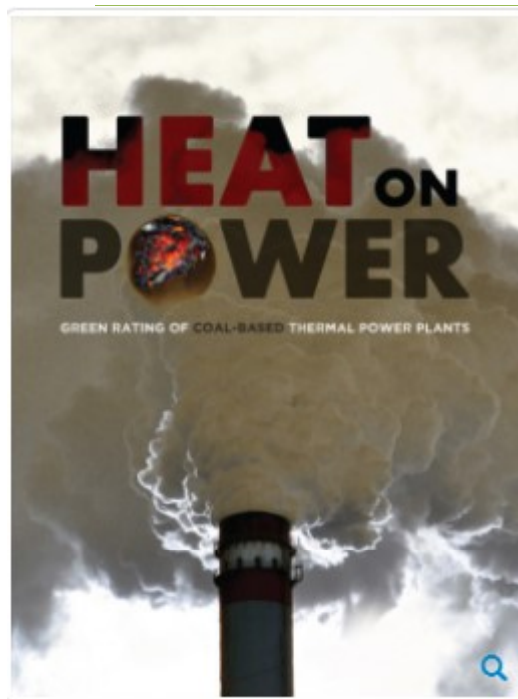


# CSE'S TPP Work at the National Level

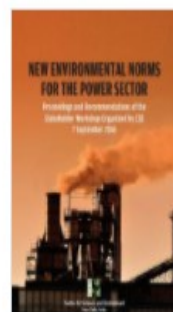


Units	PM	SO <sub>2</sub>	NO <sub>x</sub>	Mercury
Units installed before 31 December 2003	100	600 (<500 MW plants) 200 (≥ 500 MW plants)	600	0.03 (≥ 500 MW)
Units installed between 2004-16	50	600 (<500 MW plants) 200 (≥ 500 MW plants)	450	0.03
Units installed 1 January 2017 onwards	30	100	100	0.03

- New norms were introduced in Dec'15.
- CSE has been doing handholding of various stakeholder by building capacity in technology feasibility, financing issues, monitoring implementation.



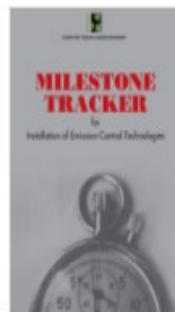
24 November, 2016



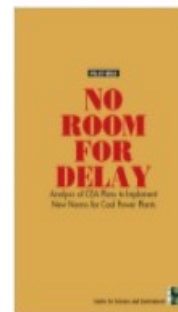
07 September, 2016



28 June, 2016



03 July, 2018



14 February, 2018



06 July, 2017

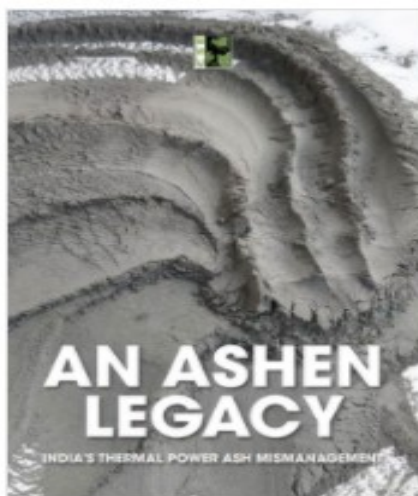
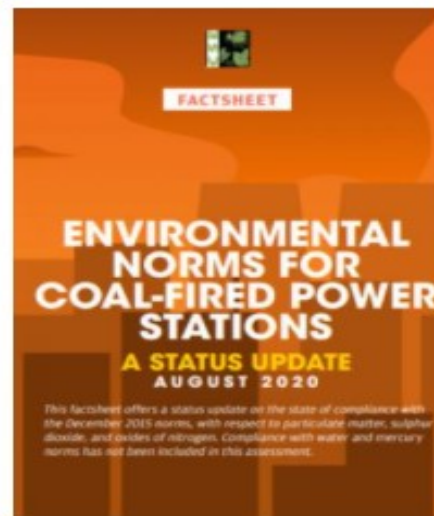
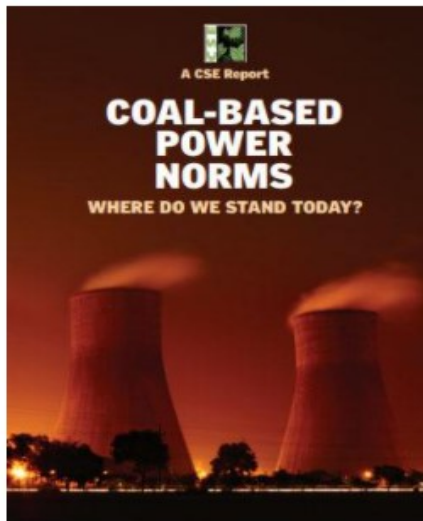


