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Educating & Informing Stakeholders on Energy, Environment & Thermal Power Plants

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Relevant Websites & Contacts

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THERMAL POWER PLANTS & AMBIENT AIR QUALITY— II

Effects on health

<u>Particulate Matter (PM)</u> is a term for mixture of solid particles and liquid droplets -e.g. dirt, dust and soot or smoke are visible and others are undetectable. PM contains inhalable coarse particles having a diameter in the range of 2.5 micrometre to 10 micrometre. Hence, it can be easily, causing neurological impairments, heart attacks, lung disease in adults and stunted lung growth and low birth weight in children.

Sulphur dioxide is emitted by burning of coal. Their quantity varies according to their origin. It gets converted into acid gas and sulphur particulate matter. If inhaled it causes airway irritation and asthma.

<u>Nitrogen (N₂)</u> is the most abundant gas in the atmosphere having 78% of the total composition. However, Oxides of nitrogen (NOx) are dangerous. Especially nitrogen combines with oxygen and emitted into the atmosphere. This happens mainly due to burning of any form of fuel (combustion) e.g. coal. This may be from hot gases coming out of a chimney, venting a burner or a combustion chamber. Oxides of nitrogen (NOx) causes inflammation in the lining of lungs, and it can reduce immunity to lung infection. This in turn induces wheezing, coughing, cold, flu and bronchitis (ref).

Mercury is one of the most harmful pollutants faced by humans, fish and wildlife. Once emitted to the air, mercury falls to the earth and builds up in our waters and soils where it is transformed into methyl mercury (<u>link</u>). Exposure to mercury is particularly dangerous for pregnant and breast feeding women, as well as children.

Table 1: Heavy metal pollutants and their harmful effects

Sl.no	pollutant	Harmful Effects
1	Arsenic	Bio concentration in aquatic organisms, acts as carcinogens
2	Chromium	Carcinogen, corrosive nature, damage liver and kidney, may cause skin allergy
3	Lead	Damage to cardio vascular system, kidneys, nervous system
4	Mercury	Permanent damage to CNS, kidney and developing foetus
5	Nickel	Bioaccumulation, carcinogen
6	Zinc	Bioaccumulation, exposure to higher concentration cause toxic effects

Environment Protection Act of 1986 is an Act of Indian Parliament. The purpose of this Act is to take appropriate steps for the protection and improvement of environment. This Act gives power to central government to make rules for the protection and improvement of environment. EPA 1986 is an umbrella act and covers Water (Prevention and Control of Pollution) Act 1974 and Air (Prevention and Control of Pollution) Act 1981.

The Ministry Of Environment and Forest & Climate Change (MOEF & CC) is the coordinating agency for setting emission standards through the Environment (Protection) Rules for all Industrial activities, including thermal power plants. The Latest Environment (protection) Amendment Rules, 2015 specific to thermal power plants was issued in December 2015. Latest standards have been prescribed on December 2015. (contd next issue)

India seeks to shut 12% of power CAPACITY IN ANTI-POLLUTION MOVE

India plans to shut aging coalfired power plants with a combined capacity of 37 gigawatts to cut emissions and reduce the use of fuel and water.

The plants are more than 25 years old and have turned uneconomical, said S.D. Dubey, chairman of the Central Electricity Authority, the planning wing of the power ministry. They will be replaced by super-critical units, which are more efficient, at the same sites, he said, without giving a timeline.

"Our first concern is emissions," Dubey said in New Delhi. "We also want plants to be more efficient in use of resources."

The plan reflects Prime Minister Narendra Modi's attempt to balance energy security with the

need to protect the environment. Coal, whose use is declining in several parts of the world because of emission concerns. accounts for about threefourths of India's electricity generation and will probably remain the nation's dominant fuel for at least two decades, the government estimates.

In December, the environment ministry issued norms to curb emissions, such as particulate matter, sulphur dioxide and nitrogen oxides, from power plants amid rising concern over air pollution in Indian cities. The norms also capped the use of water by plants.

