POLICY BRIEF

DELAYED DEADLINE

Analysis of coal power sector's plans to meet new environmental norms

Centre for Science and Environment

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Disclaimer: The analysis in this document has been made based on minutes of the meetings of the CEA committee for phase-in plans for implementation of new emission norms, held between October and December 2016, and the minutes of the subsequent meetings of RPCs, held between January and February 2017. Updates and data from later discussions has not been considered in this report. CSE claims no responsibility for any discrepancies in the reported data.

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CONTENTS

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LIST OF GRAPHS

LIST OF TABLES

ABBREVIATIONS

CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CFBC	Circulating Fluidized Bed Combustion
CPCB	Central Pollution Control Board
CSE	Centre for Science and Environment
DVC	Damodar Valley Corporation
ESP	Electrostatic precipitator
FGD	Flue-gas desulphurization
GW	Gigawatt
mg	milligram
MOEF&CC	Ministry of Environment, Forest and Climate Change
MW	Megawatt
Nm^3	Normal cubic metre
NO_x	Oxide(s) of nitrogen
NTPC	National Thermal Power Corporation
POSOCO	Power System Operation Corporation
RPC	Regional power committee
SO_2	Sulphur dioxide
SO_x	Oxide(s) of sulphur
SPCB	State pollution control board
SPM	Suspended particulate matter

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1. OVERVIEW

The thermal power sector has made very little progress in implementing the revised stack emission standards for suspended particulate matter (SPM), sulphur dioxide (SO_2) and oxide(s) of nitrogen (NO_x) notified in December 2015. The industry had raised several objections— the technology is not suitable for Indian coal, costs are too high, and space was not available. Centre for Science and Environment (CSE) research showed that these issues were manageable. CSE shared its research with major stakeholders—industry, Central Electricity Authority (CEA), Central Electricity Regulatory Commission (CERC), etc. In the period between March 2016 and March 2017, a broad agreement has emerged that most of the objections can be taken care of easily. However, in the process the industry has squandered a lot of precious time.

In September 2016, CEA asked regional power committees (RPCs) to formulate a phasing plan for installing new equipment. CSE has collected and analyzed the reports prepared by various RPCs. Overall, the reports suffer from three main weaknesses—they appear to overstate the efforts required; second, sizable capacity has still not disclosed the timelines for installation; third, preliminary timelines indicated in the phasing plans point to significant delays, with compliance beginning in 2019 for a few units and implementation plan ending by March 2023.

At this point, we are faced with several unpalatable options on account of lack of urgency by the power sector. Compliance with all norms by December 2017 would not be possible for most of the units. However, unilateral extension of timelines will set a bad precedent—the regulators should not accommodate flagrant disregard of regulations by the industry.

While the timelines indicated by the generation units for installation or upgradation of equipment clearly need to be tightened, the Ministry of Environment, Forest and Climate Change (MoEF&CC) should show some flexibility, given the on-ground situation. MoEF&CC must focus on establishing and strengthening monitoring procedures to push implementation. CSE further recommends that certain standards be loosened. There are no technical impediments to meeting the norms, but it might be economically preferable to ease the norms for some old or small units or to waive them for units that commit to shut. In conclusion, any relief or relaxation needs to be backed with 'phased compliance', tight timelines and firm commitments by the industry.

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2. COMMITTEE FOR THE PHASING PLAN

In September 2016, Ministry of Power constituted a committee to prepare the phasing plan for implementation of the new environmental norms for the thermal power sector. The committee included members from CEA, Ministry of Coal, MoEF&CC, Central Pollution Control Board (CPCB), Power System Operation Corporation (POSOCO), National Thermal Power Committee Ltd (NTPC) and Damodar Valley Corporation (DVC).

This committee met twice, on 21 October and 13 December 2016, to shortlist plants requiring upgradation, analyze any space constraints, recommend broad solutions for individual units, and develop the phase-in plan. The committee arrived at the following conclusions:

- **Retrofitting:**
  Retrofitting will not be done in old plants which have been identified for retirement. In September 2015, CEA identified 5,857 MW capacity for retirement. An additional 3,730 MW capacity was identified for replacement or retirement considering various factors—age, station heat rate, plant load factor and variable cost. Thus, the total capacity deemed fit for retiring is 9,587 MW, of which 680 MW has already been retired, and the rest 8,907 MW has been excluded from the phasing plan.

- **Particulate matter control:**
  - Only units with SPM emission levels 20 per cent higher than the revised norms will be considered for the phasing plan.
  - To avoid excessive expenditure, units identified for FGD retrofit will not upgrade their electrostatic precipitators (ESPs), as FGD retrofit is anticipated to cut particulate matter also.
  - Units shortlisted for ESP retrofit or upgradation should have at least five years of design life left, or should be allowed to run for at least five years from the date of completion of work.

- **Sulphur dioxide:**
  - In plants where space is not a constraint, FGD is recommended to control SO_2.

- **Oxides of nitrogen:**
  - Retrofit of low-NO_x burners, fine-tuning of over-fire air or secondary over-fire air should be done by plants along with their annual maintenance and overhauling schedules within the next two years.
  - Various technologies, like low-NO_x burner and over-fire air systems, were recommended for wall- and tangential-fired boilers.

A list of power stations with data on particulate matter emission levels and key recommendations—ESP retrofit or FGD installation—of the committee, was circulated among the RPCs, and they were asked to provide timelines for installation of pollution control equipment by the end of February 2017.

3. PROJECTED REQUIREMENTS—ESP UPGRADATION AND FGD INSTALLATION

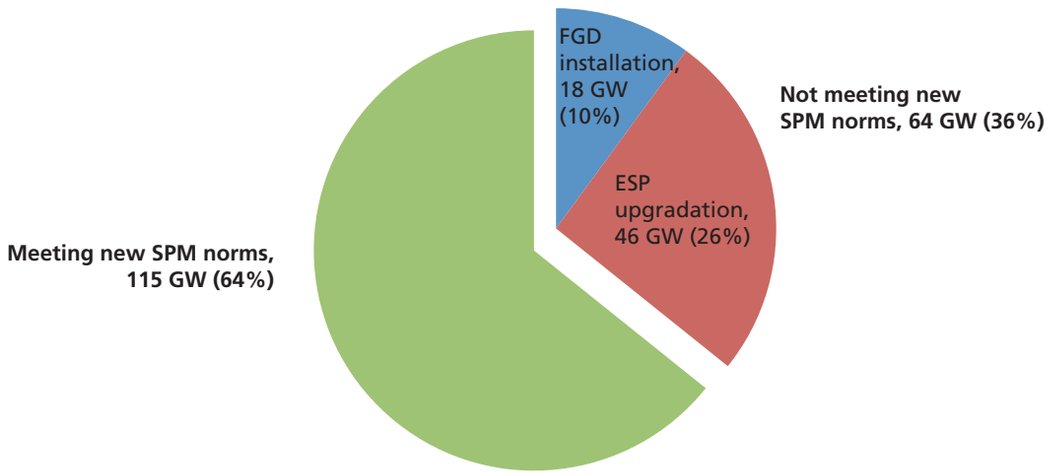
During the second meeting of the implementation committee, the CEA presented estimates of the total requirement for ESP upgradation and FGD installation across the country. In making these estimates, the agency considered a national coal- and lignite-based generation capacity of 179,548 MW across 555 units. The estimate for the requirement of ESP upgradation was based primarily on the data provided by power utilities and CPCB on emission norms and the actual SPM emission levels, while the estimated FGD installation requirement was based on availability of space at power plants.

- **26 per cent of capacity identified for ESP upgradation**
  Of the total coal- and lignite-based generation capacity, 115,214 MW (299 units) meets the new SPM norms, as per the latest CPCB data. The remaining capacity of 64,334 MW (256 units) that does not meet the new norms was considered for investments in emission control. Of these, the CEA identified 46,479 MW of capacity (211 units) for immediate ESP upgradation; the remaining 17,855 MW of capacity (45 units) was proposed to install FGD (see *Graph 1: CEA's projected requirement for ESP upgradation*).

- **53 per cent of capacity identified for FGD installations**
  95,915 MW of capacity (202 units) has been identified for FGD installation based on the availability of adequate space. Of the remaining capacity, 9,510 MW (39 units) have either already installed FGD or are based on circulating fluidized bed combustion (CFBC) boiler technology. Further, 74,123 MW (314 units) cannot install FGD due to lack of adequate space (see *Graph 2: CEA's projected requirement for FGD installation*).

