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Governing clean energy in India

Jon Phillips, Peter Newell and Pallav Purohit

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Abstract

This paper looks at the ways in which clean energy is being governed in India. It analyses and seeks to explain the nature of governance arrangements and policy-making processes around the development of energy sources and technologies defined as 'clean' both by the Clean Development Mechanism (CDM) and beyond. Such an analysis requires an assessment of governance processes across a number of scales from global to local involving actors such as the World Bank, different parts of the Indian national government and federal states, and an array of market makers and non-state actors that play a role in mobilizing finance and political and institutional support for clean energy. The paper finds that the political barriers to uptake of clean energy in India run deeper than both carbon markets and the scope of technocratic or managerial reform programs. By considering the political nature of clean energy governance in India, opportunities arise to ensure that the CDM is aligned with potentially more significant domestic initiatives and political relationships. Governance and politics are integral to ensuring this coherence and to managing the potential trade-offs between energy security, alleviation of energy poverty and addressing climate change in industrializing countries such as India.

Key words: Clean Development Mechanism (CDM); energy policy; governance; India; renewable energy

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Abbreviations and acronyms

ADB	Asian Development Bank
APP	Asia Pacific Partnership on Clean Energy and Climate
BASIC	Brazil, South Africa, India, China
CASE	Commission for Additional Sources of Energy
CCI	Clinton Climate Initiative
CEA	Central Electricity Authority
CEO	Chief Executive Officer
CER	Certified Emissions Reduction
CERC	Central Electricity Regulatory Commission
CF-Assist	Carbon Finance Assist
CII	Confederation of Indian Industry
CSE	Centre for Science and Environment
CSP	Concentrated Solar Power
CSR	Corporate Social Responsibility
DfID	Department for International Development (UK)
DNA	Designated National Authority
DOE	Designated Operational Entity
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ERPA	Emissions Reduction Purchase Agreement
ESCO	Energy Services Company
EU	European Union
FICCI	Federation of Indian Chambers of Commerce and Industry
FYP	Five Year Plan
GDP	Gross Domestic Product
GEEREF	Global Energy Efficiency and Renewable Energy Fund
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GS	Gold Standard
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit
GW	GigaWatts
HSBC	Hong Kong and Shanghai Banking Corporation
IEA	International Energy Agency
IFC	International Finance Corporation
IPP	Independent Power Producer
ILO	International Labour Organisation
IREDA	Indian Renewable Energy Development Agency
KfW	Kreditanstalt für Wiederaufbau
MDB	Multilateral Development Bank
MNRE	Ministry of New and Renewable Energy
MoEF	Ministry of Environment and Forests
MPNG	Ministry of Petroleum and Natural Gas
MW	MegaWatts
NAMA	Nationally Appropriate Mitigation Action
NAPCC	National Action Plan on Climate Change
NGO	Non-Governmental Organisation
NHPC	National Hydro Power Corporation
NTPC	National Thermal Power Corporation
PAT	Perform, Achieve, Trade
PoA	Programme of Activities

PCF	Prototype Carbon Fund
PDD	Project Design Document
PFC	Power Finance Corporation
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PV	Photovoltaic
REC	Renewable Energy Certificate
REEEP	Renewable Energy and Energy Efficiency Partnership
RGGYV	Rajiv Gandhi Grameen Vidyutikaran Yojana
RPO	Renewable Portfolio Obligation
RPS	Renewable Portfolio Standard
SAP	State Action Plan
SERC	State Electricity Regulatory Commission
SME	Small and Medium Enterprise
SNA	State Nodal Agency
TERI	The Energy and Resources Institute
UK	United Kingdom
UMPP	Ultra Mega Power Project
UNDP	United Nations Development Program
UNEP	United Nations Environment Programmes
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
VER	Verified Emissions Reduction
WWF	World Wildlife Fund

1. Introduction

All countries now face a range of energy challenges in promoting energy security, tackling energy poverty and accelerating the de-carbonisation of their economies to address climate change. But some countries face the dilemmas and conflicts that result from trying to secure these objectives more acutely than others. In governance terms, India presents a particularly challenging and increasingly important case for both domestic energy planners and international climate policy advocates alike. India is the fifth largest greenhouse gas (GHG) emitter in the world, producing approximately 5 per cent of global emissions, and projected to become the third largest GHG emitter by 2015 (IEA 2007). The country's emissions profile reflects chronic shortages in electricity supply, fast growth in consumption among a small urban elite, and persistent energy poverty. The energy sector is the largest source of GHGs, accounting for 58 per cent to India's emission inventory (MoEF 2010a). On the other hand, the carbon intensity of India's economy is around half that of China and lower than the US, driven largely by the high price of electricity and recent growth of the services sector of the economy. Moreover, India's low per capita emissions¹, a cornerstone of the country's position in international climate negotiations, are projected to remain below the 2004 world average up to 2031 (MoEF 2009a). At the same time, Indian claims to the 'right to develop' through the use of fossil fuels are framed around meeting the energy needs of its majority rural population; India is both a major producer and consumer of energy, yet is also chronically short of energy. More than 400 million people in India do not have access to electricity and 700 million people depend on the inefficient use of biomass sources for cooking fuels (IEA 2010).

The government has stated its aim to provide 'energy for all' by 2012². Yet the thrust of India's drive for 'energy independency' (Planning Commission 2006) is provided by the current supply-demand gaps and the huge increase in primary energy consumption required to meet economic growth targets of 8-10 per cent in the medium term. Meeting the fast growing energy demand for poverty alleviation and for economic and industrial development is estimated to require a six-fold increase in primary energy consumption by 2031 compared to 2004 levels, and for electricity capacity to more than double by 2017 to 300 GW, and more than double again to 778 GW by 2032 (Planning Commission 2006). Given the huge dependence on fossil fuels for both electricity³ and primary energy consumption⁴, reconciling climate change concerns with India's growth targets will require a significant transformation of the country's energy sector. As the country's Integrated Energy Policy notes: 'even if India somehow succeeds in raising the contribution of renewable energy by over 40 times by 2031-32...the contribution of renewable to our energy mix will not go beyond 5.6% of total energy required in 2031-32' (Planning Commission 2006: 82).

The high priority of energy security on the domestic agenda has given great impetus to India's long standing renewable energy programme⁵, particularly given the potential of indigenous renewable energy sources to reduce the future costs of energy imports⁶. While India has put in place policies for scaling up renewable energy generation, the potential for renewable sources to meet both on- and off-grid energy needs remain largely untapped (MNRE 2010). Targets for the growth in clean energy⁷ (Box 1) imply that growth in renewable energy will occur at a much faster pace than traditional power generation (Figure 1), making up 20 per cent of the 70 GW of total additional power planned from 2008 to 2012⁸. Total installed capacity of renewable is currently over 20 GW for grid-interactive and less than 1 GW for off-grid and captive power generation; the majority of renewable power generation is provided by India's successful wind energy industry (MNRE 2010). Government targets aim for an additional 74 GW of grid connected renewable energy capacity by 2022, including increasing the share of

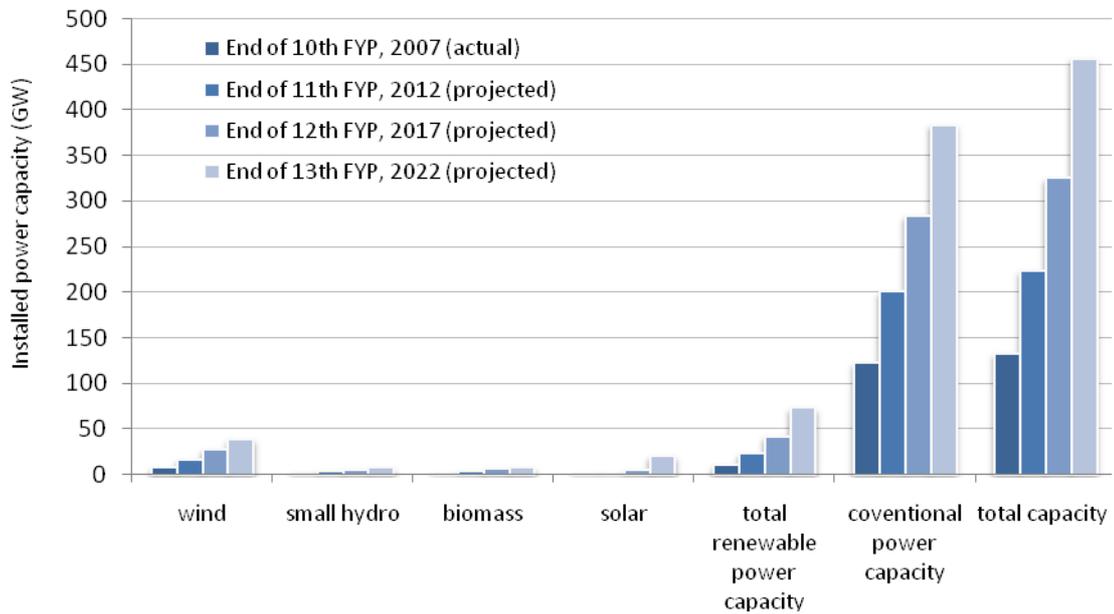
renewable energy in electricity generation by 1 per cent per annum up to 15 per cent by 2020, and implementing an ambitious National Solar Mission aimed at 20 GW of new grid-connected solar power generation over the same period⁹. Estimates of India's total renewable energy potential vary, but the Ministry of New and Renewable Energy (MNRE) cites the potential for generation of electricity through renewable sources as 88 GW excluding the high potential for solar power, a figure which may increase in the near future following further mapping of available resources, such as off-shore wind. Around 23 per cent of this potential has been developed to date (Figure 2; MNRE 2010). It is also claimed, for example, that in the longer term devoting just one per cent of India's land area to solar generation could generate 500 GW of power (Planning Commission 2011).

Box 1: Selected Indian 'clean energy' targets and climate measures

Carbon intensity	20-25 per cent reduction in emissions of carbon dioxide per unit of GDP by 2020 against 2005 levels
Renewable energy generation capacity	Increase of 40GW by 2022 from current generation capacity of approximately 17 GW
Renewable electricity	1 per cent increase per annum in the share of renewable energy in the electricity mix, reaching 15 per cent by 2020
Solar power	20GW of on-grid installations by 2022; 2 GW of off-grid generation capacity
Biofuels	20 per cent blending of bioethanol and biodiesel in transportation fuels by 2017
Nuclear	Cumulative installed capacity of 60GW by 2030

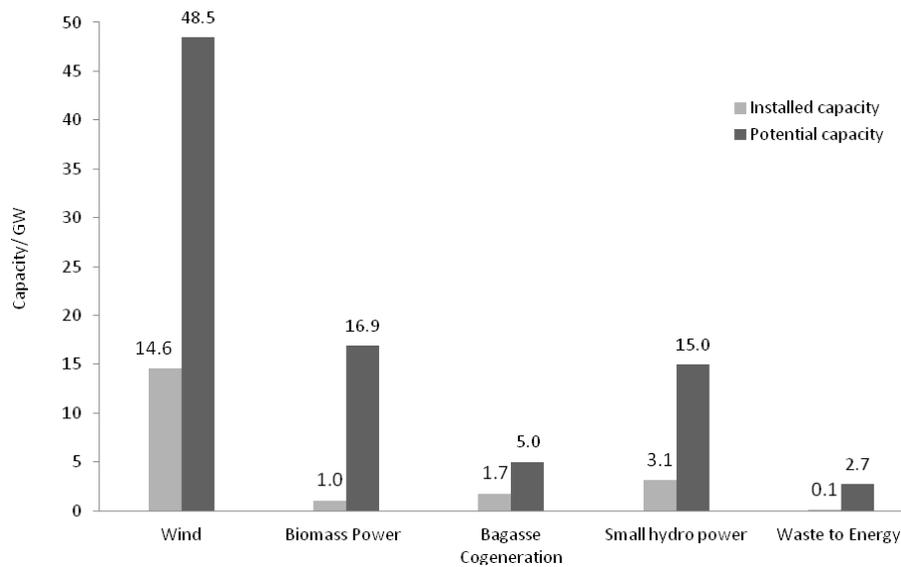
Sources: Government of India (2008a); Planning Commission (2008)

Figure 1: On-grid renewable energy power generation and projections under India's Five Year Plans (FYPs)



Source: compiled from data in MNRE (2010). For current off-grid renewable energy installations see MNRE (2010: 20). Biomass category includes bagasse cogeneration and waste-to-energy.

Figure 2: Status of renewable energy power generation in India



Source: compiled from data in MNRE (2010) and MNRE (2011). Solar power potential is not displayed; Solar potential is estimated by MW per km².

