standards. Studies by Centre for Science and Environment (CSE)[1]show that thermal power plants in India are responsible for 70 per cent of the total freshwater withdrawal by all industries; over 60 per cent of the particulate matter emissions; 50 per cent of SO2, NOx emissions and more than 80 per cent of mercury emissions by the industrial sector in the country.

According to CPCB[2] the implementation of the 2015 standards will lead to reduction in PM, SO2 and NOx by 40-50 per cent in the country. It will also reduce mercury emissions by 60 per cent and water consumption by another 40 per cent. This is not a small achievement, given the enormous pollution load and water-stress in the country.

It is also well known that gaseous emissions of NOX and SOX, when they interact with moisture in the air, convert into particulates. These 'secondary' particles are a key source of air pollution across the country. The IIT-Kanpur report for Delhi/NCR had found that as much as 25-30 per cent of the winter sources are secondary particles, which are emitted from vehicles, power plants and industries. It is also for this reason that the Hon'ble Court has issued directions on curtailing use of pet coke, furnace oil and is deliberating how to increase the

[1] CSE 2015, Heat on Power: Green Rating of Coal-Based Thermal Power Plants

[2] CPCB presentation as included in February 1, 2017, submission of Ritwick Dutta

use of natural gas in industry and thermal power plants. ***Therefore, there is an urgent need to implement the 2015 emission standards across the country***.

In its affidavit of 7.12.2017, MOEF&CC has stated the following:

"The Ministry of Power (MOP) has submitted that coal based generation contributes about 80% of electricity requirements in the country. Ministry of Power has expressed its commitment to comply with new environment norms subject to technical feasibility and time required to install emission control systems…Procurement and installation of emission control equipment, like Flue Gas Desulfurization (FGD) for SO2 control, in a unit takes about 3 years time followed by shut down of the unit for making necessary connections. Electricity being an essential commodity and un-interrupted power supply in the country needs to be ensured at all times, therefore, many units cannot be out for retrofitting at the same time and it has to be done in phases, so as to avoid problem in the power supply. ***That considering the above issues, an earliest practical feasible plan extending up to December 2022 has been prepared for the installation of FGDs and other pollution control equipment at the identified coal based units in consultation with Regional Power Committee and the utilities.***

Based on the above, MOEF&CC has stated that "in view of the practical difficulties there appears to be some substance that some more time is required to meet the standards by thermal power plants (TPPs)… "***In view of the aforesaid, this matter is placed before the Hon'ble Court seeking appropriate order having regard to aforesaid facts.***"

On February 1, 2018, MOEF&CC has filed affidavit in compliance with the 13.12.2017 order the Hon'ble Court. In this (page 5), "it is stated that specific directions have been issued by SPCB for phase-wise compliance of the standards by TPP. The action plan submitted by MOP for 7 years, up to 2024, was observed to be too long and accordingly after several rounds of discussion, Ministry decided to commence the implementation from 2018 and to complete by 2022 with respect to all pollutants." The schedule is enclosed in the affidavit.

On February 1, 2018, Advocate Ritwick Dutta has filed submissions regarding the extension of time sought by MOEF&CC for implementation of the standards.

Based on the above submissions and subsequent consultations with officials of the MOEF&CC, Central Pollution Control Board (CPCB), Ritwick Dutta and researchers from the Centre for Science and Environment (CSE) who have worked extensively on power plant emissions, EPCA is submitting this report.

2. Key issues for examination

The following are the issues that arise out of the affidavits and consultations:

1. If MOEF&CC has taken a contrary position at NGT as against its stand in Supreme Court, as explained in the submissions of Ritwick Dutta;

2. If the extension granted to power companies by CPCB is "illegal" as submitted by Ritwick Dutta;
3. If the suggested timelines for plants to phase in new emission norms by 2022 is acceptable or new timelines can be recommended for faster implementation of the standards;
4. If the draft amendment diluting the water consumption from TPPs is acceptable.
5. If the monitoring protocol for emissions is sufficiently robust.

3. Divergence in MOEF&CC position in NGT and Supreme Court

Ritwick Dutta has stated in his submission of February 1, that in NGT the MOEF&CC had taken a consistent stand that it is serious about implementing the standards and that it has written to CBCB and SPCBs to ensure compliance. This position had been reiterated in Rajya Sabha. On 3.4.2017 the then Minister, MOEF&CC had told Parliament that the standards would come into force from December 6, 2017 and there is no proposal to dilute the December 2015 notification (Annexure F of Ritwick Dutta affidavit to Hon'ble Supreme Court on February 1, 2018). The October 2017, Affidavit filed in NGT by MOEF&CC says that it has written to CPCB for the compliance report and also to the regional office for submission of the compliance report of the concerned thermal power plant.

It is therefore, clear that till October 2017, MOEF&CC had not informed NGT of the fact that the TPPs would not be compliance with the notification of December 2015. It is also clear that in its affidavit filed on 7.12.2017 – day before the standards were to come into force – MOEF&CC had found merit in the proposed extended deadline of 2022 and had requested the Hon'ble Supreme Court to "pass appropriate orders order having regard to aforesaid facts."

EPCA discussed this issue with representatives of MOEF&CC who attended its meeting on February 13, 2018. They have explained that the ministry was engaged in extensive discussions with MOP during the period beginning March 2017 till October 2017. It was only in October 13, 2017 that the proposal was finalized and the schedule of 2022 was arrived at. The case was listed before the Hon'ble Supreme Court and so they filed an affidavit on the decisions that had been arrived.

4. 'Illegality" of the extension given to power companies

MOEF&CC in its affidavit of 1.2.2018, has enclosed its 7.12.2017 letter to CPCB to exercise "powers vested in Section 5 of the Environment (Protection) Act 1986 to direct all the thermal power plants who are not in a position to comply with the norms laid down in the 7.12.2015 notification in accordance with the revised plan submitted by the Ministry of Power dated 13.10.2017 including NOx by 2022, failing which action will be initiated under the appropriate section of EP Act 1986 (Annexure R 6 of February 1, 2018 MOEF&CC affidavit of February 1, 2018).

Based on this letter, on December 11, 2017, CPCB, through its chairman A K Mehta (chairman S P Singh Parihar was on leave and so officiating chairman A K

Mehta, also Additional Secretary in MOEF&CC had signed the letter in his absence) had written to all TPP, extending the timelines for implementation based on the MOP schedules (Annexure I of Ritwick Dutta affidavit to Hon'ble Supreme Court on February 1, 2018).

Ritwick Dutta in his submission has stated that the CPCB has no power or authority under the EP Act 1986 to extend the deadline for compliance of the emission and water consumption norms, since the same were issued under Section 6 and Section 25 of the EP Act, which only empowers the Central government to frame rules. Furthermore, it is his contention that the delegation of powers (Notification No SO 157 (E) of 27.2.1996 and SO730 (E) dated 10.7.2002) to Chairman CPCB to issue directions to any industry or any local body any other authority for violations of the standards and rules notified under the EP Act, do not give powers to grant extension. It is his contention, that "*the above powers of the Chairman is only with respect to violations of standards and rules and can by no stretch of imagination extend to Amending the Rules notified under Section 6 and Section 25 of the Act or in legalizing an illegality and violation of law.*"

The December 2015 notification was issued in exercise of the powers conferred under Section 6 and 25 of the EP Act 1986. The standards are an amendment in the Environment (Protection) Act and the rules are called the Environment (Protection) Amendment Rules 2015.

Section 6 gives powers to Central government to make rules and Section 5 gives the Central government to issue directions.

The question is if the deadline set through the notification as an Amendment in the EP Act can be extended through a direction or if it requires a fresh amendment to the EP Act. The question also is if the extension on the timeline in the Amendment can be issued as a direction under Section 5 of the Act?

The view of the MOEF&CC needs to be sought on this matter.

5. If the 2022 deadline is acceptable or is advancement possible

The December 2015 Notification had divided the emission norms based on the age of the thermal power plants. It had also set specific norms for pollutants. As per the affidavit filed by MOEF&CC as cited in letter of December 7, 2017 the following is the situation of the total capacity of installed of 1,96,667 MW (650 units) of coal based power plants.

Schedule of phase-in of 2015 emission norms: MOP and MOEF&CC

		Compliant	Non-compliant	Year	TPP units	MW
1.	PM	1,15,214 MW	65,925 MW (231 units) by 2022. The phase-in compliance to			

			be kept co-terminus with installation of FGD extending up to 2022.			
				2018	1 unit	500
				2019	2 units	1300
				2020	28 units	10705
				2021	97 units	23495
				2022	94 units	28525
				2022	9 units (plan to be made)	1400
2.	SO2	16,769 MW* + 8967 MW identified for retirement/ already retired	1,61,552 MW (415 units) as per schedule extending up to 2022**			
				2018	1 unit	500
				2019	8 units	4940
				2020	55 units	27230
				2021	172 units	64027
				2022	178 units	64,704
				2022	1 unit (150 MW plan being prepared)***	150
3.	NOX		3 years to meet the standards of 600mg/NM3 and also sought relaxation of standards of 100 and 300 mg/NM3 to 600. The standard of 300 and 100 mg/NM3 would require installation of selective non-catalytic reduction (SNCR) or selective non-catalytic reduction (SCR). While these technologies are established globally, these are not		No specific deadline given. Letter says in accordance with the revised plan submitted by MOP dated 13.10. 2017 including NOx by 2022	

			established for Indian coal, which has high ash content. Therefore, technology validation is required.			

Source: Compiled from December 7 2017, letter by MOEF&CC to CPCB and excel sheets attached of schedule
Note 1* Includes 3205 MW, which is being verified by state pollution control boards if it meets revised norms.
Note 2** Some 16789 MW would not be able to install FGD due to constraints of space etc. MOP has requested to allow these units to operate without FGD till retirement.
Note 3*** Haldia power plant, not yet commissioned.

EPCA has examined this schedule in terms of technologies to mitigate different pollutants. It has received a submission from Ritwick Dutta on 10.2.2018 (Annexure 2) and detailed plan from CSE titled, *No Room for Delay* (Annexure 3).

EPCA has also examined data given to it by CPCB from its monitoring systems for 67 plants in the country.

5.1: Advancement/compliance with PM emissions

The December 2015 notification sets emission standards based on the age of the plants.

For plants set up before 2003, particulate matter (PM) standards of 100 mg/NM3 have been set. It is important to note that the last revision of PM standards was in 1989, when the standard for PM was set at 150 mg/NM3. Since then technology has greatly advanced to control PM emissions. Plants set up before December 2003 were already required to meet 150 mg/NM3 and therefore, compliance with 100 mg/NM3 is not difficult.

In TPP set up since 2003, the vast majority of environmental clearances (EC) require TPPs to meet 50 mg/NM3 – therefore, all the December 2015 standard has done is to ask for compliance with the EC condition.

According to MOP data, 56 per cent of the plants already meet the set standards. Out of the total power generation capacity (196 GW), roughly 66.5% of the plants are already compliant with the new PM norms – 130,742 MW.
This can be done expeditiously.

It is also clear that a large number of plants that do not meet the standards are old and therefore, due for retirement/shut down. This list needs to be finalized and the list of plants requirement upgrade will therefore, come down substantially.

In TPPs set up since January 2017, the norm is easily achieved, as the plant would be designed to meet the set standard.

Based on the above, there is no reason, therefore, for the PM standard to be deferred and made co-terminus with the installation of FGD. In fact, it can be implemented within the next 2 years, at the most. The suggested schedule is:

Recommended schedule for advancement of PM norms

	Year	Standard (mg/NM3)	Recommended schedule
1	Plants before December 31, 2003	100	2018-2019
2	Plants between January 1, 2003 and December 31st 2016	50	2018
3	Plants from January 2017	30	Must comply before commissioning

5.2: Advancement/compliance with SO2 emissions

The control on SO2 is critical for air pollution control. But it is also true that the highest investment needed for pollution control is in installation of FGD. The current plan of MOP schedules the installation of FGD till 2022, with only 9 units being commissioned in 2018-2019 and the remaining 405 units from 2020 onwards.

The question is if this schedule can be advanced, keeping in mind the high priority and critically polluted regions. CSE in its plan (Annexure 3) has recommended that FGD phase in should be prioritized for areas with population density of more than 400 people per sq km and the highly polluted CEPI – Comprehensive Environment Pollution Index of MOEF&CC -- districts.

The schedule can also be advanced, so that the equipment is ordered expeditiously and then installed in a phase-wise manner to account for shut-down.

CSE has also contested data that suggests that all plants require FGDs. According to its analysis, FGD is required for 60 per cent of the capacity – only in units, which are over 500 mw. Also it is found that most of these above 500 mw units are newer plants, installed after 2003.

Based on the above discussions, the recommended schedule is:

	Year	Standard (mg/NM3)	Recommended schedule
1	Plants before December 31, 2003	200-600 (based on capacity)	By December 2020
2	Plants between January 1, 2003 and December 31st 2016	200-600 (based on capacity)	By December 2020
3	Plants after January 1, 2017	100	Must comply before commissioning

5.3: Advancement/compliance with NOx emissions

There is no clarity in the final decision that has been taken on control of NOx.

The MOEF&CC letter says that NOx schedule will be in accordance with MOP decision, which is to meet standards by 2022. However, no schedule is provided.

It also notes that MOP has asked for upward revision of NOx standard of 100 mg/NM3 and 300 mg/NM3 to 600 mg/NM3. It also notes that technologies will need to be validated for the use of Indian coal to meet even 300 mg/NM3.

However, this may not be the complete case.

The fact is that MOEF&CC based on the directions of this Hon'ble Court has set NOx standards on October 23, 2017. These standards for pet coke and other fuels (including Indian grade coal) set the standard at 300 mg/NM3. Therefore, it is technological achievable.

This is also evident from the analysis of current emissions of TPPs. EPCA has analyzed the data from the NOx data collected by CPCB for 57,780 MW capacity for the recent periods.

This finds the following:
As much as 50 per cent of the power plants have reported that they already meet the relevant NOx norms (300 mg/Nm^3/or 600 mg/Nm^3

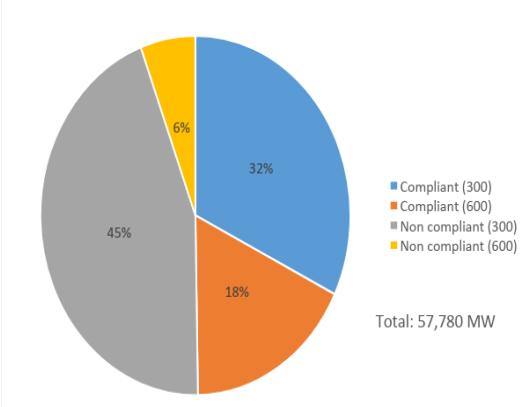
Of this, 18,260 MW are compliant with the 300 mg/Nm^3 standard.

10,120 MW are compliant with the 600 mg/Nm^3 standard.

Interesting a proportion of the older plants (installed before 2003) even meet the 300 mg/Nm^3

NOx emissions from existing TPPs (see Annexure 4 for list)

Category	Capacity in MW
Compliant (300 mg/Nm^3)	18,620
Compliant (600 mg/Nm^3)	10,120
Non-compliant (300 mg/Nm^3)	25,730
Non-compliant (600 mg/Nm^3)	3,310



Therefore, it is clear that technologies exist and in fact are being used to mitigate emissions and to bring level of NOx to 300 mg/Nm^3.

New boilers come equipped with low NOx burners. Furthermore, technologies like Over-fire-Air (OFA) dampers and low NOx burners (LNB) are proven and widely used in power plants and established to meet 300 mg/NM3 as are technologies like selective non-catalytic reduction (SNCR) or selective non-catalytic reduction (SCR).

However, there is a technology challenge for meeting the 100 mg/NM3, which is required for plants established after January 2017. The list of these plants and their technology plans needs to be detailed before a decision can be taken. It is also understood that NTPC has installed technologies to pilot and to check if the standards can be set. Based on this data and other best practices, MOEF&CC and CPCB should review the technological options for meeting this standard in consultation with MOP. The upward revision in the standard, if needed, should only be considered for 100 mg/NM3 to 300 mg/NM3.

The recommended schedule is:

	Year	Standard (mg/NM3)	Recommended schedule
1	Plants before December 31, 2003	600	2018-2019
2	Plants between January 1, 2003 and December 31st 2016	300	2018-2019
3	Plants from January 2017	100	To test technologies for meeting standard and based on results, if needed to revise standard upward. Ensure compliance by 2019.

6.If dilution of water standard is necessary

The December 2015 notification set a water discharge standard – this was a critical addition as TPPs withdraw large amounts of water for their cooling and other requirements.

The standard for all plants, except those installed after January 2017, was set at 3.5 m^3/MWh.

For TPP installed after January 2017, it was set at 2.5 m^3/MWh and the plants were expected to achieve zero discharge.

On October 16, 2017, MOEF&CC issued a draft notification to amend the standards to do the following:

a. To exclude thermal power plants using sea water
b. To increase the water consumption in plants installed after January 1, 2017 from 2.5 m^3/MWh to 3m^3/MWh

Ritwick Dutta in his affidavit of February 1 2018has stated that while on the one hand, the MOEF&CC on its part did not take any proactive steps to implement the standards and on the other it issued draft Amendment for diluting the standards with respect to water consumption. Furthermore, in his submission of February 10, 2017 he has stated that there is no need for dilution of the water requirement for new plants, as it is understood that plants with FGD installed can operate within prescribed limit of 2.5 m^3/MWh. Hence, with 100 per cent ash utilization, efficient water management systems should ensure minimum use of water.

It must be understood that Indian thermal power plants are known to be among the most wasteful consumers of water. CSE's 2015 study found that on an average, Indian TPPs consumed 4 m^3/MWh, as against the best practice of 1.34 m^3/MWh in South Africa and 2.45 m^3/MWh in China. The highest use of water in TPPs in during the cooling process – roughly 65 per cent and the other bulk user is flyash management – during discharge and disposal. Also, the more energy inefficient the plant, the higher its water use. Given the looming scarcity of water, it is clear that water budgeting is critical and therefore, there is no reason to dilute the standards for the upcoming plants – January 2017 onwards.

In fact, best Indian plants already achieve 2 m^3/MWh (CESC-Budge Budge, JSWEL-Toranagallu etc). They do this through improvements in internal water budgeting as well as fly ash management. There is no evidence to suggest that the state of the art plants, which will be installed after January 2017, cannot meet this objective – particularly, when India needs to be water frugal.

However, the coastal plants can be exempt from this norm, as they use and then discharge seawater. The concern here is to ensure that the discharge of the seawater, after use in the TPP is managed in terms of its temperature and other discharge factors. In other words, it needs to be ensured that this use and

discharge of seawater is not detrimental to the coastal ecology. This should be decided during the grant of EC.

7. Systems for effective compliance and monitoring

There are two key issues that need to be examined:

a. What can be done to ensure compliance with the extended scheduled deadlines for pollution control, after these are finalized through the appropriate directions of the Hon'ble Court?
b. What will be the system for monitoring that the TPPs meet the pollution standard?

Ritwick Dutta in his submission has said that the only way the compliance with the TPP standards can be assured if the standards and the compliance plans are included in the Environmental Clearance (EC) for each plant. He has also asked for Plant owner to put data on emissions in the public domain and for CPCB to make data public on compliance in terms of the various milestones to be achieved.

CSE in its submission has suggested an independent body that has oversight, collects quarterly progress reports from all plants and can take corrective steps if needed.

CSE has also suggested a penalty mechanism to avoid a repeat of what has happened. This penalty should be pegged at Rs 1 lakh per day per non-compliant pollutant. Their calculations show that assuming on average 3 non-compliant pollutants (this is an over-estimation as 65% plants meet the PM norms and half meet the NOx norms), a unit would need to pay Rs 11 crore per year.

The question still remains if the system for monitoring of emissions is robust and if this data can be used for regulatory purposes. CPCB on 5.2.2014 had issued directions under section 18(1) b of the Water and Air Acts to the State Pollution Control Boards and Pollution Control Committees to direct 17 categories of highly polluting to install online systems for emission and effluent monitoring.

However, there are concerns that this Continuous Emission Monitoring (CEMs) system requires to be improved to ensure that equipment is calibrated and that data is made available, not just to the state boards and to CPCB but to the public. More importantly, it is important that the CEMs data is used for regulatory purposes, which is ***not*** being done currently.

MOEF&CC and CPCB need to review and strengthen the monitoring systems for emissions at the earliest and revert back to the Hon'ble Court.

8. Recommendations for consideration of the Hon'ble Court

Based on the above examination of the issues, EPCA would make the following recommendations for consideration of the Hon'ble Court.

1. The timeline of 2022 can be advanced substantially and MOEF&CC may be directed to revise the deadlines accordingly.
   i. The final deadline for all plants to meet all emission norms should be advanced to 2020, as against 2022.
   ii. All plants must be required to meet PM and NOX standards within the next two years; 2018-2019.
   iii. TPPs must be required to meet SO2 norms by 2020, but the schedule for phasing in the norms should be based on population density and pollution. Therefore, the plants located in critically polluted areas and with high population density should be required to meet the norm by 2019. It takes 24 months to install FGDs, therefore, if the process is started expeditiously, it can be completed by 2020 at the latest.
   iv. MOEF&CC, in consultation with MOP, must finalize the list of plants, which will not be required to meet the standards as they are scheduled for shut-down/retirement. The list of these plants must be made available to the Hon'ble Court so that there is clarity and closure on this matter and no plant is in non-compliance post 2020.
   v. All new plants installed after January 2017 must be required to meet PM and NOx norms before being commissioned. All these plants must be required to meet SOx norms by 2019. A list of these plants and their schedule must also be given to the Hon'ble Supreme Court so that there is careful monitoring of the directions.
   vi. TPP, which have got EC but have not yet been commissioned, should not be allowed to be operational without meeting the 2015 standards.
   vii. No new TPP should be given EC or commissioned, without full compliance with the 2015 standards.

2. MOEF&CC in consultation with CPCB may be directed to review the technical feasibility of NOx standard of 100 mg/NM3, which is for plants installed after January 2017 and revise it if necessary. However, no further dilution of NOx standard should be allowed and all plants should meet the set standard (600 mg/NM3 or 300 mg/NM3) in the next 2 years.

3. MOEF&CC may be directed not to revise the water consumption standard for plants installed after January 2017. But it could consider allowing coastal plants to be exempt from the water norm, provided the EC conditions set the necessary environmental safeguards.

4. MOEF&CC in consultation with CPCB may be directed to review the protocol for continuous emission monitoring (CEMs) and to revise it to make it more robust, transparent and issue guidelines for its use for regulatory purposes in a time-bound manner. This work is urgently required as otherwise all the effort to improve emission profiles, by installing equipment for pollution control will be negated.

5. The Hon'ble Court may consider imposing a penalty for ensuring effective and expeditious compliance with its orders. The penalty of Rs lakh per day per non-compliant pollutant can be considered effective from January 1, 2018 or January 1, 2019. This will provide an incentive to industry to make the transition at the earliest.

It is also important to note that the timeline for implementation can be more aggressive because of the special circumstances of power availability in the country, which is in surplus. According to 2017 data of the Central Electricity Authority[3], the country has an installed capacity of 3,14,642 MW, of which 1,88,487 is coal based generation and another 25,329MW is gas based power plants. The same report shows that the coal and lignite plants are working at between 50-60 per cent of the Plant Load Factor (PLF) at best through the year and across the different regions. It is well known that gas plants are working at even less of their PLF. Therefore the scheduling of closure for installing pollution equipment can be more aggressive and expeditious.

It is also clear that the sector has lost two years, since the notification was issued. Given the dire urgency of the air pollution emergency across the country, EPCA firmly believes that it is possible to advance the now extended deadline with more aggressive actions to source equipment and to phase-in shutdowns for installation.

