

THE IMPACT OF CLIMATE CHANGE ON PEAK ELECTRICITY DEMAND IN INDIA

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ABSTRACT

Available evidence suggests that the electric sector is highly sensitive to climate change. While empirical literature largely focuses on the impact of temperature fluctuations on overall consumption, there is limited and emerging literature on the effect of extreme temperatures on peak demand, which is the highest load observed during a given period of time. For a developing country like India, assessing such relationships has significant policy implications by providing information about the capital investments needed to augment generation capacity and the larger picture on the future costs of climate change.

This paper uses high frequency multi-year state level data to estimate the relationship between peak electricity demand and temperature in India. Using time series regression models, the study shows that mean temperature is a key driver of peak electricity demand for Indian states. The resulting temperature-load response curves show that there will be region-specific polarization of electricity demand, suggesting that climate response must also be regionally calibrated.