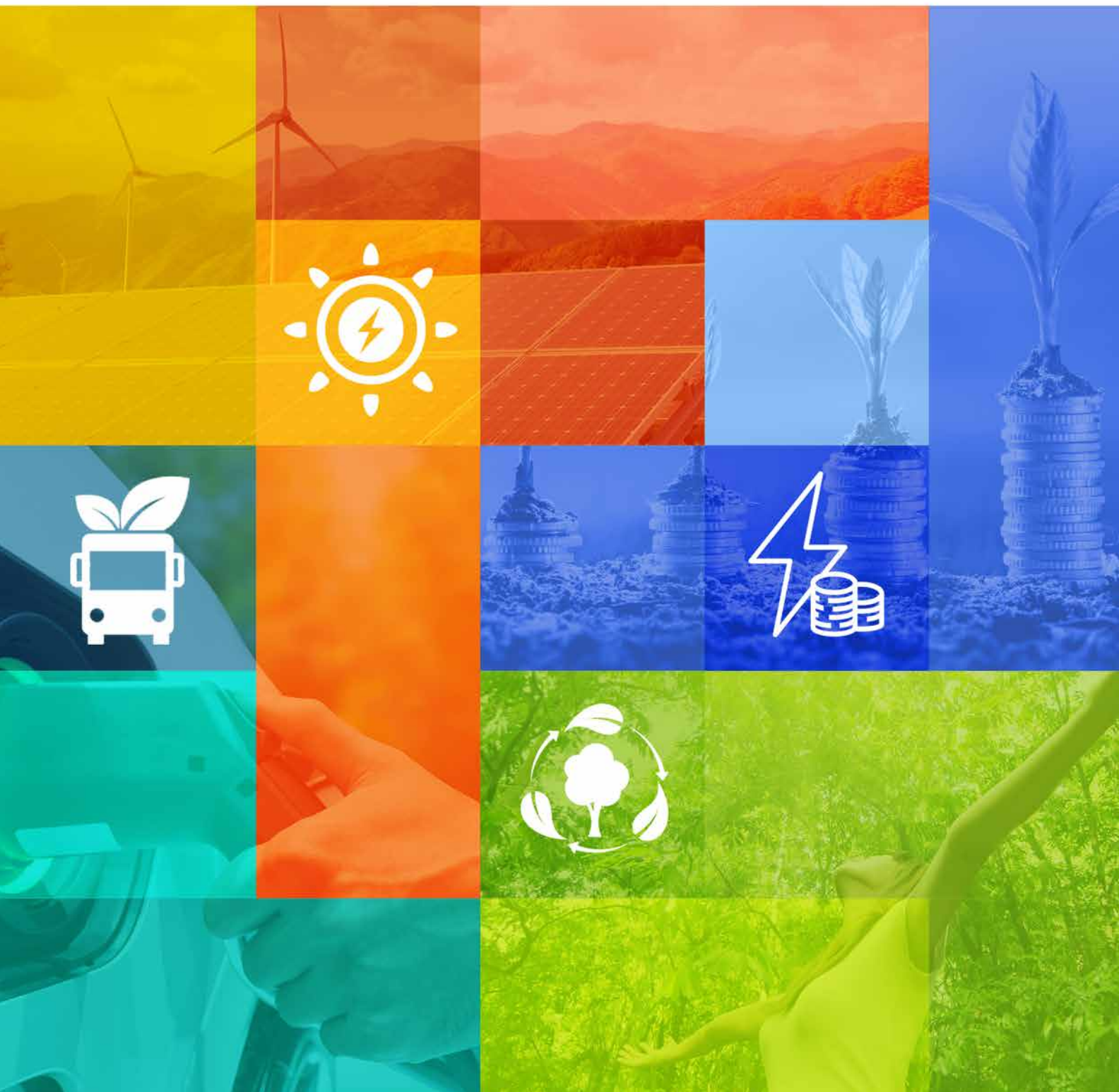


# Energy Dialogues

Annual Report 2018-19







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# Who we are

Shakti Sustainable Energy Foundation seeks to facilitate India's transition to a cleaner energy future by aiding the design and implementation of policies that promote clean power, energy efficiency, sustainable urban transport, climate action and clean energy finance.

Advancing smart energy policies will be key to meeting the defining challenge of the next

generation—how to provide millions of Indians with reliable, affordable, secure access to energy in a sustainable manner.

The energy choices that India makes today will be of profound importance for our future. Meaningful policy action on India's energy challenges will strengthen national energy security, support development and keep our environment clean.



## Our Vision

A clean and secure energy future

## Our Approach

- We believe robust energy policy frameworks are necessary for large-scale, transformative change.
- We bring together experts from government, business, civil society and academia to craft effective energy policies.
- We evaluate the results of our own work rigorously, measuring success using clear metrics based on quantifiable clean energy contributions.
- We work through cross sectoral strategies with the goal of achieving synergistic results and broad impact.





