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The Political Economy of India's Climate Agenda

CEPS Working Document No. 325/March 2010

Noriko Fujiwara

Abstract

This Working Document complements the CEPS Policy Brief, *Understanding India's climate agenda*, and elaborates on three key issues related to the country's energy challenges: access to energy, the future emissions trajectory and energy subsidies. This study looks into the making and framing of the country's domestic climate agenda from a political economy perspective. As long as both GDP and primary energy demand keep growing at the current rates, it may be concluded that the country's future, absolute greenhouse-gas emissions are also likely to grow but remain relatively low. Moreover, India's emissions intensity is expected to continue declining in line with the recent voluntary pledge by the Indian government. The study takes note of the national action plan launched in India, and the adoption of a flexible approach in international negotiations while maintaining a preference for several core principles, including equity. Lastly, the study explores the possibility for addressing issues such as international and intra-national equity in the context of the long-term EU–Indian partnership.

ISBN 978-92-9079-979-5
Available for free downloading from the CEPS website (http://www.ceps.eu)

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THE POLITICAL ECONOMY OF INDIA'S CLIMATE AGENDA

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Introduction

This Working Document complements a related CEPS Policy Brief entitled *Understanding India's Climate Agenda* (Fujiwara and Egenhofer, 2010) identifying four factors that influence 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 such as the *National Action Plan on Climate Change*; iii) approaches to international negotiations centred on the UN's dual-track process; and iv) opportunities for a bilateral partnership with the EU.

It is tempting to compare India with other advanced developing countries or emerging economies on the one hand, and with developed countries on the other. 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.

- 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 (World Bank, 2009).
- India's *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 (UNDP, 2009).[1]
- India is the fifth largest emitter of greenhouse gases (GHGs) 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, India's total GHG emissions were 1,866 $MtCO_2e$, about a quarter of China's total emissions at 7,234 $MtCO_2e$.
- India's *per capita GHG emissions* were 1.7 metric tonnes of CO_2e, less than a third of China's per capita emissions at 5.5 metric tonnes of CO_2e and the world average at 5.8

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[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 (UNDP, 2009).

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

metric tonnes of CO_2e.[3] India has declared that its per capita emissions will never exceed those of the developed countries.[4]

India's economy is less GHG- or energy-intensive than other major developing economies.

- In 2005, the GHG intensity of the Indian economy was about 760 tCO_2e per million international dollars in PPP terms, exceeding the world average of 670 tCO_2e, but outperforming China (1,350 tCO_2e) and South Africa (1,060 tCO_2e) (see Figure A.1, appendix 1).[5]
- India's energy intensity in 2006 was about a half of China's, lower than the US and only slightly higher than the EU's (Rao et al., 2009, p. 17).

While a cross-country comparison with the aid of the above parameters can be useful to obtain a quick overview about how India scores in the world, this document focuses on the making of India's climate agenda as defined and shaped by its national circumstances. Specifically, it approaches the country's climate agenda from different angles – development, vulnerability, mitigation and energy challenges, and sketches out the main features of domestic actions and international cooperation.

1. Challenges

1.1 Development for poverty eradication and adaptation to climate change

Poverty eradication through economic development is a national priority. Since India has a large population in which the majority is very poor, development is regarded as 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 less than US$2 per day (Ghosh, 2009). This implies that India's development agenda is far from completion and remains focused on poverty alleviation. 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.

1.2 Economic growth

Towards the goal of poverty eradication, the Indian government aims at maintaining the country's economic growth. India's economy has been growing fast. In the five-year period from 2004–05 to 2008–09, the economy grew at an average rate of 8.5%, despite the worldwide financial crisis affecting the second half of the five-year period, thereby lowering the average of the entire period. The Indian economy has weathered the storm, growing at 6.7% per annum in

[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. the "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).

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

2008–09, and it is projected to grow by 6.5% in 2009–10 (Economic Advisory Council to the Prime Minister, 2009) or up to 7.2% in the same period.[6]

Yet, industrial and urban growth, the expansion of infrastructure and land-use changes under pressure from population growth – estimated at around 1.1% annually (UNPD, 2009) – will not only lead to a net rise in GHG emissions but will also damage the livelihoods of rural and forest communities.

1.3 Vulnerability to climate change

India is highly vulnerable to climate-related events including extreme weather events. The country has particular concerns about the anticipated impact of the receding of the Himalayan glaciers[7] (exacerbated by the effect of black carbon) on water runoff from these glaciers, especially in the northern part of the Indian subcontinent. Densely populated urban centres and coastal areas are greatly exposed to heavy rainfall, storms (e.g. monsoons and hurricanes) or consequential floods. Particularly sensitive areas are at risk of submergence due to sea-level rise. An increasing frequency and intensity of storms and flooding or droughts resulting from changes in patterns of precipitation and temperature are expected to have substantial effects on climate-sensitive economic sectors such as agriculture, which supports the livelihood of two out of every three Indians. A resulting decline in crop yields, degraded lands, water shortages, and health problems would further undermine the capabilities of India's rural poor, widening the economic and social disparities. Loss of habitats and the means for production would lead to migration from rural communities to urban slums.[8] These slums may further attract refugees from neighbouring countries (e.g. Bangladesh) that are even more prone to the repercussions of climate change.

1.4 Access to energy

Energy is essential for development. Primary energy demand in India rose by 68% over the 1990–2005 period at an annual growth rate of about 3.5% (IEA, 2007). 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% (Planning Commission, 2006 and 2008). 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 (Planning Commission, 2006 and 2008).

At the end of 2009, coal accounted for 53.3% of the total installed utility-based capacity,[9] followed by that of hydro at 24.7%, gas at 10.5%, nuclear at 2.9% and oil at 0.9%.[10] 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% (Planning Commission, 2006 and 2008).

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[6] Based on the advanced estimates by the Central Statistical Organisation, as quoted in "Economic Survey 2009-2010" on the website of the Ministry of Finance (retrieved from http://indiabudget.nic.in/es2009-10/esmain.htm).

[7] There is some uncertainty in the data with respect to the rate at which the glaciers are expected to recede (see IPCC's "Statement on the melting of the Himalayan glaciers", IPCC, Geneva, 20 January 2010).

[8] Urban poverty in India is high, affecting over 25% of the urban population. Over 80 million poor people live in cities and towns (derived from the survey report of the National Sample Survey Organisation, as quoted in Ministry of Housing and Urban Poverty Alleviation, 2009).

[9] 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).

[10] Ibid.

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.

