

Understanding India's Climate Agenda

Noriko Fujiwara and Christian Egenhofer

Introduction

India has become an important partner for the EU in both multilateral and bilateral relations in a wide range of policy areas, including energy and climate change. Despite the strategic importance of this partnership, there may be insufficient awareness and understanding among EU stakeholders about India's development needs and challenges, its high degree of vulnerability to the impacts of climate change and the actions it has taken domestically and in international fora to address climate change. The country is among those rapidly and steadily growing economies with an increasing share of greenhouse gas (GHG) emissions, although it starts from a very low emissions base.

While India forms part of the BASIC group (i.e. Brazil, South Africa, India and China), its socio-economic parameters are much weaker than are those of the three other countries in the group. In a World Bank (2009) survey, India's total GDP in 2008 was about US\$1.2 trillion, which ranks it in twelfth place in the world compared with China's third place with US\$4.3 trillion. According to the UN Development Programme (UNDP, 2009), Indian per capita GDP (in terms of purchasing power parity or PPP) in 2007 was US\$2,800 compared with US\$5,400 for China and around US\$9,800 for South Africa and US\$9,600 for Brazil.¹ India is the fifth largest GHG emitter in the world, accounting for approximately 4.7% of total global emissions, while China has become the largest emitter with 23% of total GHG emissions.² In 2005,

¹ As the EU's poorest countries, the GDP per capita of Romania is US\$12,000 and that of Bulgaria stands at around US\$11,000.

² See the response by the Indian minister, Jairam Ramesh, in the Lok Sabha in "Minister of State of the Ministry of Environment and Forests (Shri Jairam Ramesh)", Fifteenth Session, Vol. V, Third Session, 2009/1931 (Saka), No. 10, 3

India's total GHG emissions was 1,866 MtCO₂e compared with China's total emissions at 7,234 MtCO₂e; India's per-capita GHG emissions was 1.7 MtCO₂e compared with China's per-capita emissions at 5.5 MtCO₂e.³ Furthermore, India has declared that its per capita emissions will never exceed those of the developed countries.⁴

This paper discusses four key factors that help explain India's current approach to tackling climate change: i) challenges in development, adaptation, energy use and GHG emissions; ii) domestic actions for mitigation and adaptation; iii) approaches to international negotiations; and iv) opportunities for a bilateral partnership with the EU. This Policy Brief is accompanied by a CEPS Working Document entitled *The Political Economy of India's Climate Agenda*.

1. Key messages

1.1 Challenges

Poverty eradication through economic development is a national priority. Because India has a large population in which the majority is very poor, development is the means to move the population out of absolute poverty. Nearly 80% of India's population of 1.1 billion, over 800 million persons, still survive on

December 2009(a), pp. 228-246 (retrieved from <http://164.100.47.132/textofdebates/15/III/0312.pdf>).

³ Derived from the Climate Analysis Indicators Tool (CAIT) Version 7.0, World Resources Institute, 2010 (retrieved from <http://cait.wri.org/>).

⁴ See e.g. "Speech of Mr Jairam Ramesh, Minister of State (Independent Charge) for Environment & Forests, Government of India, at the High-Level Segment of the UN Climate Conference", Copenhagen, 16 December 2009(b). See also Ramesh (2009a).

CEPS Policy Briefs present concise, policy-oriented analyses of topical issues in European affairs, with the aim of interjecting the views of CEPS researchers and associates into the policy-making process in a timely fashion. Unless otherwise indicated, the views expressed are attributable only to the authors in a personal capacity and not to any institution with which they are associated.

Noriko Fujiwara is a Research Fellow at CEPS and Head of the Climate Change research unit. Christian Egenhofer is a Senior Fellow at CEPS, where he heads the Energy and Climate Change unit. The authors wish to thank Anton Georgiev and Monica Alessi for research assistance and reviewers for comments. The research has been supported by the Climate Works Foundation.

less than US\$2 per day (Ghosh, 2009). With the goal of poverty eradication, India's economy has been growing fast. The annual GDP growth rate was 6.7% in 2008–09 and is projected to be 6.5% in 2009–10 (Economic Advisory Council to the Prime Minister, 2009). Yet, industrial and urban growth, the expansion of infrastructure and land-use changes resulting from an increasing population will not only lead to a net rise in GHG emissions but will also result in the loss of livelihoods among rural and forest communities.