## Board of Directors

### **Jamshyd Godrej**

Chairman of the Board and Managing Director  
Godrej & Boyce Manufacturing Company Ltd.

### **Nitin Desai**

Former Under Secretary General  
United Nations

### **Meher Pudumjee**

Chairperson  
Thermax Limited

### **Rajiv Lall**

Non-Executive Chairman  
IDFC Bank

### **Suman Bery**

Former Director General  
National Council for Applied  
Economic Research

## Advisory Board

### **Harish Hande**

Managing Director  
SELCO India

### **Ramesh Kymal**

Chairman & Managing Director  
Gamesa Wind Turbines Pvt. Ltd.

### **Arvind Mahajan**

Former Senior Director  
KPMG India

### **Moutushi Sengupta**

Director, India Office  
MacArthur Foundation India





# Letter from the Chairman

By the time you read this, Shakti will have marked ten years of an impactful journey in India. Since its humble beginnings in 2009, Shakti has continually been shaped and inspired by a vision of a clean and secure energy future with work spanning some of the most relevant developments of our time—from the transformation to renewable energy to innovation in sustainable urban planning to robust energy efficiency interventions and climate change mitigation.

With record breaking temperatures each year, the challenges of a fast-growing India are more urgent than ever. It inspires many of us who are associated with Shakti to continue to think bigger about the impact we can create as we advance our goal to help India transition to clean and more energy efficient growth pathways.

Earlier in the year, marking the occasion of the World Ozone Day, Union Environment Minister Shri Harsh Vardhan released the India Cooling Action Plan, making India the first country in the world to provide a pathway to reduce India's cooling requirements across sectors. Shakti, through its grantee partners supported the development of four of the six thematic areas strategized under this plan.

With support and contribution from Shakti and its partners, Sikkim now has a climate inventory and Monitoring System, which is the first step for Sikkim towards realizing its vision of being carbon neutral. The design and launch of the State Rooftop Solar Attractiveness Index (SARAL), which

ranks Indian states on their attractiveness for rooftop development providing a reference point for states to take actions that can grow the sector was facilitated by Shakti in engagement with the Ministry of New and Renewable Energy (MNRE) and other partners.

The need for what Shakti offers—support for the design and development of robust and practical policy solutions—has never been greater. There is no doubt that Shakti's role as a funder, convener, sector enabler and policy leader has not only grown but has also been endorsed by a wide range of stakeholders that we have engaged with over the last decade. We are mindful that building a collective vantage point is necessary, and enthused to use collaborations as a springboard for a deeper understanding and action to empower our work. Going forward, we need to advance novel insights and strategies, and back our intent with purposeful action.

I also take this opportunity to convey my gratitude and best wishes to Mr. Krishan Dhawan, who has helmed Shakti as Chief Executive Officer for seven productive and rewarding years. Under his leadership, Shakti has grown from strength to strength making a mark in India's clean energy policy space. It has been my honour and privilege to work with him over last seven years, and I wish him success in all his future endeavours.

**Jamshyd Godrej**

Chairman  
Shakti Sustainable Energy Foundation



# The Shakti Dialogues 2019

Recognizing the importance of open dialogue to share ideas, formulate solutions and foster cooperation, Shakti has been convening the annual Shakti Dialogues, bringing together policymakers, civil society, industry, academia and thought leaders from across the clean energy landscape in India.

From February 18-20th 2019, Shakti hosted the fifth edition of our annual convening with the goal of building upon insights gained from Shakti's on-going work as well informing our future work plans. Our goal is also to create opportunities for collaboration among stakeholders and to identify solutions that will help India in its goal to provide cleaner, sustainable, and more efficient energy to a growing population. This year we convened over 120 representatives from organizations across India to deliberate on the following themes:

**Developing financial frameworks for accelerating clean energy solutions**

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**Catalyzing climate action through corporate leadership**

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**Addressing challenges related to energy efficient and clean cold chains**

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**Addressing climate change mitigation through sub-national actions**

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**Realizing the goal of universal energy access**

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**Improving the regulatory environment for urban transport**

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The sessions were introduced by Mr. Krishan Dhawan, then CEO of Shakti and chaired by distinguished members of the Shakti Board and Advisory 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), and Mr. Harish Hande (Managing Director of SELCO). A number of actionable and practical ideas emerged from the dialogues and we look forward to following up on them.



The image features a composite background of renewable energy sources. In the foreground, there are several rows of solar panels mounted on a metal frame. In the background, a large wind turbine stands prominently, with several other smaller ones visible in the distance. The entire scene is overlaid with a semi-transparent orange filter. The text 'Clean Power' is centered in a large, white, sans-serif font.