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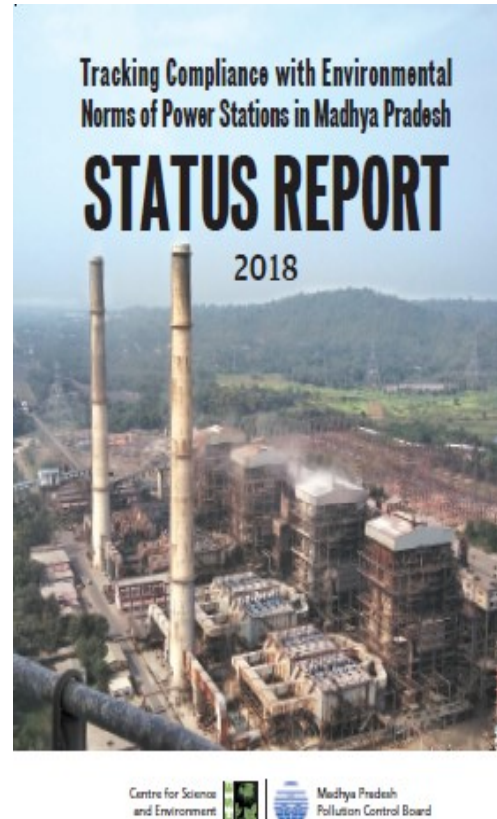