Economic development is also seen as the principal way to foster adaptation to climate change, since adaptive capacity is a function of the level of economic development of the rural and urban poor in India.

Meanwhile, **the country is highly vulnerable to climate-related events.** First, this concern stems from the forecasted impacts of climate change on weather patterns, such as monsoons or cyclones. Consequential droughts or flooding (or both) because of changes in temperature and rainfall patterns will affect agriculture, which supports the livelihood of two out of every three Indians. Second, the receding of the Himalayan glaciers⁵ would affect water security across the entire northern part of the Indian subcontinent. Third, there are particularly sensitive areas that face risks of submergence. Along India's long coastline, flooding from sea-level rise and storms of greater intensity could lead to widespread habitat loss and population displacement. Fourth and lastly, there is a risk of inflows of refugees from neighbouring countries (e.g. Bangladesh) that are even more prone to the repercussions of climate change.

Energy is essential for development. Nearly half of the commercial, primary energy demand is met by coal but the share of coal in India's total primary energy is about 38%.⁶ That is because non-commercial primary energy, such as biomass and cow dung, which is mainly used for household energy, accounts for about 28% of the total primary energy consumption in India.⁷ Coal accounted for 53.3% of the total installed utility-based capacity of 156,000MW at the end of 2009.⁸ The share of coal is followed by that for hydro, at 24.7%, gas at 10.5%, nuclear at 2.9% and oil at 0.9%.⁹ Renewable energy sources (primarily wind) make up 7.7% of the total installed capacity. Although the installed renewable capacity has recorded double-digit

growth in recent years, its contribution to the primary energy mix remains at about 1%.¹⁰

The principal energy-related challenge is access to energy, which has two distinct facets: ensuring energy supply to meet the growing demand of fuelling economic growth; and providing access to lifeline levels of clean commercial energy for the poor, chiefly electrification and cooking gas/kerosene. To date coal remains the most realistic option for power generation in the short to medium term even though an increase in the supply of coal is constrained by the ability to raise domestic production much beyond 7.8% annually in 2008-09 (Coal Controller's Organisation, 2009). A further constraint is the absence of both port and rail capacity for receiving and moving coal to feed the various power plants. More than 400 million persons do not have access to electricity and more than 700 million depend on non-commercial biomass for cooking (Ghosh, 2009).¹¹

India's future absolute emissions will grow. Existing model results show wide variance in the range of future increases in GHG emissions, depending primarily on the different assumptions regarding GDP growth, energy and carbon intensities. Projections by the Climate Modelling Forum (2009) rest on assumptions of a high, annual GDP growth rate averaged over the period up to 2030, ranging from 7.5% (McKinsey) to 8.84% (NCAER) per annum. The past record, however, shows fluctuations in the annual growth rates for the last five years.¹²

Economic modelling has shown that defining business-as-usual (BAU) emission trajectories for a growing economy like India's is difficult if not impossible. Thus, it will be a challenge to operationalise the suggestion that developing countries as a group should limit the growth of their emissions to 15-30% below BAU by 2020.

With some degree of generalisation about the various modelling results and estimations of trajectories from the past trends (see the background document for further details), the following conclusions may be drawn solely for indicative purposes. (The authors first considered different modelling results and assumptions

⁵ There is some uncertainty in the data with respect to the rate at which the glaciers are expected to recede (see IPCC, 2010).

⁶ See Planning Commission (2006 and 2008).

⁷ Ibid.

⁸ Derived from the Ministry of Power (source: CEA), Government of India, as of 31 December 2009 (retrieved from http://powermin.nic.in/JSP_SERVLETS/internal.jsp).

⁹ Ibid.

¹⁰ Planning Commission (2006 and 2008).

