

Finance, Innovation Policy and Sub-National Actions for Low Carbon Development In India

17 September 2015, New Delhi



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With support from Shakti Sustainable Energy Foundation

September 17, 2015 | 0930 – 1700 hours
Amaltas Hall, India Habitat Complex, Lodhi Road - New Delhi

About the Workshop

Low carbon development has gained global policy prominence and is being increasingly discussed among major stakeholder groups including national governments, business & industry, civil society, and research & academia.

In the multilateral fora, low carbon development found a mention in the Bali Roadmap and subsequent United Nations Framework Convention on Climate Change documents. The Twelfth Five Year Plan of India recognizes that India needs to adopt a low carbon strategy for inclusive growth in order to improve the sustainability of its growth process. The National Action Plan on Climate Change, which is the guiding document on climate change actions in India, also recognizes the need for low-carbon and energy efficient technologies in different areas.

The Energy and Resources Institute (TERI) with support from Shakti Sustainable Energy Foundation organized a workshop on low carbon development strategies in India. It focused on three implementable policy relevant areas of finance, innovation policy and sub-national actions.

Workshop Agenda

9:30 AM – 10:00 AM	Registration with tea
10:00 AM – 10:15 AM	Introduction and About the Project <ul style="list-style-type: none"> • Shailly Kedia, Fellow, The Energy and Resources Institute
10:15 AM – 12:15 PM	Session 1: Financing Low Carbon Development <ul style="list-style-type: none"> • A Damodaran, Economics & Social Sciences Professor, Indian Institute of Management, Bangalore (Chair) • Nishant Jain, Research Associate, TERI • Rita Pandey, Professor, National Institute of Public Finance and Policy • Samuel Joseph, Chief General Manager, Treasury & Accounts Group, EXIM Bank • Utkarsh Agrawal, Senior Analyst, Research & Design, SP & Dow Jones • Avisek Bagchi, Manager, Small Industries Development Bank of India
12:15 PM – 12:30PM	Tea Break
12:30 PM – 2:00 PM	Session 2: Science, Technology & Innovation Policy for Low Carbon Development <ul style="list-style-type: none"> • Ashok Jain, Professor, EMPI Business School (Chair) • Nisha Mendiratta, Director, Climate Change Programme, Department of Science and Technology • Manish Anand, Fellow, TERI • N. Srinivasan, Coordinator (Science, Technology and Innovation), Asian and Pacific Centre for Transfer of Technology • Vijay Kumar Kaul, Professor, University of Delhi
2:00 PM – 3:00 PM	Lunch
3:00 PM – 4:30 PM	Session 3: Sub-national Policies for Low Carbon Development <ul style="list-style-type: none"> • Prodipto Ghosh, Distinguished Fellow, TERI (Chair) • Ajay Kumar Lal, Director, Department of Environment, Science and Technology, Government of Himachal Pradesh • Satnam Singh Ladhar, Additional Director (Environment), Punjab State Council for Science & Technology, Government of Punjab • Parveen Dhamija, Director, Ministry of New & Renewable Energy, Delhi Government • Anu Jogesh, Policy and Governance Lead, Acclimatise India
4:30 PM – 5:00 PM	Wrapping up and Open Discussion
5:00 PM onwards	Tea and Refreshments

Format

The workshop, involving three sessions on finance, innovation policy and sub-national policies, was conducted in form of panel discussions. Panels consisted of the invited experts and were chaired by senior experts from relevant domain. The workshop began with a welcome address and introduction of the project on Low Carbon Development supported by Shakti Sustainable Energy Foundation. The three sessions followed. The chair of individual sessions set the stage for the discussion and speakers made their interventions within the time stipulated by the chair. Panel discussions were followed with a round of questions & answers moderated by the chair.

1. Welcome and Setting the Stage

Ms. Shailly Kedia (Fellow, TERI)

The workshop started with a brief introduction given by Ms. Kedia about the project and the workshop. The workshop is an output of the collaborative study on low carbon development for China and India. The intended outcome of the project would be supporting policy development by facilitating south-south cooperation, creating relevant knowledge and building capacities through exchange of experiences and ideas. The workshop will focus on three implementable policy relevant areas of finance, innovation policy and sub-national actions.