[3] January 2017, Central Electricity Authority, Ministry of Power, Report on Power Sector http://www.cea.nic.in/reports/monthly/executivesummary/2017/exe_summary-01.pdf

Annexure 1

15

		(NOx)	
		पारा (Hg)	0.03 mg/Nm^3

* टीपीपी (इकाईयां) इस अधिसूचना के प्रकाशन की तारीख से दो वर्ष के भीतर परिसीमाओं को पूरा करेंगी।

** इसके अंतर्गत सभी टीपीपी (इकाईयां) हैं, जिन्हें पर्यावरणीय निकासी प्रदान की गई है और संनिर्माण के अधीन है।

[फा. सं. क्यू-15017/40/2007-सीपीडब्ल्यू]

डा. राशिद हसन, सलाहकार

टिप्पण :- मूल नियम भारत के राजपत्र, असाधारण, भाग II, खंड 3, उपखंड (ii) में सं. का.आ. 844(अ) 19 नवंबर, 1986 द्वारा प्रकाशित किए गए थे और उनका पश्चातवर्ती का.आ. 433(अ) तारीख 18 अप्रैल, 1987 ; सा.का.नि 176(अ) तारीख 2 अप्रैल, 1996; सा.का.नि. 97 (अ), तारीख 18 फ़रवरी, 2009 ; सा.का.नि 149(अ) तारीख 4 मार्च, 2009 ; सा.का.नि. 543(अ) तारीख 22 जुलाई, 2009 ; सा.का.नि. 739(अ) तारीख 9 सितम्बर, 2010 ; सा.का.नि. 809(अ) तारीख 4 अक्टूबर, 2010, सा.का.नि. 215(अ) तारीख 15 मार्च, 2011 ; सा.का.नि. 221(अ) तारीख 18 मार्च, 2011 ; सा.का.नि. 354(अ) तारीख 2 मई, 2011 ; सा.का.नि. 424(अ) तारीख 1 जून, 2011 ; सा.का.नि. 446(अ) तारीख 13 जून, 2011 ; सा.का.नि. 152(अ) तारीख 16 मार्च, 2012 ; सा.का.नि. 266(अ) तारीख 30 मार्च, 2012 ; सा.का.नि. 277(अ) तारीख 31 मार्च, 2012; सा.का.नि. 820(अ) तारीख 9 नवम्बर, 2012 ; सा.का.नि. 176(अ) तारीख 18 मार्च, 2013 ; सा.का.नि. 535(अ) तारीख 7 अगस्त, 2013 ; सा.का.नि. 771(अ) तारीख 11 दिसम्बर, 2013 ; सा.का.नि. 2(अ) तारीख 2 जनवरी, 2014 ; सा.का.नि. 229(अ) तारीख 28 मार्च, 2014 ; सा.का.नि. 232(अ) तारीख 31 मार्च, 2014 ; सा.का.नि. 325(अ) तारीख 7 मई, 2014, सा.का.नि. 612(अ) तारीख 25 अगस्त, 2014 और अन्तिम संशोधन सा.का.नि. 789(अ) तारीख 11 नवम्बर, 2014 किया गया था।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 7th December, 2015

S.O. 3305(E).— In exercise of the powers conferred by sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986, namely:–

1. (1) These rules may be called the Environment (Protection) Amendment Rules, 2015.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Environment (Protection) Rules, 1986, in Schedule – I, -

(a) after serial number 5 and entries relating thereto, the following serial number and entries shall be inserted, namely:–

Sr. No.	Industry	Parameter	Standards
1	2	3	4
"5A.	**Thermal Power Plant (Water consumption limit)**	**Water consumption**	I. All plants with Once Through Cooling (OTC) shall install Cooling Tower (CT) and achieve specific water consumption upto maximum of 3.5m^3/MWh within a period

			of two years from the date of publication of this notification. II. All existing CT-based plants reduce specific water consumption upto maximum of 3.5m^3/MWh within a period of two years from the date of publication of this notification. III. New plants to be installed after 1st January, 2017 shall have to meet specific water consumption upto maximum of 2.5 m^3/MWh and achieve zero waste water discharged";

(b) for serial number 25, and the entries related thereto, the following serial number and entries shall be substituted, namely:-

Sr. No.	Industry	Parameter	Standards
1	2	3	4
"25.	Thermal Power Plant	**TPPs (units) installed before 31st December, 2003***	
		Particulate Matter	100 mg/Nm^3
		Sulphur Dioxide (SO_2)	600 mg/Nm^3 (Units Smaller than 500MW capacity units) 200 mg/Nm^3 (for units having capacity of 500MW and above)
		Oxides of Nitrogen (NOx)	600 mg/Nm^3
		Mercury (Hg)	0.03 mg/Nm^3(for units having capacity of 500MW and above)
		TPPs (units) installed after 1st January,2003, upto 31st December, 2016*	
		Particulate Matter	50 mg/Nm^3
		Sulphur Dioxide (SO_2)	600 mg/Nm^3 (Units Smaller than 500MW capacity units) 200 mg/Nm^3 (for units having capacity of 500MW and above)
		Oxides of Nitrogen (NOx)	300 mg/Nm^3
		Mercury (Hg)	0.03 mg/Nm^3
		TPPs (units) to be installed from 1st January, 2017**	
		Particulate Matter	30 mg/Nm^3
		Sulphur Dioxide (SO_2)	100 mg/Nm^3
		Oxides of Nitrogen (NOx)	100 mg/Nm^3
		Mercury (Hg)	0.03 mg/Nm^3

*TPPs (units) shall meet the limits within two years from date of publication of this notification.

**Includes all the TPPs (units) which have been accorded environmental clearance and are under construction".

[F. No. Q-15017/40/2007-CPW]

Dr. RASHID HASAN, Advisor

Annexure 2

SUGGESTIONS FOR ENSURING EMISSION CONTROL AND REDUCTION IN WATER CONSUMPTION IN COAL FIRED THERMAL POWER PLANTS

Submitted by Ritwick Dutta, Advocate

in

Writ Petition(s) (Civil) No. (s) 13029/1985

IN THE MATTER OF

M.C MEHTA **PETITIONER**

VERSUS

UNION OF INDIA & ORS. **RESPONDENTS**

Dated 10-2-2018

INTRODUCTION:

On 7thDecember 2015 MoEF&CC issued Notification No. S.O. 3305(E) under the Environment (Protection) Act, 1986 for air pollutant emissions and water consumption for thermal power plants. The Notification aims at regulating emissions of particulate matter (PM), Sulphur dioxide (SO2), Oxides of Nitrogen(Nox),Mercury (Hg) and water consumption and zero waste water discharge by thermal power plants. It should be noted that this is the first time India had any standards for water and other air pollutants other than PM, whereas USA, EU, China have been having standards (in some cases even stricter than Indian standards)for many years. It is pertinent to point out that before Dec 2015 India had standards only for Particulate matter (PM).

In a presentation made on 18th May 2016 by Central Pollution Control Board on "Environmental Regulations for coal based thermal power plants", it is stated that Coal based thermal power plants are responsible for more than 80% of mercury emissions of all industrial emissions. In addition, coal fired power plants are responsible for 90% of the pollution load for PM 10, PM 2.5, SO2, and NOx among all

industrial sectors. With respect to water, 70% of the industrial water consumption is from the power sector. The Economic Survey of India Vol 2, 2016-2017, Published by the Government of India states the following as the loss of life due to thermal power plants in India.

> "The health impact of coal combustion is manifested in the form of negative impact on the respiratory system, cardiovascular diseases, neurological effects, etc. This is in addition to the health impacts onthe coal miners who are at a higher risk of chronic bronchitis and other lung diseases. The annual number of deaths linked to coal based power plants pollution is estimated to be around 115000 and the total monetary cost is around US$4.6billion."(27,600Cr)

Benefits of implementing the new standards: According to CPCB includes the following : Reduction in PM emissions by 40%; reduction in Sulphur Dioxide emissions by 48%; reduction in NOx emissions by 48%; reduction in mercury emissions by 60% and reduction in water consumption by 40%.

The Emission Norms of 7th December 2015 have been followed in its breach. In order to ensure that no further breach takes place it is suggested that the following measures/ action are undertaken:

(i) Creating Firm Retirement Plans and Deadlines for Power Plants which cannot Comply with the December 7th, 2015 Notification: Each of the four regions in India has identified units that will be retired due to lack of space for FGD and other controls. These retirements should be made legally enforceable, with a firm retirement date for each such plant/unit. The plant by plant retirement schedule is essential to ensure full compliance with the Emission norms.

(ii) Creating Compliance Plans for Existing Units and Plants: Compliance plans for meeting emission and water norms in each existing unit be expeditiously developed by the plant owner or operator using currently available Continuous Emission Monitoring System(CEMS) data and water use related data. Such plans should be submitted to MoEF&CC within 3 months and MoEF&CC shall review such plans and approve with any modifications necessary to ensure compliance with the TPP standards by December 2020 – April 2021. CPCB should make unit wise CEMS data available in the public domain. Even though the start date for compliance is December 2015, according to documents

submitted to the court, Its clear that no power plant has started the process till March 2017. However CEA put its compliance schedule in public domain in May 2017. Hence, The starting date for compliance should be considered from May 2017.

(b) For existing 273 units of 72659MW that do not meet the PM standards, meeting PM and mercury standards will require upgrading existing ESPs or installing fabric filter baghouses, which are more effective than ESPs. Either approach can be done in approximately 24 months;

(c) The 2015 NOx standards for existing units installed before January 1, 2017 can be met using burner upgrades and the installation of SNCR in many cases. These can be implemented in 18 months. CEA should submit a unit wise schedule for NOx compliance like how they have submitted for PM and SO2.

(d) For existing 482units of 170931MW capacity that need FGD to meet the SO2 (and PM and Hg) standards, FGD should be implemented be implemented in 36 to 42 months, that is between May 2020 – December 2020

(e) All the existing units which came into operation before 1st January 2017 would meet the water norms of 3.5m3/MWh as expeditiously as possible and ideally within 24 months.

(iii) Creating Compliance Plans for New Units and Plants:

(a) All new power Plants which are commissioned or starting generation after 1st January, 2017 should be strictly adhering to the norms prescribed under the December, 2015 Notification which includes (PM - 30mg/Nm3, SO2 - 100mg/Nm3, NOx - 100mg/NOx, mercury – 0.03 mg/Nm3, and 2.5m3/MW for water consumption and Zero Waste Water discharge).

(b) No new plant shall be allowed to commence operation if they are not meeting the standards prescribed for plants after 1st January 2017.

(c) Those plants which were commissioned between 1st Jan 2017 to till date but not complying with the stricter standards should comply to the Rules before December 2019.

(d) No dilution of the water requirement for new plants as its understood that plants with FGD installed can operate within the prescribed limit of 2.5 CuM/MWh. Hence, with 100% ash utilization and

efficient water management systems should ensure minimum use of water.

(e) Any plant which is unable to utilize 100% of the ash as per the Fly Ash Notification, 2009, should be allowed only to operate with a capacity within which is can dispose its generated ash so as to ensure that impact on water, land and local communities are minimized.

(iv) Ensuring that the TPP Standards are Enforceable:

(a) Compliance with the TPP standards can be assured only if provisions to make the standards and the compliance plans enforceable are included in the Environmental Clearance ("EC") for each plant.

(b) To ensure the enforceability of the TPP standards, the following terms and conditions should be required to be included in the EC for any new or existing plant:

a. Requirement that emissions of SO2, NOx, PM10, and Hg be measured on the basis of an hourly average for purposes of evaluating compliance.

b. Requirement that the owner or operator of the plant maintain and make publicly available on their website at

least the past five years of quarterly reports of emissions monitoring results, exceedances, and times when emissions monitors were not operating.

c. The Central Pollution Control Board should submit quarterly report on the status of complaince in terms of the various milestone to be achieved.

d. In case there are any violation of the TPP Standards, any person shall be at liberty to approach the National Green Tribunal for seeking appropriate action against the defaulting unit.

FLYASH MANAGEMENT

Massive quantities of fly ash are being generated in the country every year. In 2015-16, 176 million tons of fly ash was generated, that is almost 3 times the total solid waste of 62 million tons generated in the country in the year For solid waste, PIB release of 5 April 2016, for Fly ash generation, CEA Report on Fly Ash Generation and Utilisation 2016-17). In spite of some improvement in utilisation, huge quantities remain un-utilised, leading to a current cumulative accumulation of more than a billion tons of ash, lying in ash ponds and ash dumps around the

country. There are limitations to the use the various uses of ash – in cement production (due to limits on demand of cement), in recovery of low lying land and other uses (pollutions and contamination risks), due to transport costs etc. There only solution to the ash problem is to ensure that generation matches the utilisation i.e Power Plants should not be allowed to use more coal and generate more ash than they can utilize. As Per CEA which brings out annually the Status of generation and utilsation of flyash in the country, the Status of compliance in 2016-2017 as per CEA is as follows:

"**TABLE –VIII**

STATUS OF UTILIZATION OF FLY ASH AS PER MOEF'S NOTFICATION DATED 3rd NOVEMBER, 2009 FOR THE YEAR 2015-2016

Sl.No.	Description	No.s of TPS
(1)	(2)	(3)
1	No.s of TPS which have achieved the target of fly ash utilization as per MoEF's Notification of 3rd November, 2009	54
2	No.s of TPS which have not been able to achieve the target of fly ash utilization as per MoEF's Notification of 3rd November, 2009	90
3	No.s of TPS which have not generated any significant fly ash or any fly ash	7
	Total	151

It may be seen from Table-VIII above that:

During the year 2015-16, out of **151** (One hundred fifty one) thermal power stations for which was received, **54** (fifty-four) power station have achieved the targets of fly ash utilization as per MoEF's Notification of 3rd November, 2009

In order to control the flyash problem it is essential that the following direction is issued:

(i) Ensure complete compliance with the fly ash notification of 2009 (S.O 2804 dated 3-11-2009) which requires all coal and lignite based power plants to achieve 100 Percent utilisation of flyash within 4 years of commissioning. The concerned SPCB shall take penal action under the provisions of Environment (Protection) Act, 1986 against those Plants which are in violation of the Notification and the action taken should be submitted in the Quarterly Report that is submitted to the Hon'ble Supreme Court.

(ii) The MoEF & CC, should undertake preparation of an updated Comprehensive Risk Assessment of Flyash and its Various Uses. This is important in view of the fact that there are a number of studies have shown the serious risk of contamination of land, water and air due heavy metals and radioactivity contained in flyash. A number of studies have been mandated by directions of the National Green Tribunal, Expert Appraisal Committee and as conditions in the environmental clearance's issued by the MoEF&CC. However, there is no effort as of now to inform decisions with regard flyash utilization based on the

outcome of these studies. It is therefore essential that MoEF&CC in association with relevant institution undertake Comprehensive Risk Assessment of flyash and its various uses in accordance with the Precautionary Principle.

Submitted by

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ANNEXURE 3

POLICY BRIEF

NO ROOM FOR DELAY

Analysis of CEA Plans to Implement New Norms for Coal Power Plants

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OVERVIEW

In December 2015, the Ministry of Environment, Forest & Climate Change (MoEF&CC) announced tighter emission standards for coal-based thermal power plants[1]. The new standards aim to drastically reduce emissions of NO_x, SO_2, PM, and mercury. In order to comply with these revised standards, existing plants were given two years (upto December 2017), while plants commissioned after 1 January 2017 were required to comply from the start of their operations.

In September 2016, Nine months after the norms were announced, Central Electricity Authority (CEA) asked Regional Power Committees (RPCs) to formulate a phasing plan for installing emission control technologies. CEA held several rounds of inconclusive meetings that produced reports with ever changing assessment of pollution control needs and timelines.

On September 1, 2017, the MoEF&CC and the Ministry of Power (MoP) met to discuss the phase in/retirement plans submitted in April 2017 by the RPCs[2]. MoEF&CC and MoP agreed that the April 2017 plan needs to be tightened such that all power stations meet the environmental norms latest by 2022. Accordingly, the four RPCs were asked to come up with revised plans. In late September the RPCs released new plans.[3-6]

CSE's analysis of the RPC plans shows a dismal picture. First, very few plants are expected to comply in the next three years; the vast majority are asking for 4-5 years of extension. Second, even these weak plans don't seem credible as they are not based on evaluation of progress made by plants and current status or detailed project planning. There are neither any firm commitments by plants nor have the regulators proposed any penal action in case of another round of delays. CSE has suggested an alternate plan that is more ambitious requiring the sector to comply within a much shorter, yet achievable timeframe. Moreover, CSE's recommendations are based on parameters such as population density and ambient pollution levels, which should logically drive implementation schedule.

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RPC's PHASE-IN PLANS

The latest RPC plan claims that roughly one third of the total capacity is non- compliant with the PM standards. They will have to undertake measures for compliance. (*see* Table 1: *Plans to meet with PM norms identified by the four RPCs*). Also, there was no discussion about 121.1 GW capacity in the RPC plan - we understand that CEA believes these plants are compliant (Indeed, CEA's April 2017 report said that approx 115 GW of capacity complies with PM norms). We believe this is an optimistic picture of compliance level; however, in the absence of detailed, reliable emissions data, we can neither confirm nor refute CEA's estimate.

TABLE 1: PLANS TO MEET PM NORMS AS IDENTIFIED BY THE FOUR RPCs (CAPACITIES IN GW)

Only 53 GW capacity will have to undertake measures for compliance

Regions	SR	WR	ER	NR	Total
Non-compliant	15.6	17.8	14.1	21.1	68.7
ESP up-gradation			0.6	12.4	13.0
Through FGD	11.0	13.7	8.7	7.2	40.1
To be retired	5.2	4.0	4.7	1.5	15.5
Compliant	23.6	58.8	18.0	20.7	121.1
Total	39.3	76.6	32.1	41.8	189.8

NOTE: SR = Southern Region; WR = Western Region; ER = Eastern Region; NR = Northern Region
Source: Regional power committees, 2017

For SO_2 emission control, RPCs identified that 160 GW capacity will have to install Flue Gas Desulphurization (FGDs) (see Table 2: *Overview – region-wise FGD plan*). As per this plan, however, only 20% of the capacity is targeted for compliance by 2020 (see Table 3: *FGD installation roadmap identified by the RPCs) with* significant back loading.

TABLE 2: OVERVIEW – REGION-WISE FGD PLAN (CAPACITIES IN GW)

85 percent capacity will install FGD

Regions	SR	WR	ER	NR	Total
Non-compliant	31.4	65.5	27.4	39.0	163.3
FGD planned	31.4	65.5	27.4	36.2	160.6
FGD not possible				2.8	2.8
Compliant	7.8	11.1	4.7	2.8	26.5
CFBC	1.4	2.1			3.5
FGD installed	1.2	4.9		1.3	7.5
To be retired	5.2	4.1	4.7	1.5	15.5
Total	39.3	76.6	32.1	41.8	189.8

Source: Regional power committees, 2017

TABLE 3: FGD INSTALLATION ROADMAP IDENTIFIED BY THE RPCs (CAPACITIES IN GW)

Almost three-fourths capacity is scheduled for compliance in 2021-22

TARGET YEAR	SR	WR	ER	NR	Total
2019	3.6	0.0	0.0	1.3	4.9
2020	5.5	8.6	0.8	12.2	27.1
2021	7.9	34.5	9.0	12.4	63.8
2022	14.5	22.5	7.4	10.3	54.6
2023	-	-	9.0*	-	9.0
Not Defined	-	-	1.1	-	1.1
Total	31.4	65.5	27.4	36.2	160.6

*RPCs were asked to prepare a phase-in plan to comply by 2022. However ERPC plan continued to show that 9 GW will comply in 2023.

Source: Regional power committees, 2017

Weaknesses of the RPC plan

- **Unavailability of Credible Emissions Data:** Even after two years of the introduction of standards, detailed, credible emissions data is unavailable. This indicates lack of seriousness in the planning process. It is difficult to analyze needs of individual plants and overall timelines in the absence of emissions data.
- **Space constraint – A non issue:** For two years, CEA and RPCs insisted that space is a constraint to install FGDs – however, the number of plants for which space was an issue kept decreasing. Now, CEA thinks that FGDs should be installed in 160 GW capacity, which we believe is not the appropriate strategy. For 77 GW capacity consisting of units that are smaller than 500MW, the RPC plans suggest that a vast majority will install FGDs to meet the 600 mg/Nm^3 norm. We feel this is unwarranted investment and has contributed to the industry asking for more time for compliance. We suggest alternatives (*given later in CSE plan*)
- **Back-loaded Plan**: There is heavy back loading on the commitments from power stations to install new equipment, especially FGD for SO_2 control. Almost all power stations commit to complete the exercise by 2022, without identifying specific, intermediate timelines on any steps that would be undertaken. This indicates that the proposed timelines have been given without commitment and will not be met unless there is credible penal action in the event of delay.
- **No Plan for NO_x Control**: Only the Southern RPC identified a schedule for NO_x control. The other RPCs have not given details about either the measures they will undertake or the timelines. Since NO_x emissions are directly linked to boiler efficiency, they deserve greater attention. In fact, CEA reports had concluded that NO_x control is a relatively minor retrofit that can be achieved during annual overhaul. The fact that most plants have not taken any steps to comply with NO_x norms is inexplicable.
- **Unclear ESP Timelines**: Timelines for ESP upgrades for non-compliant power stations were not given by three of the RPCs. Many stations intend to install FGDs to meet even ESP standards; only few plants plan to upgrade ESP upgrade. Given that FGD needs the inlet dust to be less than 100mg/Nm^3, ESP upgrade would anyway be needed. Therefore, lack of ESP plan is a serious weakness.

CPCB's REVISED DEADLINES

On 11 December 2017, Central Pollution Control Board (CPCB) issued section 5 notices to thermal power stations, asking them to take action for compliance with the 2015 norms[7]. This came after MoEF&CC's December 2017 deadline.

As per these notices, power stations totaling 163GW of capacity have been asked to implement the measures by December 2022. This is broadly in line with regional power committee timelines. For FGD installations, about 14GW capacity – mostly located around Delhi NCR - has been fast tracked for compliance by 2019 as compared to RPC plan[8] (*see* Table 4: *FGD installation roadmap identified by the CPCB*).

TABLE 4: FGD INSTALLATION ROADMAP IDENTIFIED BY THE CPCB (CAPACITIES IN GW)

Acceleration of timelines for plants in NCR. Overall, the plan is still back-loaded

TARGET YEAR	SR	WR	ER	NR	Total Capacity (GW)
Immediately	0.8	1.3	-	1.5	3.6
2018	-	0.5	-	-	0.5
2019	2.4	-	-	12.0	14.4
2020	5.8	8.7	1.2	6.7	22.3
2021	7.7	33.8	8.8	9.5	59.7
2022	14.7	22.2	17.3	8.2	62.2
No Comments	-	0.6	-	-	0.6
Total Capacity (GW)	31.4	66.9	27.3	37.8	163.4

Source: CPCB Directions under Section 5 of Environment (Protection) Act to power stations, 2017

Unlike the RPC plan, CPCB has identified a PM compliance roadmap for 163GW capacity. Of this, 76 GW has been asked to take steps immediately (see Table 5: *ESP roadmap to meet PM norms identified by CPCB*). This is in contrast with the RPC plan which identified only 68GW capacity for action. However, the timelines for plants are invariably the same as those for FGDs, which makes little sense since ESP retrofit can be finished much faster than FGD.

TABLE 5: ESP ROADMAP TO MEET PM NORMS IDENTIFIED BY CPCB (CAPACITIES IN GW)

There is no mention of 23GW capacity in the CPCB action plan

TARGET YEAR	SR	WR	ER	NR	Total Capacity (GW)
Immediately	13.2	39.2	10.9	13.3	76.6
2019	1.3			4.7	6.0
2020	2.7	2.5	0.5	2.3	8.0
2021	2.8	10.7	3.1	6.1	22.6
2022	7.7	5.8	7.5	6.3	27.3
No Comments	3.6	8.7	5.4	5.1	22.8
Total Capacity (GW)	31.4	66.9	27.3	37.8	163.4

Source: CPCB Directions under Section 5 of Environment (Protection) Act to power stations, 2017

CPCB has asked plants to adopt immediate measures for NO_x control. However, the deadline for actual compliance has been set at 2022 for nearly all power plants. The 2022 timeline seems to have been based on RPC plans which said that plants need to install SCR/SNCR to meet the norms. While Section 5 notices by CPCB said that plants need to use measures such as low NO_x burner/OFA (which can be done during annual overhaul), they erroneously retained the longer timelines. (see Table 6: *NO_x roadmap identified by CPCB*).

TABLE 6: NO_X ROADMAP IDENTIFIED BY CPCB (CAPACITIES IN GW)
No action for NO_x control till 2022

TARGET YEAR	SR	WR	ER	NR	Total Capacity (GW)
2019	-	-	-	12.0	12.0
2022	31.4	66.9	27.3	25.8	151.4
Total Capacity (GW)	31.4	66.9	27.3	37.8	163.4

Source: CPCB Directions under Section 5 of Environment (Protection) Act to power stations, 2017

Weaknesses of the new CPCB plan

- **Compliance with NO_x norms** by 2022 despite the fact that suggested retrofit can be done during annual overhaul.
- ESP upgrade plans coincide with the FGD plans for most power stations. Inaction in the intervening period to at least control PM emissions is incomprehensible.
- Plants commissioned in 2017 should be compliant with the norms announced in 2015. It is higly unlikely that any of those plants are compliant with all norms, however, it seems that pollution control boards or CEA have not sought compliance status from these plants. For example, Rattan India's power station (5 X 270MW) claims to be norms compliant as per the RPC. However, CPCB has identified a target date of 2021 & 2022, without verifying compliance.
- Some plants had been identified as norms compliant by the RPCs; they were however asked to verify this. CPCB has taken no evident action on asking for proof of compliance from these power stations.
- There is no clarity about the applicability of the 2015 norms to captive power stations, especially those of capacity >100MW. No such plant has been issued any notices by CPCB so far.
- **Inconsistency with RPC phase out plan:** Plants that have been identified for phase-out's by the RPCs and/or retirement have also been issued notices. E.g. Guru Hargobind thermal power station in Punjab has been identified for FGD installations by CPCB. However, it is slated for retirement by 2019 as per the RPC plan.
- There are other evident discrepancies in issuing notices from CPCB. For instance, consider the following:
  - CLP's Jhajjar power station has been given a deadline of 31 January 2019 to install FGD. However, the plant has been running an FGD since 2012.
  - Unit 5 of Tata Power in Trombay has already installed FGD. However, it has been given a target date of 2018.

CSE RECOMMENDATIONS

CSE believes that an aggressive timeline needs to be pursued in light of the gravity of the problem and lack of any meaningful effort by a majority of plants. Any relaxation may encourage further delays down the road.

1. Sulphur Dioxide (SO_2)

To maximize benefits from investment in pollution control, we believe densely populated and/or highly polluted areas should be first targeted. Both CEA and MoEF have indicated that this approach makes sense. Second, techno-economic considerations are also important – this means that larger (>500 MW size) and newer units which have to meet the tighter standard should prioritize FGD installation. Further, CPCB has now prioritized installation of control technology for power stations in states neighboring Delhi; however, air pollution is a problem in the entire Northern and Eastern Region. CSE therefore proposes that these be considered in the following manner:

- **Population Density:** Pollution control measures should be prioritized in areas with significant population. We have used population density of the district where a plant is located as a measure to figure out the number of people affected. Population density of 400/sq.km can be taken (average of India was 382 persons/sq.km. as per 2011 Census) to prioritize plants for installation of FGDs.
- **Pollution Levels:** CPCB had identified 43 highly polluted areas under the Comprehensive Environmental Pollution Index (CEPI) exercise[9]. Power stations located in these areas should also be prioritized.

