FIRST-RUN

An incentive mechanism to make coal-based power plants meet emission norms

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Published by
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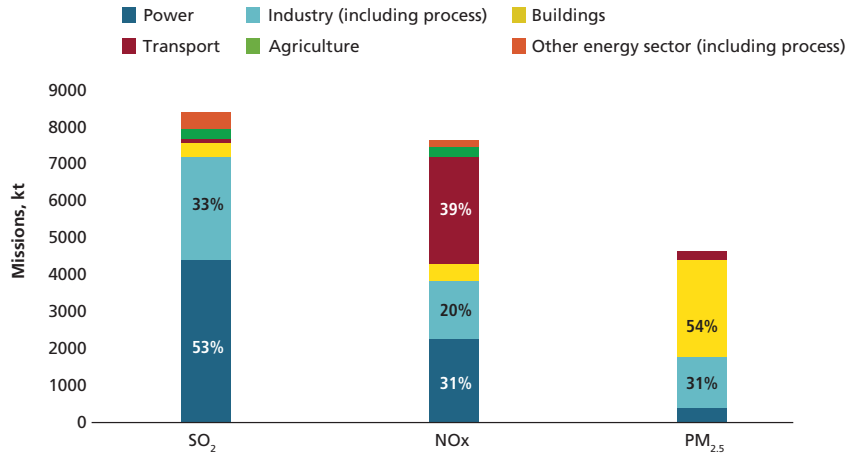
Overview

Despite substantial growth in renewable power, India continues to be heavily reliant on coal to meet its energy needs. This is unlikely to change in the near future. Coal power stations without pollution abatement technologies generate over 70 per cent of the electricity needed by the country today. As a result, they are key contributors to air pollution in the country. The coal-based power generation sector contributes over 50 per cent of sulphur dioxide (SO_2), 30 per cent of oxides of nitrogen (NO_x), and about 20 per cent of particulate matter (PM) amongst other man-made emissions in the country (see *Graph 1: India's SO_2, NO_x, and $PM_{2.5}$ (primary) emission by sources*). To bring these emissions under control, the Ministry of Environment, Forest and Climate Change (MoEFCC) notified emission limits/norms for the sector in December 2015. However, till date, neither private-run nor state-run power plants have made sufficient progress. They are even likely to miss the extended deadline of December 2022. Traditionally, the MoEFCC has faced constant challenges in getting environmental norms implemented in coal-based thermal power stations. The non-implementation of the fly ash notification of 1999 stands as a stark example of the sector's intractability.

Graph 1: India's SO_2, NO_x, and $PM_{2.5}$ (primary) emission by sources

Coal power sector holds a lion's share



Source: International Energy Agency, 2021

This sector—which provides energy to the country's industry and households—is difficult to shut down, which is the ultimate penalty given to similar scales of non-compliance in other sectors. Therefore, there is insufficient deterrence, which is clearly derailing implementation efforts. Penalties imposed are also typically challenged in the higher courts, and judicial delays in turn prolong implementation.

Clean power is a must in today's climate stressed world. Therefore, there is a clear need to strengthen the policy mechanisms to incentivize cleaner power and bring in deterrence mechanisms to check non-implementation. The Centre for Science and Environment (CSE), after a thorough research of concepts, proposes a strategy called **'First-run'** which incentivizes the running of cleaner power stations on priority basis and penalizes the laggards. When rolled-out, this can encourage power stations that are making sincere efforts to meet the 2015 environmental norms.

- Today, electricity generated by renewable energy power stations is mandatorily purchased and sold by power companies on priority. These renewable energy power stations are called 'must-run' plants. CSE proposes that after these renewable power stations, coal-based thermal power plants should be divided into three categories—Yellow, Orange, and Red (see *Table 1: The categories of coal-based power plants*)—and first preference for procuring electricity should be given to Yellow category plants.

Table 1: The categories of coal-based power plants

Category	Capacity (MW)	CSE proposal	Incentive/Penalty
Yellow (likely to meet)	81,718	Run on priority	Reimburse full FC
Orange (unlikely to meet)	83,808	Run on need basis	Reimburse 50% FC
Red (no plans)	2,420	Avoid	No reimbursement of FC

Source: Centre for Science and Environment, 2021

- The yellow category comprises of power stations that have awarded bids or opened bids as on February 2021. These stations are likely to meet emission norms by the deadline. Applying merit order (run the cheapest power plant) principles, these power stations should be run on priority after must-run power stations as 'first-run' plants. CSE advises that yellow category power stations be reimbursed in full the costs of power generation (also called the variable costs) and fixed costs (cost promised for infrastructure as per power purchase agreement even on non-operation of plant).