If the government wishes to sustain a growth rate of 8-9%, it is inevitable to some extent that investments in large infrastructure, of which the most important is power-generation capacity, will continue. The Economic Advisory Council to the Prime Minister (2009) proposes a number of policy interventions in the electricity sector. Among the proposed options are facilitating and encouraging more private investment in power generation, developing an 'active' plan for the creation of power capacity over the next 15 years, diversifying fuel sources and establishing natural gas- and nuclear energy-based power plants.

Not only power generating capacity but also facilities for international and domestic transport of energy sources hold the key to success.

India has never been a big importer of thermal coal for power generation. Imported coal accounted for about 10% of the total demand for raw coal in 2008–09 (Coal Controller's Organisation, 2009). India imports coking coal mostly from Australia for use by the steel sector for quality considerations, and non-coking coal mostly from Indonesia and South Africa for use by the power and cement sectors (also for cost and quality considerations). For example, an expert committee on integrated energy policy suggests that on the western and southern coasts, imported coal is more cost-competitive compared with domestic coal, and even more so compared with imported gas at these locations, and that such a cost is an advantage of imported coal over imported gas (Planning Commission, 2006).

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 beyond the current level,[11] and the absence of both port and rail capacity for the import and movement of coal.

The second facet is that the majority of the Indian population lacks access to energy. 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).[12] The disparity in access to energy between urban and rural areas and across income groups has stayed the same or even widened. Improving the access of India's population to energy will require investments in power-generation capacity.

Lastly, deficiencies in India's network for the transmission and distribution of electricity undermine people's access to energy. This topic is further discussed in relation to energy subsidies in section 1.7.

1.5 Decline in emissions intensity and energy intensity

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. Its success in decoupling growth in energy use and resulting emissions from GDP growth has been acknowledged.

[11] The most recent data is 7.8% annually in 2008–09 (Coal Controller's Organisation, 2009); however, the average of the last eight fiscal years (from 2001–02 to 2008–09) amounts to 5.5% based on data from annual reports by the Indian Ministry of Coal.

[12] These figures vary, especially those on the number of persons without access to electricity (e.g. FIIA (2009) as quoted in Atteridge et al. (2009), IEA (2007) and the Planning Commission (http://planningcommission.nic.in/sectors/energy.html)). We should impute data from results of the national surveys, but this is beyond the scope of this paper. See also Sethi (2010).

India's energy-use efficiency has improved over the years as reflected in a continuous decline in energy intensity (i.e. energy consumption per unit of GDP). India's energy intensity showed an economy-wide decline in PPP terms by nearly 50% between 1980 and 2006[13] and a reduction in the industrial sector by more than 40% between 1990 and 2005[14] (Rao et al., 2009). Consequently, the country's emissions intensity also declined by 17.6% between 1990 and 2005 (Ramesh, 2009a) and its CO_2 intensity declined by about 20% over the same period[15] (Figure A2.1, appendix 2).

Against this background, the Indian government has recently made a voluntary pledge based on its emissions intensity of GDP: 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, i.e. it primarily focuses on industry. More detail about this pledge is discussed in section 3.2.

1.6 Future emissions

India's future absolute emissions will grow. Economic modelling, however, has shown that defining business-as-usual (BAU) emission trajectories for a dynamic 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.

Existing model results show a wide variance in the range of future increases in GHG emissions, depending primarily on the different assumptions regarding GDP growth, energy and carbon intensities. For example, the Climate Modelling Forum (2009) summarises the initial results of five studies (Table A3.1 in appendix 3):[16]

- NCAER-CGE, a computable general equilibrium (CGE) modelling study by India's National Council of Applied Economic Research (NCAER);
- TERI-MoEF, a market allocation (MARKAL) modelling study by the Energy & Resources Institute (TERI);
- IRADe-AA, an activity analysis modelling study by Integrated Research and Action for Development (IRADe);
- TERI-Poznan, another MARKAL model-based study by TERI, presented at the 14th Conference of Parties (COP) on Climate Change at Poznan; and
- the McKinsey study, a detailed sector-by-sector analysis of GHG emissions by McKinsey and Company.

[13] India's energy intensity of GDP fell from 0.30 kgoe (kilogram of oil equivalent) per US$ of GDP in 1980 to 0.16 kgoe per $ GDP in PPP terms (Climate Modelling Forum, 2009; Planning Commission, 2006).

[14] Derived from 46.2 PJ (Peta Joules)/$ billion to 28.5 PJ/$ billion between 1990 and 2005 (Rao et al., 2009).

[15] Derived from Climate Analysis Indicators Tool (CAIT), Version 7.0. World Resources Institute, 2010 (retrieved from http://cait.wri.org).

[16] It is noted that TERI's two models resulted in two divergent figures, 4.9 billion tonnes of CO_2 (TERI MoEF) and 7.3 billion tonnes of CO_2 (TERI Poznan) for GHG emissions in 2031–32, and 3.4 tonnes CO_2e (TERI MoEF) and 5.0 tonnes CO_2e (TERI Poznan) for GHG emissions per capita in 2031–32. This divergence may have been partly explained by the assumed levels of commercial energy use in 2030–31 linked to energy prices (Climate Modelling Forum, 2009; see also Table A3.1 in appendix 3 of this document).

These five independent studies show the result that in absolute terms India's annual GHG emissions in 2031 could reach between 4.0 billion tonnes of CO_2e and 7.3 billion tonnes (4.0-7.3 Gt) under the BAU scenarios[17] (Climate Modelling Forum, 2009; see also Table A3.1 in appendix 3 of this document). These projections rest on assumptions of a high, annual GDP growth rate averaged over the period up to 2030, ranging from 7.51% (McKinsey) to 8.84% (NCAER) per annum (Climate Modelling Forum, 2009). The past record, however, shows fluctuation in the annual growth rates for the last five years, even taking into account the unprecedented scale of the worldwide financial crisis.[18]

The first step is to consider different modelling results and assumptions for the period up to 2032, e.g. the NCAER CGE, TERI MoEF, IRADe AA, TERI Poznan and McKinsey India models (Climate Modelling Forum, 2009) as well as the IEA World Energy Model (IEA, 2007 and 2009). The next step is to compare these forecasts against the past achievements, e.g. prior to 2005.

With some degree of generalisation about the various modelling results and estimations of trajectories from the past trends, the following conclusions may be drawn solely for indicative purposes. India's total GHG emissions will grow from the current level but will likely remain under 4 Gt by 2030. Energy-related CO_2 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.