GRAPH 1: CEA'S PROJECTED REQUIREMENT FOR ESP UPGRADATION

Significant capacity meets the new particulate matter norms



Source: Central Electricity Authority, 2016

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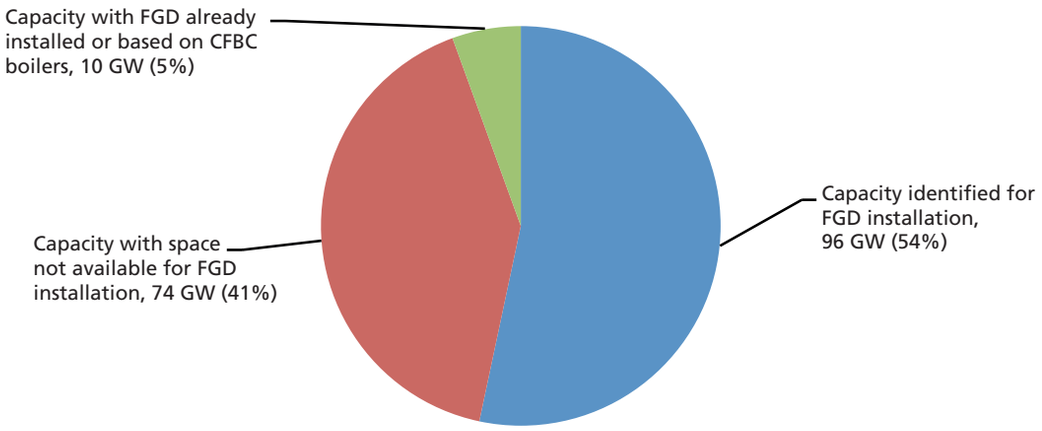
GRAPH 2: CEA'S PROJECTED REQUIREMENT FOR FGD INSTALLATION

Half the installed capacity, largely installed post-2008, requires FGD



Source: Central Electricity Authority, 2016

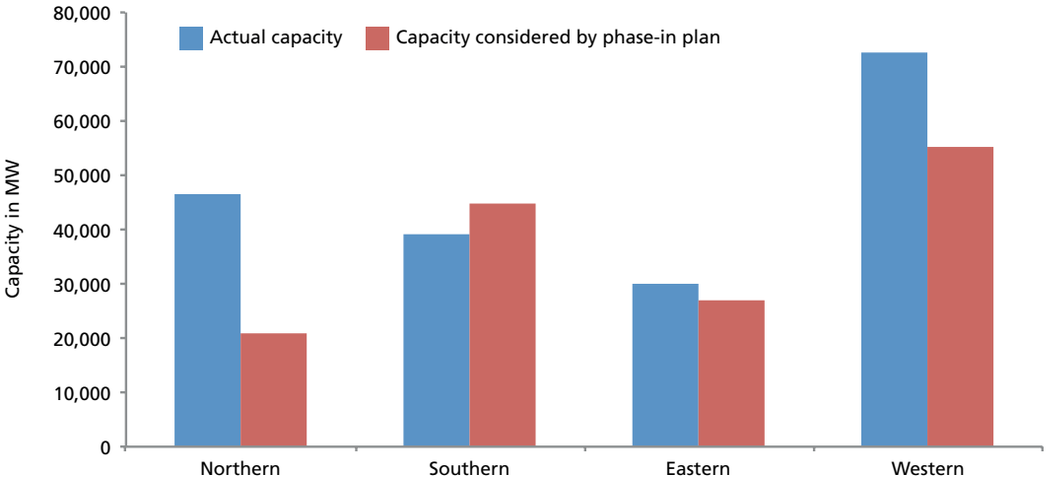
4. ANALYSIS OF REGIONAL PHASE-IN PLANS

In consultation with power stations and POSOCO, RPCs prepared phase-in plans, taking into account the power supply in the respective regions and grid stability. Consultations started with the southern region in January 2017, followed by western and eastern regions in February 2017 and northern region in March 2017. RPCs considered 143 of 188 GW of existing coal power capacity for the phase-in plans (see *Graph 3: Total existing capacity vs capacity recommended for upgradation*).

Overall, the key differences between RPCs' and CEA's lists of plants are not very significant. A capacity of 12.1 GW, mostly in the northern region, identified for ESP upgradation, is not part of the published RPCs lists. In addition, 24.5 GW of the 27.6 GW capacity identified by CEA as having no space for FGD installation, is also not part of the lists published by RPCs. However, it meets the new SPM norms, according to CEA analysis (see *Table 1: Committee recommendations summary*). Overall, according to RPCs lists, 34.4 GW capacity requires ESP upgradation and about 100 GW capacity requires FGD installation (see *Annexure A: Summary of the phase-in plan*).

GRAPH 3: TOTAL EXISTING CAPACITY VS CAPACITY RECOMMENDED FOR UPGRADATION

Regional committees discussed pollution systems upgradation for three-fourths of the capacity



Note: Southern regional phase-in plan includes 2,000 MW capacity of NTPC Talcher in Odisha and 4,460 MW capacity which is yet to be commissioned.
Source: Central Electricity Authority, 2017

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TABLE 1: CEA COMMITTEE RECOMMENDATIONS AND RPC PHASE-IN PLAN SUMMARY

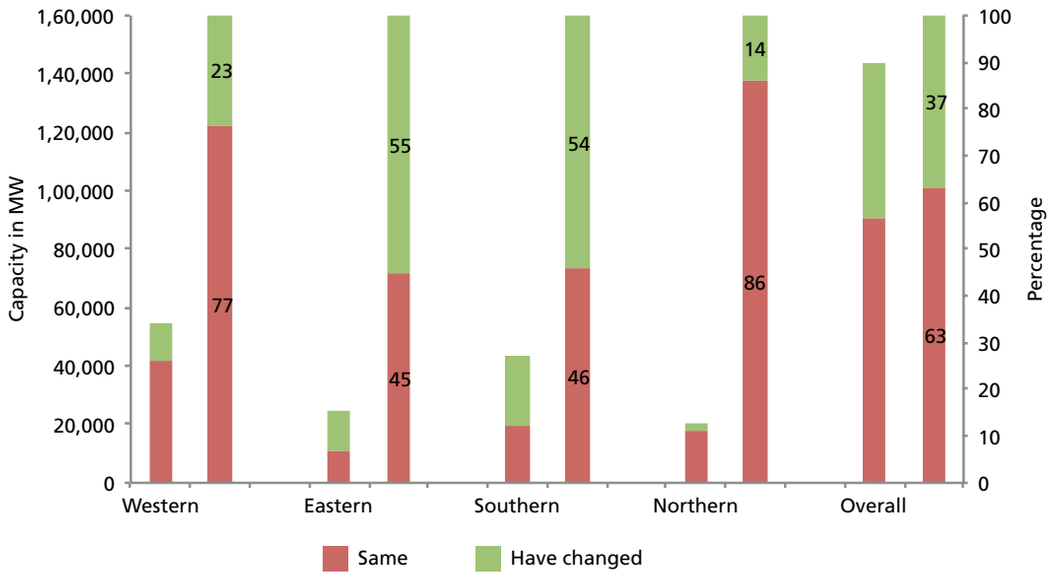
RPCs' published lists provide no information on 35 GW of the total capacity

Region	ESP upgradation	FGD installations	No space to install FGD	Already having FGD	To retire	Total
CEA committee						
	46.5	95.9	27.6	9.5	8.9	188.5
Region	ESP upgradation	FGD installations	No space to install FGD	No upgradation	To retire	Total
RPC phase-in plan						
Northern	1.8	19				20.8
Eastern	9.4	17.6				27
Western	13.2	38.7		2.5		54.4
Southern*	10	20.9	3.1	5.4	0.6	39.9
Sub-total	34.4	96.2	3.1	7.8	0.6	142.1

Note: Capacity in GW
*4.5 GW to be commissioned, 0.6 GW recommended for both ESP and FGD solution
Source: Regional offices, Central Electricity Authority, 2017

GRAPH 4: MOEF&CC'S REFINEMENT OF PARTICULATE EMISSIONS NORMS

For 91 GW capacity—almost half of the total capacity—the norms remain unchanged



Note: Data on present and modified SPM standards were unavailable for northern region and 16 GW capacity of southern region. These units were categorized into 'same' category, if the unit sizes were more than 210 MW and commissioned post-2008, in line with MoEF&CC's environmental clearance conditions.
Source: Central Electricity Authority, 2017

A. ESP upgradation

RPCs have assessed 147 GW capacity in total, including around 5 GW capacity of upcoming coal power plants. Data provided by the RPCs indicates that for a significant proportion of the coal- and lignite-based generation capacity the particulate matter emission norms have not changed (see *Graph 4: MoEF&CC's refinement in particulate emissions norms*).

Of the 147 GW capacity, 43 GW are non-compliant with the new SPM standards (see *Table 2: Plants non-compliant with SPM norms*). Another 56 GW capacity has not reported data, of which 86 per cent is new capacity largely in compliance with the new SPM norms.

TABLE 2: PLANTS NON-COMPLIANT WITH SPM NORMS

To comply with the SPM norms, plants are taking two routes, ESP upgradation or FGD installation

Region	Non-compliant with SPM norms	ESP upgradation	FGD installations
CEA committee			
	64	46	18
RPC phase-in plan			
Northern	2	2	
Eastern	11	9	2
Western	16	13	3
Southern	14	10	4
Sub-total	43	34	9

Note: Capacity in GW
Source: Regional offices, Central Electricity Authority, 2017

Summary

In aggregate, the committee identified 46 GW of capacity for ESP upgradation across the country. However, the regional phase-in plan discusses schedule for only 34 GW (see *Annexure B: List of plants which needs to upgrade ESPs according to CEA*). Region-wise, 37 per cent of the identified capacity is located in the western, 30 per cent in the southern, 27 per cent in the eastern, and the remaining 5 per cent in the northern region.

Of this capacity, 60 per cent (20 GW) comprises units that are small in size (upto 250 MW each). About 25 per cent includes large units each of 500 MW and above capacity, and the remaining 15 per cent comprise medium-sized units of greater than 250 MW and lower than 500 MW capacity (see *Table 3: ESP upgradation—age and unit size distribution*).

Age-wise, 40 per cent of the 33 GW capacity comprises units older than 25 years. Another 25 per cent share is accounted for by units installed during 1991–2002, 14 per cent of the units were installed during 2004–08, and the remaining 21 per cent during 2009–15.

Three states, West Bengal, Maharashtra and Tamil Nadu, together house 42 per cent of the capacity requiring upgradation (see *Graph 5: ESP upgradation—state-wise distribution)*. This capacity belongs to the state governments (see *Graph 6: ESP upgradation—sector-wise distribution*).

