

KHURJA COAL PLANT UNVIABLE; SOLAR PROJECT WOULD BENEFIT REGION MORE

Introduction:

The 1320 MW Khurja Supercritical Thermal Power Plant proposed in the Bulandshahr district of Uttar Pradesh, which falls within the National Capital Region was proposed in 2010.

THDCIL, formerly known as Tehri Hydro Development Corporation Ltd, is a 75:25 joint venture between the Central and Uttar Pradesh governments.

While coal-fired power generation is still growing in India, the Central Electricity Authority has estimated that all coal-based thermal power plants need to brace for drastic fall in capacity utilisation to as low as 56.5 per cent by 2022 as additional non-thermal electricity generation capacities come on stream. The Central Electricity Authority (CEA) in its National Electricity Plan released in 2018 states that 47GW of coal plants currently under construction which will be utilised beyond 2022. As a result, many plants may get partial or no schedule of generation at all – meaning many thermal power plants may have to be kept idle for lack of demand.

Cost competitiveness of Khurja vs alternatives:

The total investment in the Khurja project is estimated at of Rs 12,676 crore, which includes Rs 11,089 crore on power plant and Rs 1,587 crore for development of Amelia coal mine in district Singrauli in Madhya Pradesh. The Amelia coal mine was allocated by central government in January 2017 to meet the fuel requirement of the Khurja plant. THDCIL plans to develop the mine in synchronisation with the commissioning of the plant.

While the plant may have seemed financially viable at the time it was first proposed, India's energy sector has changed drastically in the last few years, and the cost of solar PV and wind electricity has fallen well below that of coal based power.

Earlier this year, solar tariffs hit an all-time low of Rs.2.44 per unit, for a 2,000 MW project auction by Solar Corporation of India. It was the third time a project has been auctioned at this tariff in the country. While the highest solar tariffs have been between 2.95 and 3.54 per unit, the trend is towards an average of 2.5 to 3.00 per unit.

In comparison, coal power from Khurja will cost more than Rs 4.50/KWh, with some estimates pegging the figure at Rs 5.67/KWh. At these tariffs, the Khurja Thermal Power Plant will be unable to compete with solar and wind power from the very first year of its operation. A report titled, 'The Khurja Thermal Power Project: A Recipe for an Indian Stranded Asset', by the Institute for Energy Economics and Financial Analysis (IEEFA) recommends that the 1,320 MW proposal should be re-evaluated due to its lack of financial viability.¹

¹ http://ieefa.org/wp-content/uploads/2018/10/Khurja-Thermal-Power-Project_10.2018.pdf

Given the dramatically reduced cost of renewable energy in the country, Greenpeace India recommends that solar/wind/hybrid projects are in the better interest of the country and of project promoters and investors, as opposed to building new coal plants such as Khurja.

Using Khurja as an example, this briefing starts to explore what such a conversion would entail in terms of investment required, return on equity, electricity generation and employment delivered and avoided pollution.

A 'Khurja' Sized Solar Installation:

The land made available² to Khurja is 1,200 acres for the power plant in Bulandshahr, Uttar Pradesh and close to 3,378 acres for mining in Amelia, Madhya Pradesh. Of course, solar cannot be installed on a coal mine, and we are not suggesting that forest land be cleared for renewable energy technologies.

The 1,200 acres allotted to the power plant alone has a solar potential of 240 MW. A project with an equivalent land footprint (3378 acres for the mine) in a non-forest area would be able to host an additional 675 MW, taking the total capacity from a Khurja-sized project to 915 MW.

Electricity Generation: A solar plant of this size would generate about 1,465 million units of electricity annually, and offset a significant 1.2 million tonnes of CO₂ annually.

Employment Potential: According to an NRDC report³ on employment potential in the solar sector in India (for project sizes greater than 25 MW), an estimated 8,341 jobs could be created by a Khurja-sized solar project, including the project development phase, O&M phase and allied sectors.

Financial Metrics: The cost for a 915.6 MW solar PV plant is estimated at around 3,204.6 Cr (at 3.5 Cr per MW) - a stark difference in price compared to thermal power.