21 June, 2019

# CSE's TPP Work at the National Level: 2020

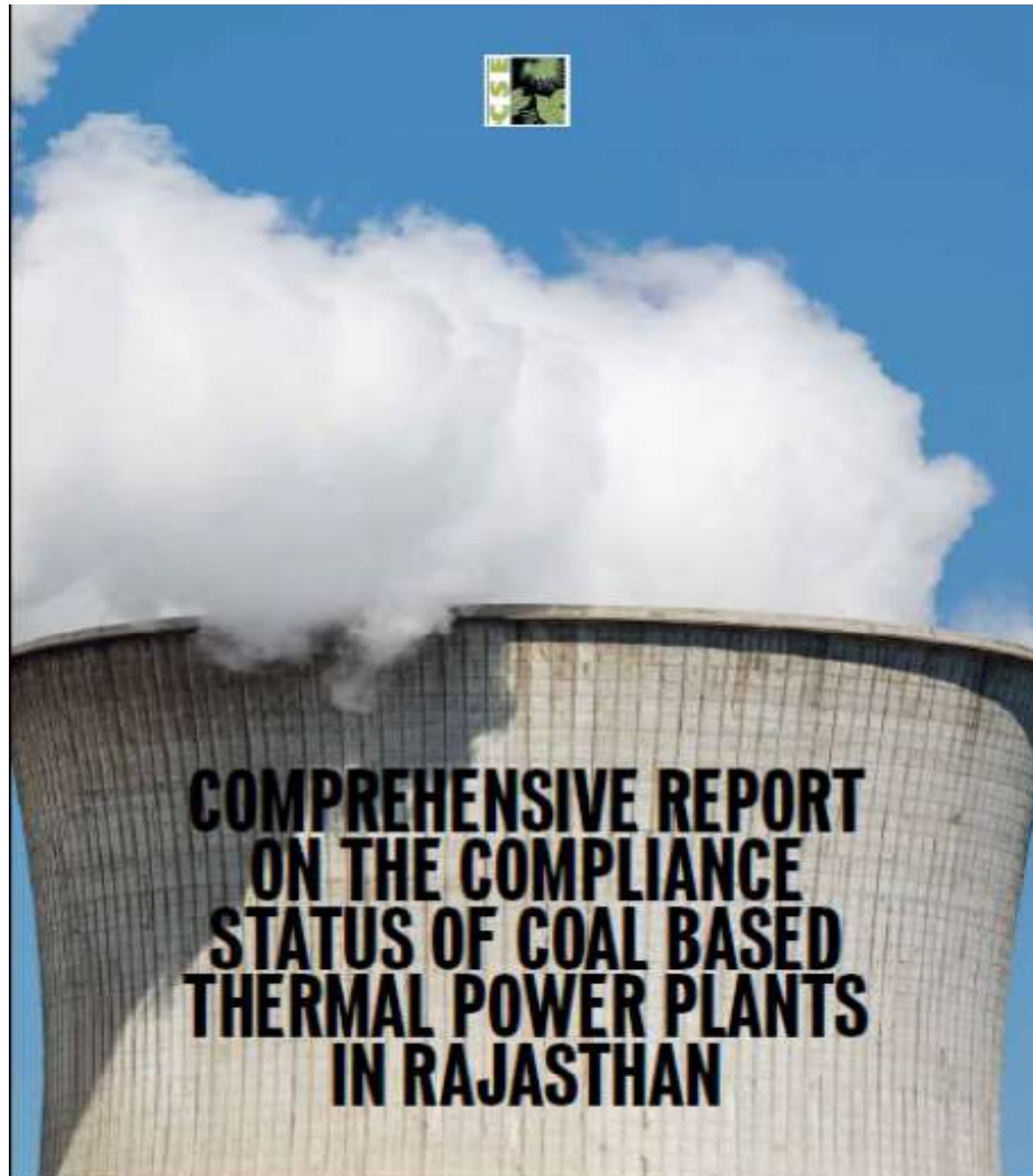


# CSE's TPP Work at the State Level

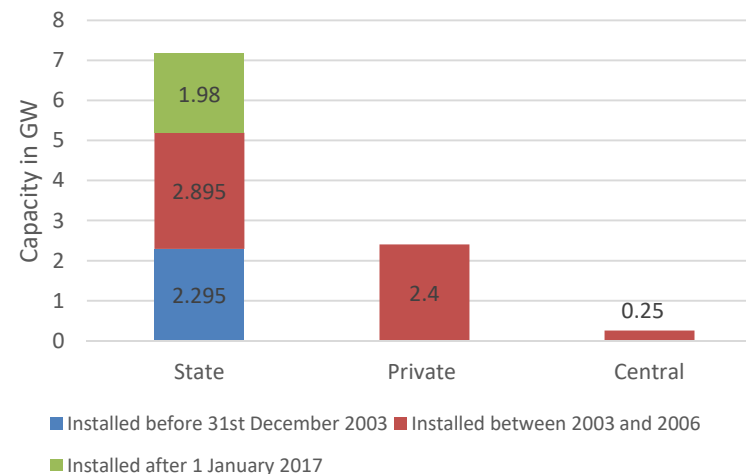
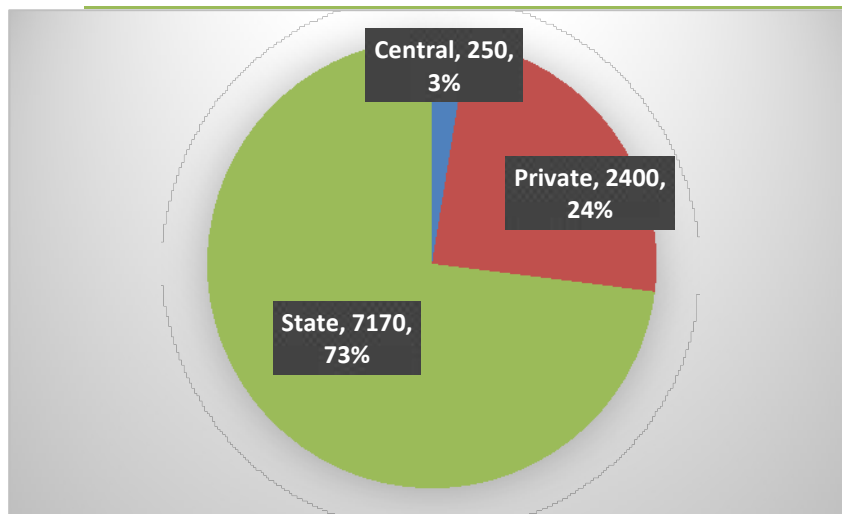


- We are still engaged with Madhya Pradesh and Maharashtra Pollution Control board for further deeper analysis of the TPPs issues and for tracking the action plan implementation.