For 111 GW (greater than 500MW units), densely populated and highly polluted areas should be prioritized in the first phase. With this we can achieve a compliance of 57 GW by December 2019. The balance should be asked to comply by December 2020 (see Table 7: *FGD Phase-in Plan for Units of 500MW and above).*

TABLE 7: FGD PHASE-IN PLAN FOR UNITS OF 500MW AND ABOVE

Densely populated and highly polluted areas must be prioritized

Criteria	Capacity (GW)	Compliance
Population density more than 400 per sq.km.+ highly polluted districts as per CEPI	56.7 *	Dec 2019
Population density below 400/ sq.km.	51.5	Dec 2020
Subtotal	108.2	
FGD installed	3.5	
Total	111.7	

*Includes two 490MW units of NTPC, Dadri

For the balance 78 GW (smaller than 500MW units), RPC plans suggest that no action is required on 12.4 GW capacity as they are in compliance because either they are CFBC boilers or have installed FGDs or are using low sulphur coal. In addition, RPC plans show that 15.5 GW would be retired. The RPC plans suggest that a vast majority of the remaining capacity will install FGDs to meet the 600 mg/Nm^3 norm.

Our recommendation is that the remaining units totaling 48.8 GW may be asked to install **alternative SO_2 control measures**, including partial FGDs, lime injection in boilers, etc. or exploring fuel change (low sulphur coal) (see Table 8: *SO_2 control Plan for Units less than 500MW capacity*). Here also, a phased approach considering population and pollution levels should be adopted.

TABLE 8: SO_2 CONTROL PLAN FOR UNITS LESS THAN 500MW CAPACITY
Alternatives to FGD must be considered

Category	Capacity in GW	Compliance
No Action needed	27.9	
CFBC/FGD Installed	7.3	
In compliance (low sulphur coal etc)	5.1	
Retirement	15.5	
SO_2 control (lime injection etc.)	48.8	
Population density more than 400 per sq.km.+ highly polluted districts as per CEPI	30.5	December, 2018
Population density below 400/ sq.km.	14.3	December 2019
Total	77.7	

2. Particulate matter (PM)

As per the RPCs reports, about 121 GW (~64 percent) does not require ESP retrofit, which we take to mean are in compliance. This seems to be an optimistic figure - *compliance should be reconfirmed by plants and cross-checked by regulators by March 2018*. Our estimate is that around 100GW may be in compliance. We believe that a majority of the balance (around 21 GW) comprises plants that were installed after 2008 and designed to meet the new standards but they may be exceeding the PM norms by a small number – this small share of capacity that may need to refurbish the ESP should do it by March 2018 (see Table 9: *ESP retrofit plans)*.

TABLE 9: ESP RETROFIT PLANS
Majority can achieve compliance in a short span of time

Capacity in GW	To comply PM norms by
121.1	March 2018 (in compliance or minor retrofits)
53.1 (a)	March 2019
15.5 (b)	To be retired
189.8	Total

a) Approx. 53 GW should be asked to comply by March 2019. Of this, 40 GW capacity plans to install FGD to cut emissions and meet the PM norms. Since optimal FGD would require low PM concentration (50-100mg/Nm3), we suggest these should overhaul the ESPs in addition to 13GW of capacity that plans to upgrade ESP.

b) To reiterate, this number is based on RPC plans. Over 34 GW of capacity is more than 25 years old and we believe most of it is non-compliant. There, a larger number of plants can be retired

3. Oxides of Nitrogen (NO_x)

As per the continuous emissions monitoring data (CEMS) data collected from CPCB for 93 GW of monitored capacity, about 50 percent capacity complies with the relevant NO_X standards. Using this as the benchmark, we may assume that 50 percent of all power stations are compliant with the NO_x standard. Hence, NO_x control measures should be implemented

in two stages (see Table 10: *Retrofit plans to comply with norms for oxides of nitrogen)* –

- 135.1 GW may be asked to complete the installation in the next overhaul cycle by December 2018,
- Balance 47 GW can be given the deadline of December 2019.

TABLE 10: RETROFIT PLANS TO COMPLY WITH NORMS FOR OXIDES OF NITROGEN

Full compliance can be achieved by 2019

To comply by	Capacity in GW
To be retired	15.5
December, 2018	135.1
December, 2019	40.1
Total	189.8

In summary, we recommend that:

- About 67% capacity meet PM standards by December 2017. If some of these are not able to meet by a small margin, they could be asked to do minor retrofits and meet PM norms by March 2018. The remaining one-third capacity should meet PM norms by March 2019.
- 90% of the capacity should meet SO_2 norms by December 2020. The remaining 10%, which are located in sparsely populated areas should meet standards by December 2021.
- 135.1 GW plants should be asked to comply with the NO_x norms by December 2018. The remaining can meet the norms during annual maintenance by December 2019.
- Overall, in the next 3 years, we can achieve close to 90% compliance which would be a great achievement.
- The plant-wise compliance schedule is attached in Annexures 2 to 5.

Finally, we note our report of charting timelines as a starting point for discussions. Getting detailed emissions data will be immensely helpful to further refine what plants need and how much time they need. CEA, RPCs, and CPCB should immediately share emissions data – we assume that at the very least RPCs have collected recent emissions data through manual sampling conducted recently. This is important since CEMS data is still not fully reliable. Also, RPCs should be asked to release documents/reports used to arrive at the phase-in schedule for each plant. It will help MoEF/CPCB confirm the credibility of the plans. Second, they can form the basis of committed action plan backed by punitive action to enforce compliance.

REFERENCES

1. Ministry of Environment, Forest & Climate Change, Gazette Notification SO 3305(E), 7th December 2015. http://www.moef.gov.in/sites/default/files/Thermal%20plant%20gazette%20scan.pdf
2. Ministry of Power, Government of India office order no. FU-1/2015-IPC dated 21/09/2016. Committee constituted for preparing a phasing plan for implementation of new environmental norms
3. Minutes of 36th (special) TCC meeting of NRPC held on 14th September 2017 at NRPC, New Delhi
4. Minutes of Special TCC Meeting of WRPC held on 28th September 2017 at WRPC, Mumbai
5. Minutes of 36th TCC meeting of ERPC held on 13th September 2017 at Bhubaneswar
6. Minutes of special meeting on preparation of the phasing plan for implementation of new environmental norms for Thermal Plants of SRPC held on 18th September 2017 at Bengaluru.
7. Directions under section 5 of the Environment (Protection) Act, 1986 regarding compliance of emission limits notified vide notification number S.O. 3305 (E) dated 07/12/2015.
8. Affidavit on behalf of the Ministry of Environment, Forest and Climate Change to IA No. 123849 of 2017 in compliance of the order dated 17/11/2017 and 04/12/2017 of Hon'ble Supreme Court.
9. Critically Polluted Industrial clusters / areas http://cpcbenvis.nic.in/industrial_pollution.html#

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ANNEXURES

ANNEXURE 1 – OBSERVATIONS AND DIFFERENCES BETWEEN RPC AND CPCB PLANS

Parameter	RPC Plan October 2017	CPCB Plan December 2017
PM	• 121 GW will not be opting for any action for SPM control. While this level of compliance seems optimistic, we note that almost 110 GW was installed after 2008 – most of this capacity was likely designed to meet the new norms so at most some plants will need to upgrade the ESPs. • Retrofit requirements have been identified for about 68 GW to meet SPM norms. Of this, 42 GW employ FGD to meet the PM norms but have no plans to upgrade the ESP. About 15 GW has retirement plans. Only 13 GW have identified an ESP retrofit plan.	• Detailed plans have been identified for ESP upgrades/retrofits for these power stations. Implementation dates have been given on a unit wise basis as well, totaling to 140 GW. • CPCB has asked units totaling to 76 GW to retrofit their ESPs immediately. • No comments have been issued for about 23GW power stations.
SO_2	• RPCs agree that installation of FGD systems in power plants close to urban settlements should be prioritized, considering the impacts on human health. However, it is unclear if this parameter has been factored in drawing the schedule. • 160 GW has been identified for FGD installations to meet the SO_2 norms. However, the target for 2019 is a mere 5 GW. FGD installations for 64 GW (40 percent of identified capacity) are targeted for the year 2021, while 55 GW (about 35 percent) is targeted for 2022.	• CPCB has accelerated compliance deadlines for power stations located in Punjab, Haryana and Western UP to 2019. This has been done keeping in mind the air pollution problem in Delhi-NCR. Few other power plants located in urban centers have also been given accelerated timelines. • 163 GW has been identified for FGD installations to meet the SO_2 norms. The target for 2019 is 18 GW. FGD installations for 55 GW (40 percent of identified capacity) are targeted for the year 2021, while 62 GW (about 40 percent) is targeted for 2022.
NO_x	• Only the Southern RPC has identified a schedule for NO_x control, which was within the next annual overhauling schedule. • The other RPCs are unclear on the measures they will undertake, and the timeline of compliance.	• Power plants have been asked to implement Low NO_x burners and Over fire air (OFA) dampers or any other suitable measure. • NO_x control targets have been stated clearly. Deadline has been set at 2022 for most plants. There are accelerated deadlines of 2019 for plants which also have accelerated FGD deadlines.

ANNEXURE 2 – PHASE IN PLAN FOR FGD INSTALLATION (UNITS LARGER THAN 500 MW)

COMPLY BY DEC 2019 - Located in districts that have population density in excess of 400/ sq.km. or are critically polluted

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	SECTOR	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
DR. N.TATA RAO TPS	VIJAYAWADA	ANDHRA PRADESH	2009	STATE	7	500	519
SIMHADRI (STAGE 1)	VISHAKHAPATNAM	ANDHRA PRADESH	2002	CENTRAL	1	500	519
SIMHADRI (STAGE 1)	VISHAKHAPATNAM	ANDHRA PRADESH	2002	CENTRAL	2	500	519
SIMHADRI (STAGE 2)	VISHAKHAPATNAM	ANDHRA PRADESH	2011	CENTRAL	4	500	519
SIMHADRI (STAGE 2)	VISHAKHAPATNAM	ANDHRA PRADESH	2011	CENTRAL	3	500	519
VIZAG TPP	VISHAKHAPATNAM	ANDHRA PRADESH	2014	PRIVATE	1	520	519
VIZAG TPP	VISHAKHAPATNAM	ANDHRA PRADESH	2014	PRIVATE	2	520	519
KAHALGAON BHAGALPUR	BHAGALPUR	BIHAR	2008	CENTRAL	5	500	1180
KAHALGAON BHAGALPUR	BHAGALPUR	BIHAR	2008	CENTRAL	6	500	1180
KAHALGAON BHAGALPUR	BHAGALPUR	BIHAR	2008	CENTRAL	7	500	1180
BARH SUPER THERMAL POWER PLANT STAGE-II	PATNA	BIHAR	2014	CENTRAL	5	660	1803
BARH SUPER THERMAL POWER PLANT STAGE-II	PATNA	BIHAR	2014	CENTRAL	4	660	1803
MARWA THERMAL POWER PLANT	JANJGIR	CHHATTISGARH	2014	STATE	1	500	421
MARWA THERMAL POWER PLANT	JANJGIR	CHHATTISGARH	2014	STATE	2	500	421
BARADARHA TPS	JANJGIR-CHAMPA	CHHATTISGARH	2014	PRIVATE	1	600	421
BARADARHA TPS	JANJGIR-CHAMPA	CHHATTISGARH	2014	PRIVATE	2	600	421
NARIYARA THERMAL POWER PLANT (AKALTARA)	JANJGIR-CHAMPA	CHHATTISGARH	2013	PRIVATE	1	600	421
NARIYARA THERMAL POWER PLANT (AKALTARA)	JANJGIR-CHAMPA	CHHATTISGARH	2013	PRIVATE	2	600	421
KORBA STPS	KORBA	CHHATTISGARH	2010	CENTRAL	7	500	183
KORBA STPS	KORBA	CHHATTISGARH	1989	CENTRAL	6	500	183
KORBA STPS	KORBA	CHHATTISGARH	1987	CENTRAL	4	500	183
KORBA STPS	KORBA	CHHATTISGARH	1988	CENTRAL	5	500	183
KORBA-WEST TPS (HASDEO)	KORBA	CHHATTISGARH	2013	STATE	5	500	183
HISAR (RAJIV GANDHI)	HISAR	HARYANA	2010	STATE	1	600	438
HISAR (RAJIV GANDHI)	HISAR	HARYANA	2010	STATE	2	600	438
ARAVALI THERMAL POWER PLANT (INDIRA GANDHI)	JHAJJAR	HARYANA	2011	CENTRAL-STATE JV	1	500	522
ARAVALI THERMAL POWER PLANT (INDIRA GANDHI)	JHAJJAR	HARYANA	2011	CENTRAL-STATE JV	2	500	522

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	SECTOR	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
ARAVALI THERMAL POWER PLANT (INDIRA GANDHI)	JHAJJAR	HARYANA	2011	CENTRAL-STATE JV	3	500	522
MAHATMA GANDHI THERMAL POWER STATION	JHAJJAR	HARYANA	2012	PRIVATE	1	660	522
MAHATMA GANDHI THERMAL POWER STATION	JHAJJAR	HARYANA	2012	PRIVATE	2	660	522
MAITHON RIGHT BANK THERMAL POWER PLANT	DHANBAD	JHARKHAND	2010	PRIVATE	2	525	1284
MAITHON RIGHT BANK THERMAL POWER PLANT	DHANBAD	JHARKHAND	2010	PRIVATE	1	525	1284
KODARMA	KODERMA	JHARKHAND	2013	CENTRAL-STATE JV	1	500	427
KODARMA	KODERMA	JHARKHAND	2013	CENTRAL-STATE JV	2	500	427
BOKARO 'A' TPS	BOKARO	JHARKHAND	2016	CENTRAL	1	500	716
YERMARUS	RAICHUR	KARNATAKA	2015	STATE	1	800	457
YERMARUS	RAICHUR	KARNATAKA	2016	STATE	2	800	457
CHANDRAPUR (MAH.)	CHANDRAPUR	MAHARASHTRA	2015	STATE	9	500	192
CHANDRAPUR (MAH.)	CHANDRAPUR	MAHARASHTRA	2015	STATE	8	500	192
KHAPARKHEDA	NAGPUR	MAHARASHTRA	2011	STATE	5	500	470
KORADI TPS	NAGPUR	MAHARASHTRA	2015	STATE	9	660	470
KORADI TPS	NAGPUR	MAHARASHTRA	2015	STATE	8	660	470
KORADI TPS	NAGPUR	MAHARASHTRA	2016	STATE	10	660	470
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	2016	CENTRAL	4	660	470
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	2016	CENTRAL	3	660	470
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	2013	CENTRAL	2	500	470
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	2013	CENTRAL	1	500	470
CHANDRAPUR (MAH.)	CHANDRAPUR	MAHARASHTRA	1991	STATE	5	500	192
CHANDRAPUR (MAH.)	CHANDRAPUR	MAHARASHTRA	1992	STATE	6	500	192
CHANDRAPUR (MAH.)	CHANDRAPUR	MAHARASHTRA	1997	STATE	7	500	192
DERANG	ANGUL	ORISSA	2014	PRIVATE	1	600	199
DERANG	ANGUL	ORISSA	2014	PRIVATE	2	600	199
TALCHER KANIHA	ANGUL	ORISSA	1995	CENTRAL	1	500	199
TALCHER KANIHA	ANGUL	ORISSA	1995	CENTRAL	2	500	199
TALCHER KANIHA	ANGUL	ORISSA	1995	CENTRAL	4	500	199
TALCHER KANIHA	ANGUL	ORISSA	1995	CENTRAL	5	500	199
TALCHER KANIHA	ANGUL	ORISSA	1995	CENTRAL	6	500	199
TALCHER KANIHA	ANGUL	ORISSA	1995	CENTRAL	3	500	199

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	SECTOR	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
RAJPURA THERMAL POWER PLANT	PATIALA	PUNJAB	2014	PRIVATE	1	700	596
RAJPURA THERMAL POWER PLANT	PATIALA	PUNJAB	2014	PRIVATE	2	700	596
METTUR TPS	SALEM	TAMIL NADU	2014	STATE	5	600	663
NORTH CHENNAI POWER CO. LTD.	TIRUVALLUR	TAMIL NADU	2013	STATE	4	600	1049
NORTH CHENNAI POWER CO. LTD.	TIRUVALLUR	TAMIL NADU	2013	STATE	5	600	1049
VALLUR THERMAL POWER PLANT	TIRUVALLUR	TAMIL NADU	2014	CENTRAL	1	500	1049
VALLUR THERMAL POWER PLANT	TIRUVALLUR	TAMIL NADU	2014	CENTRAL	2	500	1049
VALLUR THERMAL POWER PLANT	TIRUVALLUR	TAMIL NADU	2014	CENTRAL	3	500	1049
BARA TPP (PRAGYARAJ)	ALLAHABAD	UTTAR PRADESH	2015	PRIVATE	1	660	1087
BARA TPP (PRAGYARAJ)	ALLAHABAD	UTTAR PRADESH	2015	PRIVATE	2	660	1087
DADRI (NCTPP)	DELHI	UTTAR PRADESH	2010		5	490	
DADRI (NCTPP)	DELHI	UTTAR PRADESH	2010		6	490	
ANPARA C	SONBHADRA	UTTAR PRADESH	2011	PRIVATE	2	600	270
ANPARA C	SONBHADRA	UTTAR PRADESH	2011	PRIVATE	1	600	270
ANPARA TPS	SONBHADRA	UTTAR PRADESH	1994	STATE	4	500	270
ANPARA TPS	SONBHADRA	UTTAR PRADESH	1994	STATE	5	500	270
ANPARA TPS	SONBHADRA	UTTAR PRADESH	2015	STATE	6	500	270
ANPARA TPS	SONBHADRA	UTTAR PRADESH	2015	STATE	7	500	270
RIHAND STPS	SONBHADRA	UTTAR PRADESH	1988	CENTRAL	1	500	270
RIHAND STPS	SONBHADRA	UTTAR PRADESH	2005	CENTRAL	3	500	270
RIHAND STPS	SONBHADRA	UTTAR PRADESH	2005	CENTRAL	4	500	270
RIHAND STPS	SONBHADRA	UTTAR PRADESH	2005	CENTRAL	5	500	270
RIHAND STPS	SONBHADRA	UTTAR PRADESH	2005	CENTRAL	6	500	270
RIHAND STPS	SONBHADRA	UTTAR PRADESH	1989	CENTRAL	2	500	270
SINGRAULI STPS	SONBHADRA	UTTAR PRADESH	1986	CENTRAL	6	500	270
SINGRAULI STPS	SONBHADRA	UTTAR PRADESH	1987	CENTRAL	7	500	270
MEJIA	BANKURA	WEST BENGAL	2012	CENTRAL-STATE JV	7	500	523
MEJIA	BANKURA	WEST BENGAL	2012	CENTRAL-STATE JV	8	500	523
DURGAPUR STEEL TPS	BURDWAN	WEST BENGAL	2013	CENTRAL-STATE JV	1	500	1100
DURGAPUR STEEL TPS	BURDWAN	WEST BENGAL	2013	CENTRAL-STATE JV	2	500	1100
SAGARDIGHI	MURSHIDABAD	WEST BENGAL	2016	STATE	4	500	1334
SAGARDIGHI	MURSHIDABAD	WEST BENGAL	2016	STATE	3	500	1334

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	SECTOR	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
RAGHUNATHPUR (STAGE 1) THERMAL POWER PLANT	PURULIA	WEST BENGAL	2014	CENTRAL-STATE JV	1	600	468
RAGHUNATHPUR (STAGE 1) THERMAL POWER PLANT	PURULIA	WEST BENGAL	2014	CENTRAL-STATE JV	2	600	468
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	1992	CENTRAL	4	500	1334
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	1994	CENTRAL	5	500	1334
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	2012	CENTRAL	6	500	1334
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2012	CENTRAL	11	500	157
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2012	CENTRAL	12	500	157
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2000	CENTRAL	7	500	157
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2000	CENTRAL	8	500	157
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2007	CENTRAL	9	500	157
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2012	CENTRAL	10	500	157
NIGRI	SINGRAULI	MADHYA PRADESH	2014	PRIVATE	1	660	157
NIGRI	SINGRAULI	MADHYA PRADESH	2014	PRIVATE	2	660	157
MAHAN TPP	SINGRAULI	MADHYA PRADESH	2013	PRIVATE	1	600	157
TOTAL						**56,750**	

COMPLY BY DEC 2020 – Units larger than 500MW located in districts with population density below 400 persons/sq/km.

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	CENTRAL/STATE/ PRIVATE	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
SGPL TPP	KRISHNAPATNAM	ANDHRA PRADESH	2015	PRIVATE	1	660	227
SGPL TPP	KRISHNAPATNAM	ANDHRA PRADESH	2015	PRIVATE	2	660	227
NELCAST ENERGY CORPORATION LTD. (PANAIPURAM)	NELLORE	ANDHRA PRADESH	2015	PRIVATE	1	660	227
NELCAST ENERGY CORPORATION LTD. (PANAIPURAM)	NELLORE	ANDHRA PRADESH	2015	PRIVATE	2	660	227
SRI DAMODARAM SANJEEVAIAH TPS	NELLORE	ANDHRA PRADESH	2014	STATE	1	800	227
SRI DAMODARAM SANJEEVAIAH TPS	NELLORE	ANDHRA PRADESH	2014	STATE	2	800	227
SIPAT	BILASPUR	CHHATTISGARH	2007	CENTRAL	4	660	322
SIPAT	BILASPUR	CHHATTISGARH	2007	CENTRAL	5	660	322
SIPAT	BILASPUR	CHHATTISGARH	2007	CENTRAL	1	500	322
SIPAT	BILASPUR	CHHATTISGARH	2007	CENTRAL	2	500	322
SIPAT	BILASPUR	CHHATTISGARH	2007	CENTRAL	3	660	322
ADANI KORBA WEST POWER STATION (AVANTHA BHANDAR)	RAIGARH	CHHATTISGARH	2014	PRIVATE	1	600	211
TAMNAR	RAIGARH	CHHATTISGARH	2014	PRIVATE	1	600	211
TAMNAR	RAIGARH	CHHATTISGARH	2014	PRIVATE	2	600	211
TAMNAR	RAIGARH	CHHATTISGARH	2015	PRIVATE	3	600	211
TAMNAR	RAIGARH	CHHATTISGARH	2015	PRIVATE	4	600	211
RAIKHEDA TPP	RAIPUR	CHHATTISGARH	2014	PRIVATE	1	685	310
RAIKHEDA TPP	RAIPUR	CHHATTISGARH	2014	PRIVATE	2	685	310
UKAI TPS	TAPI	GUJARAT	2013	STATE	6	500	249
BELLARY (KUDITINI THERMAL POWER STATION)	BELLARY	KARNATAKA	2012	STATE	1	500	300
BELLARY (KUDITINI THERMAL POWER STATION)	BELLARY	KARNATAKA	2003	STATE	2	500	300
BELLARY (KUDITINI THERMAL POWER STATION)	BELLARY	KARNATAKA	2016	STATE	3	700	300
KUDGI STPP	BIJAPUR	KARNATAKA	2016	CENTRAL	1	800	207
KUDGI STPP	BIJAPUR	KARNATAKA	2017	CENTRAL	2	800	207
M B POWER LTD.	ANUPPUR	MADHYA PRADESH	2014	PRIVATE	2	600	200
M B POWER LTD.	ANUPPUR	MADHYA PRADESH	2014	PRIVATE	1	600	200
SEIONI TPP	SEONI	MADHYA PRADESH	2016	PRIVATE	1	600	232