- The orange category includes plants which are still in the process of tendering or conducting studies and are unlikely to meet the norms. For these plants, CSE advices that the government procure minimum amount of electricity as needed to fulfil demand. Further, reimbursement of only 50 per cent of their fixed costs should be done till they meet the norms.

- The red category includes power stations that have no plans to meet the emission norms and had sought extension from the Supreme Court in 2017 and continue to delay the process alleging study/tenders are in-progress. CSE advises the government to avoid purchase of power from red category plants which are gross violators of the norms. If at all power is scheduled from these plants due to technical purposes, no fixed cost is to be reimbursed to the plant.

As per their electricity contracts, coal TPPs receive electricity costs in two parts—fixed and variable. Fixed costs pertain to the administrative and infrastructure costs of TPPs and are reimbursed if the TPPs are technically ready to generate power (plant availability), even when they are not operating. The current penalties levied by the pollution control boards on power stations are only just a fraction of this fixed cost. Imposing massive cuts on fixed cost could motivate recalcitrant plants to meet the norms. Implementing these cuts on fixed costs will not require any new modification in the law. It can be done with an order from the pollution control boards imposing a restriction on the number of days a power station can operate. Implementing this concept can also reduce burden on financially stressed DISCOMS by allowing them to avoid paying fixed costs to non-complying coal-based thermal power stations.

2. State-wise scenario

Electricity is a concurrent subject as per the Indian constitution. Typically, state governments run the power distribution business and are responsible for deciding which power generating companies to make agreements with. States generate only a portion of electricity needed in their own territory and procure the rest from power stations in other states. Therefore, to roll-out the first-run concept, participation of state entities is crucial.

Analysing information from the merit order dispatch (MOD) portal of the Ministry of Power (MoP) and the Central Electricity Authority (CEA), CSE found seven states selling dirty coal power and ten states (including Union Territories) procuring over 50 per cent of their electricity needs from dirty coal power. In this study, CSE has considered the progress made by power stations to meet only the SO_2 norms as a measuring scale to identify the dirtiest power plants. This is because limits on NO_x have already been watered down and PM norms do not demand much changes in the system. It is the compliance with SO_2 norms that has remained a daunting challenge. Even though there is strong pressure to dilute SO_2 norms, that should not happen as implementation of SO_2 norms can considerably reduce particulate matter in the ambient air. SO_2 is a precursor to formation of over 30 per cent of particulate matter in various cities. CEA provides location of power stations and status of compliance for sulphur dioxide on a monthly basis for 169,722 MW capacity. However, data on states where coal power is sold was available in the Merit India portal only for 167,946 MW. Accordingly, it was assumed that the rest of the power plants may not have power buying/purchasing agreements/contracts and might be selling power in the short-term markets. This data was collated for this study.

Coal-based thermal power plants are situated across 17 states, with Chhattisgarh, Maharashtra and Uttar Pradesh being the ones with the largest installed capacities. Generated electricity is sold to over 33 states. The pollution control boards of the respective generating states and other stakeholders monitor the implementation of emission norms.

STATES SELLING DIRTY COAL-BASED POWER

CSE's analysis reveals:

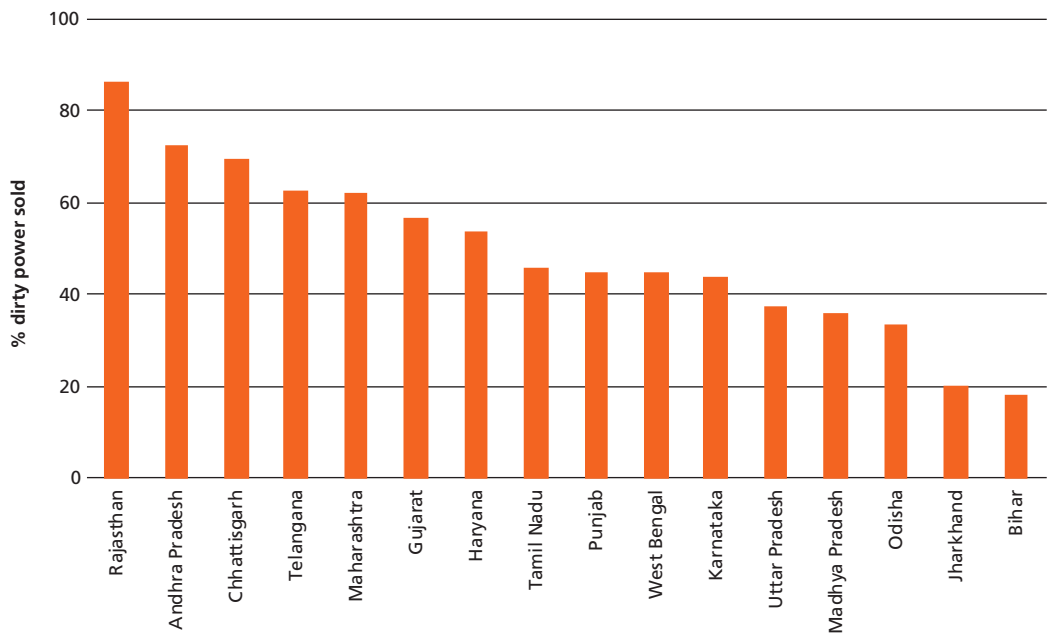
- Rajasthan stands at the top in generating and selling dirty coal-based power. According to CEA report, about 80 per cent of the capacity (primarily plants run by the state-government—Kota thermal power