From the study, it is found that both India and China had launched their climate policies at around the same time with similar structure. China provided greater fiscal stimulus for low carbon development manufacturing sectors after the 2008 financial downturn in the global economy. In India too, with the recent emphasis on Make in India, it is hoped that investments are enhanced in low carbon and climate smart interventions.

The State Action Plan on Climate Change is also a great starting point in India wherein states have made the first step at the sub-national level in response to climate change adaptation and mitigation. China's experience of interventions at the sub-national level, namely low carbon pilots, was shared. China's target-oriented approach has helped them establish targets at province and city level and plan accordingly. In the area of finance, China's Central Banking Regulatory Authority has put in place green credit guidelines to encourage responsible investments. In terms of innovation policy, to boost low carbon technologies, China launched various demonstration projects specifically for low carbon development such as 10 Cities, 1000 Vehicles; 10 Cities, 10000 Lamps; and Golden Sun.

In India, low carbon development needs a boost. Disaggregating the low carbon development scenario along with socio-economic performance in India is needed to plan for greater adaptive capacity along with mitigation actions. The pathways for different states will be different but both can go hand in hand. This is already evident from the metrics of low carbon performance and socio-economic performance developed for the states of India. Sharing of good practices and active engagement with sub-national issues is a need. Implementation of SAPCCs would require suitable institutional arrangements. This will need to be backed by strong policy and market signals in terms of financing. Moreover technologies, suitable to Indian conditions will also need to be developed. With this background, sessions of the workshop deliberated on these three areas of policy relevance.



2. Session I: Financing for Low Carbon Development

Chair: Dr. A Damodaran, Economics & Social Sciences Professor, Indian Institute of Management, Bangalore

Panelists:

- *Mr. Nishant Jain, Research Associate, TERI*
- *Dr. Rita Pandey, Professor, National Institute of Public Finance and Policy*
- *Mr. Samuel Joseph, Chief General Manager, Treasury & Accounts Group, EXIM Bank*
- *Mr. Utkarsh Agrawal, Senior Analyst, Research & Design, SP & Dow Jones*
- *Mr. Avisek Bagchi, Manager, Small Industries Development Bank of India*

Mr. Nishant Jain presented the findings of the collaborative study undertaken by TERI with respect to the finance sector in India. He set the context by explaining the need for financing by presenting most significant long-term risks in terms of likelihood worldwide. He shared the results of project team's interaction with the stakeholders on issues such as challenges in meeting finance for low carbon development, support required in meeting finances for low carbon development and the present & future requirement for financing. The need for public finance and provision of subsidies emerged quite clearly from the stakeholder consultations.

He discussed various financial mechanisms in India for low carbon development such as public finance initiatives, traditional finance, risk management instruments, market based instruments, international climate finance and public-private initiatives.



Financing for low carbon development in India has a long way to go. The Reserve Bank of India and Ministry of Finance need to promote awareness regarding the priority sector lending norms among stakeholders. There is also a need for more public spending on low carbon development initiatives. Institutions need to be strengthened to respond and anticipate complexities and needs in low carbon space. Private sector should be engaged to fill in the financing & implementation gap for LCD. Ministry of Finance should actively monitor the usage of its fund flow towards various LCD activities. There should be a knowledge sharing platform to document lessons learnt at subnational level that can feed into national level policymaking and improve national policy scenario. Awareness about Carbonex and Greenex should be enhanced. These can also be extended to more companies. Market mechanisms such as RECs and ESCerts need to be strengthened. Need for clear policy and regulatory guidelines specifically targeted at addressing issues in low carbon development

projects as these are perceived to have higher risks is also there. Stepping up philanthropic resources in the environment sector also needs to be emphasized.

Dr. Rita Pandey flagged issues related to low carbon development in the context of climate change. She mentioned that enormous technological transformations at a fast pace is required to attain LCD that cuts across many sectors. She also highlighted that information flows across various institutions is very slow. According to her, with respect to the choice and design of policies and instruments, pricing of emissions is seen as an obvious and effective policy instrument to encourage innovation and deployment of low carbon energy.

