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

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Thermal Power Plants & Ambient Air Quality

Introduction: Ambient air refers to the natural state of air in the surrounding area or environment, and is what humans and animals breathe. The quality, or composition, of the ambient air has implications on human health and its well-being. It has many components such as useful gases, harmful gases, and has variety of pollutants. It also contains diverse micro-organisms harmful as well as useful. Due to increase in economic development the level of pollutants in the ambient air had also increased over a period of time. Peak rise in pollutant level is witnessed during industrialization era in western world. The change in quality (composition) of the ambient air either has a detrimental or positive effect in human life. Within this context, pollution may be defined as the addition of unwanted gases and substances into the environment.

Human activities, such as manufacturing and burning of fossil fuels (coal, gas, wood etc.), causes changes in the composition of the air quality through the release of industrial and chemical pollutants. Due to increasing economic development over the years, the level of pollutants in the ambient air has also increased over a period of time. Therefore, it is necessary to regulate human activities, through standards, legislation and technological innovation, to ensure ambient air quality remains well under control to safeguard human life and greater public health.

Thermal power plants: Of all the industrial activities, thermal power plants are one of the major polluting sources in India (CPCB).In the 2008, coal contributes to 41% of total energy production around the world. As per Greenhouse gas emission data by EPA, in the year 2010, 25% of the greenhouse gas has been emitted by burning coal, natural gas and oil for electricity and heat production around the world.

Coal is a carbon intensive fuel and it emits 1.7 times more carbon per unit of energy generation when burned as natural gas and 1.25 times as oil. The pollutants released from those power plants are not only harmful to humans and environment but also has long term implications such as global warming, contributed by gases like carbon dioxide, carbon monoxide. As per April 2016 report from CEA, 60% of our energy basket is made up of coal.

Power Plants: Coal mining damages the natural ecosystem of an area. It releases gases such as Carbon dioxide (CO_2), sulphur dioxide (SO_2) and Methane (CH_4)into the atmosphere. Pollutants from the power plants comes out in the form of flue gas, fly ash and bottom ash. The composition of pollutants from thermal power plants include Carbon dioxide, Oxides of Nitrogen (NO_x), sulphur dioxide (SO_2), ozone, carbon monoxide (CO), heavy metals such as mercury, lead, arsenic and negligible amounts of few other metals.

Effects on health : Particulate Matter (PM) is a term for mixture of solid particles and liquid droplets -e.g. dirt, dust and soot orsmoke 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. (to be continued)

Take advantage of daylight by using light-coloured, loose-weave curtains on your windows to allow daylight to penetrate the room. Also, decorate with lighter colours that reflect daylight.

GOVERNMENT TELLS THERMAL POWER PLANTS TO REDUCE WATER USAGE

Thermal power plants are water guzzlers, consuming an average of 96,000 litres of water for every megawatt of power, and the government wants to cut this down as it contemplates the possibility of excessive dry summers and dwindling water levels in rivers in coming years.

The ministry of environment has asked all proposed thermal power plants to use at least 30% less water than the existing ones, and told operating plants to reduce their water usage by at least 10%.

Power plants draw water from rivers to cool equipment and contain fly ash, the burnt coal, and then discharged it back into the river. "Water needs to be made available to be used by power plants in the first place. If rivers run dry, plants will have to switch off generation. Further with large number of thermal power plants being planned in clusters, the volume of water available in an area will start to compete with agriculture," said a senior power sector official who requested not to be named.

A Khurana, general secretary at Association of Power Producers, said, "The ministry's norms, which will have to be complied by December 2017, will require all plants to put up cooling towers that would reduce water consumption. However, there is a cost involved, which would increase power tariff." According to Central Electricity Authority, thermal power plants are already facing difficulties due to non-availability of water, particularly in coal-bearing states like Odisha, Jharkhand and Chhattisgarh.

Power sector officials said this year at NTPC's Farakka thermal power station all units except one had to be shut down due to unavailability of water from Bhagirathi river. Thermal power plants at Karnataka and Maharashtra also had to be shut to water availability.