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	CENTRAL/STATE/ PRIVATE	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
SASAN ULTRA MEGA POWER PLANT	SIDHI	MADHYA PRADESH	2013	PRIVATE	1	660	232
SASAN ULTRA MEGA POWER PLANT	SIDHI	MADHYA PRADESH	2013	PRIVATE	2	660	232
SASAN ULTRA MEGA POWER PLANT	SIDHI	MADHYA PRADESH	2013	PRIVATE	3	660	232
SASAN ULTRA MEGA POWER PLANT	SIDHI	MADHYA PRADESH	2013	PRIVATE	4	660	232
SASAN ULTRA MEGA POWER PLANT	SIDHI	MADHYA PRADESH	2013	PRIVATE	5	660	232
SASAN ULTRA MEGA POWER PLANT	SIDHI	MADHYA PRADESH	2013	PRIVATE	6	660	232
ADANI TIRORA (PHASE 1)	GONDIA	MAHARASHTRA	2012	PRIVATE	1	660	253
ADANI TIRORA (PHASE 1)	GONDIA	MAHARASHTRA	2012	PRIVATE	2	660	253
ADANI TIRORA (PHASE 2)	GONDIA	MAHARASHTRA	2013	PRIVATE	4	660	253
ADANI TIRORA (PHASE 2)	GONDIA	MAHARASHTRA	2013	PRIVATE	5	660	253
ADANI TIRORA (PHASE 2)	GONDIA	MAHARASHTRA	2013	PRIVATE	3	660	253
BHUSAWAL TPS	JALGAON	MAHARASHTRA	2012	STATE	4	500	359
BHUSAWAL TPS	JALGAON	MAHARASHTRA	2012	STATE	5	500	359
STERLITE ENERGY LTD.	JHARSUGUDA	ORISSA	2010	PRIVATE	1	600	274
STERLITE ENERGY LTD.	JHARSUGUDA	ORISSA	2010	PRIVATE	2	600	274
STERLITE ENERGY LTD.	JHARSUGUDA	ORISSA	2010	PRIVATE	3	600	274
STERLITE ENERGY LTD.	JHARSUGUDA	ORISSA	2010	PRIVATE	4	600	274
TALWANDI SABO THERMAL POWER PLANT	MANSA	PUNJAB	2013	PRIVATE	2	660	350
TALWANDI SABO THERMAL POWER PLANT	MANSA	PUNJAB	2013	PRIVATE	3	660	350
TALWANDI SABO THERMAL POWER PLANT	MANSA	PUNJAB	2013	PRIVATE	1	660	350
KALISINDH	JHALAWAR	RAJASTHAN	2014	STATE	1	600	227
KALISINDH	JHALAWAR	RAJASTHAN	2014	STATE	2	600	227
MUTHIARA TPP	TUTICORIN	TAMIL NADU	2014	PRIVATE	1	600	367
MUTHIARA TPP	TUTICORIN	TAMIL NADU	2014	PRIVATE	2	600	367
TUTICORIN (JV) TPP	TUTICORIN	TAMIL NADU	2015	CENTRAL	1	500	367
TUTICORIN (JV) TPP	TUTICORIN	TAMIL NADU	2015	CENTRAL	2	500	367
RAMAGUNDEM STPS	KARIMNAGAR	TELANGANA	1988	CENTRAL	4	500	322
RAMAGUNDEM STPS	KARIMNAGAR	TELANGANA	1989	CENTRAL	5	500	322
RAMAGUNDEM STPS	KARIMNAGAR	TELANGANA	1989	CENTRAL	6	500	322
RAMAGUNDEM STPS	KARIMNAGAR	TELANGANA	2004	CENTRAL	7	500	322
KOTHAGUDEM-VI	KHAMMAM	TELANGANA	2011	STATE	3	500	322

PLANT NAME	DISTRICT	STATE	COMMISSIONING YEAR	CENTRAL/STATE/ PRIVATE	UNIT NUMBER	CAPACITY IN MW	POPULATION DENSITY (PERSON PER SQ.KM)
SINGARENI	MANCHERIAL	TELANGANA	2015	STATE	1	600	170
SINGARENI	MANCHERIAL	TELANGANA	2016	STATE	2	600	170
KAKATIYA	WARANGAL	TELANGANA	2010	STATE	1	500	274
KAKATIYA	WARANGAL	TELANGANA	2016	STATE	2	600	274
LALITPUR TPP (LPGCL)	LALITPUR	UTTAR PRADESH	2015	PRIVATE	1	660	242
LALITPUR TPP (LPGCL)	LALITPUR	UTTAR PRADESH	2015	PRIVATE	2	660	242
LALITPUR TPP (LPGCL)	LALITPUR	UTTAR PRADESH	2015	PRIVATE	3	660	242
ADANI MUNDRA (PHASE 2)	KUTCH	GUJARAT	2011	PRIVATE	5	660	46
ADANI MUNDRA (PHASE 2)	KUTCH	GUJARAT	2011	PRIVATE	6	660	46
ADANI MUNDRA (PHASE 3)	KUTCH	GUJARAT	2012	PRIVATE	7	660	46
MUNDRA ULTRA MEGA POWER PLANT	KUTCH	GUJARAT	2013	PRIVATE	1	800	46
MUNDRA ULTRA MEGA POWER PLANT	KUTCH	GUJARAT	2013	PRIVATE	2	800	46
MUNDRA ULTRA MEGA POWER PLANT	KUTCH	GUJARAT	2013	PRIVATE	3	800	46
MUNDRA ULTRA MEGA POWER PLANT	KUTCH	GUJARAT	2013	PRIVATE	4	800	46
MUNDRA ULTRA MEGA POWER PLANT	KUTCH	GUJARAT	2013	PRIVATE	5	800	46
ADANI MUNDRA (PHASE 3)	KUTCH	GUJARAT	2012	PRIVATE	8	660	46
ADANI MUNDRA (PHASE 3)	KUTCH	GUJARAT	2012	PRIVATE	9	660	46
SALAYA	JAMNAGAR	GUJARAT	2012	PRIVATE	1	600	153
SALAYA	JAMNAGAR	GUJARAT	2012	PRIVATE	2	600	153
SANJAY GANDHI	UMARIA	MADHYA PRADESH	2007	STATE	5	500	158
MALWA THERMAL POWER PLANT (SHRI SINGHAJI)	KHANDWA	MADHYA PRADESH	2014	STATE	1	600	178
MALWA THERMAL POWER PLANT (SHRI SINGHAJI)	KHANDWA	MADHYA PRADESH	2014	STATE	2	600	178
KAWAI TPP	BARAN	RAJASTHAN	2014	STATE	1	660	175
KAWAI TPP	BARAN	RAJASTHAN	2014	STATE	2	660	175
TOTAL						**51,530**	

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ANNEXURE 3 – PHASE IN PLAN FOR SO_2 CONTROL (UNITS SMALLER THAN 500 MW)

TO COMPLY BY DEC 2019 (low sulphur coal, lime injection etc) - Population density more than 400/sq.km. or critically polluted

NAME OF PLANT	DISTRICT	SECTOR	STATE	UNIT NO	CAPACITY	AGE IN YEARS	POPULATION DENSITY
BEGUSARAI	BEGUSARAI	STATE	BIHAR	7	105	32	1540
BEGUSARAI	BEGUSARAI	STATE	BIHAR	6	105	34	1540
MUZAFFARPUR TPS	MUZAFFARPUR	CENTRAL	JHARKHAND	4	195	0	1506
MUZAFFARPUR TPS	MUZAFFARPUR	CENTRAL	BIHAR	3	195	2	1506
RAMAGUNDEM STPS	KARIM NAGAR	CENTRAL	TELANGANA	3	200	33	1449
RAMAGUNDEM STPS	KARIM NAGAR	CENTRAL	TELANGANA	2	200	33	1449
RAMAGUNDEM STPS	KARIM NAGAR	CENTRAL	TELANGANA	1	200	34	1449
FARAKKA STPS	MURSHIDABAD	CENTRAL	WEST BENGAL	3	200	30	1334
FARAKKA STPS	MURSHIDABAD	CENTRAL	WEST BENGAL	2	200	31	1334
FARAKKA STPS	MURSHIDABAD	CENTRAL	WEST BENGAL	1	200	31	1334
SAGARDIGHI TPS	MURSHIDABAD	STATE	WEST BENGAL	1	300	9	1334
SAGARDIGHI TPS	MURSHIDABAD	STATE	WEST BENGAL	2	300	10	1334
KAHALGAON TPS	BHAGALPUR	CENTRAL	BIHAR	1	210	25	1180
KAHALGAON TPS	BHAGALPUR	CENTRAL	BIHAR	4	210	21	1180
KAHALGAON TPS	BHAGALPUR	CENTRAL	BIHAR	3	210	22	1180
KAHALGAON TPS	BHAGALPUR	CENTRAL	BIHAR	2	210	23	1180
GH TPS (LEH.MOH.)	BHATINDA	STATE SECTOR	PUNJAB	3	250	9	1180
GH TPS (LEH.MOH.)	BHATINDA	STATE SECTOR	PUNJAB	4	250	9	1180
GH TPS (LEH.MOH.)	BHATINDA	STATE	PUNJAB	2	210	19	1180
GH TPS (LEH.MOH.)	BHATINDA	STATE	PUNJAB	1	210	20	1180
BANDEL TPS	HOOGHLY	STATE	WEST BENGAL	5	210	35	1076
HALDIA TPP	PURBA MEDINIPUR	PRIVATE	WEST BENGAL	2	300	2	1076
HALDIA TPP	PURBA MEDINIPUR	PRIVATE	WEST BENGAL	1	300	2	1076
INDIA POWER TPP	PURBA MEDINIPUR	PRIVATE	WEST BENGAL	1	150	0	1076
KOLAGHAT TPS	PURBA MEDINIPUR	STATE	WEST BENGAL	5	210	24	1076
KOLAGHAT TPS	PURBA MEDINIPUR	STATE	WEST BENGAL	1	210	24	1076
KOLAGHAT TPS	PURBA MEDINIPUR	STATE	WEST BENGAL	6	210	26	1076
KOLAGHAT TPS	PURBA MEDINIPUR	STATE	WEST BENGAL	2	210	27	1076
KOLAGHAT TPS	PURBA MEDINIPUR	STATE	WEST BENGAL	3	210	32	1076
KOLAGHAT TPS	PURBA MEDINIPUR	STATE	WEST BENGAL	4	210	33	1076
SANTALDIH TPS	PURULIA	STATE	WEST BENGAL	6	250	6	1076
SANTALDIH TPS	PURULIA	STATE	WEST BENGAL	5	250	10	1076
HARDUAGANJ TPS	ALIGARH	STATE SECTOR	UTTAR PARDESH	9	250	5	1007
HARDUAGANJ TPS	ALIGARH	STATE SECTOR	UTTAR PARDESH	8	250	6	1007
PANIPAT TPS	PANIPAT	STATE SECTOR	HARYANA	8	250	12	949
PANIPAT TPS	PANIPAT	STATE SECTOR	HARYANA	7	250	13	949
PANIPAT TPS	PANIPAT	STATE	HARYANA	6	210	16	949
BUDGE BUDGE TPS	SOUTH 24 PARGANAS	PRIVATE	WEST BENGAL	3	250	8	819
BUDGE BUDGE TPS	SOUTH 24 PARGANAS	PRIVATE	WEST BENGAL	2	250	18	819

NAME OF PLANT	DISTRICT	SECTOR	STATE	UNIT NO	CAPACITY	AGE IN YEARS	POPULATION DENSITY
BUDGE BUDGE TPS	SOUTH 24 PARGANAS	PRIVATE	WEST BENGAL	1	250	20	819
NABI NAGAR TPP	AURANGABAD	CENTRAL	BIHAR	2	250	0	760
NABI NAGAR TPP	AURANGABAD	CENTRAL	BIHAR	1	250	1	760
UNCHAHAR TPS	RAEBARELI	CENTRAL	UTTAR PRADESH	2	210	28	739
UNCHAHAR TPS	RAEBARELI	CENTRAL	UTTAR PRADESH	1	210	29	739
UNCHAHAR TPS	RAEBARELI	CENTRAL	UTTAR PRADESH	5	210	11	739
UNCHAHAR TPS	RAEBARELI	CENTRAL	UTTAR PRADESH	3	210	18	739
UNCHAHAR TPS	RAEBARELI	CENTRAL	UTTAR PRADESH	4	210	18	739
BOKARO	BOKARO	CENTRAL	JHARKHAND	1	210	31	716
JOJOBERA TPS	BOKARO	PRIVATE	JHARKHAND	3	120	15	716
JOJOBERA TPS	BOKARO	PRIVATE	JHARKHAND	2	120	16	716
BOKARO	BOKARO	CENTRAL	JHARKHAND	2	210	27	716
NEYVELI (EXT) TPS	CUDDALORE	CENTRAL	TAMIL NADU	2	210	14	702
NEYVELI (EXT) TPS	CUDDALORE	CENTRAL	TAMIL NADU	1	210	15	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	7	210	24	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	6	210	25	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	5	210	25	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	4	210	26	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	1	210	29	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	3	210	30	702
NEYVELI TPS -II	CUDDALORE	CENTRAL	TAMIL NADU	2	210	30	702
TAQA, NEWELL	CUDDALORE	PRIVATE	TAMIL NADU	2	250	15	702
DADRI (NCTPP)	DELHI	CENTRAL	UTTAR PRADESH	3	210	24	702
DADRI (NCTPP)	DELHI	CENTRAL	UTTAR PRADESH	2	210	25	702
DADRI (NCTPP)	DELHI	CENTRAL	UTTAR PRADESH	1	210	26	702
DADRI (NCTPP)	DELHI	CENTRAL	UTTAR PRADESH	4	210	23	702
YAMUNA NAGAR TPS	YAMUNANAGAR	STATE SECTOR	HARYANA	2	300	9	687
YAMUNA NAGAR TPS	YAMUNANAGAR	STATE SECTOR	HARYANA	1	300	10	687
ROSA TPP PH-I	SHAHJAHANPUR	PRIVATE SECTOR	UTTAR PRADESH	4	300	5	684
ROSA TPP PH-I	SHAHJAHANPUR	PRIVATE SECTOR	UTTAR PRADESH	3	300	6	684
ROSA TPP PH-I	SHAHJAHANPUR	PRIVATE SECTOR	UTTAR PRADESH	1	300	7	684
ROSA TPP PH-I	SHAHJAHANPUR	PRIVATE SECTOR	UTTAR PRADESH	2	300	7	684
JAMSHEDPUR	JAMSHEDPUR	PRIVATE	JHARKHAND	3	120	6	648
JAMSHEDPUR	JAMSHEDPUR	PRIVATE	JHARKHAND	2	120	12	648
JAMSHEDPUR	JAMSHEDPUR	PRIVATE	JHARKHAND	1	120	15	648

NAME OF PLANT	DISTRICT	SECTOR	STATE	UNIT NO	CAPACITY	AGE IN YEARS	POPULATION DENSITY
MAHADEV PRASAD STPP	JAMSHEDPUR	PRIVATE	JHARKHAND	2	270	4	648
MAHADEV PRASAD STPP	JAMSHEDPUR	PRIVATE	JHARKHAND	1	270	5	648
MEJIA TPS	BANKURA	CENTRAL	WEST BENGAL	6	250	10	523
MEJIA TPS	BANKURA	CENTRAL	WEST BENGAL	5	250	10	523
MEJIA TPS	BANKURA	CENTRAL	WEST BENGAL	4	210	13	523
MEJIA TPS	BANKURA	CENTRAL	WEST BENGAL	3	210	19	523
MEJIA TPS	BANKURA	CENTRAL	WEST BENGAL	2	210	20	523
MEJIA TPS	BANKURA	CENTRAL	WEST BENGAL	1	210	21	523
DR. N. TATA RAO TPS	VIJAYAWADA	STATE	ANDHRA PRADESH	7	210	8	519
BUTIBORI TPP	NAGPUR	PRIVATE	MAHARASHTRA	2	300	4	470
BUTIBORI TPP	NAGPUR	PRIVATE	MAHARASHTRA	1	300	5	470
GOINDWAL SAHIB	TARN TARAN	PRIVATE SECTOR	PUNJAB	1	270	1	464
GOINDWAL SAHIB	TARN TARAN	PRIVATE SECTOR	PUNJAB	2	270	1	464
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	3	210	26	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	2	210	31	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	1	210	32	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	8	250	7	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	7	210	15	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	6	210	18	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	5	210	18	457
RAICHUR TPS	RAICHUR	STATE	KARNATAKA	4	210	23	457
UCHPINDA TPP	JANJGIR-CHAMPA	PRIVATE	CHHATTISGARH	3	360	1	421
UCHPINDA TPP	JANJGIR-CHAMPA	PRIVATE	CHHATTISGARH	1	360	2	421
IB VALLEY TPS	JHARSUGUDA	STATE	ODISHA	2	210	22	274
IB VALLEY TPS	JHARSUGUDA	STATE	ODISHA	1	210	23	274
JHARSUGUDA	JHARSUGUDA	PRIVATE	ORISSA	1	350	2	274
JHARSUGUDA	JHARSUGUDA	STATE	ORISSA	1	210	23	274
JHARSUGUDA	JHARSUGUDA	STATE	ORISSA	2	210	23	274
ANPARA TPS	SONBHADRA	STATE	UTTAR PRADESH	3	210	29	270
ANPARA TPS	SONBHADRA	STATE	UTTAR PRADESH	2	210	30	270
ANPARA TPS	SONBHADRA	STATE	UTTAR PRADESH	1	210	31	270
OBRA TPS	SONBHADRA	STATE	UTTAR PRADESH	13	200	35	270
OBRA TPS	SONBHADRA	STATE	UTTAR PRADESH	12	200	36	270
OBRA TPS	SONBHADRA	STATE	UTTAR PRADESH	9	200	37	270
OBRA TPS	SONBHADRA	STATE	UTTAR PRADESH	10	200	38	270
OBRA TPS	SONBHADRA	STATE	UTTAR PRADESH	11	200	40	270
SINGRAULI STPS	SONBHADRA	CENTRAL	UTTAR PRADESH	5	200	33	270
SINGRAULI STPS	SONBHADRA	CENTRAL	UTTAR PRADESH	3	200	34	270
SINGRAULI STPS	SONBHADRA	CENTRAL	UTTAR PRADESH	4	200	34	270
SINGRAULI STPS	SONBHADRA	CENTRAL	UTTAR PRADESH	1	200	35	270

NAME OF PLANT	DISTRICT	SECTOR	STATE	UNIT NO	CAPACITY	AGE IN YEARS	POPULATION DENSITY
SINGRAULI STPS	SONBHADRA	CENTRAL	UTTAR PRADESH	2	200	35	270
BINJKOTE TPP	RAIGARH	PRIVATE	CHHATTISGARH	1	300	0	211
OP JINDAL TPS	RAIGARH	PRIVATE	CHHATTISGARH	2	250	9	211
OP JINDAL TPS	RAIGARH	PRIVATE	CHHATTISGARH	3	250	9	211
OP JINDAL TPS	RAIGARH	PRIVATE	CHHATTISGARH	4	250	9	211
OP JINDAL TPS	RAIGARH	PRIVATE	CHHATTISGARH	1	250	10	211
DHARIWAL TPP	CHANDRAPUR	PRIVATE	MAHARASHTRA	2	300	3	192
DHARIWAL TPP	CHANDRAPUR	PRIVATE	MAHARASHTRA	1	300	4	192
EMCO WARORA TPS	CHANDRAPUR	PRIVATE	MAHARASHTRA	2	300	4	192
EMCO WARORA TPS	CHANDRAPUR	PRIVATE	MAHARASHTRA	1	300	4	192
WARDHA WARORA TPP	CHANDRAPUR	PRIVATE	MAHARASHTRA	4	135	6	192
WARDHA WARORA TPP	CHANDRAPUR	PRIVATE	MAHARASHTRA	3	135	6	192
WARDHA WARORA TPP	CHANDRAPUR	PRIVATE	MAHARASHTRA	2	135	7	192
WARDHA WARORA TPP	CHANDRAPUR	PRIVATE	MAHARASHTRA	1	135	7	192
BALCO TPS	KORBA	PRIVATE	CHHATTISGARH	2	300	1	183
BALCO TPS	KORBA	PRIVATE	CHHATTISGARH	1	300	2	183
BANDAKHAR TPP	KORBA	PRIVATE	CHHATTISGARH	1	300	2	183
DSPM TPS	KORBA	STATE	CHHATTISGARH	1	250	10	183
DSPM TPS	KORBA	STATE	CHHATTISGARH	2	250	10	183
PATHADI TPP	KORBA	PRIVATE	CHHATTISGARH	2	300	7	183
PATHADI TPP	KORBA	PRIVATE	CHHATISGARH	1	300	8	183
TOTAL					**30,720**		

TO COMPLY BY DEC 2020 (low sulphur coal, lime injection etc) - Population density less than 400/sq.km.

NAME OF PROJECT	DISTRICT	SECTOR	STATE	UNIT NO	CAPACITY	AGE IN YEARS	POPULATION DENSITY
PARICHHA TPS	JHANSI	STATE SECTOR	UTTAR PRADESH	6	250	4	398
PARICHHA TPS	JHANSI	STATE SECTOR	UTTAR PRADESH	5	250	5	398
PARICHHA TPS	JHANSI	STATE	UTTAR PRADESH	3	210	11	398
PARICHHA TPS	JHANSI	STATE	UTTAR PRADESH	4	210	11	398
NASIK (P) TPS	NASIK	PRIVATE	MAHARASHTRA	5	270	0	393
NASIK (P) TPS	NASIK	PRIVATE	MAHARASHTRA	4	270	0	393
NASIK (P) TPS	NASIK	PRIVATE	MAHARASHTRA	3	270	0	393
NASIK (P) TPS	NASIK	PRIVATE	MAHARASHTRA	1	270	3	393
KOTA TPS	KOTA	STATE	RAJASTHAN	5	210	23	374
KOTA TPS	KOTA	STATE	RAJASTHAN	7	195	14	374
KOTA TPS	KOTA	STATE	RAJASTHAN	6	195	23	374
MUNDRA TPS	KUTCH	PRIVATE	GUJARAT	4	330	7	374
MUNDRA TPS	KUTCH	PRIVATE	GUJARAT	3	330	7	374
MUNDRA TPS	KUTCH	PRIVATE	GUJARAT	2	330	7	374
MUNDRA TPS	KUTCH	PRIVATE	GUJARAT	1	330	8	374
JALGAON TPS	JALGAON	STATE	MAHARASHTRA	3	210	35	359
JALGAON TPS	JALGAON	STATE	MAHARASHTRA	2	210	38	359
TORANGALLU TPS EXT	BELLARY	PRIVATE	KARNATAKA	2	300	8	300
TORANGALLU TPS EXT	BELLARY	PRIVATE	KARNATAKA	1	300	8	300
BANDEL TPS	KOLKATTA	STATE	WEST BENGAL	4	60	51	280
BANDEL TPS	KOLKATTA	STATE	WEST BENGAL	3	60	51	280
BANDEL TPS	KOLKATTA	STATE	WEST BENGAL	2	60	52	280
BANDEL TPS	KOLKATTA	STATE	WEST BENGAL	1	60	52	280
SOUTHERN REPL, TPS	KOLKATTA	PRIVATE	WEST BENGAL	1	68	26	280
SOUTHERN REPL, TPS	KOLKATTA	PRIVATE	WEST BENGAL	2	68	27	280
RAYALASEEMA TPS	KADAPA	STATE	ANDHRA PRADESH	5	210	6	274
RAYALASEEMA TPS	KADAPA	STATE	ANDHRA PRADESH	3	210	10	274
RAYALASEEMA TPS	KADAPA	STATE	ANDHRA PRADESH	4	210	10	274
RAYALASEEMA TPS	KADAPA	STATE	ANDHRA PRADESH	2	210	22	274
RAYALASEEMA TPS	KADAPA	STATE	ANDHRA PRADESH	1	210	23	274
KAMALANGA TPS	DHENKANAL	PRIVATE	ODISHA	3	350	3	268
KAMALANGA TPS	DHENKANAL	PRIVATE	ODISHA	2	350	4	268
KAMALANGA TPS	DHENKANAL	PRIVATE	ODISHA	1	350	4	268
BHILAI TPS	DURG	CENTRAL	CHHATTISGARH	2	250	8	268
BHILAI TPS	DURG	CENTRAL	CHHATTISGARH	1	250	9	268
D.P.L. TPS	DURGAPUR	STATE	WEST BENGAL	6	110	32	268
D.P.L. TPS	DURGAPUR	STATE	WEST BENGAL	7	300	10	268
D.P.L. TPS EXT.	DURGAPUR	STATE	WEST BENGAL	8	250	3	268

NAME OF PROJECT	DISTRICT	SECTOR	STATE	UNIT NO	CAPACITY	AGE IN YEARS	POPULATION DENSITY
PARLI TPS	BEED	STATE	MAHARASHTRA	8	250	1	242
PARLI TPS	BEED	STATE	MAHARASHTRA	7	250	7	242
PARLI TPS	BEED	STATE	MAHARASHTRA	6	250	10	242
NAWAPARA TPP	RAIPUR	PRIVATE	CHHATTISGARH	2	300	0	211
AMARKANTAK EXT TPS	ANUPPUR	STATE	MADHYA PRADESH	5	210	9	200
CHANDRAPURA(DVC)	CHANDRAPURA	CENTRAL	JHARKHAND	7	250	8	192
CHANDRAPURA(DVC)	CHANDRAPURA	CENTRAL	JHARKHAND	8	250	7	192
NORTH CHENNAI TPS	CHENNAI	STATE	TAMIL NADU	3	210	21	192
NORTH CHENNAI TPS	CHENNAI	STATE	TAMIL NADU	2	210	22	192
NORTH CHENNAI TPS	CHENNAI	STATE	TAMIL NADU	1	210	23	192
SURATGARH TPS	GANGANAGAR	STATE SECTOR	RAJASTHAN	6	250	8	179
SURATGARH TPS	GANGANAGAR	STATE SECTOR	RAJASTHAN	5	250	14	179
SURATGARH TPS	GANGANAGAR	STATE SECTOR	RAJASTHAN	4	250	15	179
SURATGARH TPS	GANGANAGAR	STATE	RAJASTHAN	3	250	16	179
SURATGARH TPS	GANGANAGAR	STATE	RAJASTHAN	2	250	17	179
SURATGARH TPS	GANGANAGAR	STATE	RAJASTHAN	1	250	19	179
CHHABRA TPP	BARAN	STATE SECTOR	RAJASTHAN	1	250	8	175
CHHABRA TPP	BARAN	STATE SECTOR	RAJASTHAN	4	250	3	175
CHHABRA TPP	BARAN	STATE SECTOR	RAJASTHAN	3	250	4	175
CHHABRA TPP	BARAN	STATE SECTOR	RAJASTHAN	2	250	7	175
SATPURA TPS	BETUL	STATE	MADHYA PRADESH	11	250	3	157
SATPURA TPS	BETUL	STATE	MADHYA PRADESH	10	250	4	157
SIKKA REP TPS	JAMNAGAR	STATE	GUJARAT	4	250	2	153
SIKKA REP TPS	JAMNAGAR	STATE	GUJARAT	3	250	2	153
TOTAL					**14,466**		

