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INSIDE THIS ISSUE:

<i>India News</i>	2
<i>World News</i>	3
<i>Statistics</i>	4
<i>Regulations & Cases</i>	4
<i>Publications</i>	4
<i>Miscellaneous</i>	4

Relevant Websites & Contacts

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FLY ASH UTILIZATION IN THERMAL POWER PLANTS—PART 1

Introduction: Ashes are the by-product of burning coal or lignite to provide necessary energy to convert water into steam. The steam is used to run the turbine to produce electricity. The burning of coal or lignite produces gas, heat and ash which let out through a flue (pipe/chimney) (refer—[Flue gas](#)). The ash is composed of two parts— fly ash and bottom ash. The weightless ash that goes through the flue is called fly ash. There are certain ash particles that are heavy which tends to settle outside the bottom of the boiler hence known as bottom ash.

Ash Composition: Both fly ash and bottom ash contain aluminium, iron, silicon, and smaller concentrations of calcium, potassium, sodium, sulphur. They also contain essential macro nutrients required for growth of plants phosphorus, potassium, magnesium and sulphur, including micro nutrients such as iron, manganese, zinc, copper, cobalt, boron, molybdenum etc. 50% of fly ash have oxides of silicon, aluminium and iron ([Dzantor Coal CGP Journal, 2015](#)).

Measures for storage /control of fly ash: Fly ash can be collected by pollution control facilities such as electrostatic precipitator, bag filter, and mechanical precipitator. Bottom ash is collected through a water impounded hopper and cooled in the water. The ash is then sent to an ash pond where fly ash and bottom ash are stored. This ash pond should be made impervious to prevent seepage of the ash water into the groundwater. Any excess water used to mix with ash, after getting into ash pond, should be treated and reused. If there is any mismanagement in the ash pond or capacity of the pond gets saturated, then it will be difficult to dispose the ash.

Usage of Fly ash: Fly ash can be utilized in cement manufacturing, brick making, ash dyke raising, mine filling, road/ rail embankments, agriculture. The utilization of the ash is seen a necessary action both for its management and to mitigate its harmful effects.

Institutions involved in Fly Ash Control: Two institutions are involved in management of fly ash i.e. Ministry of Environment Forest & Climate Change ([MoEF & CC](#)) and Central Electricity Authority ([CEA](#)). MoEF & CC has issued a Fly Ash Utilisation in [1999](#), which has been amended in [2003](#), [2009](#) and [2016](#). Fly ash mentioned in the notification includes fly ash, bottom ash and pond ash.

New coal or lignite thermal power stations or expansions units commissioned after [this](#) notification to achieve the target of fly ash utilisation is given in the table below (refer sub-paragraph 3 of paragraph 3 of notification S.O 2804(E) 3rd November 2009)

Serial Number	Fly ash utilization level	Target date
(1)	(2)	(3)
1.	At least 50% of fly ash generation	One year from the date of commissioning.
2.	At least 70% of fly ash generation	Two years from the date of commissioning.
3.	90% of fly ash generation	Three years from the date of commissioning.
4.	100% of fly ash generation	Four years from the date of commissioning.

35% OF INDIA'S TOTAL THERMAL POWER CAPACITY LYING UNUSED

More than a third of India's 303 gigawatt thermal power capacity is lying unused while the rest is running at a shade over 55% utilization owing to inadequate demand. Analysts said utilization is expected to fall further if more capacity is added as planned by the government, portending losses for power firms.

About 35% of the total capacity, or 104 gigawatt, is lying idle at present. The government added about 24,000 mw of fresh conventional capacity last year and plans to add 86 by 2022. In addition, 100 gigawatt of solar capacity is to be added by 2022.

"Falling capacity utilization translates into losses and inability of new power plants to service interest costs, leading to non-performing assets at banks," said a senior analyst, who did not wish to be identified.

The list of shut units includes a chunk of 31 gigawatt capacity that was set up after 2009. These include 6,360 mw capac-

ity that does have power supply contracts with distribution companies but is lying shut due to non-availability of coal. Another 5,650 mw have neither coal nor power supply contracts with any distribution company.

The next set of 9,316 mw have coal supply contracts but does not have power supply agreements. Yet another set of 2,940 mw have letter of coal supply assurance from Coal India and has managed to sign power purchase agreements but has not been receiving coal from the state-run miner. The last set includes 3,300 mw of plants that do not have power purchase agreements and despite Coal India's assurance of supplies, have not been receiving coal.

