Chapter 27
India's Evolving Climate Change Strategy

Patodia Rastogi

Abstract India, along with most other developing countries, has viewed climate change as an environmental concern that first and foremost must be addressed by the industrialized west. As a developing country with a massive population living in poverty, India's priority lies with the development challenges it faces. As a result, domestic action on climate change has been minimal and to the extent that it existed, it was primarily viewed as a "co-benefit" of another policy. Only in 2008, primarily due to increasing pressure from the international community and India's growing status as a major economy, that a dramatic shift was seen in India's approach to addressing climate change. The release of the National Action Plan on Climate Change, a comprehensive framework policy where climate change was the central focus, marked this change. Since then, India has built on the National Plan and undertaken various initiatives that point towards its commitment on this issue. This chapter explores the evolution of domestic climate policy-making in India – from the period where climate was considered purely a "first world problem" to one where India is now proactively engaging at all levels to address climate change.

27.1 Introduction

India's current status as a developing country as well as a major emerging economy poses it with unique challenges in relation to climate change. India has a population of over a billion people, second only to China's, and is expected to become the

Patodia Rastogi is an independent consultant formerly the International Fellow at the Center for Climate and Energy Solutions, VA, USA formerly the Pew Center on Global Climate Change. She can be contacted at npatodia@yahoo.com.

P. Rastogi (✉)
Ecologic Institute Washington, 1630 Connecticut Ave. NW,
Suite 300, Washington, DC 20009, USA
e-mail: npatodia@yahoo.com

E.J. Hollo et al. (eds.), *Climate Change and the Law*, Ius Gentium: Comparative Perspectives on Law and Justice 21, DOI 10.1007/978-94-007-5440-9_27,

world's most populous country by 2025.[1] With almost 42% of its population living in poverty[2] and about 350 million people with no access to electricity,[3] India's primary challenge remains poverty eradication and raising the standards of its people. Compounding these challenges is the potential impact of climate change. Approximately half a million people are dependent for their livelihood on the glacier-fed Himalayan region which is one of the main freshwater sources for the Gangetic basin. Studies have shown that in the longer-term, melting glaciers and the resulting water stress could have a crippling effect on that region.[4] India's agriculture-dependent economy could be affected by lower crop yields, another impact of climate change. Hundreds of millions of people live in coastal India and climate change impacts like sea level rise could have a devastating effect on them.[5]

In spite of the developmental challenges India faces, its economy has been experiencing unprecedented growth. It is currently the fourth largest economy in the world[6] and to meet its economic and development goals, the Indian government has targeted economic growth rates of about 8–10% a year for the next two decades.[7] The Government of India estimates that to meet these goals a three- to four-fold increase in primary energy supply and a five- to six-fold increase in electricity generation capacity will need to occur.[8] Coal and oil, both fossil fuels, account for about 75% of India's energy consumption and approximately 70% of electricity is generated from coal-fired power plants.[9] It is expected that due to the high demand for energy, coal will remain the mainstay of the Indian economy for the foreseeable future.

Even though India contributes only about 5% to global greenhouse (GHG) emissions, it still is ranked fourth in terms of absolute emissions. Furthermore, its emissions are projected to experience one of the highest growth rates in the next few

[1] US Census Bureau, "China's Population to Peak at 1.4 Billion Around 2026", 15 December 2009, available at: http://www.census.gov/newsroom/releases/archives/international_population/cb09-191.html (last accessed on 30 April 2012).

[2] World Bank, "New Global Poverty Estimates – What It Means for India", available at http://go.worldbank.org/51QB3OCFU0 (last accessed on 30 April 2012).

[3] World Bank, "India's Power Sector", available at http://go.worldbank.org/HQBS4S8190 (last accessed on 30 April 2012).

[4] Elizabeth L. Malone, *Changing Glaciers and Hydrology in Asia: Addressing Vulnerabilities to Glacier Melt Impacts* (Washington, DC: USAID, 2010) at 3.

[5] UNFCCC, "Indian Minister of Environment Jairam Ramesh: Press Conference at COP 16", 7 December 2010, available at http://unfccc.int/resource/webcast/player/app/play.php?id_episode=2988 (last accessed on 23 April 2012).

