Energy, emissions, and economy-wide impacts of coupled energy efficiency and renewable energy Measures

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As India moves toward meeting its Intended Nationally Determined Contributions (INDCs) to emissions, policymakers have to choose among alternative policy options. The investment in renewable energy continues to be the primary choice. Energy efficiency is relegated to second place, as savings are not visible and its economy-wide impacts are difficult to estimate. The debate on the choice between energy efficiency and renewable energy is far from settled, however, and decisions continue to be made without empirical evidence to support one over the other.

This paper estimates the reduction in energy consumption, emissions, and economy-wide impacts on employment and income over time due to the promotion of efficient household appliances in India. We then estimate the investment (and associated emissions) required to meet the equivalent energy demand through conventional and renewable sources if the energy efficiency measures were not deployed.

This method helps to quantify the monetary and environmental benefits of efficiency improvement programs in relation to other popular choices. The impacts of these alternative policy scenarios are estimated based on their economy-wide impacts using a coupled input-output econometric framework of the newly developed E3-India model. The model captures the relationship between the economy, energy, and emissions, covering 20 economic sectors and 5 income quintiles for India's 28 states.