ET, April 14, 2016

INDIA TO STOP THERMAL COAL IMPORTS; SAVE RS 40,000 CRORE

In view of rising production of the dry fuel, India plans to completely stop thermal coal imports in 2-3 years that would result in annual savings of Rs 40,000 crore, Union Minister Piyush Goyal said.

Coking coal, however, would need to be imported, the Coal and Power Minister said at the maiden Maritime India Summit here, adding that his Ministry was ready to tie up with Indian shipping companies for this purpose. Record coal production by the world's largest coal miner CIL, helped India reduce its import bill of the dry fuel by more than Rs 28,000 crore in the last fiscal. He said his Ministry was ready to enter into pacts with Indian shipping companies for import and transportation of coal.

"This is the time for Indians to buy ships, to invest in infrastructure. This is the time for Indian shipping companies to own ships. I am happy to do long term contracts with Indian shipping companies to transport our coal. Why don't we have a long-term contract," he said.

Goyal also proposed setting up a small private equity fund that would be handled by an international fund investor expert.

"We can have some base capital of about USD 250 million and this fund can provide equity to various organisations undertaking logistics through coastal shipping and inland waterways," he said. Goyal said if PSUs as well as the ministries of power, coal and others contributed to this, it will give confidence to the private sector to participate in this initiative.

"We could also raise about Rs 4,000 crore from international investors," he said. Goyal said government is committed to ramping up Coal India Ltd's production to 1 billion tonne by 2019.In 2015-16, the 'Maharatna' achieved a record production of 536 MT, which was 42 MT more than the previous fiscal. Its production grew by 8.5% year-on-year. CIL, which accounts for over 80% of the domestic coal production, was however eying 550 MT in 2015-16. Goyal said the Petroleum Ministry, along with players like GAIL and Petronet should collaborate with the Power Ministry for entering into long term contracts to ensure supply of gas to nearly 24,000 MW projects. "Currently we have 24,000 MW of gas-based projects and we have a stock that will be sufficient till March 2017. But after that I am looking at around 70-80 mmscfd of gas for Indian power plants alone.

"So I have been talking around with countries like Australia, the US to see if we can get long term contract and to look at end to end contract tied in or hedged in at a fixed price which keeps the power cost affordable," he said.

Goyal said that affordability of power is important and if gas comes at more than USD 6, then it will not be affordable. (ET, 15 April, 2016)

China Pulls Emergency Stop on Coal Power Construction

China's central government has ordered local authorities to delay or cancel construction of new coal-fired power plants, as regulators attempt to reduce a glut in capacity, just one year after decisions were delegated to the provinces.

The National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) have ordered a halt to construction of coal-fired plants in 13 provinces where capacity is already in surplus, including major coal producers such as Inner Mongolia, Shanxi, and Shaanxi. A further 15 provinces will be required to delay construction of already-approved plants.

Harsh punishments have been threatened for construction that goes ahead in breach of the new regulations. Operating licenses will be denied, connection to the power grid blocked, and financial institutions will halt lending to transgressors.

The curbs come as Chinese government departments are asked to make rapid policy adjustments in response to slowing electricity demand, as the country shifts towards a less wasteful and less energy-intensive economy, and aims to reduce the amount of coal power generation.

China's central government decided early last year to decentralize the authority to approve environmental impact assessments on coal projects starting from March 2015 onward.

But the problem goes back further, say analysts, pointing to the Chinese economy's addiction to debt-fuelled capital spending.

"The document shows the government has realized how serious the overcapacity issue is, and that decisive measures need to be taken to solve it," Song Ranping, developing country climate action manager at the World Resources Institute (WRI), told china dialogue.

"The government now needs to make sure this is implemented and evaluate how successful the measures are, so that controls can be further tightened if necessary," he added.

Central and local governments need to address issues such as oversupply at an earlier stage, Song said. He pointed to the need for an "early warning mechanism" that flags local decisions that exacerbate the surplus.

