



## Workshop Proceedings Report

# Fast-tracking Sustainable Energy Solutions for Human Development

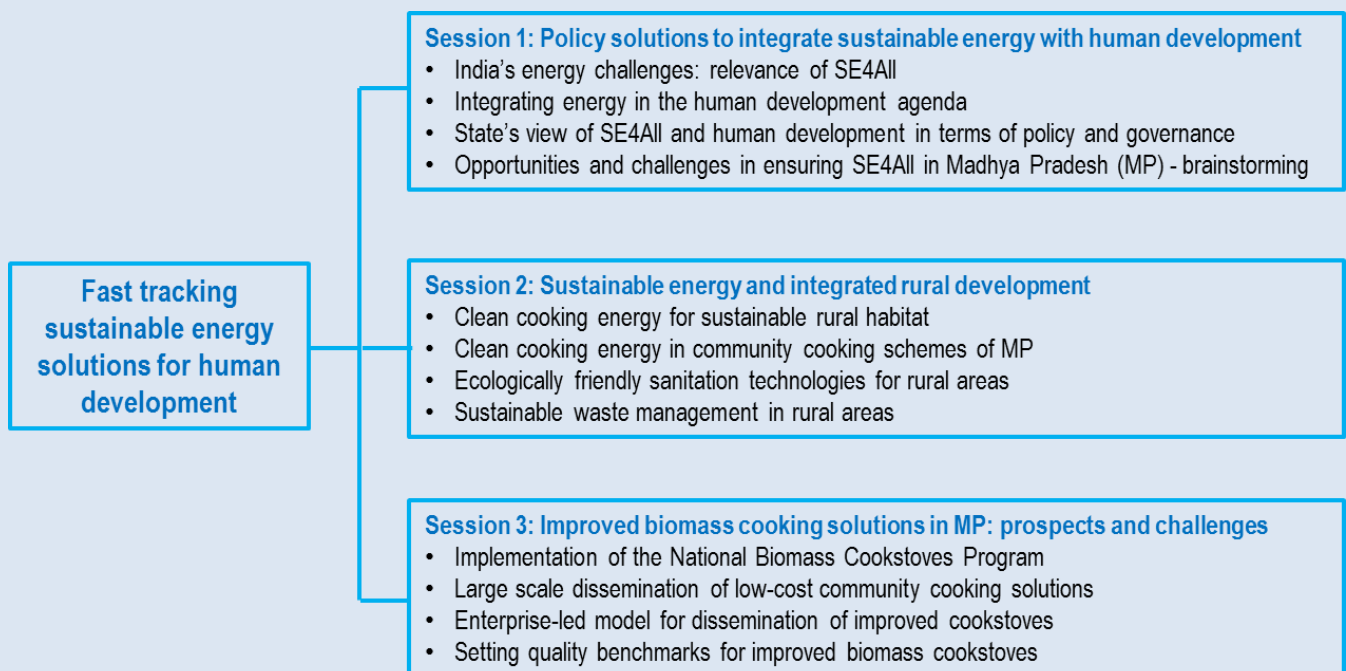
Hotel Courtyard Marriott, Bhopal

December 17, 2014

## Workshop Summary

Achieving Sustainable Energy for all (SE4ALL) is one of the fundamental needs for attaining the development goals while ensuring economic growth and safeguarding the environment. Access to energy is a necessary precondition to achieving many development goals that extend far beyond the energy sector – eradicating poverty, increasing food production, providing clean water, improving public health, enhancing education, creating economic opportunity, and empowering women (UN, 2012). Despite this, the ground realities are starkly different. Around 1.3 billion people worldwide lack access to electricity, while 2.8 billion people do not have clean and safe cooking facilities, implying that billions of people are exposed to harmful smoke and emissions on a daily basis.

In this backdrop, The Energy and Resources Institute (TERI), under the auspices of its SE4ALL capacity building hub, in collaboration with the United Nations Development Program (UNDP) and Department for International Development, Government of UK (DfID), organized a series of workshops for senior government officials on the broad theme of Energy for Human Development. In Madhya Pradesh, a workshop was organized on December 17, 2014 under the specific theme of 'Fast-tracking Sustainable Energy Solutions for Human Development'. The workshop was attended by 75 senior & mid-level government officials and subject matter experts from TERI. A comprehensive structure of the workshop is graphically depicted below.