A majority of the old capacity-22 gigawatts-is controlled by provincial governments, while

13,000 megawatts belongs to companies of the central government, such as NTPC Ltd, Dubey said. About 2 gigawatts of capacity belonging to nonstate producers is also being considered for shutdown, he said without naming the plant owners.

The Central Electricity Authority will hold talks with plant owners and electricity buyers to prepare a roadmap for phasing out the old capacity, he said.

Coal fires 62% of India's 298 gigawatts generation capacity, according to the government's data. The aging plants being considered for a shutdown account for about 12% of the country's total capacity. livemint.com May 8,2016

FRESH DIRECTIONS TO NTPC OVER BADARPUR PLANT FLYASH DISPOSAL

NTPC-run Badarpur thermal power plant to come up with an action plan for disposing of fly ash, a major source of air pollution in summer.

The plant was among those identified by the Delhi Pollution Control Committee (DPCC) for immediate closure last year, as part of measures to control pollution although later a 210 MW unit there was given permission to operate, while four others were shut down. "Fresh directions seeking action plan over disposal of fly ash are likely to be issued by Wednesday. This will come over and above routine reminders. They will be asked to expedite the process of disposal," a senior government official said.

The report, 'Comprehensive Study on Air Pollution and Green plants to operate, authorities House Gases (GHGs) in Delhi', by IIT-Kanpur has identified soil, ents to sell it off as Delhi has road dust and airborne fly ash few such industries.

The DELHI government will soon among the major sources of issue fresh directions to the harmful PM 2.5 and 10 (micro respirable pollutants) pollution in summer.

> Green body Centre for Science and Environment (CS E), in its analysis of 47 coalbased thermal power plants in the country last year, held the Badarpur plant as one of the "most polluting". The NTPC , however, responded saying it complies with all the environmental and pollution-related norms.

> Cement industry is one of the major buyers of fly ash, which is essentially a residue that is released on combustion of coal, especially from thermal power plants.

> The official said while scientific disposal of fly ash is part of terms and conditions for such often find it difficult to get cli

"We will ask them to look for alternatives and have some system in place. Neighboring states such as Uttar Pradesh have a large number of such industries but carrying cost comes into the picture in such cases." said the official.

According to the IIT report, the major summer sources of PM 2.5 include coal and fly ash (26 per cent), soil and road dust (27 per cent) while the same sources are responsible for 37 and 26 per cent volume of PM 10.

"It was observed that in summer the atmosphere looks whitish to grayish which can be attributed to the presence of large amounts of fly ash and dust particles in the atmosphere ...unless sources contributing to fly ash are controlled, one cannot expect significant improvement in air quality," the report said. ET May 15,2016

India have a target for renewable energy generation of 175 gigawatts by 2022

JAPAN'S COAL-FIRED PLANTS TO CAUSE THOUSANDS OF EARLY DEATHS

Plans by Japan to build dozens of coal-fired power stations will cause at least 10,000 premature deaths, according to a study, as the country struggles to fulfill its climate change obligations five years after the Fukushima disaster closed down almost all of its nuclear plants.

Greenpeace and the environmental group Kiko Network said in a joint report that Japan's determination to press ahead with a massive expansion in fossil fuel-based power production, with at least 43 plants to be built over the next 12 years. would come at a price to human health and "lock in carbon emissions for decades". The warning comes after a meeting of the G7 environment ministers in Tovama at the weekend. at which Japan repeated its pledge to cut carbon emissions by 26% from 2013 levels by 2030 - a target campaigners have derided as woefully inadequate.

"Six large coal-fired power plants are planned within 100km of Tokyo. This massive expansion of coal power generation so close to huge urban areas like Tokyo is simply insane," said Lauri Myllyvirta, a senior coal campaigner at Greenpeace.

"We could save thousands of lives cut short from air pollution if the government chose to embrace renewable energy over dirty coal. Japan is already considered the worst performer among the G7 when it comes to phasing out coal. If we are to have any chance of limiting average global temperature rise to 1.5 degrees, fossil fuels must be kept in the ground – not pumped into the air over our cities."