TABLE 3: ESP UPGRADATION—AGE AND UNIT SIZE DISTRIBUTION

Largely, units smaller than 250 MW, need ESP upgradation

Unit size in MW	Commercial operating date				
	Over 25 years	1991–2002	2003–08	2008–16	Sub-total
Less than 250	10,220	6,655	880	2,795	20,550
250–499		500	1,850	3,000	5,350
500 and above	3,000	1,000	2,000	2,500	8,500
Total	13,220	8,155	4,730	8,295	34,400

Source: Regional offices, Central Electricity Authority, 2017

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Data on the commissioning schedule for ESP upgradation is provided for units aggregating only 14 GW of capacity. The commissioning schedule ranges from March 2017 (for units where work is ongoing) to as late as March 2023.

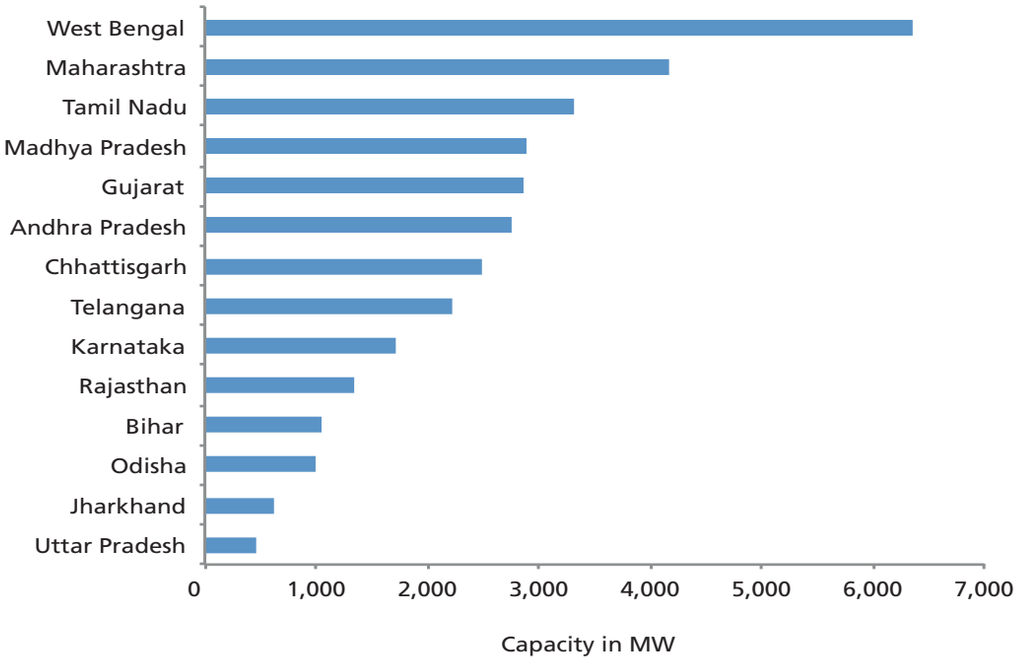
B. FGD installations

Based on the availability of adequate space for installation of equipment, 95,915 MW of capacity (across 202 units) was identified by the CEA-led committee for FGD installation. However, at the regional level, the list totalled 99,885 MW of capacity (across 209 units).

Of the 99,885 MW (209 units), 3,650 MW (13 units) belonging to the southern region (1,200 MW; five units) and western region (2,450 MW; eight units) claimed compliance with

GRAPH 5: ESP UPGRADATION—STATE-WISE DISTRIBUTION

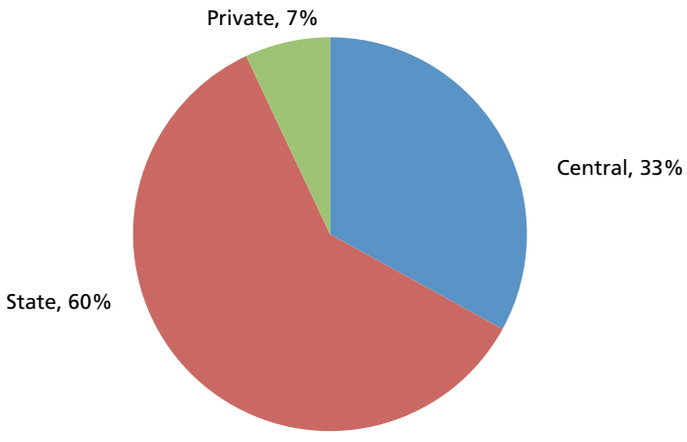
The top three states house more than two-fifths of the capacity requiring upgradation



Source: Regional offices, Central Electricity Authority, 2017

GRAPH 6: ESP UPGRADATION—SECTOR-WISE DISTRIBUTION

The vast majority of the 34 GW capacity requiring upgradation comprises small units belonging to the state sector



Source: Regional offices, Central Electricity Authority, 2017

TABLE 4: REGION-WISE CAPACITY REQUIRING FGD INSTALLATION

FGDs are largely planned in western region

Region	Capacity (in MW)	No. of units
Northern	19,030	36
Southern	20,880	42
Western	38,730	78
Eastern	17,595	40
Total	96,235	196

Source: Regional offices, Central Electricity Authority, 2017

TABLE 5: UNIT AND SIZE DISTRIBUTION OF TOTAL CAPACITY IDENTIFIED FOR FGD

Bulk of the capacity identified for FGD installation became operational from 2009–16

Size	Commercial operating date			
	1991–2003	2004–08	2009–16	Total
Upto 250 MW	1,520	210	1,755	3,485
> 250 and < 500 MW	500	1,250	10,320	12,070
500 MW and above	1,500	4,000	75,180	80,680
Total	3,520	5,460	87,255	96,235

Source: Regional offices, Central Electricity Authority, 2017

SO_2 norms. Excluding that capacity, the RPCs have identified 96,235 MW requiring FGD installations (see *Annexure C: List of plants which need to install FGD according to CEA*), of which 40 per cent is located in the western region, followed by 20 per cent in the northern, 21 per cent in the southern, and the remaining 19 per cent in the eastern region (see *Table 4: Region-wise capacity requiring FGD installation*).

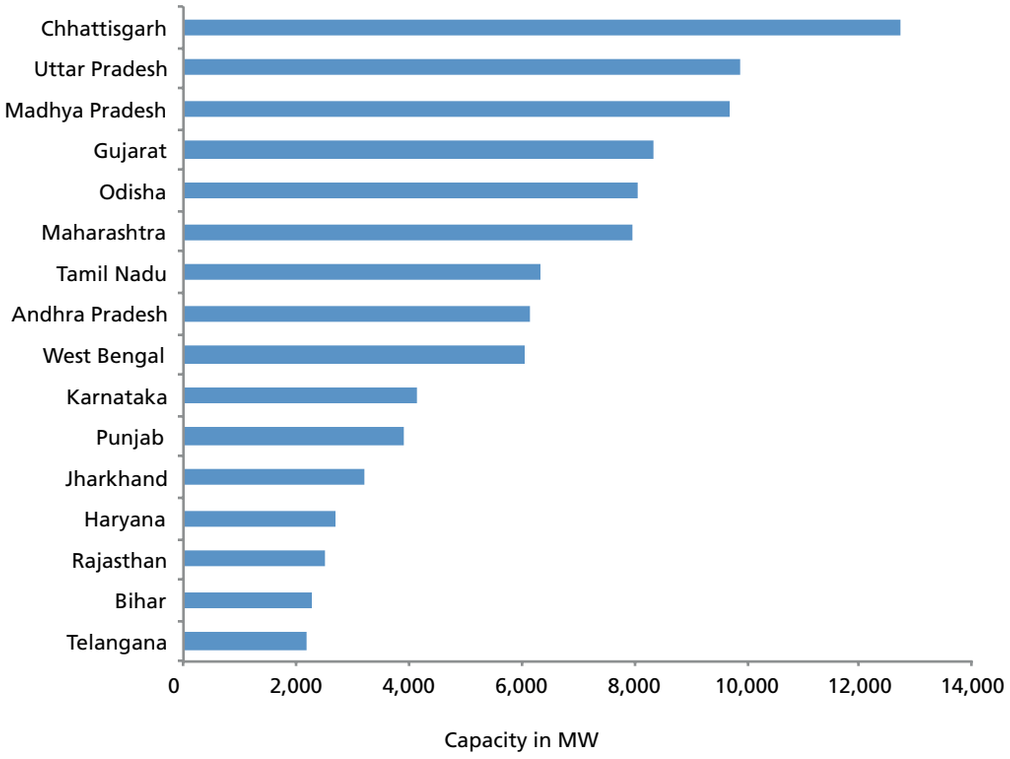
A significant (91 per cent) share of the capacity identified for FGD installation comprises of units installed during 2009–16. Beginning in 2004, environmental clearances started requiring plans to allot space for installation of FGDs. Mid-life plants (installed during 2004–08) comprise 6 per cent of the identified capacity, while units installed during 1991–2003 account for only 3 per cent of this capacity (see *Table 4: Region-wise capacity identified for FGD installation*).

In terms of unit size, 84 per cent of the identified capacity comprises of larger units of 500 MW and above. Another 13 per cent share is accounted for by units from 250 MW to 500 MW, and the remaining 3 per cent by units of upto 250 MW (see *Table 5: Unit and size distribution of total capacity identified for FGD (in MW)*).

Six states, Maharashtra, Odisha, Gujarat, Madhya Pradesh, Uttar Pradesh, and Chhattisgarh, house 60 per cent of the capacity requiring FGD installations (see *Graph 7: FGD installation—state-wise distribution*).