station, Suratgarh, Giral, and Adani Kawai) doesn't comply with the SO_2 norms notified by MoEFCC. Over 50 per cent of the electricity generated in seven states—Rajasthan, Andhra Pradesh, Chhattisgarh, Telangana, Maharashtra, Gujarat, and Haryana—is unclean (see *Graph 2: States selling dirty coal power—in terms of percentage of total power capacity*).

- In terms of capacity, Maharashtra tops the chart in dirty coal power generation and sale. Second in the line is Gujarat, followed by Chhattisgarh, Rajasthan, Uttar Pradesh, and Andhra Pradesh. Each of these states have over 6000 MW of coal capacity which generates unclean power (see *Graph 3: States selling dirty coal power—in terms of capacity*).
- State-run companies in these states are mostly responsible for generation of unclean electricity and defaulting on norms. Most of them violate both particulate matter and sulphur dioxide norms.
- West Bengal, which had fared the worst in the analysis done by CSE in January 2021, has now in a span of two months taken corrective actions. The power generating companies have initiated tenders and bid opening has begun. Considering this pro-activeness, CSE has now reclassified the plants to "Yellow" category.

Graph 2: States selling dirty coal power—in terms of percentage of total power capacity

Over 50 per cent of coal power generated in seven states is dirty

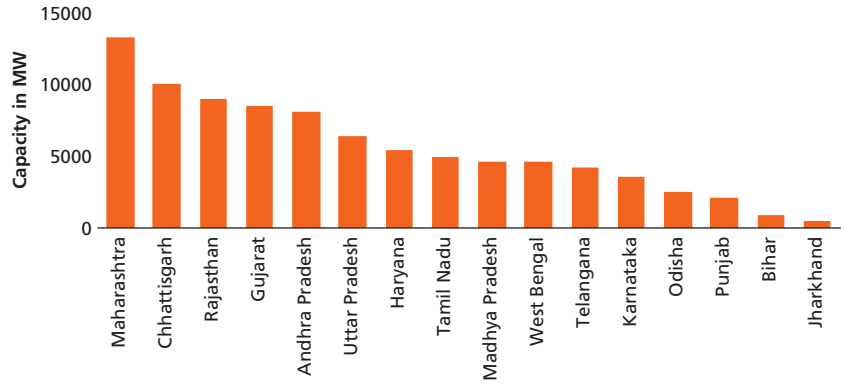


Source: Centre for Science and Environment, 2021

Note – small states like Goa and Assam not included in the analysis

Graph 3: States selling dirty coal power—in terms of capacity (MW)

Over 50 per cent of coal power generated in seven states is dirty



Source: Centre for Science and Environment, 2021

Note – small states like Goa and Assam not included in the analysis

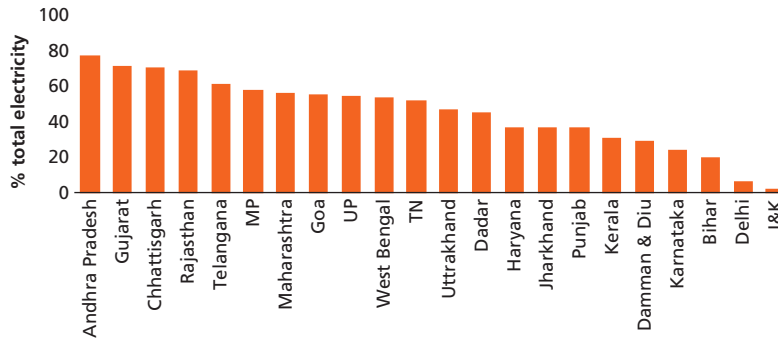
STATES BUYING DIRTY COAL-BASED POWER

CSE's analysis reveals:

- Four states—Andhra Pradesh, Chhattisgarh, Gujarat, and Rajasthan—have agreements to buy near about 70 per cent of their electricity from the dirtiest coal capacity (see *Graph 4: States buying dirty coal power—in terms of percentage of total power capacity*).
- In terms of capacity of electricity purchase, Maharashtra tops the list, followed by five states—Gujarat, Uttar Pradesh, Rajasthan, Andhra Pradesh, and Tamil Nadu—each having agreements with over 6000 MW unclean coal capacity. These states typically generate and consume unclean electricity (see *Graph 5: States buying dirty coal power—in terms of capacity*).