A clear price signal that a surplus of coal-fired power is uneconomic is lacking in China, because the country's power tariffs are state controlled. That means energy producers still receive a good price despite the oversupply.

The communique issued last week by the NDRC and the NEA comes in the wake of announcements made at China's twin legislative sessions in March and in the country's13th Five-Year Plan, which placed a strong emphasis on greener, smarter economic growth.

To put this into effect, the NDRC and NEA are imposing strict controls. Provinces with too much electricity are, in principle, not supposed to add extra coal-fired capacity, while those with power shortages are to give preference to non-fossil fuel generation and keep new coal-fired generation to a minimum. Thermal generating units that do not meet efficiency or environmental, safety, or quality standards are to be gradually phased out. The measures will most likely apply to facilities that have operated for 20 years or more.

A sharp fall in the amount of hours that coal-fired power stations operate has underlined the major surplus in China's electricity supply.

According to data published by the NEA in January, the average coal-fired power plant was in use for 4,329 hours in 2015, a new 69-year low.

The industry regards over 5,500 hours of operation as an indication that electricity is in short supply. Under 4,500 hours means an electricity surplus.

Vested Interest: The NEA calculates that no more than 190GW of additional coal-fired generation is needed before 2020, yet 300GW of capacity has been approved or is under construction—far more than demand warrants.

Despite overcapacity and falling profits, enthusiasm for building new coal-fired power plants remains strong due to vested interests, the relatively high initial costs of renewable energy investment, and continued demand from industries that rely on coal power, such as cement, steel, base metals, and chemicals. According to the CEC, 22.28GW of new capacity was built in the first two months of 2016, 13.95GW of which, over 60 percent, was thermal coal power.

Paris Climate Agreement

This trend is clearly at odds with what China needs to do to meet its commitments under the Paris climate agreement, in which the world's largest energy consumer has agreed to peak carbon emissions by 2030 or before.

This will require a decisive shift away from coal and towards renewables, a transformation that will depend on China's grid giving greater priority on the grid to solar and wind to displace coal, and augment hydro's share of non-fossil fuel generation.

(Chinafile, 8, April, 2016)

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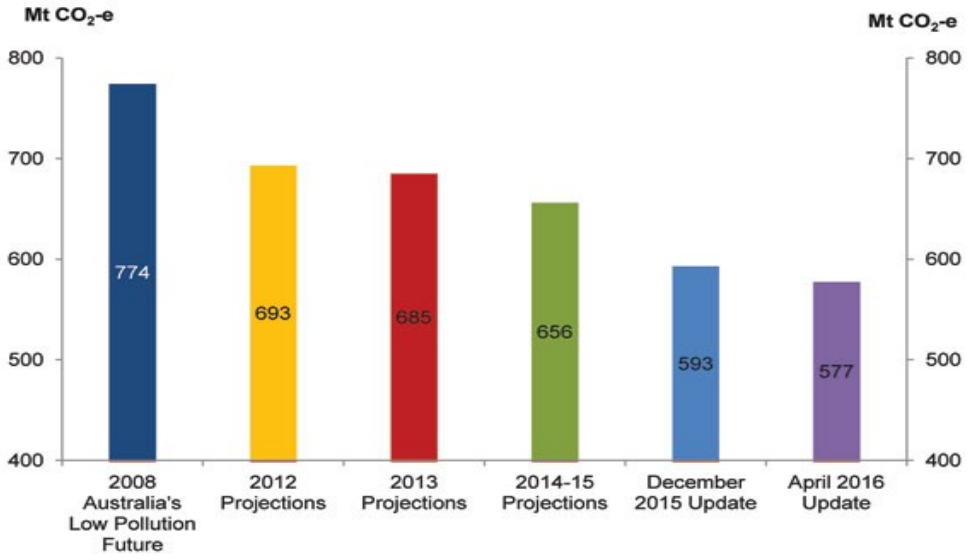
30 years of CAG
Citizen consumer and civic Action Group

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.

PROJECTED CO2 EMISSIONS IN 2019–20, AUSTRALIA



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