She recommended that public sector needs to make investment and put policies in place to encourage private investment. She mentioned that compatibility among policy and regulatory instruments is also important and policies need to be predictable & stable to reduce the risk and uncertainty that investors and consumers face. She ended her talk by raising some pertinent questions such as:

- Should 'sustainability impact' be included in performance parameters of financial systems?
- What is the level of fiscal support to the financial systems which may have positive & negative impacts on environmental and equity outcomes?
- What is the case for and practice of different approaches to policy incentivized lending in addressing social and environmental outcomes?



Mr. Samuel Joseph presented what EXIM Bank has been doing with respect to financing for green and low carbon projects. EXIM Bank launched India's first dollar denominated Green Bonds early this year in March 2015 which offers investors the opportunity to participate in financing of 'green' projects that help mitigate climate change.

The key drivers that helped EXIM bank to consider a green bond issuance were rapid growth in the green bond market globally, prospect of real investor diversification and country's commitment to green projects in line. Mr Joseph flagged the issue that the green bond principles currently used are not specific to Indian conditions. There is a need to design India specific green bond principles.



Mr. Utkarsh Agrawal emphasised on S&P BSE sustainability indices and the role they play in promoting sustainable investment. He mentioned that benchmarks are needed to check the real profitability of sustainable investment. Sustainability indices can be viewed as one of the instrumental capital market solutions to hedge against environmental, social and governance (ESG) related risks. Growth of passive investments across all investment strategies supports interest towards sustainability indices.

S&P BSE launched Greenex, the first Indian sustainability index in February 2012. It selects top 25 companies from S&P BSE 100 with energy efficient practices and focuses on greenhouse gas emissions, float market capitalization and liquidity. S&P BSE also launched Carbonex – the second Indian sustainability index in November 2012. It is a composite index having allocation effect and focuses on strategy & governance (40%), reporting & disclosure (30%), performance & achievement (20%), and ecosystem actions (10%).

These indices are performing better than conventional indices in terms of volatility and returns, however, investors in India and globally are still keen to invest in them.



Mr. Avisek Bagchi focused on Small Industrial Development Bank of India (SIDBI) initiatives in financing investment Micro, Small and Medium Enterprises (MSME) sector for low carbon development. He emphasised on how MSMEs serve as the growth engine in India's development trajectory. MSMEs as backbone of the Indian economy, contribute about 8.72% of the GDP. There are about 29 million units operating across the country,

which account for about 45% of the manufacturing output and about 40% of the total exports.

He mentioned that India is the fourth largest energy consumer in the world. Almost half of the total energy consumption is accounted by the industrial sector in India. There are several challenges to attain energy efficiency in MSME sector. Out-dated technology levels and lack of access to modern technological solutions, absence of local service providers (LSPs) to sustain energy-efficient technologies and lack of access to global markets are some of the constraints that inhibit the growth of the sector. He iterated that SIDBI is focusing its efforts on lending schemes for energy efficiency, promoting cleaner production and environmental conservation projects in the MSME sector.



Prof. Damodaran concluded the session by mentioning that tax as revenue instrument needs to be explored at greater length. The carbon markets are not functioning well and the emission trading schemes, which used to work well, has now begun backloading. He highlighted that both India and China have undersold themselves in the carbon market. He praised the European Union for experimenting with raising taxes, taking out excess allowances from the carbon market.



He suggested that the green stimulus provided by countries in recent years should be looked at in correlation with how the countries' green indices have fared. He cited examples from other developed and developing countries on how they are using carbon tax regimes in their

own ways to promote low carbon development and stated that India should also learn from those examples.

3. Session II: Science, Technology & Innovation Policy for Low Carbon Development

Chair: Dr. Ashok Jain, Professor, EMPI Business School

Panelists:

- *Ms. Nisha Mendiratta, Director, Climate Change Programme, Department of Science and Technology*
- *Mr. Manish Anand, Fellow, TERI*
- *Mr. N. Srinivasan, Coordinator (Science, Technology and Innovation), Asian and Pacific Centre for Transfer of Technology*
- *Mr. Vijay Kumar Kaul, Professor, University of Delhi*

Ms. Nisha Mendiratta explained the role of science which is in discovery, providing technological solutions and creating affordable innovations. She provided an overview of the various policy initiatives of the Department of Science & Technology pertaining to low carbon development. One example was the Science, Technology and Innovation Policy of 2013.

She emphasized on the need for technology needs assessment for low carbon development. Mainstreaming of climate change concerns in STI system in India needs to be strengthened. In addition there is a need to build capacity for efficient use of funds.