The upper limit of 4 Gt on India's expected total GHG emissions in 2030 may be concluded on the following grounds (see Table A3.1 in appendix 3). In a comparison of the five studies, it appears that the NCAER and IRADe studies give the most details about their assumptions to support the modelling results: NCAER at 4.00 billion tonnes of CO_2e (4 Gt) and IRADe at 4.23 billion tonnes of CO_2 (4.23 Gt). Yet, it is important to note that these studies assume high GDP growth rates, 8.84% (NCAER) and 7.66% (IRADe) per annum respectively. The McKinsey study predicts total GHG emissions at 5.7 billion tonnes of CO_2 under the assumption of a GDP growth rate at 7.51% per annum, noting that the expected GHG emissions will vary from 5.0 to 6.5 billion tonnes of CO_2 if the GDP growth rate ranges from 6% to 9%. In contrast, the IEA reference scenario predicting about 3.3 Gt of CO_2 in 2030[19] assumes India's annual GDP[20] growth at 6.3% on average over 2007–30 (IEA, 2009). Based on the GDP trend (see section 1.2), it seems reasonable to assume that the growth India is likely to deliver between now and 2030 will settle at 6-7% on average.

Looking at the rate of growth in energy-related emissions based on past trends and in total emissions (even in the high GDP growth period of the last five years), it may be concluded that

[17] BAU here refers to the assumption used in the models (i.e. NCAER CGE, TERI MoEF and IRADe AA) that there will be no new mitigation policies than those present at the beginning of the reviewed studies, approximately in 2004 (Climate Modelling Forum, 2009).

[18] The Economic Advisory Council to the Prime Minister (2009) reports annual GDP growth rates: 7.5% (2004–05), 9.5% (2005–06), 9.7% (2006–07), 9.0% (2007–08QE) and 6.7% (2008–09 Rev). The Economist quarterly data (Economist Intelligence Unit, 2010) even reports the fall of real GDP (% change, year on year) to 4.8% in the fourth quarter of 2008 and 4.1% in the first quarter of 2009. Concerning the fluctuations in India's growth rate between 1991 and 2008, see also the "Economic survey 2008-2009" on the website of the Ministry of Finance (retrieved from http://indiabudget.nic.in).

[19] See D. Graczyk (IEA), "Energy situation in India", presentation at "Les perspectives énergétiques de l'Indie", Paris, 18-19 June 2009 (retrieved from http://www.dauphine.fr/cgemp/).

[20] This refers to GDP as expressed in year 2008 dollars in PPP terms (IEA, 2009).

India's energy consumption growth and emissions growth have remained at the 3-4% range.[21] This is the basis of the IEA reference scenario for the period up to 2030, with the assumption of a growth rate for primary energy demand at 3.4% per annum on average (IEA, 2009) or 3.6% per annum, translating into more than double by 2030 (IEA, 2007).

All models assume that in the BAU scenario until 2030, both energy intensity and CO_2 (or CO_2e) intensity is likely to continue falling (Climate Modelling Forum, 2009). An expert committee on integrated energy policy believes that it is possible to reduce India's energy intensity by up to 25% from the current level and to reduce the GHG intensity of the economy by as much as one-third (Planning Commission, 2006).

India's energy consumption and share of global energy supplies will remain low and hence its emissions growth and total emissions will remain low. The above expert committee also concludes that India's share of the incremental world supply of fossil fuels could increase from 13% in the most energy-efficient scenario to 21% in the coal-dominant scenario in 2031–32. These rises assume a 2% per annum growth in the world's supply of fossil fuel until 2031–32 (Planning Commission, 2006).

One key element is the level of energy supply from imports. In the IEA (2007) reference scenario, coal consumption is projected to triple between 2005 and 2030. The share of hard coal imports in total Indian coal demand could reach 28% under the IEA (2007) scenario compared with the current share of imported coal at around 10% in 2008–09 (Coal Controller's Organisation, 2009). Still, in practice, the limitations of port and rail facilities mean that a drastic surge in the level of imported coal may not be realised. The IEA (2007) further estimates that net oil imports would grow steadily and natural gas imports would also increase, because gas supplies from domestic sources are unlikely to be adequately developed.

Another element is the level of installed electricity-generation capacity. Under the McKinsey (2009) scenario, the power-generation sector alone would account for more than 50% of GHG emissions, 2.9 billion tonnes of CO_2e by 2030, based on the assumption that more than 60% of its generation capacity will remain coal-based. Similarly, in the IEA (2007) reference scenario, the power-generation capacity in which coal-fired power dominates would more than triple between 2005 and 2030. A practical question is whether the government could achieve the goal of scaling up the power-generation capacity from the 2009 level of 156,000 MW[22] to nearly 800,000 MW in 2031–32, by five times under the assumption of sustained growth of 8% (Planning Commission, 2006). The investment India needs to meet the demand identified in the reference scenario would reach $1.25 trillion (in year 2006 dollars) in energy infrastructure, three-quarters of it in the power sector, between 2006 and 2030 (IEA, 2007). The key is to attract private investment.

1.7 Energy subsidies

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 (e.g. Graczyk, 2006). The energy sector is riddled with cross-subsidies, however, whereby one form of consumption subsidises another or one kind of fuel subsidises another (e.g. IEA, 2002). 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

[21] India's total use of energy grew by 3.3% between 1990 and 2004. See the "Economic survey 2007-2008" (http://indiabudget.nic.in). India's emissions increased from 934.8 Mt of CO_2 to 1165.7 Mt of CO_2 by 3.7% between 1999 and 2005, while its GDP rose by 9.1% during the same period. See "India's emission's performance" sourced from EIA & UNDP HDR in Sethi (2009).

[22] 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).

way of oil bonds and asks the upstream and downstream companies to absorb the balance.[23] 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). Another issue is cross-border smuggling with neighbouring countries. The price of subsidised kerosene in India is over three to four times less than that in Bangladesh (Rs 29.28 per litre) or Nepal (Rs 36.29 per litre) as of January 2010 (Government of India, 2010; for the subsidies on kerosene, see also the Ministry of Petroleum & Natural Gas, 2009).

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.[24] Yet, the Act requires the state governments to 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). Nationwide aggregate technical and commercial losses amounted to 33.07% in 2006–07, with such losses varying across the states from 12.08% to 67.56% in 2006–07.[25]

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.[26] 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. The utilities' losses amounted to 11.02% of the revenue from direct sales to consumers in 2006–07.[27]

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 of electricity is normally ascribed to the unorganised small and

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[23] See data from Petroleum Planning and Analysis Cell (PRAC) (retrieved from http://ppac.org.in/default.htm) and analysis by the Planning Commission (retrieved from http://planningcommission.nic.in/).

