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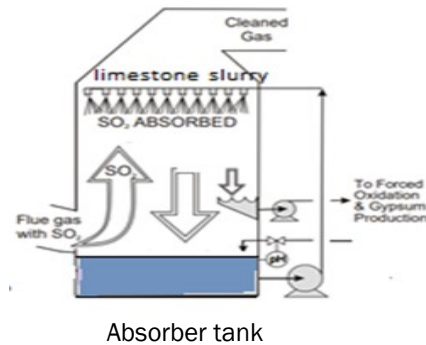
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METHODS OF REDUCING SULFUR OXIDE FROM POWER PLANT - 2

Flue Gas Desulfurization (FGD):

Oxides of sulfur is one of the main pollutant of thermal power plant, which makes its minimization in atmosphere important. Sulfur dioxide is responsible for formation of [acid rain](#), to limit the emission of sulfur from the power plants environmental protection regulations were enacted for industries. There are different methods available for the reduction of SO_x in the atmosphere but most thermal power plant prefer Flue Gas Desulfurization (FGD). [Flue gas](#) is the exiting gas from the furnace via pipelines or channels to the atmosphere. The main aim of FGD is to remove SO_x from the flue gas before it releases to the atmosphere.



FGD system can be of 2 types: Dry scrubber and wet scrubber as per the use of dry or wet sorbent.

Most of the FGD system uses Wet scrubbers for better result. In wet scrubbers the surface of contact between sorbent and flue gas is large, when compared with dry scrubber. There are a number of wet scrubbers used in FGD; such as spray tower, packed towers, venturi scrubbers, tray towers. These scrubbers inject liquid limestone to the inlet flue gas to remove SO₂. SO₂ reacts with the limestone to produce gypsum, which can be removed from the bottom of the FGD system. This kind of FGD use recirculation method for 95% removal of SO₂ from Flue gas.

Continuous emission monitoring systems will be used at the inlet and outlet of FGD to monitor SO₂ removal from Flue gas. Gypsum produced from the FGD system is nearly identical to the mined natural gypsum and provide a wide range of [environmental friendly application](#).

Removal of oxides of sulfur from flue gas have been studied over 150 years and the methods were practised thoroughly. [FGD](#) system along with pure limestone sorbent can increase the removal percentage of SO₂ from the Flue gas for conventional coal based thermal power plant.



‘WATER SCARCITY MAY HIT THERMAL POWER’

India's thermal power plants, about 90% of which rely on fresh water for cooling, risk facing serious outages because of shortage of water, according to a new report by the World Resources Institute (WRI).

Between 2013 and 2016, 14 of India's 20 largest thermal utility companies experienced one or more shutdowns due to water shortages, the WRI said, and calculated that this cost the power producers more than ₹91 billion (\$1.4 billion) in potential revenue from the sale of power.

"India lost about 14 terawatt-hours of thermal power generation due to water shortages in 2016, cancelling out more than 20% of growth in the country's total electricity generation from 2015," the report's authors wrote. About 40% of the country's thermal power plants are facing great stress in terms of water availability, according to the report, defines water stress as the ratio of total water withdrawal over available supply.

According to the report, not only does high water stress result in equipment shutting down, it also results in a lower level of efficiency when it is running.

"Freshwater-cooled thermal power plants that are located in high water-stress areas have a 21% lower average capacity factor, compared to the ones in low and medium water-stress areas," the WRI said.

The WRI's report predicts that this problem is set to worsen as India's thermal power sector expands and demand for water from other sectors increases. It says that by 2030, 70% of India's thermal power plants are likely to experience increased competition for water from agriculture, industry and municipalities.

Significantly, the study found that water stress often occurs in places with abundant water supplies.

"We also found that, even in water-abundant or low water-

stress regions, thermal plants can still face water shortage-related risks during droughts or when monsoons are delayed. Some of those plants — for example, Farakka, Raichur, and Tiroda — experienced significant, if not the biggest, disruptions in generation caused by water shortages," the WRI report's authors said.

"Our lack of knowledge about how much water India's power sector is using makes the problem harder to solve," Ivaturi N Rao, Head, Corporate Environment & Climate Change for Tata Power, was quoted as saying in the report. "The Government of India has recently mandated limits for specific water consumption at thermal power plants, which is a critical step forward. However, they should also create policy incentives for water conservation. This will help encourage water efficiency and innovation across the power sector."

[The Hindu](#) January 16, 2018

Vindhyachal Thermal Power Station in the Singrauli district of Madhya Pradesh, with an installed capacity of 4,760MW, is currently the biggest thermal power plant in India. It is a coal-based power plant owned and operated by NTPC.