# Clean Power



India has emerged as one of the champions of the global energy transition. Riding on a favorable policy environment and dipping prices, renewable energy capacity and generation have grown manifold. India recently witnessed a record low solar tariff of ₹2.44 per unit. Several rural electrifications have been launched, and the Saubhagya scheme is on track to meet its target. But critical challenges still need to be addressed. The quality and affordability of supply must be improved. State-owned distribution companies (discoms) face severe financial losses. Renewable energy must be integrated with the grid in a cost-effective way in order to realize its full potential. Shakti is supporting efforts to scale-up clean power in India by mainstreaming renewables, reducing power demand through efficiency measures, promoting distribution sector reforms and enhancing electricity access.

### **Moving beyond connections: Access for development**

Access to energy is at the heart of development. While there is a lot of focus on connecting households to the electricity grid, the goal of reliable 24X7 power is yet to be achieved. And beyond connections, consumers need reliable power and improved customer services especially in the segments which are critical and essential for the last mile population like health, education and livelihoods. Thus over the last year, Shakti evolved its energy access program to find ways to improve the delivery of electricity services in the health and education sector. We recently supported a study to assess the baseline situation of electricity supply in the health and education sector in Gujarat, Bihar and Jharkhand. The idea is to create a roadmap to achieve reliable and quality electricity supply for these segments in the most optimum manner. In a similar effort targeting livelihoods, we supported efforts in select rural agro-based Micro and Mini SMEs in Uttar Pradesh and Bihar in order to understand the benefits of potential of implementing solar projects, and how to improve their production capacity with better electricity supply.

### **Enhancing energy access through the convergence of solutions**

DRE has come a long way in India and can play a key role in closing the electricity gap. But the transformative potential of DRE is yet to be completely recognized. DRE can complement the grid and not be in competition to it. The co-existence of last-mile DRE solutions and grid power can help provide 24X7 power for all, improve living standards, and support the delivery of health and educational services. Over the last year, Shakti supported efforts to develop a more evolved narrative to promote the value of DRE systems by

engaging government, investors, developers and thought leaders on the issue. In the same vein, Shakti is working to deepen the market for energy efficient equipment in rural areas by exploring market-based interventions and establishing the technical feasibility for the interchangeability of AC and DC inputs for equipment.

a similar exercise in Bihar where stakeholder consultations are underway.

## States are demonstrating innovating ways of providing reliable power to all

Bolstered by a conducive ecosystem, Indian states are gradually looking to deploy innovating ways of providing reliable power to all. Last year, Shakti commissioned the development of an integrated mini-generation and distribution model, which aims to provide reliable power through locally available energy resources while leveraging community engagement and private sector expertise. Now, ongoing efforts are exploring potential sites in Uttar Pradesh and Assam to test the model.



## Looking to the future: Power Sector Vision 2030

Efforts at the state level can enable India's power sector to deliver clean, reliable and affordable power for all. With this in mind, Shakti initiated efforts to support the development of long-term visioning exercises for Maharashtra and Bihar, in order to shape what the power sector should look like in 2030. In Maharashtra, stakeholder discussions amongst key state actors including generation, transmission and distribution utilities, regulatory commissions, load dispatch centres and water, transport and public work departments have culminated in an integrated vision and actionable roadmap for improving the performance of the power sector. The state's energy department has approved this Power Sector Vision 2030, which takes into account the implications and benefits of emerging trends in the power sector, the need to decarbonize and green operations and to make the sector sustainable. We are supporting

In Jharkhand, efforts enabled by Shakti have led to the development of draft Renewable Energy based Mini Grid Policy and Regulations for the state. The draft policy has been presented to the state government for review. At 45.17%, Jharkhand has one of the lowest levels of household electrification rates in India, and this policy can play a key role in helping to bridge this gap.

In another effort, Shakti is facilitating pilots to explore the feasibility of co-existence of micro-hydel plants with solar, and their integration with the electricity grid in order to provide enhanced electricity access. Ten site assessments have been undertaken in five states so far, based which recommendation have been submitted to the Ministry of New and Renewable Energy. The recommendations are expected to inform India's solar hybrid policy.

## Strengthening the Decentralized Renewable Energy ecosystem

Decentralized Renewable Energy (DRE) can play a key role in meeting India's ambitious electrification targets. But in the absence of local entrepreneurs, the delivery of energy services in rural areas remains largely untapped. To address this crucial barrier, Shakti has been investing in efforts to incubate select entrepreneurs in the North-Eastern states, Odisha and Bihar. Entrepreneurs have been equipped with resources, management expertise, intellectual capital and technical assistance in order to boost their capacity and enhance their vision. Now, we are focusing on entrepreneurs in North East India, East India and Rajasthan.