Graph 4: States buying dirty coal power—in terms of percentage of total power capacity

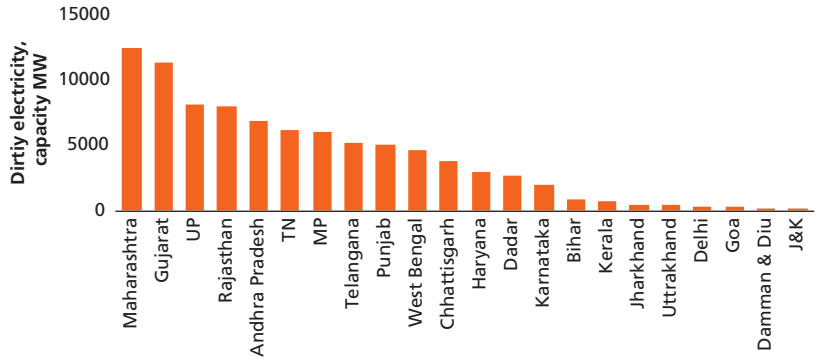
Four states top the list in buying dirty coal power



Source: Centre for Science and Environment, 2021

Graph 5: States buying dirty coal power—in terms of capacity (MW)

Maharashtra and Gujarat top the list in buying dirty coal power



Source: Centre for Science and Environment, 2021

- Barring three states—Uttar Pradesh, West Bengal, and Madhya Pradesh—the rest of the states procuring dirtiest coal power have per capita electricity consumption more than the national average. Similarly, states which are generating dirtiest coal power also have very high per capita electricity consumption (see *Table 2: Per capita electricity consumption and dirty power*).

Table 2: Per capita electricity consumption and dirty power

Barring a few, states having high per capita demand are generating dirty electricity

State buying dirty power	Capacity, MW	Per capita electricity consumption (kWh)	State selling dirty power	Capacity, MW	Per capita electricity consumption (kWh)
Maharashtra	11,769	1424	Maharashtra	12,946	1424
Gujarat	10,917	2378	Gujarat	10,076	2378
UP	8,089	606	Chhattisgarh	9,998	1961
Rajasthan	7,960	1282	Rajasthan	8,941	1282
Andhra Pradesh	6,850	1480	Uttar Pradesh	6,419	606
TN	6,228	1866	Andhra Pradesh	6,050	1480
MP	5,379	1084	Haryana	5,440	2082
Telangana	5,164	1896	Tamil Nadu	4,894	1866
Punjab	5,078	2046	Madhya Pradesh	4,629	1084
West Bengal	4,600	703	West Bengal	4,600	703
Chhattisgarh	3,723	1961	Telangana	4,163	1896
Haryana	3,005	2082	Odisha	2,490	1628
Dadar	2,545	15179	Punjab	2,073	2046
Karnataka	2,010	1396	Karnataka	2,010	1396
All India		1181	All India		1181

