



MAJOR ECONOMIES AND CLIMATE CHANGE RESEARCH GROUP

# INDIA

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## EXECUTIVE SUMMARY

As a rising economy and growing contributor of greenhouse gas (GHG) emissions, India faces the challenge of maintaining growth while simultaneously trying to reduce its emissions or, at the very least, slow the rate of growth in emissions. In order to overcome institutional barriers to lowering the carbon intensity of development, the Twelfth Five Year Plan emphasizes India's need to pursue low carbon strategies for inclusive growth. This report outlines some of these existing strategies in the sectors we have identified as priorities for emissions reductions, these being energy production, energy efficiency, and transport. These particular sectors were selected keeping in mind their current contributions to GHG emissions, abatement potential, and future anticipated rate of growth.

### ENERGY PRODUCTION AND EFFICIENCY

Coal is India's primary energy source, which is significant given that coal production in India has more than doubled in the last twenty years. India's National Action Plan on Climate Change (NAPCC) outlines strategies that include a shift to cleaner coal technologies and initiatives enabling the reception and uptake of renewable energy sources, like solar and wind.

India's vast population has driven its massive demand for electricity. Electricity is the main contributor within energy production and is also growing at a rapid pace, with 400 million Indians still to be connected to the grid. Inefficiencies in the current provision of electricity, primarily derived from coal, have led to high levels of GHG emissions in this sector. Improving efficiency standards and updating technology, both for coal and emerging renewable energy sources, will help reduce emissions from electricity production.

Key policy recommendations for the electricity sector include:

- Carbon capture and storage (CCS) for coal plants
- Expansion of nuclear power
- Continued expansion of policy instruments such as carbon trading and Renewable Purchase Obligations
- Expansion of solar and wind industries require greater incentives and a re-examination of domestic content requirement rules
- Land acquisition is another major barrier to expansion of renewables, and the recent law in this regard needs to be operationalized by working closely and winning the confidence of state governments and private sector

### INDUSTRY

The industrial sector is a key contributor of GHG emissions, with iron and steel and cement industries being among the largest single sectors with mitigation potential. The main barriers to achieving mitigation in these sectors are technical and financial. Recommendations include:

- Advanced processes such as FINEX and DRI need to be incorporated into the steel industry to achieve the needed efficiency gains
- Institutionalizing recycling programs are also crucial

- Clinker substitutes ought to be explored in cement production.
- Both sub-sectors would greatly benefit from the introduction of CCS technologies, although CCS in the industrial sector is still largely in the pre-demonstration stage across the world

## TRANSPORT

With the rapid urbanization experienced by India, transport is also a high-growth sector, with road dominating emissions. Road transport now contributes 87% of India's transport sector GHG emissions. India currently lacks the infrastructure for forms of mass transit that would relieve congestion caused by increased demand for some passenger vehicles and lower emissions. Additionally, implementation of India's fuel efficiency standards is not presently stringent enough to have a significant effect. Policy recommendations in this sector include:

- Vigorous implementation of emissions standards Bharat Standards III and IV
- Improved urban public transport, focusing on winning political support for lower-cost approaches such as Bus Rapid Transit (BRT) in cities
- Dedicated freight corridors along major routes
- Comprehensive re-examination of the flaws in the current public-private partnership (PPP) model in transport infrastructure to realize an optimal mix of participation

## GENERAL BARRIERS AND RECOMMENDATIONS

India must overcome the following barriers in order to reduce emissions from energy production, curb demand for carbon intensive transport and increase energy efficiency:

- Political fragmentation and lack of cohesive strategies with specific targets
- Monopolies in energy markets
- Major financing gap to achieve a low-carbon economy
- Lack of state and domestic private sector capacity for implementation of existing policies
- Major land acquisition challenges
- Disinclination to sign international treaties that would commit India to emissions reductions that might prohibit economic growth

All recommendations made in this analysis fit within the overarching goal of strengthening technical and enforcement capacity for India's National Climate Action Plan:

- Use the NAPCC as a broad framework, but develop specific localized action plans
- Focus on co-benefits of climate change policies, such as energy security and public health
- Seek external funding through funding mechanisms like the Clean Development Mechanism for energy-production and efficiency related projects
- Instill capacity for negotiating well-monitored and structured public-private partnerships like the UNFCCC's Green Climate Fund or the U.S. State Department's U.S.-India Partnership, keeping in mind that PPP initiatives need to be carefully designed to avoid failure