2018 marked an important milestone for Shakti—we ushered in our tenth year.

During this time, we have been privileged to work on many important issues—from the transformation in renewable energy to innovation in sustainable urban planning and robust energy efficiency interventions.

Key Highlights:
- India releases Draft Cooling Action Plan
- The Clean Energy Lab is cultivating CSOs in India’s clean energy Ecosystem
- Closing the data gap on air quality
- Sikkim to get GHG Inventory and MRV System
- Launch of the Distribution Utilities Forum
- Putting a Price on Carbon: A Guide for Indian Businesses
- Roadmap for the electrification of bus fleets in Indian cities
Shakti Sustainable Energy Foundation seeks to facilitate India’s transition to a sustainable energy future by aiding the design and implementation of policies in the following sectors: clean power, energy efficiency, sustainable urban transport, climate policy and clean energy finance.
Dear friends,

Shakti was set up in 2009 as a first-time endeavour by the philanthropic community to foster policy research in clean energy and climate change mitigation. 2018-2019 marks the start of our tenth year of existence, continuing our critical pursuit of a clean and secure energy future for all of India’s citizens.

From the very beginning, Shakti has occupied a unique niche, supporting and advancing policy solutions to tackle a broad array of sustainability and climate challenges, and being seen as a trusted partner in this endeavour. Over the years Shakti, its team and its programs have evolved and grown to reflect emerging realities and opportunities. This growth has been made possible by continued support from the initial core funders as well as new donors keen to support India’s clean energy transition. This support has enabled us to broaden and deepen the grantee partner network needed for the execution of our program objectives and to strengthen the civil society sector.

Shakti has also played a key role in convening diverse and relevant stakeholders to build a systemic and aligned understanding of clean energy pathways.

The first quarter of 2019 has seen several significant and positive policy announcements by the Government in areas that we work on. These include the National Clean Air Action Plan, the India Cooling Action Plan, the second phase of FAME (Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles), a major boost to investment in the residential rooftop solar sector and further investment in KUSUM, the solar irrigation pump program. The Government has also announced financial support to help thermal power plants make investments necessary to meet emission standards and help address the growing problem of air quality.

While the objectives of the Saubhagyा program for full household connectivity are close to being met, much still needs to be done to ensure the reliable supply of electricity from the distribution companies to connected households. Under the Ujala program, over 340 mmm LED light bulbs have been distributed. The scheduled introduction of BS VI fuel standards in 2020, the narrowing difference in price between diesel and petrol, and the ban on diesel cars vehicles over 10 years old in the NCR region are resulting in a fall in the percentage of new diesel car sales.

Today, the impact of our work can be seen through concrete results such as advancing higher fuel quality standards for vehicles, mainstreaming decentralized renewable energy (DRE) solutions at the state level, supporting development of the national cooling efficiency policy, initiating work on implementing power plants emission standards, establishing low-cost air quality sensor networks, starting clean air city action plans, and successfully launching a CSO incubator.

I am pleased to share with you EnergyMatters 2018, a compilation of the issues of our monthly newsletter, outlining some of our efforts.

I would like to express my thanks to our staff, Board, funders, and partners who together make our work happen.

Sincerely,
Krishan Dhawan
Chief Executive Office
Shakti Sustainable Energy Foundation
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Second Distribution Utilities Forum Meeting Looks at the Impact of Rural Electrification on Discoms

Following its successful launch in May 2018, the Shakti-supported Distribution Utilities Forum held its second meeting on 31st October 2018. The Forum brought together senior management of more than a dozen electricity distribution companies (discoms) on a common platform to discuss their experience of implementing rural electrification programs and the financial and operational implications of doing so. This theme was selected based on recommendations of the Forum’s launch meeting.

Mr. Gireesh Pradhan, former Chairman of the Central Electricity Regulatory Commission, chaired the meeting and set the context for the discussion. Dr. Ajay Mathur, Director General of The Energy and Resources Institute (TERI), provided the opening remarks. Forum participants spoke about the challenges they faced while implementing last-mile connectivity programs in rural areas and how they addressed these challenges.

Jaipur Vidyut Vitran Nigam Limited and Odisha Power Transmission Corporation Limited presented their experience of implementing the Saubhagya scheme while Maharashtra State Electricity Distribution Company Limited and West Bengal State Electricity Distribution Company Limited shared best practices on the subject.

TERI functions as the secretariat for the Forum. For more information about the Forum, download the Forum’s brochure.
Shakti Supports the Global Cooling Prize Launch for Breakthrough Innovations in Cooling Technology

On 12th November 2018, Shri Harsh Vardhan, Union Minister for Environment, Forest and Climate Change, inaugurated the Global Cooling Prize in New Delhi, an innovative challenge that aims to spur the development of a residential cooling solution that has at least five times lesser climate impact than today’s standard solutions. By harnessing the power of innovation, the prize is intended to find sustainable cooling solutions to address the growing challenge of climate change. Shakti co-sponsored the launch in collaboration with a global coalition of partners.

The Prize is led by Mission Innovation, the Government of India through the Department of Science and Technology (DST) and its partner organizations, the Ministry of Power, Bureau of Energy Efficiency, and Ministry of Environment, Forests and Climate Change. It will be administered by a coalition of leading research institutes—Rocky Mountain Institute (RMI), Conservation X Labs, the Alliance for an Energy Efficient Economy (AEE), and CEPT University.

The coalition will drive and support incubation, commercialization, and ultimately mass adoption of the breakthrough technology, starting in India and expanding to other countries.

Speaking at the launch, Mr. John Loughhead, Vice-Chair of the Mission Innovation Steering Committee and Mr. Iain Campbell, Senior Fellow at Rocky Mountain Institute lauded the effort. In addition, Shakti’s CEO, Mr. Krishan Dhawan was part of the panel discussion on ‘Scaling and Financing Breakthrough Innovation on Cooling.’
On 21st November 2018, the Shakti-supported Access to Clean Cooking Energy and Electricity: Survey of States (ACCESS) 2018, with results from the second phase of the ACCESS survey, was launched in New Delhi. The survey, undertaken by the Council on Energy, Environment and Water (CEEW), is India’s largest energy access survey covering more than 50 districts, 750 villages over 9,000 households in Bihar, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal—six of the most energy-deprived states in the country.

The first phase of the survey, released in 2015, highlighted the need to look at affordability and supply-side bottlenecks to address the energy access challenge in India. In the years following this survey, the government has made concerted efforts to close the energy gap at the national level and the state level. The 2018 survey revisits the households to understand the changes in their energy access situation over the last three years, and to study the impact of government policies during this period. Its analysis and findings provide a multidimensional view of the nuances associated with electricity access and clean cooking such as the duration of supply, quality, reliability, affordability, availability and health and safety.

The report was launched by Shri Dharmendra Pradhan (Minister of Petroleum & Natural Gas and Skill Development and Entrepreneurship).

This was followed by a discussion on the key existing gaps in the sector, the progress made till date and the possible way forward for the government’s Ujjwala and Saubhagya schemes. Download the report.