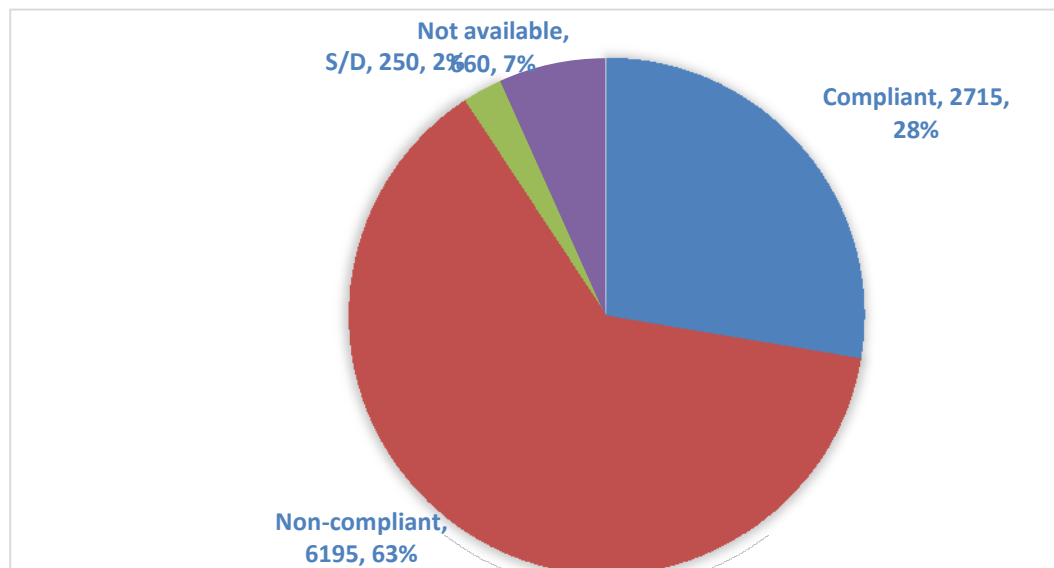
# Rajasthan TPP - Profile



Unit Size	Capacity in GW				
	Vintage (years)				
	25+	20-25	11~20	0-10	Total
Upto 250 MW	0.85	0.25	2.15	2.07	5.32
>250 and <500 MW	0	0	0	0	0
500 MW and above	0	0	0	4.5	4.5
<b>Total</b>	<b>0.85</b>	<b>0.25</b>	<b>2.15</b>	<b>6.57</b>	<b>9.82</b>

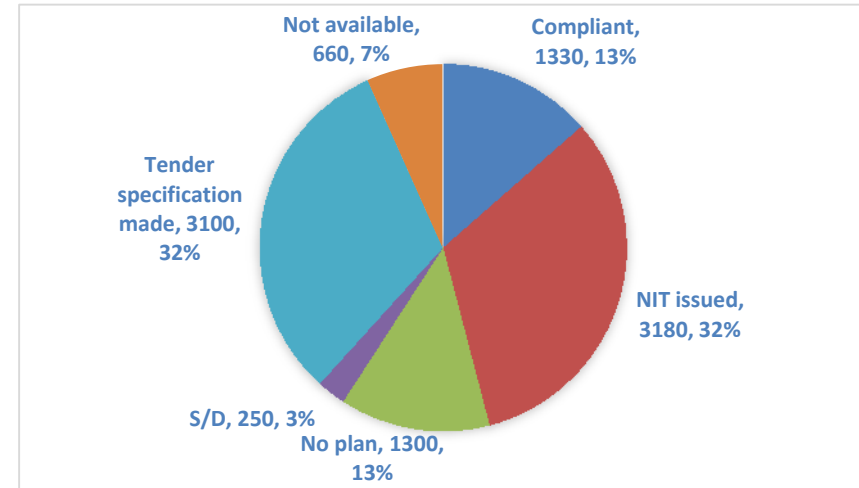
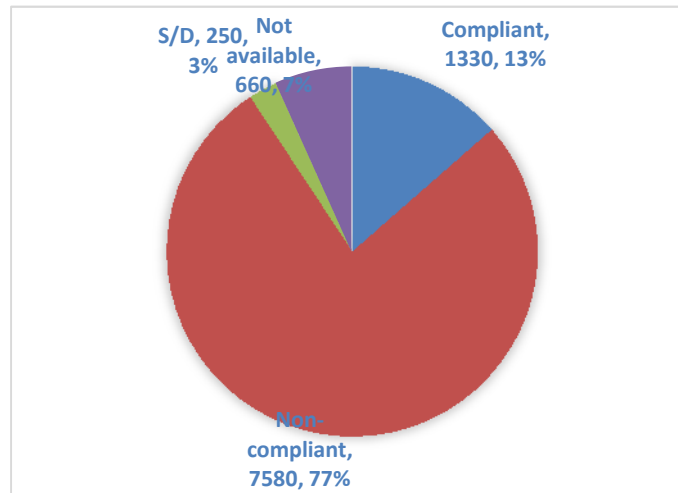
- Total installed capacity of the state- 9.8 GW
- Rajasthan has a young fleet of thermal power plants, with 21 units comprising 6.57 GW (67 percent of the capacity) are less than 10 years old.
- The share of old units (25+) is fairly low i.e. only 8.5 percent of the capacity (0.85 GW) and this capacity is state-owned.