GRAPH 7: FGD INSTALLATION—STATE-WISE DISTRIBUTION

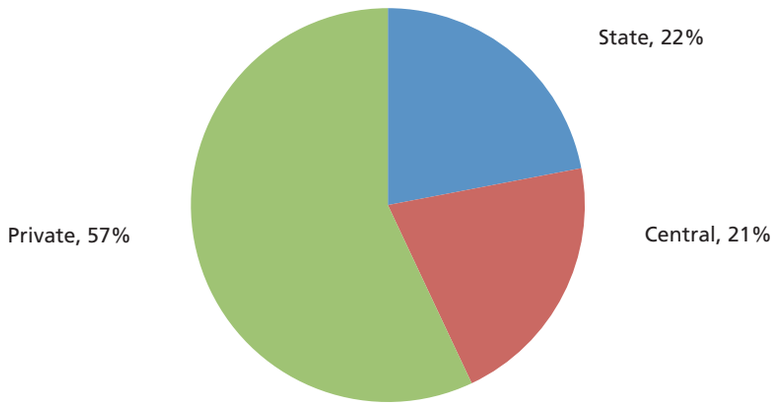
Odisha in the eastern region and Uttar Pradesh in the northern region will also house most FGDs along with states in the western region



Source: Regional offices, Central Electricity Authority, 2017

GRAPH 8: FGD INSTALLATION—SECTOR-WISE DISTRIBUTION

Adani, Tata, Reliance and Jindal groups hold considerable share of the private sector plants planning to install FGD



Source: Regional offices, Central Electricity Authority, 2017

Most FGD units will be built by the private sector, since plants constructed post-2008 largely belong to the private sector (see *Graph 8: FGD installation—sector-wise distribution*).

As for the timelines, the phasing plans consider a time requirement of about three years for installation of FGDs, including pre-installation works, in view of NTPC's experience in executing such works. Phase-in timelines has been scheduled for 71 GW of the 96 GW capacity. 9.9 GW capacity is awaiting CERC decision to commit a deadline and the rest has not given any schedule.

5. CSE RECOMMENDATIONS

a. ESP upgradation

The committee for implementation of the emission norms has indicated that about 115 GW of coal- and lignite-based generation capacity, installed across 299 units, is meeting the new SPM norms. CSE was unable to independently verify the compliance level; the data we received from CPCB was not comprehensive. But even if the actual emission levels of many of these units are higher than the required emission level, the units are most likely designed to meet the norms. These units should be able to meet the norms through minor optimization of the installed equipment, which must be executed immediately (by the end of 2018).

Of the remaining 64 GW of capacity across 256 units, which are not meeting the SPM emission norms, investment in ESP is not required in 13 GW capacity, which is over 25 years of age and operating inefficiently (see *Table 6: Pollution control equipment upgradation—age-wise break-up*). CSE recommends that such units must be either immediately or gradually retired and replaced.

While the phasing plans of RPCs indicate that ESP upgradation work will be completed between March 2017 and March 2023, CSE recommends that half of the upgrade work be executed by December 2017, while the remaining should be executed by December 2018.

b. FGD installation

FGD installation must be prioritized for large newer units (of 500 MW and above size and installed during the 2009–16). Given that such units have more than 17 years of remaining life, investments required in FGD become economically feasible. Further, the environmental benefits of FGD investments are higher for such units given their larger pollution load.

TABLE 6: POLLUTION CONTROL EQUIPMENT UPGRADATION—AGE-WISE BREAK-UP

Plans to meet new environmental norms are mostly unavailable for units installed prior to 2003

Commercial operating date	Overall Capacity	ESP up-gradation	FGD installations	To retire	No data
Pre-1990	33.5	13		9	11.5
1991–2003	31	8	3.5		19.5
2003–08	12	5	5.5		1.5
2009–16	111.5	8	87		16.5
Total	188	34	96	9	49

Note: Capacity in GW
Source: Regional Offices, Central Electricity Authority, 2017

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TABLE 7: SUMMARY OF UNITS LARGER THAN 500 MW

New units are largely of 500 MW and above size

Region	Commercial operating date		
	1991–2003	2004–08	2009–16
Northern	1,000 (2)	-	15,100 (27)
Eastern	500 (1)	500 (1)	12,670 (25)
Western	-	1,000 (2)	31,190 (52)
Southern	-	2,500 (5)	16,220 (32)
Total	1,500 (3)	4,000 (8)	75,180 (136)

Note: Data in parentheses indicates number of units
Source: Regional offices, Central Electricity Authority, 2017

TABLE 8: SCHEDULE RECOMMENDED FOR FGD INSTALLATION

Schedule is heavily back-loaded

Year	Capacity (MW)
2018	27,760
2019	28,440
2020	22,980
Total	79,180

Note: Calendar years (ending in December). Schedule considers 500 MW and above size installed during 2009–16
Source: Regional offices, Central Electricity Authority, 2017

As per the phase-in plans of RPCs, units of 500 MW and above size and installed during 2009–16 aggregate to about 75.18 GW of capacity. For such units, CSE believes FGD installations must be prioritized in units of 500 MW and above capacity (see *Table 7: Summary of units larger than 500 MW*).

CSE believes that the timelines for FGD installation can and should be tightened significantly, from the current indicated plan of February 2020– March 2023. In consideration of the time required for FGD installation and constraints in equipment supply, it is recommended that FGD installation should be completed for 28 GW of capacity (or 35 per cent of the 79 GW) by December 2018; 28 GW (35 per cent) by December 2019; and remaining 23 GW (30 per cent) by December 2020 (see *Table 8: Schedule recommended for FGD installation*).

Large units of 500 MW and above size, which were installed prior to 2004, can perhaps be exempted from installing FGD. Of the 5.5 GW of such capacity identified by the phasing plans, three units adding 1.5 GW of capacity are more than 23 years of age and nearing their useful life. Further, CEA claims that a majority of the units with a capacity of 500 MW and above commissioned before 2008, do not have space for FGDs.

FGD installations can be avoided for 15 GW of smaller units ranging in capacity from 120–499 MW and installed in 1990–2016. CSE expects that most of these units should be able to achieve the desired SO_2 emission levels of 600 mg/Nm^3, either through partial FGD or though other control technologies (like reducing sulphur content of fuel or injecting sorbents).

c. NO_x control

The committee for implementation of emissions norms has indicated that low NO_x systems or burners are to be installed by all thermal units during the next scheduled overhauling period, over a period of two years.

Outages for executing maintenance and overhauling works have been scheduled for about 82.6 GW of the coal- and lignite-based capacity (see *Annexure D: List of plants schedule dfor annual maintenance in 2017*). Of these, the outage duration for about 7 per cent of the capacity is less than ten days.

CSE recommends that all required modifications for reducing NO_x emissions must be executed during 2017–18 for the capacities that have been included in the annual maintenance plans. The outage duration must be expanded accordingly, as required. For the remaining 48 per cent of the capacity, outages must be planned between April and December 2018 for implementation of low-NO_x solutions.

d. Strengthening monitoring

The CPCB, under Section 18(1)B of the Air (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Control of Pollution) Act, 1974, must immediately issue guidance to the state pollution control boards (SPCBs) to issue letters to power plants to submit detailed action plans for implementation of environmental norms within a period of three months. These action plans must be evaluated to ensure that they are based on the best possible option. SPCBs must conduct regular meetings with power generators to identify key issues and challenges, and provide required assistance. They should monitor the actual progress in implementation achieved by the plants against the progress projected in the action plans. They must also evolve a mechanism of penalties for units which fail to meet the requirements under the action plans.

e. Baseline data compilation

The MoEF&CC must start putting in dedicated efforts right away to prepare a detailed baseline dataset on the actual emissions from the coal- and lignite-based thermal generation units. While most of these units have installed continuous emissions monitoring system for monitoring emissions, the quality of information generated and notified to respective SPCBs is affected by issues with equipment calibration etc. Further, several of the units are currently not reporting data on SO_x and NO_x. Thus, the emissions data available with CPCB seems incomplete and patchy.

Compilations of accurate baseline data on emissions are not only crucial for accurately identifying the units that require intervention, but also for ensuring that power plants comply with emissions norms when they come into force.

ANNEXURES

1. ANNEXURE A: SUMMARY OF THE PHASE-IN PLAN

The national committee recommended ESP upgradation in 46,479 MW (211 units) and FGD installations in 17,855 MW (45 units) to comply with the revised SPM norms. The remaining 115,214 MW (299 units) were found in compliance with SPM norms. Out of the 115,214 MW (299 units), 78,060 MW (157 units) had space to install FGD, 9,510MW (39 units) had already installed FGD, and the rest 27,644 (103 units) were assessed to have no space. Therefore, RPCs were asked to draw phase-in timelines for upgrading ESPs of capacity 46,479 MW (211 units) and installing FGD in 95,915 MW (202 units).

After fine-tuning the list, and making a few additions and deletions, RPCs have assessed and drawn schedules for a total capacity of 147 GW (see *Table: Summary of regional phase-in plans*). The lists shortlisted and circulated by the committee and those deliberated upon at the regional levels had varying details. The eastern region included five units of 1,640 MW in addition to the circulated list; similarly southern region included 43 units of 14,020 MW in addition to the circulated list. There was not much deviation in the western region's list from the committee's list, while the northern region never disclosed its committee list. The additional data considered by the eastern region was recommended for FGD upgradation by RPCs, and in the southern region 5,630 MW capacity (11 units) was recommended for FGD upgradation. The rest did not require any upgradation.