[6] On a GDP PPP basis for the year 2011. IMF, "World Economic Outlook Database 2012", available at http://www.imf.org/external/pubs/ft/weo/2010/02/weodata/index.aspx (last accessed on 22 April 2012).

[7] Government of India, *Integrated Energy Policy Report of the Expert Committee* (New Delhi: Planning Commission, 2006).

[8] Ibid.

[9] Energy Information Administration, "Country Analysis Briefs: India", 21 November 2011, available at http://www.eia.doe.gov/cabs/India/Full.html (last accessed on April 22 2012).

decades – about 47% between now and 2020. In terms of per capita emissions, India however ranks extremely low – only about a tenth of the United States' per capita emissions and a third of the world average.[10]

Striking the right balance between these two conflicting factors – on the one hand tackling the country's development challenges and on the other being recognized as a major emerging economy – is the basis on which India has developed its recent approach to climate change. Historically, India's stance on climate change has been driven primarily by its categorization within the United Nations Framework Convention on Climate Change (UNFCCC) as a Non Annex 1 party (developing country party) where it has no obligation to reduce its GHG emissions. More recently though, its emergence on the world stage as a major economy cast a spotlight on the country and it has felt an increasing pressure to undertake domestic action to address climate change. This chapter explores the evolution of climate policy-making in India. The following section elaborates on India's historical stance of the climate issue being a "first world problem" and highlights relevant domestic legislation that was developed in this context. The third section discusses the drivers that led to the launch of the National Action Plan on Climate Change (NAPCC) and further elaborates on the relevant Missions of the NAPCC. It also describes policies and measures that have been developed since the NAPCC and concludes with a brief overview of engagement at the sub-national level on climate change.

27.2 Until the Mid 2000s: India's Traditional Approach to Climate Change

As a Non Annex 1 party to the UNFCCC and the Kyoto Protocol, India has no legal obligation to reduce its GHG emissions. Instead India has long argued that the historical responsibility[11] to deal with climate change lies with the developed countries as they are the creators of the problem and that they must take on a leadership role in addressing climate change. The "overriding priority" of India (and other developing countries) is to address development and poverty eradication and any action to reduce emissions should be voluntary. This principle, commonly known as the principle of common but differentiated responsibility, is one that India has long been an advocate of. The firewall created through this principle between developed

[10] Based on author's calculations. Data is from International Energy Agency, *CO2 Emissions from Fuel Combustion 2010 Highlights* (Paris: OECD/IEA, 2010); International Energy Agency, *World Energy Outlook 2010* (Paris: OECD/IEA, 2010) and United States Environmental Protection Agency (USEPA), *Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990–2020* (Washington, DC: USEPA, 2006). Data does not include emissions from land-use, land-use change and forestry.

[11] Mukund G. Rajan, *Global Environmental Politics: India and the North–South Politics of Global Environmental Issues* (New Delhi: Oxford University Press, 1997).

and developing countries shielded India from undertaking any meaningful action to reduce emissions.

India's domestic approach to climate change largely mirrored its multilateral stance. Domestic policies per se did not exist and climate change was addressed only in a piecemeal manner, mainly through energy or forestry policies in which climate was never the central focus. The main thrust of these policies was social and economic development. Climate change was mentioned, if at all, only as a "co-benefit" of another policy.

27.2.1 Five Year Plans

Many policies developed during this period that had a climate "co-benefit" originated in India's Five Year Plans. Five Year Plans, much like in other countries, lay the foundation for economic planning and development for the country. In India's case, its Five Year Plans are developed by its Planning Commission. Environmental concerns were addressed for the first time in the Sixth Five Year Plan (1980–1985)[12] and one of the primary objectives of the Ninth Five Year Plan (1997–2002) was to "ensure environmental sustainability of the developmental process through social mobilization and participation of people".[13] Climate change was given due importance for the first time as late as the Eleventh Five Year Plan (2007–2012). Most of the objectives in the Eleventh Five Year Plan were driven by the need to build energy resources to meet the growing energy demand and ensuring India's economic growth. Objectives included reducing energy intensity by 20% by 2016–2017, building additional capacity for nuclear power and renewable energy, and the Plan also set a specific objective of increasing forest cover by 5%.[14]

27.2.2 Energy Conservation Act (2001)

The Energy Conservation Act of 2001[15] laid the foundation for promoting energy efficiency by establishing the Bureau of Energy Efficiency (BEE) with the primary objective of reducing energy intensity. The Act empowered the government to set

[12] Planning Commission, *Eighth Five Year Plan Volume 2*, available at http://planningcommission.nic.in/plans/planrel/fiveyr/8th/vol2/8v2ch4.htm (last accessed on April 28 2012).