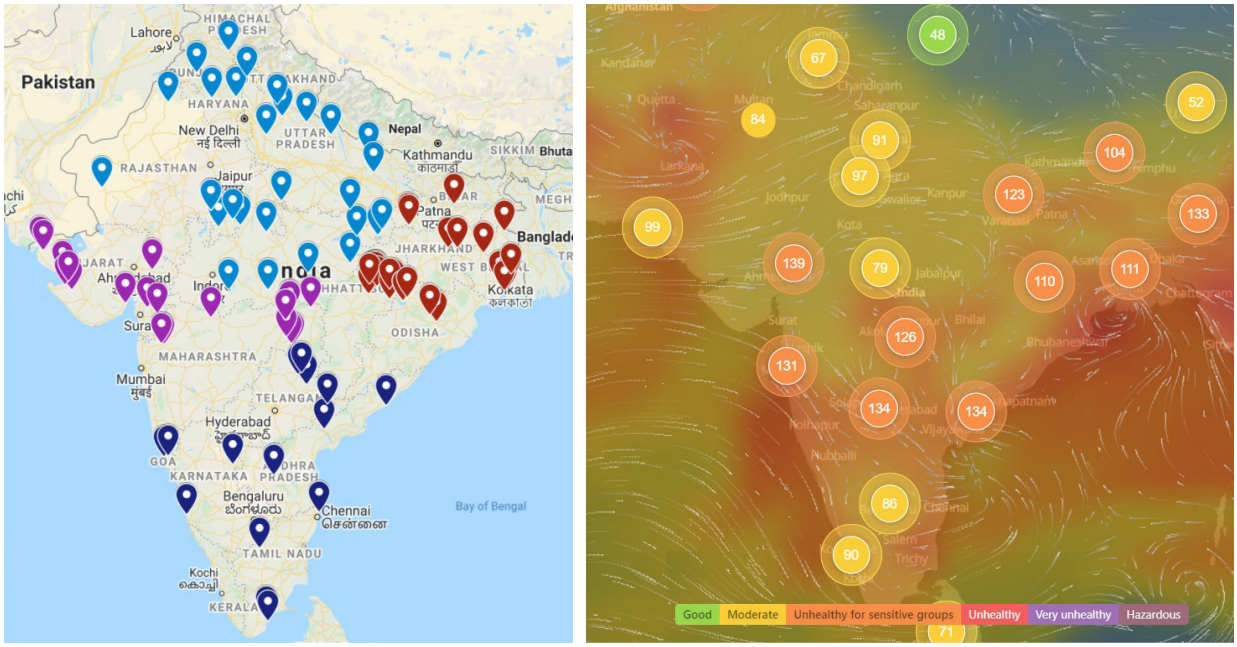
Source: Centre for Science and Environment, 2021

THE INTERLINKS

- Maharashtra, which tops the list of states selling the dirtiest coal, has the highest number of non-attainment cities in India. Non-attainment cities have higher levels of particulate matter in the ambient air than prescribed (see *Map 1: Particulate matter pollution trails around dirty coal TPPs*).
- Over 140 "Orange" category or dirty coal-based thermal power stations are located in a 100 km radius of 61 non-attainment cities. It is to be noted that of the 123 non-attainment cities which have been identified so far, about half have coal-based thermal power stations in their vicinity (see *Map 2: Buffer analysis*). If this buffer is extended to 250–300 km radius then all the non-attainment cities have a coal-based thermal power station in their radius.

Map 1: Particulate matter pollution trails around dirty coal TPPs

Ambient particulate matter is high in a 300 km vicinity of coal power stations



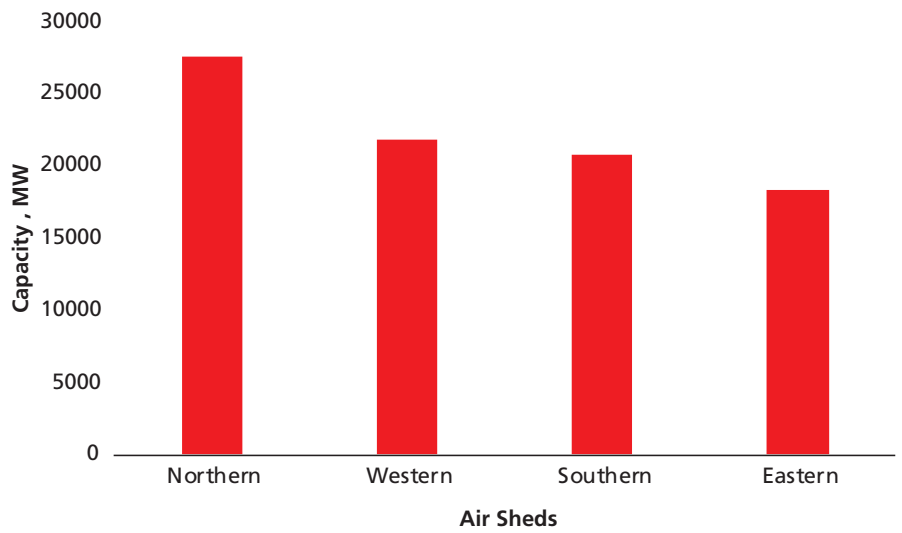
Note—numbers denote the AQI levels, blue marks are plants located in the northern region, red marks are those located in the eastern region, dark blue marks are plants located in the southern region, and magenta marks are plants located in the western region

Source: Centre for Science and Environment, 2021 (Maps to be superimposed)