[24] For details, see also "National Electricity Policy", *Gazette of India*, Ministry of Power, New Delhi, 12 February 2005; and "Tariff Policy", *Gazette of India*, Ministry of Power, New Delhi, 6 January 2006.

[25] 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 in Kanpur, 3-8 August 2009 .

[26] Ibid.

[27] Ibid.

medium-sized industrial sector facing rising electricity rates.[28] Energy costs come to represent more than 10% of production costs in many industries (Delio et al., 2009). In contrast, 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. Electricity subsidies to electricity providers are financed from state budgets and result from the difference in the cost of electricity provision and fixed charges paid by farmers, which in most states are lump sums based on the declared power of electronic irrigation pumps, and hence do not recover the costs (Planning Commission, 2006; OECD, 2009). Similarly, the poorest households pay only a low lump sum for monthly charges (Planning Commission, 2006).

2. Domestic actions

2.1 National legislation and programmes

For a long time India has pursued domestic regulatory and funding programmes 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 Policy in 2006. The 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.[29] The current expenditure of the Indian government on adaptation exceeds 2.6% of GDP, with an emphasis on agriculture, water resources, health and sanitation, forests, coastal zone infrastructure and extreme weather events. [30] Among other things, 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.[31]

2.2 The National Action Plan on Climate Change and recent initiatives

In June 2008, the prime minister announced the first *National Action Plan on Climate Change*. (Government of India, 2008). This plan embodies a comprehensive and integrated strategy for implementing domestic actions on climate change, and outlines policies and measures addressing mitigation and adaptation, identifying eight 'national missions' through 2017. This requires ministries to submit detailed implementation plans, strategies, timelines, and monitoring and evaluation criteria to the Prime Minister's Council on Climate Change. The Council was established with a view to coordinating national action for assessing, adapting to and mitigating climate change.

The Council is tasked with undertaking periodic reviews and reporting on progress in these missions. The national solar mission and the national mission on enhanced energy efficiency are the most advanced ones to date on mitigating GHG emissions.

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[28] Delio et al. (2009) shows the trend of electricity rates for small to medium-sized industrial customers in New Delhi and Kerala from 2000 to 2007.

[29] Data derived from the Indian government's budget documents in Ghosh (2009).

[30] See "Economic Survey 2009-2010" on the website of the Ministry of Finance (retrieved from http://indiabudget.nic.in/es2009-10/esmain.htm).

[31] 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".

1. The *national solar mission* sets specific policy objectives by 2022, including the installation of solar-power generation capacity of 20,000 MW by 2022. The Integrated Energy Policy (Planning Commission, 2006) forecasts a total peak demand of 323,000 MW, resulting in the need for 425,000 MW of installed capacity in 2021–22 based on a GDP growth rate of 8% per annum. Another objective is installation of 20 million solar lighting systems for rural areas. Specific proposed measures include mandatory renewable purchase obligations (a form of feed-in tariffs), promotion of proven solar heating technology through mandatory solar heaters for buildings, certification and rating of manufacturers, and soft loans. In addition to budgetary support ($900 million already approved), international financial support under the UN Framework Convention on Climate Change (UNFCCC) is expected.
2. The *national mission for enhanced energy efficiency* is expected to reduce energy consumption by 5% and save about 100 million tonnes of CO_2 annually by 2015. In addition to measures under the existing Energy Conservation Act, which should bring about savings of 10,000 MW by 2012, the mission envisages a number of initiatives including mandatory energy-efficiency standards applied to large energy-intensive industries, 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 it covers large energy-intensive industries. There will be two funds for channelling investment to energy-efficiency projects. Public–private partnerships have been promoted to reduce energy consumption in the municipal, buildings and agricultural sectors.

The focus on energy efficiency may also be central to the national mission on sustainable habitats. This mission promotes energy efficiency in urban planning through calls for extending the existing Energy Conservation Building Code, urban waste management and recycling (including power production from waste), stronger enforcement of fuel efficiency standards for automobiles, pricing incentives for purchasing efficient vehicles and incentives for the use of public transportation. Five other missions are the water mission, one for sustaining the Himalayan ecosystem, a national mission for a 'green India', one for sustainable agriculture, and one on strategic knowledge for climate change.[32] At present, it is not clear how much progress has been made at the implementation stage.

Moreover, the Ministry of Environment and Forests (2010) has outlined a list of 24 recent initiatives related to climate change, ranging from scientific research, policy development and implementation to international cooperation (Table A4.1 in appendix 4). National missions under the *National Action Plan on Climate Change* constitute part of policy implementation together with initiatives such as 30 'solar cities', energy efficiency standards for four key appliances (i.e. refrigerators, air conditioners, tubelights and transformers), development of fuel efficiency norms and clean development mechanism (CDM) projects.

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 that are to be assessed against 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.

[32] For details about each mission, see the *National Action Plan on Climate Change* (Government of India, 2008), (retrieved from http://pmindia.nic.in/climate_change.htm).

2.3 State government actions

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 to be implemented across sectors by 2012.

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).[33] The challenge is that renewable energy sources are not evenly spread across states. Those states with higher potential for renewable energy sources could aim at higher levels in their renewable purchase obligations.

Several states have launched demand-side management programmes for energy efficiency. Similar to the uneven distribution of renewable energy sources, the potential for energy efficiency is spread across states corresponding to the location of industrial facilities. Consequently, energy service companies (ESCOs) specialised in providing energy efficiency-related services are concentrated in the three industrial regions, the west, the national capital region around Delhi and the south (Delio et al., 2009).

3. Approaches to international negotiations

3.1 India's view of UN-led long-term cooperation

This section summarises India's view of long-term UN-led cooperation, largely based on compiled submissions by the government to the Framework Convention (Ministry of Environment and Forests, 2009). (For individual building blocks in the Bali Action Plan, see appendix 5.)

India's views about long-term international cooperation has several guiding principles: equity, right to development, full compensation for the incremental costs[34] of mitigation, and Annex I countries' commitments to deeper reduction targets for the second commitment period under the Kyoto Protocol.

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. This is understood in terms of the right of each individual to the common atmospheric resource, accounting also for the historical responsibility of developed countries. Another key principle is the right to development. Rapid development is imperative not only on economic and social grounds, but also as a pre-requisite for adaptation to climate change (see section 1).

Taking into account the principles of equity and right to development, India urges Annex I countries to take on an ambitious medium-term target and to provide financial and technological support to non-Annex I countries.