Shakti is supporting 'Train the Trainer' sensitization programmes for banking officials in order to increase their awareness of lending for DRE solutions. So far, 131 trainers from bank staff training colleges, 464 bankers and 109 senior bank officers from Assam, Meghalaya, Odisha, Bihar, Rajasthan, Karnataka, Tamil Nadu, Uttar Pradesh have participated in these programmes. Going forward, Shakti is supporting efforts to extend this training to other institutions such as cooperative banks and micro finance institutions.

Shakti is also supporting efforts to improve energy access for irrigation through solar pumps in the state of Chhattisgarh, which has already deployed around 40,000 off-grid solar pumps with plans for further expansion. Studies supported by Shakti will take stock of these installations, evaluate their impact, and feed into inputs for the implementation of the Kisan Urja Suraksha evam Utthaan Mahabhiyan (Kusum) scheme.

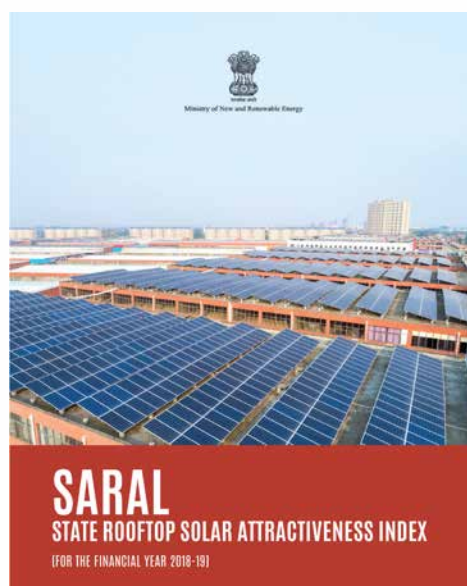
The Shakti-commissioned Distributed Renewable Energy Investment Policy Tracker (DIPTI <http://dipti.sustainabilityoutlook.in/>) is the first comprehensive knowledge repository of the distributed renewable energy sector in India. With India's massive electrification effort underway, DIPTI is designed to empower investors and other DRE players with the data, resources and insights needed to take more informed decisions on investments and potential opportunities.



## Mainstreaming rooftop solar in India

With a target of 40 GW of rooftop solar PV by 2022, rooftop solar is a promising solution for to meet India's growing energy needs sustainably. While commercial and industrial consumers have been making significant strides to harness rooftop solar, the residential consumer category continues to face challenges.

In 2018, Shakti supported the development of discom-led business models for residential consumers of BSES Yamuna, a distribution utility in Delhi. The utility is moving ahead to pilot the models in a densely populated locality in East Delhi. To support these pilots and trigger scale, the Delhi Electricity Regulatory Commission notified the Group and Virtual Net Metering Guidelines in June 2019. Taking the success and learning from Delhi, we began working in two other states—Jharkhand and Gujarat.

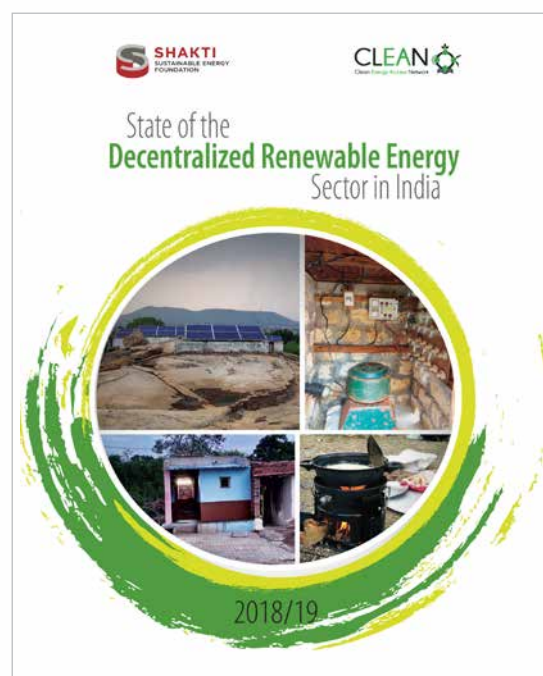


The Ministry of New and Renewable Energy has adopted the Shakti-supported 'The State Rooftop Solar Attractiveness Index – SARAL' as part of its 100-day plan. SARAL is an index to assess and evaluate various states for their preparedness to support rooftop solar deployment, and performance so far. It ranks based on parameters that are critical for establishing strong solar rooftop markets and aims to instill competitiveness among states.

Efforts supported by Shakti have led to the development of a toolkit to plan large-scale grid integration of rooftop solar. It consists of a) a tool for discoms to estimate the economic value of integrating rooftop solar into the grid and b) a decision-support tool for rooftop solar business models led by discoms.