[13] Planning Commission, *Ninth Five Year Plan Volume 1*, available at http://planningcommission.nic.in/plans/planrel/fiveyr/9th/vol1/v1c1-1.htm (last accessed on April 28 2012).

[14] Planning Commission, *Eleventh Five Year Plan 2007–2012 Volume 1*, available at http://planningcommission.nic.in/plans/planrel/fiveyr/welcome.html (last accessed on April 28 2012).

[15] Ministry of Law, Justice and Company Affairs, *Energy Conservation Act*, 29 September 2001, available at http://www.powermin.nic.in/acts_notification/pdf/ecact2001.pdf (last accessed on 30 April 2012).

energy consumption standards for equipment and appliances, specify energy conservation building codes for commercial buildings and set energy consumption norms and standards for consumers. It also established a compliance mechanism through energy audits to be conducted by accredited auditors.

27.2.3 Integrated Energy Policy (2006)

The Integrated Energy Policy (2006)[16] was an effort by the Planning Commission to address the country's growing energy demands. The Integrated Energy Policy provides a comprehensive framework for energy policy in India. Its vision is to "to reliably meet the demand for energy services of all sectors including the lifeline energy needs of vulnerable households in all parts of the country with safe, clean and convenient energy at the least-cost."[17] The policy states that India should pursue all available fuel options and forms of energy and that coal will remain the mainstay of the Indian economy till 2031–2032. In terms of addressing climate change, the Integrated Energy Policy makes recommendations that include power sector reforms, ramping up mass transit, increasing nuclear power and renewables, and highlighting energy efficiency in all sectors.

27.2.4 Other Relevant Legislation

The Electricity Act 2003[18] was a landmark legislation for power sector reforms in India. It encouraged the development of renewable energy by mandating that State Electricity Regulatory Commissions (SERCs) promote renewable energy by allowing connectivity and sale of electricity to any interested person and specified that a certain percentage of the electricity consumption should be from renewables. Building on this Act, the National Electricity Policy (2005) called for increased participation by the private sector to exploit non-conventional energy resources and allowed for renewable energy procurement through a competitive bidding process. It also called for a more level playing field between non-conventional technologies and conventional ones by allowing for differential tariffs.[19] To further encourage

[16] Planning Commission, Integrated Energy Policy. 2006.

[17] Press Information Bureau, "Integrated Energy Policy", 26 December 2008, available at http://www.pib.nic.in/newsite/erelease.aspx?relid=46172 (last accessed on 25 April 2012).

[18] Ministry of Law and Justice, *The Electricity Act 2003*, 26 May 2003, available at http://www.powermin.nic.in/acts_notification/electricity_act2003/pdf/The%20Electricity%20Act_2003.pdf (last accessed on 17 April 2012).

[19] Ministry of Power, *National Electricity Policy*, 12 February 2005, available at http://www.powermin.nic.in/whats_new/national_electricity_policy.htm (last accessed on 10 April 2012).

renewable energy development, the National Tariff Policy (2006)[20] stipulated the SERCs to purchase a minimum percentage of power from renewable sources.

Most of the legislative and policy initiatives described in this section were driven primarily by India's development imperatives – a need to exploit all potential energy resources to ensure that there is an adequate energy supply and to continue to spur economic growth. It was only in the late 2000s, due to various factors most notably the growing international pressure to address climate that led India to develop a climate-specific policy framework.