# PM compliance Status



- 28 units with a combined capacity of 6.19 GW (63% of the total) were found to be non-compliant.
- Non-compliance cannot be associated only with older units alone, when nearly two-third of the total capacity is non-compliant.
- RRUVNL Chhabra unit 5&6 PM which were commissioned in 2017 & 2019, has the PM emission level in the range of 300-500 mg/Nm<sup>3</sup>, 10-16 times higher than the stipulated standards of 30 mg/Nm<sup>3</sup>.
- Kota TPS shows PM applicable standard 150 mg/Nm<sup>3</sup> in place of 100 mg/Nm<sup>3</sup> in the monthly environmental reports.

# S02 Compliance Status



- Of the entire 36 units, 23 units with a combined capacity of 7.58 GW (82% of the total) were found to be non-compliant. Of the 23 non-compliant units, no unit has finalized its tender for FGD installation, till August, 2020.
- A combined capacity of 3.1 GW (34% of the total) have made tender specification and while units with a combined capacity of 3.18 GW (34% of the total) have issued NIT for FGD installation.
- Still, 10 units, with a combined capacity of 1.33 GW (15% of the total) - belonging to JSW Jalipa Kapurdi (8 units) and NLC Barsingsar Lignite (2 units) were found to be compliant. It is to be noted that both these plants have CFBC based boilers.
- Units 1-4 of Kota TPS, and Unit 6 of Chhabra TPS which accounts for a total of 1.3 GW (14% of the total) have not shown any plan for FGD implementation.

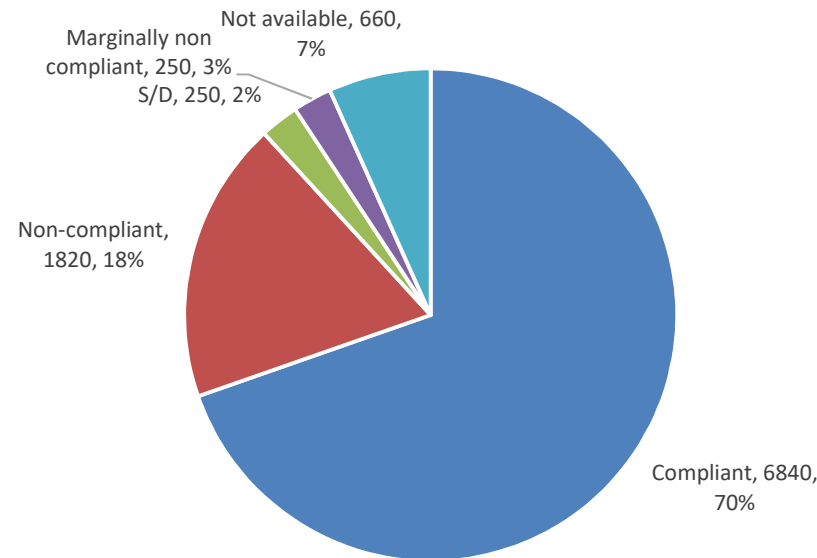
# SO<sub>2</sub> Compliance Status

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- Installation of wet FGD requires around two and half years.
- Till November,2020, no plant has initiated work for FGD installation.
- Unless non-compliant plants initiate work for FGD installation by the end of year 2020, it is highly unlikely that they can meet the 2022 deadlines.
- Some non-compliant units may also opt for DSI technology based on their present SO<sub>2</sub> emission level and applicable SO<sub>2</sub> standards.