### Tracking the progress of clean energy by addressing data gaps

Accurate and reliable data on clean energy is a critical enabler for policy makers analysing and developing energy policies. The Shakti-supported Brookings India Electricity and Carbon Tracker is a near-real-time tracker that shows electricity generated by source (e.g. Renewable, Thermal) at a national level. It also shows total electricity-based CO<sub>2</sub> emissions every five minutes and CO<sub>2</sub> emissions per kWh. Additionally, it displays the moving averages for each generation source, as well as a wide variety of summary statistics and analysis. Until now, national electricity generation data was only available on a daily basis, as energy (kWh). This tracker focuses on capacity (kW) over time, which makes it possible to draw patterns and inferences about electricity generation in the country. The Shakti-supported 'State of the Decentralized Renewable Energy Sector in India 2018-19' report developed by the Clean Energy Access Network surveyed CLEAN's member organizations to assess the growth of the DRE sector in the country and future needs. It highlights 28 impactful case studies from the sector, which indicate the sector's expansion from energy access to development.



### Strengthening the distribution sector

The distribution sector is a critical component of the power sector value chain and in the last decade, India has initiated multiple programs to enhance its financial and operational viability. In light of these dynamics, Shakti has initiated several efforts to strengthen the distribution sector. In Maharashtra, efforts supported by Shakti have led the Maharashtra State Electricity Distribution Company Limited (MSEDCL) to adopt 20 Standard Operating Procedures (SOPs) to improve their customer experience. The MSEDCL is also mapping its consumer journey as well as digitizing their consumer facing processes in a bid to be more efficient. In Gujarat, Shakti is supporting efforts to develop a 'time of use' tariff structure designed to incentivise customers to use more energy at off-peak times, in order to balance demand. This in turn will enable discoms to optimize their power purchase costs.

Shakti has facilitated efforts to enable a Delhi Discom to develop a peak load management strategy that will help optimizing distribution performance in the wake of increasing distributed generation from rooftop solar as well as the new category of load coming from EV charging. Shakti has also facilitated the design of a cost of supply framework, which provides solutions to addressing some of the challenges faced by discoms when calculating the actual cost of supply. This framework has been shared with state actors in Bihar, Rajasthan and Uttar Pradesh. It also featured at the Distribution utilities Forum, a Shakti-supported platform that convenes the leadership of distribution



utilities on a common platform to share views, successes, learning and solutions. A few participating utilities will now test it out.

In addition, Shakti facilitated Demand Response (DR) events with Uttar Pradesh Power Corporation Limited and Jaipur Vidyut Vitran Nigam Limited in Uttar Pradesh and Rajasthan respectively. DR is a strategy used by distribution companies to alter the power consumption behavior of an electricity customer to better match the demand for power with the supply from the distribution companies. This effort is helping to introduce efficiency in distribution operations and while also aligning discom objectives with the willingness of consumers.



## **Deepening stakeholder engagement in the power sector**

There is a need for greater and more informed participation of civil society organizations (CSOs) and well as consumers to promote greater accountability and transparency mechanisms in policy and regulatory processes. Both groups can act as catalysts for facilitating expanded electricity access, improved supply quality, cost affordability, overall system efficiency and the adoption of cleaner resources. In Uttar Pradesh, Shakti is supporting state-efforts to build CSO capacity for their more effective engagement in the electricity sector. In Rajasthan, Shakti-supported efforts have led to the creation of district level Electricity Consumer Assistance Cells that are aiding consumers in the process of grievance redressal. In Tamilnadu, ongoing efforts are helping to increase consumer awareness on the readability of electricity bills along with improving the consumer grievance redressal process.



# Transport





**U**rbanization in India has accelerated at an unprecedented rate in recent years. India's urban population reached 420 million in 2015 and is expected to almost double to 800 million by 2050. The transport sector is already a significant consumer of energy, and the massive increase in the number of private vehicles accompanying urbanization will lead to numerous stresses on cities: rapidly expanding urban sprawl, inadequate and unreliable urban infrastructure, growing congestion and hazardous air pollution. With urban renewal initiatives such as the Smart City Mission and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) underway, cities are looking to grow sustainably. The electric mobility push is expected to change the urban landscape. Against this backdrop, Shakti works to accelerate the transition to sustainable urban transport in cities.

### Growing India's Smart Cities

India's Smart Cities Mission is designed to be an innovative and all-inclusive approach for cities to pioneer and effect new, innovative blueprints for urban growth. But five years into the mission, progress has not been as rapid as anticipated largely due to the absence of a strong enabling policy and regulatory framework. Another challenge is that Urban Local Bodies (ULBs) face problems due to limited manpower and lack of planning. Recognizing the vital importance of cities as venues for strategic action on clean energy and climate change Shakti is facilitating efforts to enhance the success of the Smart Cities Mission.