27.3 Late 2000s Onwards: India's Growing Status as a Major Emerging Economy

The twenty-first century saw the arrival of India on the world stage as a global power. With the Indian economy growing at a phenomenal rate of 8% a year, India was no longer viewed solely as a "developing country". In fact, during the 2007 financial crisis both India and China were considered critical partners in the G20 talks that helped avert a global meltdown due to their growing economies. This acknowledgement of India's status as a major emerging economy brought with it more responsibility. To be recognized as a legitimate global player the world needed to see India as a country willing to shoulder responsibilities. This expectation was reflected within the multilateral climate negotiations where India began to feel international pressure to be more proactive and take action to reduce its own GHG emissions.[21] The shift in India's stance on taking action domestically and launching the National Action Plan on Climate Change (NAPCC)[22] can be attributed to a large extent to this growing international pressure. Facing the fear of isolation[23] and continued international pressure, prior to the much-hyped Copenhagen Summit in 2009, India further announced that it would voluntarily reduce its emissions intensity between 20 and 25% below 2005 levels by 2020.[24]

---

[20] Ministry of Power, *National Tariff Policy*, 6 January 2006, available at http://www.powermin.nic.in/whats_new/pdf/Tariff_Policy.pdf (last accessed on 25 April 2012).

[21] Shyam Saran "Climate Change Negotiations: The Challenge for Indian Diplomacy", Speech delivered at Vivekanand International Foundation, 19 March 2010, available at http://www.vifindia.org/node/299 (last accessed on 29 April 2010).

[22] Government of India, *National Action Plan on Climate Change*, Prime Minister's Council on Climate Change, New Delhi, July 2008, available at http://pmindia.nic.in/Pg01-52.pdf (last accessed on 22 April 2012).

[23] Aaron Atteridge et al. "Climate Policy in India: What shapes International, National and State Policy?" 41(1) *Ambio* (2012) 68 at 71.

[24] Excluding agriculture emissions. UNFCCC, "Letter including India's Domestic Mitigation Actions", 30 January 2010, available at: http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/indiacphaccord_app2.pdf (last accessed on 30 April 2012).

While international diplomatic pressure played a critical role that led to India's more proactive stance, one cannot dismiss the importance that domestic priorities played in this context as well. A realization by the Indian government that it is extremely vulnerable to climate change impacts meant that it was in India's own interest to take action both domestically and internationally. With its accelerating energy demands and India importing more than 70% of its oil, it made sense for India to prioritize energy security and focus on energy efficiency and renewables. This is reflected in specific missions of the NAPCC. Energy access, another domestic concern, could put India's development at risk. The Indian government's focus on developing renewable energy helps it to achieve this goal.

Another driver worth noting is the immense opportunity that the clean energy technology sector provides for the twenty-first century. With the race for fossil fuels becoming increasingly competitive, many countries are looking at building their own domestic capacities to shore up energy supplies. Potential growth in this sector and the economic opportunity that it opens up in the global marketplace has driven great interest in this sector. Projections of global investment in clean energy technologies are far from trivial – estimates show that from now until 2020, cumulative global investment totals for clean power generation technologies could reach nearly USD 2.3 trillion assuming strong action on climate change.[25] Countries that are first-time movers in the clean energy technology space are more likely to become market leaders and be able to exploit the potential of this sector. Global competition has already begun in this sector with China being the leader in solar power manufacturing and wind generation. Some European countries, Denmark and Germany specifically, have taken steps to enhance their renewable technology capacities. India's Solar Mission is an acknowledgement of the opportunity the clean technology space offers. Success in this Mission will enable India to become a frontrunner in solar manufacturing.[26] By establishing aggressive renewable policies through its climate programs, India has begun laying the path towards becoming a leader in the technology choices of the future.

27.3.1 National Action Plan on Climate Change

The National Action Plan on Climate Change (NAPCC) released by Prime Minister Manmohan Singh in 2008 marked a watershed moment in India's domestic engagement on the climate issue. Consisting of eight national missions that run till 2017, the

[25] Center for Climate and Energy Solutions, *Clean Energy Markets: Jobs and Opportunities* (Arlington: 2011), available at http://www.c2es.org/docUploads/clean-energy-markets-update2011_0.pdf (last accessed on 1 May 2012).

[26] Farookh Abdullah, "A Renewable Future for Mankind: Challenges and Prospects", 13 January 2011, *Making It Magazine.net*, available at: http://www.makingitmagazine.net/?p=2849 (last accessed on 26 April 2012).