TABLE: SUMMARY OF REGIONAL PHASE-IN PLANS

Region	Category	Capacity	Committee recommendation	
			ESP	FGD
Western	No change in SPM norms			
	Compliant	28,600 (57)		28,600 (57)
	Non-compliant	6,110 (23)	3,610 (17)	2,500 (6)
	No data on SPM levels	7,190 (13)		7,190 (13)
	Change in SPM norms			
	Compliant	1,160 (7)	120 (2)	1,040 (5)
	Non-compliant	9,230 (39)	8,810 (37)	420 (2)
	No data on SPM levels	1,430 (3)		1,430 (3)
	No data on SPM standards	660 (4)	660 (4)	
	Sub-total	54,380 (146)	13,200 (60)	41,180 (86)
Eastern	No change in SPM norms			
	Compliant	9,340 (20)		9,340 (20)
	Non-compliant	420 (2)		420 (2)
	No data on SPM levels	1,450 (3)		1,450 (3)
	Change in SPM norms			
	Compliant	2,550 (5)		2,550 (5)
	Non-compliant	10,230 (39)	8,730 (36)	1,500 (3)
	No data on SPM levels	1,025 (5)	330 (3)	2,335 (7)
	No data on SPM standards	350 (1)	350 (1)	
	Sub-total	27,005 (80)	9,410 (40)	17,595 (40)

Region	Category	Capacity	Committee recommendation	
			ESP	FGD
Southern	No change in SPM norms			
	Compliant	5,230 (14)		5,230 (14)
	Non-compliant			
	No data on SPM levels	7,040 (12)		7,040 (12)
	Change in SPM norms			
	Compliant	1,010 (2)	210 (1)	800 (1)
	Non-compliant	13,700 (47)	9,250 (35)	3,950 (11)
	No data on SPM levels			
	No data on SPM standards	16,160 (49)*	550 (3)	5,060 (9)
	Sub-total	44,740 (127)	10,010 (39)	20,480 (47)
Northern	No change in SPM norms	17,820 (33)		17,820 (33)
	Change in SPM norms	2,990 (23)	1,780 (20)	1,210 (3)
	Sub-total	20,810 (56)	1,780 (20)	19,030 (36)
	Column total	1,46,935 (409)	34,400 (159)	99,885(209)

*In addition to capacity demarcated for either ESP or FGD installation, 500 MW (1) was recommended for both FGD and ESP, 4,460 MW (6) is yet to be commissioned, 3,090 MW (15) had no space, 600MW (9) was to be retired, and 1,700 MW (4) required no upgradation, while there was no recommendation for another 2,300 MW (6) capacity.
Note: 3,650 MW (13 units) belonging to southern (1,200 MW; five units) and western (2,450 MW; 8 units) regions claimed compliance with sulphur dioxide norms and have requested exemption from the 'FGD installation category'
Source: Central Electricity Authority, 2017

2. ANNEXURE B: LIST OF PLANTS WHICH NEED TO UPGRADE ESPs ACCORDING TO CEA

Name of project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Western region					
Chhattisgarh					
KORBA STPS	Central	5	500	29	2018
KORBA STPS	Central	4	500	30	2018
KORBA-WEST TPS	State	4	210	31	2020
KORBA-WEST TPS	State	3	210	32	2020
KORBA STPS	Central	2	200	33	2018
KORBA STPS	Central	1	200	34	2018
KORBA-WEST TPS	State	2	210	34	2020
KORBA-WEST TPS	State	1	210	34	2020
KORBA-III	State	2	120	36	2020
KORBA-III	State	1	120	41	2020
Gujarat					
SURAT LIG. TPS	Private	4	125	7	2020
SURAT LIG. TPS	Private	3	125	7	2020
KUTCH LIG. TPS	State	4	75	7	2020
AKRIMOTA LIG TPS	State	2	125	11	2020
AKRIMOTA LIG TPS	State	1	125	12	2020
WANAKBORI TPS	State	7	210	18	2020
KUTCH LIG. TPS	State	3	75	20	2020
KUTCH LIG. TPS	State	2	70	26	2020
KUTCH LIG. TPS	State	1	70	27	2020
WANAKBORI TPS	State	6	210	29	2020
WANAKBORI TPS	State	5	210	30	2021
UKAI TPS	State	5	210	32	2017
WANAKBORI TPS	State	4	210	31	2021
WANAKBORI TPS	State	3	210	33	2018
WANAKBORI TPS	State	2	210	34	2018
WANAKBORI TPS	State	1	210	35	2017
UKAI TPS	State	3	200	38	2017
UKAI TPS	State	4	200	38	2017
Madhya Pradesh					
VINDHYACHAL STPS	Central	10	500	10	2019
VINDHYACHAL STPS	Central	9	500	10	2019
SANJAY GANDHI TPS	State	2	210	24	2019
SANJAY GANDHI TPS	State	1	210	24	2019
VINDHYACHAL STPS	Central	6	210	26	2018
VINDHYACHAL STPS	Central	5	210	27	2018
VINDHYACHAL STPS	Central	4	210	27	2018
VINDHYACHAL STPS	Central	3	210	28	2018
VINDHYACHAL STPS	Central	2	210	28	2018
VINDHYACHAL STPS	Central	1	210	29	2018

Name of project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Maharashtra					
BHUSAWAL TPS	State	5	500	5	2020
BHUSAWAL TPS	State	4	500	5	2020
PARAS TPS	State	4	250	7	2021
PARAS TPS	State	3	250	10	2021
PARLI TPS	State	6	250	10	2021
TROMBAY TPS	Private	5	500	33	2017
Northern region					
Rajasthan					
JALIPA KAPURDI TPP	Private	7	135	2	2021
JALIPA KAPURDI TPP	Private	6	135	2	2021
JALIPA KAPURDI TPP	Private	8	135	2	2022
JALIPA KAPURDI TPP	Private	5	135	2	2022
JALIPA KAPURDI TPP	Private	4	135	4	2022
JALIPA KAPURDI TPP	Private	3	135	4	2022
BARSINGSAR LIGNITE	Central	2	125	4	2019
JALIPA KAPURDI TPP	Private	2	135	5	2023
BARSINGSAR LIGNITE	Central	1	125	5	2019
JALIPA KAPURDI TPP	Private	1	135	6	2023
Uttar Pradesh					
UTRAULA TPS	Private	2	45	3	2021
KUNDARKI TPS	Private	2	45	3	2021
UTRAULA TPS	Private	1	45	3	2021
BARKHERA TPS	Private	2	45	3	2021
MAQSOODPUR TPS	Private	2	45	3	2021
KUNDARKI TPS	Private	1	45	3	2021
KHAMBARKHE RA TPS	Private	2	45	4	2021
BARKHERA TPS	Private	1	45	4	2021
MAQSOODPUR TPS	Private	1	45	4	2021
KHAMBARKHE RA TPS	Private	1	45	4	2021
Eastern region					
Bihar					
KAHALGAON TPS	Central	4	210	21	ND
KAHALGAON TPS	Central	3	210	22	ND
KAHALGAONTPS	Central	2	210	23	ND
KAHALGAON TPS	Central	1	210	25	ND
MUZAFFARPUR TPS	Central	2	110	31	ND
MUZAFFARPUR TPS	Central	1	110	32	ND
Jharkhand					
TENUGHAT TPS	State	1	210	23	ND
BOKARO 'B' TPS	Central	2	210	26	ND
BOKARO 'B' TPS	Central	1	210	31	ND

Name of project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Odisha					
TALCHER STPS	Central	6	500	12	ND
TALCHER STPS	Central	5	500	13	ND
West Bengal					
D.P.L. TPS EXT.	State	8	250	3	ND
SANTALDIH TPS	State	6	250	6	ND
BAKRESWAR TPS	State	1	210	8	ND
SAGARDIGHI TPS	State	1	300	8	ND
D.P.L. TPS"	State	7	300	9	ND
BAKRESWAR TPS	State	5	210	9	ND
SANTALDIH TPS	State	5	250	9	ND
MEJIATPS	Central	5	250	9	ND
SAGARDIGHI TPS	State	2	300	9	ND
MEJIATPS	Central	6	250	10	ND
MEJIA TPS	Central	4	210	12	ND
MEJIA TPS	Central	3	210	19	ND
MEJIA TPS	Central	2	210	20	ND
MEJIA TPS	Central	1	210	21	ND
FARAKKA STPS	Central	5	500	23	ND
KOLAGHAT TPS	State	5	210	23	ND
KOLAGHAT TPS	State	1	210	24	ND
FARAKKA STPS	Central	4	500	24	ND
KOLAGHAT TPS	State	6	210	26	ND
KOLAGHAT TPS	State	2	210	26	ND
FARAKKA STPS	Central	1	200	31	ND
KOLAGHAT TPS	State	3	210	31	ND
D.P.L. TPS	State	6	110	32	ND
KOLAGHAT TPS	State	4	210	33	ND
BANDEL TPS	State	1	210	34	ND
BANDEL TPS	State	4	60	51	ND
BANDEL TPS	State	3	60	51	ND
BANDEL TPS	State	2	60	51	ND
Southern region					
Andhra Pradesh					
Simhadri	Central	4	500	5	ND
Simhadri	Central	3	500	5	ND
Dr Narla Tata Rao	State	7	500	7	ND
Dr Narla Tata Rao	State	6	210	22	ND
Dr Narla Tata Rao	State	5	210	23	ND
Dr Narla Tata Rao	State	4	210	26	ND
Dr Narla Tata Rao	State	3	210	27	ND
Dr Narla Tata Rao	State	2	210	36	ND
Dr Narla Tata Rao	State	1	210	37	ND