# Key Speakers and Presentations

## Dr. Leena Srivastava, Vice-chancellor, TERI University & Executive Director, TERI

Dr. Srivastava opened her welcome address by observing that in spite of no direct reference to energy in the Millennium Development Goals, it forms a subtext of other development goals as an 'enabler'. However, over time, the direct link of energy with human development has been recognized, with stress being laid on 'energy access' and 'energy efficiency' targets for 2030. With this background, TERI has initiated efforts to initiate online training programmes for diverse stakeholders in the energy value chain, recognizing their specific needs and individual capacity needs. Dr. Srivastava appreciated the



**“Fueling the increase in energy consumption from fossil fuels will threaten the energy security of the nation”**

efforts of the Government of Madhya Pradesh in tackling energy access and climate change with an integrated strategy. To set a broader policy agenda, Dr. Srivastava mentioned the intention of the central government to set up 100,000 MW installed capacity of solar power in the coming 5 years. Over and above this, 40,000 MW of solar roof top systems will also be installed. As the targets set for the nation are enormous, and sought to be achieved in a short window of time, it becomes significant to ensure that all stakeholders in the energy value chain have the requisite resources and capacities to address the challenges in implementation. Dr. Srivastava presented a snapshot of India's current energy usage, and projections of energy consumption in the coming years. Further, various alternative energy pathways were mentioned, and their implications were discussed. Considering that the primary source of India's energy production is from fossil fuels, a large percentage of which is imported. This makes it important that India actively considers alternative energy pathways, through greater infusion of renewable energy in the national energy production. Dr. Srivastava mentioned that enhancing energy efficiency also has potential in addressing the demand side pressures of the energy economy. However, on the residential side, one of the greatest challenges continues to be the use of biomass for cooking, which is very prevalent in both rural and urban India. This challenge, Dr. Srivastava observed, can be tackled only with better and socially acceptable technology, like improved biomass cookstoves. Overall, the challenge of ensuring energy access to the poor must be dealt with holistically, as opposed to disintegrated approaches to find solutions.

## Anthony J C DeSa, Hon'ble Chief Secretary, Government of Madhya Pradesh

Mr. DeSa emphasized on the importance of energy for human development metaphorically by stating that the beginning of modern civilization was through the ability of man to light a fire at will. He acknowledged the fact that internationally, energy has so far been ignored, even though it is critical for human development. Madhya Pradesh has stressed on sustainable energy for its people through renewables, even though the state has been energy surplus since 2011. He mentioned that the state has nearly 4,500 MW of installed renewable energy capacity, of which 900 MW is from solar energy. The state hopes to achieve 6,000 MW renewable energy installed capacity by 2017. The state has made concerted efforts to create an environment

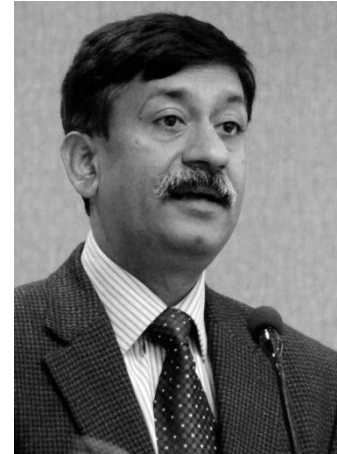


**“In spite of energy self-sufficiency, Madhya Pradesh has invested in clean energy projects as part of its commitment to clean and equitable development”**