Getting to a Better Regulatory Framework for India’s Transport Sector

While the demand for transport has rapidly grown in Indian cities, formal public transport systems, such as buses, metros etc., have been unable to adequately meet this demand. As a result, people tend to rely more on private vehicles, which are more emission intensive and polluting. This in turn worsens congestion and air quality in Indian cities.

Regulatory hurdles in the transport sector often compound these challenges. The sector’s regulatory environment is governed by multiple agencies at the central, state and city-level, which can lead to distortions in financing, implementation, pricing and other functions. It is against this background that Shakti has engaged MP Ensystems to examine the elements of the existing regulatory framework of the transport sector and recommend ways to enhance it. A better regulatory framework can equip the sector to close the transport demand gap as well as provide sustainable and efficient connectivity.

A stakeholder workshop held on 15th November 2018 in Mumbai brought together transport experts and civil society to examine these issues in more detail. A major challenge highlighted was that while there are multiple governance levels or urban transport, there is no overarching regulatory framework or regulator for implementing sustainable urban mobility projects. Inputs from this workshop will feed into the solutions for a more evolved regulatory framework for the transport sector.
Closing the Data Gap on Air Quality

Air pollution continues to be a serious issue in India that is not only affecting the health of citizens but will also likely impact its economy. A challenge that needs to be overcome is the limited availability of air quality data. A number of Indian cities are still outside the ambit of air quality monitoring, whereas other cities (like New Delhi) have a disproportionate number of real-time air quality monitoring stations. In this context, increasing the availability of air quality data and making it accessible for all is an important step ahead.

Shakti is helping to close this gap by funding two independent low-cost ambient air quality monitoring networks, which will provide real-time measurement of PM 2.5. Combined, the two networks consist of 250 low-cost monitors in more than 50 cities and towns. These monitors are being deployed mostly in cities where the government-owned monitors are either few or none. Soon to be active, they will provide real time and credible air quality data that can help enhance public awareness of the rising levels of air pollution as well as inform policies for better air quality management.
A New Beginning as Shakti Enters its 10th Year

Shakti was founded in 2009 to foster the design and implementation of clean energy policies in India. Around that time, India had already launched the National Action Plan for Climate Change, which outlined existing and future policies and programmes directed at climate change mitigation and adaptation, and the move towards renewable energy was just beginning. We worked hard in those initial years to identify big, relevant themes to work on such as discom reform, energy access, renewable energy, efficiency in appliances, lighting, buildings and industry, and sustainable transport. These early efforts have laid a strong foundation for our current work and relationships.

As we now enter our 10th year, it is encouraging to see how far we’ve come. India, as a signatory to the 2015 Paris Agreement, has announced its NDCs and is working to achieve them. As a signatory to the Kigali Agreement, India has developed its draft national Cooling Action Plan. A very ambitious 175 GW renewable energy plan is under implementation and India is taking international leadership by establishing the International Solar Alliance. Great strides have been made in expanding energy and clean cooking access. Amongst this progress, the challenges around air quality have mounted and need to be systemically addressed.
The impact of Shakti’s grant making efforts have been significantly enhanced by our ability to successfully convene stakeholders from diverse constituencies, thereby synergies and greater impact of initiatives. In addition, we continue to look to strengthen the capacity of our CSO partners and the CSO eco-system and to this end successfully launched a CSO incubator in 2018.

As India as well as the international community strives to tackle climate change and promote economic growth and environmental health, we will contribute to, and lead on the efforts required to meet these ambitions.

Marking the occasion of entering our 10th year, we hosted an event on October 25th, 2018 in New Delhi bringing together our partners and a wide range of energy stakeholders, including representatives from government, energy companies, non-profits, and special interest groups. Mr. Jamshyd Godrej, our Board Chair and Mr. Suresh Prabhu, Union Minister of Commerce and Industry (and founding Shakti Board member) addressed the gathering, recounting Shakti’s journey, progress and impact over the past nine years.
‘Bus Karo’ Focuses on Data for City Transport

Shakti is facilitating ‘Bus Karo’, a forum led by the World Resources India comprising State Road Transport Undertakings (STUs), city bus operators and private operators working to advance bus services in Indian cities. The 13th workshop of the Bus Karo series was held on October 26th, 2018 on the theme of ‘Data for city transport’ in Bengaluru, with the Bengaluru Metropolitan Transport Corporation (BMTC).

Vast quantities of data are available for public transport, but the key challenge is to aggregate, analyse and share this data to inform better planning. Therefore, the workshop focused on how cities can use data to inform better decision making for public transport issues.

The workshop convened public and private agencies to identify the use of mobility data collected from different sources, role of data analytics and the added value of open transit data for the uptake of public transport services. Rich perspectives on the theme were offered by representatives from 12 State Road Transport Corporations, private stakeholders, entrepreneurs, data scientists, academicians, data enthusiasts and civil society. A key takeaway from the discussion was that data from different sources can be analysed in different ways to improve existing services and customer experience. This can help optimize the utilization of already available resources.
In July 2018, the Government of India imposed a two-year safeguard duty on solar cells and modules imported from China and Malaysia to spur domestic solar manufacturing and increase job creation in the clean energy sector. Given this development, there is an urgent need to assess whether safeguard duties are helping to achieve the stated goals and what their impacts are on the broader solar sector.

Towards this, Shakti, the Council on Energy, Environment and Water and Indian Renewable Energy Development Agency Ltd. convened the High-Level Working Group on Renewable Energy Policy and Finance to discuss the safeguard duty in extensive detail as well as the state of domestic PV manufacturing in India. The Group, comprising representatives from the industry and the investment and regulatory sector met on 24th October 2018 in New Delhi.

Discussions at the convening highlighted the on-ground challenges faced by the Group as well as the strategies used to manage them. Going forward, recommendations from the Group will contribute to engage policy and decision makers in a strategic dialogue on renewable energy in India.
India Releases Draft Cooling Action Plan

On the occasion of World Ozone Day, Union Environment Minister Shri Harsh Vardhan released a draft India Cooling Action Plan, which provides a roadmap to meet the country’s growing cooling needs in a climate-friendly manner. India is the first country in the world to develop such a document. The draft plan provides a pathway to reduce the country’s cooling requirements across sectors through 2017-18 to 2037-38. The overarching goal of the plan is to provide sustainable cooling and thermal comfort for all while securing socio-economic benefits.

The plan has been prepared by the Ministry of Environment, Forest and Climate Change after extensive deliberations and multi-stakeholder engagement. Shakti, through its grantee partners, Alliance for Energy Efficient Economy (AEEE), Council on Energy Environment and Water (CEEW) and The Energy and Resources Institute (TERI) has supported the development of four of the six thematic areas developed under this plan.

With rapid urbanization and development, India’s cooling needs will increase, which in turn will increase peak power demand and GHG emissions. It is necessary that future cooling systems be energy efficient, use low-GWP refrigerants and curb climate change. The draft India Cooling Action Plan is a significant step in this regard.