Name of project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Karnataka					
Raichur	State	8	250	7	ND
Raichur	State	7	210	14	ND
Raichur	State	6	210	17	ND
Raichur	State	5	210	18	ND
Raichur	State	4	210	22	ND
Raichur	State	3	210	26	ND
Raichur	State	2	210	31	ND
Raichur	State	1	210	32	ND
Tamil Nadu					
Neyveli TPS Exp	Central	2	250	2	ND
Tuticorin (P) TPP	State	2	150	3	ND
Tuticorin (P) TPP	State	1	150	4	ND
Neyveli TPS II Exp	Central	1	250	5	ND
North Chennai TPS	State	3	210	21	ND
North Chennai TPS	State	2	210	22	ND
North Chennai TPS	State	1	210	22	ND
Tuticorin	State	4	210	25	ND
Tuticorin	State	5	210	26	ND
Mettur	State	4	210	27	ND
Mettur	State	3	210	28	ND
Mettur	State	2	210	29	ND
Mettur	State	1	210	30	ND
Tuticorin	State	3	210	35	ND
Tuticorin	State	2	210	36	ND
Tuticorin	State	1	210	38	ND
Telangana					
Kothagudem TPS (new)	State	10	250	19	ND
Kothagudem TPS (new)	State	5	250	20	ND
Ramagundem	Central	6	500	27	ND
Ramanagundam STPS	State	5	500	28	ND
Ramanagundam STPS	State	4	500	29	ND
Ramagundem	State	2	210	33	ND

ND: Not discussed

3. ANNEXURE C: LIST OF PLANTS WHICH NEED TO INSTALL FGD ACCORDING TO CEA

Name of the project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Western region					
Chhattisgarh					
MARWA TPS	State	2	500	0	2021
BANDAKHAR TPP	Private	1	300	1	2020
RAIKHEDA TPP	Private	2	685	1	2020
UCHPINDA TPP	Private	3	360	1	2022
UCHPINDA TPP	Private	1	360	1	2022
AKALTARA TPS	Private	2	600	2	2022
BARADARHA TPS	Private	2	600	2	2020
RAIKHEDA TPP	Private	1	685	2	2020
TAMNAR TPP	Private	3	600	2	2021
TAMNAR TPP	Private	4	600	2	2021
AKALTARA TPS	Private	1	600	3	2022
AVANTHA BHANDAR	Private	1	600	3	2020
BARADARHA TPS	Private	1	600	3	2020
TAMNAR TPP	Private	2	600	3	2021
TAMNAR TPP	Private	1	600	3	2021
MARWA TPS	State	1	500	3	2021
KORBA-WEST Ext. TPS	State	5	500	4	2021
KASAIPALLI TPP	Private	2	135	5	2020
KASAIPALLI TPP	Private	1	135	5	2020
KORBA STPS	Central	7	500	6	2022
SIPAT STPS	Central	3	660	6	2022
SIPAT STPS	Central	2	500	8	2022
OP JINDAL TPS	Private	2	250	9	2022
OP JINDAL TPS	Private	1	250	9	2022
OP JINDAL TPS	Private	4	250	9	2021
OP JINDAL TPS	Private	3	250	9	2021
SIPAT STPS	Central	1	500	10	2022
Gujarat					
MUNDRA UMTPP	Private	2	800	4	2021
MUNDRA UMTPP	Private	5	800	4	2021
MUNDRA UMTPP	Private	3	800	4	2021
MUNDRA UMTPP	Private	4	800	4	2021
UKAI TPS	State	6	500	4	2022
MUNDRA TPS	Private	6	660	5	CERC decision
MUNDRA UMTPP	Private	1	800	5	2021
SALAYA TPP	Private	2	600	5	2020
SALAYA TPP	Private	1	600	5	2020
MUNDRA TPS	Private	4	330	6	CERC decision
MUNDRA TPS	Private	3	330	6	CERC decision
MUNDRA TPS	Private	5	660	6	CERC decision
MUNDRA TPS	Private	2	330	7	CERC decision
MUNDRA TPS	Private	1	330	7	CERC decision

Name of the project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Madhya Pradesh					
ANUPPUR TPP	Private	2	600	1	
SEIONI TPP	Private	1	600	1	2022
NIGRI TPP	Private	1	660	2	2020
NIGRI TPP	Private	2	660	2	2020
SASAN UMTPP	Private	6	660	2	CERC decision
SASAN UMTPP	Private	5	660	2	CERC decision
SHRI SINGHAJI TPP	State	2	600	2	2021
SASAN UMTPP	Private	2	660	3	CERC decision
SASAN UMTPP	Private	4	660	3	CERC decision
SASAN UMTPP	Private	3	660	3	CERC decision
SHRI SINGHAJI TPP	State	1	600	3	2022
SATPURA TPS	State	11	250	3	2022
MAHAN TPP	Private	1	600	4	2021
SASAN UMTPP	Private	1	660	4	CERC decision
SATPURA TPS	State	10	250	4	2022
SANJAY GANDHI TPS	State	5	500	10	2022
SANJAY GANDHI TPS	State	4	210	17	2022
SANJAY GANDHI TPS	State	3	210	18	2022
Maharashtra					
BELA TPS	Private	1	270	4	2022
BUTIBORI TPP	Private	2	300	4	2021
BUTIBORI TPP	Private	1	300	4	2021
EMCO WARORA TPS	Private	2	300	3	2022
EMCO WARORA TPS	Private	1	300	4	2022
MAUDA TPS	Central	2	500	4	2021
MAUDA TPS	Central	1	500	5	2021
MAUDA TPS	Central	3	660	1	2020
TIRORA TPS	Private	5	660	2	CERC decision
TIRORA TPS	Private	4	660	3	CERC decision
TIRORA TPS	Private	3	660	4	CERC decision
TIRORA TPS	Private	1	660	4	CERC decision
TIRORA TPS	Private	2	660	4	CERC decision
WARDHA WARORA TPP	Private	3	135	6	2021
WARDHA WARORA TPP	Private	4	135	6	2021
WARDHA WARORA TPP	Private	2	135	6	2021
WARDHA WARORA TPP	Private	1	135	7	2022
CHANDRAPUR STPS	State	9	500	1	2020
CHANDRAPUR STPS	State	8	500	2	2021

Name of the project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Northern region					
Haryana					
INDIRA GANDHI STPP	Central	3	500	5	2021
INDIRA GANDHI STPP	Central	2	500	6	2021
RAJIV GANDHI TPS	State	2	600	7	2023
RAJIV GANDHI TPS	State	1	600	7	2023
INDIRA GANDHI STPP	Central	1	500	7	2021
Punjab					
GOINDWAL SAHIB	Private	2	270	1	2020
GOINDWAL SAHIB	Private	1	270	1	2020
TALWANDI SABO TPP	Private	3	660	1	2020
TALWANDI SABO TPP	Private	2	660	2	2021
Nabha TPP (Rajpura TPP)	Private	1	700	3	2022
Nabha TPP (Rajpura TPP)	Private	2	700	3	2021
TALWANDI SABO TPP	Private	1	660	3	2021
Rajasthan					
KALISINDH TPS	State	2	600	2	2021
KALISINDH TPS	State	1	600	3	2021
KAWAI TPS	Private	2	660	4	2022
KAWAI TPS	Private	1	660	4	2022
Uttar Pradesh					
LALITPUR TPS	Private	3	660	1	2020
LALITPUR TPS	Private	2	660	1	2020
LALITPUR TPS	Private	1	660	1	2020
ANPARA TPS	State	7	500	1	2020
ANPARA TPS	State	6	500	2	2021
PRAYAGRAJ TPP	Private	2	660	2	2021
PRAYAGRAJ TPP	Private	1	660	2	2020
RIHAND STPS	Central	6	500	4	2021
RIHAND STPS	Central	5	500	5	2021
ROSA TPP Ph-I	Private	4	300	5	2022
ANPARA C TPS	Private	2	600	6	2023
ANPARA C TPS	Private	1	600	6	2023
ROSA TPP Ph-I	Private	3	300	6	2023
DADRI (NCTPP)	Central	6	490	7	2021
DADRI (NCTPP)	Central	5	490	7	2021
ROSA TPP Ph-I	Private	2	300	7	2023
ROSA TPP Ph-I	Private	1	300	7	2023
UNCHAHAR TPS	Central	5	210	10	2021
ANPARA TPS	State	5	500	22	2022
ANPARA TPS	State	4	500	23	2022
Eastern region					
Bihar					
NABI NAGAR TPP	Central	1	250	1	NA
BARH II	Central	2	660	2	NA

Name of the project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
MUZAFFARPUR TPS	Central	3	195	2	NA
BARH II	Central	1	660	3	NA
KAHALGAON TPS	Central	7	500	7	NA
Jharkhand					
BOKARO .A. TPS	Central	1	500	1	2022
Adhunik TPS	Private	1	270	3	2022
Adhunik TPS	Private	2	270	3	2022
KODARMA TPP	Central	2	500	4	2021
KODARMA TPP	Central	1	500	5	2021
MAITHON RB TPP	Private	2	525	5	2022
JOJOBERA TPS	Private	5	120	6	2021
MAITHON RB TPP	Private	1	525	6	2021
Odisha					
DERANG TPP	Private	2	600	2	2021
DERANG TPP	Private	1	600	3	2021
KAMALANGA TPS	Private	2	350	3	2021
KAMALANGA TPS	Private	3	350	3	2021
KAMALANGA TPS	Private	1	350	4	2021
STERLITE TPP	Private	3	600	5	
STERLITE TPP	Private	4	600	5	
STERLITE TPP	Private	2	600	6	2022
STERLITE TPP	Private	1	600	6	
TALCHER STPS	Central	4	500	13	
TALCHER STPS	Central	3	500	14	
IB VALLEY TPS	State	2	210	21	2021
IB VALLEY TPS	State	1	210	23	2021
West Bengal					
RAGHUNA THPUR TPP	Central	2	600	1	2022
SAGARDIGHI TPS	State	3	500	1	2022
SAGARDIGHI TPS	State	4	500	1	2020
RAGHUNATHPUR TPP	Central	1	600	2	2022
Haldia	Private	2	300	2	2022
Haldia	Private	1	300	2	2021
DURGAPUR STEEL TPS	Central	2	500	5	2021
DURGAPUR STEEL TPS	Central	1	500	5	2021
MEJIA TPS	Central	7	500	6	2021
MEJIA TPS	Central	8	500	6	
FARAKKA STPS	Central	6	500	6	NA
BUDGE BUDGE TPS	Private	3	250	7	2021
BUDGE BUDGE TPS	Private	2	250	18	
BUDGE BUDGE TPS	Private	1	250	19	