[33] The Forum of Regulators has recommended setting the minimum level of renewable purchase obligations at 5% of the total power purchases in 2010, in line with the *National Action Plan on Climate Change*. See Kumar (2009).

[34] The incremental costs constitute investment and lifetime costs that are attributable to the climate action (mitigation or adaptation) as part of the overall costs of activities and measures.

3.2 Outcomes of the COP15

Prior to the COP15 in Copenhagen, India defined three 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 the COP15 was the consensus to continue the dual-track negotiation process, one under the UNFCCC and the other under the Kyoto Protocol. India has traditionally had a strong interest in multilateral climate-change negotiations taking place under the UNFCCC.

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 domestic mitigation actions that are implemented with their own resources and independent from 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 approach to several sticking points in international negotiations. One 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).

After the Copenhagen conference, the country reiterated the traditional position as part of the BASIC group. The joint statement underscores the centrality of the UNFCCC process and the decision of the parties to carry forward the negotiations on the two tracks (AWG-LCA and AWG-KP), calling for at least five meetings of these groups before the Mexico Conference (COP16, November–December 2010), including the first one in March 2010. The BASIC group leaders also expressed the hope that the Copenhagen Accord would facilitate the above dual-track negotiation process to lead to a successful conclusion at the next conference in Mexico.[35]

At the end of January 2010 the Indian government formally pledged "to reduce the emissions intensity of its GDP by 20-25% by 2020 in comparison to the 2005 level through domestic

[35] See the joint statement issued at the conclusion of the second meeting of ministers of BASIC group, New Delhi, 24 January 2010.

mitigation", and conveyed this pledge to the UNFCCC.[36] It has been clarified that i) its domestic mitigation actions will be entirely voluntary in nature and will not have a legally binding character; and ii) the assessment of emissions intensity against this pledge excludes emissions from agriculture.[37] 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.

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 (known as the Joint Work Programme on Energy, Clean Development and Climate Change). The 2009 EU–India summit highlighted the importance of an early implementation of this programme, which builds on the Joint Action Plan of 2005. Energy cooperation aims at securing safe, affordable and sustainable energy supplies, promoting energy efficiency and conservation, and sharing information on clean coal technologies (CCT). A special focus is placed on R&D, including on fusion energy and CCT, but especially on renewable energy. R&D initiatives include the launch of a joint call for proposals on solar energy worth €10 million. Cooperation on climate change focuses on modelling mitigation options and deploying climate-friendly technologies, and on the future of the CDM. Other initiatives include capacity-building support under the Action Plan Support Facility[38] and a follow-up of a completed study on emissions monitoring. Forms of cooperation involving the private sector include a platform for research cooperation on climate change and mobilisation of European Investment Bank loans worth of €250 million for investment projects contributing to mitigation and adaptation along with facilitating the transfer of clean energy technologies.[39] The programme does not provide a basis for concrete actions and thus progress in this sense has not been tangible.

Atteridge et al. (2009), a study prepared to inform the Swedish EU presidency by a group of European and Indian research institutes, identify a primary aim of the EU as that of catalysing large GHG emission reductions and an aim of India's as supporting economic development and enhancing technology transfer. Specific areas of mutual interest and for productive collaboration include support for

- a clean-cooking stoves programme, targeted at the large non-commercial, energy sector;
- the development and deployment of solar energy; and
- the implementation of the national mission on enhanced energy efficiency (e.g. credit provision for targeted lending to ESCOs, and technology deployment in small and medium-sized industries).

The above set of three support programmes may overlap to some extent with the four areas for flagship programmes identified in another proposal prepared for the EU–India summit (Luff and

[36] See Press Note, Ministry of Environment and Forests, 30th January 2010; see also a letter from Rajani Ranjan Rashmi (Joint Secretary, Ministry of Environment & Forests) to Yvo de Boer (Executive Secretary, UNFCCC), dated 30 January 2010.

[37] Ibid.

[38] For further details, see the EU-India Action Plan Support Facility website (at http://www.apsfenvironment.in/nbar1/about.html).

[39] Two loans have been provided by the European Investment Bank: €150 million to the Export-Import Bank of India (EXIM Bank) and €100 million to VW India Private Ltd., a subsidiary of the VW Group (retrieved from http://www.eib.org/).

Whitfield, 2009). These four areas are solar energy (CSP and photovoltanic), adaptation, black carbon and biochar.

In addition, 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, especially the poor developing countries that are vulnerable, known as the least developed countries and small island developing states (European Commission, 2007; see also European Commission, 2003). 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. Integrating climate change into poverty reduction efforts is likewise one of the priority areas covered under this framework (European Commission, 2007).

In the long term, an EU–Indian partnership could be further 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.

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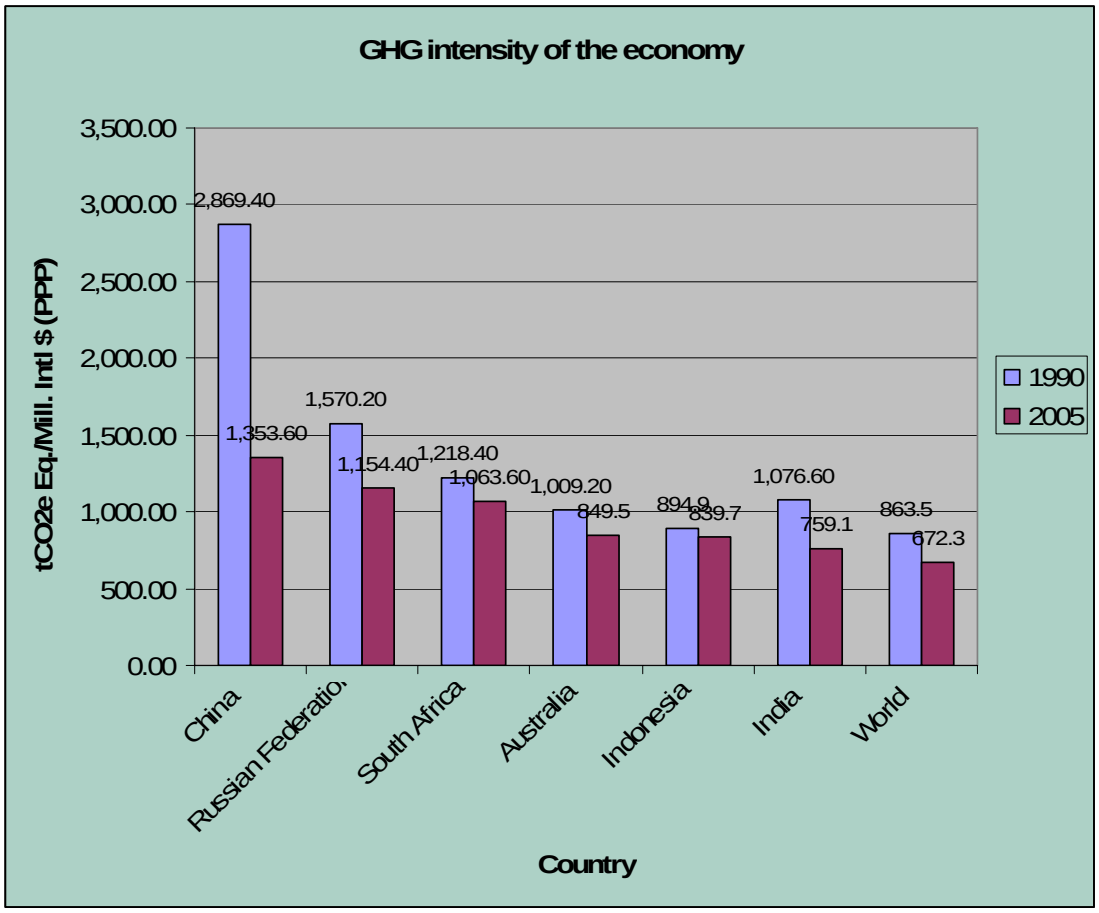
Appendix 1. GHG intensity across countries