Meeting the Rising Demand for Cold Chains Sustainably

Shakti, MP Ensystems Advisory Pvt. Ltd and the University of Birmingham are collaborating on an initiative that will devise solutions to advance cleaner and more energy-efficient cold chains in India. Cold chains are a key focus under India’s Operation Green and will grow rapidly in the next few years. By 2022, India is expected to see massive capacity addition in pack-houses, refrigeration vehicles and ripening chambers. Currently cold chains, for the most part, are powered by conventional sources, which can be polluting and emissions-intensive. Given their anticipated growth, the way forward is to identify ways to make cold chains cleaner — this can help create an environmentally sustainable system that not only minimizes loss and increases farmers’ incomes, but also leads to wider socio-economic benefits.

The British High Commission in India is working with the state of Haryana to pilot a clean cold chain project in Haryana. As a part of this initiative, Shakti is currently supporting MP Ensystems Advisory Pvt. Ltd to develop a comprehensive roadmap to guide this transition as well as to increase the understanding of well-functioning, clean cold chains. In addition, Shakti is supporting a series of workshops to convene agricultural communities and financiers to look at opportunities for new thinking on cooling.
Colorado-Gujarat Energy Dialogue to Deepen Ties Between States in the US and India

On September 10th-11th, Shakti, the Center for Strategic & International Studies and the Gujarat Energy Research and Management Institute hosted a dialogue between the state governments of Colorado and Gujarat to foster cooperative action on clean energy. This dialogue is part of a first-of-its-kind subnational energy dialogue between states in the US and India. On the first day, government officials from Colorado and Gujarat shared their ideas and experiences on emerging clean energy opportunities and challenges in their respective states. The second day saw a research roundtable attended by representatives from CEPT University, Indian Institute of Management-Ahmedabad, Sardar Patel Renewable Energy Research Institute (SPRERI), Pandit Deendayal Petroleum University (PDPU), Gujarat Power Engineering and Research Institute (GPERI) and Gujarat Energy Training and Research Institute (GETRI). From Colorado, representatives of the University of Colorado, Boulder, the National Renewable Energy Laboratory, and the Colorado School of Mines were present. Critical themes such as renewable energy integration, energy storage, utility business models and innovations, and electric mobility were discussed in extensive detail.

As an important step ahead, the dialogue culminated with the signing of a Memorandum of Understanding (MOU) between the Colorado Energy Office and Gujarat Energy Research and Management Institute (GERMI) to promote knowledge exchange on the integration of renewable energy and the electrification of transportation as well as encourage collaborative research activities.

Making India’s Electricity Sector more Sustainable

India is seeking to transform its power sector in a way to promote access, reliability, affordability and sustainability. Several important policies have been announced in this regard, but there are still concerns around high AT&C losses, low quality of service, peak power deficits and high cross-subsidies. In particular, electricity tariff structures, service delivery models and discom revenue recovery models warrant attention since they play a key role in the functioning of the power sector and must be designed taking emerging developments into account.

In cognizance of this, Shakti in collaboration with the Federation of Indian Chambers of Commerce and Industry (FICCI), Price water house Coopers (PwC), is facilitating research and analyses to examine the existing tariff structures in India and the developmental, social, and economic objectives that can be achieved through retail tariff reforms.

On 12th September 2018, a workshop in New Delhi brought together critical stakeholders to deliberate on these issues. Held at a time when the Ministry of Power is taking concerted steps to simplify and rationalize power tariffs in the country, the workshop helped identify reform actions and key principles to tariff determination.

Shri Ajay Kumar Bhalla, Secretary, Ministry of Power, spoke at the workshop highlighting the need for regulators and discoms to be market-oriented. An important outcome of this workshop is that it paved the way for deliberations amongst all types of stakeholders on these critical themes.
India’s First Vehicle Rating System Based on Environmental Performance

How does a green-minded consumer purchase a vehicle? In the face of climate change and rising GHG emissions, more and more consumers are asking themselves this question. But obtaining information about the overall environmental and emission performance of vehicles can be challenging—until now.

The Green Vehicle Rating System supported by Shakti and developed by the Alliance for an Energy Efficient Economy aims to meet this need by rating two and three-wheeler vehicles. The rating helps consumers to understand the negative impact of GHG emissions and criteria pollutants released from tail pipes across vehicle models. Along with a comparative analysis of vehicle models, the rating also estimates the external costs of the impact of vehicle exhausts.

The report was released by Shri Alok Tripathi, Executive Director of the Petroleum Conservation Research Association (PCRA) at an event in New Delhi on 28th August 2018. This was followed by a panel discussion comprising representatives from civil society and academia.

Driven by rapid urbanization and increased incomes, India has seen a steady rise in two and three-wheeler vehicles. Of the total petrol sales in India, two wheelers consume 61%.

Of the total diesel consumed by the transport sector, three-wheelers consume around 28%. Collectively this leads to a huge impact on oil imports, air pollution and carbon emissions. With a green rating, consumers can take more informed decisions on opting for low-emission two and three-wheeler vehicle models. This in turn can nudge the transport sector towards an efficient and cleaner future.

With a green rating, consumers can take more informed decisions on opting for low-emission two and three-wheeler vehicle models.
The **MSME Sector Gets a Boost from the SAMEEEKSHA Platform**

Shakti is supporting the Small and Medium Enterprises Energy Efficiency and Knowledge Sharing (SAMEEEKSHA) platform jointly set up by the Bureau of Energy Efficiency, Swiss Agency for Development and Cooperation (SDC) and the Ministry of Micro, Small & Medium Enterprises (MoMSME), with The Energy and Resources Institute (TERI) acting as the platform’s secretariat. SAMEEEKSHA pools and shares the knowledge of institutions and key stakeholders that work towards promoting energy efficiency in India’s MSME sector.

SAMEEEKSHA’s meeting on 23rd August 2018 in Kolkata brought together regional-level stakeholders from the government, SME clusters, industry and civil society. The meeting was marked by the release of two sets of reports supported by Shakti. First, profiles of SME clusters from across the country mapping energy performance and opportunities for improvement, developed by TERI. Second, a report titled Factors influencing the uptake of energy efficiency initiatives by Indian SMEs, prepared by the Council on Energy, Environment and Water. The discussion was enriched by contributions from Mr. Abhay Bakre, Director General of the BEE and Dr. Ajay Mathur, Director General of TERI, and other participants. Mr. Shubhasis Dey, Programme Manager (Energy Efficiency) from Shakti highlighted how BEE’s new ROSHANEE (Roadmap Of Sustainable and Holistic Approach to National Energy Efficiency) mission would make the MSME sector even more critical for energy efficiency in India.
Coming Soon:
The State Rooftop Solar Attractiveness Index (SARAL)

Rooftop solar is expected to make a significant contribution towards meeting India’s renewable energy goals. But only 2.5 GW of the 40 GW rooftop solar by 2022 target has been achieved so far. While there are challenges to overcome, the sector is seeing considerable interest from government entities, entrepreneurs, investors and consumers.