conducive for renewable energy projects. For example, the state government has allowed renewable energy projects land at subsidized costs, much lower than the actual market value. Mr. DeSa noted that it is a plight of energy access policy that availability of electricity is considered synonymous to ‘energy access’, while a more comprehensive sense of the term encompassing cooking energy and energy for productive uses has not yet sunk in widely. The problem of inefficient cooking devices poses a massive impediment to energy access, as it has health, climate and economic implications on the rural poor. It is also directly connected to natural resources management in a state like Madhya Pradesh, which has high forest area and abundant biomass availability. The state has recently initiated the process of ‘feeder-separation’ of domestic and agricultural power lines, which has permitted the state to achieve greater equity in electricity distribution and use. It has also been recognized that access to energy has strong linkages with education, health and overall rural prosperity. In this regard, the state is attempting to find solutions to make clean energy affordable to the deprived sections of the rural society. Mr. DeSa hoped that the workshop would help in identifying a few key areas where policy interventions could be made for enhancing energy access. He listed some policy initiatives of the government in the state to promote training, marketing and capital formation of micro-enterprises and individual entrepreneurs, like *Mukhyamantri Arthik Sahayta Yojana*, *Mukhyamantri Swarozgar Yojana* and *Mukhyamantri Yuva Udhyami Yojana*.

## I. H. Rehman, Director, Social Transformation Division, TERI

Mr. I. H. Rehman gave three presentations on the day, on the themes of energy access, integrating energy with human development and improved cooking technology. Mr. Rehman stressed on how the meaning of 'energy access' should be broadened to include energy for productive uses, cooking energy and energy for recreational purposes. Under the common goal of Sustainable Energy for All, TERI has worked at both the policy and implementation levels. He explained how TERI's work in the rural areas on clean energy access has been hinged on interventions in the sectors of agriculture, health, education and livelihoods. For



instance, TERI has worked on cold chain for vaccines and reliable energy for Primary Health Centers, demonstrating a clear linkage between energy and diverse sectors including health. Even while Madhya Pradesh has been a good performer in terms of availability of energy, affordability of clean energy across the country still needs to be worked on. While LPG is a clean cooking fuel, its availability in rural areas, and affordability for rural households is low, significantly reducing its potential as an acceptable alternative to traditional biomass stoves. In its projects, TERI strives to address all dimensions of energy access. Further, TERI has integrated robust and advanced monitoring mechanisms to minimize leakage of resources and maximize efficiency. Better monitoring helps project implementers to customize the technology to suit the requirements of intended beneficiaries. In most of its projects in Madhya Pradesh, TERI has attempted to adopt a market-driven approach for better project sustainability through the creation of Energy Enterprises. In course of the project, forward and backward linkages of these enterprises with actors along the supply chain are strengthened (including financial institutions) for creating a viable business ecosystem. However, policy interventions required in provision of finance and tax subvention for clean energy markets, to make business attractive and viable. Mr. Rehman also sought the intervention of the Government to support the training youth as technicians and entrepreneurs to create a cadre of rural energy champions in the state. In the afternoon session, Mr. Rehman stressed on the importance of ensuring quality standards in the dissemination of clean cookstoves. He spoke on the reasons of failure of past cookstoves program, and what lessons can be learnt from them. He shared the experience of TERI in performance testing and dissemination of improved cookstoves, and emphasized on the need to make cookstoves programs more adoption-centric, than dissemination-centric.

---

**“The definition of energy access must broaden, to include reliable and affordable energy for consumptive and productive purposes”**

---

## **S R Mohanty, Principal Secretary, Departments of Education and Renewable Energy, Government of Madhya Pradesh**

Mr. Mohanty charted the growth story of the renewable energy sector in Madhya Pradesh, since the formation of the separate Renewable Energy Department, carved out of the Energy Department of the state. From 350 MW of solar power in 2009, the state's solar power installed capacity has ballooned to 2 GW in six years. Currently, there are 2,500 solar energy projects in the state, including the country's largest solar power plant in Neemuch. An ultra-mega solar power plant is being set up in Rewa, which will be the first in the country, and the largest in the world.