Assuming the project is funded by a 80:20 mix of debt-equity (2563.6 Cr debt, 641 Cr equity) and assuming a PPA rate of Rs. 2.75/KWh, which is the current average price discovered at reverse auctions, the annual revenue starts at Rs.410.70 Cr.

Factoring in O&M and Interest costs, the IRR generally comes to around 20%.

Assuming a PPA of Rs. 2.5/KWh would see the IRR at 12%.

Pollution and Health: Moreover, emissions from coal power plants are now widely recognised in the scientific community as one of the primary sources of air pollution, which is leading to

² http://forestsclearance.nic.in/writereaddata/FAC_Minutes/10119125212141Minutes20thSep2018.PDF

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<http://shaktifoundation.in/wp-content/uploads/2014/02/NRDC-CEEW-Report-India-CleanEnergyJobs-Feb-20151.pdf>

more than one lakh deaths annually in India.⁴ A recent study pointed out that India has three of the world's largest NO₂ hotspots; Sonbhadra-Singrauli in Madhya Pradesh, Talcher-Angul in Odisha and Delhi-NCR.⁵ *It is not a coincidence that these areas lie in the coal belt in Northern India, and that 2 of these 3 hotspots are close to the proposed mine and plant.*

According to the EIA report prepared by the project proponent, Khurja Power Plant will result in addition of 5.06 µg/m³ of SO₂, 5.06 µg/m³ of NO_x and 1.51 µg/m³ of PM₁₀⁶ which will add on to the already highly polluted region of Delhi-NCR and Khurja. Average PM₁₀ concentration recorded for October 2018 by Uttar Pradesh Pollution Control Board for Khurja at two existing station is already 208 µg/m³⁷ which is two times higher than the daily NAAQS, more than three times the annual NAAQS and 10 times higher than the WHO annual guidelines of 20 µg/m³⁸.

A recent study conducted by researchers from ICMR (Indian Council of Medical Research), AIIMS (All India Institute of Medical Sciences), along with several central government ministries, national and international researchers and institutes has highlighted *Uttar Pradesh as the state with the maximum number of deaths due to air pollution, with more than 260,000 deaths only in 2017.*⁹

Another recent study and Air Quality Life Index developed by team at University of Chicago's Energy Policy Institute (EPIC)¹⁰ calculated the effect of air quality on life expectancy and found that people living in Bulandshahr district of Uttar Pradesh with the proposed Khurja power plant had the highest number of years of life lost at 11.1 years against 10.2 years in Delhi¹¹. Although the years of life lost as a number can be debated but the fact that *Bulandshahr is one of the most polluted geographies in India and setting up a new pollution source here can only worsen the situation.*

Given the alarming nature of air quality in the region, the question of setting up new polluting industries in the area should not even arise, until air quality shows significant improvement to healthy levels.

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<http://cat.org.in/wp-content/uploads/2017/03/Coal-Kills-An-Assessment-of-Death-and-Disease-caused-by-Indias-Dirtiest-Energy-Source.pdf>

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<https://economictimes.indiatimes.com/news/environment/pollution/india-home-to-3-of-the-largest-no2-emission-hotspots-greenpeace/articleshow/66420596.cms>

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<http://www.environmentclearance.nic.in/writereaddata/EIA/071220166HP7XLOZKhurjaSTPPEIARepor.pdf>

⁷ http://www.uppcb.com/air_quality_oct2018.html

⁸ [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)

⁹ <https://www.thelancet.com/action/showPdf?pii=S2542-5196%2818%2930261-4>

¹⁰ <https://aqli.epic.uchicago.edu/the-index/>

¹¹ https://twitter.com/EPIC_India/status/1064798188584886272

Conclusion:

Not just in view of cost competitiveness, but also in view of the environmental impact of mining in India's oldest sal forest and the air pollution crisis in Northern India, especially the Delhi-NCR region - the Khurja Supercritical Thermal Power Plant is not a sound investment.

Far better energy options are available. Given the financial situation and NPA crisis in the country, scarce resources are better directed towards cheaper energy projects that avoid collateral social and environmental impacts, while also facilitating the inevitable energy transition away from fossil fuels.