Several Indian states have adopted policies, incentives and metering regulations to make the most of their solar potential and available rooftop area. At the same time, it is important for state power sector entities to be better-prepared to be able to contribute towards meeting the target. It is also important to develop the foundation for an attractive and competitive rooftop solar market.

The soon-to-be-launched Shakti-supported State Rooftop Solar Attractiveness Index (SARAL) aims to meet this need. SARAL will rank states based on a wide range of parameters that gauge their attractiveness for solar rooftop deployment and investment opportunities. Developed by the Associated Chambers of Commerce of India (ASSOCHAM) India with assistance from Ernst & Young (EY), SARAL will identify areas of improvement and act as an investment tool.

Powering Jharkhand through Rooftop Solar

State-level implementation remains key in meeting India’s renewable energy goals. On August 10th, 2018, Shakti collaborated with the Center for Environment and Energy Development (CEED), Jharkhand Renewable Energy Development Agency (JREDA) and the Central University of Jharkhand (CUJ) to host a national conference on powering Jharkhand through rooftop solar. The conference saw the participation of key representatives from government departments, the state regulatory commission, policy think-tanks, research institutions, civil society and solar developers.

Jharkhand has set a target of 500 MW grid-connected solar rooftop by 2022. A report released by CEED estimated that Ranchi and Jamshedpur alone have a solar rooftop potential of more than 1 GW, which can bring in an investment of INR 500 crore and create 25,000 jobs. Tapping this potential can help the state meet its energy demand in a cost-effective manner. Ms. Disha Agarwal, Programme Officer (Renewables) at Shakti was part of the panel that explored immediate steps and long-term strategies to expand solar rooftop in Jharkhand. The panel also set out the challenges and opportunities in the context of the current state of Jharkhand’s power sector.
Implementing Power Plant Emission Norms Can Yield Significant Benefits

In December 2015, the Ministry of Environment, Forests and Climate Change notified more stringent emission standards for thermal power plants in India. In the light of this important development, Shakti supported a study to assess the industry-wide cost implications and benefits of implementing these emission standards.

The resultant study, carried out by the Center for Study of Science, Technology and Policy (CSTEP), was released in New Delhi on 13th July 2018, revealing pertinent findings. The study indicates that the cost of electricity from these plants is likely to increase by 25–75 paise per kWh.

However, the health benefits will significantly outweigh the costs of compliance by a factor of 4:1. The standards can help avoid at least 300,000 untimely deaths caused by air pollution. There is a significant reduction in morbidity as well. The total health benefit is monetised to be over Rs 9.6 lakh crores by 2030. The cumulative investment required to implement pollutant control technologies is estimated at about Rs 4 lakh crore by 2030.

Discussing a Carbon Tax Structure for India

As India takes measures to achieve its NDC goals, a carbon tax has the potential to be an effective climate mitigation instrument. A newly released discussion paper, commissioned by Shakti, contributes to the discourse on this theme.

The discussion paper, prepared by Ernst & Young, analyzes a carbon tax structure for India and assesses its merits and challenges. It covers pertinent issues such as the level of GHG emissions in India and their sources, assessment of the current tax and non-tax measures for reducing carbon emissions, learnings from other countries which have implemented a carbon tax mechanism, and possible linkage of the carbon tax structure with the Goods and Services Tax (GST) in the country.

Its findings informed the discussion at a consultative workshop held in New Delhi on July 27th, 2017. Mr. Suman Bery, Shakti Board Member, facilitated a session on the potential design and implementation of a carbon tax regime for India which saw active participation from experts from industry, think tanks, multilateral associations and academia.
SUMNet Proposes Sustainable Urban Transport Solutions

The finding of walkability audits and alternative street designs from 11 cities were presented.

The Sustainable Urban Mobility Network (SUMNet), supported by Shakti over the last six years, is a network of multi-city grassroots level civil society organizations working towards sustainable urban transport policies in India. From July 2-4, 2018, SUMNet held its annual workshop in Bangalore bringing together members from 13 different cities to deliberate on the challenges and prospects of sustainable urban transport in their respective cities. In a working, knowledge transfer-oriented environment, members presented their ideas, exchanged approaches and jointly looked for innovative solutions. The finding of walkability audits and alternative street designs from 11 cities were presented. Members also shared the experience of engaging with policy makers in Bihar and Jharkhand to draft a policy on non-motorised vehicles. An informative discussion on urban mobility focused on enhancing governance and institutional structures as well as good data practices for informed decision making.

Going forward, members will focus on ways to implement proposed street designs in their respective cities and collect primary data on informal transport systems for a few cities to understand policy gaps.
Making Transit Oriented Development Work for Indian Cities

The idea of Transit Oriented Development (TOD) is gaining popularity in Indian cities, but there remain many challenges and barriers to its development. It is within this context that Shakti is supporting the Centre for Environment Planning and Technology University (CEPT University) to design better planning principles for TOD. As a part of these efforts, a workshop organized in Ahmedabad, brought together experts to discuss this topic in detail. A range of key issues related to TOD zones were highlighted including affordable housing, parking, street design, public engagement and social equity. The findings of a TOD assessment of Mumbai and Bangalore were presented. An important point of discussion was that access to transit must cater to the rising demand for affordable housing, and therefore, new ToD and metro policies should be proactive in this regard.

The discussion was enriched by valuable contributions from representatives and decision makers from the Delhi Development Authority, the Ahmedabad Municipal Corporation and the Ahmedabad Urban Development Authority as well as civil society, the private sector and research institutes. Drawing on these learnings, CEPT University will prepare a handbook on “Planning principles of TOD for Indian Cities.”

Green Power Market Development Group Launches NCR Chapter, Knowledge Portal

The Shakti-supported Green Power Market Development Group India is helping to increase the share of renewable energy in the overall energy consumption of commercial and industrial establishments. The Group is being led by the World Resources Institute India and the Confederation of Indian Industry. On July 27th, 2018, a new chapter of the GPMDG was launched in the National Capital Region (NCR) to facilitate transactions and business models that promote onsite and offsite renewable energy procurement.

The event also saw the launch of the gpmdg.org to curate tools, case studies and other documentation to serve as a repository for future work in these areas. This portal is intended to help disseminate knowledge to larger audiences, thus enabling them to make and execute decisions related to renewable energy procurement.
Better Planning and Operation of Bus Services

Bus systems are key to providing efficient public transport services. But most formal bus systems in Indian cities need improvement in order to be able to cater to the demand for transport. Two reports supported by Shakti provide solutions for the better planning and operation of bus services:

- **Regulatory frameworks for Integrated Shared Mobility Governance in India** assesses the existing mobility regulations for governing shared modes of transport (such as buses, Intermediate Public Transit systems and Internet-based aggregators of transport services) providing solutions for better regulatory governance.

- **Bus Benchmarking Activity Report – Bangalore and Chandigarh** presents the results of a bus benchmarking exercise of the Bangalore Metropolitan Transport Corporation (BMTC) and the Chandigarh Transport Undertaking (CTU) identifying areas of improvement and opportunities.