Using atmospheric modelling to gauge the potential effects on public health, the groups projected that between 6,000 and 15,000 people would die prematurely in the Tokyo area over the new plants' average operating life of 40 years.

Additional plants near the Osaka and Hyogo regions in western Japan would cause 4,000-11,000 premature deaths over a similar period. Projected particle pollution emissions from the new power plants around Tokvo would be equivalent to that from 13m passenger cars, the report said. A study published last week by Oxford University's Smith School of Enterprise and the Environment said Japan risked being saddled with a fleet of worthless coal-fired power stations due to overcapacity and lower energy costs.

The school's sustainable finance programme said overcapacity, combined with global moves to cut carbon emissions and the shift towards more cost-effective renewables, could leave the country with a stranded investment in coal plants worth \$56bn "The expansion of coal in Japan appears to be predicated on a benign environment for incumbent utilities," the programme's director, Ben Caldecott, said.

"The reality is that disruption in the power sector is accelerating. The idea that the power sector will remain relatively static and 'safe' for new coalfired power stations is counter to the evidence we see internationally across the G20."

The G7 environment ministers' meeting ended on Monday with a pledge that countries would not wait until the deadline of 2020 – set at last year's UN climate conference in Paris – to decide how they will achieve their long-term emissions cut of 80% by the middle of the century. But there are growing doubts that Japan, the only G7 country investing in new coal plants, will even achieve its 2030 target.

In contrast to the US, Britain and other developed nations

that are abandoning coal, Japan has turned to fossil fuels to fill the energy gap left by the closure of dozens of nuclear power plants in the wake of the triple meltdown at Fukushima Daiichi in March 2011.

All but two reactors remain offline while they undergo safety checks, while potential reactor restarts have encountered strong opposition from residents concerned about the facilities' vulnerability to powerful earthquakes, tsunamis and volcanic eruptions.

Japan relied on nuclear for about 30% of its energy needs before Fukushima and, despite the shutdowns, the government says nuclear will generate 20-22% of total electricity by 2030. Its enthusiasm for coal is at odds with sections of the business community, however.

Japanese trading house Mitsui said last week it would trim its thermal coal investments amid growing pressure worldwide for firms to lower their dependence on fossil fuels.

"Considering the result of the global climate summit (in Paris), we basically plan to reduce thermal coal assets," Mitsui's chief executive, Tatsuo Yasunaga, told analysts, Kimiko Hirata, the international director of Kiko Network, said: "Governments that have signed the Paris agreement must now legislate to keep fossil fuels in the ground and strongly support policies which lead to 100% renewable energy. "Following the Fukushima disaster and subsequent shutdown of its nuclear fleet, Japan has been setting global records for energy consumption reduction, while renewables such as solar, have been booming. "Japan needs to give renewables priority access to the grid and stop wasting resources trying to restart nuclear plants and expanding dirty coal." The Guardian May 17, 2016

Climate change is destroying our path to sustainability. Ours is a world of looming challenges and increasingly limited resources. Sustainable development offers the best chance to adjust our course.

- Ban Ki-moon

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3 BARE *years* of CAG Citizen consumer and civic Action Group

Citizen consumer and civic Action Group (CAG) is a nonprofit, 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.

EIA PROJECTS 48% INCREASE IN WORLD ENERGY CONSUMPTION BY 2040, <u>EIA</u> 2016

World energy consumption by source, 1990-2040



REGULATIONS AND CASES

- Draft National Water Framework Bill, 2016 Click here
- Model Bill for the Conservation, Protection, Regulation and Management of Groundwater, 2016 <u>Click here</u>

PUBLICATIONS

- Economic dynamics and technology diffusion in Indian power sector B.Sudhakara Reddy, May 2016 <u>Click here</u>
- IRENA, Renewable energy and jobs, Annual Review 2016, May 2016 Click here

MISCELLANEOUS

- POWER-GEN & DistribuTECH Africa, 19-21 July 2016, Johannesburg, South Africa Click here
- 8th International Congress on Environmental Modelling and Software (iEMSs 2016), 10-14 July 2016, Toulouse, France click <u>here</u>