Figure A1.1. India's GHG intensity in comparison with other top emitters above the world average



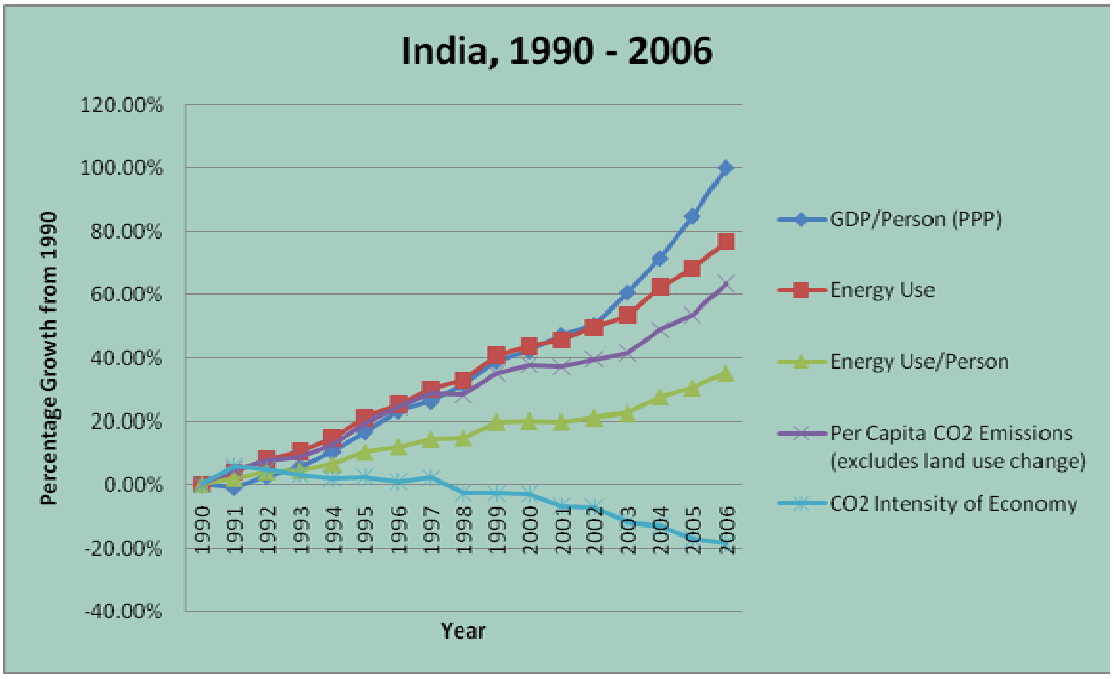
Notes: GHG emissions intensity of selected[40] economies in 1990 and 2005, excluding emissions from LULUCF (tonnes of CO_2 equivalent per 2005 million international dollars at purchasing power parity).

Source: Climate Analysis Indicators Tool (CAIT), Version 6.0. World Resources Institute (2009) (retrieved from http://cait.wri.org).

[40] These countries are selected from the top 16 emitters for whom the GHG intensity of their economies is above the world average.

Appendix 2. India energy and CO_2 emission trends

Figure A2.1. India country trends



Source: Climate Analysis Indicators Tool (CAIT), Version 7.0. World Resources Institute (2010) (retrieved from http://cait.wri.org).

Appendix 3. Results of five climate modelling studies

Table A3.1. Results for illustrative scenarios

	NCAER CGE Model	TERI MoEF Model	IRADe AA Model	TERI Poznan Mode	McKinsey India Model
GHG emissions in 2030-31 (CO_2 or CO_2e) (billion tons)	4.00 billion tons of CO_2e	4.9 billion tons (in 2031–32)	4.23 billion tons	7.3 billion tons in 2031–32	5.7 billion tons (including methane emissions from agriculture); ranges from 5.0 to 6.5 billion tons if GDP growth rate ranges from 6 to 9%
Per capita GHG emissions in 2030–31 (CO_2 or CO_2e)	2.77 tons of CO_2e per capita	3.4 tons of CO_2e per capita (in 2031–32)	2.9 tons of CO_2e per capita	5.0 tons of CO_2e per capita (in 2031–32)	3.9 tons of CO_2e per capita (2030), all GHGs
CAGR of GDP until 2030–31 (%)	8.84%	8.84% (Exogenous – taken from CGE)	7.66% (Endogenous, 2010–11 to 2030–31)	8.2% 2001–31 (Exogenous)	Exogenous – 7.51% (2005–2030) from MGI Oxford, Econometric model
Commercial energy use in 2030–31 (mtoe)	1,087 (Total commercial primary energy forms)	1,567 (Total commercial energy including secondary forms) in 2031–32	1,042 (Total Commercial primary energy)	2,149 (Total commercial energy including secondary forms) in 2031–32	NA
Fall in energy intensity	3.85% per annum *(compound annual decline rate)*	From 0.11 in 2001–02 to 0.06 in 2031–32 kgoe per $ GDP at PPP	From 0.1 to 0.04 kgoe per $ GDP at PPP	From 0.11 in 2001–02 to 0.08 in 2031–32 kgoe per $ GDP at PPP	Approximately 2.3% per annum between 2005 and 2030 (at PPP GDP, constant USD 2005 prices)
Fall in CO_2 (or CO_2e) intensity	From 0.37 kg CO_2e to 0.15 kg CO_2e per $GDP at PPP from 2003–04 to 2030–31	From 0.37 to 0.18 kg CO_2 per $ GDP at PPP from 2001–02 to 2031–32	From 0.37 to 0.18 kg CO_2 per $ GDP at PPP from 2003–04 to 2030–31	From 0.37 to 0.28 kg CO_2 per $ GDP at PPP from 2001–02 to 2031–32	Approximately 2% per annum between 2005 and 2030 (at PPP GDP, constant USD 2005 prices)

Source: Climate Modelling Forum (2009), p. 9.