NAPCC is a package of existing and planned initiatives, policies and programs focused both on adaptation and mitigation. While the Plan emphasized India's development objectives, it established for the first time, a concrete framework to address climate specifically in the domestic context.

The eight Missions comprehensively address mitigation, adaptation as well as research and development. The missions are the National Solar Mission, National Mission on Sustainable Habitat, National Mission for Sustaining the Himalayan Ecosystem, National Water Mission, the National Mission on Enhanced Energy Efficiency, National Mission for a Green India, National Mission for Sustainable Agriculture and National Mission on Strategic Knowledge for Climate Change. In early 2012, the Government of India announced its plans to establish an additional mission on clean coal technologies.[27] These Missions are to be institutionalized through inter-sectoral groups, consisting of members from the relevant ministries, civil society, industry and academia. Detailed plans that include targets, timelines and objectives are to be developed by these groups and submitted to the Prime Minister's Council on Climate Change.

Some of the missions build on existing legislation or policies, like the National Mission on Sustainable Habitat or the Green India Mission, while others like the Solar Mission, chart a new and ambitious path by the government to access a previously untapped energy source. Considering the significant progress made by the National Mission on Enhanced Energy Efficiency (NMEEE) and the National Solar Mission, this section provides an overview of the achievements specifically of these two Missions.

27.3.1.1 National Mission on Enhanced Energy Efficiency – Perform Achieve and Trade Scheme

Under the NAPCC, The National Mission on Enhanced Energy Efficiency was mandated to implement four new initiatives: the Perform, Achieve and Trade Scheme; Market Transformation for Energy Efficiency; Energy Efficiency Financing Platform and; Framework for Energy Efficient Economic Development.[28] While the latter three are still in the early stages of implementation, the Perform, Achieve and Trade scheme (PAT Scheme) was recently launched by the Government of India.[29] The PAT scheme is an innovative market mechanism for

[27] Hindu Bureau, "National Mission on Clean Coal Technologies on the Cards", 27 February 2012, *The Hindu Business Line*, available at http://www.thehindubusinessline.com/industry-andeconomy/economy/article2938979.ece?ref=wl_industry-and-economy (last accessed on 30 April 2012).

[28] Ministry of Power, *National Mission on Enhanced Energy Efficiency Draft Mission Document: Implementation Framework*, December 2008, available at http://www.indiaenvironmentportal.org.in/files/National%20Mission%20for%20Enhanced%20Energy.pdf (last accessed on 1 May 2012).

[29] Ministry of Power "Notification (Energy Conservation Rules 2012)", 30 March 2012, available at http://220.156.189.23/schemes/documents/nmeee/pat/PAT_Rules_English.PDF (last accessed on 1 May 2012).

trading energy efficiency certificates in energy-intensive sectors. After many delays mostly due to industry pushback and legal holdups, the PAT scheme was finally rolled-out in April 2012 making India the first developing country to implement a market-based mechanism.

The PAT scheme is being implemented in three phases – the first phase covers 478[30] facilities from eight energy-intensive sectors, namely aluminum, cement, chlor-alkali, fertilizer, iron and steel, pulp and paper, textiles and thermal power plants. The government expects the scheme to deliver reductions of about 100 million tons of CO_2 annually by the end of its first phase. The Energy Conservation Act 2001, the legal framework on which the PAT scheme is based, was amended by the Parliament in 2010 to allow for the establishment of the scheme.

The PAT scheme is a baseline-credit scheme that allows facilities to trade certificates to meet their compliance requirements and simultaneously reduce costs. Each facility has a specific energy consumption target (a reduction in energy consumption from the facility's baseline) with less energy efficient facilities having a greater reduction target compared to more efficient ones. A facility's baseline is based on its historic specific energy consumption over the period 2007–2010. Facilities that make greater reductions than their target will be receive "Energy Saving Certificates" (EsCerts) which can be traded with other facilities that have difficulty meeting their target or bank them for use in a subsequent phase. Those facilities that are unable to meet their targets must buy EsCerts or pay a penalty. One Energy Saving Certificate is equivalent to 1 ton of oil equivalent, an energy consumption measure rather than a carbon reduction measure.

The first phase extends over a 3-year period (2012–2015) and covered facilities are expected to meet their target by the end of the first phase. Monitoring and verification will be conducted by auditors at the end of the first phase and Energy Saving Certificates will be issued ex-post.

