FACTSHEET

Proposed norms for coal-based power plants

Current status

Of the total pollution from the industrial sector, the coal-based power sector currently accounts for approximately 60 per cent of particulate matter (PM) emissions, 45-50 per cent of SO_2 emissions, 30 per cent of NOx emissions and more than 80 per cent of mercury emissions. However, there are currently no standards to curb emissions of SO_2, NOx and Mercury. The only standards that exist are for PM, which are between 50-150 mg/Nm^3, quite relaxed compared to the global norms of 30 mg/Nm^3. The proposed standards released by the MoEF&CC today bridges this gap.

Proposed norms – Air Pollution

Pollutant	Existing	Units installed before 2003	Units installed after 2003	Units installed after Jan. 1, 2017
PM (mg/Nm^3)	50- 150 mg/Nm^3	100	50	30
SO_2 (mg/Nm^3)	None	600 (<500 MW size) 200 (>500 MW size)	200 (> 500 MW size)	100
NO_x (mg/Nm^3)	None	600	300	100
Mercury (mg/Nm^3)	None	0.03 (>500 MW size)	0.03 (>500 MW size)	0.03 (all units)

Impact of proposed norms in reducing air pollution

Annual emissions (tonnes/annum)	Existing state of the art 1000MW plant		New Plant
	Current	By 2017	January 2017 onwards
PM	1,552	1,552	1,186
SO_2	41,304	7,814	3,907
NOx	14,077	11,862	3,954
Hg	3.6	0.86	0.86

1. **PM Norms:** Current norms are 150 mg/Nm^3 for old plants while for plants commissioned after 2008, Environment clearances typically specify 50 mg/Nm^3.
    a. The new norms therefore imply around 33% cut for oldest plants; in fact, required cuts would be even higher since, CSE's recent study showed, almost two thirds of the units don't meet the existing norms.
    b. Some of the good Indian units are meeting the 50 mg/ Nm^3 norms. However, many of the units that were established after 2003 don't meet the 50mg/ Nm^3 norm. These will need to upgrade their ESPs to meet the norms.
    c. New units after 2017 would need to meet 30mg/ Nm^3, same as China's. With advanced technology, global best units are able to achieve 5 mg/ Nm^3 so this is an achievable and a desirable target. The norms for these new plants would require PM emissions to be 25% lower than the existing high-performing Indian plants.

2. **SO_2 norms:** No national norms; however, certain states like Gujarat and Maharashtra have established norms. Also, certain coastal imported coal-based units were required to install SO_2 control technology and were given SO_2 norms of 50 mg/ Nm^3.
    a. The new norm will require the smaller units to optimize raw material/fuel mix and operation to achieve the norm of 600mg/ Nm^3.
    b. The older plants with unit sizes of 500MW and above have sufficient space for Flue gas desulphurization (FGD) installation for SO_2 control. Accordingly, norms of 200 mg/ Nm^3 are appropriate. These norms would imply cuts in SO_2 emissions of 80% for the good plants and even higher cuts for average performers
    c. The plants commissioned 2017 onwards must have FGD in order to reduce the SO_2 emission to 100mg/ Nm^3, which is equal to the Chinese norm. A global-best plant can achieve SO_2 emission of 20mg/Nm^3. This norm would ensure that new plants would have SO_2 emissions that are 90% lower than emissions of the state-of-the-art domestic coal-based plants in India.
3. **NOx norms:** There are no national NOx norms either. Old units are no NOx control technologies; new and large size units have installed low NOx burners to control NOx emission.
    a. Older and smaller units have limited ability to cut NOx emissions.
    b. Large size plants (500MW unit capacity) which are already equipped with low NOx burner can optimize boiler operation further to achieve emission below 300mg/ Nm^3 (equal to Chinese norm). For these units over 15% cuts in NOx emissions would be achievable
    c. New plants commissioned after 2017 would need to meet NOx norms of 100 mg/ Nm^3 (global best plants can achieve 50 mg/ Nm^3). This norm would imply NOx emissions from new plants would be around 70% lower than current best plants
4. **Mercury:** No mercury norms in place currently
    a. With technological modification in pollution control and coal washing, mercury emission reduction to 0.03 mg/ Nm^3 (same as China's) is achievable. USA has even stricter norm of 0.0017mg/ Nm^3. New norms would help cut mercury emissions by over 75%.

Proposed norms - Water use

Currently, norms don't specify water use; however, environment clearances and consent to operate establish water use.

	OTC plants	Existing CT plants	Upcoming plants (after January, 2017)
Water consumption (m^3/MWh)	Convert to CT-based plants; max. allowed consumption of 4 m^3/MWh	3.5 m^3/MWh	2.5 m^3/MWh

a. Coal-based power plants withdrew over 22 billion cubic metre of fresh water in 2012 – once-through-cooling (OTC) systems based plants, which are particularly wasteful water users withdrew around 90% of this number while generating less than 20% of power.
b. Under new norms, OTC plants would need to convert to cooling tower-based ones and cut water draw to 4 m^3/MWh from current average draw of around 150 m^3/MWh.
c. Existing CT-based plants consume 4m^3/MWh – these will need to cut water use to 3.5 m^3/MWh.

d. New plants would need to cut water use to 2.5m^3/MWh, which is equal to the average water use of Chinese plants. Plants can be a zero liquid discharge and easily reduce the water consumption below the standards. A global best cooling tower based plant has water consumption as low at 1.6m^3/MWh.

The change in water use norms would cumulatively reduce fresh water withdrawal by 80% to less than 5m^3/MWh (including water use of new capacity) by 2017 from over 22 billion cubic metre in 2012.