HOUSEHOLD BURNING, COAL COMBUSTION BEHIND 75% DEATHS

Exposure to household burning emissions and coal combustion were the main reasons behind 75 per cent of air pollution related deaths in India in 2015 which came chiefly from rural areas, reveals a report.

The report, by experts from the Indian Institute of Technology (IIT)- Bombay and the US-based Health Effects Institute, found that residential biomass fuel burning contributed to some 268,000 deaths in 2015 and coal combustion from both thermal electric power plants and industry contributed to 169,000 deaths.

Anthropogenic dusts contributed to 100,000 deaths; agricultural burning to 66,000 deaths; and transport, diesel, and kilns were behind over 65,000 deaths in India.

"This systematic analysis of emissions from all sources and their impact on ambient air pollution exposure found significant contributions from regional sources (like residential biomass, agricultural residue burning and industrial coal), underlying that from local sources (like transportation and brick kilns)," said Chandra Venkataraman from IIT-Bombay.

The premature mortality, attributed to air pollution, contributed to over 29 million healthy years of life lost. Overall, air pollution contributed to nearly 1.1 million deaths in 2015, with the burden falling disproportionately (75 per cent) on rural areas.

The 2017 Global Burden of Disease identified air pollution, both outdoors and in households,

as the second most serious risk factor for public health in India, after malnutrition, contributing to 6.4 per cent of all healthy years of life lost in 2016.

This new study provides the first comprehensive assessment conducted in India to understand exposures at national and state levels from all major sources of particulate-matter air pollution (particulate matter with an aerodynamic diameter of less than 2.5 µm, or PM2.5).

It takes advantage of enhanced satellite data and India's growing network of air pollution monitors, and is the first to estimate the exposure from different air pollution sources state by state throughout India.

[Times now](#) January 16, 2018

US ENERGY OFFICIAL SAYS ‘WAR ON COAL’ HAS PUT NATION AT RISK

US Deputy Secretary of Energy, Dan Brouillette, on January 13 lashed out at what he described as the “war on coal” in the United States which, he said, had thwarted the construction of clean power plants, discouraged investments in new mining operations, and, as a result, put the nation at risk.

Nothing that coal and nuclear account for more than half of the total grid energy in the United States, Brouillette said: When a crisis strikes our grid these two fuels are some of the most reliable that we have. They are available 24x7 to keep the lights on and disaster away.

So, clearly, fewer coal and nuclear plants mean that the lights will go out and stay out when we face our next emergency.

From the functioning of our hospitals to the maintenance of our military assets, the results could be catastrophic, he warned.

Brouillette spoke on the second and final day of the Atlantic Council’s Global Energy Forum in Abu Dhabi.

He was introduced by retired Gen. James L. Jones, Jr., interim chairman of the Atlantic Council.

Brouillette said that the “regulatory war” on coal and nuclear fuels “has been long and tough and it has distorted the marketplace for both coal and nuclear in the United States.”

Past US leaders and policymakers, he said, had imposed price controls on oil and gas that led to production declines and artificial shortages.

Furthermore, he said, in the name of protecting the environment, they played energy favorites—subsidizing some sources while burying coal and nuclear under an avalanche of regulation.

They chose to regulate rather than innovate their way out of

America’s energy dilemmas,” he said. US President Donald J. Trump’s determination to include coal and nuclear in his “all-of-the-above strategy” will help reduce the risk posed by past policies, he added.

Trump, Brouillette pointed out, has signed off on the construction of several new energy pipelines, halted “draconian” oil and gas regulations, signed legislation repealing the rule that hindered coal development, and is working to reinvigorate the nuclear energy sector. Early in January, the Republican-controlled Federal Energy Regulatory Commission (FERC) dealt a setback to Trump’s plans to boost the coal industry when it rejected the administration’s goal of bolstering coal-fired and nuclear power plants.

FERC also noted in its decision that despite claims by the Trump administration to the contrary, there is no evidence that any past or planned shutdowns of coal-fired power plants posed a threat to the nation’s electric grid.

While Brouillette did not address FERC’s decision in his remarks on January 13, in a panel discussion at the Global Energy Forum on January 12 he said he did not view the decision as a setback.

As a matter of fact, he said, FERC had pledged to conduct its own review of grid resiliency.

Brouillette, meanwhile, cited a report produced last year by the Department of Energy on America’s grid and its power supplies that he said found “coal and nuclear power plants were being retired at a disturbing rate.”

The United States has become a leading global energy exporter as a result of an energy revolution in the country. This has turned the domestic energy paradigm on its head

and caused ripple effects in international oil and gas markets as well as in the security paradigms of this century, said Jones.

Brouillette recalled the United States’ remarkable journey to becoming a global energy player and said it was now on its way to achieving what Trump describes as energy dominance.