Appendix 4. India's domestic initiatives related to climate change

Table A4.1. India's 24 recent initiatives related to climate change

Area	Initiative/event	Contribution
Science & Research	1. Indian Network for Climate Change Assessment (INCCA)	Network of 120 research institutions and 250 scientists launched; major conferences planned in May and November 2010
	2. Himalayan Glaciers Monitoring Programme	Comprehensive programme to scientifically monitor the Himalayan glaciers – phase I completed; phase II launched; discussion paper on state of Himalayan glaciers released
	3. Launch of Indian Satellite to Monitor Greenhouse Gases	ISRO to launch a micro-satellite in 2010 to study aerosols (soot particles), followed by a comprehensive satellite in 2011 to monitor GHG gases; India to join elite club of countries to do so
	4. India's Forest and Tree Cover as a Carbon Sink	Research estimates the value of India's forests as a carbon sink, and the assessment shows that they neutralise 11% of India's annual GHG emissions
	5. India's GHG Emissions Profile	India's GHG emission pathways until 2030 under different assumptions made public; they show that India will remain a minor per-capita emitter even in 2030
Policy development	6. Expert Group on Low Carbon Economy	Planning Commission-led group set up to develop a strategy for India as a low-carbon economy; to feed into the 12th plan process
	7. State Action Plans on Climate Change	Delhi became the first state to release a climate change action plan; other states are finalising their plans
	8. National Policy on Biofuels	National policy on biofuels approved by the cabinet to promote cultivation, production and use of biofuels for transport and in other applications
Policy implementation	9. National Missions under *National Action Plan on Climate Change* (NAPCC)	National missions on solar energy, energy efficiency and strategic knowledge approved; other missions in final stages of preparation
	10. First National Conference on Green Building Materials and Technologies	Conference to stimulate a green building sector; to set an example, the government proposes that all its new buildings will be GRIHA 4*-compliant subject to site conditions
	11. 30 'Solar Cities'	In principle, approval given to 30 'solar cities' with the aim of a 10% deduction in projected demand of conventional energy through a combination of energy efficiency and renewables
	12. Energy-Efficiency Standards for Appliances	Energy-efficiency ratings made mandatory for four key appliances – refrigerators, air conditioners, tubelights and transformers from 7 January 2010; more to follow through 2010
	13. Fuel-Efficiency Norms	Plan for fuel economy norms for vehicles announced; to be made operational in two years
	14. CDM Program	India assessed as Best CDM Country; Indian projects to neutralise 10% of emissions by 2012
International cooperation	15. India to host 'Rio+20'	India to host 11th COP of Convention on Biodiversity (CBD) in 2012, and to mark the 20th anniversary of Rio
	16. UN Climate Technology Conference	India successfully hosts global conference on technology, the 'Delhi Statement' is adopted
	17. SAARC Environment Ministers Conference	India successfully hosts the SAARC Ministers Conference and agrees joint actions on climate change; 2010 SAARC summit to be on the theme of climate change
	18. India's Submissions to UNFCCC	Report documenting India's 12 proactive submissions to UNFCCC released
Forestry	19. State of Forests Report 2009	Latest state of forest report released; shows continued rise in India's forest cover
	20. Launch of CAMPA	Ambitious Rs 11,700crore (US$2.5 bn) programme for forest conservation launched
	21. Green India Mission	New mission under the NAPCC to fast-track reforestation being finalised
	22. Capacity Building in Forestry Scheme	New Rs 369 crore (US$80 mn) scheme for HRD for forest personnel
	23. Intensification of Forest Management	New Rs 600 crore (US$125 mn) scheme to improve forest management, infrastructure, fire prevention, etc.
	24. Inclusion of Forestry within NREGA	Forestry-related activities included as part of India's flagship employment guarantee scheme to fast-track reforestation; pilots being implemented

Source: Ministry of Environment and Forests (2010).

Appendix 5. Key concerns for India at the UN negotiations

India's key concerns with four building blocks in the Bali Action Plan – mitigation, adaptation, financing and technology – are among others highlighted respectively. The following summary of individual building blocks is largely based on compiled submissions by the government to the Framework Convention that cover the period up to August 2009 (Ministry of Environment and Forests, 2009).

Mitigation

Under mitigation, three issues are of particular concern:[41] the clean development mechanism (CDM), nationally appropriate mitigation actions (NAMAs) and unilateral trade measures.

a) CDM

India ranks second in the world by the number of CDM projects and issued credits, after China.[42] India has submitted proposals for improving the CDM. Regarding environmental additionality, the country calls for the provision of clear guidelines for different kinds of CDM activities and especially where the eligible activities can be expanded. Some of the main items are set out below:

- no requirement for demonstration of financial additionality[43] for CDM activities;
- 'simplification of additionality' for small-scale CDM activities, together with those concerning methodologies, documentation and the project size;
- complete removal of additionality requirements for renewable energy projects;
- revision of monitoring criteria and inclusion of small-scale projects; and
- the development of new methodologies for programmatic CDM[44] or bundled[45] CDM activities.

b) NAMAs[46]

India's official view underlines that NAMAs by developing countries as envisaged in the Bali Action Plan are not meant to be carried out with domestic financing and resources but should be supported and enabled by technology transfer, capacity building and financial transfers provided by developed countries. Such actions are also meant to be voluntary in nature. Moreover, the

[41] The author has selected these topics for research purposes.

[42] See the UNFCCC website (http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html).

[43] The financial additionality requirement means that public funding for CDM projects from Annex I parties will not result in the diversion of official development assistance and will be separate from and not counted towards the financial obligations of Annex I parties (Preamble to Decision 17/CP.7 – UNFCCC 2001: 20; see also "CDM: Government of India interim approval criteria" on the website of the Ministry for Environment and Forests, retrieved from http://www.envfor.nic.in/cc/cdm/criteria.htm).