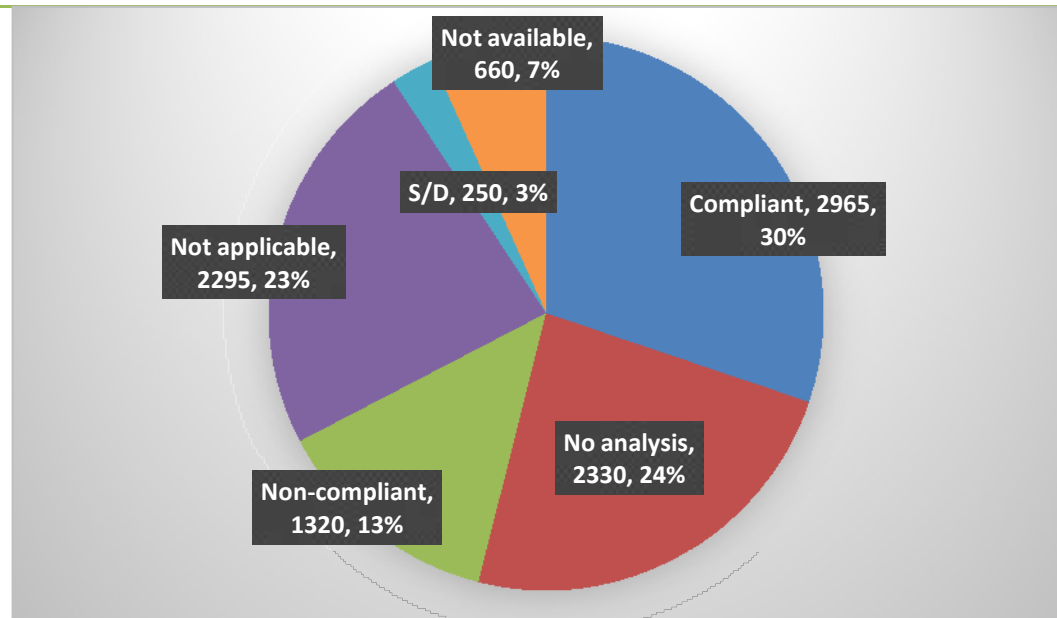


# NO<sub>x</sub> Compliance Status



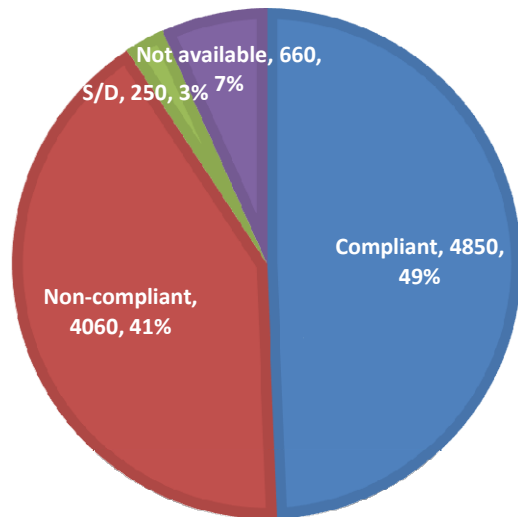
- Out of total 36 units 28 units representing 70 per cent of the capacity (6.8 GW) is compliant with NO<sub>x</sub> standards. (considering recently relaxed standard of 450 mg/Nm<sup>3</sup>)
- Rajasthan has a young fleet. New generation plants are generally installed with Low NO<sub>x</sub> Burner (LNB) or over fire air (OFA) or both, that can be one of the reasons for high NO<sub>x</sub> compliance.
- Four units represent 18 percent of the capacity (1.82 GW) is non-compliant, out of this non-compliant capacity, 1.32 GW (RRVUNL Chabra unit 5&6) has to meet stringent standards of 100 mg/Nm<sup>3</sup>.

# Mercury (Hg) Compliance Status



- Of all the 36 units in Rajasthan, only 7 units having a combined capacity of 2.965 GW (30% of the total) were found to be compliant.
- Capacity of 1.32 GW (13% of the total) i.e. 2 units (5 and 6) of Chhabra Thermal Power Plant were non-compliant in relation to Hg emission, in fact actual mercury levels are observed 300-1400 times higher than the standard.
- 13 units with a combined capacity of 2.33 GW, (25% of the total) did no analysis of Hg emission levels (JSW Jalipa and RRVUNL, Chabra), which is a major non-compliance.