India Can Benefit from Better Air Quality, Human Health and Agricultural Yield by Achieving its INDC

India has committed to several measures that focus on GHG mitigation and address climate change. It is extremely relevant that the co-benefits to be derived from these measures are also evaluated and quantified. This can significantly strengthen the case for climate action.

A new Shakti-supported report prepared by The Energy and Resources Institute (TERI) carries out a co-benefits assessment of various energy policy scenarios with a focus on co-benefits such as better air quality, human health and agricultural productivity.
Prominent Business Leaders Commit to ‘Clean Air for All’ Principles

Leaders of India’s prominent corporate groups, including Godrej & Boyce Manufacturing Co Ltd., Shell India, Kirloskar Brothers Limited, Dalmia Bharat, KPIT Technologies, Tata Motors, Mahindra Lifespaces and others, were part of a high-level CEO Forum, which came together on June 1st, 2018 to shape actions towards supporting India’s ambient air quality goals.

In its latest database, the World Health Organisation reported 14 Indian cities as the most polluted in the world in terms of PM 2.5 concentrations. Given the urgency of the air pollution challenge in Indian cities today, this initiative taken by industry leaders is a welcome step.

The Forum was facilitated by World Resources Institute India and Shakti. An important outcome was that the participating CEOs committed to voluntarily reducing emissions from their operations. They also recommended ‘Clean Air for All’ principles for business to use for addressing the growing challenge of air pollution. The principles are outlined in a CEO Communique, which highlights the need for concrete capacity building action within existing set-ups and driving voluntary business action.

Shakti-Supported Reports Released at the CEEW Renewable Energy Dialogue 2018

At the CEEW Renewable Energy Dialogue 2018 in New Delhi, leaders from civil society, industry, investors, lenders and financial institutions discussed ways to accelerate India’s renewable energy transition. Among the reports released to foster knowledge transfer and strategic decision making in the pursuit of wider and deeper renewable energy markets were three reports supported by Shakti:

- Scaling up Rooftop Solar in the Residential Segment
- Curtailing Renewable Energy Curtailment
- The Future of Renewable Energy Jobs

The first two formed the basis of panel discussions and saw extensive participation from key stakeholder communities across multiple geographies. The Dialogue was organised by the CEEW in collaboration with the Ministry of New and Renewable Energy (MNRE), rooftop solar International Solar Alliance (ISA), International Energy Agency (IEA), Shakti and REN21.
A study previously commissioned by Shakti has found that improving the performance of tyres can reduce fuel consumption by 20%. But current tyre standards in India benchmark for safety and durability parameters and not for rolling resistance and other parameters such as wet grip, which have a greater bearing on fuel efficiency.

To facilitate the development of appropriate standards for tyres, Shakti commissioned a study on the Indian tyre market. This study has generated test data on rolling resistance and wet grip performance of passenger car tyres, suited to the Indian context. This coupled with an analysis of market trends and international best practices, has been analyzed to provide recommendations for the Standards and Labelling program for passenger car tyres in India, which has made good strides in implementation so far.

The analysis presented this study is a good starting point for further stakeholder discussions. It can be further expanded to inform the development of a Monitoring and Evaluation protocol for the fuel efficiency of passenger car tyres, which will help to make the overall programme more effective.

Shakti is co-supporting the Energy Transition Commission India (ETC India), a high-level, multi-stakeholder platform on energy and electricity sector transitions, which focuses on developing decarbonization pathways for the power sector. Through continuous engagement with policymakers and other stakeholders, ETC India is currently developing scenarios for the demand, supply and flexibility requirements of the power sector in 2030. ETC India held its second stakeholder workshop on June 25, 2018 bringing together policymakers, civil society, research organizations, investors, electricity generators, equipment suppliers, and oil and gas companies to contribute to the scenario analysis.

ETC India follows a similar approach to that of the Energy Transitions Commission International. The India chapter was convened in the light of India’s leadership potential in achieving a clean, efficient and affordable electricity system. The Energy and Resources Institute serves as the Secretariat for ETC India.
Indian Renewable Energy Federation Generates Regional-Level Perspectives

The Shakti-supported Indian Renewable Energy Federation works to promote policy, regulatory and business solutions that will increase the deployment of renewable energy. Since it was established, the IREF has provided recommendations to inform several policy developments such as the National Solar Mission Phase II and amendments to the Electricity Act 2003 and has facilitated stakeholder engagement and policy dialogue at the state level.

In the last year, the Federation convened industry representatives in 10 regional workshops to build shared perspectives and approaches. The culminating workshop was held in New Delhi on June 20th, 2018, which saw illuminating discussions on themes such as power purchase agreements, commercial integration of renewable energy, land issues and the availability of capital and financing, amongst others.

While the renewable energy sector has grown considerably, there is still immense potential to be realized. The discussion and its findings—to be published soon—will provide regional and state level perspectives and learnings to help shape India’s renewable energy agenda.
Working Group on Renewable Energy Finance and Policy

Starting in 2016, Shakti and the Council on Energy, Environment and Water have convened a High-Level Working Group to enable increased investment in India’s renewable energy market. Based on its deliberations, the Group comprising leaders from civil society, industry, investors, lenders and other financial institutions submitted a set of policy recommendations to key government officials, which were well received.

This year, the Group has grown to include more practitioners to collectively develop solutions that de-risk the renewable energy sector. Discussions at the Group’s convening held on 3rd May 2018 in New Delhi were centered around the curtailment risk for solar and wind projects. With India adding significant renewable energy capacity and operating a large and complex power system, curtailment for technical reasons may be unavoidable. However, appropriately managing curtailment risk can provide comfort to developers, investors as well as system operators.

Going forward, the Group will focus on other themes including decentralized solutions to energy access, such as rooftop solar. It will continue to develop and provide concrete action points to policy and decision makers in the country.

Launch of the Distribution Utilities Forum

Senior management executives from more than 20 electricity distribution utilities came together for the inaugural meeting of the Distribution Utilities Forum held on 4th May 2018 in New Delhi. The meeting was chaired by Mr. Gireesh Pradhan, former Chairperson of the Central Electricity Regulatory Commission and Secretary of the Ministry of New and Renewable Energy.

The distribution sector is a key focus of ongoing power reforms in India. An efficient, resilient, and financially robust distribution sector is essential to meet the Government’s electrification ambitions as well as the national and global climate commitments. The Distribution Utilities Forum will bring together for the first time MDs, CEOs and other senior management of distribution utilities on a common platform to share views, learning and solutions for some of the critical challenges facing the sector.

Going forward, the Forum will focus on themes such as open access in distribution, technical and human resource challenges, as well the roll-out of rural electrification schemes such as Saubhagya and Power for All. The Energy and Resources Institute (TERI) functions as the secretariat for the forum and is supported by Shakti Sustainable Energy Foundation.
Sikkim to Get GHG Inventory and MRV System

Shakti is engaging with IORA Ecological Solutions Pvt. Ltd. to develop a state-wide GHG Inventory and Climate MRV System for Sikkim, which last year announced its vision of becoming the first carbon neutral state in India. The system will help the state develop annual GHG inventories, track the implementation of climate-relevant actions and contribute to India’s NDC goals.

