

Employment and GHG Emission Effects of Grid Connected Solar PV Deployment in India: A Multiregional Input Output (MRIO) based Analysis

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There has been prevalence of differentiated incentives for solar power projects utilizing domestically produced solar panels (DCR) from those using imported solar panels in India. The recent WTO ruling against Indian solar DCR content urges a need for comprehensive assessment of economic, environmental and social impacts of the two modes of solar deployment categories thus better understanding effectiveness of DCR as policy instrument for leveraging the green growth opportunities implicit in the existing ambitious solar scale up target for India.

This paper constructs a multiregional input output model for two categories (DCR & Open to import) of solar deployment in India and studies economy wide employment and emission impacts transacting across economies. The analysis involves estimation of GDP, employment generation, distributive efficiencies of wage generated and embodied GHG emissions of the solar deployment process in India and economies of China and Germany, that substantially contribute to imports associated with solar deployment in India.

The results show that gross GHG emissions associated with DCR based solar deployments is 58.2 % higher to the open category deployment however emission coefficient of associated GDP generation (KT of CO₂/ unit of GDP) is only marginally high for DCR deployments (2.04%). The results also show that domestic manufacturing leads to greater high skill wage generation in high tech industries for India when compared to imported panel deployment. The wage generation for Germany lies predominantly in medium and high skill sector while China generates predominantly medium and low skill labour in the deployment process.

The positive trend of moving towards greater high quality jobs in India as demonstrated by the domestic manufacturing option indicates a possibility to move up the value chain but the condition of greater GHG emissions accentuates the Development-Environment paradox for India as an emerging economy.

The paper thus highlights a strong case for interventions towards facilitating appropriate and affordable technology transfer for enhancing process efficiency so as to not only avoid suboptimal lock-ins of global resources but also establish socially optimal solutions for energy transitions in developing economies.