It is against this background that we situate our analysis of the governance of clean energy in India and in particular the role of the Clean Development Mechanism (CDM). India has been one of the biggest recipients of CDM finance to date, hosting over 700 registered projects to date (a fifth of the global total, with over 1600 approved by India) and gaining a fifteen per cent market share in certified emissions reductions (CERs) (Fenhann 2011a). But Indian CDM projects have also faced a high rejection rate¹⁰ and faced criticism for projects' claims to additionality and contributions to poverty alleviation and sustainable development.

Given the success of India in attracting CDM projects, it is unsurprisingly that the country has been the subject of numerous CDM related studies. Existing literature has addressed various issues on the functioning of aspects of the CDM market in India, including the performance of specific technologies (Kathuria 2002; Purohit and Michaelowa 2007, 2008; Purohit 2008, 2009); forms of technology transfer (Ockwell et al. 2008; Dechezleprêtre et al 2008; Das 2011); empirical analysis of CDM projects performance against various criteria (Sirohi 2007; Castro and Benecke 2008; Gangale and Mengolini, 2011); and barriers to implementation and market growth (e.g. Babu and Michaelowa 2003). Other studies have considered the particular characteristics of the Indian market, including the prominence of unilateral projects (Krey 2005; Michaelowa 2007), the role of India's Designated National Authority (DNA) in CDM governance (Ganapati and Lui 2009) or the role the perspective of firms in directing CDM investment (Jung 2006; Hultman et al. *in press*). More directly relevant to the broad governance approach taken in this paper, some attention has been directed to considering 'carbon governance' in general in India (Benecke 2009) and the role of social institutions in shaping new markets such as the CDM (Pulver and Benny 2010).

What we find is missing so far is a more detailed understanding of the actors, networks and coalitions that sustain or frustrate particular policy initiatives, or of the structures, institutions and modes of governance that shape outcomes in the clean energy sector in India. Our analysis consciously locates CDM projects and decision-making processes as one site among broader configurations of political and economic power in the energy sector. Such configurations result not just from domestic political arrangements and relations of power, but also from the regional and global relations of power in which India is embroiled and which shape what is possible in the clean energy sector. Our aim then is to advance an understanding of governance in practice: the role of power, politics and decision-making processes in shaping clean development governance. Governance then is broadly conceived and perceived to operate across levels (global, regional, national, provincial and local) and across arenas (public and private), in which the CDM is one site of the broader politics of energy it must engage and transform if it is to realise its progressive potential.

This paper is based on 36 semi-structured interviews and a series of meetings during September 2010 with a range of Delhi-based policy makers and bureaucrats in relevant government ministries and authorities, project developers, consultants, private foundations, financiers, representatives of various bilateral and multilateral donors, and representatives of non-governmental organisations and civil society. The follow two sections places the governance of clean energy in India in a broad regional and global context of funding from regional and Multilateral Development Banks (MDBs) and India's role in the climate negotiations. The next section then looks in detail at how clean energy is governed from New Delhi, including the roles of different ministries and their relative influence in decision-making over the CDM, renewable energy and broader (non-clean) energy politics. This is followed by a consideration of the relative importance of state governments in both the implementation of Central government

policies, governance of the CDM and broader politics of energy under India's federal political system. Governance issues are then traced down to the village scale, where a variety of local institutions mediate the distribution of benefits and participation of citizens in clean energy policies and CDM projects. Finally, the distinctive features of clean energy governance by non-state actors (civil society, business and various forms of 'private' governance) are discussed, before considering conclusions and their implications for understanding how clean energy and the CDM in India are governed in practice.

2. India in Global Context

This and the following section consider actors and institutions beyond India's borders that have a role in governing clean energy in India and the extent and ways in which these forms of 'governance from above' (Newell et al 2009) shape and constrain India's policy making process and policy autonomy with regard to clean energy policy. Within the formal channels of the United National Framework Convention on Climate Change (UNFCCC), India has been an active participant in the climate negotiations since they commenced in the early 1990s. India has been a leading voice within the G77+ China grouping in the climate negotiations and more recently in the BASIC group of countries, placing the emphasis firmly on the idea that Northern industrialised countries bear most historical responsibility for climate change and are therefore obliged to act first to reduce their emissions and compensate countries like India with finance for mitigation and adaptation measures undertaken (Mathur and Varughese, 2009; Michel and Pandya 2009; Fujiwara 2010). India's inflexibility has maintained pressure on Annex 1 countries and earned the country a reputation as difficult negotiating partner. Strong notions of equity underpin the Indian position on a range of negotiation issues, characterised by the principle of 'Common but Differentiated Responsibility' and the 'right to development', at times expressed through support for the contraction and convergence model of global emissions reductions (Meyer 2000). This position has been sustained by a form of 'climate nationalism' at home, strongly rebuking the idea that India should bear responsibility for reducing its emissions or formally making commitments in the absence of serious efforts by Annex I countries (Dubash 2009a).

As its own contribution to the problem has grown with time, however, India has come under increasing international pressure to reduce its own emissions and, alongside other significant emitters, to outline Nationally Appropriate Mitigation Actions (NAMAs). International pressure has not been the primary driver of governmental action on renewable energy, but it has contributed to the formation of a narrative of climate co-benefits for domestic actions de-linked from global commitments behind which government, business and civil society interests have largely united (Dubash 2009a, Fisher forthcoming). More recently there has been increased pressure from some groups within civil society to adopt more ambitious and proactive responses to climate change. This comes in a more critical sense from Greenpeace India whose report *Hiding behind the Poor* accused the government of using the suppressed demand of millions of Indian's in energy poverty to mask the increasing GHG emissions of Indian elites and industries (Greenpeace India 2007). Groups such as the Centre for Science and Environment (CSE) have trod a more cautious line, supportive of an equity-based bargaining position but also making a case for 'no-regrets' policy actions.

Yet the balance that India's negotiators have maintained between conciliatory signals at the international negotiations and a tough stance to appease domestic audiences has become more difficult to maintain as India has taken steps towards a more engaged and constructive international stance (Vihma 2011). While equity arguments remain

integral to India's negotiating position, the weaving of climate policy into wider foreign policy objectives¹¹ has resulted in greater flexibility on India's part – largely driven by individuals, Prime Minister Manmohan Singh and Minister of Environment and Forests Jairam Ramesh in particular (Atteridge 2010).

India's stance on climate change will remain development focused, but there remains a potential to identify and support activities that deliver development benefits with climate co-benefits (including in clean energy) in line with the dominant framing of climate policy in India. This has been India's attitude towards the CDM and carbon finance to date – i.e. oriented by the need to make carbon finance work for India rather than allow it to be used as a means of committing India to emissions reductions. In practice, the incremental costs of clean energy investment are more commonly experienced as an additional financial bonus to improve the internal rate of return for projects that are financially feasible without CDM revenue (Ellis and Kamel 2007; Schneider 2009). Nonetheless, India has pushed for reform of the CDM Executive Board to reduce market transaction costs and enable the expansion of the project-based mechanism to include large hydro power, nuclear power and forestry, and the complete removal of additionality requirements for renewable energy projects. Conversely India has also argued strongly that the UNFCCC has no mandate to consider expanding the CDM by means of sectoral crediting, suggesting that top-down sectoral CDM approaches (including sectoral benchmarking) constitute an attempt to overturn the equity principle of the UNFCCC (Saran 2008, cited in Vihma 2011; MoEF 2009b). Likewise, India's position on Nationally Appropriate Mitigation Actions (NAMAs) has emphasised that domestically financed government policies (such as the National Solar Mission) will not be considered under the international negotiations, which should be reserved for actions with 'enhanced support' from Annex I countries (van Asselt et al. 2010). However, additional carbon finance to support areas that have failed to attract CDM revenue may provide a potential area of agreement with annex I countries. For example, India's MNRE has stated that adequate international finance through the CDM, NAMAs or other sources could double the ministry's current renewable energy targets (Gupta 2010).

3. Clean Energy Governance 'from Above'

India's broad energy challenges, current and future climate impact and potentially lucrative CDM market has made the country a site of significant flows of regional and global funding for clean energy. India has also been the recipient of a series of donor and development bank programmes to direct and scale-up the CDM and other sources of clean energy finance. In terms of support for the CDM, the DNA has been the subject of ongoing capacity building programmes from the United Nations Development Programme (UNDP), Asian Development Bank (ADB) and German Technical Organisation (GTZ) (MoEF 2010b) to institutionalise the CDM in India and attempt to address apparent market failures and governance deficits. Perhaps anticipating the importance of state governance in the development of CDM projects (see below), UNDP funded the establishment of CDM promotional cells in Indian states from 2004, in addition to capacity building with state energy agencies to assist in the development of rural development and poverty alleviation projects (MoEF 2010b). The ADB's technical assistance program has targeted assisting project development among local municipalities and addressing barriers in the domestic finance sector that obstruct lending for CDM projects. GTZ (now GIZ) has also run capacity building programs at state level to assist in the promotion of CDM projects, focusing on high quality projects with sustainable development benefits (MoEF 2010b). Through its Carbon Procurement Unit, GIZ is also directly involved in shaping a small part of the trade of Indian credits,

facilitating the sale of Gold Standard¹² credits from GIZ-supported projects for German buyers¹³.

Both the World Bank and ADB have administered a series of carbon market programmes to initiate projects, support implementation and catalyse private investment in the CDM in India and Asia more broadly. The World Bank's Carbon Finance Assist (CF-Assist) programme has focused a significant proportion of its limited resources in India, although the reasons may have more do with individual employees than any targeted allocation of funds; one of the chief architects of CF-Assist in Washington has described how his relocation to New Delhi was significant in launching CF-Assist in India¹⁴. However, despite the personal investment and technical capacity invested in India, CF-Assist has not created the impact envisioned by some of its creators due to a lack of demand for its capacity building services within India¹⁵. The ADB and International Finance Corporation (IFC, the private sector lending arm of the World Bank Group) operate carbon funds for client companies, co-financing projects with upfront finance in exchange for a portion of the expected CERs generated¹⁶, essentially acting as intermediaries to provide price transparency in the market and transfer the risk of non-delivery of credits away from buyers. Both have also developed analogous carbon funds to provide upfront co-financing for projects generating credits beyond 2012¹⁷, responding to market uncertainties over the existence of market mechanisms for emissions reductions beyond the expiry of the first commitment period of the Kyoto Protocol (ADB 2010a, IFC 2011). Within India, the first of World Bank's carbon funds, the market-building Prototype Carbon Fund (PCF), has received criticism for offering poor interest rates and administering an overly-bureaucratic process¹⁸. Moreover, the Government of India (MoEF in particular) has previously appeared to reject the World Bank Climate Investment Funds (CIFs) as a potential source of finance (Bretton Woods Project 2008), which the *Times of India* (2008) has suggested could be enough 'tarnish the image of the fund', given India's status as a 'prominent potential client'. More recently, The Indian Government has signalled its intent to secure \$750 million of additional finance through the CIF Clean Technology Fund in support of existing programmes including the National Solar Mission, National Energy Efficiency Mission and a state specific Development Policy Loan on Environmental Sustainability and Climate Change for Himachal Pradesh, with further plans under development (MoEF 2011).

Although India is gaining significant economic and political power within the global economy, MDBs remain highly influential in India's energy sector, particularly considering comparatively high domestic rates for debt finance. Indeed, financial crises and calls for climate-sensitive energy financing have provided MDBs with strategic opportunities to re-engage with energy financing in Asia, where countries have become less dependent on MDBs to meet project financing requirements (Nakhoda 2010). The majority of support provided by MDBs to the broader energy sector has focused on large scale infrastructure projects and, more recently, institutional reform focused on public-private partnerships throughout the energy generation, transmission and distribution chain¹⁹ (*Power Line* 2010; Wright 2010). For example, the World Bank approved a \$1 billion loan in 2009 to support implementation of a plan by PowerGrid Corporation, to strengthen five transmission systems in the northern, western and southern regions of the country (Kammen 2011). MDB governance of the energy sector is important then, both through the loans they extend and through the transmission of global norms of finance allocation, management and ownership; creating or altering political relationships of power between the recipients and providers of capital (Wright 2011).

Moreover the magnitude of these flows of public energy finance currently dwarfs the value of carbon markets to the Indian economy. For example, ADB and IFC are part-

financing the first of India's Ultra Mega Power projects (UMPPs), the \$4.1 billion, 4000MW Mundra project in Gujarat²⁰. IFC support for the project is premised on the use of more efficient supercritical technology that will result in lower emissions than the average Indian coal fired power station. However, the Mundra plant will still emit 23 million tonnes of carbon dioxide per year (IFC 2008), more than the nation of Tunisia according to the US Department of Energy (Swan, 2008). Supercritical coal projects are also eligible to apply for CDM finance and the companies contracted to build India's UMPPs have so far indicated considerable interest in registering projects under the CDM²¹, raising obvious questions over claims of financial additionality. For all the rhetoric of the need for UMPPs to meet India's pressing energy needs, the use of international public funds for coal fired power stations clearly undermine the credibility of the World Bank's promotion of itself as a clean development bank through its Climate Investment Funds and arguably also circumscribe the Government of India's climate change actions (Fisher 2009).