ANNEXURE 4 – PHASE IN PLAN FOR ESP UPGRADATION

Plants to comply by March, 2019

PLANT NAME	DISTRICT	STATE	UNIT NO	CAPACITY
DR. N.TATA RAO TPS	VIJAYAWADA	ANDHRA PRADESH	7	500
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	4	660
BARA TPP (PRAGYARAJ)	ALLAHABAD	UTTAR PRADESH	3	660
SINGRAULI STPS	SONBHADRA	UTTAR PRADESH	7	500
SRI DAMODARAM SANJEEVAIAH TPS	NELLORE	ANDHRA PRADESH	1	800
TRN ENERGY PVT. LTD. (NAWAPARA TPP)	RAIGARH	CHHATTISGARH	2	300
TUTICORIN (JV) TPP	TUTICORIN	TAMIL NADU	2	500
KAKATIYA	WARANGAL	TELANGANA	1	500
UNCHAHAR TPS	RAEBARELI	UTTAR PARDESH	6	500
SAGARDIGHI TPS	MURSHIDABAD	WEST BENGAL	1	300
BINJKOTE TPP (SKS POWER)	RAIGARH	CHHATISGARH	1	300
CHHABRA TPP	BARAN	RAJASTHAN	5	660
RAYALASEEMA TPS	KADAPA	ANDHRA PRADESH	5	210
RAYALASEEMA TPS	KADAPA	ANDHRA PRADESH	3	210
KUTCH LIGNITE TPS (GSECL)	KUTCH	GUJARAT	4	75
SURAT LIGNITE (CFBC)	SURAT	GUJARAT	3	125
SURAT LIGNITE (CFBC)	SURAT	GUJARAT	4	125
AKRIMOTA (CFBC)	KUTCH	GUJARAT	1	125
AKRIMOTA (CFBC)	KUTCH	GUJARAT	2	125
TENUGHAT TPP	TENUGHAT	JHARKHAND	1	210
SOLAPUR TPS (NTPC)	SOLAPUR	MAHARASHTRA	1	660
CHANDRAPUR (MAHA GENCO)	CHANDRAPUR	MAHARASHTRA	8	500
KHAPARKHEDA	NAGPUR	MAHARASHTRA	1	210
KHAPARKHEDA	NAGPUR	MAHARASHTRA	2	210
KHAPARKHEDA	NAGPUR	MAHARASHTRA	3	210
KORADI TPS	NAGPUR	MAHARASHTRA	7	210
METTUR TPS	SALEM	TAMIL NADU	1	210
METTUR TPS	SALEM	TAMIL NADU	2	210
METTUR TPS	SALEM	TAMIL NADU	3	210
METTUR TPS	SALEM	TAMIL NADU	4	210
ANPARA TPS	SONBHADRA	UTTAR PRADESH	7	500
RIHAND STPS	SONBHADRA	UTTAR PRADESH	2	500
RIHAND STPS	SONBHADRA	UTTAR PRADESH	3	500
RIHAND STPS	SONBHADRA	UTTAR PRADESH	4	500
SINGRAULI STPS	SONBHADRA	UTTAR PRADESH	6	500
MEJIA	BANKURA	WEST BENGAL	7	500
MEJIA	BANKURA	WEST BENGAL	8	500
UKAI TPS	TAPI	GUJARAT	3	200
UKAI TPS	TAPI	GUJARAT	4	200
UKAI TPS	TAPI	GUJARAT	5	210
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	9	500
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	10	500
BHUSAWAL TPS (MAHAGENCO)	JALGAON	MAHARASHTRA	4	500
BHUSAWAL TPS (MAHAGENCO)	JALGAON	MAHARASHTRA	5	500
TUTICORIN (JV) TPP	TUTICORIN	TAMIL NADU	1	500

PLANT NAME	DISTRICT	STATE	UNIT NO	CAPACITY
SANJAY GANDHI TPS (MPPGCL)	UMARIA	MADHYA PRADESH	1	210
SANJAY GANDHI TPS (MPPGCL)	UMARIA	MADHYA PRADESH	2	210
SANJAY GANDHI TPS (MPPGCL)	UMARIA	MADHYA PRADESH	3	210
SANJAY GANDHI TPS (MPPGCL)	UMARIA	MADHYA PRADESH	4	210
SANJAY GANDHI TPS (MPPGCL)	UMARIA	MADHYA PRADESH	5	500
RAICHUR TPS	RAICHUR	KARNATAKA	1	210
RAICHUR TPS	RAICHUR	KARNATAKA	2	210
RAICHUR TPS	RAICHUR	KARNATAKA	3	210
RAICHUR TPS	RAICHUR	KARNATAKA	4	210
ROSA TPP PH-I	SHAHJAHANPUR	UTTAR PARDESH	3	300
ROSA TPP PH-I	SHAHJAHANPUR	UTTAR PARDESH	1	300
KOLAGHAT TPS	PURBA MEDINIPUR	WEST BENGAL	2	210
KOLAGHAT TPS	PURBA MEDINIPUR	WEST BENGAL	3	210
KOLAGHAT TPS	PURBA MEDINIPUR	WEST BENGAL	5	210
KOLAGHAT TPS	PURBA MEDINIPUR	WEST BENGAL	6	210
SANTALDIH TPS	PURULIA	WEST BENGAL	6	250
SANTALDIH TPS	PURULIA	WEST BENGAL	5	250
SAGARDIGHI TPS	MURSHIDABAD	WEST BENGAL	2	300
BALCO TPS	KORBA	CHHATISGARH	2	300
BALCO TPS	KORBA	CHHATISGARH	1	300
SINGRAULI STPS	SONBHADRA	UTTAR PARDESH	1	200
SINGRAULI STPS	SONBHADRA	UTTAR PARDESH	2	200
SINGRAULI STPS	SONBHADRA	UTTAR PARDESH	3	200
SINGRAULI STPS	SONBHADRA	UTTAR PARDESH	4	200
SINGRAULI STPS	SONBHADRA	UTTAR PARDESH	5	200
IB VALLEY TPS	JHARSUGUDA	ODISHA	2	210
IB VALLEY TPS	JHARSUGUDA	ODISHA	1	210
SATPURA TPS (MPPGCL)	BETUL	MADHYA PRADESH	11	250
SATPURA TPS (MPPGCL)	BETUL	MADHYA PRADESH	10	250
CHHABRA TPP	BARAN	RAJASTHAN	1	250
CHHABRA TPP	BARAN	RAJASTHAN	2	250
CHHABRA TPP	BARAN	RAJASTHAN	3	250
CHHABRA TPP	BARAN	RAJASTHAN	4	250
AMARKANTAK EXT TPS	ANUPPUR	MADHYA PRADESH	5	210
PARLI TPS	BEED	MAHARASHTRA	8	250
PARLI TPS	BEED	MAHARASHTRA	7	250
PARLI TPS	BEED	MAHARASHTRA	6	250
PARLI TPS	BEED	MAHARASHTRA	4	210
RAYALASEEMA TPS	KADAPA	ANDHRA PRADESH	4	210
RAYALASEEMA TPS	KADAPA	ANDHRA PRADESH	2	210
RAYALASEEMA TPS	KADAPA	ANDHRA PRADESH	1	210
KUTCH LIGNITE TPS (GSECL)	KUTCH	GUJARAT	1	70
KUTCH LIGNITE TPS (GSECL)	KUTCH	GUJARAT	2	70

PLANT NAME	DISTRICT	STATE	UNIT NO	CAPACITY
KUTCH LIGNITE TPS (GSECL)	KUTCH	GUJARAT	3	75
NASIK TPS	NASIK	MAHARASHTRA	4	210
NASIK TPS	NASIK	MAHARASHTRA	5	210
PARICHHA TPS	JHANSI	UTTAR PARDESH	6	250
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	1	210
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	2	210
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	3	210
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	4	210
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	5	210
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	6	210
WANAKBORI TPS (JECL)	KHEDA	GUJARAT	7	210
NASIK RATTAN INDIA TPP	NASIK	MAHARASHTRA	1	270
NASIK RATTAN INDIA TPP	NASIK	MAHARASHTRA	2	270
PARAS TPS (MAHAGENCO)	AKOLA	MAHARASHTRA	3	250
PARAS TPS (MAHAGENCO)	AKOLA	MAHARASHTRA	4	250
RAJWEST POWER	JODHPUR	RAJASTHAN	7	135
RAJWEST POWER	JODHPUR	RAJASTHAN	8	135
BAJAJ ENERGY	PILIBHIT	UTTAR PARDESH	1	45
BAJAJ ENERGY	PILIBHIT	UTTAR PARDESH	2	45
BAJAJ ENERGY	KHERI	UTTAR PARDESH	1	45
BAJAJ ENERGY	KHERI	UTTAR PARDESH	2	45
BAJAJ ENERGY	GONDA	UTTAR PARDESH	1	45
BAJAJ ENERGY	GONDA	UTTAR PARDESH	2	45
BAJAJ ENERGY	SHAHJAHANPUR	UTTAR PARDESH	1	45
BAJAJ ENERGY	SHAHJAHANPUR	UTTAR PARDESH	2	45
BAJAJ ENERGY	UTRAULA	UTTAR PARDESH	1	45
BAJAJ ENERGY	UTRAULA	UTTAR PARDESH	2	45
SIMHADRI (STAGE 2)	VISHAKHAPATNAM	ANDHRA PRADESH	3	500
SIMHADRI (STAGE 2)	VISHAKHAPATNAM	ANDHRA PRADESH	4	500
KORBA STPS (NTPC)	KORBA	CHHATTISGARH	4	500
KORBA STPS (NTPC)	KORBA	CHHATTISGARH	5	500
KORBA STPS (NTPC)	KORBA	CHHATTISGARH	3	200
KORBA STPS (NTPC)	KORBA	CHHATTISGARH	1	200
BOKARO 'A' TPS	BOKARO	JHARKHAND	1	500
YERMARUS	RAICHUR	KARNATAKA	2	800
KORADI TPS	NAGPUR	MAHARASHTRA	10	660
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	3	660
MAUDA THERMAL POWER PLANT	NAGPUR	MAHARASHTRA	2	500
TALCHER KANIHA (NTPC)	ANGUL	ORISSA	5	500
TALCHER KANIHA (NTPC)	ANGUL	ORISSA	6	500
ANPARA TPS	SONBHADRA	UTTAR PRADESH	4	500
ANPARA TPS	SONBHADRA	UTTAR PRADESH	5	500
RIHAND STPS	SONBHADRA	UTTAR PRADESH	1	500
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	4	500
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	5	500
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	6	500
UKAI TPS	TAPI	GUJARAT	6	500

PLANT NAME	DISTRICT	STATE	UNIT NO	CAPACITY
KUDGI STPP (NTPC)	BIJAPUR	KARNATAKA	2	800
KUDGI STPP (NTPC)	BIJAPUR	KARNATAKA	3	800
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	1	210
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	2	210
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	3	210
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	4	210
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	5	210
VINDHYACHAL STPS	SINGRAULI	MADHYA PRADESH	6	210
RAMAGUNDEM STPS (NTPC)	KARIMNAGAR	TELANGANA	2	200
RAMAGUNDEM STPS (NTPC)	KARIMNAGAR	TELANGANA	4	500
RAMAGUNDEM STPS (NTPC)	KARIMNAGAR	TELANGANA	5	500
RAMAGUNDEM STPS (NTPC)	KARIMNAGAR	TELANGANA	6	500
RAMAGUNDEM STPS (NTPC)	KARIMNAGAR	TELANGANA	7	500
RAICHUR TPS	RAICHUR	KARNATAKA	5	210
RAICHUR TPS	RAICHUR	KARNATAKA	6	210
RAICHUR TPS	RAICHUR	KARNATAKA	7	210
RAICHUR TPS	RAICHUR	KARNATAKA	8	250
MEJIA TPS	BANKURA	WEST BENGAL	6	250
MEJIA TPS	BANKURA	WEST BENGAL	5	250
MEJIA TPS	BANKURA	WEST BENGAL	4	210
MEJIA TPS	BANKURA	WEST BENGAL	3	210
MEJIA TPS	BANKURA	WEST BENGAL	2	210
MEJIA TPS	BANKURA	WEST BENGAL	1	210
UNCHAHAR TPS	RAEBARELI	UTTAR PARDESH	1	210
UNCHAHAR TPS	RAEBARELI	UTTAR PARDESH	2	210
UNCHAHAR TPS	RAEBARELI	UTTAR PARDESH	3	210
UNCHAHAR TPS	RAEBARELI	UTTAR PARDESH	4	210
UNCHAHAR TPS	RAEBARELI	UTTAR PARDESH	5	210
NABI NAGAR TPP	AURANGABAD	BIHAR	2	250
KOLAGHAT TPS	PURBA MEDINIPUR	WEST BENGAL	1	210
KOLAGHAT TPS	PURBA MEDINIPUR	WEST BENGAL	4	210
KAHALGAON TPS	BHAGALPUR	BIHAR	1	210
KAHALGAON TPS	BHAGALPUR	BIHAR	4	210
KAHALGAON TPS	BHAGALPUR	BIHAR	3	210
KAHALGAON TPS	BHAGALPUR	BIHAR	2	210
FARAKKA STPS	MURSHIDABAD	WEST BENGAL	1	200
MUZAFFARPUR TPS	MUZAFFARPUR	BIHAR	4	195
MUZAFFARPUR TPS	MUZAFFARPUR	BIHAR	3	195
ANPARA TPS	SONBHADRA	UTTAR PARDESH	3	210
ANPARA TPS	SONBHADRA	UTTAR PARDESH	2	210
ANPARA TPS	SONBHADRA	UTTAR PARDESH	1	210
OBRA TPS	SONBHADRA	UTTAR PARDESH	13	200
OBRA TPS	SONBHADRA	UTTAR PARDESH	12	200

PLANT NAME	DISTRICT	STATE	UNIT NO	CAPACITY
OBRA TPS	SONBHADRA	UTTAR PARDESH	10	200
OBRA TPS	SONBHADRA	UTTAR PARDESH	11	200
IND-BARATH TPS	JHARSUGUDA	ORISSA	1	350
SURATGARH TPS (RRVUNL)	GANGANAGAR	RAJASTHAN	6	250
NORTH CHENNAI TPS (TANGEDCO)	CHENNAI	TAMIL NADU	3	210
NORTH CHENNAI TPS (TANGEDCO)	CHENNAI	TAMIL NADU	2	210
NORTH CHENNAI TPS (TANGEDCO)	CHENNAI	TAMIL NADU	1	210
D.P.L. TPS	DURGAPUR	WEST BENGAL	6	110
D.P.L. TPS	DURGAPUR	WEST BENGAL	7	300
D.P.L. TPS EXT.	DURGAPUR	WEST BENGAL	8	250
TORANGALLU TPS EXT (JSW ENERGY)	BELLARY	KARNATAKA	2	300
TORANGALLU TPS EXT (JSW ENERGY)	BELLARY	KARNATAKA	1	300
KOTA TPS	KOTA	RAJASTHAN	5	210
KOTA TPS	KOTA	RAJASTHAN	6	195
KOTA TPS	KOTA	RAJASTHAN	7	195
PARICHHA TPS	JHANSI	UTTAR PARDESH	5	250
PARICHHA TPS	JHANSI	UTTAR PARDESH	3	210
PARICHHA TPS	JHANSI	UTTAR PARDESH	4	210
NASIK RATTAN INDIA TPP	NASIK	MAHARASHTRA	3	270
NASIK RATTAN INDIA TPP	NASIK	MAHARASHTRA	4	270
NASIK RATTAN INDIA TPP	NASIK	MAHARASHTRA	5	270
RAJWEST POWER	JODHPUR	RAJASTHAN	1	135
RAJWEST POWER	JODHPUR	RAJASTHAN	2	135
RAJWEST POWER	JODHPUR	RAJASTHAN	3	135
RAJWEST POWER	JODHPUR	RAJASTHAN	4	135
RAJWEST POWER	JODHPUR	RAJASTHAN	5	135
RAJWEST POWER	JODHPUR	RAJASTHAN	6	135
TOTAL				**57,950**

Please Note: This plan is based on section 5 directions issued by Central Pollution Control Board. CSE bears no responsibility on the veracity of the data provided by them

ANNEXURE 5 -LIST OF STATIONS IDENTIFIED FOR RETIREMENT

NAME OF PROJECT	SECTOR	STATE	UNIT NO	CAPACITY IN MW	AGE IN YEARS	PHASE OUT PLAN
BARAUNI TPS	STATE	BIHAR	6	105	34	
BARAUNI TPS	STATE	BIHAR	7	105	32	
MUZAFFARPUR TPS	CENTRAL	BIHAR	1	110	32	12/31/2023
MUZAFFARPUR TPS	CENTRAL	BIHAR	2	110	31	12/31/2024
BOKARO B TPS	CENTRAL	JHARKHAND	1	210	31	
BOKARO B TPS	CENTRAL	JHARKHAND	2	210	27	
BOKARO B TPS	CENTRAL	JHARKHAND	3	210	24	
CHANDRAPURA(DVC)	CENTRAL	JHARKHAND	1	130	53	
CHANDRAPURA(DVC)	CENTRAL	JHARKHAND	2	130	53	
CHANDRAPURA(DVC)	CENTRAL	JHARKHAND	3	130	49	
PATRATU TPS	STATE	JHARKHAND	1	40	51	
PATRATU TPS	STATE	JHARKHAND	2	40	50	
PATRATU TPS	STATE	JHARKHAND	3	40	48	
PATRATU TPS	STATE	JHARKHAND	4	40	48	
PATRATU TPS	STATE	JHARKHAND	5	90	46	
PATRATU TPS	STATE	JHARKHAND	6	90	45	
PATRATU TPS	STATE	JHARKHAND	7	105	40	12/31/2017
PATRATU TPS	STATE	JHARKHAND	8	105	39	
PATRATU TPS	STATE	JHARKHAND	9	110	33	12/31/2017
PATRATU TPS	STATE	JHARKHAND	10	110	31	12/31/2017
TENUGHAT TPS	STATE	JHARKHAND	1	210	23	
TENUGHAT TPS	STATE	JHARKHAND	2	210	21	
IND BARATH TPP	PRIVATE	ODISHA	1	350	1	
TALCHER (OLD) TPS	CENTRAL	ODISHA	1	60	50	12/31/2023
TALCHER (OLD) TPS	CENTRAL	ODISHA	2	60	49	12/31/2023
TALCHER (OLD) TPS	CENTRAL	ODISHA	3	60	49	12/31/2023
TALCHER (OLD) TPS	CENTRAL	ODISHA	4	60	48	12/31/2023
TALCHER (OLD) TPS	CENTRAL	ODISHA	5	110	35	12/31/2023
TALCHER (OLD) TPS	CENTRAL	ODISHA	6	110	34	12/31/2023
TITAGARH TPS	PRIVATE	WEST BENGAL	1	60	32	
TITAGARH TPS	PRIVATE	WEST BENGAL	2	60	35	
TITAGARH TPS	PRIVATE	WEST BENGAL	3	60	34	
TITAGARH TPS	PRIVATE	WEST BENGAL	4	60	33	
D.P.L. TPS	STATE	WEST BENGAL	3	70	53	
D.P.L. TPS	STATE	WEST BENGAL	4	75	53	
D.P.L. TPS	STATE	WEST BENGAL	5	75	51	
DURGAPUR TPS	CENTRAL	WEST BENGAL	3	130	50	
DURGAPUR TPS	CENTRAL	WEST BENGAL	4	210	36	
SANTALDIH TPS	STATE	WEST BENGAL	1	120	44	
SANTALDIH TPS	STATE	WEST BENGAL	2	120	42	

NAME OF PROJECT	SECTOR	STATE	UNIT NO	CAPACITY IN MW	AGE IN YEARS	PHASE OUT PLAN
SANTALDIH TPS	STATE	WEST BENGAL	3	120	39	
SANTALDIH TPS	STATE	WEST BENGAL	4	120	36	
DR. N. TATA RAO TPS	STATE	ANDHRA PRADESH	1	210	38	12/31/2018
DR. N. TATA RAO TPS	STATE	ANDHRA PRADESH	2	210	37	12/31/2019
DR. N. TATA RAO TPS	STATE	ANDHRA PRADESH	3	210	28	11/30/2019
DR. N. TATA RAO TPS	STATE	ANDHRA PRADESH	4	210	27	6/30/2020
DR. N. TATA RAO TPS	STATE	ANDHRA PRADESH	5	210	23	12/31/2020
DR. N. TATA RAO TPS	STATE	ANDHRA PRADESH	6	500	22	12/31/2021
TUTICORNI (P) TPP	PRIVATE	TAMIL NADU	1	150	4	12/31/2019
TUTICORNI (P) TPP	PRIVATE	TAMIL NADU	2	150	3	11/30/2020
NEYVELI TPS -I	CENTRAL	TAMIL NADU	1	50	55	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	2	50	54	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	3	50	54	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	4	50	54	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	5	50	53	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	6	50	52	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	7	100	50	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	8	100	48	
NEYVELI TPS -I	CENTRAL	TAMIL NADU	9	100	47	
ENNORE TPS	STATE	TAMIL NADU	1	60	47	
ENNORE TPS	STATE	TAMIL NADU	2	60	46	
ENNORE TPS	STATE	TAMIL NADU	3	110	45	
ENNORE TPS	STATE	TAMIL NADU	4	110	44	
ENNORE TPS	STATE	TAMIL NADU	5	110	42	
TUTICORIN TPS	STATE	TAMIL NADU	1	210	38	11/30/2018
TUTICORIN TPS	STATE	TAMIL NADU	2	210	37	10/31/2019
TUTICORIN TPS	STATE	TAMIL NADU	3	210	35	6/30/2020
TUTICORIN TPS	STATE	TAMIL NADU	4	210	25	11/30/2020
TUTICORIN TPS	STATE	TELANGANA	5	210	26	6/30/2021
KOTHAGUDEM TPS (NEW)	STATE	TELANGANA	9	250	20	7/31/2020
KOTHAGUDEM TPS (NEW)	STATE	TELANGANA	10	250	19	6/30/2021
KOTHAGUDEM TPS A	STATE	TELANGANA	1	60	51	
KOTHAGUDEM TPS A	STATE	TELANGANA	2	60	51	
KOTHAGUDEM TPS A	STATE	TELANGANA	3	60	50	
KOTHAGUDEM TPS A	STATE	TELANGANA	4	60	50	
KOTHAGUDEM TPS B	STATE	TELANGANA	5	120	43	
KOTHAGUDEM TPS B	STATE	TELANGANA	6	120	43	
KOTHAGUDEM TPS C	STATE	TELANGANA	7	120	40	
KOTHAGUDEM TPS C	STATE	TELANGANA	8	120	39	
RAMAGUNDEM-B TPS	STATE	TELANGANA	1	63	46	
KORBA-II	STATE	CHHATTISGARH	1	50	51	
KORBA-II	STATE	CHHATTISGARH	2	50	50	
KORBA-II	STATE	CHHATTISGARH	3	50	49	
KORBA-II	STATE	CHHATTISGARH	4	50	49	

NAME OF PROJECT	SECTOR	STATE	UNIT NO	CAPACITY IN MW	AGE IN YEARS	PHASE OUT PLAN
KORBA-III	STATE	CHHATTISGARH	1	120	41	12/31/2018
KORBA-III	STATE	CHHATTISGARH	2	120	36	3/31/2019
KORBA-WEST TPS	STATE	CHHATTISGARH	1	210	34	1/31/2020
KORBA-WEST TPS	STATE	CHHATTISGARH	2	210	34	3/31/2020
KORBA-WEST TPS	STATE	CHHATTISGARH	3	210	32	6/30/2021
KORBA-WEST TPS	STATE	CHHATTISGARH	4	210	31	12/31/2020
GANDHI NAGAT TPS	STATE	GUJARAT	1	120	40	
GANDHI NAGAT TPS	STATE	GUJARAT	2	120	40	
SIKKA REP TPS	STATE	GUJARAT	1	120	29	
SIKKA REP TPS	STATE	GUJARAT	2	120	24	6/30/2017
UKAI TPS	STATE	GUJARAT	1	120	41	
UKAI TPS	STATE	GUJARAT	2	120	41	
SABARMATI	PRIVATE	GUJARAT	15	30	55	12/31/2017
SABARMATI	PRIVATE	GUJARAT	16	30	54	12/31/2017
SATPURA TPS	STATE	MADHYA PRADESH	6	200	38	
SATPURA TPS	STATE	MADHYA PRADESH	7	210	37	
SATPURA TPS	STATE	MADHYA PRADESH	8	210	34	
SATPURA TPS	STATE	MADHYA PRADESH	9	210	33	
GEPL TPP PH-I	PRIVATE	MAHARASHTRA	1	60	5	3/31/2018
GEPL TPP PH-I	PRIVATE	MAHARASHTRA	2	60	5	3/31/2018
BHUSAWAL TPS	STATE	MAHARASHTRA	2	210	38	4/1/2017
CHANDRAPURA STPS	STATE	MAHARASHTRA	1	210	34	
CHANDRAPURA STPS	STATE	MAHARASHTRA	2	210	33	
KORADI TPS	STATE	MAHARASHTRA	5	200	39	
PARLI TPS	STATE	MAHARASHTRA	3	210	37	
BADARPUR TPS	CENTRAL	DELHI	1	95	44	JULY'18
BADARPUR TPS	CENTRAL	DELHI	2	95	43	JULY'18
BADARPUR TPS	CENTRAL	DELHI	3	95	42	JULY'18
GND TPS (BHATINDA)	STATE	PUNJAB	1	110	43	DEC'17
ROPAR TPS	STATE	PUNJAB	1	210	33	DEC'17
ROPAR TPS	STATE	PUNJAB	2	210	32	DEC'17
ROPAR TPS	STATE	PUNJAB	3	210	29	DEC'22
ROPAR TPS	STATE	PUNJAB	4	210	28	DEC'22
OBRA TPS	STATE	UTTAR PRADESH	8	94	42	DEC'18
PANKI TPS	STATE	UTTAR PRADESH	3	105	41	DEC'18
PANKI TPS	STATE	UTTAR PRADESH	4	105	40	DEC'18
TOTAL				**15,552**		

ANNEXURE – REVISED PHASE-IN PLANS RECOMMENDED BY CSE

This phasing plan is based on the Office Memorandum F. No. FU-1/2017-IPC sent by the Ministry of Power (MoP), to the Ministry of Environment, Forest and Climate Change (MoEF&CC) on 13 October 2017 (Annexure 1). The plan submitted by MoP focuses on FGD and ESP upgradation only. CSE's previous phasing plan was based on the phasing plans released by the Regional Power Committees under the Central Electricity Authority (CEA).