Name of the project	Sector	Unit no.	Total capacity in MW	Age in years	Hook-up shut down schedule as per CEA phase-in plan
Southern region					
Andhra Pradesh					
APGENCO	State	2	800	0	
HNPCL (Hinduja)	Private	1	520	0	
HNPCL (Hinduja)	Private	2	520	0	
NCCL(SGPL) Phase I	Private	1	660	0	2020
TPCIL	Private	1	660	0	2021
TPCIL	Private	2	660	0	2021
APGENCO (Dr N T Rao)	State	1	800	1	
APGENCO (Rayalseema)	State	5	210	5	
APGENCO (Rayalseema)	State	4	210	8	
APGENCO (Rayalseema)	State	3	210	8	
NTPC	Central	7	500	11	2021
APGENCO (Rayalseema)	State	2	210	20	
APGENCO (Rayalseema)	State	1	210	21	
Karnataka					
Bellary TPS	State	3	700	0	2020
YTPS, Yermarus	State	1	800	0	2020
YTPS, Yermarus	State	2	800	0	2020
Bellary TPS	State	2	500	3	2019
JSWEL	Private	1	300	6	2020
JSWEL	Private	2	300	6	2020
Bellary TPS	State	1	500	8	2019
JINDAL (JSWEL) SBU I (Torangallu TPS)	Private	1	130	16	2019
JINDAL (JSWEL) SBU I (Torangallu TPS)	Private	2	130	16	2019
Odisha					
Talcher Stage II	Central	6	500	10	2020
Talcher Stage II	Central	5	500	11	2020
Talcher Stage II	Central	3	500	12	2020
Talcher Stage II	Central	4	500	12	2020
Tamil Nadu					
MUTHIARA TPP	Private	2	600	0	2020
ITPCL TPP	Private	1	600	0	
MUTHIARA TPP	Private	1	600	1	2020
VALLUR TPP	Central	3	500	1	2020
VALLUR TPP	Central	2	500	2	2020
NORTH CHENNAI Ext. TPS	State	1	600	2	
NORTH CHENNAI Ext. TPS	State	2	600	2	
VALLUR TPP	Central	1	500	3	2020
Mettur-5 (Stage - III) (METTUR TPS Ext.)	State	1	600	3	
Neyveli STCMS-1 (TAQA)	Central	1	250	13	
Telangana					
Kakatiya TPP (KTPP)	State	2	600	0	2019
Kothagudem TPS (KTPS)	State	11	500	4	2019
Kakatiya TPP (KTPP)	State	1	500	5	2020

4. ANNEXURE D: LIST OF PLANTS SCHEDULED FOR ANNUAL MAINTENANCE IN 2017

Developer	Plant name	Unit no.	Capacity (MW)
Western region			
Torrent Power	SABARMATI (C STATION)	15	30
Torrent Power	SABARMATI (C STATION)	16	30
CSPGCL	Korba (East) - II	3	50
CSPGCL	Korba (East) - II	4	50
CSPGCL	Korba (East) - II	1	50
GSECL	Kutch Lignite	1	70
GSECL	Kutch Lignite	2	70
GSECL	Kutch Lignite	3	75
GSECL	Kutch Lignite	4	75
Torrent Power	SABARMATI (D-F STATIONS)	2	110
Torrent Power	SABARMATI (D-F STATIONS)	3	110
CSPGCL	Korba (East) -III	1	120
Torrent Power	SABARMATI (D-F STATIONS)	1	120
GSECL	SIKKA REP. TPS	2	120
GSECL	SIKKA REP. TPS	1	120
GSECL	UKAI TPS	1	120
GSECL	UKAI TPS	2	120
GIPCL	Surat Lignite (CFBC BOILER)	1	125
GIPCL	Surat Lignite (Stage 2)	4	125
GIPCL	Surat Lignite (Stage 2)	3	125
GMD Corporation	Akrimota	2	125
GMD Corporation	Akrimota	1	125
GIPCL	Surat Lignite (CFBC BOILER)	2	125
Sai Wardha	Wardha Warora	1	135
Sai Wardha	Wardha Warora	2	135
Sai Wardha	Wardha Warora	3	135
Sai Wardha	Wardha Warora	4	135
ABC India	Kasaipalli TPP	2	135
MPPGCL	SATPURATPS	6	200
GSECL	UKAI TPS	3	200
GSECL	UKAI TPS	4	200
NTPC	KORBASTPS	2	200
NTPC	KORBASTPS	1	200
NTPC	VINDHYACHAL STPS	1	210
MPPGCL	SATPURATPS	7	210
GSECL	WANAKBORI TPS	5	210
GSECL	WANAKBORI TPS	2	210
GSECL	WANAKBORI TPS	6	210
CSPGCL	KORBA-WEST TPS	1	210
MPPGCL	Sanjay Gandhi	3	210

Developer	Plant name	Unit no.	Capacity (MW)
MPPGCL	SATPURATPS	8	210
MPPGCL	SATPURATPS	9	210
NTPC Ltd.	VINDHYACHAL STPS	6	210
NTPC Ltd.	VINDHYACHAL STPS	4	210
NTPC Ltd.	VINDHYACHAL STPS	5	210
MAHAGENCO	CHANDRAPUR (MAH.)	4	210
MAHAGENCO	Khaparkheda	2	210
GSECL	GANDHI NAGAR TPS	3	210
GSECL	GANDHI NAGAR TPS	5	210
NTPC Ltd.	VINDHYACHAL STPS	3	210
MAHAGENCO	NASIK TPS	3	210
MAHAGENCO	Khaparkheda	4	210
GSECL	GANDHI NAGAR TPS	4	210
MPPGCL	Sanjay Gandhi	1	210
GSECL	WANAKBORI TPS	3	210
CSPGCL	KORBA-WEST TPS	4	210
MAHAGENCO	Koradi	6	210
Reliance	Dahanu Thermal Power Station	1	250
JSPL	Raigarh (OP JINDAL TPS)	2	250
GSECL	SIKKA REP. TPS	3	250
GSECL	SIKKA REP. TPS	4	250
CSPGCL	Korba (East) DSM	1	250
MAHAGENCO	Paras	4	250
Tata Power	TROMBAY TPS	8	250
MAHAGENCO	PARLI TPS	8	250
Reliance	Dahanu TPS	2	250
MPPGCL	Satpura (Stage 4)	11	250
JSPL	Raigarh (OP JINDAL TPS)	4	250
Rattan India	Amaravati TPS	1	270
Rattan India	Amaravati TPS	2	270
Rattan India	Amaravati TPS	5	270
Dhariwal Infra	Dhariwal	1	300
Dhariwal Infra	Dhariwal	2	300
JSW Energy	Ratnagiri	1	300
Vidharbha Industries	Butibori	1	300
JSW Energy	Ratnagiri	4	300
Adani Power	AdaniMundra (Phase 1)	1	330
Tata Power	Trombay TPS	5	500
NTPC Ltd.	Korba STPS	7	500
NTPC Ltd.	Mauda TPP	2	500
NTPC Ltd.	Sipat (Stage 2)	5	500
NTPC Ltd.	Vindhyachal STPS Stage-IV	12	500
MAHAGENCO	Bhusawal	5	500
MAHAGENCO	Chandrapur STPS Expansion	5	500
MAHAGENCO	Chandrapur STPS Expansion	6	500
MAHAGENCO	CHANDRAPUR(MAH.)	8	500
MAHAGENCO	CHANDRAPUR (MAH.)	9	500

Developer	Plant name	Unit no.	Capacity (MW)
NTPC Ltd.	KORBA STPS	5	500
GSECL	UKAI TPS	6	500
MPPGCL	Sanjay Gandhi (Stage 2)	5	500
NTPC Ltd.	Vindhyachal	10	500
NTPC Ltd.	Vindhyachal	7	500
NTPC Ltd.	KORBASTPS	6	500
Essar Power	Salaya	1	600
Essar Power	Salaya	2	600
Reliance Power	Sasan UMPP	3	660
Adani Power	Adani Mundra (Phase 3)	8	660
Adani Power	Adani Tirora (Phase 1)	1	660
Adani Power	Adani Tirora (Phase 1)	2	660
Adani Power	Adani Tirora (Phase 2)	4	660
Reliance Power	Sassan UMPP	1	660
NTPC	Sipat	1	660
MAHAGENCO	Koradi	9	660
MAHAGENCO	Koradi	10	660
Reliance Power	Sasan UMPP	2	660
Adani Power	Adani Mundra (Phase 2)	6	660
Coastal Gujarat Power	Mundra UMPP	4	800
Coastal Gujarat Power	Mundra UMPP	2	800
Coastal Gujarat Power	Mundra UMPP	3	800
Coastal Gujarat Power	Mundra UMPP	1	800
Western region total		110	33,955
Eastern region			
CESC	B.B.G.S	1	250
CESC	B.B.G.S	2	250
CESC	B.B.G.S	3	250
WBPDC	Bakreswar	4	210
WBPDC	Bakreswar	5	210
WBPDC	Bakreswar	1	210
WBPDC	BANDEL TPS	5	60
WBPDC	BANDEL TPS	2	60
WBPDC	BANDEL TPS	3	60
WBPDC	BANDEL TPS	4	60
Bihar State Electricity Board	Barauni	6	105
Bihar State Electricity Board	Barauni	7	105
NTPC Ltd. & Bihar	Barh Super Thermal Power Plant Stage-II	5	660
DVC	BOKARO 'B' TPS	3	210
DVC	CHANDRAPURA(DVC)TPS	2	130
DVC	CHANDRAPURA(DVC)TPS	3	130
DVC	CHANDRAPURA(DVC)TPS	8	250
DPL	D.P.L. TPS	7	300