MDBs have begun to increase the proportion of their core concessional and private sector finance towards clean energy projects. The World Bank and IFC for example are reportedly doubling energy efficiency and renewable generation loans to India to \$2 billion in the next three years (while the World Bank alone plan for \$1.5-2 billion of investment in conventional energy over the same period; Seetharaman 2011)²², whereas the ADB targets \$2 billion of investment in projects with clean energy components²³ from 2013 across its country programs (ADB 2010b). ADB's flagship renewable energy investment for example, the Asia Solar Energy Initiative, aims to generate 3000 MW of solar generation capacity across the region by 2013 from \$2.25 billion of direct financing, leveraging \$6.75 billion from private sector sources. It is also targeting donor countries to raise \$500 million in order to 'buy down' high upfront capital costs currently associated with solar technologies (ADB 2010b). However, levels of finance for renewable energy remain inadequate compared to the scale of the energy challenge in 'credit-worthy' countries such as India that receive considerable levels of finance from regional and multilateral development banks.

European multilateral banks – the European Bank for Reconstruction and Development (EBRD) and European Investment Bank (EIB) – have more limited financing mandates in India, but smaller initiatives have sought to create niche interventions to maximise the utility of small public funds, most commonly through public private partnerships (PPPs). The first commitment under the EU Global Energy Efficiency and Renewable Energy Fund (GEEREF)²⁴ is tasked to use around €50m to provide clean energy in emerging economies in Asia, primarily India. With a limited public funding base that has not yet achieved full political commitment from European governments (Behrens 2009), GEEREF directs funds into regional programmes below €10 million, aiming to shape a market niche usually ignored by private investors and international finance institutions alike and often not supported by effective legislation in developing countries. Also at a smaller project scale, the Renewable Energy and Energy Efficiency Partnership (REEEP) supports projects through public-private partnerships (PPPs) and aims to fill a niche in the provision of finance, regulatory analysis and advice, as well as pro-poor renewable energy access projects (Parthan et al. 2010). Projects have included early identification of barriers to the implementation of India's Renewable Energy Certificate (REC) scheme in Maharashtra and promotion of greater accountability among electricity institutions by increasing civil society participation in state and federal regulatory processes for renewable energy. With seventeen completed and nine active projects, India has been one of the main beneficiary countries of REEEP funding (in part reflecting the priorities of REEEP's primary donors, the UK and Norway), but its strategic position is questioned by some policy makers in India, both on the limited scale of its programmes and the evidence of the value-added to policy-making to date²⁵.

Likewise, grants from the Global Environment Fund (GEF) targeting climate change mitigation have been limited in size. Atteridge et al. (2009) calculate that the sum of funds transferred to India for clean energy projects through the CDM, GEF grants and bilateral and multilateral concessions loans was an inadequate \$1.4 billion between 1997 and 2005²⁶. In terms of direct support for clean energy from donors, projects and programmes are typically framed to address Indian priorities of energy efficiency and energy access. The UNDP for example runs a Climate and Energy Programme that partners with Government ministries on industrial energy efficiency projects and off-grid rural energy provision projects, such as biomass power generators for poor rural populations²⁷. Western donor agencies are sure to emphasise that village scale interventions and policy work alike are primarily development focused, offering secondary climate co-benefits, to avoid being perceived as ‘pushing climate’ concerns on India²⁸. The German development bank KfW has also been a supporter of Indian public and private energy finance institutions and has recently announced plans to provide €800 million in soft loans during 2011-12 for renewable energy projects in India (*The Economic Times* 2011). In many ways these other forms of public and private energy finance aimed at tackling climate change seek to scale up or go beyond the reach of carbon finance. As the EU-India dialogue document states the CDM is ‘piecemeal and subject to global and national economic fluctuations’ (AGCC 2009: 18).

Although carbon markets and bilateral sources of finance are limited, a series of bilateral initiatives are playing an increasing role in clean energy governance. For example, the EU-India Initiative on Clean Development and Climate Change targets voluntary initiatives, cooperation on clean technology and the development of the CDM for the mutual benefit of both parties (AGCC 2009; Fujiwara and Egenhofer 2010). Plans include technological research and development and ‘flagship’ projects aimed at demonstrating the potential of particular technologies and attracting finance to them²⁹, and cooperation on technology transfer³⁰ and International Property Rights issues. The proliferation of such initiatives of course brings other governance challenges, not least issues of poor coordination between initiatives and a comparable lack of safeguards and checks on the influence of donors, consultants and other non-state actors that can wield considerable influence over policy (Mahalingham et al. 2006). The High Level Dialogue meetings between India and EU heard evidence for example that there are too many, poorly focussed institutional links that limit the effectiveness of each initiative (AGCC 2009).

The story becomes increasingly complex when broadening renewable energy governance to include the range of bilateral trade deals and agreements between countries and corporations. Developments such as the US-India agreement on civilian nuclear energy³¹ place India’s ‘clean’ energy goals and energy security concerns firmly in the realm of inter-state politics, as do aspirations India’s apparent hopes for renewable energy technologies as the basis of a new era of cooperation with China on energy security (Qin Jize and Ai Yang 2011). India’s involvement in the Asia Pacific Partnership on Clean Development and Climate (APP) may also be considered in relation to the broader international climate governance architecture. Despite India’s firm commitment to the UNFCCC as a forum for international climate negotiations, India has been as active a member of the APP as other countries, for example in large industrial energy efficiency projects (APP 2011). While the APP does not seem to have emerged as a significant source of finance or a strong political grouping, India’s involvement in the APP may well be best understood in similar terms to its pragmatic engagement with other sources of climate and carbon finance from international sources to date: as one of a many sources of finance to be utilised and shaped towards India’s development priorities (Karlsson and van Asselt 2009). It is as yet unclear the extent to which the Indian government will seek assistance from international funds to support the scale-up of its climate-related

(but energy security focused) clean energy policies. As Dubash (2011) notes, Indian energy governance has not existed independent of the global norms of energy management, but other than the influence of multilateral development banks in shaping the autonomy of Indian energy governance, it has been the national political economy of India that has had greater influence over the direction of domestic energy governance. India's engagement with the CDM and promotion of clean energy is one part of this evolving political landscape, within which national governance has had a greater influence over the direction of clean energy development and indeed over the role of the CDM and its outcomes.

4. The National Governance of Clean Energy

4.1 The national level policy process

This section considers how clean energy is governed at the national level, exploring the roles of different ministries in decision-making and the inter-bureaucratic relations and politics that determine how the benefits of clean energy are generated and distributed, and how international mechanisms like the CDM are received into domestic politics and policy. The formal governance structure of the energy sector is fairly complex. The contemporary governance of clean energy is the product of a history of legislative change addressing clean energy policy specifically (particularly the New and Renewable Energy Policy Statement in 2005; National Action Plan on Climate Change (2009) and a series of technology-specific support mechanisms) and the political economic direction of the energy sector as a whole. Particularly important here has been the Electricity Act of 2003, which produced a coherent framework for the de-regulation of the energy sector, addressing the piecemeal reform processes that had been adopted across several states from the early 1990s (Singh 2006). Also important is the Integrated Energy Policy Report (Planning Commission 2006), which attempted for the first time an economy-wide, long term assessment of India's energy needs, and which continues to provide a reference framework for India's broad energy policy initiatives.

Under India's federal constitution, energy policy and environmental regulation are governed concurrently by central and state governments. Government decision-making on energy at the Central level is distributed broadly between the Ministry of Petroleum and Natural Gas (MPNG), the Ministry of Coal, the Ministry of New and Renewable Energy, the Ministry of Atomic Energy, the Ministry of Power and the Ministry of Environment and Forests, which also houses the National CDM Authority, the DNA. Of these ministries, those most closely associated with the formulation of policy on climate change have been the MoEF, MNRE and Ministry of Power (Mehra 2008). The MNRE is responsible for administering policies for the promotion of renewable energy, and advising states on policy and regulations and the use of subsidies, in cooperation with its nine regional offices. The Ministry of Power and the associated Central Electricity Authority (CEA) coordinate broad power-related policies and their legal frameworks, including rural electrification programmes and the regulation of the liberalised elements of electricity generation and transmission.

At state level, state government energy departments are responsible for energy policymaking and implementation and State Nodal Agencies (SNAs) are tasked with implementing energy subsidies and investment programmes passed down from New Delhi. Electricity regulation is shared between the Central Electricity Regulatory Commission (CERC) and parallel state bodies – State Electricity Regulatory Commissions (SERCs) – whose roles include setting tariffs for state purchasing of grid-connected renewable energy. State level electricity utilities (State Electricity Boards) are tasked

with the management of electricity transmission, distribution and grid management, and for renewable energy power purchasing (Benecke 2010).

In addition to the ministries, regulators and state agencies, government agencies fulfil functions in finance and research and development for clean energy and a range of other energy options. The Indian Renewable Energy Development Agency (IREDA) is essentially the funding arm of the MNRE, providing institutional finance at slightly better than commercial rates exclusively for renewable energy and energy efficiency measures and administering MNRE incentive schemes. The government-owned Power Finance Corporation (PFC) and Rural Electrification Corporation (REC) also provide concessional finance for renewable energy projects as part of a broader financing portfolio. MNRE also funds technical and research institutions involved in resource assessment, technology development and renewable energy certification, such as the Solar Energy Centre, Centre for Wind Energy Technology, Alternative Hydro Energy Centre to name a few (New Energy India 2011).

Yet, as in other countries, the nature of governance in practice in India indicates a more complicated picture than that described by the formal distribution of decision making responsibilities between ministries and between government and the market. Despite the ongoing reform process, the power sector retains a substantial public sector presence (including state owned energy companies NTPC and NHPC and state owned banks providing significant levels of energy finance) with a high level of planning control and influence over the everyday functioning of energy markets retained by state interests. While the framework for electricity regulation is fairly clearly structured, electricity pricing has proven to be an intractable political issue, where government has been unable or unwilling to remove subsidies encouraging wasteful consumption, for example (Mehra 2008; Narain 2011). Experience from the power sector reform process suggests that the ability of independent electricity regulatory agencies to fulfil their promised role as free from political influence has been limited and highly variable across sectors and individual regulators (Holliday 2010). The reform process has been partial, with the state allowing growth in captive power generation that does not threaten the control of some state run bodies or address the political economy that led to existing problems with infrastructure, subsidies and procedural issues (Dubash 2011; Joseph 2010). The political outcome has been what Dubash (2011) has described as the 'grafting' of a market onto a state-led sector in a 'pragmatic hybrid'.

Although India's current growth in renewable energy has been generated largely by the private sector, the pro-active role of the state in facilitating investment and creating an enabling regulatory framework has been vital to this growth. India's Five Year Plans and various policy 'missions' such as the ambitious Solar Mission are based on a continued model of state-led development. India's successful wind energy sector is largely a product of a series of financial and fiscal incentives provided by both central and state governments to allow wind energy to become cost competitive. In the post-reform period, government has provided incentives for independent power producers (IPPs) by imposing Renewable Purchase Obligations (RPOs) on SERCs, creating feed-in tariffs and offering accelerated depreciation, direct subsidies, tax exemptions, reductions on import duty and low interest loans. This is likely to continue for several technologies, with MNRE setting renewable energy targets for 2022 that will require an estimated \$10 - \$64 billion in subsidies (Sargisyan et al. 2010).

To promote indigenous solar energy manufacturing, the government has made access to premium tariffs under India's National Solar Mission contingent on the use of domestically manufactured equipment, alongside subsidies to manufacturers while the industry becomes established. Commercial giants of the Indian wind industry such as

Suzlon were initially reliant on similar incentives to gain the market share that they currently enjoy. While wind energy remains reliant on state subsidies, these same companies have argued for the removal of subsidies as ‘market distortions’ and been criticised accordingly for attempting to ‘kick away the ladder’³². Indeed, generous renewable energy subsidies are currently producing significant profits for some companies, leading to calls for a reconsideration of the structure of industry support and a concomitant redirection of CDM revenue to projects demonstrating genuine financial additionality, rather than boosting profits for large corporate renewable energy companies³³.