¹¹ These figures vary (e.g. FIIA 2009 quoted in Atteridge et al. 2009; IEA 2007). We should draw data from results of the national surveys, but this is beyond the scope of this paper (see also Sethi, 2010).

¹² The Economic Advisory Council to the Prime Minister (2009) reports the following annual GDP growth rates: 7.5% (2004–05), 9.5% (2005–06), 9.7% (2006–07), 9.0% (2007–08 QE), and 6.7% (2008–09 Rev). The Economist quarterly data (Economist Intelligence Unit, 2010) even reports a fall in the real GDP (percentage change, year on year) to 4.8% in the fourth quarter of 2008 and 4.1% in the first quarter of 2009.

for the period up to 2032 – e.g. NCAER CGE, TERI MoEF, IRADe AA, TERI Poznan and McKinsey India Models (Climate Modelling Forum, 2009) – as well as the IEA’s World Energy Model (IEA, 2007), and then compared the forecasts against prior achievements, e.g. before 2005.) India’s total GHG emissions will grow from their current level but are likely to remain under 4 Gt by 2030. Energy-related CO₂ emissions will likely increase by around 3-4% per annum. These estimates are based on the assumptions of a GDP growth rate in the range of 6-7% per annum and a surge in primary energy demand of around 3.4% per annum in 2030.

India is set on a low-carbon path with declining energy intensity, i.e. with the objective of decoupling economic growth and rises in GHG emissions. Both energy and GHG emission intensities will likely go down. India’s energy intensity showed an economy-wide decline in PPP terms by nearly 50% between 1980 and 2006 and a reduction in the industrial sector by more than 40% between 1990 and 2005 (Rao et al., 2009). Moreover, India’s emissions intensity declined by 17.6% between 1990 and 2005.¹³ All models show that energy intensity and CO₂ (or CO₂e) intensity are likely to continue falling (Climate Modelling Forum, 2009).

India has made a voluntary pledge to reduce the emissions intensity of its GDP through domestic actions by 20-25% by 2020 from 2005 levels. This pledge excludes emissions from agriculture.

There is no net subsidy in the energy sector as the total tax revenues collected from the energy sector far exceed the total energy subsidies. The energy sector is riddled with cross-subsidies, however, whereby one form of consumption subsidises another or one kind of fuel subsidises another. The budget of the central government funds less than 10% of the subsidies in cash. Of the remaining subsidy flows, it funds about a third by way of oil bonds and asks the upstream and downstream companies to absorb the balance.¹⁴ A significant share of the subsidies is meant to help compensate under-recoveries by the oil marketing companies, which are not allowed to charge the import parity price for various petroleum products. Under-recoveries are the difference between the import parity price of a petroleum product excluding all taxes and the net realisation by oil marketing companies net of all taxes. The large price difference between subsidised kerosene (Rs 9 per litre) and diesel (Rs 33 per litre) has led to a diversion of kerosene to adulterate diesel (Government of India, 2010). Consequently, an expert group on a petroleum-product pricing system has

recommended that the government let the market determine petrol and diesel prices while in the future raising the price of kerosene every year in step with the growth in per-capita agricultural GDP at a nominal cost figure (Government of India, 2010). This recommendation goes in line with the joint commitment by the G20 countries (including India) at the Pittsburgh summit in 2009: to phase out fossil fuel subsidies over the medium term while providing targeted support for the poorest.

Under the Electricity Act of 2003, the state governments can provide subsidies to certain classes of consumers. Yet, the Act requires that the state governments fully compensate the utility companies. In reality, the utilities are unable to recover their full costs of supply owing to excessive transmission and distribution (T&D) and commercial losses (which include billing and collection losses). Almost 100% of electricity transmission in India is owned by the public sector while about 13% of electricity distribution in India is owned by the private sector (Kumar, 2009).¹⁵ The net losses of the state government-owned utilities are thus subsidies for the electricity sector as a whole. These losses are incurred despite the fact that industrial and commercial power users and the larger domestic consumers pay more than the average cost of supply and cross-subsidise other consumers, such as agriculture and small households. Even if the commercial losses of the state-owned utilities are treated as net subsidies, the foregoing statement that the total taxes collected from the energy sector exceed its total subsidies (inclusive of under-recoveries) still holds. Because of the high level of cross-subsidies in the electricity sector, theft of electricity – which is classified as T&D or commercial loss – is quite common. Such theft is normally ascribed to the unorganised small and medium-sized industrial sector and commercial users of electricity. The electricity tariff for power used by the agricultural sector, which reportedly accounts for about 25% of electricity consumption (Singh, 2009), is heavily subsidised and is mostly unmetered.