The backbone of the state's growth story in renewable energy is due to participatory policy planning, transparency in policy and minimum intervention of the government in project implementation. The state's renewable energy action plan was drafted with active involvement of industrialists, banks, investors and the general public. Once the policy was in place, the department focused on removing 'irritants' in the policy to make the state's policy environment attractive for investors. Three focus areas were selected: (a) relaxing the environmental impact assessment guidelines for renewable energy projects, (b) minimizing land and technical inspections by government functionaries and (c) easing the regulations for allotment of land for large projects. The state has not ignored the need for concerted interventions in decentralized and off-grid solutions for rural areas. The Urja Vikas Nigam has created a cadre of rural entrepreneurs and technicians at the block-level through Akshay Urja shops, who are given financial support, and need-based trainings on business and technology related aspects. The state government looks forward to active contribution by agencies like TERI in identifying potential sectors of business opportunity for these entrepreneurs, and charting out a plan of action based on contextual conditions. The state government plans to take the Akshay Urja programme forward by setting up integrated Common Facilitation Centers (CFC) in every district. The CFCs will be a nodal center for integrating renewable energy with various sectors like agriculture, fuel processing and training of entrepreneurs. The state government is open to piloting more innovative projects for linking renewable energy with rural development, in association with organisations like TERI. With regard to urban areas, the state government is developing 'renewable cities', where the share of solar and wind energy in domestic energy provision and energy for public facility will be

---

**“The success story of MP's renewable energy transformation is pivoted on participatory planning and transparency in government programs”**

---

between 50-60%. Gwalior has been chosen as the first city for implementation of this project.

### **N. Vasudevan, Senior Fellow, Industrial Energy Efficiency**

MSME is an important sub-sector in the industry sector in Madhya Pradesh. There are a number of MSME clusters located across the state. There is lack of reliable energy related data on MSME clusters in the state. Such data and information would help in decision making process and initiate actions/ develop programs/schemes for energy efficiency improvements of MSME clusters. Some of the activities that can be initiated in MSME sub-sector in Madhya Pradesh in close coordination with the industry



department include the following: (a) short-listing of energy intensive MSME clusters for further analysis, (b) collection of energy consumption data and analysis of energy performance of selected clusters, (c) present technology status and profile, (d) identification of energy saving potential and options for energy saving, (e) preparation of cluster specific manuals that would help the state government to initiate actions.

### **Dr S. K. Sarkar, Distinguished Fellow, TERI**

Dr. Sarkar shared his experience with bottom-up energy planning in West Bengal, involving the village community and panchayati raj institutions. He felt that unless energy planning is devolved and decentralized, understanding the needs, priorities and concerns of the rural populace will be challenging. Dr. Sarkar also pointed out that various sectors where government action can directly influence clean energy provisioning for human development. He gave the example



of health and transport sectors, where many state governments have shown examples of how energy, economic development and social welfare can be woven together. Dr. Sarkar moderated two interactive sessions on the day, where he urged government officials to identify specific sectors where they thought lack of energy services inhibited optimum performance. At the end of the interactive sessions, Dr. Sarkar collated the feedback, interjections, suggestions and questions of the participants and set the tone for sector-specific discussions which were conducted subsequently.

# Background Presentations



**Dr. Suneel Pandey, Associate Director, TERI**

Dr. Pandey made a presentation of innovative, low-cost and community-led solutions for solid-waste management in urban and rural areas. Citing the example of a pilot project in Haryana, Dr. Pandey demonstrated how site-specific technology like biomass gasifiers can be used to convert waste into useful products or services like energy and manure.

**Col Rakesh Johri, Senior Fellow, TERI**

Col Johri presented a variety of sanitation models that are fit for implementation in the villages of Madhya Pradesh, along with their cost (capital and operating) implications. He introduced the novel technology of 'bio-toilets' which can be used effectively for community sanitation interventions. Col Johri stressed on the need for intensive end-user trainings and capacity building of field implementation staff.



**Bhuvnesh Patel, Chief Engineer, MP Urja Vikas Nigam (MPUVN)**

Mr. Patel spoke about the experience of MPUVN in past improved cookstove projects and the reasons for their failure in the state. He invited TERI professionals to partner with MPUVN for performance testing, pilot demonstration and project monitoring of the National Biomass Cookstoves Initiative in Madhya Pradesh. Mr. Patel also shared MPUVN's action plan for training of Akshya Urja entrepreneurs at the district level.