Annexure 2 - Phase-in plan for Flue gas desulphurisation systems (FGD) installation

TO COMPLY BY DEC 2019 – Located in districts that have population density in excess of 400/sq.km or are critically polluted

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
1	TROMBAY TPS	5	500	1984	Maharashtra	31/03/2018	December 2019
2	MAHATMA GANDHI TPS	1	660	2012	Haryana	31/01/2019	December 2019
3	MAHATMA GANDHI TPS	2	660	2012	Haryana	31/01/2019	December 2019
4	NORTH CHENNAI Ext. TPS	1	600	2013	Tamil Nadu	31/12/2019	December 2019
5	VIZAG TPP	2	520	2016	Andhra Pradesh	30/09/2019	December 2019
6	SINGRAULI STPS	7	500	1987	Uttar Pradesh	31/12/2020	December 2019
7	DADRI (NCTPP)	1	210	1991	Uttar Pradesh	31/12/2020	December 2019
8	DADRI (NCTPP)	2	210	1992	Uttar Pradesh	31/10/2020	December 2019
9	DADRI (NCTPP)	3	210	1993	Uttar Pradesh	31/08/2020	December 2019
10	TENUGHAT TPS	1	210	1994	Jharkhand	31-12-2020	December 2019
11	DADRI (NCTPP)	4	210	1994	Uttar Pradesh	30/06/2020	December 2019
12	TENUGHAT TPS	2	210	1996	Jharkhand	31/12/2020	December 2019
13	TAQA, Neyveli	2	250	2002	Tamil Nadu	30/06/2020	December 2019
14	PANIPAT TPS	8	250	2005	Haryana	31/12/2020	December 2019
15	SAGARDIGHI TPS	1	300	2008	West Bengal	31/12/2020	December 2019
16	Dr. N.TATA RAO TPS	7	500	2009	Andhra Pradesh	31/12/2020	December 2019
17	INDIRA GANDHI STPP	1	500	2010	Haryana	31/10/2020	December 2019
18	DADRI (NCTPP)	5	490	2010	Uttar Pradesh	30/04/2020	December 2019
19	DADRI (NCTPP)	6	490	2010	Uttar Pradesh	29/02/2020	December 2019
20	INDIRA GANDHI STPP	2	500	2011	Haryana	30/04/2020	December 2019
21	INDIRA GANDHI STPP	3	500	2012	Haryana	28/02/2020	December 2019
22	METTUR TPS Ext.	1	600	2012	Tamil Nadu	31/12/2020	December 2019
23	RIHAND STPS	6	500	2013	Uttar Pradesh	31/12/2020	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
24	NORTH CHENNAI Ext. TPS	2	600	2013	Tamil Nadu	30/09/2020	December 2019
25	MAHAN TPP	1	600	2013	Madhya Pradesh	31/12/2020	December 2019
26	NIGRI TPP	1	660	2014	Madhya Pradesh	30/06/2020	December 2019
27	PRAYAGRAJ TPP	2	660	2015	Uttar Pradesh	30/06/2020	December 2019
28	VIZAG TPP	1	520	2015	Andhra Pradesh	30/06/2020	December 2019
29	BARADARHA TPS	2	600	2015	Chhattisgarh	30/09/2020	December 2019
30	BANDAKHAR TPP	1	300	2015	Chhattisgarh	31/03/2020	December 2019
31	NIGRI TPP	2	660	2015	Madhya Pradesh	30/09/2020	December 2019
32	SAGARDIGHI TPS	4	500	2016	West Bengal	31/03/2020	December 2019
33	GOINDWAL SAHIB	1	270	2016	Punjab	30/04/2020	December 2019
34	GOINDWAL SAHIB	2	270	2016	Punjab	28/02/2020	December 2019
35	PRAYAGRAJ TPP	1	660	2016	Uttar Pradesh	30/04/2020	December 2019
36	CHANDRAPUR STPS	9	500	2016	Maharashtra	31/03/2020	December 2019
37	KORADI TPS	10	660	2016	Maharashtra	31/12/2020	December 2019
38	UNCHAHAR TPS	6	500	2017	Uttar Pradesh	31/08/2020	December 2019
39	PRAYAGRAJ TPP	3	660	2017	Uttar Pradesh	29/02/2020	December 2019
40	Binjkote TPP	1	300	2017	Chhattisgarh	30/09/2020	December 2019
41	MOUDA TPS	4	660	2017	Maharashtra	31/12/2020	December 2019
							December 2019
42	SINGRAULI STPS	1	200	1982	Uttar Pradesh	31/12/2021	December 2019
43	SINGRAULI STPS	2	200	1982	Uttar Pradesh	31/12/2021	December 2019
44	WANAKBORI TPS	1	210	1982	Gujarat	31/12/2021	December 2019
45	KORADI TPS	6	210	1982	Maharashtra	31/03/2021	December 2019
46	SINGRAULI STPS	3	200	1983	Uttar Pradesh	31/08/2021	December 2019
47	SINGRAULI STPS	4	200	1983	Uttar Pradesh	31/08/2021	December 2019
48	WANAKBORI TPS	2	210	1983	Gujarat	31/12/2021	December 2019
49	KORADI TPS	7	210	1983	Maharashtra	31/03/2021	December 2019
50	SINGRAULI STPS	5	200	1984	Uttar Pradesh	30/04/2021	December 2019
51	WANAKBORI TPS	3	210	1984	Gujarat	31/12/2021	December 2019
52	KOLAGHAT TPS	3	210	1985	West Bengal	30/09/2021	December 2019
53	RAICHUR TPS	1	210	1985	Karnataka	31/03/2021	December 2019
54	CHANDRAPUR STPS	3	210	1985	Maharashtra	31/03/2021	December 2019
55	SINGRAULI STPS	6	500	1986	Uttar Pradesh	28/02/2021	December 2019
56	RAICHUR TPS	2	210	1986	Karnataka	30/06/2021	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
57	WANAKBORI TPS	4	210	1986	Gujarat	31/12/2021	December 2019
58	WANAKBORI TPS	5	210	1986	Gujarat	31/12/2021	December 2019
59	CHANDRAPUR STPS	4	210	1986	Maharashtra	31/03/2021	December 2019
60	NEYVELI TPS- II	2	210	1987	Tamil Nadu	30/09/2021	December 2019
61	NEYVELI TPS- II	3	210	1987	Tamil Nadu	30/06/2021	December 2019
62	WANAKBORI TPS	6	210	1987	Gujarat	31/12/2021	December 2019
63	NEYVELI TPS- II	1	210	1988	Tamil Nadu	31/12/2021	December 2019
64	RIHAND STPS	2	500	1989	Uttar Pradesh	31/12/2021	December 2019
65	KHAPARKHEDA TPS	1	210	1989	Maharashtra	31/03/2021	December 2019
66	KOLAGHAT TPS	2	210	1990	West Bengal	31/03/2021	December 2019
67	GANDHI NAGAR TPS	3	210	1990	Gujarat	31/12/2021	December 2019
68	KHAPARKHEDA TPS	2	210	1990	Maharashtra	31/03/2021	December 2019
69	KOLAGHAT TPS	6	210	1991	West Bengal	31/12/2021	December 2019
70	RAICHUR TPS	3	210	1991	Karnataka	30/09/2021	December 2019
71	GANDHI NAGAR TPS	4	210	1991	Gujarat	31/12/2021	December 2019
72	CHANDRAPUR STPS	5	500	1991	Maharashtra	31/03/2021	December 2019
73	CHANDRAPUR STPS	6	500	1992	Maharashtra	31/03/2021	December 2019
74	KOLAGHAT TPS	5	210	1993	West Bengal	30/06/2021	December 2019
75	IB VALLEY TPS	1	210	1994	Odisha	30/09/2021	December 2019
76	RAICHUR TPS	4	210	1994	Karnataka	31/12/2021	December 2019
77	IB VALLEY TPS	2	210	1995	Odisha	30/09/2021	December 2019
78	CHANDRAPUR STPS	7	500	1997	Maharashtra	31/03/2021	December 2019
79	GANDHI NAGAR TPS	5	210	1998	Gujarat	31/12/2021	December 2019
80	WANAKBORI TPS	7	210	1998	Gujarat	31/12/2021	December 2019
81	VINDHYACHAL STPS	7	500	1999	Madhya Pradesh	30/06/2021	December 2019
82	VINDHYACHAL STPS	8	500	2000	Madhya Pradesh	30/06/2021	December 2019
83	KHAPARKHEDA TPS	3	210	2000	Maharashtra	31/03/2021	December 2019
84	PANIPAT TPS	6	210	2001	Haryana	30/04/2021	December 2019
85	KHAPARKHEDA TPS	4	210	2001	Maharashtra	31/03/2021	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
86	NEYVELI (EXT) TPS	1	210	2002	Tamil Nadu	30/06/2021	December 2019
87	NEYVELI (EXT) TPS	2	210	2003	Tamil Nadu	31/12/2021	December 2019
88	PANIPAT TPS	7	250	2004	Haryana	28/02/2021	December 2019
89	RIHAND STPS	3	500	2005	Uttar Pradesh	31/10/2021	December 2019
90	RIHAND STPS	4	500	2005	Uttar Pradesh	30/04/2021	December 2019
91	VINDHYACHAL STPS	9	500	2006	Madhya Pradesh	30/09/2021	December 2019
92	SAGARDIGHI TPS	2	300	2007	West Bengal	31/03/2021	December 2019
93	SANTALDIH TPS	5	250	2007	West Bengal	31/03/2021	December 2019
94	YAMUNA NAGAR TPS	1	300	2007	Haryana	31/12/2021	December 2019
95	DSPM TPS	1	250	2007	Chhattisgarh	30/06/2021	December 2019
96	DSPM TPS	2	250	2007	Chhattisgarh	30/09/2021	December 2019
97	VINDHYACHAL STPS	10	500	2007	Madhya Pradesh	30/09/2021	December 2019
98	YAMUNA NAGAR TPS	2	300	2008	Haryana	31/10/2021	December 2019
99	PATHADI TPP	1	300	2009	Chhattisgarh	31/03/2021	December 2019
100	MEJIA TPS	7	500	2010	West Bengal	30/09/2021	December 2019
101	ROSA TPP Ph-I	1	300	2010	Uttar Pradesh	31/12/2021	December 2019
102	ROSA TPP Ph-I	2	300	2010	Uttar Pradesh	31/12/2021	December 2019
103	PATHADI TPP	2	300	2010	Chhattisgarh	31/03/2021	December 2019
104	WARDHA WARORA TPP	1	135	2010	Maharashtra	30/09/2021	December 2019
105	WARDHA WARORA TPP	2	135	2010	Maharashtra	30/09/2021	December 2019
106	KODARMA TPP	1	500	2011	Jharkhand	31/12/2021	December 2019
107	MAITHON RB TPP	1	525	2011	Jharkhand	30/09/2021	December 2019
108	DURGAPUR STEEL TPS	1	500	2011	West Bengal	30/06/2021	December 2019
109	MEJIA TPS	8	500	2011	West Bengal	30/09/2021	December 2019
110	SANTALDIH TPS	6	250	2011	West Bengal	31/12/2021	December 2019
111	ROSA TPP Ph-I	3	300	2011	Uttar Pradesh	31/10/2021	December 2019
112	HARDUAGANJ TPS	8	250	2011	Uttar Pradesh	31/12/2021	December 2019
113	KHAPARKHEDA TPS	5	500	2011	Maharashtra	31/03/2021	December 2019
114	WARDHA WARORA TPP	3	135	2011	Maharashtra	31/12/2021	December 2019
115	WARDHA WARORA TPP	4	135	2011	Maharashtra	31/12/2021	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
116	DURGAPUR STEEL TPS	2	500	2012	West Bengal	30/06/2021	December 2019
117	RIHAND STPS	5	500	2012	Uttar Pradesh	28/02/2021	December 2019
118	ROSA TPP Ph-I	4	300	2012	Uttar Pradesh	31/10/2021	December 2019
119	HARDUAGANJ TPS	9	250	2012	Uttar Pradesh	31/10/2021	December 2019
120	VINDHYACHAL STPS	11	500	2012	Madhya Pradesh	31/12/2021	December 2019
121	BUTIBORI TPP	1	300	2012	Maharashtra	30/06/2021	December 2019
122	BARH II	4	660	2013	Bihar	30/09/2021	December 2019
123	KODARMA TPP	2	500	2013	Jharkhand	31/12/2021	December 2019
124	KORBA-WEST Ext. TPS	5	500	2013	Chhattisgarh	30/09/2021	December 2019
125	VINDHYACHAL STPS	12	500	2013	Madhya Pradesh	31/12/2021	December 2019
126	BUTIBORI TPP	2	300	2013	Maharashtra	31/03/2021	December 2019
127	DERANG TPP	1	600	2014	Odisha	31/03/2021	December 2019
128	Nabha TPP (Rajpura TPP)	1	700	2014	Punjab	30/04/2021	December 2019
129	Nabha TPP (Rajpura TPP)	2	700	2014	Punjab	28/02/2021	December 2019
130	MARWA TPS	1	500	2014	Chhattisgarh	30/06/2021	December 2019
131	BARADARHA TPS	1	600	2014	Chhattisgarh	30/06/2021	December 2019
132	DERANG TPP	2	600	2015	Odisha	31/03/2021	December 2019
133	ANPARA TPS	6	500	2015	Uttar Pradesh	30/06/2021	December 2019
134	BALCO TPS	1	300	2015	Chhattisgarh	30/09/2021	December 2019
135	CHANDRAPUR STPS	8	500	2015	Maharashtra	31-03-2021	December 2019
136	KORADI TPS	8	660	2015	Maharashtra	31/03/2021	December 2019
137	NABI NAGAR TPP	1	250	2016	Bihar	31/12/2021	December 2019
138	ANPARA TPS	7	500	2016	Uttar Pradesh	30/04/2021	December 2019
139	YERMARUS TPP	1	800	2016	Karnataka	31/12/2021	December 2019
140	BALCO TPS	2	300	2016	Chhattisgarh	30/06/2021	December 2019
141	MARWA TPS	2	500	2016	Chhattisgarh	31/03/2021	December 2019
142	UCHPINDA TPP	3	360	2016	Chhattisgarh	31/12/2021	December 2019
143	KORADI TPS	9	660	2016	Maharashtra	31/03/2021	December 2019
144	OBRA TPS	11	200	1977	Uttar Pradesh	31/12/2022	December 2019
145	SABARMATI	1	120	1978	Gujarat	31/12/2022	December 2019
146	OBRA TPS	10	200	1979	Uttar Pradesh	31/10/2022	December 2019
147	OBRA TPS	9	200	1980	Uttar Pradesh	31/08/2022	December 2019
148	OBRA TPS	12	200	1981	Uttar Pradesh	30/06/2022	December 2019
149	OBRA TPS	13	200	1982	Uttar Pradesh	30/04/2022	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
150	KORBA STPS	1	200	1983	Chhattisgarh	31/12/2022	December 2019
151	KORBA STPS	2	200	1983	Chhattisgarh	31-12-2022	December 2019
152	KOLAGHAT TPS	4	210	1984	West Bengal	31/03/2022	December 2019
153	KORBA STPS	3	200	1984	Chhattisgarh	31/12/2022	December 2019
154	SABARMATI	2	121	1984	Gujarat	31/12/2022	December 2019
155	FARAKKA STPS	1	200	1986	West Bengal	31/12/2022	December 2019
156	FARAKKA STPS	2	200	1986	West Bengal	31/12/2022	December 2019
157	ANPARA TPS	1	210	1986	Uttar Pradesh	31/10/2022	December 2019
158	FARAKKA STPS	3	200	1987	West Bengal	31/12/2022	December 2019
159	ANPARA TPS	2	210	1987	Uttar Pradesh	31/08/2022	December 2019
160	KORBA STPS	4	500	1987	Chhattisgarh	31/12/2022	December 2019
161	VINDHYACHAL STPS	1	210	1987	Madhya Pradesh	31/12/2022	December 2019
162	RIHAND STPS	1	500	1988	Uttar Pradesh	28/02/2022	December 2019
163	UNCHAHAR TPS	1	210	1988	Uttar Pradesh	31/12/2022	December 2019
164	ANPARA TPS	3	210	1988	Uttar Pradesh	30/06/2022	December 2019
165	KORBA STPS	5	500	1988	Chhattisgarh	31/12/2022	December 2019
166	SABARMATI	3	121	1988	Gujarat	31/12/2022	December 2019
167	VINDHYACHAL STPS	2	210	1988	Madhya Pradesh	31/12/2022	December 2019
168	UNCHAHAR TPS	2	210	1989	Uttar Pradesh	31/12/2022	December 2019
169	KORBA STPS	6	500	1989	Chhattisgarh	31/12/2022	December 2019
170	VINDHYACHAL STPS	3	210	1989	Madhya Pradesh	31/12/2022	December 2019
171	VINDHYACHAL STPS	4	210	1989	Madhya Pradesh	31/12/2022	December 2019
172	VINDHYACHAL STPS	5	210	1990	Madhya Pradesh	31/12/2022	December 2019
173	NEYVELI TPS- II	4	210	1991	Tamil Nadu	31/03/2022	December 2019
174	NEYVELI TPS- II	5	210	1991	Tamil Nadu	30/06/2022	December 2019
175	VINDHYACHAL STPS	6	210	1991	Madhya Pradesh	31/12/2022	December 2019
176	KAHALGAON TPS	1	210	1992	Bihar	31/12/2022	December 2019
177	FARAKKA STPS	4	500	1992	West Bengal	31/12/2022	December 2019
178	NEYVELI TPS- II	6	210	1992	Tamil Nadu	30/09/2022	December 2019
179	KOLAGHAT TPS	1	210	1993	West Bengal	30/06/2022	December 2019
180	ANPARA TPS	4	500	1993	Uttar Pradesh	30/04/2022	December 2019
181	NEYVELI TPS- II	7	210	1993	Tamil Nadu	31/12/2022	December 2019
182	KAHALGAON TPS	2	210	1994	Bihar	31/12/2022	December 2019
183	FARAKKA STPS	5	500	1994	West Bengal	31/12/2022	December 2019
184	ANPARA TPS	5	500	1994	Uttar Pradesh	28/02/2022	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
185	NORTH CHENNAI TPS	1	210	1994	Tamil Nadu	31/12/2022	December 2019
186	KAHALGAON TPS	3	210	1995	Bihar	31-12-2022	December 2019
187	TALCHER STPS	1	500	1995	Odisha	31/12/2022	December 2019
188	NORTH CHENNAI TPS	2	210	1995	Tamil Nadu	30/06/2022	December 2019
189	KAHALGAON TPS	4	210	1996	Bihar	31/12/2022	December 2019
190	TALCHER STPS	2	500	1996	Odisha	31/12/2022	December 2019
191	MEJIA TPS	1	210	1996	West Bengal	31/12/2022	December 2019
192	NORTH CHENNAI TPS	3	210	1996	Tamil Nadu	31/03/2022	December 2019
193	BUDGE BUDGE TPS	1	250	1997	West Bengal	31/12/2022	December 2019
194	MEJIA TPS	2	210	1997	West Bengal	31/12/2022	December 2019
195	GH TPS (LEH.MOH.)	1	210	1997	Punjab	30/04/2022	December 2019
196	MEJIA TPS	3	210	1998	West Bengal	31/12/2022	December 2019
197	GH TPS (LEH.MOH.)	2	210	1998	Punjab	30/04/2022	December 2019
198	BUDGE BUDGE TPS	2	250	1999	West Bengal	31/12/2022	December 2019
199	UNCHAHAR TPS	3	210	1999	Uttar Pradesh	31/10/2022	December 2019
200	UNCHAHAR TPS	4	210	1999	Uttar Pradesh	31/10/2022	December 2019
201	RAICHUR TPS	5	210	1999	Karnataka	31/03/2022	December 2019
202	RAICHUR TPS	6	210	1999	Karnataka	30/06/2022	December 2019
203	SIMHADRI	1	500	2002	Andhra Pradesh	31/03/2022	December 2019
204	SIMHADRI	2	500	2002	Andhra Pradesh	30/06/2022	December 2019
205	RAICHUR TPS	7	210	2002	Karnataka	30/09/2022	December 2019
206	TALCHER STPS	3	500	2003	Odisha	31/12/2022	December 2019
207	TALCHER STPS	4	500	2003	Odisha	31/12/2022	December 2019
208	TALCHER STPS	5	500	2004	Odisha	31/12/2022	December 2019
209	MEJIA TPS	4	210	2004	West Bengal	31/12/2022	December 2019
210	TALCHER STPS	6	500	2005	Odisha	31/12/2022	December 2019
211	UNCHAHAR TPS	5	210	2006	Uttar Pradesh	30/04/2022	December 2019
212	KAHALGAON TPS	5	500	2007	Bihar	31/12/2022	December 2019
213	MEJIA TPS	5	250	2007	West Bengal	31/12/2022	December 2019
214	MEJIA TPS	6	250	2007	West Bengal	31/12/2022	December 2019
215	OP JINDAL TPS	1	250	2007	Chhattisgarh	31/03/2022	December 2019
216	KAHALGAON TPS	6	500	2008	Bihar	31/12/2022	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
217	GH TPS (LEH.MOH.)	3	250	2008	Punjab	28/02/2022	December 2019
218	GH TPS (LEH.MOH.)	4	250	2008	Punjab	28/02/2022	December 2019
219	OP JINDAL TPS	2	250	2008	Chhattisgarh	31/03/2022	December 2019
220	OP JINDAL TPS	3	250	2008	Chhattisgarh	30/06/2022	December 2019
221	OP JINDAL TPS	4	250	2008	Chhattisgarh	30/06/2022	December 2019
222	KAHALGAON TPS	7	500	2009	Bihar	31/12/2022	December 2019
223	BUDGE BUDGE TPS	3	250	2009	West Bengal	31/12/2022	December 2019
224	RAJIV GANDHI TPS	1	600	2010	Haryana	30/04/2022	December 2019
225	RAJIV GANDHI TPS	2	600	2010	Haryana	28/02/2022	December 2019
226	RAICHUR TPS	8	250	2010	Karnataka	31/12/2022	December 2019
227	KORBA STPS	7	500	2010	Chhattisgarh	31/12/2022	December 2019
228	FARAKKA STPS	6	500	2011	West Bengal	31/12/2022	December 2019
229	ANPARA C TPS	1	600	2011	Uttar Pradesh	31/08/2022	December 2019
230	SIMHADRI	3	500	2011	Andhra Pradesh	30/09/2022	December 2019
231	MAHADEV PRASAD STPP	1	270	2012	Jharkhand	30/06/2022	December 2019
232	MAITHON RB TPP	2	525	2012	Jharkhand	30/06/2022	December 2019
233	ANPARA C TPS	2	600	2012	Uttar Pradesh	30/06/2022	December 2019
234	SIMHADRI	4	500	2012	Andhra Pradesh	31/12/2022	December 2019
235	VALLUR TPP	1	500	2012	Tamil Nadu	30/06/2022	December 2019
236	MOUDA TPS	1	500	2012	Maharashtra	31/12/2022	December 2019
237	MAHADEV PRASAD STPP	2	270	2013	Jharkhand	30/06/2022	December 2019
238	VALLUR TPP	2	500	2013	Tamil Nadu	30/09/2022	December 2019
239	AKALTARA TPS	1	600	2013	Chhattisgarh	30/06/2022	December 2019
240	DHARIWAL TPP	1	300	2013	Maharashtra	31/03/2022	December 2019
241	EMCO WARORA TPS	1	300	2013	Maharashtra	31/03/2022	December 2019
242	EMCO WARORA TPS	2	300	2013	Maharashtra	31/03/2022	December 2019
243	MOUDA TPS	2	500	2013	Maharashtra	31/12/2022	December 2019
244	RAGHUNATHPUR TPP	1	600	2014	West Bengal	31/03/2022	December 2019
245	VALLUR TPP	3	500	2014	Tamil Nadu	31/12/2022	December 2019
246	AKALTARA TPS	2	600	2014	Chhattisgarh	31/03/2022	December 2019