Mr. Manish Anand explained the work done by TERI under the project. He pointed out that while there is policy emphasis on achieving inclusive growth, but challenges on how to achieve it remain. India needs to step up its spending on research and development to up to 2% of its GDP, which is currently 0.8% of its GDP. He quoted China's example in R&D spending, which stands at 1.85% of its GDP.

Data availability pertaining to R&D in low carbon technology is a challenge. Corporates have to engage more in R&D for low carbon development. In India a very good example of leapfrogging of technology is the development of wind energy sector due to the effort of a private company, Suzlon. This was made possible due the conducive environment - internal restructuring of Suzlon facilitated their entry into the wind sector in India and there was policy guidelines and support by the Government of India. The challenges in STI are how to transform from the linear path of development of R&D towards a pathway in which societal

concerns are incorporated. There is also a need for indigenous R&D and technology development.



Mr. N. Srinivasan stressed on the importance of technology. He was of the view that technology can play a crucial role in implementation of sustainable development goals. He also indicated that there is a push towards inclusion of society as part of the innovation ecosystem. But the push also requires political commitment and according to him, innovation should be the mandate of all the ministries. Given the young workforce, low carbon development provides with opportunities to create enterprises and employment.

He opined that it is important to understand better how money and resources flow in STI systems. On low carbon development, he believed that there are certain low-hanging fruits that should be explored such as improving energy efficiency, attention to improving the conventional highly polluting brick kilns, adoption of low carbon urban transport system, exploring opportunities for issuing more green bonds and increased attention to bio-economy.



Prof. Vijay Kumar Kaul pointed out the need for transitioning to a low carbon innovation ecosystem. He talked about the three drivers of change as resource efficiency, investing in infrastructure, and stimulating innovation. He regarded the work of Schumpeter regarding creative destruction and economic growth as relevant in the modern times. He also suggested two ways to increase economic growth: innovation in product process and producing same output with lesser input.

He mentioned that transformative innovation is required in material sciences, digitisation and life sciences. He was of the opinion that governments have to be the key players in moving towards low carbon development trajectory, while incentives need to be created for markets to play an important role.



Prof Ashok Jain as the chair of the panel discussion made the concluding remarks. He said apart from technology innovation, diffusion of technology is equally important. There has to be adopters for the technology. Technology should also lead to local employment generation, which happened with the advancement in solar technology in China. Difficulties in supply chain need to be tackled for promotion and diffusion of technology.

He advocated that organization or systemic innovation is important. There are also many difficulties to overcome in supply chains. Organisation or system innovation is important. NGOs could play significant role in providing local solutions in a country like India. We also need to understand that investment in R&D is not the same as investment in innovation.



4. Session III: Sub-national Policies for Low Carbon Development

Chair: Prodipto Ghosh, Distinguished Fellow, TERI

Panelists:

- *Mr. Ajay Kumar Lal, Director, Department of Environment, Science and Technology, Government of Himachal Pradesh*
- *Mr. Satnam Singh Ladhar, Additional Director (Environment), Punjab State Council for Science & Technology, Government of Punjab*
- *Dr. (Mrs.) Parveen Dhamija, Director, Ministry of New & Renewable Energy, Delhi Government*
- *Ms. Anu Jogesh, Policy and Governance Lead, Acclimatise India*
- *Ms. Nimisha Pandey, Fellow, TERI*

Ms. Anu Joseph pointed out the issues in implementation of State Action Plans on Climate Change based on her experience of the study of SAPCCs of five states. She pondered over how are SAPCCs are placed in climate proofing development in the Indian states and how can they be built into India's narrative on its climate contribution globally. She mentioned that while 32 states and UTs have their SAPCCs in place, but they are not reflective of the whole climate action. There is mismatch between money required and fund allocated for these plans.

She believed that the climate action plans are more of sustainable development plans as there is no precedence for approaching climate plans. SAPCCs don't really look at what climate stressors can do to current development trajectories and they are inadequately rooted in relevant scientific knowledge.

There is need for more cross-consultation between and within states. SAPCCs need to be considered from the angle of incorporating environmental sustainability into development projects and not just implementation of individual projects.