"While plants are shut due to unavailability of coal, Coal India is saddled with some 45 million tonnes of coal as of July 31. Its stock position has reached a level where the company is being forced to scale down productions, yet power plants are

not receiving coal because the government is yet to change a policy that was framed when coal was in short supply," said Ashok Khurana, director general of the Association of Power Producers.

If these new plants are allowed to receive coal they could have generated power and sold them at least at the power exchanges, Khurana said. "These could have reduced power prices further but these power companies could at least recover their interest cost and service their debt burden," he said. Nonetheless, of the rest, about 72 gigawatt, some are shut due to water shortage, some due to equipment failure and yet another set has been shut because its operations have turned uneconomical due to age of equipment. These include a set of plants with 11-gigawatt capacity that are shut as part of planned maintenance which is likely to come on stream within a fortnight.

[The Economic Times](#) August 17, 2016.

Thermal power plants in operation before 3rd November 2009 should utilize 100% of fly ash generated with five years from the same date.

WIND ENERGY SLOWS DOWN THERMAL POWER PRODUCTION

In an unprecedented move, only two power generating units of Tuticorin Thermal Power Station (TTPS) are functional. Currently, the production is on in the second and the fifth units, each with a production capacity of 210 MW.

Wind-powered energy production is at an optimum level, and it has brought down the demand for production of coal-fired energy from conventional thermal power station. This situation has led to a drastic reduction in coal usage in the thermal power station. On a daily average, four tonnes of coal is required for production from a unit. A coal

stock of five lakh tonnes is maintained in the plant now. To avoid any combustion in the stockyard, which could be caused by rising temperature, coal is being watered. Sources said 25 per cent of the coal used in the plant was imported from Indonesia, and the rest was sourced domestically.

Sources from Non-Conventional Energy Source, TANGEDCO, Tirunelveli Circle, said 2,150 MW of wind energy was generated until noon on Sunday. On Saturday, this circle saw a production of 2,193 MW. The electricity production from wind mills did not go below 2000

MW in the last four or five days. On August 4, the production touched 2,215 MW.

Further, sources said a 1,800 Mega Volt Ampere (MVA) wind power substation, the highest capacity ever in Tamil Nadu, is likely to be commissioned at Kanarpatti near Kayathar either by September end or in the middle of October.

Besides, works were in progress to establish a 1030 MVA wind power substation at Thennampatti near Ottanatham, sources added.

[The Hindu](#) August 8, 2016

COAL BURNING CAUSES MOST AIR POLLUTION DEATHS IN CHINA

Burning coal has the worst health impact of any source of air pollution in China and caused 366,000 premature deaths in 2013, Chinese and American researchers said on Thursday.

Coal is responsible for about 40 per cent of the deadly fine particulate matter known as PM 2.5 in China's atmosphere, according to a study the researchers released in Beijing. Those figures are consistent with what Chinese scientists have been saying in recent years about industrial coal burning and its relation to air pollution.

The study, which was peer-reviewed, grew out of a collaboration between Tsinghua University in Beijing, one of China's top research universities, and the Health Effects Institute, based in Boston, a research center that receives funding from the U.S. Environmental Protection Agency and the worldwide motor vehicle industry. The researchers' primary aim was to identify the main sources of air pollution leading to premature deaths in China.

The study attributed 155,000 deaths in 2013 related to ambient PM 2.5 to industrial coal burning, and 86,500 deaths to coal burning at power plants. Fuel combustion of both coal and biomass in households was another major cause of disease that year, resulting in 177,000 deaths, the study concluded.

The researchers also found that transportation was a major cause of mortality related to PM 2.5, with 137,000 deaths attributed to it in 2013. In recent years, Chinese scientists have said that motor vehicle emissions are a leading source of air pollution in cities, although not as great

as coal burning. Vehicle ownership is rising fast in China, and officials, carmakers, and oil and gas companies have quarreled over setting emissions standards.

China consumes almost as much coal and coal burning in the country is the biggest source of both air pollution and greenhouse gas emissions, the leading cause of climate change. Chinese cities are among the most polluted in the world. Provinces in northern China, where steel, cement and power plants are common, have the highest concentrations of PM 2.5 in the country.

But the growth in China's coal consumption has begun to slow. Last year, there was a slight decline in coal use compared with 2014, largely because of an economic slowdown that has been faster and deeper than many experts had expected.

In addition, the Chinese government announced plans in 2013, when popular anxiety over air pollution reached new heights, to curb coal use in three major population centers in the east. Placing limits on coal use is also consistent with pledges made by President Xi Jinping to try to reduce the effects of climate change. The new study projected four scenarios based on different possible government policies, and each projection showed a decline in the average levels of PM 2.5 in coming years.

