Dependence on Scarce Water Puts Indiaâ€™s Electricity Supply at Risk

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New analysis finds over one third of India's thermal power generation faces high water risk

Although thermal power plants generate most of India's electricity, they are not required to disclose how much wa ter they consume. A new paper from the World Resources Institute (WRI), "Parched Power: Water Demands, Risks and Opportunities for India's Power Sector", analyzes all of India's 400+ thermal power plants and finds that India's power supply is increasingly in jeopardy due to water shortages, costing power generation and revenue.Â Using a new methodology that WRI developed, researchers discovered that 90% of India's thermal power plants depend on freshwater for cooling. This is significant because thermal power plants - which include coal, solar thermal, geothermal, waste incineration, petroleum and some natural gas power plants - generate almost all of India's electricity. Combining this with WRI's Aqueduct water risk analysis, the researchers found that nearly 40% of India's freshwater-dependent thermal power plants experience high water stress. These plants are increasingly vulnerable, amidst India's ongoing commitment to expanding electricity access for all.Â "Water shortages shut down power plants across India every year,"Â said O.P. Agarwal, CEO, WRI India.Â "When power plants rely on water sourced from scarce regions, they put electricity generation at risk and leave less water for cities, farms and families. Without urgent action, water will become a chokepoint for India's power sector."

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The Indian energy sector's dependence on increasingly scarce water resources has serious consequences. Between 2013 to 2016, 14 of India's 20 largest thermal utility companies experienced one or more shutdowns due to water shortages. WRI calculates that shutdowns cost these companies over INR 91 billion ($1.4 billion) in potential revenue from the sale of power. And water shortages canceled out more than 20 percent of India's growth in electricity generation between 2015 and 2016. This problem is only set to worsen as India's thermal power sector expands and competing water demands increase. Parched Power shows that by 2030, 70% of India's thermal power plants are likely to experience increased competition for water from agriculture, industry and municipalities."Our lack of knowledge about how much water India's power sector is using makes the problem harder to solve,"Â said Dr. Ivaturi. N. Rao, Head-Corp. Environment & Climate Change for Tata Power, India's largest integrated power company.Â "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."Â The power sector's dependence on limited water resources also carries risks for investors.Â

The report offers solutions: mandate disclosure of water usage data; implement advanced cooling technologies; improve plant efficiency; and shift toward solar and wind energy. Current regulations by the Ministry of Environment, Forests and Climate Change (MOEF-CC) and the Ministry of Power (MoP) call for increases in plant efficiency and set maximum bounds for water intensity, which should be enacted and enforced. India already has a robust target that 40% of its power supply will come from renewable sources by 2030, under the Paris Agreement on climate change. WRI found that meeting this target, along with implementing proposed efficiency mandates, can save India's power sector 12.4 billion cubic meters of freshwater withdrawals. By prioritizing solar photovoltaic and wind energy in areas of high water stress, India can boost its resilience, save water, and reduce carbon.Â "Renewable energy is a viable solution to India's water-energy crisis,"Â said Deepak Krishnan, Manager, Energy Program, WRI India and co-author of the report.Â "Solar PV and wind power can thrive in the same water-stressed areas where thermal plants struggle, so accelerating renewables can lower India's water risk while meeting our NDC."

The paper was released today during Abu Dhabi Sustainability Week at the World Future Energy Summit.

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