As research by the consultancy group Emergent Ventures India shows, ‘Even before taking carbon credits into account, renewable energy projects in India are looking increasingly attractive on a risk return basis’ (Kadokia and Acharya 2010: 14). The Renewable Energy Certificate (REC) scheme in particular has generated considerable excitement among investors. The RECs scheme aims to introduce a market mechanism to RPOs, allowing state utilities and large industrial consumers to meet minimum purchase obligations for renewable energy by buying renewable power from other parties that have generated a surplus; where carbon trading programmes aim to promote low carbon technologies, RECs aim to provide an analogous incentive for energy from renewable sources (Goyal and Jha 2009). Although the scheme is likely to take some time to become fully operational, industry experts and investors have signalled their belief that the scheme could become more lucrative than the CDM within a few years, presuming the continued existence of the CDM (Singh et al. 2011), while government departments have been keen to allay fears that revenue from CERs and RECs could be mutually exclusive and ensure that the CDM remains aligned with state priorities.

Within the context of India’s range of state incentives, central planning and current enthusiasm for domestic trading initiatives³⁴, the promise of CDM revenue merely provides an ‘additional upside’ (Kadokia and Acharya 2010: 15) to existing investment plans, the ‘icing on the cake’ (Hamilton 2010) or a ‘psychological boost’ to project developers³⁵. Government policies to facilitate the uptake of renewable energy mean that CDM and carbon finance can play an additional, supplementary role in determining the viability of a project, rather than a decisive one. While this raises questions of over the additionality of such projects, for many within India the CDM would be most usefully deployed in supporting India’s most pressing energy needs, particularly those that government incentives have experienced difficulty in addressing such as rural electrification and other decentralised energy projects. Associated policy prescriptions address the technical and governance challenges of bundling small projects among small and medium enterprises or developing programmes of activities (PoAs) (MNRE 2009; Gupta 2010).

A reasonable priority for India with respect to the CDM then could be to consider how to maintain India’s attractiveness as a host country while enhancing the sustainable development benefits that the recipients of projects receive. The DNA has however had less intervention in the functioning of CDM than the state has had in other areas of the energy economy. The DNA is responsible for ensuring that sustainable development benefits are integrated into the design of each CDM project, but to date the state has played a minor role in directing the market through potential ‘hard’ regulations such as taxation regimes, a floor price for CERs or differential fees in line with priority sectors (Benecke 2009). In the absence of project prioritisation by the DNA, India has seen a wide variety of project methodologies under the CDM although with time, biomass, wind, energy efficiency and hydro projects have come to dominate the Indian CDM portfolio (Fenhann 2011a). While international pressure over the high rejection rate of

Indian projects at the Executive Board has reportedly led to a tightening of the host country approval process (Benecke 2009), the Indian DNA's broad sustainable development criteria and relative lack of checks against the claims of project design documents (PDDs) seem more geared towards ensuring a smooth domestic approval process for project developers than ensuring the integrity of sustainable development outcomes (Pulver and Benny 2010). Studies of the perspectives of companies on the CDM approval process indicate that firms perceive there to be a low risk of project rejection by the Indian DNA (Hultman et al. *in press*). Critics have argued that this has resulted in negative social and environmental effects associated with particular projects (Böhm and Dabhi 2010), an issue to which we return below.

The CDM itself is part of inter-bureaucratic politics through the inputs from various ministries that are tasked by the DNA to assess projects relevant to their area of expertise and in the promotion of the CDM to potential project developers. For example, MNRE has reportedly been among the more active ministries in pursuing CDM projects within its mandate for renewable energy, whereas the Ministry of Coal and MPNG are not represented as members of the CDM authority (Ganapati and Lui 2009), indicating perhaps the low level of interest from more powerful ministries in the CDM. However, it is perhaps only in cases when plans for renewable energy growth or enhanced environmental concerns begin to suggest limits on fossil energy development that conflicts between government bodies become apparent, as observed in recent inter-ministerial conflicts resulting from the renewed interest of the MoEF in environmental impact assessment procedures (Ramesh 2010). This tends to occur only in the rare cases when clean energy measures are positioned outside of the dominant national framing of clean energy co-benefits. We return to this issue below with respect to state-Centre politics under the Solar Mission, but at the national level it is also important to consider the *ungovernance* of clean energy in India.

This entails recognition that the actors and institutions which ascribe themselves the label clean development actors are rarely those which yield most power over clean development (Newell et al. 2009). Consider for example the MNRE, the only ministry in the world dedicated solely to renewable energy. While designating strategy management for renewable energy to MNRE may arguably avoid the common governance challenges of duplication within government (Liming 2007), decision making on renewable energy is still subject to a range of power relations and politics that govern the energy sector. Over the previous two years MNRE has seen its budget increase by 61 per cent and 20 per cent respectively (Planning Commission 2010). The financial allocation for renewable energy sources however remains small in comparison to total energy allocation. For the 11th five year plan (2007-12), the financial allocation for renewable energy sector was less than 2 per cent of the total energy allocation (Government of India 2008b). Moreover, clean energy technologies compete with a range of poorly targeted supply-side and end-user subsidies for kerosene and diesel that could be reallocated to clean energy sources for off-grid applications (Bandyopadhyay 2010; Shenoy 2010). The Ministries of Power and Coal, with core mandates for electricity generation and coal exploitation respectively command much larger budgets and greater political power within government than either MNRE or MoEF. While MNRE may provide avenues of stakeholder engagement (however imperfect) for promoting low carbon, pro-poor appropriate energy technologies, there is no evidence to suggest that the Ministry of Power is obliged to include MNRE within its decision making on policies that affect the power sector. With parallels to the CDM, a study under The Electricity Governance Initiative found that the social and environmental impacts of energy sector reform – such as job losses and project impacts – are not measured and therefore tend to be externalised and discounted, whereas international obligations such as GHG emissions are subject to more thorough monitoring and reporting

(Mahalingham et al. 2006). Ensuring accountability on such issues is further complicated by a multiplicity of administrative and judicial institutions without clearly defined roles to provide means of redress.

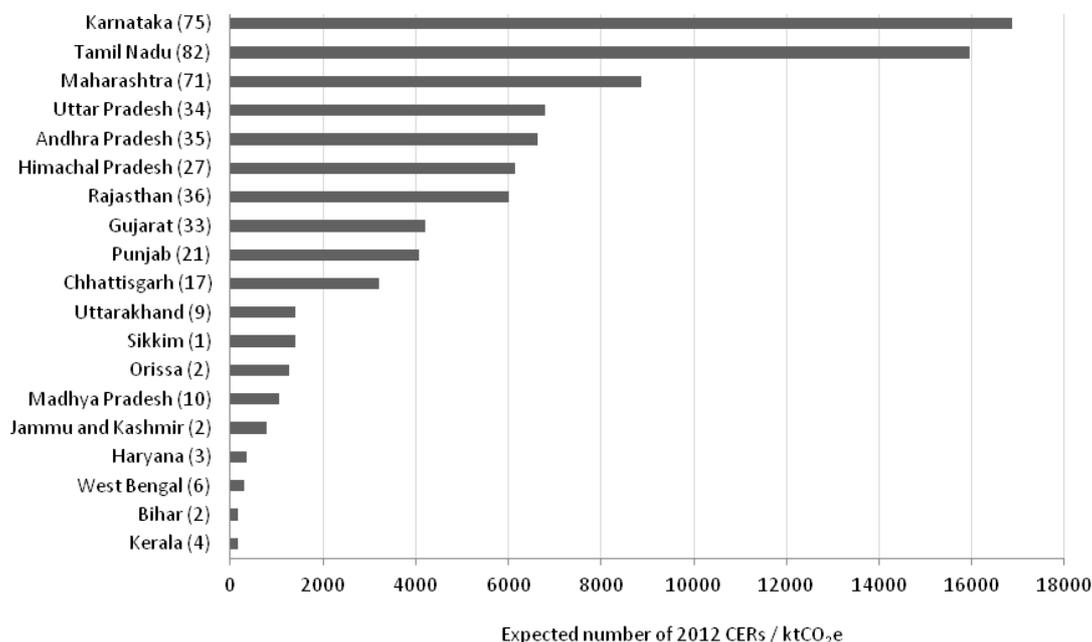
In another instance of the un-politics of clean development, the decision to form a National Clean Energy Fund³⁶ to be distributed eventually through a 'green investment bank' from a tax on both domestic and imported coal is considered by some observers to be politically feasible only because the revenue collected is essentially small enough to have a minimal impact on the coal industry³⁷. These funds are not insignificant however, at an estimated \$1.1 billion for financial year 2011 (Singh et al. 2011), and in many ways are part of further attempts to scale up renewable energy beyond the limited means of carbon markets or existing public finance allocations, or in the words of the MNRE, a way to 'think beyond the budget' (MNRE 2010: 30). The Ministry of Environment and Forests is the nodal agency for the management of the fund and has to date only specified the use of 200 Crore (\$45 million) for programmes under India's National Green Mission on forest cover; notably not a clean energy programme. Allocation of the fund will ultimately be determined by an inter-ministerial committee; the allocation of funds drawn from a tax on the coal industry and earmarked for clean energy is likely to be subject to significant ministerial competition and watched closely for indications of the government's future course on clean energy planning and financing (Mukul 2011).

In light of the differential power among ministries, the Planning Commission, as the coordinating body for India's Five Year Plans and 'holistic' energy planning exercises such as the Integrated Energy Policy, has a potentially important role in directing Indian energy policy towards simultaneously addressing climate change concerns, energy poverty and energy security. Yet the Planning Commission is not deemed to have the authority nor the mechanisms to enforce change in the relevant ministries, or for that matter to ensure coherence between them (Dubash 2011). In preparation for the country's next five year plan (2012-2017), the Planning Commission has recently been tasked with preparing a roadmap for inclusive low carbon growth, including how the government may meet its carbon intensity target. Details on the necessary level of domestic and international finance are currently in preparation, but the interim report outlining possible actions available to India has received criticism for providing little in the way of additional measures to those outlined in the National Action Plan on Climate Change (a plan that has itself received criticism for largely repackaging existing policies; Dubash 2009b), and in the case of renewable energy suggesting 'aggressive' deployment rates that are in fact lower than those previously outlined by ministries (CSE 2011), potentially undermining existing policies and adding to incoherence in central government targets (Planning Commission 2011).

4.2 Federal Politics

The CDM and renewable energy are of course not only governed by the central government in Delhi. Everyday governance at state and local level governance has a key role to play in determining the extent to which benefits flow from the CDM and from broader national plans for increases in renewable energy generation. This is reflected in the uneven distribution of CDM projects and the associated distribution of CERs within India (Figure 3). To take the extremes as an example, seven states do not host any CDM projects, while leading states Tamil Nadu, Maharashtra and Karnataka each host over 200 projects each that have reached validation stage (Fenhann 2011b).

Figure 3. Unequal distribution of renewable energy CDM projects in Indian states



Source: compiled from data in Fenhann (2011b). Figures in brackets indicate the number of projects hosted by each state.

Also reflecting the unequal distribution observed internationally, the majority of CDM revenue has been distributed to a small number of states. Gujarat for example, has a number of industrial gas destruction projects and is host to projects generating over forty per cent of India's CERs from eleven per cent of all projects, due mostly to a concentration of industrial gas destruction projects in the state (Fenhann 2011b). While comparatively prosperous states have seen greater CDM investment than poorer states (Sirohi 2007), the intra-national distribution of CDM projects does not appear to be explained by economic variables or resource potential alone. Isolating the significance of governance processes in the distribution of CDM projects is challenging, but governance, in the narrow sense of respect for the rule of law and property rights, as well as an attractive 'investment climate', appears to be decisive in several cases within India.

Several states have created single window clearance systems and CDM promotional centres within state nodal agencies to facilitate the CDM process, raise awareness among potential project developers and act as a focal point for bundling projects from across the state. Although these states include those that have hosted a number of CDM projects, including Andhra Pradesh, Orissa and West Bengal, it is states such as Gujarat and Tamil Nadu have been among the biggest winners of the CDM in India to date. Considering that CDM revenue alone is rarely sufficient to initiate project development, it is perhaps unsurprising that the biggest state winners of renewable energy CDM projects in India have been those with attractive existing policies and governance arrangements to facilitate private investment in renewable energy. For example, states such as Kerala that have little in the way of renewable energy installations have also not benefited from CDM activities to date, in contrast to states such as Tamil Nadu which, it could be argued, has an existing set of state-market relationships formulated around the prosperous wind energy industry (Benecke 2010).

In contrast, there has been a perception in some states that, as a market mechanism, the CDM 'would be taken care of by industry'³⁸. In some cases this may be a response to the limited capacity of State Nodal Agencies on whom the burden of responsibility for implementing MNRE directives ultimately falls. The experience of state bureaucrats suggests that the promotion of renewable energy and the CDM at state level is often driven by motivated individuals rather than institutionalised processes³⁹. Indeed, there is great variability in institutional capacity across states, as well as in the actual roles and functions that analogous state authorities perform. From the perspective of project developers, the division of responsibility for approving and overseeing projects is not always clear. Issues of coordination between Delhi and state governments can frustrate coherent policy on a broad range of energy and infrastructure policies where state interests are not perceived to be served by national policies (particularly where party-political interests differ between state), in some cases resulting in open opposition from states (Bellman 2010). Investor perceptions of governance in different states may also play a role in attracting investors in CDM to some parts of the country over others, since policy stability and financial certainty is so important to investment decisions (Hamilton 2010). Governance then, as distinct from the existence of particular technology policies, appears crucial to attracting CDM investment to certain states.