- The non-attainment cities with coal-based power stations in a 100 km radius include Nagpur, Chandrapur, Korba, Anpara, Varanasi, Prayagraj, Gorakhpur, Patna, Muzaffarpur, Gaya, Dhanbad, Asansol, Raniganj, Kolkata, Barrackpore, Haldia, Angul, Bhubaneswar, Cuttack, Talcher, Kalinganagar, Rourkela, Visakhapatnam, Rajahmundry, Vijayawada, Eluru, Anantapur, Davanagere, Kadapa, Madurai, Thoothukudi, Surat, Nashik, Kota, Vadodara, Ahmedabad, Gwalior, Jhansi, Bareilly, Gajraula, Ghaziabad, Khurja, Noida, Chandigarh, Baddi, Kala Amb, Nalagarh, Parwanoo, Sundar Nagar, Dera Bassi, Gobindgarh, Khanna, Ludhiana, Naya Nangal, and Patiala.
- Plants located in the northern region air sheds are the dirtiest. Haryana, Madhya Pradesh, Punjab, Rajasthan, and Uttar Pradesh are considered for the Northern region air shed. Bihar, Chhattisgarh, Jharkhand, Odisha, and West Bengal are considered for the Eastern region air shed. Andhra Pradesh, Tamil Nadu, Telangana, and Karnataka are considered for the Southern region air shed. Finally, Maharashtra and Gujarat are considered for the Western region air sheds (see *Graph 6: Dirtiest coal power generation is prominent in the northern region*).

Graph 6: Dirtiest coal power generation is prominent in the northern region

32 per cent of the dirtiest capacity is located in the northern air shed



Source: Centre for Science and Environment, 2021

Map 2: Buffer analysis

61 of the 123 non-attainment cities have polluting coal plants in a vicinity of 100 km

Link for more details - https://cutt.ly/8lL889K

Source: Centre for Science and Environment, 2021

3. Way forward

The progress in implementation of norms remains inadequate despite the deadline approaching in a year and a half. Most power stations are derailing from the path to compliance. The deterrence mechanism to check the same is weak. The maximum penalty that can be imposed on these defaulting power stations is closure, which is impractical, and the other option available is imposing fines. However, the fines imposed on these stations are very small and thus completely ineffective in pushing for course correction. The current penalty/fine system is seriously compromised—even though CPCB put a levy in 2020 on the stations for failing to meet the norms by the earlier deadline of December 2019, the power plants were successful in delaying payments and challenging the same in higher courts. Currently, the regulators are not well equipped to fight such legal proceedings. Further, the judicial process in this country is a long drawn out affair which thus allowing the plants to operate in that period of time.

Therefore, it is critical that regulators come together to execute innovative mechanisms to check pollution from this sector. After thorough research, CSE has put forth the concept of first-run or preferential scheduling that could serve as an incentive for stations which are well on their way to meet the new norms. States should source cleaner electricity, thus increasing its demand. Stronger demand for clean power will push regulators to identify, label, and source the same. The implementation of this mechanism will also not require changes in the existing legislation system. The state-wise assessment of coal power procurement, done by CSE, has found Maharashtra and Gujarat are the most active buyers and sellers of dirty coal power. Andhra Pradesh, Chhattisgarh, and Rajasthan are the states with the highest percentage of contracts and generation of polluted coal capacity in their overall energy mix.

State-run power stations in these states were the major defaulters. While Centre-run NTPC and DVC has leaped ahead, state-run stations are still in the very preliminary stages of implementation. These states also have high per capita demand for electricity which is expected to grow with the current focus of the government on the manufacturing sector. According to CSE's analysis, dealing with pollution through the current administrative division of states does not actually aid in reducing it. While it might seem that the five largest states, especially those in the western region, are the most polluting, if the air-shed approach is taken into account, the northern belt has the most polluting coal-based power stations. Haryana, Madhya Pradesh, Punjab, Rajasthan, and Uttar Pradesh are the states included in the northern air-sheds. In summary, the report recommends that these nine states prioritize taking more stringent

action on power plants: Haryana, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, and Andhra Pradesh. Energy is a concurrent subject, the central and state governments therefore would have to cooperate together to enforce pollution standards by adopting first-run mechanism at the earliest.

To roll-out this mechanism:

- The Union Ministry of Power should initiate implementation of the first-run concept.
- The State Pollution Control Boards should certify power plants in the yellow, orange, and red categories. And this labelling needs to be updated every six months on a rolling basis. According to CSE's research, there is 81,718 MW of Yellow capacity that is expected to meet the norms, 83,808 MW of Orange capacity that is unlikely to meet the norms, and Red capacity of 2,420 MW that has no plans to meet the norms. They should place limits on the number of days such polluting plants can run.
- In accordance with the pollution control board notices, the respective state electricity commissions should allow no reimbursement of fixed cost for the Red category and partial reimbursement (50 per cent) of fixed costs for the Orange category.
- The state government along with the distribution companies should stand firm in not procuring power from the Red category, and run Orange category stations only on a need basis.