[44] Programmatic CDM refers to CDM project activities where emission reductions are achieved not by a single investment, but by multiple actions executed over time as a result of a government measure or a private sector initiative.

[45] This entails bringing together several small-scale CDM projects.

[46] The concept of NAMAs by developing-country parties was first introduced in the Bali Action Plan (1(b) (ii)).

country has suggested that non-Annex I countries formulate NAMAs for slowing the growth of their emissions and implement them on the condition of and in proportion to the financial and technological support from developed countries. Other important criteria for NAMAs include their compatibility with the sustainable development goal articulated in the Bali Action Plan, and their conformity with national development priorities as well as the objectives of poverty eradication. The following key concerns apply in this respect:

- An international UN Framework Convention on Climate Change (UNFCCC) registry should compile proposed NAMAs with information about an estimate of the mitigation effects, but also of the incremental costs, including the costs incurred in the transfer of technology and capacity-building.
- Both the proposed mitigation actions and the necessary support to enable their implementation should be measurable, reportable and verifiable.
- How the financing is obtained for reducing emissions from deforestation and forest degradation (REDD) and REDD plus.[47]
- India considers the proposed link between sectoral crediting and NAMAs to be inconsistent with the principles of the UNFCCC (e.g. the common but differentiated responsibilities and respective capabilities), because such a link would impose certain forms of commitments on developing countries.

c) Proposal for prohibition of trade measures

The UNFCCC has a single stand-alone provision in Art. 3.5 on trade measures, inspired by the statement in Art. XX, GATT: "Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade." It is one of the five guiding principles of the FCCC, with the same status as other principles, including the "common but differentiated responsibilities and respective capabilities" (Art. 3.1). Moreover, under the UNFCCC and the Kyoto Protocol, developed countries commit themselves to minimising adverse economic, social and environmental impacts on developing countries when responding to climate change (Art. 4.8 of the FCCC; Arts. 2.3 and 3.14 of the Kyoto Protocol). In this respect, Art. 2.3 of the Protocol makes an explicit reference to the effects on international trade as one form of adverse effects to be minimised.

In the run up to COP15 and in pursuit of the Bali Action Plan, India proposed the prohibition of unilateral measures.[48] "Such measures[49] would violate the principles and provision of the Convention, including, in particular, those related to the principle of common but differentiated responsibilities (Article 3, paragraph 1), to trade and climate change (Article 3, paragraph 5),

[47] The terms 'REDD' and 'REDD plus' refer to an initiative under discussion in the UNFCCC negotiations. This initiative would financially compensate developing countries for GHG emission reductions resulting from a reduction in domestic deforestation rates. The 'plus' represents the recently-added extra consideration of sustainable forest management and afforestation/reforestation in developing countries.

[48] See the document entitled "Work on the AWG-LCA Revised Negotiating Text: Intersessional formal consultations, Paragraphs 159 to 165 (pp. 142-146) of FCCC/AWGLCA/2009/INF.1", prepared by the Informal Group on Mitigation, Subgroup on Economic and Social Consequences of Response Measures, Paragraph 1(b)(vi) of the Bali Action Plan, 14 August 2009.

[49] "Such measures" refer to "any form of unilateral measures, including... [those] against goods and services imported from developing countries on grounds of protection and stabilisation of the climate" in the preceding sentence.

and to the relationship between mitigation actions of developing countries and the provision of financial resources and technology by developed country Parties (Article 4, paragraphs 3 and 7)."[50] This kind of argument has received wider support from emerging and developing economies with opposition from developed countries.

Adaptation

India has proposed that the international community focuses on a number of core principles to guide adaptation action and implementation in developing countries. These include common but differentiated responsibilities and respective capabilities; provision of new, additional and predictable financial resources through a new institutional mechanism; addressing adaptation issues coherently under the UNFCCC; securing access to the means of implementation including finance, technology, capacity building and knowledge sharing; taking into account the specificity and differences among levels and layers of assessed vulnerability; and providing the full costs of technology for single projects.

Financing

India underlines the crucial role of *new and additional* sources for funding adaptation and mitigation action in developing countries in the form of grants and resource transfers, and emphasises their distinction from the existing or future sources of development assistance. The following are specific proposals:

- To scale up carbon finance, Indian negotiators have proposed a number of new funding sources. These sources include annual contributions by developed countries equal to 0.5% of their combined GDPs, levies on international travel or use of marine haulage, voluntary private grants, and other bilateral or unilateral voluntary grants. The new and additional contributions should be mandatory to make flows predictable. Carbon market funding should be separate.
- India envisages the new financial architecture to be under the direct control of the Conference of Parties, executed by an executive board.
- Developing countries would have direct access to funding with an emphasis on vulnerable countries and least developed countries (LDCs).
- There will be eligibility criteria for specific investments to receive funding under the UNFCCC to cover i) the incremental costs of mitigation, technology diffusion, R&D, capacity building and preparing/implementing national action plans, and ii) the full costs of adaptation, patents and fees for intellectual property rights.

India joined the call of the BASIC group for the early flow of US$ 10 billion from developed countries in 2010 as promised in the Copenhagen Accord, with a focus on the LDCs, small island developing states and African countries. It also welcomed the progress made on the proposal for financing and implementation of the REDD plus mechanism.[51]

Technology & technology mechanism

In the Indian view, the known technologies for addressing mitigation and adaptation are not employed to a sufficient extent in all countries, but especially in non-Annex I parties, while new

[50] See the document entitled "Work on the AWG-LCA Revised Negotiating Text: Intersessional formal consultations, Paragraphs 159 to 165 (pp. 142-146) of FCCC/AWGLCA/2009/INF.1", op. cit.

[51] See the joint statement issued at the conclusion of the second meeting of ministers of BASIC group, New Delhi, 24 January 2010.

ones are not being developed fast enough to deliver a timely breakthrough in climate action. This sense of urgency has led Indian negotiators to propose the establishment of a new instrument, the technology transfer mechanism. Acceleration of development deployment, adoption, diffusion and transfer of technology to non-Annex I parties (primarily from Annex II parties) are seen as a requirement to avoid lock-in on high-emission paths and constrained development opportunities. At the same time, they would require new institutional arrangements.

The new technology mechanism to facilitate cooperation on the above-mentioned technological change processes would operate under the guidance and authority of the COP. It consists of an executive body on technology and a multilateral climate technology fund. The work of the executive body would be based on a technology action plan that lays down the actions and timelines for the first three years. The action plan would target all technological change stages and processes. R&D rates would be accelerated primarily through scientific and technical cooperation at all levels.

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