1.2 Domestic actions

For a long time India has pursued domestic regulatory and funding policies focused on energy conservation and the deployment of renewable energy technologies. These actions have been supported by legislation, regulation and tariff arrangements, e.g. the Energy Conservation Act in 2001, the New and Renewable Energy Policy in 2005 and the Integrated Energy

¹³ See the response of J. Ramesh in the Lok Sabha (Ramesh, 2009).

¹⁴ See data from Petroleum Planning and Analysis Cell (PRAC), <http://ppac.org.in/default.htm>; and analysis by the Planning Commission, <http://planningcommission.nic.in/>

¹⁵ See A. Kumar (Central Electricity Regulatory Commission, CERC), “Multi-year tariff and performance-based regulation”, Presentation at the “2nd Capacity Building Programme for Officers of Electricity Regulatory Commissions, Indian Institute of Technology, Kanpur, 3-8 August 2009.

Policy in 2006. Promotion of renewable energy can be traced back to the early 1990s.

India has a number of publicly funded programmes to address both the direct impacts of climate change (e.g. through scientific research) and the reduction of its vulnerability to climate-related risks (e.g. through poverty eradication and rural development programmes). In 2006–07, the Indian government spent no less than 12% of its annual budget or 2.63% of GDP on these programmes.¹⁶

In addition, the government intends to increase not only the quantity but also the quality of forest cover, thereby maintaining (at least in the next decade) the current level of carbon sequestration by forestry, which equates to 10% of annual GHG emissions.¹⁷

India has launched a comprehensive and integrated strategy to implement domestic actions on climate change under its *National Action Plan on Climate Change*.¹⁸ This plan outlines policies and measures addressing mitigation and adaptation under eight “missions” through 2017. The national solar mission and that on enhanced energy efficiency are the most advanced ones to date on mitigating GHG emissions.

- *National solar mission*. This mission plans to install solar-power generation capacity of 20,000 MW by 2022. The 2006 Integrated Energy Policy (Planning Commission, 2006) forecasts a total peak demand of 323,000MW, resulting in the need for 425,000MW of installed capacity in 2021–22 based on a GDP growth rate of 8% per annum. Specific proposed measures include mandatory renewable purchase obligations (a form of feed-in tariffs), mandatory solar heaters for buildings, the certification and rating of manufacturers, and soft loans.
- *National mission on enhanced energy efficiency*. This mission is expected to reduce energy consumption by 5% and save about 100 million tonnes of CO₂ annually by 2015. The mission consists of a number of initiatives including mandatory energy-efficiency standards, labelling for energy-saving appliances, building and vehicle standards, and domestic trading of energy-efficiency certificates. The trading scheme is based on energy intensity and covers large energy-intensive industries.

¹⁶ Data derived from the Indian government’s budget documents in Ghosh (2009).

¹⁷ See the speech by Manmohan Singh, the prime minister, “PM’s address at the Inauguration of the 10th Delhi Sustainable Development Summit, New Delhi, 5 February 2010”.

¹⁸ See Government of India, *National Action Plan on Climate Change*, Prime Minister’s Council on Climate Change, New Delhi, 2008 (retrieved from http://pmindia.nic.in/climate_change.htm).

Based on the *National Action Plan on Climate Change* and the 11th Five Year Plan (2007–12), the government is considering a set of nationally accountable mitigation outcomes and specific performance targets for sectors such as industry, energy, transport, agriculture, buildings and forestry for the years 2020 and 2030. The planning commission recently set up an expert group composed of various stakeholders to prepare a strategy for a low-carbon economy before the start of the 12th Five Year Plan from April 2012.