Annexure

Power station—state-wise	Power station capacity (MW)
Yellow category	
Andhra Pradesh	
SIMADHARI	1,981
THERMAL POWERTECH CORPORATION INDIA LIMITED	801
Assam	
NTPC BONGAIGAON	225
Bihar	
BARH	1,499
KAHALGAON	1,779
NABINAGAR POWER GENERATING COMPANY	515
Chhattisgarh	
DB POWER	458
KORBA STPS STG (I & II)	16
LARA SUPER THERMAL POWER PLANT	860
NSPCL	206
SIPAT	2,813
Gujarat	
ADANI POWER LIMITED (APL - MUNDRA) STG - III	2,848
CGPL MUNDRA UMPP	3,705
Haryana	
JHAJJAR	2,065
JHAJJAR (CLP)	2,640
Jharkhand	
ADHUNIK POWER AND NATURAL GAS LIMITED (APNRL)	392
KODERMA (DVC)	450
MAITHON POWER LIMITED (MPL)	803
Karnataka	
KUDGI STPS	1,244
RTPS	1,720
YERAMARUS TPS	1,600

Power station—state-wise	Power station capacity (MW)
Madhya Pradesh	
GADARWARA	1,383
KHARGONE	345
MB POWER	553
SASAN UMPP	3,583
SHREE SINGAJI SUPER THERMAL POWER PROJECT	
VIDHYACHAL STPS	4,643
Maharashtra	
CHANDRAPUR UNIT 8 & 9	1,000
DAHANU THERMAL POWER STATION (DTPS UNIT 1 & 2)	500
JSW U1, JAIGAD	300
KORADI UNIT 8, 9 & 10	1,980
MOUDA	1,613
NTPC SOLAPUR	103
PARALI	750
PARAS	500
SOLAPUR SUPER THERMAL POWER PROJECT	55
TROMBAY	1,250
Odisha	
NTPC DARIPALI	1,601
TALCHER	3,304
Punjab	
GOVINDWAL (GVK)	540
NABHA POWER LTD, RAJPURA	
TALWANDI SABOO	1,980
Rajasthan	
BARSINGSAR (NLC)	250
KLTPS 4	75
RAJWEST LTPS (IPP)	1,080
Tamil Nadu	
IL & FS	870
NLC TPS II	1,840
NNTPS	358
NTPL (NLC TAMILDANU POWER LIMITED)	988
TAQA (STCMS)	250
VALLUR (NTECL) STPS	1,492

Power station—state-wise	Power station capacity (MW)
Telangana	
RAMAGUNDAM STPS STG - 1 & 2	2,478
Uttar Pradesh	
ANPARA - A	567
ANPARA - B	900
ANPARA - D	900
DADRI TPS	1,453
LALITPUR POWER	1,875
MEJA THERMAL POWER PLANT	630
RIHAND STPS	1,619
ROSA	1,140
SINGRAULI STPS	1,007
TANDA - II	88
UNCHAHAR	577
West Bengal	
BAKRESWAR (BKTPP)	1,050
DURGAPUR STEEL THEMAL POWER STATION (DSTPS)	1,100
FARAKKA	1,821
MEJIA TPS	960
RAGHUNATHPUR (DVC)	247
SAGARDIGHI (SGTPP) - II	1,000
SANTALDIH (STPS)	500

Power station—state-wise	Power station capacity (MW)
Orange category	
Andhra Pradesh	
HINDUJA	1040
KRISHNAPATNAM (DSTPP) – I	1600
RAYALASEEMA TPS	1650
Bihar	
BARAUNI THERMAL POWER STATION	250
BHARTIYA RAIL BIJALEE COMPANY LIMITED	75
KANTI BIJLEE UTPADAN NIGAM LTD	512
Chhattisgarh	
ACBIL	201
BALCO	325
DSPM, KORBA (EAST)	500
HTPS, KORBA (WEST)	840
JINDAL POWER LIMITED	753
KORBA (WEST) EXT.	500
KTPS, KORBA (EAST)	440
KSK MAHANADI	2324
LANCO AMARKANTAK POWER LIMITED (LAMKPL)	870
MARUTI CLEAN COAL AND POWER LIMITED (MCCPL)	264
MARWA THERMAL POWER STATION	2000
RAIGARH ENERGY GENERATION LTD.	27
RKM ENERGY PVT. LTD	190
SPECTRUM - ACBIL	4
TRN ENERGY PVT. LTD	760
Goa	
GOA ENERGY PVT. LTD	14
SESA STERLITE LTD	13
Gujarat	
ADANI POWER LIMITED (MUNDRA)	2000
AKRIMOTA THERMAL POWER STATION (ALTPS)	250
AMGEN C TORRENT	422
APMUL-1 ADDITIONAL-200	434
BECL	500
EPGL	1200
SLPP	500