But in the study's executive summary, the researchers said that "despite these air pollution reductions, the overall health burden is expected to increase by 2030 as the population ages and becomes more susceptible to diseases most closely linked to air pollution."

Even under the most stringent

policies on coal use and energy efficiency, coal is expected to remain the single biggest contributor to PM 2.5 and China's health burden in 2030, the study said.

The study was a follow-up to a Global Burden of Disease study examining deaths in 2013, which estimated that PM 2.5 contributed to 2.9 million premature deaths worldwide, with 64 per cent of those in China, India and other developing countries in Asia. Premature deaths due to PM 2.5 exposure were also high in Eastern Europe. A larger study on 2013 deaths was published last year by The Lancet, a British medical journal.

That study estimated the number of premature deaths in China in 2013 related to PM 2.5 exposure at 916,000, out of a population of 1.4 billion. Researchers found that outdoor air pollution was the fifth leading cause of premature deaths in China.

An earlier Global Burden of Disease study that examined health figures for 2010 found that outdoor air pollution contributed to 1.2 million premature deaths, nearly 40 per cent of the global total. Exposure to ambient particulate matter that year was the fourth leading cause of premature deaths in China.

In 2013, the Organization for Economic Cooperation and Development, based in Paris, warned that "urban air pollution is set to become the top environmental cause of mortality worldwide by 2050, ahead of dirty water and lack of sanitation." It said that as many as 3.6 million people could end up dying prematurely from air pollution each year, mostly in China and India.

[The Economic Times](#) August 18,

In 2014-15 only 55.69 percent of fly ash generated by the thermal power plants is utilized in India.

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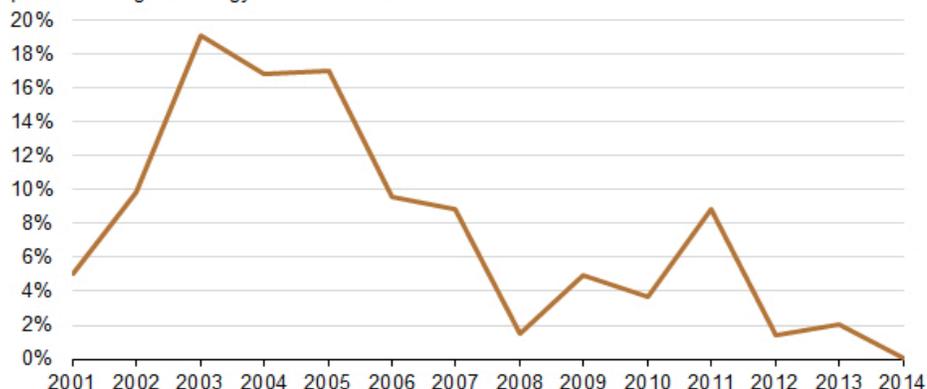


Citizen consumer and civic Action Group (CAG) is a non-profit, non-political and professional organization that works towards protecting citizens' rights in consumer and environmental issues and promoting good governance processes including transparency, accountability and participatory decision making.

CHANGE IN CHINESE COAL CONSUMPTION (2016)

Coal use in China is slowing

Annual change in Chinese coal consumption (2001-14)
percent change in energy content terms



Source: U.S. Energy Information Administration, China National Bureau of Statistics (NBS)

REGULATIONS AND CASES

- Subhas Datta Vs State of West Bengal & Ors. [2016], Pollution of river water by Bakreshwar thermal power plant, *Original application No. 24/2014/EZ*, 02 August 2016 [Click here](#)
- Ministry of Environment Forest and Climate Change, Notice for seeking inputs/comments regarding amendments of chemical accident rules, Dated 08 August, 2016 [Click here](#)

PUBLICATIONS

- Kumar. A, Jain S, Gupta S, Sonaram, Merawat S, [2016] 'A research paper on partial replacement of cement in M-30 concrete from silica fume and fly ash', *SSRG International journal of Civil Engineering*, Vol. 3 Issue 5 p 40-45 May [Click here](#)
- Sharda, J. Bukley T.[2016] 'Risky and Over-Subsidized: A financial analysis of the Rampal power plant', *Institute for energy economics and financial analysis*, Last accessed 26 September 2016 [Click here](#)

MISCELLANEOUS

- CONECT 2016 Conference of Environmental and Climate technologies organized by the institute of energy systems and environment, Riga, Latvia, 12-14 October, 2016. [Click here](#)
- Africa Renewable Energy Forum- the first official international side meeting of COP22 - Marrakech 2016 [Click here](#)