For investors the CDM presents one of a set of governance challenges, including policies on land⁴⁰, state level clearances, renewable energy tariffs, and grid connections to name but a few. Following the power sector reform process a large burden of responsibility for the promotion of renewable energy at state level falls on State Electricity Regulation Commissions. As a result, the regulations affecting electricity differ across states on many counts⁴¹. Analogous to CDM processes, some states such as Rajasthan and Uttarakhand have set up single window clearance procedures to facilitate quick and hassle-free approvals for renewable energy power projects, although opinion is divided over the extent to which multiple bottlenecks have been replaced by equally obstructive centralised ones (World Bank and ESMAP 2010). The rapid development of the wind energy industry in India for example has been driven in part by progressive state level legislation, including policy measures such as renewable portfolio standards (RPSs)⁴² and feed-in-tariffs⁴³. In response to the Centre, states have announced promotional policy packages in the form of wheeling, bank, and buyback guarantees, and considerable tariff escalations for wind, co-generation, small hydro and biomass projects. Several states are also providing concession/exemption in sales tax.

While SERCs have the powers to penalise electricity distributors for not meeting their obligations under the RPS, the reality of RPO enforcement is that the majority of SERCs have been reluctant to impose punitive measures given the common perception that the capacity of under-resourced states to initiate and procure sufficient power from renewable sources is severely restricted⁴⁴. To date, eight of fifteen states have met their RPO, but only a few states (such as Rajasthan and Maharashtra) have specified penalties on distribution utilities and only the Maharashtra Electricity Regulatory Commission (MERC) has actually penalised utilities for failing to meet the mandated RPO (Goyal and Jha 2009; Limaye 2010). Aiming to meet RPOs more efficiently, India has introduced its own domestic trading mechanism, the Renewable Energy Certificate scheme, a market based initiative to introduce competition among states, which may well be affected by similar governance issues as those experienced to date; a combination of turf wars, lack of administrative competence and capacity constraints produce unstable and unpredictable policies that can deter investors. Influential financial actors such as HSBC conclude that clean energy targets under the NAPCC are unlikely to be met, predominantly due to the unlikelihood that states will successfully implement national policies, particularly in terms of penalising non-compliance (Singh et al. 2011).

Considering India's history of incomplete implementation of environmental legislation, state governance and relationships with the central government in Delhi will likely continue to be a key factor in the success of a range of clean energy programs and policies.

One such example is provided by early evidence of India's push to establish an international competitive advantage in solar industries. Although direct normal incidence is high in the desert states of North West India (Purohit and Purohit 2010), among these states it has been those with strong institutional capacity that have emerged as the early movers to promote investment in solar generation and manufacturing. Rajasthan and Gujarat in particular have received considerable attention from project developers to date⁴⁵. The Gujarat Government has been particularly proactive in governance and policy terms, creating its own climate change department and developing a green investment fund, while Rajasthan has initiated a single window clearance system for solar projects and given out large tracts of desert land to solar developers in the western districts that border Pakistan. Both states have developed solar policies independent of the national solar mission to provide state incentives for solar generation and seek to concentrate the benefits of India's growth in solar manufacturing within their state borders (Scofield 2011).

Gujarat's solar power policy includes setting the price tariff for solar-generated power at an attractive fixed rate over 25 years, with higher rates for the initial 12 years over which project developers would aim to cover debt financing (GEDA 2009; Bridge to India 2011). This has been in contrast to the national solar mission, where considerable interest from prospective project developers and a competitive reverse bidding process has resulted in a drop in the tariff price, to the extent that some of India's largest energy producers such as Tata Power have opted out of the bidding process on the basis that successful projects are not feasible at the prices cited (Pearson 2010). It has also seen a surge in the number of power purchase agreements (PPAs) signed under the Government of Gujarat scheme. While debates will continue over the advantages and disadvantages of each policy approach in terms of predictable and lucrative investment environments for investors on the one hand and the cost to the state and consumer on the other, the governance of this rapidly emerging policy area will be critical to determining in which ways the balance of energy poverty, energy security and climate co-benefits is addressed, as well as how the environmental and social impacts of clean energy projects are managed (cf. Siddiqui et al 2011). In a time of uncertainty regarding the status of CDM revenue alongside domestic policy initiatives, the Gujarat Electricity Regulation Commission (GERC) has attempted to give clear market signals by stipulating a six year timeframe outlining how carbon credits will be shared between project developers and consumers. Investor excitement over national and state solar incentives also indicates the extent to which CDM must be compatible with more important national processes if it is to be transformative for renewable energy in the Indian context.

Capacity constraints at state level have been indicated in the uneven response of states to the NAPCC. Given that future national and state initiatives for climate co-benefits (including for renewable energy generation) may be structured under the NAPCC, it is significant that initial indications of the process suggest that state governance is particularly relevant in the early stages of strategy design. Such cross-sectoral initiatives can face difficulties if challenging the compartmentalised structure of policy making at state level. Experiences from the formulation of the State Action Plan in Orissa emphasise the primary importance of high-level political engagement and leadership at state level, in addition to the importance of administrative coordination, capacity and broad stakeholder consultation. Also important is the integration of new strategies with

existing planning and budgetary processes in order to adequately reflect sub-national priorities while ensuring that appropriate systems are in place for the implementation of national policy (Hedger and Sharma 2010). With respect to the CDM, these aspects of institutional design have arguably been taken up by only a handful of states.

Various actions have been proposed to address capacity deficits at state level, particularly in new and unfamiliar policy areas such as state electricity regulation, the CDM (Babu and Michaelowa 2003; TERI and IGES 2005) or more recently in state responses to the NAPCC. By July 2011 only 14 states of 28 states had submitted State Action Plans on Climate Change (SAPs)⁴⁶. In response, UNDP and the Indian government initiated discussions with states on a common framework for the preparation of SAPs (MoEF 2010c). Other international institutions have assisted states directly in the preparation of their responses. The German international cooperation agency GIZ for example has targeted assistance to one of India's poorest and more politically marginalised states, Manipur, while the UK Department for International Development (DfID) and the World Bank have been active in shaping the SAP in Orissa.

4.3 The local governance of clean development

Below the level of states, India's decentralisation of power has extended to the local scale through the Panchayat Raj system⁴⁷, opening space for community consultation mediated by institutions and individuals with a permanent and visible presence in local political life that cannot be achieved by state institutions. Like other proposed industrial developments, CDM projects are required to hold local consultations with affected stakeholders prior to project implementation (Newell 2005). Given the DNA's limited regulatory oversight of the sustainable development assessments of CDM projects cited above, it is perhaps not surprising that reports of lax procedures in the assessment of local opinion are commonplace⁴⁸. One-off invitations to consultation meetings are often issued in English language newspapers in areas where the language is rarely spoken or a significant proportion of residents are illiterate. Such situations test the system of stakeholder consultations envisaged around the development of CDM projects. The PDD of the Chutak hydro-power project listed in full participants at a public meeting about the project, many of whom signed with a thumb print. Where the norm is to use formulaic language to report a general lack of comments received, such efforts reflect the continued sensitivity of dam projects against a background of widespread mobilisations and protests against forced displacements resulting from projects such as the Narmada dam (Mehta 2006). However the wider implication is the need for adequate means of local participation in project consultations and, in some cases, project design.

The Panchayat system could play a role in facilitating consultations on CDM projects and potentially act to assure that the sustainable development benefits of proposed projects receive adequate attention from project developers. It has also been suggested by some NGOs as a means to increase local participation in wider energy policy considerations (World Bank 2010). However, local level decision-making is also subject to similar political forces observed in national and international level processes. Here there is potential for local corruption among actors assigned influential positions, for elite capture of consultative processes and for limited accountability in the management of project revenues and benefits. The Indian energy giant Suzlon has made allegations of corruption among state and local level officials whilst attempting to secure the necessary community approval for what is planned to be the largest wind farm in India, accusing 'unscrupulous' local politicians of exploiting a large corporate company for personal financial gain by stoking local resistance⁴⁹. Moreover, the Gram Sabha⁵⁰ has

limited capacity to respond to all local developments and in many cases quarterly meetings are infrequent enough to dictate that meetings regularly focus solely on one issue, such as negotiating distributive issues of the rural employment guarantee scheme.

The experience of some NGOs suggests that other existing local institutions (for example 'Youth Sabha') have the potential to address local concerns beyond large state-led policy initiatives such as the employment guarantee scheme⁵¹. However, the time and effort required to initiate projects with strong deliberative decision making and cross-community support can result in prohibitively high transaction costs in the eyes of CDM investors and project developers, or at least in less attractive financing rates for such projects. These barriers are compounded in areas with a history of poorly planned state- and NGO- interventions⁵². Some NGOs judge that in order to implement successful demand-driven energy technology programmes, a series of discussions with community members spanning one to two years is required before proposing an intervention in new areas⁵³, which all but eliminates such projects from the project-based CDM as it stands.

At the local level as at the national level, CDM financing must be considered as a recent development in the history of energy projects and electrification, one that enters India's national and local political landscape in the context of ongoing discontent with consultative and participatory processes around development and infrastructure projects⁵⁴. The Ministry of Power, the primary executive agency mandated with planning in the power sector, has notably not considered environmental and social impacts of power projects or power sector reform processes (Mahalingham et al. 2006). Rather, Environmental Impact Assessments (EIAs) are considered the mandate of MoEF, an historically weak central government department that has recently come into conflict with other government departments by demanding a series of suspensions of major industrial projects. The tougher line is reportedly driven by Minister Jairam Ramesh, mainly through the enforcement of existing assessment criteria, and has sparked lively public debate that is commonly but perhaps misleadingly framed as one of environmental concern versus the economic growth imperative (Ramesh 2010; Narain 2011).

Beyond the CDM, the EIA process itself has been repeatedly criticised for failing to allow involvement of affected citizens in the scoping stage of project design, opting instead for only public hearings based on the completed EIA (Mahalingham et al. 2006), a similar process to CDM consultations. These are prominent issues in contemporary national and local politics in India, particularly where infrastructure projects are planned in forested or 'tribal' areas. For example, in the short term on-shore wind power project developers may continue to be major beneficiaries of CDM in India, but many of the most accessible wind sites have already been utilised and available sites for a variety of energy sources may increasingly be situated in 'tribal' or forested areas. Land is clearly a contentious issue concerning energy and other infrastructure development in India and land acquisition is referred to by some from the investment community as a 'long, tedious and often opaque business' underpinned by 'a huge amount of murky political economy' (Kadakia and Acharya 2010: 15). Indeed, many conventional energy generation projects, not least nuclear power, have been delayed on such issues, making renewable energy a particularly attractive political option where land is available and the transfer of its use less contentious (such as for solar power in desert states). In this regard Jairam Ramesh's position on environmental clearance procedures and consultation is commonly characterised as 'anti-business' to the point that some commentators have expressed surprise at his political staying power at MoEF within an otherwise fiercely pro-growth government. Yet as Narain (2011) notes, strong institutions and procedures for meaningful public participation also help to create a credible governance process

that mitigates risk faced by investors. Some involved in the CDM market in India suggest that, provided that accountability structures for both private and public sector are in place, it is possible for project planning to improve through a drive from project developers to gain a reputation for following correct procedures and in doing so 'earn goodwill with government agencies' (Kadokia and Acharya 2010: 15). These potential reforms point to set of principles that may be considered to address the 'good' governance of the CDM.

4.4 The 'Good' Governance of CDM

In the same way that overcoming land acquisition barriers is considered a 'development risk' to investment in India, a series of interventions from various actors contribute to improving what might be considered the 'good' governance of CDM (Chapman 2011). These initiatives aim to reduce the governance risk to the 'efficient' functioning of the market and creating the conditions to implement emissions reductions at the scale necessary to overcome existing transaction costs. These include some efforts from market participants and government administration to shape governance arrangements in line with investor interests in removing regulatory procedures that in some cases protect the credibility of the market, such as easing the CDM project approval processes, facilitating investors in securing a range of property rights, or creating more 'business friendly' trade in CERs (and Verified Emissions Reductions, VERs) by opening India's commodity exchanges to allow greater access to international buyers and greater market liquidity.