Over the years, Shakti has been facilitating technical and advisory support to cities shortlisted under the Smart Cities Mission. In Udaipur, our support led to the development of a policy for public transport and Intermediate Public Transport. The Suraj Pol junction in the city was redesigned for better mobility and accessibility and is now running successfully. In Vishakhapatnam, a route rationalisation plan and technical specifications were developed for e-rickshaws and e-loaders. In Ludhiana, a scoping study for e-rickshaws was developed, and in Gwalior, Shakti-supported efforts informed the development of tenders for an rickshaw project and bus shelters.

In Chennai, Shakti has helped position a C40 City Director to provide technical assistance on sustainable urban transport to city agencies. In Delhi, our support has contributed to the development of the draft Electric Vehicle Policy 2019, which was published for public consultation. In addition, the Delhi Government notified eight bus terminals to be constructed—these are important steps for Delhi, which has India's largest operational metro network and a sizeable bus fleet, but still faces significant urban mobility challenges



## Better management practices for ULBs

Shakti is supporting efforts to improve the fiscal management practices of ULBs in select states, which will help them improve their credit rating and be able to raise Green Municipal Bonds for sustainable urban transport projects. Last year, our grantee partner Janaagraha signed a tripartite Memorandum of Understanding (MoU) with the Ministry for Housing and Urban Affairs and the National Institute of Urban Affairs to develop model frameworks for state governments to institutionalize sound financial management practices in ULBs. Janaagraha also signed an MoU with the Commissioner and Director of Municipal Administration, Telangana to conduct an evaluation of 16 Urban Local Bodies and two Urban Development Authorities in order to identify and implement systemic reforms for urban governance. In addition, based on recommendations made to the 15th Finance Commission, Shakti supported efforts to develop pathways for the fiscal decentralization of ULBs. Shakti also supported analytical briefs on the financial and operational management of two city bus transport corporations.



## Bus Karo is creating a strategic vision for better bus services

The Bus Karo Forum facilitated by Shakti is a peer-to-peer knowledge sharing network consisting of State Transport Undertakings (STUs) and city bus and private bus operators. Last year, Shakti's support to this forum helped develop a data analytics tool for measuring the performance of bus systems for the Bangalore Metropolitan Transport Corporation (BMTC). This tool is currently housed by the BMTC and being used to monitor bus operations in real-time. The data will help the BMTC plan bus routes and schedules to help increase their ridership. In addition, the BMTC was provided specific inputs on the regulatory amendments needed to introduce the services of bus aggregators as well as on taxation reforms required at the state level to improve the Bangalore city bus system.

## A toolkit for estimating bus fleets

Public buses are an integral part of a city's transport system. But they are unable to meet the current transport demand because of limited investments and the lack of the infrastructure required to maintain and expand bus operations. Efforts supported by Shakti have attempted to address some of these challenges. For instance, the Shakti-supported bus fleet estimation tool is being used to develop a long-term roadmap for enhancing the fleet of the Jammu and Kashmir State Road Transport Corporation (JKSRTC), Andhra Pradesh State Road Transport Corporation (APSRTC) and Maharashtra State Road Transport Corporation. The tool will help them gauge their current and projected bus transport demand along with the short, medium and long-term investments required to improve bus services and infrastructure improvement.

In New Delhi, four bus terminals in Delhi were provided solutions to improve the layout of bus bays and the movement of buses. These recommendations have already been tendered for construction. In addition, redesign guidelines for three bus depots in Delhi have been shared with the Delhi transport department. The designs are intended to optimize space and enhance bus parking and maintenance including for electric buses.

## 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 compound these challenges. The sector's regulatory environment is governed by multiple agencies at the central, state and city-level. It is against this background that Shakti is supporting an assessment of the existing regulatory framework of the transport sector as well as 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.

## Congestion pricing measures in Mumbai

Transport Demand Management measures (TDM) such as congestion pricing can help improve mobility and reduce pollution in a rapidly urbanizing India. Congestion pricing, one example of a TDM measure, levies taxes or charges on private vehicles that enter high occupancy areas during peak hour traffic. The charges keep a check on private vehicles and shift ridership to public transport modes.