The GHG emission inventory provides estimates for major GHG emitting sectors — Energy, Industrial Processes and Product Use (IPPU), Agriculture, Forestry and Other Land Use (AFOLU), and Waste for the years 2005-2015 for CO2, CH4 and N2O gases. The inventory was presented at a workshop on 11th May in Gangtok for its validation by state-government officials and the nodal officers associated with this initiative. This was followed by discussions on data gaps and how they could be addressed, and the institutional arrangements required for the System.

Dr. Thomas Chandy, Principal Secretary and Chairperson of the Forests, Environment & Wildlife Management Department, Government of Sikkim, in his remarks to the workshop, highlighted the importance of this initiative in helping the state respond to climate change.

The workshop brought together decision makers from various city departments including road and transport, as well as health scientists, CSOs and environmentalists to find solutions to the issue of worsening air quality. Shri Anurag Aggarwal, Home Secretary, Union Territory, in his inaugural address, underscored the need for urgent action as well as for incorporating air quality improvement measures under the Smart City Liveability Index.

Presentations from the Chandigarh Pollution Control Committee highlighted the need for an air action plan that would facilitate inter-departmental collaboration. Other themes were covered such as better waste management measures, health impact and knowledge gaps in air quality management.

The is second of four Shakti-supported workshops for cities outside the Delhi-NCR region, where pollution levels are increasing.

Tackling air Pollution in Chandigarh is the Need of the Hour

On 16th May 2018, Shakti along with Clean Air Initiative for Asian Cities Center Inc, and the Department of Environment of the Union Territory of Chandigarh organized a tri-state stakeholder workshop for Chandigarh, Mohali and Panchkula on bridging the knowledge gap on air quality management. Known for being one of the most well-planned cities in the country, Chandigarh has been grappling with deteriorating air quality for a few years now. A recent study by the Department of Environment reveals that ambient air quality in the city is at its worst since 2007 at specific locations, largely due to vehicular emissions.

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Bridging the Knowledge Gap on Air Quality Management

With air pollution a growing concern, Shakti is working on several fronts to support the development of policy and technological solutions for better air quality management. It is widely recognized that poor air quality is not confined to the Delhi-NCR region. An important step ahead is to address the knowledge gaps on air pollution, particularly for cities outside the Delhi-NCR region, which are grappling with worsening air quality. On 11th April, Shakti along with Clean Air Initiative for Asian Cities Center Inc, the Uttarakhand Pollution Control Board and the Gati Chief Conservator of Forest, IFS, Uttarakhand), who provided perspectives on the prevention and control of air pollution. Other participants also exchanged insights on the subject. This was the first of four city-level workshops supported by Shakti aimed at bridging the knowledge gap on air quality management in Indian cities.

The workshop was attended by Mr. S. K. Das (Former Chief Secretary, Uttarakhand), Mrs. Vibha Das (Former Secretary Education, Government of India) and Mr. R. B. S. Rawat (Former Principal Foundation organized a stakeholder consultation workshop for Dehradun on mitigating air pollution. The workshop brought together key Government officials, subject matter experts and civil society organizations to facilitate the exchange of information on the existing status of air pollution in the city and state, as well as possible policy solutions.
A Practical Roadmap for the Electrification of Bus Fleets in Indian Cities

India is readying for an ambitious transition towards electric vehicles, which is expected to help improve air quality in cities, reduce oil imports and contribute to the country’s clean energy agenda.

As policy makers and other stakeholders confront both the challenges and opportunities that lie ahead, it becomes clear that proper planning is a key priority. A recently released report supported by Shakti provides a practical roadmap for the adoption of electric buses in Bengaluru. The report is particularly relevant given that last year Karnataka became the first Indian state to announce a policy for electric vehicles. Now, the Bangalore Metropolitan Transport Corporation (BMTC) is in the process of procuring its first fleet of electric buses. To inform these efforts, the report identifies some of the key barriers in large-scale EV penetration and proposes a long-term implementation plan for the electrification of buses in Bengaluru.

The roadmap holds immense potential for replication by cities and states across India and can help city authorities evaluate technology choices, assess the impact on distribution grids and analyze infrastructure requirements. Last year, Shakti supported a similar study for the city of Kolkata.
Electric Buses Get a Focus at 12th Bus Karo workshop

Identifying the need for better bus transport, Shakti supports the ‘Bus Karo’ initiative led by WRI India. Bus Karo is a knowledge sharing network consisting of State Transport Undertakings (STUs), city bus and private bus operators working to advance bus services in Indian cities.

The twelfth Bus Karo workshop, held in New Delhi, focused on the theme of ‘Strategizing Electric Bus Operations in Indian cities’. Building on the momentum of electric mobility in India, the workshop brought together over 130 experts, government officials, policy makers and civil society practitioners to offer insights on how to undertake the transition to an electric bus fleet. Discussions were held around battery technology and support infrastructure, financing, operations, innovation in public bus transit and collaborative models for public and on-demand bus transport.

Rich perspectives were offered by Mr. Surendra Bagde (General Manager, Brihanmumbai Electric Supply and transport Undertaking), Mr. M. Ramshekhar (CEO, Delhi Integrated Multi-Modal Transit System Ltd.), Prof. Shivanand Swamy (CEPT University), Mr. Ashwin Mahesh (Co-founder, Lithium), Mr. Anil Kaushik (AGM, NTPC), and other experts. Highlighting the broader climate change context, Mr. Chinmaya Acharya, Chief of Programmes at Shakti, underscored the relevance of electric buses as an important opportunity to reduce emissions, improve local air quality issues as well as provide efficient mobility services.

The workshop was held in New Delhi on April 5-6th at part of WRI’s annual conference, Connect Karo.

Turning Big Ideas into Action at the Shakti-ISB Clean Energy Lab

We need more Civil Society Organizations (CSOs) working in the clean energy space to help drive India’s transition to a cleaner and sustainable future. But it takes skill, resources and capacity to translate a big idea into concrete action. This is where the Clean Energy Lab comes in. The Lab, launched by Shakti and the Indian School of Business last year, is incubating five Fellows, helping them develop early stage CSOs working in the area of clean energy to create policy impact.

The Lab acts as a resource providing support to the Fellows to convert their ideas into scalable institutions. As part of the year long incubation programme, Fellows benefit from mentorship, networking support, capacity building programmes as well as collaboration and fund-raising assistance. Fellows attended an immersion programme held from April 23-25 at the Shakti office, which was facilitated by experts from the clean energy sector.

The right support at the right time can turn their big ideas into real-world solutions, thereby strengthening the clean energy ecosystem.
Meeting India’s Renewable Energy Target: A Business Case for Institutional Investment

Finance will be crucial to meet India’s renewable energy target of 175 GW by 2022. A significant potential source are institutional investors, both foreign and domestic, who manage USD 70 trillion and USD 564 billion of assets respectively. A study, supported by Shakti and undertaken by the Climate Policy Initiative, explores ways to unlock this potential. The study develops a business case for institutional investors to invest in India’s renewable energy sector, identifying key barriers to investment and proposing potential pathways forward.