More commonly though initiatives at the international, national and state level have focused on improving the rule of law, reducing corruption and promoting a stable national investment environment. Good governance of the CDM is well supported by the programmes of international donors, particularly those with interests in market-led development and the success of the CDM as a carbon offset mechanism. The German international cooperation agency GIZ for example has an ongoing capacity building operation with the Indian DNA to reduce the costs of early project development and foster projects with sustainable development elements meeting 'international standards' (MoEF 2010b). GIZ activities also include improving the transparency and accessibility of the DNA's operations by redesigning its public website and reducing the administrative burden of host country approval through the introduction of a paperless application process. The World Bank, which promotes business development through its influential but contentious *Doing Business* reports⁵⁵ is also developing a Climate Technology Investment Index to evaluate and compare countries on an enabling environment supporting private sector investments in clean technology, including energy generation (Mani 2010).

Donors such as GTZ/GIZ have also been partners in projects that have responded to criticisms of consultation procedures by collecting photo and video evidence of participation. Creating greater transparency in the process reduces the risk of delays in the application process, although the risk of rejection by the DNA on the grounds of sustainable development criteria remains low. Given the financial implications of delays and bottlenecks in the CDM pipeline, the efficient running of the CDM registration also opens commercial opportunities for private, market-based forms of 'good' governance. Private company Carbonflow for example sells software able to trace a project application through the bureaucratic processes of the DNA and Executive Board. For a fee, project developers and investors access the means to assess timeframes and identify bottlenecks in the process that could translate into financial losses. Investor perceptions of good governance are also important factors in directing the distribution of CDM

projects and are often guided by management and business consultant assessments of the investment climate at state level (e.g. Indictus Analytics 2004). The level of corruption that businesses perceive they may encounter when setting up new operations are also important to understanding the distribution of projects and unequal flows of clean energy finance. Corruption perception indexes such as those generated and compiled by Transparency International India elude to the levels of corruption experienced by end-users of services as well as by businesses operating across different states, although the content of consultant-produced project feasibility studies that may assess corruption risks are typically not made publically available. One international NGO commissioned to produce an inter-state comparative report of barriers to CDM project development reported pressure from state institutions to reassess its corruption indicators prior to publication⁵⁶.

4.5 Non-state actors

4.5.1 Civil society

Given that India is known for its vibrant civil society and powerful environmental movement, it is unsurprising that there has been significant engagement around energy politics and more recently the issue of climate change. For more globally oriented groups such as CSE (responsible for the infamous report *Global warming in an unequal world* (Agarwal and Narain 1991), which heavily influenced India's official negotiations stance on per capita emissions reductions and historically responsibility for climate change) and TERI the focus is on climate change and evaluation of and advocacy around the international negotiating stances of the Indian Government, national policy measures, and state level implementation. They play a role both in providing a research base to decision-making around energy and climate change, such as CSE's report on energy efficiency in Indian industries (Bushan 2010) as well as engaging in high-level policy dialogue (such as Centre for Policy Research).

These groups differ in the extent to which they engage directly with government and with policy design, implementation, and critique, with TERI in particular having a long history of policy implementation including the development of India's CDM strategy (TERI 2005; TERI and IGES 2005) and maintaining extensive links to government through its past and present personnel. On the other hand CSE has critiqued CDM for the short-term economic advantages that have been accrued by energy and industrial companies at the expense of environmental sustainability and local control over development projects.

Several NGOs are involved as implementation agents and developers of clean energy projects, particularly for multilateral agencies such as the various UN bodies, targeting niche policy areas such as rural electrification and aligning themselves broadly with the co-benefits framing of clean energy and the CDM in India. Groups such as WWF have targeted their approach to climate change in support of core principles of biodiversity conservation, promoting 'no-go' sites for industrial development in ecologically fragile areas, while taking a pragmatic stance toward working directly with industrial polluters and publishing the annual Carbon Disclosure Project with the Confederation of Indian Industries (CII)⁵⁷.

Alongside these more policy-engaged groups are a number of activist groups that find common ground over opposition to India's climate change policies, its embrace of international market mechanisms such as the CDM and indeed of the inclusive growth policy framing of processes such as the Planning Commission's low carbon expert group (India Climate Justice Groups 2009; Focus on the Global South 2011). Such groups,

informed by a broadly Gandhian worldview, include workers associations, forest peoples alliances, citizen's groups and some trade unions, many of whom have formed on the basis of social movements or resistance to existing forestry or dam policies. Such groups charge the Government of India with sacrificing the effectiveness and equity of global climate policy in its pursuit of climate finance and call for the Government of India to show leadership by abandoning the western model of high energy production and consumption. Some are actively involved in independent assessments of CDM project planning and outcomes, using international networks and online media to expose and draw attention to cases of dubious project additionality, 'carbon fraud' and linking occasionally perverse local social and environmental impacts to their broader structural context of the CDM (Böhm and Dabhi 2009)

Public deliberation around climate change has also increased significantly in the last few years, with newspapers running regular stories on climate negotiations and debates in Parliament (Vihma 2011). However, beyond the CDM there are also concerns over the levels of public participation in electricity policy and broader energy policy and over the means for facilitating such involvement in policy making. Although policies such as the Electricity Act of 2003 have allowed for greater opportunities for civil society input through regulatory hearings, the dynamics of the power sector can prove to be complex and the coverage of organisations able to engage with the social and environmental assessments of electricity policies on behalf of civil society is limited and uneven (Mahalingham et al. 2006). Likewise the potential for NGOs and civil society to fulfil watchdog roles over the environmental and social planning of India's large number of CDM projects is limited (Newell 2008). These limitations question the common assumption, particularly in oft repeated comparisons to China, of an engaged Indian civil society able to influence policy by engaging in an open democratic space.

4.5.2 The business of clean energy

It is clear from assessments of energy and climate finance that the private sector has a central role to play in funding low carbon energy generation worldwide (World Bank 2009), if only in redirecting massive worldwide investment in fossil energy sources (Newell et al. 2009). Under the Eleventh Five Year plan, India has allocated \$850 million of public finance to support renewable energy, with estimates suggesting that meeting 2012 targets will require leveraging as much as 15 times the budgetary support (Global Climate Network 2010). Considering India's longer term renewable energy goals, the World Bank has estimated that \$10-64 billion in subsidies will be required. The Pew Environment Group (2010) has calculated \$4 billion of investment in clean energy in India during 2010, a 25 per cent increase from 2009 levels and increasingly a challenge to the attractiveness of European countries and the United States. Considering that India received \$21.3 billion in CDM investment (mostly unilateral CDM investment) on its 711 registered projects across all sectors until August 2011 (Fenhann 2011a) and that the IEA (2007) estimate the cost of financing India's energy infrastructure to 2030 at \$1.25 trillion, India has been keen to see the CDM as a welcome additional source of international finance to meet domestic needs.

Despite the limited scope of power sector reforms to date (Bhattacharyya 2007) potential investment in Indian energy infrastructure generates considerable commercial interest. The head of the Infrastructure Development Finance Corporation (IDFC) has recently predicted that power generation could become 'the next telecom of the Indian infrastructure story' (Bellman 2010). Both the CDM and the broader renewable energy economy also generate considerable investor interest. Leading banking groups such as HSBC have identified India as an attractive investment environment, estimating that the

low carbon energy market in India could be worth \$58 billion in 2020 with the renewable electricity market experiencing a six-fold increase from 2009 (AGCC 2009; Singh et al. 2011). The anticipation of high returns has also been a factor in the early growth of the CDM market, with business press reports hyping the potential of carbon finance to get companies rich quick, partially driven by the windfall profits of early industrial gas projects (Pulver and Benny 2010). Headlines such as 'Corporate India to earn Rs 2000 Crores' (*Financial Express* 2010) have helped to establish that the carbon market provides easy pickings for profit hungry entrepreneurs willing to take a chance.

But despite the financial challenges, governance is crucial in so far as flows of private investment in clean technology 'appear to be a response to attractive returns *and* regulatory incentives' (AGCC 2009: 18). Perhaps unsurprisingly, surveys of Indian industry cite a lack of regulatory benefits as the largest barrier to implementing 'climate friendly' activities in the country (The Climate Group 2011). However, comparative studies of CDM host country investment risk commonly cite India as an attractive investment location because of its established CDM institutional architecture and regulatory environment, in addition to the economic environment and large mitigation potential (Jung 2006, Oleschak and Springer 2007). Likewise, India consistently ranks highly in indices of attractive countries for renewable energy investment, indicating an increasingly favourable regulatory and policy environment along with a growing number of entrepreneurs and project developers (Ernst & Young 2010; REN21 2011).

News that the Planning Commission was due to release details of how India would go about meeting its emissions intensity target under the next five year plan recently led to HSBC upgrading its assessment of the country's climate strategy rating from 'neutral' to 'positive' (Knight et al. 2011). Such investor assessments emphasise the importance of governance and policy environments in providing 'long, loud and legal' signals to private investors to un-lock renewable energy potential (Hamilton 2010). For example, India's publicly owned Power Finance Corporation – one of the largest sources of finance for the power sector and better known for financing India's Ultra-Mega Power Projects – has cited investor demand for solar financing under the government's National Solar Mission as a determining factor in its decision to create a renewable energy finance subsidiary company that promises greater finance to the renewable energy sector (Kumar 2011).

The participation of project developers' in carbon markets is in part governed by the value that banks place on carbon and the financial governance systems in place to manage carbon as a commodity. To date much of India's renewable energy growth has been financed domestically and rather conservatively (MNRE 2010). Several foreign and domestic banks house carbon funds, but the reluctance of some Indian banks (both public and private sector) to consider Emissions Reduction Purchases Agreements (ERPAs) as a guarantee of future CER revenue has restricted the ability of projects to get off the ground and resulted in a significant number of projects financed 'from the balance sheet' of companies with the capital available to do so (World Bank 2008). Whereas financially viable projects have difficulty proving their additionality, projects that require CDM revenue to meet the incremental costs of implementation have found themselves unable to provide adequate guarantees of future returns from the CDM for investors and financiers. To an extent Indian firms have favoured non-additional or marginally additional projects as a risk reduction strategy in response to market uncertainties invoked by the CDM approval process at the Executive Board (Hultman et al. *in press*). Indeed, although the CDM is conceived as a platform for bilateral investment, to date 82 per cent of CDM projects in India have been unilaterally implemented (IGES 2011). Many of the beneficiaries of the Indian CDM market have indeed been large corporate companies with existing personal and institutional

relationships and credit lines with Indian banks⁵⁸. Giants of Indian industry such as Reliance Industries, Indian Oil and Tata Steel each have ten or more projects, drawing criticism from activists who claim that the CDM subsidises polluting industries to continue business as usual (Böhm and Dabhi 2009).

Meanwhile several small and medium enterprises (SMEs) are seeking the potential profits from providing clean energy solutions to 'base of the pyramid' energy users, who under some estimates comprise almost sixty per cent of the Indian population. Such investments are faced with upfront costs estimated at three to ten times greater than conventional energy sources in India (particularly where end-user subsidies for kerosene and diesel disincentivise clean energy investment) (Bairiganjan et al. 2010). Whereas reducing governance risk in order to reduce the cost of capital has been partially successful for grid connected renewable energy technologies, more direct policy interventions have been suggested to increase capital flows to areas of the energy economy typically neglected by private sector investors; Bairiganjan et al. (2010) for example suggest utilising the Government of India's existing power over both state and commercial banks by designating clean energy as a priority lending sector⁵⁹ of the Indian economy.

Creating an enabling environment for renewable energy becomes a deeply political issue when considering the potential trade-offs of providing 'long, loud and legal' market signals. For example, international investors who participate in one of India's multiple clean energy governance fora the APP, state that in addition to 'enforcing an already robust regulatory framework', the Indian government must ensure 'strong investor rights protection' to enable foreign investment and increased private sector participation (CleanTech AustralAsia 2008:29), policies that may be against elements of India's macroeconomic policy or plans for developing domestic manufacturing capacity⁶⁰. Just as India has political power to negotiate or reject the terms of concessional public finance from the likes of the World Bank, the government also has a certain level of economic and political power to dictate terms to international investors.

Among current government initiatives, the National Solar Mission creates perhaps the clearest example of political challenges in constructing long term policies. The Solar Mission is potentially contentious due to its costs, as it proposes to step outside of the dominant co-benefits framing of clean energy, at least in the short to medium term. Questions of who will bear the cost of solar electricity tariffs and how the costs will be managed are foremost in determining the short and long term success of a policy that could put India in a very strong political position with respect to clean energy technology manufacturing and distribution⁶¹. This is also an indication of the limited likelihood that India will consider *disincentives* to investment in polluting energy sources alongside incentives to clean energy generation, beyond the relatively small tax on coal in place at present. Considering clean energy governance within the history of broader energy governance in India, Dubash (2011: 74) considers that although 'combining energy security and climate change has begun to open doors...the new narrative is insufficiently fleshed out to provide clear indications of how to manage the trade-offs that will inevitably arise'.