**S. Arun, Associate Fellow, TERI**

Mr. Arun's presentation focused on the evolution of improved cookstoves programmes in India, and the rationale and focus of TERI's improved cookstoves program. He discussed details of some cookstove models developed by TERI. Further, he elaborated on the method of implementation of TERI's cookstove dissemination program in Madhya Pradesh through a network of entrepreneurs, government agencies, NGOs and financial institutions.



**Mradul Khare, Executive Engineer, MPUVN**

Mr. Khare spoke briefly on off-grid and decentralized energy solutions being implemented by MPUVN under the state's renewable energy policy. He presented an analysis of the prospects and consequences of grid connected solar systems and off-grid solar systems. He stressed on the importance of encouraging private ownership and management of off-grid solar systems.





# Discussions and Key Outcomes



## Theme 1: Policy solutions to integrate sustainable energy with human development

Discussion theme	Key outcomes
<b>Building capacities of Akshay Urja entrepreneurs</b>	<ul style="list-style-type: none"><li>• A detailed training needs assessment exercise of Akshay Urja entrepreneurs is currently being carried out by MPUVN. Based on the findings of this assessment, TERI will identify Akshay Urja entrepreneurs and enlisted technicians in each district for advanced trainings. The training content and delivery modes will be designed by TERI professionals</li><li>• TERI will make efforts to build the internal capacities of selected Akshay Urja entrepreneurs through (a) periodical trainings, (b) providing technical support, and (c) provision of finance. While some of the Akshay Urja shops will be integrated as a part of the TERI-DfID clean energy program, government schemes like the <i>Mukhyamantri Yuva Udhyami Yojana</i>, <i>Mukhyamantri Arthik Sahayta Yojana</i> and <i>Mukhyamantri Swarozgar Yojana</i> will be utilized for providing capital support to these entrepreneurs.</li><li>• Forward and backward market linkages were recognized as essential for establishing a robust and self-sustaining clean energy market in Madhya Pradesh.</li></ul>

For this, TERI professionals will engage with multiple stakeholders in the local value chain and attempt to establish forward and backward market linkages for Akshay Urja entrepreneurs on a case-to-case basis, depending on the local situation and business environment in the district.

### **Setting up pilot Common Facilitation Centres in selected districts**

- Taking forward TERI's past work on INSTEP and Energy Enterprises, TERI will provide technical and knowledge support to the Department of Renewable Energy (Govt. of MP) for setting up pilot Common Facilitation Centres (CFCs) in two districts of Madhya Pradesh.
- TERI will explore local business opportunities and conduct a demand analysis in these districts to develop a business model for CFCs and a bouquet of services that can be offered at CFCs.

### **Promoting a conducive business environment for clean energy products**

- It was recognized that the present taxation regime was unsupportive of renewable energy markets. For eliminating this hurdle to market development, TERI will submit a detailed proposal to the Chief Secretary's office for reduction/subvention of taxes (VAT) in renewable energy products including domestic solar systems and improved biomass cookstoves
- TERI will work with the Government to identify government schemes whereby training, branding and marketing (product promotion) support can be provided to clean energy entrepreneurs for setting up micro-enterprises

### **Exploring sectoral linkages of clean energy with provision of health services**

- TERI & the National Health Mission will work on a collaborative project to study the impact of clean cookstoves dissemination on reduction of pneumonia incidence among the 'under-5' population of selected districts. The pilot project will be initiated at Satna
- NHM will seek TERI's support in involving ASHA workers in awareness generation and possibly, dissemination of improved cookstoves in rural households
- Department of Health invited proposals from TERI for setting up solar power stations at Primary Health Centres for providing uninterrupted power supply for operating essential

medical equipment

- TERI will explore opportunities for developing clean energy projects in the sectors of access to clean drinking water and setting up cold-chains for vaccine distribution

### **Developing online programs/modules for training on clean energy**

- TERI University and the Department of Tribal Welfare will work in collaboration to launch online certificate courses for tribal youth to develop vocational skills in the renewable energy sector
- Training modules developed under the SE4All initiative by TERI will be widely disseminated among the small entrepreneurs and technicians in Madhya Pradesh with assistance from the MPUVN