While details of the subsequent phases of the PAT scheme are still being fleshed out, early signs have hinted at the possibility of broadening the scheme to include other energy-intensive sectors like petroleum refineries, petrochemicals, chemicals etc. and further tightening the targets.

27.3.1.2 Solar Mission

Prime Minister Manmohan Singh has emphasized the importance of the Indian economy to gradually shift away from a fossil fuels-based economy to one more dependent on non-fossil fuels and renewable sources of energy.[31] This principle is

[30] Ministry of Power "Notification (Rules)", 30 March 2012, available at http://220.156.189.23/schemes/documents/nmeee/pat/PAT_Notification_English.pdf.

[31] Manmohan Singh, "Release of the National Action Plan on Climate Change", Prime Minister's Speech, 30 June 2008, available at http://pmindia.gov.in/speech-details.php?nodeid=667 (last accessed on 1 May 2012).

reflected in the Solar Mission,[32] one of the most ambitious Missions launched by the government. The Mission sets a goal of generating 20 GW of grid-connected solar power plants by 2022, a several thousand-fold increase from current levels. While extremely ambitious, the Government of India has already demonstrated some early success in getting this Mission off the ground.

The Government of India decided to award solar projects to the private sector for the first phase of this Mission (till 2013) through a process of reverse auction rather than a feed-in tariff, primarily due to great interest shown by the Indian solar industry. The first reverse auction was conducted in 2010 wherein 150 MW of solar PV and 470 MW of concentrated solar thermal power were auctioned. Response to this first auction was overwhelming – bid applications totaled 5,126 MW, about eight times more than the maximum allotted capacity of 620 MW and price quotes received were on average 25–32% below the central government's declared tariffs.[33] The government selected the projects based on the criteria of a maximum discount offered on the declared tariff. Due to the extremely low bids, there was some concern raised about the viability of some projects selected in the first auction and as a result about half the bids were discarded. Learning from this experience, guidelines were revised for the second round of auctioning held in 2011. This round is expected to award 350 MW of solar PV and concentrated solar thermal power projects to eligible project developers. Bids received have been significantly lower than even the first round, with the lowest one being 38% below the average price in the first round.

27.3.2 Other Relevant Initiatives

While the National Action Plan on Climate Change was primarily developed to address international concerns, it helped elevate the issue of climate change domestically. Apart from building on the work of the Missions, the Indian government has made further advancements to strengthen its policies in the climate and clean energy sectors, both at the national and at the state level.

27.3.2.1 Coal Levy

India showed its commitment to addressing climate change by being one of the first developing countries to implement a levy on coal. What is most noteworthy of this effort is the fact that the revenues solely go towards a National Clean Energy Fund.

[32] Ministry of New and Renewable Energy, *Jawaharlal Nehru National Solar Mission*, available at http://india.gov.in/allimpfrms/alldocs/15657.pdf (last accessed on 1 May 2012) and; Ministry of New and Renewable Energy, *Resolution Jawaharlal Nehru National Solar Mission*, 11 January 2010, available at http://www.mnre.gov.in/solar-mission/jnnsm/resolution-2/ (last accessed on 26 April 2012).

[33] Ranjit Deshmukh, Ashwin Gambhir and Girish Sant "India's Solar Mission: Procurements and Auctions" 46 *Economic and Political Weekly* (2011) 22, at 24–25.

First introduced in India's budget in February 2010 and implemented in July 2010, a levy of 50 rupees a ton (approximately USD 1 a ton) was imposed on domestic and imported coal, lignite and peat.[34] The levy is expected to generate about USD 500 million a year. The National Clean Energy Fund is to support research and development for clean energy technologies primarily including critical renewable energy infrastructure projects like silicon manufacturing, advanced solar manufacturing, geothermal energy, hydrogen and fuel cells, and clean fossil energy (Carbon Capture and Storage, coal gasification etc.)[35]

27.3.2.2 Renewable Energy Certificate Mechanism

In March 2011, the Government of India launched its Renewable Energy Certificate Mechanism, another example of the Indian government's use of innovative ways to encourage development of renewable energy.