4.6 Private governance

Although ongoing market-based reforms of energy governance are planned, the sector as a whole retains a high level of direct state influence. Perhaps the exception is in carbon markets and the emerging governance landscape of renewable energy where the most significant role of the state has been not in the addition of generation capacity but

in setting enabling policies, rules and procedures⁶² for private sector finance and technology development. To date the majority of corporate finance has focused on mature markets in large scale wind installations and commercially viable hydro projects (MNRE 2010)⁶³. According to Benecke (2010) the generation of power from renewable energy services is almost ninety per cent in the hands of private parties, even if transmission and distribution of electricity remains state controlled. This leads Benecke (2010: 9) to claim that 'the CDM provides an entirely new mode of governance for RE [renewable energy] that departs from the dominance of state-led steering'. At minimum, it has opened significant political space for a range of private sector actors to influence how decisions are made, how priorities are set and how these relatively new markets are governed in practice. These actors include a range of market participants such as technology developers, manufacturers, potential independent power producers, consultants and carbon market project developers and financiers, focused on assessing levels of (un)certainty in energy and carbon markets and promoting governance reforms that ease difficulties in monetising and accessing carbon credits.

A high degree of formal authority is assigned to Designated Operational Entities (DOEs) as the validators of CDM project activities and the verifiers of the emissions reductions that they produce, and have attracted considerable criticism. As DOEs are responsible for assessing the work of project developers who pay their fees, there is a potential disincentive to critically assess claims, with only the fairly weak regulatory power of the Executive Board to apply punitive measures (Green 2008). Indeed, empirical and anecdotal evidence suggests that a substantial number of Indian projects are unlikely to be additional (Michaelowa and Purohit 2007; Lohmann 2009; Alexew et al. 2010) and due to capacity constraints the DNA is heavily reliant on the assessment of DOEs. In India, DOE validators have been shown to be reluctant to visit project sites and some have been documented duplicating stakeholder consultation comments from one PDD to another. DOE suspensions by the Executive Board have caused delays for project developers, which, combined with a perceived lack of technical expertise and continued backlogs, has resulted in many CDM project developers placing a significant portion of blame for delayed financial returns with (mainly international) DOEs.

Although the formal international institutional structure of the CDM creates a role for DOEs in monitoring and auditing, national governance also has a role in determining the ways that private governance takes place in practice. International rules set by the Executive Board do not require any verification of the delivery of sustainable development benefits outlined in the PDD; but the lack of oversight of sustainable development aspects of the CDM by India as a host country confers significant responsibility on a set of private market actors for the initial validation of fair and transparent stakeholder consultation and its assurances of future sustainable development benefits. While proposals to reform the project-based CDM through Programmes of Activities⁶⁴ may reduce transaction costs, emissions verification costs are likely to be considerable and will doubtlessly continue to drive new and elaborate methods of carbon accounting to limit monitoring costs. The challenges of validating sustainable development benefits in multiple and disparate locations on the other hand, tend to be met by claims from market participants that the positive sustainable development impacts of PoAs can be taken as read⁶⁵.

A variety of consultants have also played a significant role in the private governance of the CDM, particularly in the early success of India in attracting projects. International consultancies such as Ernst & Young and Price waterhouse Coopers utilised existing networks of clients and partnered with local technical consultants to approach potential clients with little or no knowledge of the CDM (Pulver and Benny 2010). In doing so they have been able to gain a foothold in the emerging CDM market and generate significant

new business by shaping the rules and practices of a new market. Several years later there are ongoing concerns over the number of 'consultant-driven' projects in India and the implications for delivering viable projects with significant sustainable development benefits⁶⁶. As observed in other countries, staff with CDM expertise frequently move between the DNA, consultancies and DOEs⁶⁷, indicating that it is not only in countries with minimal institutional capacity with regard to the CDM that turnover can be high and the lines between public and private interests blurred.

Private foundations have also had an important role in formulating policy and in promoting renewable energy installations. The Clinton Climate Initiative (CCI) for example has signed a Memorandum of Understanding with the Government of Gujarat to facilitate the set up a 3000 MW solar park in the state, reducing capital and construction costs by pooling industries and developing local manufacturing capacity⁶⁸. CCI also plans to act as an intermediary with lenders such as the ADB to lever low cost financing. While Gujarat is already in possession of plentiful solar radiation and available land, perceptions of the governance of a new and uncertain sector has been instrumental in strengthening the Gujarat's existing economic base. State level governance has hence been important not only in attracting large investors⁶⁹ but also in attracting an international private foundation that has positioned itself to facilitate private investment. In doing so, CCI takes on a distinct governance role of its own (driven in this case by a climate change agenda), notable in the business press in its rationale for 'choosing Gujarat' for its solar park intervention (CCI 2010). Private foundations can also exert influence over policy direction and implementation⁷⁰, particularly by filling gaps in government data, provided they can demonstrate their 'value-added' and, in the case of The Shakti Sustainable Energy Foundation⁷¹, demonstrating that they act in the Indian national interest and do not reflect the priorities of international funders⁷².

The role of business groups and lobbies has become increasingly influential over time as Indian industries have sought to benefit from the CDM. Private trade and manufacture associations FICCI (The Federation of Indian Chambers of Commerce and Industry) and CII (The Confederation of Indian Industry) have a key role in raising awareness of CDM opportunities for Indian Industry, including joint hosting of conferences and business networking sessions with the MoEF in the case of FICCI and developing a pipeline of CDM projects among CII members. These groups act as the unified voice of industry with government, identifying and communicating barriers to CDM implementation including improving the accessibility of market information, often in the name of assisting small and medium enterprises (SMEs) that constitute the majority of the country's economy but which face capacity constraints and information deficits that can be mitigated by larger corporate companies, and to a certain extent aggregated SMEs.

Beyond the CDM, Indian business has also established links with international businesses to lobby governments on proactive climate policies that could develop commercial opportunities for Indian industries⁷³ (such as the UK-India Business Leaders Climate Group). Domestic Indian opportunities are most obvious in the direct savings possible from improvements in energy efficiency and through the emergence of new businesses such as Energy Service Companies⁷⁴ (Delio et al. 2009). While seeking to directly benefit Indian businesses in the short term, industry bodies also have the role of demonstrating adequate industry action in alignment with government aims, in order to reduce the risk of punitive government measures to force change at the expense of the bottom line of their members. However, despite public announcements from parts of the government on the potential benefits of the CDM for reducing energy poverty (Gupta 2010), it has been noted that in practice the interests of the government and of industry

bodies are not as distinct on issues such as the delivery of sustainable development benefits under the CDM as might be expected (Benecke 2009).

International standards for carbon offsets have emerged to provide an additional level of checks on the sustainable development aspects of projects from an independent, privately administered body. Gold Standard CDM projects have found only a limited market in India, with eight projects registered by the Executive Board (although 47 of 179 Gold Standard CDM projects in the pipeline are Indian projects). Suzlon meanwhile, which has been one of the primary beneficiaries of the CDM in India, considers that its own Corporate Social Responsibility (CSR) standards of community consultation and benefit sharing (such as building schools and health clinics) exceed the minimum requirements of sustainable development and 'boutique credit' schemes such as the Gold Standard⁷⁵, although these have not prevented the company becoming involved in land disputes with local political powers (Arnoldy 2010). Indeed, within the CDM community in India there are some that feel, in light of the volume of CDM finance that has previously flowed to industrial gas projects or coal-fired power stations, the sustainable development benefits of renewable energy projects should be taken as read. Technology developers such as Suzlon also commonly work with State Nodal Agencies of MNRE to implement clean energy projects (New Energy India 2011)

Under the current project-based CDM, small companies or NGOs aiming to gain carbon credits for the distribution of pro-poor clean energy technologies such as efficient cookstoves or solar lighting systems have commonly faced deficits in the data required to adequately report emissions reductions and community consultations under the CDM. Many of these projects have opted for the less stringent regulatory process and the smaller financial rewards of the voluntary carbon market⁷⁶, traded on the Chicago Climate Exchange. For these projects, the additional burden of Gold Standard accreditation often outweighs the benefits of a price premium on VERs and India hosts a relatively small percentage of Gold Standard VER projects⁷⁷ considering its large market share of the CDM. Indeed, in parts of government the voluntary market is considered not for its potential contribution to poverty alleviation or a role in paving the way to future CDM methodologies, but rather as small scale and more of use to the corporate social responsibility interests of European and North American companies⁷⁸

Of course, the predominantly private institutions that govern the voluntary carbon market differ from those of the CDM, but as indicated above, varieties of formal and informal private governance are influential in shaping a range of clean energy initiatives in India including international carbon markets and domestic renewable energy policies and markets. Beyond the immediate concerns of shaping market reforms and easing the path of commoditisation of carbon, these 'market makers' are also concerned with maintaining a level of credibility in emissions reductions and sustainable development outcomes that ultimately ensures the continued legitimacy of a market for which the future is far from assured. How decisions are made and power exercised through the everyday functioning of these markets therefore has significant implications for the social benefits and emissions reductions that they aim to produce.

5. Conclusions

This paper has suggested the importance of governance, politics and institutions in understanding how and whether schemes such as the CDM are capable of producing social and development benefits while leveraging additional sources of clean energy finance in India. Although some of the governance factors that influence the performance of the CDM are determined by the structural design of the mechanism

itself, we have argued that in the case of India, 'governance from below' by a multitude of actors and institutions at national and local level shapes how and whether benefits flow from the CDM to their intended beneficiaries. The scope of current high-level discussions on CDM governance reforms do not address the underlying politics discussed here, but instead are largely limited to the functions of the Executive Board or Designated National Authorities. Likewise, new policies such as sectoral trading and Programmes of Activities will be subject to many of the same political forces and governance issues outlined above.

In contrast, the broad governance approach presented here has included the governing roles of a range of actors across the public-private spectrum; across scales from village institutions to global institutions; and including both formal institutions and the informal practices of day to day governance. Considering this broad definition, a range of issues surrounding policy coherence, institutional coordination, accountability and barriers to participation are conceived as products of various actors' power and influence over policy-making and the CDM administrative processes. Far from being technocratic or managerial issues (Bhattacharyya 2010), these aspects of governance are highly political by virtue of their importance in directing and shaping the flows of international and domestic clean energy finance and the associated benefits and trade-offs. This, we argue, is critical for understanding the 'governance in practice' of market-based mechanisms such as the CDM. Here in particular, it can often be the 'un-governance' of clean energy that has the most significant impact on whether or not clean energy goals are achieved: the actors and policy processes that are not typically perceived as the subjects of clean energy governance but which can undermine the effect of clean energy policies.

India's early state-led growth in clean energy technologies has largely dictated the role that the CDM has come to play in the country. In this regard, the extent to which the CDM can fulfill its dual aims of creating sustainable development benefits alongside emissions reductions is dependent on the broader institutional environment of energy policy and the political structures of the domestic energy sector. In turn, we argue that this implies an appreciation of how the influence and power of various actors shapes the extent to which national policy is coordinated towards particular public goals and reflects particular interests in attempts to simultaneously address climate change, energy poverty and energy security. As India introduces a new range of domestic market-based policies for clean energy, strong and effective institutions will be required to manage these political trade-offs. We have argued here for greater appreciation in scholarship and policy making of the role that national and local energy governance plays in determining whether the CDM becomes aligned with domestic clean energy politics and, ultimately, in determining its prospects for contributing to low carbon energy transitions in industrializing countries such as India.

¹ India's per capita emissions were 1.7 tonnes of CO₂e in 2005, considerably lower than the world average of 4.4 tonnes and well below that of Annex I economies and China with which India is often grouped (MoEF 2009a).

² The aim of the RGGVY (Rajiv Gandhi Grameen Vidyutijaran Yojana) programme is to electrify all villages by 2012. The definition of an electrified village however clearly does not cover the full range of energy needs for cooking and heating; in practice, many electrified villages do not receive a reliable or continuous supply.

