

**Gupta, Dipti**; Indian Institute of Management Ahmedabad

diptig@iima.ac.in

Authors:

**Title: Achieving sustainable development in India along the low carbon pathways:**

**Macroeconomic assessment**



In the rapidly growing Indian economy which is predominantly fuelled by fossils, achieving fast economic growth and GHG mitigation targets concurrently will have wide ranging implications, which we intend to examine in this paper. India faces high income inequality with bottom 50% of population owning only 2% of total national wealth. There are other developmental challenges like almost 300 million people are living in poverty and are not having access to electricity, 92 million do not have access to safe drinking water, and around 2 million are homeless. On the other hand, India has committed to reduce the GHG emission intensity of its GDP by 33-35% by 2030 from 2005 levels, and 40% power generation capacity using non-fossil sources by 2030. For exploring the macroeconomic consequences of achieving development along the low carbon pathways, we use a hybrid modelling architecture that integrates the strengths of the AIM/Enduse bottom-up model of energy systems and the IMACLIM top-down economy-wide model. This hybrid architecture stands upon an original dataset that reconciles national accounting, energy balance and energy price statistics. Its macro-economic side takes into account the ‘second-best’ aspects of the economy that may pose obstacles to the transition, for instance, the regulated nature of many Indian markets. We find that yearly economic growth of 6.5% during 2015-2050 can be achieved through low carbon scenarios notwithstanding high investment costs. This result partly stems from the improvement in trade balance as the current huge deficit stems substantially from fossil fuel imports. However, significant change is observed in sectoral activity shares and household consumption pattern towards low-carbon products and services. These transitions would require policies to reconcile the conflicting interests of entrenched businesses in retreating sectors like coal and oil, and the emerging low-carbon sectors and technologies such as renewables, smart grids, electric vehicles, modern biomass energy, solar cooking, carbon capture and storage etc. Our findings suggest that the policies promoting investments in green technologies will aid economic growth in the long run.