“Why is America suddenly emerging as an energy player beyond its borders? The reason is this: after a long drawn out battle between innovation and regulation in my country, innovation is finally winning,” he said.

Innovation has spurred a technology revolution which has led to an “astonishing renaissance” in American energy, he added.

Brouillette rejected the notion that a nation can only benefit at another nation’s expense. “So, when you do business with America on energy know that we will use our energy resources to advance our shared aspirations and goals,” he told the audience that included global energy policymakers.

The most important lesson to be learned from the United States’ experience is: “for any nation that seeks to produce energy cleaner, more abundantly, more affordably, more efficiently, and in more diverse forms, it must allow innovation to work its magic,” he said.

There is one critical piece of the energy puzzle necessary for any nation to achieve energy security, he added. “That final piece is reliability.”

[Atlantic Council](#) January 13, 2018

World coal production fell by 6.2%, or 231 million tonnes of oil equivalent (mtoe) in 2016, the largest decline on record.

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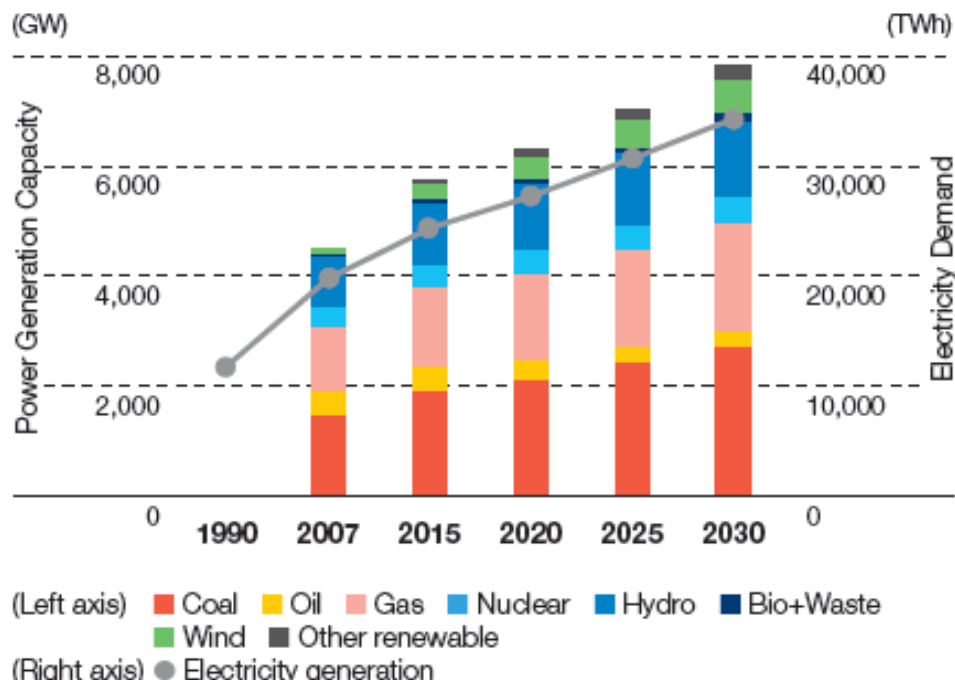
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Citizen consumer and civic Action Group (CAG) is a non-profit, non-political and professional organization that works towards protecting citizens' rights in consumer and environmental issues and promoting good governance processes including transparency,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

ESTIMATED POWER GENERATION CAPACITY BY POWER SOURCE



REGULATIONS AND CASES

- Tanaji Gambhire Vs Union of India & Ors "Demolition of illegal structures and payment of environmental compensation", *Review application No. 35 OF 2016 IN Original application No. 184 OF 2015*, 08th January 2018, [Click here](#)
- Central Pollution Control Board, (2017). *Guidelines on dust mitigation measures in handling construction material and C&D wastes*. [online] New Delhi Available at: [Click here](#) [Accessed 5 Feb 2018]

PUBLICATIONS

- World Resource Institute, International Renewable Energy Agency, (2017). *Water use in India's power generation: Impact of renewables and improved cooling technologies to 2030* [online] Available at: [Click here](#) [Accessed 5 Feb 2018]
- Yague, S. et al., (2018). *Coal-Mining Tailings as a Pozzolanic Material in Cements Industry*. *MDPI* [online] 8 (46) Available at: [Click here](#) [Accessed 6 Feb 2018]

MISCELLANEOUS

- 8th World Petro Coal Congress and Expo-2018 during February 15-17, 2018 being held at Convention Centre-NDCC, Parliament Street, Opposite Jantar Mantar, New Delhi, India. [Click here](#)
- ICTPPGT 2018 : 20th International Conference on Thermal Power Plants, Generation and Transmission during March 15-16, 2018 being held at London, United kingdom. [Click here](#)