³ Cumulative installed electricity capacity is currently produced from the following sources: 55 per cent from coal, 21 per cent from large hydro plants, 10 per cent from natural gas, 3 per cent from nuclear and 1 per cent from Oil. The installed capacity of renewable power is 11 per cent

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- of India's total (CEA 2011), but the actual generation is approximately 4 per cent, as renewable energy technologies are not capable of generating electricity at all times (MNRE 2010).
- ⁴ In 2005, 39 per cent of primary energy was produced by coal, 25 per cent from oil and 5 per cent from natural gas (IEA 2007). The majority of India's rural population without access to modern fuels or electricity use biomass for their primary energy consumption.
- ⁵ This can be traced back to the oil shocks of the early 1970s and early Indian investment in renewable energy research and development, leading to the creation of the Commission for Additional Sources of Energy (CASE) in 1981, the precursor to the current Ministry of New and Renewable Energy.
- ⁶ UNEP (2011; cited in The Climate Group 2011) estimates that India spends 45 per cent of its export earnings on energy imports. In 2008 India imported approximately 11 per cent of its coal supplies, 75 per cent of its oil, and 26 per cent of its natural gas. The Planning Commission (2006) projects that dependence on energy imports could almost double by 2032 to over 50 per cent of commercial energy consumption.
- ⁷ In this paper we consider energy generation defined as 'clean' through the CDM and through various aspects of Indian energy policy, while recognising that definitions of clean energy are contested. Indeed, governance is particularly important in considering definitions of 'clean' and 'sustainable' energy sources (Newell et al. 2009).
- ⁸ Is it notable however that previous Government projections for installation of renewable energy have had greater success than planned increases in fossil fuel capacity, which have been held up in various planning processes (MNRE 2010).
- ⁹ Additional targets for off-grid solar applications total 2,000 MW, including 20 million solar lighting systems and an area of 20 million square metres for solar thermal generation. There are also plans to install a further 2 million family sized biogas plants by 2022, from the current baseline of 4.2 million
- ¹⁰ Forty seven Indian projects have been rejected by the CDM Executive Board – 24 per cent of all rejected projects compared with 21 per cent of successfully registered project. However 34 per cent of projects rejected at an earlier stage by Designated Operational Entities have been hosted by India (Fenhann 2011a)
- ¹¹ For example India's prospects of permanent membership of the Security Council
- ¹² The Gold Standard is a carbon credit label that applies a set of sustainable development criteria to projects additional to criteria mandated by either the compliance or voluntary markets
- ¹³ Discussion with GIZ representative, India Carbon Market Conclave 2010, New Delhi, September 2010
- ¹⁴ Interview with senior staff member, Social, Environment and Water Resources Management Unit, World Bank, New Delhi, September 2010
- ¹⁵ Interview with senior staff member, Social, Environment and Water Resources Management Unit, World Bank, New Delhi, September 2010
- ¹⁶ The IFC's Carbon Delivery Guarantee programme for example has guaranteed three transactions for the delivery of 2.2 million credits from CDM projects (IFC 2011)
- ¹⁷ The ADB Future Carbon Fund (\$115) and the IFC Post-2012 Carbon Facility (€150m)
- ¹⁸ Authors' interview with a Director of MNRE, New Delhi, September 2010.
- ¹⁹ For example, the World Bank was influential in the initial unbundling of the electricity sector through a loan to the state of Orissa, supported by domestic enthusiasm for increased private sector involvement in the distribution of electricity (Dubash 2010). One of the World Bank's longest ongoing investments in India is a partnership to improve the planning and implementation capacities of the state-owned electricity utility PowerGrid,
- ²⁰ Both ADB and IFC are providing \$450m of debt finance to the project, with IFC providing a further \$50m in equity. Mundra UMPP is the first of sixteen Ultra Mega Power Projects planned by 2017, each of 4000 MW generation capacity or more.
- ²¹ Reliance Power for example has indicated that it will apply for CDM credits for all of its UMPPs projects, including the already registered Sasan 4,000 MW project, which is expected to generate 22.5 million CERs over its initial ten year period, with expected revenues of over \$450 million (The Climate Group 2011: 45).
- ²² India is now the largest recipient of IFC finance. The IFC portfolio in the country stands at an estimated \$3.6 billion, with around \$1 billion in the power sector. The IFC claims that around 75 per cent of power sector investments in India are directed to clean energy (Panchabuta 2011)

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- ²³ The definition of clean energy here is important too, notably including large hydro power and 'cleaner fuels' such as natural gas projects. ADB accounting methods ascribe a percentage of project finance to a clean energy component. For example a supercritical coal power plant is considered to provide 20 per cent of its investment to clean energy goals, while 'new renewable energy' projects are rated as 100 per cent. Likewise, end-use efficiency projects such as water saving irrigation interventions are deemed to contribute towards clean energy targets by reducing the energy used in pumping water (ADB nd)
- ²⁴ GEEREF is supported by the European Union (EU), Germany and Norway and advised by the European Investment Bank Group (the European Investment Bank and the European Investment Fund)
- ²⁵ Authors' interview with a Director of MNRE, New Delhi, September 2010
- ²⁶ This includes approximately \$540 million from the CDM and GEF and the remaining \$900 million from bilateral and multilateral aid budgets for renewable energy and energy efficiency activities.
- ²⁷ For example, UNDP is currently implementing \$4m project to install biomass plants in Karnataka alongside a \$5.6m project with MNRE to address the barriers to biomass project implementation.
- ²⁸ Interview with Senior Climate Finance Advisor, DfID, New Delhi, September 2011
- ²⁹ Alongside this there have also been bilateral deals with individual countries such as the Franco-Indian working group dealing with clean technology transfers and their financing, discussions with the Spanish government on the development CSP and with UN agencies such as UNEP on accelerating the market for solar home systems in southern India (AGCC 2009:21).
- ³⁰ It should be noted that technology transfer has always been relatively low in India as a percentage of total CDM projects.
- ³¹ In 2008 India signed a civil nuclear agreement with the US, ending many years of isolation from global nuclear markets enforced by India's refusal to sign the Nuclear Non-Proliferation Treaty.
- ³² Authors' interview with the Head of Climate Change and Energy Programme of an international NGO, September 2010
- ³³ Authors' interview with Deputy Director General, CSE, New Delhi, September 2010
- ³⁴ In addition to the REC scheme, the most significant of these is the Perform, Achieve and Trade (PAT) scheme for trade in energy efficiency measures. Pilot schemes are also planned for the introduction of domestic trade in sulphur- and nitrogen-based industrial air pollutants (Singh 2011)
- ³⁵ Authors' interview with Member Secretary of the National CDM Authority and Director, MoEF, New Delhi, September 2010
- ³⁶ A \$1.1 per tonne tax was placed on coal in the 2010 budget (Singh et al. 2011)
- ³⁷ Authors' interview with Director, MNRE, New Delhi, September 2010
- ³⁸ Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010
- ³⁹ Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010
- ⁴⁰ The DNA has insisted that where land acquisition has taken place a 2 per cent share of the proceeds of the project has to go to a community project.
- ⁴¹ A study of thirteen SERCs in India concluded that while many challenges remain, regulatory agencies have made significant progress toward making critical decision processes, such as tariff setting, open and transparent. SERCs are also beginning to provide the political space for public engagement in these processes (Hira et al., 2005).
- ⁴² Individual states have specified their own RPOs, ranging from 1-12 per cent of electricity generation over the next few years.
- ⁴³ Ten states are currently implementing major wind energy programmes (Rao and Kishore, 2009). Wind energy generation has been developed substantially in Tamil Nadu and Maharashtra, which contribute 42 per cent and 18 per cent respectively to the total installed wind capacity in the country.
- ⁴⁴ Interview with Senior Climate Finance Advisor, DfID, New Delhi, September 2011
- ⁴⁵ In Rajasthan, 1524 MW of solar power has been registered, of which 71 MW is expected to come up in 2010-11. In Gujarat, 716 MW solar power projects have been allocated to developers, of which 100 MW is expected to come up in 2010-11 (CRISIL 2010).

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- ⁴⁶ The north eastern states of Manipur, Meghalaya, Arunachal Pradesh, Mizoram, Sikkim, Tripura and Assam have been among the first to submit their plans whereas Maharashtra, Madhya Pradesh, Gujarat and Bihar are among the states that have not yet sent their drafts to the MoEF. The case of Gujarat is interesting in particular. Gujarat has not yet submitted its SAPCC but already has a Rs. 13,000 Crore (over \$2.6 billion) adaptation programme up and running in addition to clean energy promotion policies (Suneja 2011).
- ⁴⁷ *Panchayati Raj* is a system of governance in which Gram Panchayats are the basic units of administration. *Gram panchayats* are local self-governments at the village or small town level in India. As of 2002, there were about 265,000 Gram Panchayats in India. The Gram Panchayat is the foundation of the *Panchayat System*.
- ⁴⁸ 70 per cent of the CDM projects submitted to the CDM Executive Board until June 2007 held some kind of consultation meeting (Castro and Michaelowa 2008).
- ⁴⁹ Authors' interview with Deputy Marketing Manager, Suzlon, New Delhi, September 2010.
- ⁵⁰ *Gram Sabha* means a body consisting of persons whose names are for the time being entered as electors in the electoral roll for a *Panchayat*.
- ⁵¹ Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010
- ⁵² These include examples such as: supply of biogas digesters for which no maintenance training was supplied and for which no local market in replacement parts existed; or State Nodal Agency agricultural extension staff making the delivery of core services such as seed distribution dependent on the acceptance of energy technologies in order to meet roll-out targets dictated by MNRE (Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010)
- ⁵³ Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010
- ⁵⁴ It is worth noting that in CDM consultations the structure of the CDM, its rationale and its implications for the distribution of financial and social benefits are generally poorly communicated and local awareness of the roll of carbon markets in project financing is low.
- ⁵⁵ In the past *Doing Business* reports have faced criticism from labour movements for promoting deregulation of labour laws and failing to coordinate with the International Labour Organisation (ILO) standards. *Doing Business* indices have also been used in international comparative indicators on CDM host country attractiveness (eg. Jung et al. 2006)
- ⁵⁶ Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010
- ⁵⁷ Authors' interview with the Head of Climate Change and Energy Programme, WWF, September 2010
- ⁵⁸ Interview with senior staff member, Social, Environment and Water Resources Management Unit, World Bank, New Delhi, September 2010
- ⁵⁹ Indian banks and foreign banks operating in India are currently required by the Reserve Bank of India to invest a percentage of Net Bank Credit in government-directed 'priority sectors' of the Indian economy, including housing, education, agriculture and small scale industries.
- ⁶⁰ The National Solar Mission (JNNSM) aims to create a domestic solar industry.
- ⁶¹ The MNRE cites CERC data that suggests that India's target of 15 per cent of renewable energy in the electricity mix can be met without additional costs to the end-user, with additional costs borne by state electricity utilities (Gupta 2010)
- ⁶² For the CDM this is indicated by broad and 'all encompassing' sustainable development criteria and a lack of a steering taxation regime imposed on the sale of CERs (Benecke 2008)
- ⁶³ Around 70 per cent of small hydro installations have been financed by the private sector; Suzlon holds an approximate 50 per cent market share of wind power in India with current installed capacity of 5,000 MW, as well as being a prominent exporter of wind technology.
- ⁶⁴ Programmatic CDM (or Programme of Activities) aims to reduce transaction costs by replicating small projects (e.g. distribution of solar lanterns to households) in multiple locations. India currently has seven PoAs registered with the Executive Board (five household-level energy efficiency projects and two biomass projects) with eighteen projects at the validation stage (four of which are renewable energy projects (solar water heating and solar PV projects) (Fenhann 2011b).

- ⁶⁵ These claims are based on the assumption that PoA projects at household level (e.g. distribution of clean cooking technologies) 'do no harm' and can only fail in emissions reductions terms e.g. by discontinued use of cookstoves
- ⁶⁶ The presumption being that consultants do not have the identification of quality projects as their first priority; the successful issuance of CERs and the delivery of anticipated sustainable development benefits do not hold any monetary value for consultants.
- ⁶⁷ Interview with senior staff member, Social, Environment and Water Resources Management Unit, World Bank, New Delhi, September 2010
- ⁶⁸ The project could become the largest solar installation in the world and one of the largest foreign direct investment projects in Gujarat, one of India's more financially successful states. CCI is also reportedly developing plans for solar investments in Rajasthan and Andhra Pradesh, two other states with a combination of 'business friendly' policies and an investment environment perceived as conducive (Pathak and Amin 2008)
- ⁶⁹ These include Indian Corporate companies such as Essar Power, Reliance, Tata Power and Suryachakra (Pathak and Amin 2008)
- ⁷⁰ The Shakti Sustainable Energy Foundation for example runs a 'Regulatory Assistance Project' for the power sector.
- ⁷¹ Shakti Sustainable Energy Foundation is the Regional Climate Foundation of ClimateWorks Foundation in India.
- ⁷² Authors' interview with Climate Policy and Renewable Energy experts, Shakti Foundation, New Delhi, September 2010.
- ⁷³ Authors' interview with Director, CII, New Delhi, September 2010
- ⁷⁴ Energy Services Companies (ESCOs) earn revenue based on the energy savings they produce for client companies.
- ⁷⁵ Authors' interview with Deputy Marketing Manager, Suzlon, New Delhi, September 2010
- ⁷⁶ Authors' interview with Senior Program Officer of an international NGO and former staff member in the Maharashtra State Government, Gurgaon, September 2010
- ⁷⁷ 18 of 306 (6 per cent) global projects in the pipeline (Gold Standard 2011)
- ⁷⁸ Authors' interview with Director, MNRE, New Delhi, September 2010

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