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## India's carbon target: Why, how?

December 13th, 2009  
 By Anishu Bharadwaj & Shuba V. Raghavan

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Tags: Carbon intensity, China, CO2 emissions, Energy efficiency, India France, Jairam Ramesh

As world leaders deliberate over global warming in Copenhagen, there is considerable acrimony at home on the recent statement by Jairam Ramesh, minister for environment, articulating a 20-25 per cent cut in India's "carbon intensity" by 2020. Opposition staged a walkout, there was a reported rift in the Indian negotiating team and several people questioned the basis for the Indian position. The general feeling is that India surrendered too much ground to the West without anything in return and that this policy would seriously undermine development and growth.

In the last several days in the media, "carbon intensity", the new jargon, has become almost as ubiquitous as Sehwag and Dhoni.

But what is the technical feasibility of reducing carbon intensity? All economic activity related to fossil fuels — such as coal, oil or natural gas — results in the emission of carbon dioxide (CO2). Carbon intensity is the total CO2 emissions of a country per unit of economic output (gross domestic product). Of course, the amount of CO2 emitted will vary according to the activity; for example, coal plants spew out more CO2 than gas plants, while wind turbines or solar power plants do not emit any. The carbon intensity of a country depends on several factors. First is the overall energy needed per unit of GDP. The second factor is the efficiency of energy generation and consumption.

Finally, the higher the percentage of fossil fuels in the energy mix the higher is the CO2 emitted. For instance, while highly polluting coal accounts for more than 50 per cent of electricity for both China and India, France derives more than 70 per cent of its electricity from nuclear power.

India presently emits about 1,400 million tonnes of CO2. Despite the government's recent announcement, emissions would still grow to about 2,500 million tonnes in 2020. However, in absence of this policy, the emissions would have been close to 3,000 million tonnes. So, the recent announcement would just slow down the growth of emissions. So, how do we realistically reduce carbon intensity?

Coal plants will continue to be the major contributor to electricity generation for India's foreseeable future. We could only marginally reduce the carbon footprint of coal plants with super critical boilers. The proposed nuclear expansion will take at least a decade. If India were to earnestly implement the recently announced ambitious solar mission with required investments and policies, it will still take more than a decade to attain the solar mission's target of 20,000 MW. Thus, CO2 reduction from power sector will likely be more visible after 2020.

Transportation, that accounts for about 11 per cent, of the total CO2 emissions has no easy solution. Bio-fuels would not be able to substitute oil beyond five per cent given India's food security constraints.

Since it is projected that over half of India's population will live in urban centres, the government has to invest heavily in mass transit, making the cities habitable while reducing CO2 emissions. This, again, is a slow process.

Energy efficiency provides better opportunity to reduce carbon intensity sooner at low cost. Indian infrastructure is poised for rapid growth and this should be designed in an energy-efficient manner.

For instance, recent cement and steel plants in India are among the most efficient in the world. The older, inefficient plants should either be modernised or rebuilt given what modern Indian plants here can achieve. Our electricity distribution network operates with about 30 per cent losses, which have to be brought down to world standards. Our new buildings have to be designed to be energy efficient. If mandated and properly implemented, India can reach the best practices and reduce CO2 emissions in this sector by 20-30 per cent by 2020.

All things considered the government's target of about 20 per cent cut in carbon intensity by 2020 appears achievable (though rather ambitious). It is important to realise that this could be achieved without an adverse impact on economic growth.

We should also think whether it is prudent to follow the Chinese model of energy-intensive growth. Is it advisable to build 50-100 coal power plants in a year as done by China? India has at best built 10 in a year. Can we afford to have the type of urban air pollution problems that China faces? Or the fact that a few thousand people die in coal mining disasters every year? Can't India chart out its own unique development trajectory and demonstrate that sustainable growth is not a cliché, but can be achieved. This is precisely the opportunity that lies ahead.

The government has taken a bold position commensurate with India's stature. However, this is just the beginning and a long road lies ahead. Implementing this is no easy task and requires meticulous planning and synchronised efforts by the Central and state governments. In the absence of proper implementation, these targets would only remain targets on paper.

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