Power station—state-wise	Power station capacity (MW)
STPS 1 & 2	740
UTPS	1550
WTPS	2480
Haryana	
PTPS	1630
RGTPP (KHEDAR) (IPP)	2400
YTPP - I & 2 (YAMUNANAGAR)	1200
Jharkhand	
CHANDRAPURA TPS	350
TENUGHAT TPS	420
Karnataka	
BTPS - 1	1000
UPCL	1010
Madhya Pradesh	
ATPS (210 MW) CHACHAI	210
JHABUA POWER	384
JP BINA	350
JP NIGRIE	495
SSTPS KHANDWA (SINGAJI)	1860
STPS SARNI	1330
Maharashtra	
ADANI- TIRODA	3085
BHUSAWAL	1420
CHANDRAPUR	1920
DHARIWAL	261
EMCO	200
GMR (EMCO)	350
KHAPERKHEDA	1340
KORADI	620
NASIK	630
RATAN INDIA	1200
VIDARBHA INDUSRTIES POWER LTD. (VIPL UNIT 1 & 2)	600
Odisha	
GMR	262
IB VALLEY TPS	420
JINDAL INDIA THERMAL POWER LIMITED (JITPL)	123

Power station—state-wise	Power station capacity (MW)
JINDAL THERMAL INDIA LTD	95
OPGC STAGE - 2 (UNIT 3 & 4)	990
VEDANTA LTD	600
Punjab	
GURU HARGOBIND SINGH TPS (GHTPS)	920
Ropar TPS	1153
Rajasthan	
CHABRA TPS	1000
GIRAL LTPS	250
KALISINDH TPP	1200
KAWAI (ADANI)	1200
KLTPS 1, 2 & 3	215
KOTA TPS	1240
KSTPS-WR	2336
SURATGARH TPS	1500
Tamil Nadu	
COASTAL ENERGEN	558
MTPS STAGE 1 & 2	1441
NCTPS	1830
NCTPS STAGE 2	1200
TTPS	1050
Telangana	
KAKTIYA TPP - I	1100
KOTHAGUDEM - VI	1800
RAMAGUNDAN B	63
SINGARENI TPP	1200
Uttar Pradesh	
BARA (PRAYAGRAJ POWER)	1980
BEPL, BARKHERA	82
BEPL, KHAMBHARKHERA	80
BEPL, KUNDARKHI	82
BEPL, MAQSOODPUR	82
BEPL, UTRAULA	82
HARDUAGANJ EXT.	499
LANCO (ANPARA-C)	1080
OBRA - B	900

Power station—state-wise	Power station capacity (MW)
OBRA-A	175
PARICHHA	981
TANDA	396
West Bengal	
BUDGE BUDGE TPS	750
DPL TPS	550
HALDIA ENERGY LIMITED (HEL)	600
KOLAGHAT (KTPS)	1260
SAGARDIGHI (SGTPP) - I	600
SOUTHERN TPS	135
TATA POWER HALDIA	15
TITAGARH	240

Note – A difference of 73 MW in the Yellow category can be found between the analysis sheet and annexure, a difference of 85 MW in the Orange category can be found between the analysis sheet and annexure. Analysis considers higher capacity, only the compressed representation is available in the annexure for clarity.

Power station—state-wise	Power station capacity (MW)
Red category	
Andhra Pradesh	
VIJAYAWADA TPS (DR NARLA TATA RAO TPS (DR NTTPS)) - I, II & III	1260
VIJAYAWADA TPS (DR NARLA TATA RAO TPS (DR NTTPS)) - IV	500
Haryana	
PTPS UNIT - 5	210
West Bengal	
BANDEL (BTPS)	450

Clean power is a must in today's climate stressed world. Therefore, there is a clear need to strengthen the policy mechanisms to incentivize cleaner power and bring in deterrence mechanisms to check non-implementation. The Centre for Science and Environment (CSE), after a thorough research of concepts, proposes a strategy called 'First-run' which incentivizes the running of cleaner power stations on priority basis and penalizes the laggards. When rolled-out, this can encourage power stations that are making sincere efforts to meet the 2015 environmental norms.

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