Since India has a federal governance system, states play an important role in implementing policies and measures, including those addressing energy and climate change. For example, the National Capital Territory of Delhi recently announced the first state action plan, which comprises 65 specific actions to address climate change, which is to be implemented across sectors by 2012. Several states have launched demand-side management programmes for energy efficiency. Under the 2003 Electricity Act, renewable purchase obligations have been introduced in 15 states, with the minimum percentage of renewable energy procurement varying across states from 1 to 10% in 2008–09 (Kumar, 2009). The challenge is that renewable energy sources are not evenly spread across the states. Those states with greater potential for renewable energy sources could aim at higher levels in their renewable purchase obligations.

1.3 Approaches to international negotiations

Internationally, India calls for equitable allocation of and equitable access to atmospheric space and demands strict adherence to the principle of common but differentiated responsibilities and respective capabilities in formulating the climate obligations of the Annex I and Non-Annex I countries. Other guiding principles for long-term cooperation include the right to development, full compensation for incremental mitigation costs and commitments to deep emission cuts to be taken on by Annex I countries for the second commitment period under the Kyoto Protocol.

Prior to COP15 in Copenhagen, India defined three kinds of basic national interests: i) no legally-binding emissions reduction target; ii) no legally-binding peaking year for the country; and iii) a distinction between supported and unsupported mitigation actions by developing countries in respect of measurement, reporting and verification (MRV).

For India, the main outcome of COP15 was the consensus to continue the dual-track negotiation process, one under the UN Framework Convention on Climate Change (UNFCCC) and the other under the Kyoto Protocol. India’s voluntary pledge to reduce its emissions intensity was submitted in conformance with the relevant provisions of the UNFCCC, covering

voluntary national actions and policies (see above) as well as the provisions of the UNFCCC on the reporting of such actions and their review. The Indian submission does not refer to the Copenhagen Accord at all.

India expects that the Copenhagen Accord will complement the dual-track negotiations. In addition, the country maintains that the Accord is neither legally binding nor does it mention a specific year for the peaking of developing country emissions. The Accord recognises that the time frame for peaking will be longer in developing countries, noting their priorities for development and poverty eradication. The need to limit the global temperature rise to less than 2°C above pre-industrial levels by the year 2050 is recognised in the context of equity and sustainable development, such that the right of developing countries to an equitable share in access to the global atmosphere can be ensured. In India's view, a global goal should be expressed only in terms of a limit in the temperature rise, and not in terms of a quantified emissions reduction target that could lead to a binding commitment for developing countries. Lastly, the Accord ensures that developing countries' mitigation actions will be subject to domestic MRV, and that respect for national sovereignty will be safeguarded under its provisions for international consultations and analysis of those domestic mitigation actions that are not attained through international finance and technology support.

While maintaining their preference for the guiding principles, more recently the Indian government appears to have taken a more flexible and adaptive approach to several sticking points in international negotiations. One such example is a pledge to reduce emissions intensity in response to other countries' unilateral announcements. Equally important is its willingness to engage in the coordination of positions with other major negotiating partners, traditionally the G77 and China, but increasingly the BASIC group as well. Together with the three other BASIC countries, India is seeking to ensure that climate change negotiations are finalised in accordance with the UNFCCC, the Bali Action Plan and the Kyoto Protocol. The government has also attempted to steer the negotiating process constructively by putting forward concrete proposals on items of special interest, especially on the technology mechanism, financing instrument and reductions in emissions from deforestation and forest degradation (REDD plus).

1.4 Bilateral partnership with the EU

The EU and India have developed a joint work programme on energy, clean development and climate change under the bilateral cooperation framework. This programme aims at facilitating cooperation on both energy and climate change. A special focus is placed on R&D (including fusion energy and clean coal technology) as well as on renewables (especially solar energy). The programme does not provide a basis for concrete actions and thus progress in this sense has not been tangible.