Congestion pricing is an important measure for cities like Mumbai, which have witnessed a steep growth of personal motor vehicles in recent years. According to the Comprehensive Mobility Plan (CMP) for Greater Mumbai (2016), the total number of personal motor

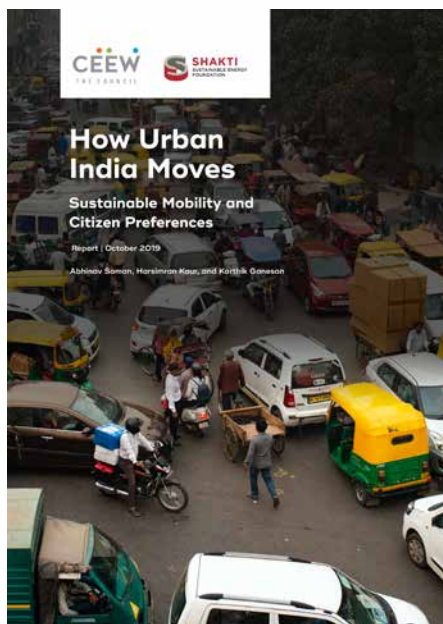
vehicles increased from 0.79 million in 2001 to 2.27 million in 2015. The CMP for Greater Mumbai (2016) mentions congestion pricing as one of the strategies under 'Traffic Management Measures'. It is within this context that Shakti is supporting the development of a congestion pricing strategy for Greater Mumbai. The knowledge created through this effort can encourage the adoption of congestion pricing as well as other TDM measures in other Indian cities.

## Survey on public perception towards clean transport

One of the most effective ways to nudge the transport sector towards an efficient and cleaner future is to inform and influence consumer behaviour towards low-carbon transport modes such as walking, cycling and public transport. But what do consumers perceive about these modes of transport? What are their preferences regarding transport modes and expenditure on transport activities? Shakti has supported a survey of consumer perspectives and experiences on sustainable transport modes, which threw up interesting findings. Overall, there is significant support among respondents for policy interventions supporting sustainable mobility and deployment of clean fuels, including demand-management policies and congestion pricing. A



significant majority (71 per cent) of the respondents said that their next vehicle would likely be an EV and even greater share of surveyed population (93 per cent) was in favour of central and state governments providing incentives and subsidies for EVs.



## The Sustainable Urban Mobility Network

Shakti is supporting the Sustainable Urban Mobility Network (SUMNet), a network of grassroots level civil society organizations that works towards fostering policy dialogue and action on sustainable urban transport issues. Over the last year, SUMnet has carried out walkability studies in 11 cities and showcased alternate street designs to implementing agencies. In Gaya, civic agencies also demonstrated the street design. Under the aegis of SUMNet, a cycle rickshaw policy is being formulated for Jharkhand and Bihar.

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# Electric Vehicles



**P**ushing ahead with its goal to increase electric vehicles in order to curb worsening air quality in cities and reduce expensive oil imports, India recently announced the second phase of the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME 2) scheme with an outlay of Rs. 10,000 crores. Several states such as Andhra Pradesh, Karnataka, Kerala, Maharashtra, Uttar Pradesh, and Uttarakhand have already finalized EV policies while Delhi and Telangana have released draft EV policies. The momentum for EVs is growing but it may take several more years before EVs attain a self-sustaining momentum, and sales take off in large numbers. A number of challenges such as high EV costs and range anxiety primarily due to lack of charging stations will need to be tackled. It is within this context that Shakti is working to accelerate the transition to electric vehicles in India.

### **Informing the design of the second phase of the FAME scheme**

As India prepares to implement FAME II, it is important that learning from the first phase is incorporated, particularly in order to address some of the implementation challenges faced by stakeholders. Last year, Shakti facilitated the development of a report on the learnings emerging on subsidies under FAME I as well as international best practices. The recommendations were presented to the members of the Department of Heavy Industry's 'Committee for Standardisation of Electric bus Specification'. This committee is chaired by the Director, Automobile Research Association of India (ARAI) and includes members from the Ministry of Road Transport and Highways (MoRTH), Ministry of Housing and Urban Affairs (MoHUA) and the Association of State Road Transport Undertakings (ASRTU). Our grantee partner for this effort, UITP, is a member of the committee. The report and committee recommendations will be used to develop a future course of action on electric bus subsidies as well as inform the bus funding scheme under FAME II.

### **Capacity building programs on the planning and deployment of electric buses**

In the face of increasing urbanization and air pollution, more and more Indian cities are looking at cleaner transport options such as electric buses. A few cities have launched electric buses under the Faster Adoption and Manufacturing of (Hybrid and) Electric vehicles (FAME) scheme, while many others are at different stages of planning and roll-out. Critical decisions will need to be taken around vehicle technology alternatives, incentive schemes and procurement models for electric buses, particularly in context of the second phase of the FAME scheme, which was launched in early 2019.

Shakti is enabling efforts to help cities take more informed decision in this regard by supporting capacity building programs on the planning and deployment of electric buses. These training programmes bring together representatives from State Transport Undertakings, Special Purpose Vehicles (SPVs) managing city buses, manufacturers, think-tanks and consultants, Indian and International experts. Sessions provided an overview of the procurement of electric buses and tender structures, charging infrastructure, implementation challenges and considerations required for the full transition to electric buses.