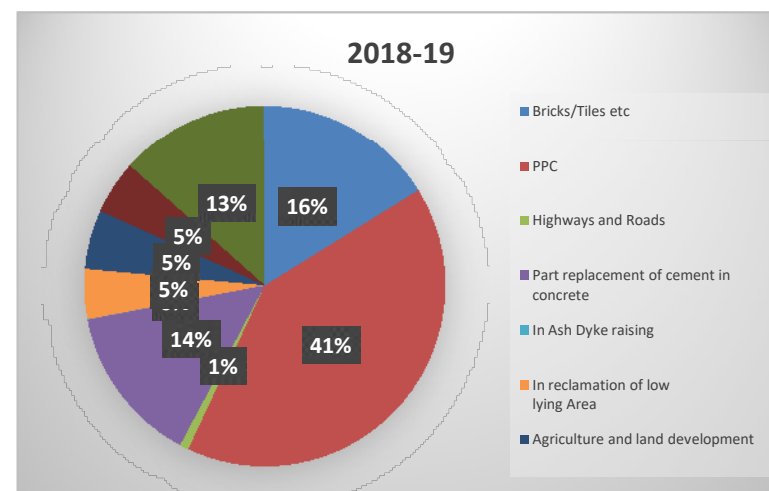
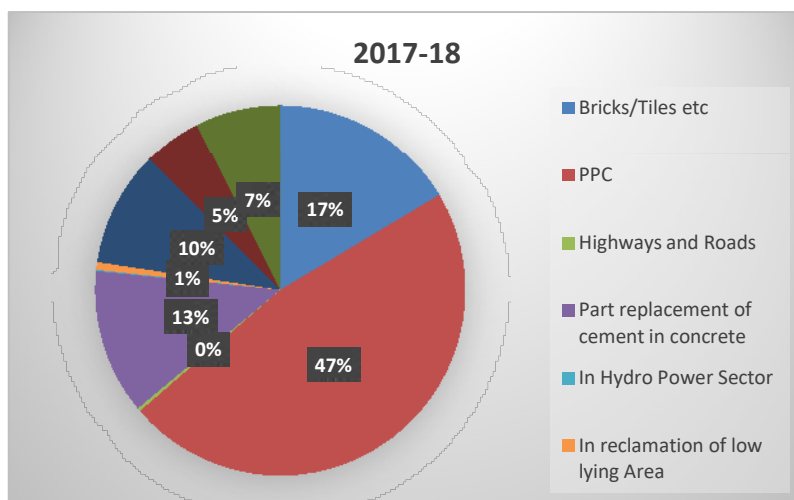
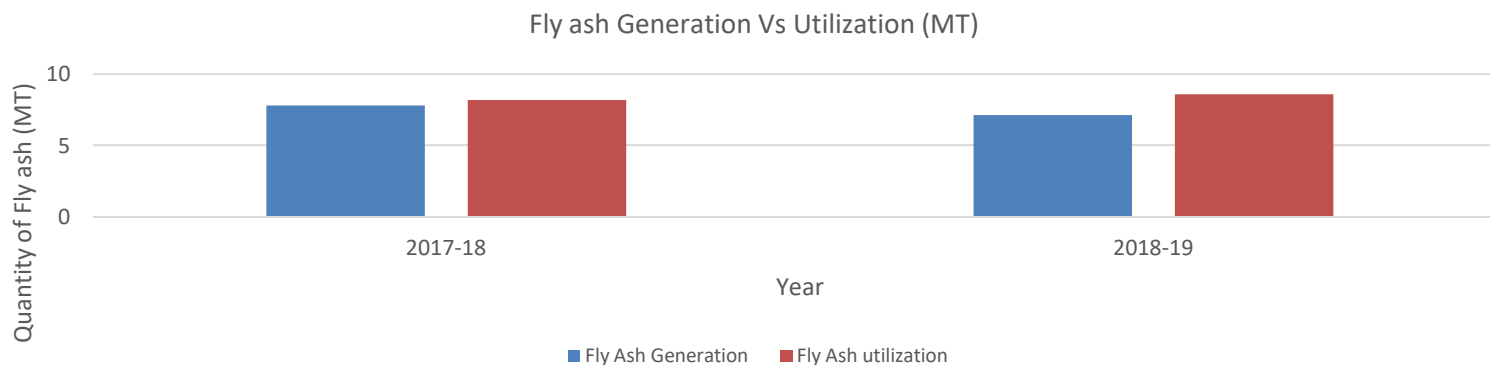
# Water Compliance Status