### **Integrating gender priorities with clean energy dissemination**

- It was felt that village women were still being considered only as primary consumers of clean energy products, and not as 'producers' or 'entrepreneurs'. TERI will work with Tejaswini project staff in Dewas, Chhattarpur and Panna districts to replicate the Producer Company model of cookstoves manufacturing and sale with Self Help Group federations

## **Theme 2: Sustainable energy and integrated rural development**

### **Discussion theme**

### **Key outcomes**

#### **Community cooking solutions**

- TERI will develop some pilot/demonstration sites in schools and hostels near Bhopal for a various community cookstove options
- After visits to the pilot site, TERI will submit a detailed proposal to the Secretary, Department of Tribal Welfare to install community cookstoves in 89 hostels for tribal students in the state
- TERI will discuss with the Additional Chief Secretary (Rural Development) about

the possibility of inclusion of medium-sized cookstoves in the Mid-day meal programme

**Waste-to-energy projects in rural areas**

- It was felt that there needs to be wider dissemination of information about waste-to-energy projects among policy makers in Madhya Pradesh. TERI will share some of its publications/reports on waste-to-energy projects with key government functionaries
- A scoping exercise will be undertaken in selected districts to assess the potential of implementing a community-led waste-to-energy project in Madhya Pradesh

**Environmentally friendly sanitation technologies for rural areas under the Swachh Bharat Mission (SBM)**

- SBM officials in the state were eager to test the effectiveness of 'bio-toilet' technology for schools. TERI will provide contacts of approved suppliers to sanitation officials in Madhya Pradesh. Further, TERI will try to directly link the Department of Public Health Engineering with DRDO for transfer of technology of bio-toilets for field implementation
- TERI professionals will work out detailed cost implications of setting up bio-toilets in rural areas, particularly in community sanitation projects in schools and health centres

### **Theme 3: Improved biomass cooking solutions in Madhya Pradesh: prospects and challenges**

**Discussion theme**

**Key outcomes**

**Performance standards of improved cookstoves**

- TERI will help MPUVN formulate performance benchmarks and guidelines for forced-draft cookstoves for dissemination under the National Biomass Cookstoves Program in Madhya Pradesh

**Knowledge support to  
implementation of National  
Biomass Cookstoves Program**

- TERI staff will take MPUVN officials to dissemination sites of TERI's cookstoves program, to gauge end-users' perceptions about improved cooking technology
- TERI will provide inputs to MPUVN to make the field implementation of NBCI more entrepreneur-driven, than a top-down implementation approach by the State Nodal Agency
- TERI will assist MPUVN to develop a local performance-testing facility for improved cookstoves in the state