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
247	DHARIWAL TPP	2	300	2014	Maharashtra	31/03/2022	December 2019
248	BARH II	5	660	2015	Bihar	31/03/2022	December 2019
249	MUZAFFARPUR TPS	3	195	2015	Bihar	31/12/2022	December 2019
250	HALDIA TPP	1	300	2015	West Bengal	31/12/2022	December 2019
251	HALDIA TPP	2	300	2015	West Bengal	31/12/2022	December 2019
252	SAGARDIGHI TPS	3	500	2015	West Bengal	31/03/2022	December 2019
253	UCHPINDA TPP	1	360	2015	Chhattisgarh	31/03/2022	December 2019
254	BOKARO `A` TPS	1	500	2016	Jharkhand	30/06/2022	December 2019
255	IND BARATH TPP	1	350	2016	Odisha	31/03/2022	December 2019
256	RAGHUNATHPUR TPP	2	600	2016	West Bengal	31/03/2022	December 2019
257	MOUDA TPS	3	660	2016	Maharashtra	31/12/2022	December 2019
258	NABI NAGAR TPP	2	250	2017	Bihar	31/12/2022	December 2019
259	MUZAFFARPUR TPS	4	195	2017	Bihar	31/12/2022	December 2019
260	YERMARUS TPP	2	800	2017	Karnataka	31/12/2022	December 2019
261	India Power TPP	1	150	2017	West Bengal		December 2019
TOTAL						95,512 MW	

TO COMPLY BY DEC 2020 – Located in districts that have population density in below 400/sq.km

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
1	KOTHAGUDEM TPS (NEW)	11	500	2011	Telangana	30/09/2019	December 2020
2	DAMODARAM SANJEEVAIAH TPS	2	800	2015	Andhra Pradesh	31/12/2019	December 2020
3	SINGARENI TPP	2	600	2016	Telangana	30/09/2019	December 2020
4	SINGARENI TPP	1	600	2016	Telangana	31/12/2019	December 2020
							December 2020
5	BELLARY TPS	1	500	2007	Karnataka	31/12/2020	December 2020
6	RAYALASEEMA TPS	3	210	2007	Andhra Pradesh	30/09/2020	December 2020
7	RAYALASEEMA TPS	5	210	2010	Andhra Pradesh	30/06/2020	December 2020
8	KAKATIYA TPS	1	500	2010	Telangana	31/03/2020	December 2020
9	MUNDRA UMTPP	1	800	2012	Gujarat	30/06/2020	December 2020
10	KAWAI TPS	1	660	2013	Rajasthan	31/08/2020	December 2020
11	KAWAI TPS	2	660	2013	Rajasthan	30/06/2020	December 2020
12	DAMODARAM SANJEEVAIAH TPS	1	800	2014	Andhra Pradesh	31/12/2020	December 2020
13	TUTICORIN (JV) TPP	2	500	2015	Tamil Nadu	30/06/2020	December 2020
14	TALWANDI SABO TPP	2	660	2015	Punjab	31/12/2020	December 2020
15	RAIKHEDA TPP	1	685	2015	Chhattisgarh	30/06/2020	December 2020
16	KAKATIYA TPS	2	600	2015	Telangana	30/06/2020	December 2020
17	TALWANDI SABO TPP	3	660	2016	Punjab	31/10/2020	December 2020
18	SEIONI TPP	1	600	2016	Madhya Pradesh	31/03/2020	December 2020
19	RAIKHEDA TPP	2	685	2016	Chhattisgarh	30/09/2020	December 2020
20	LALITPUR TPS	1	660	2016	Uttar Pradesh	31/12/2020	December 2020
21	SOLAPUR	1	660	2017	Maharashtra	31/12/2020	December 2020
22	CHHABRA TPP	5	660	2017	Rajasthan	30/04/2020	December 2020
23	NAWAPARA TPP	2	300	2017	Chhattisgarh	30/09/2020	December 2020
24	UKAI TPS	4	200	1979	Gujarat	31/12/2021	December 2020
25	UKAI TPS	3	200	1979	Gujarat	31/12/2021	December 2020
26	NASIK TPS	3	210	1979	Maharashtra	31/03/2021	December 2020
27	NASIK TPS	4	210	1980	Maharashtra	31/03/2021	December 2020
28	NASIK TPS	5	210	1981	Maharashtra	31/03/2021	December 2020
29	BHUSAWAL TPS	3	210	1982	Maharashtra	31/03/2021	December 2020
30	UKAI TPS	5	210	1985	Gujarat	31/12/2021	December 2020
31	PARLI TPS	4	210	1985	Maharashtra	31/03/2021	December 2020
32	PARLI TPS	5	210	1987	Maharashtra	31/03/2021	December 2020

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
33	SOUTHERN REPL. TPS	2	67.5	1990	West Bengal	31/12/2021	December 2020
34	KUTCH LIG. TPS	1	70	1990	Gujarat	31/12/2021	December 2020
35	KUTCH LIG. TPS	2	70	1991	Gujarat	31/12/2021	December 2020
36	SANJAY GANDHI TPS	2	210	1993	Madhya Pradesh	31/03/2021	December 2020
37	SANJAY GANDHI TPS	1	210	1993	Madhya Pradesh	31/03/2021	December 2020
38	RAYALASEEMA TPS	1	210	1994	Andhra Pradesh	31/12/2021	December 2020
39	RAYALASEEMA TPS	2	210	1995	Andhra Pradesh	30/09/2021	December 2020
40	KUTCH LIG. TPS	3	75	1997	Gujarat	31/12/2021	December 2020
41	SANJAY GANDHI TPS	4	210	1999	Madhya Pradesh	30/06/2021	December 2020
42	SANJAY GANDHI TPS	3	210	1999	Madhya Pradesh	30/06/2021	December 2020
43	SANJAY GANDHI TPS	5	500	2007	Madhya Pradesh	31/03/2021	December 2020
44	RAYALASEEMA TPS	4	210	2007	Andhra Pradesh	30/06/2021	December 2020
45	PARLI TPS	6	250	2007	Maharashtra	31/03/2021	December 2020
46	AMARKANTAK EXT TPS	5	210	2008	Madhya Pradesh	31/03/2021	December 2020
47	SIPAT STPS	4	500	2008	Chhattisgarh	31/12/2021	December 2020
48	SIPAT STPS	5	500	2009	Chhattisgarh	31/12/2021	December 2020
49	CHHABRA TPP	1	250	2009	Rajasthan	31/12/2021	December 2020
50	CHHABRA TPP	2	250	2010	Rajasthan	31/10/2021	December 2020
51	PARLI TPS	7	250	2010	Maharashtra	31/03/2021	December 2020
52	BELLARY TPS	2	500	2012	Karnataka	30/06/2021	December 2020
53	BHUSAWAL TPS	4	500	2012	Maharashtra	31/03/2021	December 2020
54	BHUSAWAL TPS	5	500	2012	Maharashtra	31/03/2021	December 2020
55	SIPAT STPS	3	660	2012	Chhattisgarh	31/12/2021	December 2020
56	SALAYA TPP	2	600	2012	Gujarat	31/03/2021	December 2020
57	SALAYA TPP	1	600	2012	Gujarat	30/06/2021	December 2020
58	MUNDRA UMTPP	3	800	2012	Gujarat	30/06/2021	December 2020
59	MUNDRA UMTPP	2	800	2012	Gujarat	31/03/2021	December 2020
60	TIRORA TPS	3	660	2013	Maharashtra	31/09/2021	December 2020
61	TIRORA TPS	2	660	2013	Maharashtra	31/12/2021	December 2020
62	CHHABRA TPP	3	250	2013	Rajasthan	31/08/2021	December 2020
63	SHRI SINGHAJI TPP	1	600	2013	Madhya Pradesh	31/03/2021	December 2020
64	SATPURA TPS	11	250	2013	Madhya	31/03/2021	December 2020

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
					Pradesh		
65	SATPURA TPS	10	250	2013	Madhya Pradesh	31/03/2021	December 2020
66	SASAN UMTPP	2	660	2013	Madhya Pradesh	30/06/2021	December 2020
67	SASAN UMTPP	1	660	2013	Madhya Pradesh	30/09/2021	December 2020
68	PARICHHA TPS	6	250	2013	Uttar Pradesh	31/12/2021	December 2020
69	KAMALANGA TPS	1	350	2013	Odisha	31/12/2021	December 2020
70	KAMALANGA TPS	2	350	2013	Odisha	31/12/2021	December 2020
71	TIRORA TPS	5	660	2014	Maharashtra	31/03/2021	December 2020
72	TIRORA TPS	4	660	2014	Maharashtra	31/06/2021	December 2020
73	TAMNAR TPP	2	600	2014	Chhattisgarh	31/12/2021	December 2020
74	TAMNAR TPP	1	600	2014	Chhattisgarh	31/03/2021	December 2020
75	TALWANDI SABO TPP	1	660	2014	Punjab	28/02/2021	December 2020
76	CHHABRA TPP	4	250	2014	Rajasthan	31/08/2021	December 2020
77	SHRI SINGHAJI TPP	2	600	2014	Madhya Pradesh	31/03/2021	December 2020
78	SASAN UMTPP	5	660	2014	Madhya Pradesh	31/12/2021	December 2020
79	KALISINDH TPS	1	600	2014	Rajasthan	30/06/2021	December 2020
80	KAMALANGA TPS	3	350	2014	Odisha	30/09/2021	December 2020
81	NASIK (P) TPS	1	270	2014	Maharashtra	31/03/2021	December 2020
82	TUTICORIN (JV) TPP	1	500	2015	Tamil Nadu	31/12/2021	December 2020
83	SASAN UMTPP	6	660	2015	Madhya Pradesh	30/09/2021	December 2020
84	KALISINDH TPS	2	600	2015	Rajasthan	30/04/2021	December 2020
85	PAINAMPURAM TPP	2	660	2015	Andhra Pradesh	30/09/2021	December 2020
86	PAINAMPURAM TPP	1	660	2015	Andhra Pradesh	31/12/2021	December 2020
87	BELLARY TPS	3	700	2016	Karnataka	31/12/2021	December 2020
88	Sembcorp Gayatri P.Ltd.	1	660	2016	Andhra Pradesh	31/12/2021	December 2020
89	PARLI TPS	8	250	2016	Maharashtra	31/03/2021	December 2020
90	LALITPUR TPS	3	660	2016	Uttar Pradesh	31/10/2021	December 2020
91	LALITPUR TPS	2	660	2016	Uttar Pradesh	28/02/2021	December 2020
92	Sembcorp Gayatri P.Ltd.	2	660	2017	Andhra Pradesh	30/09/2021	December 2020

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
93	NASIK (P) TPS	2	270	2017	Maharashtra	31/03/2021	December 2020
94	RAMAGUNDEM STPS	1	200	1983	Telangana	31/03/2022	December 2020
95	RAMAGUNDEM STPS	3	200	1984	Telangana	30/06/2022	December 2020
96	RAMAGUNDEM STPS	2	200	1984	Telangana	31/03/2022	December 2020
97	D.P.L. TPS	6	110	1985	West Bengal	31/03/2022	December 2020
98	RAMAGUNDEM STPS	4	500	1988	Telangana	30/06/2022	December 2020
99	RAMAGUNDEM STPS	6	500	1989	Telangana	30/09/2022	December 2020
100	RAMAGUNDEM STPS	5	500	1989	Telangana	30/09/2022	December 2020
101	SOUTHERN REPL. TPS	1	67.5	1991	West Bengal	31/03/2022	December 2020
102	KOTA TPS	5	210	1994	Rajasthan	31/12/2022	December 2020
103	SURATGARH TPS	1	250	1998	Rajasthan	31/12/2022	December 2020
104	SURATGARH TPS	2	250	2000	Rajasthan	31/10/2022	December 2020
105	SURATGARH TPS	3	250	2001	Rajasthan	31/08/2022	December 2020
106	SURATGARH TPS	4	250	2002	Rajasthan	30/06/2022	December 2020
107	SURATGARH TPS	5	250	2003	Rajasthan	30/04/2022	December 2020
108	KOTA TPS	6	195	2003	Rajasthan	31/12/2022	December 2020
109	RAMAGUNDEM STPS	7	500	2004	Telangana	31/12/2022	December 2020
110	PARICHHA TPS	4	210	2006	Uttar Pradesh	30/04/2022	December 2020
111	PARICHHA TPS	3	210	2006	Uttar Pradesh	30/04/2022	December 2020
112	D.P.L. TPS	7	300	2007	West Bengal	30/06/2022	December 2020
113	BHILAI TPS	1	250	2008	Chhattisgarh	31/12/2022	December 2020
114	TORANGALLU TPS EXT	2	300	2009	Karnataka	30/09/2022	December 2020
115	TORANGALLU TPS EXT	1	300	2009	Karnataka	30/06/2022	December 2020
116	BHILAI TPS	2	250	2009	Chhattisgarh	31/12/2022	December 2020
117	SURATGARH TPS	6	250	2009	Rajasthan	28/02/2022	December 2020
118	CHANDRAPURA(DVC)	7	250	2009	Jharkhand	31/12/2022	December 2020
119	MUNDRA TPS	1	330	2009	Gujarat	31/12/2022	December 2020
120	KOTA TPS	7	195	2009	Rajasthan	31/10/2022	December 2020
121	STERLITE TPP	2	600	2010	Odisha	31/03/2022	December 2020
122	CHANDRAPURA(DVC)	8	250	2010	Jharkhand	31/12/2022	December 2020
123	MUNDRA TPS	4	330	2010	Gujarat	30/09/2022	December 2020
124	MUNDRA TPS	3	330	2010	Gujarat	30/09/2022	December 2020
125	MUNDRA TPS	2	330	2010	Gujarat	31/12/2022	December 2020
126	MUNDRA TPS	5	660	2010	Gujarat	30/06/2022	December 2020
127	SIPAT STPS	1	660	2011	Chhattisgarh	31/12/2022	December 2020
128	MUNDRA TPS	6	660	2011	Gujarat	31/03/2022	December 2020

S No	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	FGD Phasing Plan for Implementation (DD/MM/YYYY)	CSE Phasing Plan
129	TIRORA TPS	1	660	2012	Maharashtra	31/03/2022	December 2020
130	SIPAT STPS	2	660	2012	Chhattisgarh	31/12/2022	December 2020
131	PARICHHA TPS	5	250	2012	Uttar Pradesh	28/02/2022	December 2020
132	UKAI TPS	6	500	2013	Gujarat	31/03/2022	December 2020
133	MUNDRA UMTPP	5	800	2013	Gujarat	31/03/2022	December 2020
134	MUNDRA UMTPP	4	800	2013	Gujarat	31/03/2022	December 2020
135	AVANTHA BHANDAR	1	600	2014	Chhattisgarh	31/03/2022	December 2020
136	D.P.L. TPS EXT.	8	250	2014	West Bengal	31/03/2022	December 2020
137	SASAN UMTPP	4	660	2014	Madhya Pradesh	31/03/2022	December 2020
138	SASAN UMTPP	3	660	2014	Madhya Pradesh	31/03/2022	December 2020
139	MUTHIARA TPP	1	600	2014	Tamil Nadu	30/09/2022	December 2020
140	ANUPPUR TPP	1	600	2015	Madhya Pradesh	31/03/2022	December 2020
141	TAMNAR TPP	4	600	2015	Chhattisgarh	30/06/2022	December 2020
142	TAMNAR TPP	3	600	2015	Chhattisgarh	31/03/2022	December 2020
143	SIKKA REP. TPS	4	250	2015	Gujarat	31/01/2022	December 2020
144	SIKKA REP. TPS	3	250	2015	Gujarat	31/01/2022	December 2020
145	ANUPPUR TPP	2	600	2016	Madhya Pradesh	30/06/2022	December 2020
146	MUTHIARA TPP	2	600	2016	Tamil Nadu	31/12/2022	December 2020
147	KUDGI	1	800	2016	Karnataka	30/06/2022	December 2020
148	NASIK (P) TPS	5	270	2017	Maharashtra	31/12/2022	December 2020
149	NASIK (P) TPS	4	270	2017	Maharashtra	31/12/2022	December 2020
150	NASIK (P) TPS	3	270	2017	Maharashtra	31/12/2022	December 2020
151	KUDGI	2	800	2017	Karnataka	30/09/2022	December 2020
152	KUDGI	3	800	2017	Karnataka	31/12/2022	December 2020
TOTAL						66,840 MW	

NOTE: 1,200 MW of capacity already has an FGD (2*600MW Udupi thermal power station), which was included in the original plan given by the Ministry of Power. This is not included in this table.

Annexure 4 – Phase in plan for ESP upgradation

ANNEXURE 4 – PHASE IN PLAN FOR ESP UPGRADATION

Plants to comply by December, 2018

S.No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	CSE's ESP Phasing plan (YYYY)
1	TROMBAY TPS	5	500	1984	Maharashtra	31/03/2018	December 2018
2	DAMODARAM SANJEEVAIAH TPS	2	800	2015	Andhra Pradesh	31/12/2019	December 2018
3	TENUGHAT TPS	1	210	1994	Jharkhand	31-12-2020	December 2018
4	PANIPAT TPS	8	250	2005	Haryana	31/12/2020	December 2018
5	INDIRA GANDHI STPP	1	500	2010	Haryana	31/10/2020	December 2018
6	BARSINGSAR LIGNITE	1	125	2010	Rajasthan	31/08/2020	December 2018
7	INDIRA GANDHI STPP	2	500	2011	Haryana	30/04/2020	December 2018
8	BARSINGSAR LIGNITE	2	125	2011	Rajasthan	30/04/2020	December 2018
9	INDIRA GANDHI STPP	3	500	2012	Haryana	28/02/2020	December 2018
10	DAMODARAM SANJEEVAIAH TPS	1	800	2014	Andhra Pradesh	31/12/2020	December 2018
11	TUTICORIN (JV) TPP	2	500	2015	Tamil Nadu	30/06/2020	December 2018
12	KORADI TPS	10	660	2016	Maharashtra	31/12/2020	December 2018
13	PRAYAGRAJ TPP	3	660	2017	Uttar Pradesh	29/02/2020	December 2018
14	SOLAPUR	1	660	2017	Maharashtra	31/12/2020	December 2018
15	NAWAPARA TPP	2	300	2017	Chhattisgarh	30/09/2020	December 2018
16	UNCHAHAR TPS	6	500	2017	Uttar Pradesh	31/08/2020	December 2018
17	CHHABRA TPP	5	660	2017	Rajasthan	30/04/2020	December 2018
18	MOUDA TPS	4	660	2017	Maharashtra	31/12/2020	December 2018
19	Binjkote TPP	1	300	2017	Chhattisgarh	30/09/2020	December 2018
20	UKAI TPS	3	200	1979	Gujarat	31/12/2021	December 2018
21	METTUR TPS	1	210	1987	Tamil Nadu	31/03/2021	December 2018
22	METTUR TPS	2	210	1987	Tamil Nadu	30/06/2021	December 2018
23	METTUR TPS	4	210	1990	Tamil Nadu	31/12/2021	December 2018
24	KUTCH LIG. TPS	2	70	1991	Gujarat	31/12/2021	December 2018
25	RAYALASEEMA TPS	1	210	1994	Andhra Pradesh	31/12/2021	December 2018
26	IB VALLEY TPS	1	210	1994	Odisha	30/09/2021	December 2018
27	RAYALASEEMA TPS	2	210	1995	Andhra Pradesh	30/09/2021	December 2018
28	IB VALLEY TPS	2	210	1995	Odisha	30/09/2021	December 2018
29	KUTCH LIG. TPS	3	75	1997	Gujarat	31/12/2021	December 2018
30	WANAKBORI TPS	7	210	1998	Gujarat	31/12/2021	December 2018
31	KHAPARKHEDA TPS	3	210	2000	Maharashtra	31/03/2021	December 2018
32	PANIPAT TPS	7	250	2004	Haryana	28/02/2021	December 2018
33	RIHAND STPS	4	500	2005	Uttar Pradesh	30/04/2021	December 2018

S.No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	CSE's ESP Phasing plan (YYYY)
34	SANJAY GANDHI TPS	5	500	2007	Madhya Pradesh	31/03/2021	December 2018
35	PARLI TPS	6	250	2007	Maharashtra	31/03/2021	December 2018
36	SANTALDIH TPS	5	250	2007	West Bengal	31/03/2021	December 2018
37	CHHABRA TPP	1	250	2009	Rajasthan	31/12/2021	December 2018
38	CHHABRA TPP	2	250	2010	Rajasthan	31/10/2021	December 2018
39	ROSA TPP Ph-I	1	300	2010	Uttar Pradesh	31/12/2021	December 2018
40	ROSA TPP Ph-I	2	300	2010	Uttar Pradesh	31/12/2021	December 2018
41	MEJIA TPS	7	500	2010	West Bengal	30/09/2021	December 2018
42	BARKHERA TPS	1	45	2011	Uttar Pradesh	30/09/2021	December 2018
43	KHAMBARKHERA TPS	1	45	2011	Uttar Pradesh	30/09/2021	December 2018
44	KHAMBARKHERA TPS	2	45	2011	Uttar Pradesh	30/09/2021	December 2018
45	MAQSOODPUR TPS	1	45	2011	Uttar Pradesh	30/09/2021	December 2018
46	MEJIA TPS	8	500	2011	West Bengal	30/09/2021	December 2018
47	BARKHERA TPS	2	45	2012	Uttar Pradesh	31/03/2021	December 2018
48	BHUSAWAL TPS	5	500	2012	Maharashtra	31/03/2021	December 2018
49	KUNDARKI TPS	1	45	2012	Uttar Pradesh	30/09/2021	December 2018
50	KUNDARKI TPS	2	45	2012	Uttar Pradesh	31/03/2021	December 2018
51	MAQSOODPUR TPS	2	45	2012	Uttar Pradesh	31/03/2021	December 2018
52	UTRAULA TPS	1	45	2012	Uttar Pradesh	30/09/2021	December 2018
53	BHUSAWAL TPS	4	500	2012	Maharashtra	31/03/2021	December 2018
54	CHHABRA TPP	3	250	2013	Rajasthan	31/08/2021	December 2018
55	PARICHHA TPS	6	250	2013	Uttar Pradesh	31/12/2021	December 2018
56	SATPURA TPS	11	250	2013	Madhya Pradesh	31/03/2021	December 2018
57	SATPURA TPS	10	250	2013	Madhya Pradesh	31/03/2021	December 2018
58	JALIPA KAPURDI TPP	7	135	2013	Rajasthan	31/12/2021	December 2018
59	JALIPA KAPURDI TPP	8	135	2013	Rajasthan	31/12/2021	December 2018
60	CHHABRA TPP	4	250	2014	Rajasthan	31/08/2021	December 2018
61	NASIK (P) TPS	1	270	2014	Maharashtra	31/03/2021	December 2018
62	CHANDRAPUR STPS	8	500	2015	Maharashtra	31-03-2021	December 2018
63	BALCO TPS	1	300	2015	Chhattisgarh	30/09/2021	December 2018
64	TUTICORIN (JV) TPP	1	500	2015	Tamil Nadu	31/12/2021	December 2018
65	ANPARA TPS	7	500	2016	Uttar Pradesh	30/04/2021	December 2018
66	PARLI TPS	8	250	2016	Maharashtra	31/03/2021	December 2018
67	BALCO TPS	2	300	2016	Chhattisgarh	30/06/2021	December 2018
68	NASIK (P) TPS	2	270	2017	Maharashtra	31/03/2021	December 2018
69	OBRA TPS	11	200	1977	Uttar Pradesh	31/12/2022	December 2018
70	OBRA TPS	10	200	1979	Uttar Pradesh	31/102022	December 2018

S.No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	CSE's ESP Phasing plan (YYYY)
71	OBRA TPS	12	200	1981	Uttar Pradesh	30/06/2022	December 2018
72	OBRA TPS	13	200	1982	Uttar Pradesh	30/04/2022	December 2018
73	KORBA STPS	1	200	1983	Chhattisgarh	31/12/2022	December 2018
74	ANPARA TPS	1	210	1986	Uttar Pradesh	31/10/2022	December 2018
75	FARAKKA STPS	1	200	1986	West Bengal	31/12/2022	December 2018
76	ANPARA TPS	2	210	1987	Uttar Pradesh	31/08/2022	December 2018
77	ANPARA TPS	3	210	1988	Uttar Pradesh	30/06/2022	December 2018
78	UNCHAHAR TPS	1	210	1988	Uttar Pradesh	31/12/2022	December 2018
79	RAMAGUNDEM STPS	6	500	1989	Telangana	30/09/2022	December 2018
80	ANPARA TPS	4	500	1993	Uttar Pradesh	30/04/2022	December 2018
81	ANPARA TPS	5	500	1994	Uttar Pradesh	28/02/2022	December 2018
82	KOTA TPS	5	210	1994	Rajasthan	31/12/2022	December 2018
83	GH TPS (LEH.MOH.)	1	210	1997	Punjab	30/04/2022	December 2018
84	MEJIA TPS	2	210	1997	West Bengal	31/12/2022	December 2018
85	GH TPS (LEH.MOH.)	2	210	1998	Punjab	30/04/2022	December 2018
86	KOTA TPS	6	195	2003	Rajasthan	31/12/2022	December 2018
87	RAMAGUNDEM STPS	7	500	2004	Telangana	31/12/2022	December 2018
88	PARICHHA TPS	3	210	2006	Uttar Pradesh	30/04/2022	December 2018
89	PARICHHA TPS	4	210	2006	Uttar Pradesh	30/04/2022	December 2018
90	UNCHAHAR TPS	5	210	2006	Uttar Pradesh	30/04/2022	December 2018
91	GIRAL TPS	1	125	2007	Rajasthan		December 2018
92	GH TPS (LEH.MOH.)	3	250	2008	Punjab	28/02/2022	December 2018
93	GH TPS (LEH.MOH.)	4	250	2008	Punjab	28/02/2022	December 2018
94	JALIPA KAPURDI TPP	1	135	2009	Rajasthan	31/12/2022	December 2018
95	JALIPA KAPURDI TPP	2	135	2010	Rajasthan	31/12/2022	December 2018
96	GIRAL TPS	2	125	2010	Rajasthan		December 2018
97	JALIPA KAPURDI TPP	3	135	2011	Rajasthan	31/08/2022	December 2018
98	JALIPA KAPURDI TPP	4	135	2011	Rajasthan	31/08/2022	December 2018
99	FARAKKA STPS	6	500	2011	West Bengal	31/12/2022	December 2018
100	SIMHADRI	3	500	2011	Andhra Pradesh	30/09/2022	December 2018
101	PARICHHA TPS	5	250	2012	Uttar Pradesh	28/02/2022	December 2018
102	SIMHADRI	4	500	2012	Andhra Pradesh	31/12/2022	December 2018
103	KATGHORA TPP	1	35	2012	Chhattisgarh		December 2018
104	UKAI TPS	6	500	2013	Gujarat	31/03/2022	December 2018
105	JALIPA KAPURDI TPP	5	135	2013	Rajasthan	30/04/2022	December 2018
106	JALIPA KAPURDI TPP	6	135	2013	Rajasthan	30/04/2022	December 2018
107	MOUDA TPS	2	500	2013	Maharashtra	31/12/2022	December 2018