According to the study, the renewable sector is becoming increasingly attractive from the perspective of such institutions, as compared with other energy investment opportunities in India. As a market, India is economically attractive for foreign institutional investors compared to other similar markets across the world. Further, the renewable energy sector is a long-term and low-medium risk investment, which aligns reasonably well with the risk, return, and long investment horizon requirements of institutional investors.

But there are still some barriers to accessing this apparent match—including sector specific risks like off-take risk, lack of publicly listed entities and low credit rating of investments, along with currency risk. The study stresses that with appropriate regulatory and policy changes, the sector can provide a good match with institutional investors’ investment objectives.
Putting a Price on Carbon: A Guide for Indian Businesses

At a time when countries are adopting low-carbon and climate-resilient pathways, the role of businesses in driving sustainable business models that supplement these efforts is greater than ever before. A growing number of businesses around the world have adopted internal carbon pricing as a tool to address climate-related risk, as well as to explore opportunities for business efficiencies and for innovation.

Responding to this momentum, a few forward-looking Indian businesses are showing interest in factoring an internal carbon price into their business plans. But they are also highlighting the need for guidance tailored to the Indian context. To help bridge this gap, Shakti facilitated the development of a primer for businesses on how to design and implement an internal carbon pricing scheme.

The primer, developed by WRI India, is meant to help businesses become familiar with the concept of carbon pricing. It provides a seven-step approach to adopting a carbon pricing scheme, which is based on WRI India’s research, survey of 30 companies and in-depth collaboration with five Indian businesses in the textiles, cement, oil and gas, IT & Technology and manufacturing sectors. As businesses incorporate internal carbon pricing as a key resource in addressing climate risk, this primer is an important tool they can use.

Mini-grid Policy for Jharkhand Seeks to Bridge Electricity Gap

Mini-grids are emerging as a promising solution to bridge the electricity gap in unserved and under-served areas of the country. In a bid to enhance electricity access in Jharkhand, Shakti in collaboration with the Jharkhand Renewable Energy Development Agency (JREDA) and the Centre for Environment and Energy Development (CEED) gathered stakeholders to deliberate on a draft mini-grid policy for the state.

At 45.17%, Jharkhand has one of the lowest levels of household electrification rates in India, and mini-grids can help bridge this gap. The draft mini-grid policy is a step ahead in the direction of a more enabling ecosystem for the sector. Key stakeholders including private investors, mini-grid developers, government officials, civil societies, policymakers, think tanks and micro-finance banks offered perspectives on strengthening the draft policy.

Speaking on the occasion, Mr. Arbind Prasad, Chairman of the Jharkhand State Electricity Regulatory Commission (JSERC) stated that such a policy was a positive step in creating opportunities for private investment in the sector. Mr. Niranjan Kumar, Director, JREDA highlighted JREDA’s commitment towards developing mini-grids for meeting India’s ‘Power for All’ programme.
Shakti Dialogues 2018 Puts Spotlight on Emerging Energy and Climate Themes

With more than 150 participants—high-level officials, researchers, civil society organizations, policy strategists, and industry representatives—the Shakti Dialogues 2018 delivered rich insights and perspectives on the rapid transitions underway in India’s clean energy sector.

The Dialogues build on Shakti’s unique ability to convene key stakeholders and drive collaborative action toward meeting India’s energy and climate goals. Drawing on insights gained from Shakti’s on-going programme work and from emerging priorities and developments in the country, the Dialogues focused on six critical themes:

- Framing a national vision on electric mobility
- Catalyzing financing frameworks to support India’s clean energy ambitions
- Addressing air quality challenges in a rapidly urbanizing India
- Integrating energy efficiency considerations into the national affordable housing programme
- Driving reforms in the power sector
- Engaging business leadership in climate mitigation

The sessions were introduced by Mr. Krishan Dhawan, CEO of Shakti and chaired by distinguished members of the Shakti Board including Mr. Nitin Desai (Former Under Secretary General, United Nations) and Mr. Suman Bery (former Director General of the National Council of Applied Economic Research, as well as key experts including Mr. Gireesh Pradhan (Former Chairman of the Central Electricity Regulatory Commission) and Mr. Anirban Ghosh (Chief Sustainability Officer at the Mahindra Group).

The convening enabled Shakti’s grantees and stakeholders from various sectors to interact with each other as well as explore areas of future collaboration. The diverse exchange of ideas was marked by a broad consensus on the need for enabling and practical policy solutions.

This is the fourth edition of the Shakti Dialogues, which was held in New Delhi from 26-28th February 2018. Follow the conversation on social media using shaktidialogues2018.
For the last three years, Shakti has provided strategic and funding support to the India Energy Access Summit, an annual gathering of leaders and innovators exploring ways to accelerate India’s clean energy transition. The 2018 summit was convened through 12-13 February by the Climate Group and the Clean Energy Access Network in partnership with the Ministry of New and Renewable Energy. Through a series of high-level discussions, the speakers identified opportunities, challenges and successes in India’s DRE landscape as well as highlighted ways in which DRE could deliver on India’s Nationally Determined Contributions. Discussions also focused on how interaction between the grid and DRE could help meet these goals.

The summit was inaugurated by Mr. Raj Shah (President of the Rockefeller Foundation) and Mr. Desh Deepak Verma (Rajya Sabha Secretary General, Rajya Sabha, Parliament of India). The follow-up session on ‘A Converging Dialogue to Accelerate India’s Clean Power for All Goals,’ saw a panel discussion with eminent personalities discussing India’s clean energy growth trajectory. The panel included Mr. Krishan Dhawan (CEO of Shakti), Ms. Elizabeth McKeon (Head of Strategy, IKEA Foundation), Dr. Harish Hande (Founder and CEO, SELCO Foundation), Ms. Helen Clarkson (Chief Executive, The Climate Group) and Dr. Arunabha Ghosh (CEO of the Council on Energy, Environment and Water).

Shakti, along with Ashden India led a session on ‘India’s Leadership on 100% Electrification’ which focused on the catalytic role that India could play in the move to achieve 24x7 power for all by 2022, and the vital role of DRE for reinforcing such efforts. These and other sessions served to enhance the dialogue on how DRE solutions could be aligned with India’s national priorities on energy access.
India Lab Announces Three New Green Finance Instruments

The India Innovation Lab for Green Finance, hosted and supported by Shakti since 2015, continues to make progress on financial instruments, which could catalyze large-scale investment in green infrastructure. The Lab recently selected three new ideas for green finance instruments to move forward for development in its 2018 cycle:

- **The Residential Rooftop Solar Accelerator** aims to increase residential rooftop solar power in India by leasing solar rooftop systems to households that do not have the required credit history to purchase them, and by leveraging data and technology to achieve scale and lower customer acquisition costs.