India might find useful some of the information emanating from the EU's experience in adaptation cooperation with its partner countries in Africa, the Caribbean and Pacific. Some of the risks of disaster these countries are facing as a result climate change, e.g. flooding on coastal areas, are also likely to be relevant to India.

In the long term, an EU–Indian partnership could be developed into a more viable framework to address issues of fundamental concern to the respective parties. For example, it is important to focus on both international equity (which is a major concern for India) and intra-national equity, especially as it relates to access to resources and gender equality in this context (a concern for the EU). Any improvement in the livelihood of rural communities would lead to enhanced adaptive capacity – an area in which international cooperation could play a role.

References

- Climate Modelling Forum (2009), *India's GHG emissions profile: Results of five climate modelling studies*, Ministry of Environment and Forests, Government of India, New Delhi, September.
- Coal Controller's Organisation (2009), *Provisional coal statistics, 2008–09*, Ministry for Coal, Government of India, New Delhi, April.
- Economic Advisory Council to the Prime Minister (2009), *Economic outlook for 2009/10*, New Delhi, October.
- Economist Intelligence Unit (2010), *India*, Country Report, EIU, London, January.
- Ghosh, P. (2009), "Is India a solution to the problem or a problem to the solution?", in S. Narain, P. Ghosh, N.C. Saxena, J. Parikh and P. Soni, *Climate change: Perspectives from India*, UNDP India, New Delhi, November.
- Government of India (2008), *National Action Plan on Climate Change*, Prime Minister's Council on Climate Change, New Delhi (retrieved from http://pmindia.nic.in/climate_change.htm).
- (2010), "Expert Group on a viable and sustainable system of pricing of petroleum products", New Delhi, 2 February.
- Intergovernmental Panel on Climate Change (IPCC) (2010), "Statement on the melting of the Himalayan glaciers", IPCC, Geneva, 20 January.
- International Energy Agency (IEA) (2007), *World Energy Outlook 2007: China and India insights*, OECD/IEA, Paris.
- Kumar, A. (2009), "Multi-year tariff and performance-based regulation", Presentation at the "2nd Capacity Building Programme for Officers of Electricity Regulatory Commissions, Indian Institute of Technology in Kanpur, 3-8 August.
- Planning Commission (2008), *Eleventh Five Year Plan, 2007–2012*, New Delhi: Oxford University Press.
- (2006), *Integrated energy policy*, Report of the Expert Committee, Government of India, New Delhi, August.
- Ramesh, J. (2009a), "Minister of State of the Ministry of Environment and Forests (Shri Jairam Ramesh)", Response in the Lok Sabha, Fifteenth Session, Vol. V, Third Session, 2009/1931 (Saka), No. 10, 3 December 2009, pp. 228-246 (retrieved from <http://164.100.47.132/textofdebates/15/III/0312.pdf>).
- (2009b) "Speech of Mr Jairam Ramesh, Minister of State (Independent Charge) for Environment & Forests, Government of India, at the High-Level Segment of the UN Climate Conference", Copenhagen, 16 December 2009.
- Rao, N., G. Sant and S.C. Rajan (eds) (2009), *An overview of Indian energy trends: Low carbon growth and development challenges*, Prayas Energy Group, Pune, September.
- Sethi, S.P (2010), "Beyond Copenhagen", Speech delivered at the "IFRI Annual Conference 2010", in Brussels, 11 February.
- Singh, A. (2009), "Climate co-benefit policies for the Indian power sector: Domestic drivers and North-South cooperation", *Climate Policy*, No. 9, pp.529-543.
- Singh, M. (2010), "PM's address at the Inauguration of the 10th Delhi Sustainable Development Summit, New Delhi, 5 February.
- UNDP (2009), *Human Development Report*, UNDP, New York, NY (retrieved from <http://hdrstats.undp.org/en/indicators/91.html>).
- World Bank (2009), "Gross Domestic Product, 2008", World Development Indicators Database, World Bank, Washington, D.C. (retrieved from <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf>).