Under the Electricity Act 2003, State Electricity Regulatory Commissions (SERCs) are required to specify Renewable Purchase Obligations (RPOs), a requirement for distribution companies to purchase a certain percentage of electricity from renewable sources. The Central Electricity Regulatory Commission (CERC) set regulations[36] for the implementation of the Renewable Energy Certificate (REC) mechanism in 2010. The mechanism provides flexibility to states that do not have adequate renewable sources to meet their Renewable Purchase Obligations through a trading mechanism. The mechanism allows a renewable energy generator to either sell its renewable energy at a feed-in tariff previously determined or sell its electricity and "renewable" attributes separately. The "renewable" electricity attributes can be exchanged in the form of a Renewable Energy Certificate (REC). One REC is equivalent to 1 mega-watt hour (MWh) of renewable electricity fed into the grid. RECs are differentiated into two types – solar and non-solar – both with floor and ceiling prices determined by the CERC. Currently the Indian REC market has conducted trades worth about USD 5 million since its launch. It is expected that monthly sales will be valued at over USD 20 million by the end of 2012.[37]

---

[34] Ministry of Finance "Levy of Clean Energy Cess", 24 June 2010, available at http://www.cbec.gov.in/excise/cx-circulars/cx-circulars-10/circ-cec01-2k10.htm (last accessed on 25 April 2012).

[35] Ministry of Finance "Guidelines for Appraisal and Approval of Projects/Schemes Eligible for Financing under the National Clean Energy Fund", 18 April 2011, available at http://finmin.nic.in/the_ministry/dept_expenditure/plan_finance2/Guidelines_proj_NCEF.pdf (last accessed on 1 May 2012).

[36] Central Electricity Regulatory Commission, "Notification (Central Electricity Regulatory Commission Regulations 2010", 14 January 2010, available at https://www.recregistryindia.in/pdf/REC_Regulation/2(a)CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf (last accessed on 23 April 2012) and; ABPS Infra "Report on the Conceptual Framework for Renewable Energy Certificate Mechanism for India", June 2009, available at http://mnre.gov.in/file-manager/UserFiles/MNRE_REC_Report.pdf (last accessed on 27 April 2012).

[37] PTI, "Energy Credits Trading likely to touch 100 crores by year-end", *Hindu Business Line*, January 4 2012, available at http://www.thehindubusinessline.com/industry-and-economy/economy/article2774310.ece (last accessed on 27 April 2012).

27.3.2.3 Expert Group on Low Carbon Strategies

Recognizing the importance of transitioning to a low carbon economy, the Indian government set up an "Expert Group on Low Carbon Strategies for Inclusive Growth" consisting of experts from various ministries, civil society and the private sector.[38] The Expert Group is based in the Planning Commission. Recommendations from the Expert Group's work are expected to feed into India's Twelfth Five Year Plan (2013–2017). The group submitted its interim report in May 2011. The report, while interim, gives a flavor of the range of actions that will be required for India to transition to a low carbon economy. These include actions to increase investment in renewable technologies, reduce losses from transmission and distribution from the power sector; adopt super-critical technologies in coal based thermal power generation; get iron, steel and cement sectors to adopt best-available technology and; to increase the share of rail in overall freight transport.

27.3.3 Engagement at the State level

Soon after the launch of the NAPCC in August 2009, Prime Minister Manmohan Singh addressed state environment ministers and urged them to develop State Action Plans on Climate Change (SAPCC). Following this, the Ministry of Environment and Forests provided additional guidance by providing states with a common framework for developing these plans. The State Plans are to be prepared under the auspices of the NAPCC and the intention is to have a top-down approach where national and state actions are "harmonized".[39]

Responses by states have been mixed with some states making climate change a priority while others have yet to submit their action plans.[40] As can be expected, most of these sub-national plans are driven by each state's assessment of their vulnerabilities and opportunities, as well as their own development agenda.

As a coastal state where most of its population lives below the poverty line, the state of Orissa's plan gives greater importance to adaptation and focuses on the agriculture sector and coastal disasters.[41] Due to the abundance of coal in the state,

[38] Planning Commission, *Interim Report of the Expert Group on Low Carbon Strategies for Inclusive Growth*, May 2011, available at http://planningcommission.nic.in/reports/genrep/Inter_Exp.pdf (last accessed on 27 April 2012).