Plant name	Standard (m <sup>3</sup> /MWh)	Average SEC (m <sup>3</sup> /MWh)	Compliance Status
Adani Kawai TPS	3.5	3.198	Compliant
JSW Jalipa Kapurdi TPS	3.5	2.67	Compliant
RRVUNL Chhabra TPS	3.5	2.273 (Unit 1,2,3, &4)	Compliant (Unit 1,2,3, &4)
	3	4.008 (Unit 5 & 6)	Non-Compliant (Unit 5 & 6)
RRVUNL Giral TPS	3.5	S/D	S/D
RRVUNL Kalisindh TPS	3.5	3.49	Compliant
RRVUNL Kota TPS	3.5	12.92*	Non-Compliant
RRVUNL Suratgarh TPS	3.5	4.14	Non-Compliant
NLC Barsingsar Lignite	3.5	2.6	Compliant

- 41 per cent of the capacity (4 GW) is non-compliant.
- RSPCB has highlighted the water related issues in inspection reports, one of being is poor water metering.

# Fly Utilization



- Fly utilization in TPPs is a major and serious issues across the country.
- Rajasthan Power plants are maintaining 100 per cent fly ash utilization. Cement industries being the major consumers. Plants even clearing their backlogs from fly ash pond.
- Can be good case study to improve fly ash utilization in the TPPs across the country.

# Way Ahead

Parameter	Action Points
<b>Particulate emission</b>	<ul style="list-style-type: none"> <li>• High non-compliance with respect to other states. Needs urgent attention.</li> <li>• Each non-compliant should submit action plan to RSPCB at the earliest.</li> <li>• ESP upgradation/retrofitting takes much lesser time, hence compliance much before 2022 achievable.</li> </ul>
<b>SO<sub>2</sub></b>	<ul style="list-style-type: none"> <li>• No work awarded till now.</li> <li>• Each non-compliant should submit action plan to RSPCB at the earliest.</li> <li>• Plant will not meet even 2022 if further delayed.</li> </ul>
<b>NO<sub>x</sub></b>	<ul style="list-style-type: none"> <li>• Major capacity is compliant.</li> <li>• Non-compliance is mainly to meet standard of 100 mg/Nm<sup>3</sup>.</li> </ul>
<b>Hg</b>	<ul style="list-style-type: none"> <li>• Better transparency in disclosing mercury data, can be further improved.</li> <li>• Mercury compliance is connected with SO<sub>2</sub> and NO<sub>x</sub> control, thus focus primary focus should be on SO<sub>2</sub>.</li> </ul>
<b>Water:</b>	<ul style="list-style-type: none"> <li>• Non-compliant should submit action plan to RSPCB.</li> <li>• As per RSPCB, Water metering need to be improved.</li> </ul>
<b>Flyash</b>	<ul style="list-style-type: none"> <li>• Need to maintain 100% fly ash utilisation.</li> <li>• Rajasthan can be a case studies for other states on fly ash utilization.</li> </ul>

# Way Ahead

Parameter	Action Points
<b>CEMS</b>	<ul style="list-style-type: none"> <li>• RSPCB has highlighted various CEMS issues in their TPP inspection reports. Data connectivity issues with RSPCB being the major issues.</li> <li>• To improve transparency and compliance, TPP CEMS data should be made available in public domain. (Already 15 states have done that)</li> </ul>
<b>Plan for Old units</b>	<ul style="list-style-type: none"> <li>• Need to have clear plan for the old units &gt;20-year-old to avoid significant pollution as well as investment.</li> <li>• RRVUNL Kota units 1-5 are scheduled to retire as these thermal station units do not have space for FGD installation and shall attain age of =&gt;25 years on 1/1/2022.</li> <li>• RRVUNL Suratgarh Unit 1 &amp; 2 are &gt;20 year old.</li> <li>• These plants should be trialed for biomass cofiring.</li> </ul>
<b>Capacity building</b>	CSE can design short capacity building programmes tailor made for RSPCB official and power plant officials for CEMS and Water related issues.
<b>Survey of Non-compliant units</b>	<p>CSE can visit non-compliant units with our power plant experts/advisors to understand the obstacles the hinderance in compliance and suggesting the possible way to address them.</p> <p>In depth CEMS audit to improve CEMS data availability and Water audit to improve water utilization can also be conducted.</p>



Thank you