# List of Participants

No.	Name	Designation	Organisation
1	Mr. B. R. Naidu	Principal Secretary	Department of Tribal Welfare
2	Mr. V. K. Sonakia	Joint Director	Department of Industries
3	Dr. Sandhay Vyas	Joint Director	Women and Child Development Department
4	Mr. Neeraj Agrawal	Deputy secretary	Department Energy
5	Mr. Faiz Kidawai	Managing Director	National Health Mission
6	Mr. V. Pradeep	Section Engineer	Water Resources Department
7	Dr. Raihna gupta	Secretary	Women and Child Development
8	Mr. I. C. P. Kesri	Principal Secretary	Department of Energy
9	Mr. Anup Garg	Additional Engineer	Madhya Pradesh Urja Vikas Nigam
10	Mrs. Jyoti Shrivastav	Director	Women and Child Development
11	Mrs. Vandana Chatterjee	Add. Engineer	Madhya Pradesh Urja Vikas Nigam
12	Mr. Neelesh Nema	Add. Engineer	Madhya Pradesh Urja Vikas Nigam
13	Mr. O. P. Sharma	Add. Engineer	Madhya Pradesh Urja Vikas Nigam
14	Mr. G. S. Khanooja	Deputy GM	M.P.Power Generation Company Limited
15	Mr. G. S. Damor	General Manager	Madhya Pradesh Public Health Engineering Department
16	Mr. U. K Sadhav	Add. Director	Urban Administration & Development Department
17	Mr. N. P. Malvia	GM	Madhya Pradesh Jal Nigam
18	Mr. Ajay K Shukla	Executive Engineer	Madhya Pradesh New & Renewable Energy Department
19	Mr. Mridul Khare	Executive Engineer	Madhya Pradesh New & Renewable Energy Department
20	Mr. Himanshu Joshi	Executive Engineer	Madhya Pradesh New & Renewable Energy Department
21	Mr. Avneesh Shukla	Executive Engineer	Madhya Pradesh New & Renewable Energy Department
22	Mr. Radha Raman Tripathi	Executive Engineer	Madhya Pradesh New & Renewable Energy Department
23	Mr. Anil Mishra	Executive Engineer	Madhya Pradesh New & Renewable Energy Department
24	Mr. Naquijohan Qureshi	District Project Officer	Women and Child Development
25	Mr. Hymanathi Varman	Special Purpose officer	Panchayat & Rural Development Department
26	Mr. I U Khan	Executive Engineer	Madhya Pradesh Urja Vikas Nigam
27	Mr. B. K. Patel	Chief Engineer	Madhya Pradesh Urja Vikas Nigam
28	Mr. Vijay Biloriya	Secretary	Madhya Pradesh New & Renewable Energy Department
29	Mss. Aditi Deshmukh	Joint Secretary	Madhya Pradesh New & Renewable Energy Department
30	Mr. Mohit Kathel	Secretary	Madhya Pradesh New & Renewable Energy Department
31	Mr. Sanjay Verma	Additional Secretary	Madhya Pradesh Urja Vikas Nigam
32	Mr. S. Deshmukh	Deputy Director	Madhya Pradesh Urja Vikas Nigam

33	Mr. Bhavesh Agrawal	CEO	Madhya Pradesh Rural Engineering Services
34	Mr. M. L. Gupta	Secretary	Madhya Pradesh Rural Engineering Services
35	Mr. Sanjay Nema	Chief Manager	National Health Mission
36	Mr. S. R. Mohanti	Add. Chief Secretary	School & Education Department
37	Mr. Anthony De Sa	Chief Secretary	Madhya Pradesh
38	Mr. Sandeep Yadav	Director	Budget Dept.
39	Mr. B. K. Thakur	Director	Panchayat & Rural Development Department
40	Mr. Sandeep Saran	Director	Madhya Pradesh Urja Vikas Nigam
41	Dr. Veena Ghanokar	Secretary	Tribal Welfare
42	Mr. Nageshwar Patidar	Director	Panchayat & Rural Development Department
43	Mr. Ajit Tiwari	Special Purpose Officer	Panchayat & Rural Development Department
44	Mr. Ravindra Pare	Officer of Special Duty	Panchayat & Rural Development Department
45	Mr. S. K. Singh	J.C. SBM	Panchayat & Rural Development Department
46	Mr. Sudhir Jain	D.C. SBM	Panchayat & Rural Development Department
47	Mr. Rajesh Sharma	Field Officer	NCT Chhindawara
48	Mr. Mohanish Pal	Supervisor	NCT Chhindawara
49	Mr. Deepak Budholia	Entrepreneur	Global Care Foundation
50	Mrs. Ekta Budholia	Entrepreneur	Global Care Foundation
51	Mr. Sudarshan K Soni	Public Relations Officer	Panchayat & Rural Development Department
52	Mr. Shishir Soni	Deputy Secretary	Public Health Engineering
53	Mr. Vijay Kasrekar	Manager	Shriram Deo. Comp
54	Mrs. Nidhi Pande	Entrepreneur	Producer Company
55	Dr Leena Srivastava	Executive Director	TERI
56	Dr S K Sarkar	Distinguished Fellow	TERI
57	Mr. I H Rehman	Director	TERI
58	Dr Suneel Pandey	Associate Director	TERI
59	Col Rakesh Johri	Senior fellow	TERI
60	Mr. N Vasudevan	Senior Fellow	TERI
61	Mr. Vivek Jha	Fellow	TERI
62	Mr. Upinder Dhingra	Associate Fellow	TERI
63	Mr. S. Arun	Associate Fellow	TERI
64	Mr. Dhananjay Barlinge	Research Associate	TERI