Developer	Plant name	Unit no.	Capacity (MW)
DPL	D.P.L. TPS	8	250
DPL	D.P.L. TPS	6	110
Jindal India Thermal Power Ltd.	DERANG	1	600
Jindal India Thermal Power Ltd.	DERANG	2	600
DVC	Durgapur steel TPS	2	500
NTPC ltd.	FARAKKA STPS	3	200
NTPC ltd.	FARAKKA STPS	6	500
NTPC ltd.	FARAKKA STPS	5	500
NTPC ltd.	FARAKKA STPS	4	500
NTPC ltd.	FARAKKA STPS	1	200
GMR Energy Ltd.	GMR Energy Ltd. (KAMALANGA)	2	350
GMR Energy Ltd.	GMR Energy Ltd. (KAMALANGA)	1	350
GMR Energy Ltd.	GMR Energy Ltd. (KAMALANGA)	3	350
Haldia Energy Ltd	Haldia	1	300
OPGCL	IB Valley	2	210
OPGCL	IB Valley	1	210
NTPC Ltd.	Kahalgaon Bhagalpur	2	210
NTPC Ltd.	Kahalgaon Bhagalpur	1	210
NTPC Ltd.	Kahalgaon Bhagalpur	6	500
NTPC Ltd.	Kahalgaon Bhagalpur	4	210
DVC	Kodarma	2	500
WBPDC	KOLAGHAT TPS	1	210
WBPDC	KOLAGHAT TPS	5	210
WBPDC	KOLAGHAT TPS	2	210
WBPDC	KOLAGHAT TPS	4	210
WBPDC	KOLAGHAT TPS	6	210
WBPDC	KOLAGHAT TPS	3	210
Maithon Power Ltd.	Maithon Right Bank TPP	1	525
DVC	Mejia	3	210
DVC	Mejia	4	210
DVC	Mejia	5	250
DVC	Mejia	1	210
DVC	Mejia	7	500
DVC	Mejia	8	500
NTPC Ltd. & Bihar	MUZAFFARPUR TPS	2	110
JSEB	PATRATU TPS	9	110
JSEB	PATRATU TPS	10	110
JSEB	PATRATU TPS	4	40
JSEB	PATRATU TPS	6	90
JSEB	PATRATU TPS	7	105
WBPDC	Sagardighi	1	300
WBPDC	Sagardighi	2	300
WBPDC	SANTALDIH TPS	5	250
WBPDC	SANTALDIH TPS	6	250
CESC	Southern TPS	1	67.5
CESC	Southern TPS	2	67.5
NTPC ltd.	TAICHER (OLD) TPS	3	60

Developer	Plant name	Unit no.	Capacity (MW)
NTPC ltd.	TAICHER (OID) TPS	4	60
NTPC Ltd.	TALCHER (OLD) TPS	6	110
NTPC ltd.	TAICHER (OLD) TPS	1	60
NTPC Ltd.	Talcher Kaniha	3	500
NTPC Ltd.	Talcher Kaniha	4	500
NTPC Ltd.	Talcher Kaniha	1	500
NTPC ltd.	TAICHER (OLD) TPS	2	60
NTPC ltd.	TALCHER (OLD) TPS	5	110
TenughatVidyut Nigam Limited	Tenughat	1	210
TenughatVidyut Nigam Limited	Tenughat	2	210
CESC	TITAGARH TPS	1	60
CESC	TITAGARH TPS	2	60
CESC	TITAGARH TPS	3	60
CESC	TITAGARH TPS	4	60
Eastern region total		79	18,955
Southern region			
NTPC	RSTPS-1 (Stage - I)	1	200
NTPC	RSTPS-2	2	200
NTPC	RSTPS-4	4	500
NTPC	Talcher Stage II -3	3	500
NTPC	Talcher Stage II -4	4	500
NTPC	Vallur Unit - 1	1	500
NTPC	Vallur Unit - 2	2	500
NTPC	Vallur Unit - 3	3	500
NTPC	Simhadri-3	3	500
NTPC	Simhadri-2	2	500
NLC	NLC TS II - 1	1	210
NLC	NLC TS II - 2	2	210
NLC	NLC TS II - 3	3	210
NLC	NLC TS II - 4	4	210
NLC	NLC TS II - 5	5	210
NLC	NLC TS II - 6	6	210
NLC	NLC TS II - 7	7	210
NLC	Neyvely TS I Expn : Unit-1	1	210
NLC	Neyvely TS I Expn Unit-2	2	210
NLC	NLC TS II Expn Unit-1	1	250
NLC	NLC TS II Expn Unit-2	2	250
NLC	NTPL, Tuticorin Unit-1	1	500
NLC	NTPL, Tuticorin Unit-2	2	500
APGENCO	VTPS-1	1	210
APGENCO	VTPS-2	2	210
APGENCO	VTPS-3	3	210
APGENCO	VTPS-4	4	210
APGENCO	VTPS-5	5	210

Developer	Plant name	Unit no.	Capacity (MW)
APGENCO	VTPS-6	6	210
APGENCO	VTPS-7	7	500
APGENCO	RTPP Stage 1 : Unit - 1	1	210
APGENCO	RTPP Stage 1 : Unit - 2	2	210
APGENCO	RTPP Stage 2 : Unit - 4	3	210
APGENCO	RTPP Stage 3 : Unit - 5	5	210
TSGENCO	KTPS-5	5	120
TSGENCO	KTPS-6	6	120
TSGENCO	KTPS-7	7	120
TSGENCO	KTPS-8	8	120
TSGENCO	KTPS-9	9	250
TSGENCO	KTPS-11	11	500
TSGENCO	KTPP Unit - 1	1	500
TSGENCO	KTPP Unit - 2	2	600
KPCL	Raichur TPS U-1	1	210
KPCL	Raichur TPS U-2	2	210
KPCL	Raichur TPS U-3	3	210
KPCL	Raichur TPS U-4	4	210
KPCL	Raichur TPS U-5	5	210
KPCL	Raichur TPS U-6	6	210
KPCL	Raichur TPS U-7	7	210
KPCL	Raichur TPS U-8	8	250
KPCL	Bellary TPS U-1	1	500
KPCL	Bellary TPS U-2	2	500
TANGENCO	Tuticorin-1	1	210
TANGENCO	Tuticorin-2	2	210
TANGENCO	Tuticorin-3	3	210
TANGENCO	Tuticorin-4	4	210
TANGENCO	Tuticorin-5	5	210
TANGENCO	Mettur-1	1	210
TANGENCO	Mettur-2	2	210
TANGENCO	Mettur-3	3	210
TANGENCO	Mettur-4	4	210
TANGENCO	Mettur-5 (Stage - III)	5	600
TANGENCO	North Chennai-1 (Stage - I)	1	210
TANGENCO	North Chennai-2 (Stage - I)	2	210
TANGENCO	North Chennai-3 (Stage - I)	3	210
TANGENCO	North Chennai-4 (Stage - II)	4	600
TANGENCO	North Chennai-5 (Stage - II)	5	600
Southern region total		67	19,760
Northern region			
Lanco Anpara Power Ltd.	ANPARA C	2	600
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	ANPARA TPS	1	210
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	ANPARA TPS	2	210

Developer	Plant name	Unit no.	Capacity (MW)
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	ANPARA TPS	3	210
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	ANPARA TPS	4	500
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	ANPARA TPS	6	500
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	ANPARA TPS	7	500
Bihar State Electricity Board	BARAUNI TPS	7	105
Bihar State Electricity Board	BARAUNI TPS	6	105
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	1	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	2	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	3	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	4	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	5	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	6	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	7	135
Raj West Power Ltd.	Barmer (Jallipa Kapurdi)	8	135
Neyveli Lignite Corporation Ltd. (N.L.C. Ltd.)	Barsingsar TPS	1	125
Neyveli Lignite Corporation Ltd. (N.L.C. Ltd.)	Barsingsar TPS	2	125
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Chhabra	4	250
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Chhabra	1	250
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Chhabra	2	250
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Chhabra	3	250
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	HARDUAGANJ TPS	8	250
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kalisindh	1	600
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kalisindh	2	600
Adani Power Ltd.	Kawai TPP	2	660
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	1	110
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	2	110

Developer	Plant name	Unit no.	Capacity (MW)
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	6	195
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	7	195
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	3	210
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	4	210
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Kota	5	210
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	OBRATPS	10	200
Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (U.P.R.V.U.N.L)	PARICHHA TPS	2	110
Reliance	Rosa Thermal Power Plant	4	300
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Suratgarh STPS	1	250
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Suratgarh STPS (Stage 1)	3	250
Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L)	Suratgarh STPS (Stage 2)	5	250
Northern region total		40	9,980

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