S.No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	CSE's ESP Phasing plan (YYYY)
108	BELA TPS	1	270	2013	Maharashtra		December 2018
109	MUZAFFARPUR TPS	3	195	2015	Bihar	31/12/2022	December 2018
110	SWASTIK KORBA TPP	1	25	2015	Chhattisgarh		December 2018
111	MOUDA TPS	3	660	2016	Maharashtra	31/12/2022	December 2018
112	IND BARATH TPP	1	350	2016	Odisha	31/03/2022	December 2018
113	BOKARO `A` TPS	1	500	2016	Jharkhand	30/06/2022	December 2018
114	NASIK (P) TPS	5	270	2017	Maharashtra	31/12/2022	December 2018
115	NASIK (P) TPS	4	270	2017	Maharashtra	31/12/2022	December 2018
116	NASIK (P) TPS	3	270	2017	Maharashtra	31/12/2022	December 2018
117	YERMARUS TPP	2	800	2017	Karnataka	31/12/2022	December 2018
118	KUDGI	3	800	2017	Karnataka	31/12/2022	December 2018
119	KUDGI	2	800	2017	Karnataka	30/09/2022	December 2018
120	NABI NAGAR TPP	2	250	2017	Bihar	31/12/2022	December 2018
121	MUZAFFARPUR TPS	4	195	2017	Bihar	31/12/2022	December 2018
122	Bhavnagar Lignite TPP	2	250	2017	Gujarat		December 2018
123	India Power TPP	1	150	2017	West Bengal		December 2018
TOTAL						37,215 MW	

Plants to comply by December, 2019

S. No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	ESP Phasing plan for implementation (YYYY) by CSE
1	UKAI TPS	4	200	1979	Gujarat	31/12/2021	December 2019
2	NASIK TPS	4	210	1980	Maharashtra	31/03/2021	December 2019
3	NASIK TPS	5	210	1981	Maharashtra	31/03/2021	December 2019
4	SINGRAULI STPS	1	200	1982	Uttar Pradesh	31/12/2021	December 2019
5	SINGRAULI STPS	2	200	1982	Uttar Pradesh	31/12/2021	December 2019
6	WANAKBORI TPS	1	210	1982	Gujarat	31/12/2021	December 2019
7	SINGRAULI STPS	3	200	1983	Uttar Pradesh	31/08/2021	December 2019
8	SINGRAULI STPS	4	200	1983	Uttar Pradesh	31/08/2021	December 2019
9	KORADI TPS	7	210	1983	Maharashtra	31/03/2021	December 2019
10	WANAKBORI TPS	2	210	1983	Gujarat	31/12/2021	December 2019
11	KORBA STPS	2	200	1983	Chhattisgarh	31-12-2022	December 2019
12	SINGRAULI STPS	5	200	1984	Uttar Pradesh	30/04/2021	December 2019
13	WANAKBORI TPS	3	210	1984	Gujarat	31/12/2021	December 2019
14	RAMAGUNDEM STPS	2	200	1984	Telangana	31/03/2022	December 2019
15	KOLAGHAT TPS	4	210	1984	West Bengal	31/03/2022	December 2019
16	KOLAGHAT TPS	3	210	1985	West Bengal	30/09/2021	December 2019
17	PARLI TPS	4	210	1985	Maharashtra	31/03/2021	December 2019
18	UKAI TPS	5	210	1985	Gujarat	31/12/2021	December 2019
19	RAICHUR TPS	1	210	1985	Karnataka	31/03/2021	December 2019
20	D.P.L. TPS	6	110	1985	West Bengal	31/03/2022	December 2019
21	SINGRAULI STPS	6	500	1986	Uttar Pradesh	28/02/2021	December 2019
22	WANAKBORI TPS	4	210	1986	Gujarat	31/12/2021	December 2019
23	RAICHUR TPS	2	210	1986	Karnataka	30/06/2021	December 2019
24	WANAKBORI TPS	5	210	1986	Gujarat	31/12/2021	December 2019
25	SINGRAULI STPS	7	500	1987	Uttar Pradesh	31/12/2020	December 2019
26	WANAKBORI TPS	6	210	1987	Gujarat	31/12/2021	December 2019
27	KORBA STPS	4	500	1987	Chhattisgarh	31/12/2022	December 2019
28	VINDHYACHAL STPS	1	210	1987	Madhya Pradesh	31/12/2022	December 2019
29	RAMAGUNDEM STPS	4	500	1988	Telangana	30/06/2022	December 2019
30	RIHAND STPS	1	500	1988	Uttar Pradesh	28/02/2022	December 2019
31	KORBA STPS	5	500	1988	Chhattisgarh	31/12/2022	December 2019
32	VINDHYACHAL STPS	2	210	1988	Madhya Pradesh	31/12/2022	December 2019
33	RIHAND STPS	2	500	1989	Uttar Pradesh	31/12/2021	December 2019
34	KHAPARKHEDA TPS	1	210	1989	Maharashtra	31/03/2021	December 2019
35	METTUR TPS	3	210	1989	Tamil Nadu	30/09/2021	December 2019
36	RAMAGUNDEM STPS	5	500	1989	Telangana	30/09/2022	December 2019
37	UNCHAHAR TPS	2	210	1989	Uttar Pradesh	31/12/2022	December 2019
38	VINDHYACHAL STPS	3	210	1989	Madhya Pradesh	31/12/2022	December 2019
39	VINDHYACHAL STPS	4	210	1989	Madhya Pradesh	31/12/2022	December 2019

S. No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	ESP Phasing plan for implementation (YYYY) by CSE
40	KOLAGHAT TPS	2	210	1990	West Bengal	31/03/2021	December 2019
41	KHAPARKHEDA TPS	2	210	1990	Maharashtra	31/03/2021	December 2019
42	KUTCH LIG. TPS	1	70	1990	Gujarat	31/12/2021	December 2019
43	VINDHYACHAL STPS	5	210	1990	Madhya Pradesh	31/12/2022	December 2019
44	KOLAGHAT TPS	6	210	1991	West Bengal	31/12/2021	December 2019
45	RAICHUR TPS	3	210	1991	Karnataka	30/09/2021	December 2019
46	VINDHYACHAL STPS	6	210	1991	Madhya Pradesh	31/12/2022	December 2019
47	FARAKKA STPS	4	500	1992	West Bengal	31/12/2022	December 2019
48	KAHALGAON TPS	1	210	1992	Bihar	31/12/2022	December 2019
49	KOLAGHAT TPS	5	210	1993	West Bengal	30/06/2021	December 2019
50	SANJAY GANDHI TPS	1	210	1993	Madhya Pradesh	31/03/2021	December 2019
51	SANJAY GANDHI TPS	2	210	1993	Madhya Pradesh	31/03/2021	December 2019
52	KOLAGHAT TPS	1	210	1993	West Bengal	30/06/2022	December 2019
53	RAICHUR TPS	4	210	1994	Karnataka	31/12/2021	December 2019
54	NORTH CHENNAI TPS	1	210	1994	Tamil Nadu	31/12/2022	December 2019
55	FARAKKA STPS	5	500	1994	West Bengal	31/12/2022	December 2019
56	KAHALGAON TPS	2	210	1994	Bihar	31/12/2022	December 2019
57	NORTH CHENNAI TPS	2	210	1995	Tamil Nadu	30/06/2022	December 2019
58	KAHALGAON TPS	3	210	1995	Bihar	31-12-2022	December 2019
59	MEJIA TPS	1	210	1996	West Bengal	31/12/2022	December 2019
60	NORTH CHENNAI TPS	3	210	1996	Tamil Nadu	31/03/2022	December 2019
61	KAHALGAON TPS	4	210	1996	Bihar	31/12/2022	December 2019
62	MEJIA TPS	3	210	1998	West Bengal	31/12/2022	December 2019
63	SANJAY GANDHI TPS	4	210	1999	Madhya Pradesh	30/06/2021	December 2019
64	SANJAY GANDHI TPS	3	210	1999	Madhya Pradesh	30/06/2021	December 2019
65	UNCHAHAR TPS	3	210	1999	Uttar Pradesh	31/10/2022	December 2019
66	UNCHAHAR TPS	4	210	1999	Uttar Pradesh	31/10/2022	December 2019
67	RAICHUR TPS	6	210	1999	Karnataka	30/06/2022	December 2019
68	RAICHUR TPS	5	210	1999	Karnataka	31/03/2022	December 2019
69	RAICHUR TPS	7	210	2002	Karnataka	30/09/2022	December 2019
70	MEJIA TPS	4	210	2004	West Bengal	31/12/2022	December 2019
71	TALCHER STPS	5	500	2004	Odisha	31/12/2022	December 2019
72	AKRIMOTA LIG TPS	2	125	2005	Gujarat	31/12/2020	December 2019
73	AKRIMOTA LIG TPS	1	125	2005	Gujarat	30/09/2020	December 2019
74	RIHAND STPS	3	500	2005	Uttar Pradesh	31/10/2021	December 2019
75	TALCHER STPS	6	500	2005	Odisha	31/12/2022	December 2019
76	VINDHYACHAL STPS	9	500	2006	Madhya Pradesh	30/09/2021	December 2019
77	RAYALASEEMA TPS	3	210	2007	Andhra Pradesh	30/09/2020	December 2019
78	YAMUNA NAGAR TPS	1	300	2007	Haryana	31/12/2021	December 2019
79	PARAS TPS	3	250	2007	Maharashtra	31/03/2021	December 2019

S. No.	Name of Project	Unit No	Total Capacity (MW)	Year of commissioning	State	ESP Phasing plan for implementation (DD/MM/YYYY) by MOP	ESP Phasing plan for implementation (YYYY) by CSE
80	VINDHYACHAL STPS	10	500	2007	Madhya Pradesh	30/09/2021	December 2019
81	SAGARDIGHI TPS	2	300	2007	West Bengal	31/03/2021	December 2019
82	RAYALASEEMA TPS	4	210	2007	Andhra Pradesh	30/06/2021	December 2019
83	MEJIA TPS	6	250	2007	West Bengal	31/12/2022	December 2019
84	D.P.L. TPS	7	300	2007	West Bengal	30/06/2022	December 2019
85	MEJIA TPS	5	250	2007	West Bengal	31/12/2022	December 2019
86	BAKRESWAR TPS	5	210	2007	West Bengal		December 2019
87	SAGARDIGHI TPS	1	300	2008	West Bengal	31/12/2020	December 2019
88	YAMUNA NAGAR TPS	2	300	2008	Haryana	31/10/2021	December 2019
89	AMARKANTAK EXT TPS	5	210	2008	Madhya Pradesh	31/03/2021	December 2019
90	KUTCH LIG. TPS	4	75	2009	Gujarat	31/12/2020	December 2019
91	Dr. N.TATA RAO TPS	7	500	2009	Andhra Pradesh	31/12/2020	December 2019
92	SURATGARH TPS	6	250	2009	Rajasthan	28/02/2022	December 2019
93	TORANGALLU TPS EXT	1	300	2009	Karnataka	30/06/2022	December 2019
94	TORANGALLU TPS EXT	2	300	2009	Karnataka	30/09/2022	December 2019
95	BAKRESWAR TPS	1	210	2009	West Bengal		December 2019
96	KAKATIYA TPS	1	500	2010	Telangana	31/03/2020	December 2019
97	RAYALASEEMA TPS	5	210	2010	Andhra Pradesh	30/06/2020	December 2019
98	SURAT LIG. TPS	3	125	2010	Gujarat	30/09/2020	December 2019
99	SURAT LIG. TPS	4	125	2010	Gujarat	31/12/2020	December 2019
100	PARLI TPS	7	250	2010	Maharashtra	31/03/2021	December 2019
101	PARAS TPS	4	250	2010	Maharashtra	31/03/2021	December 2019
102	RAJIV GANDHI TPS	1	600	2010	Haryana	30/04/2022	December 2019
103	RAICHUR TPS	8	250	2010	Karnataka	31/12/2022	December 2019
104	RAJIV GANDHI TPS	2	600	2010	Haryana	28/02/2022	December 2019
105	KOTHAGUDEM TPS (NEW)	11	500	2011	Telangana	30/09/2019	December 2019
106	SANTALDIH TPS	6	250	2011	West Bengal	31/12/2021	December 2019
107	UTRAULA TPS	2	45	2012	Uttar Pradesh	31/03/2021	December 2019
108	D.P.L. TPS EXT.	8	250	2014	West Bengal	31/03/2022	December 2019
TOTAL						28,710 MW	

Annexure 4: NOX emission data of individual plants as given to EPCA by CPCB, February 2018

Compliant with the standard of 600 mg/Nm^3

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
1	UKAI TPS	4	200	1979	Gujarat	300-600
2	UKAI TPS	3	200	1979	Gujarat	300-600
3	SINGRAULI STPS	2	200	1982	Uttar Pradesh	300-600
4	SINGRAULI STPS	1	200	1982	Uttar Pradesh	300-600
5	SINGRAULI STPS	5	200	1984	Uttar Pradesh	300-600
6	UKAI TPS	5	210	1985	Gujarat	300-600
7	SINGRAULI STPS	6	500	1986	Uttar Pradesh	300-600
8	SINGRAULI STPS	7	500	1987	Uttar Pradesh	300-600
9	KHAPARKHEDA TPS	1	210	1989	Maharashtra	300-600
10	KOLAGHAT TPS	2	210	1990	West Bengal	300-600
11	GANDHI NAGAR TPS	3	210	1990	Gujarat	300-600
12	DADRI (NCTPP)	1	210	1991	Uttar Pradesh	300-600
13	FARAKKA STPS	4	500	1992	West Bengal	300-600
14	DADRI (NCTPP)	2	210	1992	Uttar Pradesh	300-600
15	KAHALGAON TPS	1	210	1992	Bihar	300-600
16	DADRI (NCTPP)	3	210	1993	Uttar Pradesh	300-600
17	ANPARA TPS	4	500	1993	Uttar Pradesh	300-600
18	FARAKKA STPS	5	500	1994	West Bengal	300-600
19	ANPARA TPS	5	500	1994	Uttar Pradesh	300-600
20	DADRI (NCTPP)	4	210	1994	Uttar Pradesh	300-600
21	VINDHYACHAL STPS	7	500	1999	Madhya Pradesh	300-600
22	VINDHYACHAL STPS	8	500	2000	Madhya Pradesh	300-600

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
23	NASIK TPS	3	210	1979	Maharashtra	less than 300
24	NASIK TPS	4	210	1980	Maharashtra	less than 300
25	NASIK TPS	5	210	1981	Maharashtra	less than 300
26	ANPARA TPS	1	210	1986	Uttar Pradesh	less than 300
27	ANPARA TPS	2	210	1987	Uttar Pradesh	less than 300
28	ANPARA TPS	3	210	1988	Uttar Pradesh	less than 300
29	VINDHYACHAL STPS	6	210	1991	Madhya Pradesh	less than 300
30	KOLAGHAT TPS	1	210	1993	West Bengal	less than 300
31	RAYALASEEMA TPS	1	210	1994	Andhra Pradesh	less than 300
32	RAYALASEEMA TPS	2	210	1995	Andhra Pradesh	less than 300
33	MEJIA TPS	1	210	1996	West Bengal	less than 300
34	MEJIA TPS	2	210	1997	West Bengal	less than 300
35	MEJIA TPS	3	210	1998	West Bengal	less than 300
36	BUDGE BUDGE TPS	1	250	1997	West Bengal	ZERO
37	BUDGE BUDGE TPS	2	250	1999	West Bengal	ZERO
TOTAL					10,120 MW	

Compliant with the standard of 300 mg/Nm^3

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
1	MEJIA TPS	4	210	2004	West Bengal	less than 300
2	RAYALASEEMA TPS	4	210	2007	Andhra Pradesh	less than 300
3	RAYALASEEMA TPS	3	210	2007	Andhra Pradesh	less than 300

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
4	BHILAI TPS	1	250	2008	Chhattisgarh	less than 300
5	MUNDRA TPS	1	330	2009	Gujarat	less than 300
6	BHILAI TPS	2	250	2009	Chhattisgarh	less than 300
7	BUDGE BUDGE TPS	3	250	2009	West Bengal	ZERO
8	UDUPI TPP	1	600	2010	Karnataka	less than 300
9	MUNDRA TPS	4	330	2010	Gujarat	less than 300
10	MUNDRA TPS	3	330	2010	Gujarat	less than 300
11	MUNDRA TPS	2	330	2010	Gujarat	less than 300
12	MUNDRA TPS	5	660	2010	Gujarat	less than 300
13	MEJIA TPS	7	500	2010	West Bengal	less than 300
14	INDIRA GANDHI STPP	1	500	2010	Haryana	less than 300
15	ROSA TPP Ph-I	2	300	2010	Uttar Pradesh	less than 300
16	ROSA TPP Ph-I	1	300	2010	Uttar Pradesh	less than 300
17	ANPARA C TPS	1	600	2011	Uttar Pradesh	less than 300
18	UDUPI TPP	2	600	2011	Karnataka	less than 300
19	MUNDRA TPS	6	660	2011	Gujarat	less than 300
20	ROSA TPP Ph-I	3	300	2011	Uttar Pradesh	less than 300
21	TIRORA TPS	1	660	2012	Maharashtra	less than 300
22	MAHADEV PRASAD STPP	1	270	2012	Jharkhand	less than 300
23	ROSA TPP Ph-I	4	300	2012	Uttar Pradesh	less than 300
24	BELLARY TPS	2	500	2012	Karnataka	ZERO
25	MAHAN TPP	1	600	2013	Madhya Pradesh	less than 300
26	BARH II	4	660	2013	Bihar	less than 300
27	TIRORA TPS	3	660	2013	Maharashtra	less than 300
28	TIRORA TPS	2	660	2013	Maharashtra	less than 300
29	MAHADEV PRASAD STPP	2	270	2013	Jharkhand	less than 300

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
30	SASAN UMTPP	2	660	2013	Madhya Pradesh	less than 300
31	TIRORA TPS	5	660	2014	Maharashtra	less than 300
32	TIRORA TPS	4	660	2014	Maharashtra	less than 300
33	MARWA TPS	1	500	2014	Chhattisgarh	less than 300
34	SASAN UMTPP	3	660	2014	Madhya Pradesh	less than 300
35	BARH II	5	660	2015	Bihar	less than 300
36	CHANDRAPUR STPS	9	500	2016	Maharashtra	less than 300
37	BELLARY TPS	3	700	2016	Karnataka	less than 300
38	Sembcorp Gayatri P.Ltd.	1	660	2016	Andhra Pradesh	less than 300
39	Sembcorp Gayatri P.Ltd.	2	660	2017	Andhra Pradesh	less than 300
TOTAL					18,620 MW	

Non-Compliant with the standard of 600 mg/Nm^3

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
1	SINGRAULI STPS	4	200	1983	Uttar Pradesh	over 600
2	SINGRAULI STPS	3	200	1983	Uttar Pradesh	over 600
3	FARAKKA STPS	2	200	1986	West Bengal	over 600
4	FARAKKA STPS	1	200	1986	West Bengal	over 600
5	FARAKKA STPS	3	200	1987	West Bengal	over 600
6	VINDHYACHAL STPS	1	210	1987	Madhya Pradesh	over 600
7	UNCHAHAR TPS	1	210	1988	Uttar Pradesh	over 600
8	VINDHYACHAL STPS	2	210	1988	Madhya Pradesh	over 600
9	UNCHAHAR TPS	2	210	1989	Uttar Pradesh	over 600
10	VINDHYACHAL STPS	3	210	1989	Madhya Pradesh	over 600

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
11	VINDHYACHAL STPS	5	210	1990	Madhya Pradesh	over 600
12	KAHALGAON TPS	2	210	1994	Bihar	over 600
13	KAHALGAON TPS	3	210	1995	Bihar	over 600
14	KAHALGAON TPS	4	210	1996	Bihar	over 600
15	UNCHAHAR TPS	4	210	1999	Uttar Pradesh	over 600
16	UNCHAHAR TPS	3	210	1999	Uttar Pradesh	over 600
TOTAL					3,310 MW	

Non-Compliant with the standard of 300 mg/Nm^3

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
1	UNCHAHAR TPS	5	210	2006	Uttar Pradesh	300-600
2	VINDHYACHAL STPS	9	500	2006	Madhya Pradesh	300-600
3	KAHALGAON TPS	5	500	2007	Bihar	300-600
4	PARLI TPS	6	250	2007	Maharashtra	300-600
5	VINDHYACHAL STPS	10	500	2007	Madhya Pradesh	300-600
6	YAMUNA NAGAR TPS	2	300	2008	Haryana	300-600
7	SIPAT STPS	4	500	2008	Chhattisgarh	300-600
8	PATHADI TPP	1	300	2009	Chhattisgarh	300-600
9	KAHALGAON TPS	7	500	2009	Bihar	300-600
10	PATHADI TPP	1	300	2009	Chhattisgarh	300-600
11	SIPAT STPS	5	500	2009	Chhattisgarh	300-600
12	PATHADI TPP	2	300	2010	Chhattisgarh	300-600
13	DADRI (NCTPP)	5	490	2010	Uttar Pradesh	300-600
14	DADRI (NCTPP)	6	490	2010	Uttar Pradesh	300-600

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
15	PATHADI TPP	2	300	2010	Chhattisgarh	300-600
16	RAYALASEEMA TPS	5	210	2010	Andhra Pradesh	300-600
17	RAJIV GANDHI TPS	2	600	2010	Haryana	300-600
18	KODARMA TPP	1	500	2011	Jharkhand	300-600
19	INDIRA GANDHI STPP	2	500	2011	Haryana	300-600
20	SIPAT STPS	1	660	2011	Chhattisgarh	300-600
21	ANPARA C TPS	2	600	2012	Uttar Pradesh	300-600
22	MAHATMA GANDHI TPS	2	660	2012	Haryana	300-600
23	MAHATMA GANDHI TPS	1	660	2012	Haryana	300-600
24	INDIRA GANDHI STPP	3	500	2012	Haryana	300-600
25	MOUDA TPS	1	500	2012	Maharashtra	300-600
26	SIPAT STPS	3	660	2012	Chhattisgarh	300-600
27	SIPAT STPS	2	660	2012	Chhattisgarh	300-600
28	VINDHYACHAL STPS	11	500	2012	Madhya Pradesh	300-600
29	KORBA-WEST Ext. TPS	5	500	2013	Chhattisgarh	300-600
30	AKALTARA TPS	1	600	2013	Chhattisgarh	300-600
31	UKAI TPS	6	500	2013	Gujarat	300-600
32	MOUDA TPS	2	500	2013	Maharashtra	300-600
33	SATPURA TPS	11	250	2013	Madhya Pradesh	300-600
34	SATPURA TPS	10	250	2013	Madhya Pradesh	300-600
35	VINDHYACHAL STPS	12	500	2013	Madhya Pradesh	300-600
36	SASAN UMTPP	1	660	2013	Madhya Pradesh	300-600
37	HALDIA TPP	2	300	2015	West Bengal	300-600
38	HALDIA TPP	1	300	2015	West Bengal	300-600
39	CHANDRAPUR STPS	8	500	2015	Maharashtra	300-600

S.No.	Name of Project	Unit No	Total Capacity in MW	Year of commissioning	State	Present NO_x emission levels in mg/Nm^3
40	KUDGI	1	800	2016	Karnataka	300-600
41	UNCHAHAR TPS	6	500	2017	Uttar Pradesh	300-600
42	Binjkote TPP	1	300	2017	Chhattisgarh	300-600
43	YAMUNA NAGAR TPS	1	300	2007	Haryana	over 600
44	BELLARY TPS	1	500	2007	Karnataka	over 600
45	SANTALDIH TPS	5	250	2007	West Bengal	over 600
46	KAHALGAON TPS	6	500	2008	Bihar	over 600
47	CHANDRAPURA(DVC)	7	250	2009	Jharkhand	over 600
48	CHANDRAPURA(DVC)	8	250	2010	Jharkhand	over 600
49	RAJIV GANDHI TPS	1	600	2010	Haryana	over 600
50	FARAKKA STPS	6	500	2011	West Bengal	over 600
51	SANTALDIH TPS	6	250	2011	West Bengal	over 600
52	MEJIA TPS	8	500	2011	West Bengal	over 600
53	AKALTARA TPS	2	600	2014	Chhattisgarh	over 600
54	SASAN UMTPP	4	660	2014	Madhya Pradesh	over 600
55	SASAN UMTPP	6	660	2015	Madhya Pradesh	over 600
56	NAWAPARA TPP	2	300	2017	Chhattisgarh	over 600
TOTAL					25,730 MW	