[39] Ministry of Environment and Forests "Towards a common framework for preparation of State Level Strategy and Action Plans on Climate Change", National Consultation Workshop, 19 August 2010, available at http://moef.nic.in/downloads/others/Experts-SAPCC-Preeti.pdf (last accessed on 26 April 2012).

[40] Draft reports submitted by states to the MoEF can be found at http://moef.nic.in/modules/others/?f=sapcc-2012. As of April 2011, 10 states were listed on this website. However, draft plans of some of the states can be found on other websites and/or in form of power point presentations.

[41] Government of Orissa, "Orissa Climate Change Action Plan 2010–2015", available at http://moef.nic.in/downloads/public-information/Orissa-SAPCC.pdf (last accessed on 28 April 2012).

the plan makes clear that most of the additional power will be generated from coal but prioritizes clean coal as well. Karnataka, another coastal state, emphasizes actions in the agriculture, water and energy[42] sectors according equal importance to both adaptation and mitigation. The desert state Rajasthan's action plan[43] sketches out action for the short-, medium- and long-term and includes specific time frames and targets for implementation. Its plan focuses on its regional concerns – desertification and land degradation, and human health. It also emphasizes the opportunities that abound in the state for exploiting the use of renewables, specifically solar and biomass. With a large population whose livelihood is dependent on agriculture and forestry, Madhya Pradesh's plan focuses more on strategies that ensure that the state is "climate-resilient" one.[44] The state of Gujarat is one that has been extremely active in implementing "on the ground" climate action, and as one of the most industrialized states in the country it comes as no surprise that its focus is on mitigation opportunities. It was not only one of the first states to establish its own climate change department[45] but also has its own Solar Policy and Wind Energy Policy and is the leader in developing Clean Development Mechanism (CDM) projects in the country.[46] While specific timeframes or targets seem to be lacking in most of the plans, some states have included budgets for implementing their action plans. For example, the state of Orissa estimates an ambitious budget of USD 3,200 million approximately over 5 years.

27.4 Conclusion

As a country that has routinely resisted taking action on climate change, in the last few years India has taken some substantial strides in undertaking ambitious domestic climate policy. International pressure and domestic concerns have played a critical role in catalyzing action. Action at the national level has trickled down to all levels, with involvement from the states, private sector as well as civil society.

---

[42] EMPRI and TERI "Karnataka State Action Plan on Climate Change Prepared for the Government of Karnataka", 17 September 2011, available at http://www.empri.kar.nic.in/Karnataka%20SAPCC%20draft%20-%20EMPRI,%20TERI%202011-09-17.pdf (last accessed on April 23 2012).

[43] Government of Rajasthan "Rajasthan State Action Plan on Climate Change" available at http://210.212.96.131/rpcb/ReportsAndPaper/ClimateChange_15_12_2011.PDF (last accessed on 25 April 2012).

[44] Government of Madhya Pradesh, "Madhya Pradesh State Action Plan on Climate Change", February 2012, available at http://moef.nic.in/downloads/public-information/MP-SAPCC.pdf (last accessed on 23 April 2012).

[45] Business Standard, "Gujarat to set up Asia's First Climate Change Department", Business Standard, 25 February 2009, available at http://www.business-standard.com/india/news/gujarat-to-setasias-first-dept-for-climate-change/350044/ (last accessed on 1 May 2012).

[46] Government of Gujarat "Climate Change Action and Adaptation", available at http://moef.nic.in/downloads/others/States-SAPCC-gujarat.pdf (last accessed on 1 May 2012).

However, India should remain cautious that its impressive list of climate undertakings is not bogged down by bureaucratic hurdles and is implemented in a timely manner. As India heads into the next few decades of critical economic growth, it will continue to grapple with the competing tensions of tackling economic development and climate change. To ensure that neither priority is compromised, it is essential that the Indian government continues to find that balance where the economy and the environment are not at loggerheads with each other. Instead, by exploring innovative ways to engage the private sector in tackling climate change, continuing a dialogue with civil society, and laying the foundation for a low carbon and climate-resilient economy, India can ensure that its economic growth is in sync with the environment.