- **Financing for Low-Carbon Auto Rickshaws** aims to increase sustainable transit in India, by financing asset loans for low carbon and electric auto-rickshaw drivers that leverage financial and digital technologies, such as real time information and payment systems.

- **The Long-Term Debt Facility for Traction Batteries** aims to reduce the ownership cost of electric buses in India, by generating additional revenue from repurposing traction batteries as energy storage batteries after the end of the traction period, which would maximize the use of the battery for another 5-10 years.

Over the next few months, the selected three ideas will receive guidance from Lab Members and other high-level experts, in preparation for their launch at the end of the year.

Shakti-Supported Study Contributes to MNRE’s Concept Note on Solar PV Manufacturing Scheme

The Ministry of New and Renewable Energy, in December 2017, released a concept note on the solar PV manufacturing scheme with the goal of boosting solar manufacturing capacity in the country. A study supported by Shakti, undertaken with ICF and the Indian Chamber of Commerce, has contributed to the development of this concept note.

While India’s solar market is growing, the domestic solar PV manufacturing industry, however, has not been able to tap into this market on account of its inability to compete with imported products. This study therefore aims to identify the main challenges faced by India’s solar PV manufacturing industry. It identifies the exact capital costs at various stages of the manufacturing process, based on which the MNRE has proposed the capital subsidy that may be required for creating new manufacturing capacities. In addition, the concept note also encourages the deployment of renewable energy-based power plants to provide for clean electricity as an input to the manufacturing process. This recommendation, too, has been informed by the study.

Mr. Upendra Tripathy, Director General of the International Solar Alliance, and Mr. Krishan Dhawan, CEO of Shakti launched this study at the 6th Green Energy Summit organized by the Indian Chamber of Commerce in New Delhi. In the light of India’s ambitious solar ambitions, the prioritization of manufacturing capacity is an important development for the solar PV sector.
Strengthening Technical Expertise on Low-Cost Air Pollution Sensors

With air quality a worsening problem in India cities, low-cost air quality sensors can help address critical data gaps. Shakti is facilitating efforts to establish two independent networks of low-cost air quality sensors in India. To enhance knowledge sharing and dialogue, Shakti recently convened a workshop bringing together civil society, researchers, funding agencies and consultancies to discuss the applications of low-cost air quality sensors.

The workshop was led by Mr. Tim Dye, an independent expert with expertise in environmental field monitoring, data management and public communications, who provided an overview of three critical themes: the current state of play of low-cost sensor technologies, best practices for operation and maintenance, and ways to correctly interpret air quality data. Adding to these presentations, participants summarized knowledge and project successes while also highlighting the opportunity and challenges pertaining to low-cost air quality sensors.

As key findings, the workshop concluded that in order to enhance the credibility of data provided by low-cost sensors, there is a clear need to improve sensor performance and implement standards. It was highlighted that low-cost sensors provide an excellent opportunity to fill the existing data and knowledge gap on air pollution and can also be used as public engagement tools.
Solarizing India’s Agri-Pumps

In the agriculture sector, solar irrigation pumps are a promising alternative to traditional water pumping systems which usually operate using grid electricity, diesel or kerosene. With a target of 1,000,000 solar pumps by 2020-21, India is taking steps both at the national level and in states to meet this target. Reflective of the importance of this initiative, the Government’s 2018 Budget plans to encourage farmers to shift to solar power pumps by getting state electricity distribution companies to purchase any surplus electricity generated.

During the last two years, Shakti has engaged with key stakeholders in a rigorous analytical effort to provide actionable recommendations for deploying solar energy for irrigation. Specifically, Shakti commissioned Dalberg Global Development Advisors and Sambodhi to evaluate the impact of the solar pumping scheme in four states—UP, Bihar, Rajasthan and Tamil Nadu. The study reveals the broader socio-economic impact of solar water pumps and recommends ways to improve the design and implementation of the program at the national and in states.

Shakti also contributed to the development of three other research studies, conducted by the Council on Energy, Environment and Water, which highlight the need for context-specific deployment strategies, customer-centric approaches, and better technologies and financing for scaling up solar agri pumps.

These studies were launched at the National Dialogue on Solar for Irrigation in India and are already having an impact on discussions about how to scale up solar agri pumps. Shri Amitabh Kant, CEO, NITI Aayog, delivered the keynote address at the event underscoring the relevance of the studies as well as the potential of solar energy to fulfill unmet irrigation needs and increasing farmers’ resilience to climate change. He also offered to convene a meeting of relevant states, for taking the recommendations forward.
Clean Energy Lab to Incubate Five Clean Energy Ideas

Shakti and The Indian School of Business (ISB) have joined hands to launch the Clean Energy Lab, a uniquely designed incubation programme for civil society organizations working in the area of clean energy to create policy impact. In 2018, the Lab is incubating five Fellows with exceptional ideas to work across clean energy themes. The Lab will support the Fellows to build their ideas into scalable institutions, which can create research-based policy impact in India.

The Fellows, selected from among a highly competitive pool of 120 applicants, were part of an intensive 5-day capacity building boot camp held recently at ISB Hyderabad, designed to help them refine their ideas. The Fellows will now begin a year-long incubation program, which will include dedicated mentorship with assigned experts, capacity building and training sessions and a multitude of opportunities to network and partner with potential collaborators. This suite of resources is critical to get their big ideas off the ground. It is also intended to broaden the clean energy ecosystem to help turn more big ideas into real-world solutions.

Sharing his views on the rationale for developing the Lab, Krishan Dhawan, CEO, Shakti as well as Lab Mentor says, “One of Shakti’s roles as a foundation focused on India’s clean energy sector is to build and strengthen the capacity of civil society to participate more effectively in policy dialogue and action. Platforms like the Clean Energy Lab are an important part of the solution. Given India’s increasing energy demand and urgent development priorities, outcomes from the Lab can make a very important contribution.”

Integrating 175 GW of Renewable Energy into the Grid

India’s renewable energy market has gained increased momentum stoked by an ambitious target of 175 GW of renewable energy by 2022. However, renewable energy is more variable than conventional sources. Integrating a large quantum of renewable energy into the grid in a cost-effective manner, while maintaining grid stability and reliability, will require changes to power system planning and operations.

Given this context, Shakti is enabling the development of integrated power sector modelling frameworks to address the variability challenge through optimizing the balancing capacity. An integrated framework such as this takes several factors into account including the location of renewable sources, type of generating and transmission capacities required and the future demand scenario for power.

A released study, commissioned by Shakti, proposes a national-level power sector modelling framework that considers the ambitious renewable energy target as an integral component of the overall expansion plan for the power sector. The framework provides a pathway to assess if the grid can successfully integrate new renewable energy while meeting the expected load of 24*7 power for all. It also proposes technical and infrastructure changes required to achieve an optimal resource mix.

Going forward, Shakti will engage with civil society organizations so that they can use the modelling framework, and conduct national, regional and state level analysis around grid dispatch, generation and transmission planning. Shakti will also be engaging with other stakeholders to strengthen the data availability regime, which is critical to the success of any such modelling framework.