Mr. Satnam Singh Ladhar was of the view that SAPCC has been instrumental for the states to streamline their activities towards climate change mitigation. Punjab, in particular has divided its plan into 8 sub-missions in line with the NAPCC. He portrayed Punjab's efforts in fulfilling its state action plan.

The Punjab Preservation of Sub-Soil Water Act, 2009 has led to improvement in groundwater situation in the state. One action point under this policy is that paddy can't be transplanted before 15th June into the fields. This has led to improvement in water levels over the years. He described state's effort to curb the menace of excessive paddy straw (which usually gets burned on farms itself) and pointed out that biomass based power plants are being used to generate power from some of this paddy straw. The state is also focusing on diversification of crops and aims to bring 12 lakh hectares of crops out of paddy cultivation.

Punjab has also been adjudged as the best state in solar policy and its implementation. From 9 MW in 2012, the state wishes to generate 206 MW in 2015 and 4500 MW by 2022. The state also plans to generate bio-ethanol from paddy straw. He indicated Punjab's plan to increase its forest area to up to 15% of the total land area by 2022. It has been estimated that from agriculture, commercial, domestic, municipalities, MSME and industrial segments, the estimated savings in electricity consumption is 7241.62 million units and the likely reduction in CO₂ is 6.01 million tonnes.



Mr. Ajay Kumar Lal talked about the efforts being made by Himachal Pradesh to achieve low carbon development. He mentioned state's effort to enforce a complete ban on use of non-biodegradable carry bags and the experience in enforcing it. He also shared that the state is first in India and probably in the world as well to adopt a policy on Payment of Ecosystem Services. They are also the first state to prepare a detailed 'Green House Gas Emissions Inventory'.

Like some other states, Himachal Pradesh has an advanced Aryabhata geo-informatics & Space Application Centre (AGiSAC) for decentralized planning and decision-making and is now able to monitor climate related changes, vulnerability, risks and hazards assessments. The state is also exploring options for Green Road Technologies to build roads wherein plastic waste is mixed with bitumen. The state of Himachal Pradesh has also implemented the first successful bio-CDM project in Asia for which the state has also received the first tranche of payment from the government of Spain. The project has over the first crediting period of 20-years raised INR 20 crores. These funds can be utilized for the development of communities in villages of Himachal Pradesh who raised multiple forest plantations on degraded public land in the mid and high hills.



Mr. Lal also stressed on the need to overcome a lot of issues that the state faces in implementing its initiatives including inadequate institutional support, economic and environmental conflict, economic resource constraints and lack of incentives among others.

Dr. Parveen Dhamija spoke about the huge potential (900 GW) for renewable energy in India. Talking about the Delhi State Action Plan for Climate Change, she mentioned that under the solar mission, all hotels had to mandatorily put up solar water heaters. Even houses with area above certain value were encouraged to do so. She believed that solar rooftops installed over Delhi metro stations have been very successful and should be emulated. A lot of greening of the city during the Commonwealth Games took place under the state climate action plan. It also led to closing of several inefficient coal-based power plants. 20 implementing departments were identified to fulfil 65 different action points.



She also mentioned some of the schemes of the MNRE, such as Solar Cities and Solar parks, towards promoting renewable energy in India. Solar cities are also supposed to be getting 10% of their energy from renewable energy. 1000 solar parks are also coming up in the country. She focused on the ministry's several initiatives to meet the target of meeting 175 GW of renewable energy by 2020 associated with solar, wind, small hydro and biomass-based power. She is associated with the Unnat Chulha Abhiyaan (improved cookstoves) which aims to minimize indoor air pollution and reach up to the levels of WHO standards.

She also indicated the challenges faced in form of maintaining low cost and outreach to people.

Dr. Prodipto Ghosh as the Chairperson of the discussion indicated that many positive experiments on low carbon development have been undertaken by the states in India even with funding constraints. While NAPCC has been instrumental in setting the national policy framework, SAPCCs have been instrumental in initiating mainstreaming of climate considerations in state policy.

Replying to a question, he mentioned that with scaling up of renewable energy project, tariffs are decreasing and it might even reach to grid parity levels in a few years. He indicated that the objective of the NAPCC and other policy documents is not just to meet targets for renewable energy but its intention has also been that while moving towards this target, a large market shall open up leading to accomplishment of grid parity.