Shakti is also supporting a national-level working group on 'Electric buses for India' which convenes key government officials, representatives of State Road Transport Undertakings (SRTUs), professionals from academia and think-tanks promoting electric mobility. The working group acts as a knowledge sharing platform for various city bus agencies on matters of energy performance of electric buses, tendering structures and charging infrastructure.

**T**he Shakti-supported national-level working group on electric buses for India acts as a knowledge sharing platform for various city bus agencies on matters of energy performance of electric buses, tendering structures and charging infrastructure.



## Charging electric vehicles – Impact and opportunities for Discoms

India is emphasizing the development of a robust ecosystem for the faster adoption of electric vehicles (EVs). Last year, Delhi announced a draft EV policy intended to promote the adoption of battery electric vehicles (BEVs) so that 23% of all new vehicle registrations would be electric by 2023. In order to achieve this goal, charging infrastructure will need to be rolled out in a planned and effective way. But new BEVs will also be an additional burden on the grid. In order to facilitate this transition, a Shakti-supported study is assessing the influx of various types of EVs in Delhi along with the impact of their charging pattern on the distribution network in Delhi. In Uttar Pradesh too, the government is encouraging the deployment of EVs with a draft EV policy in the works. Shakti is engaging with Discoms in Uttar Pradesh to develop a business model to promote EV charging businesses. Efforts supported by Shakti will identify the locations, type of charging facilities and upgrades to the distribution network from the discoms' perspective.

## Evolving the narrative on electric mobility in India

Last year, Shakti facilitated a comprehensive analysis of communication in the electric mobility ecosystem in India and identified important and powerful narratives that are beginning to emerge around electric mobility in India. During this process, multiple organizations working in the space of electric mobility were convened for a 2-day workshop to co-build a common vision and plan of action for accelerating adoption of electric mobility in India through unique information and communication strategies. The workshop was a critical step for bringing these players together and arriving at a common road map. The participants were the leading experts on electric mobility from different sectors —OEMs, think tanks, research institutes, journalists, shared mobility companies, and



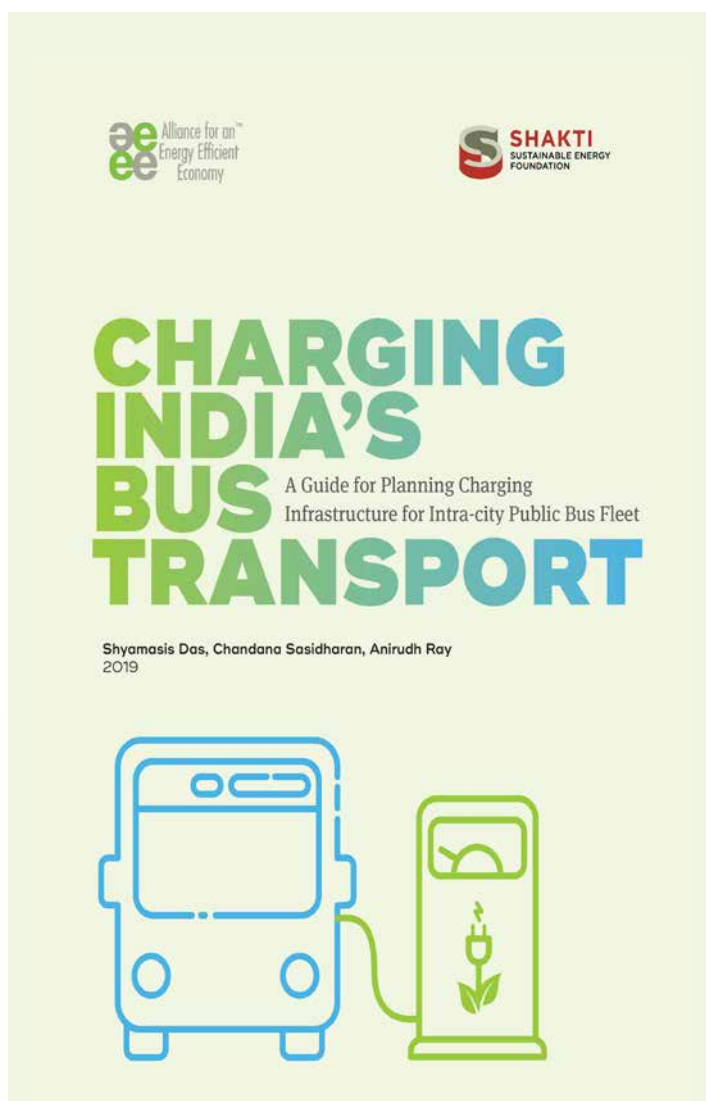


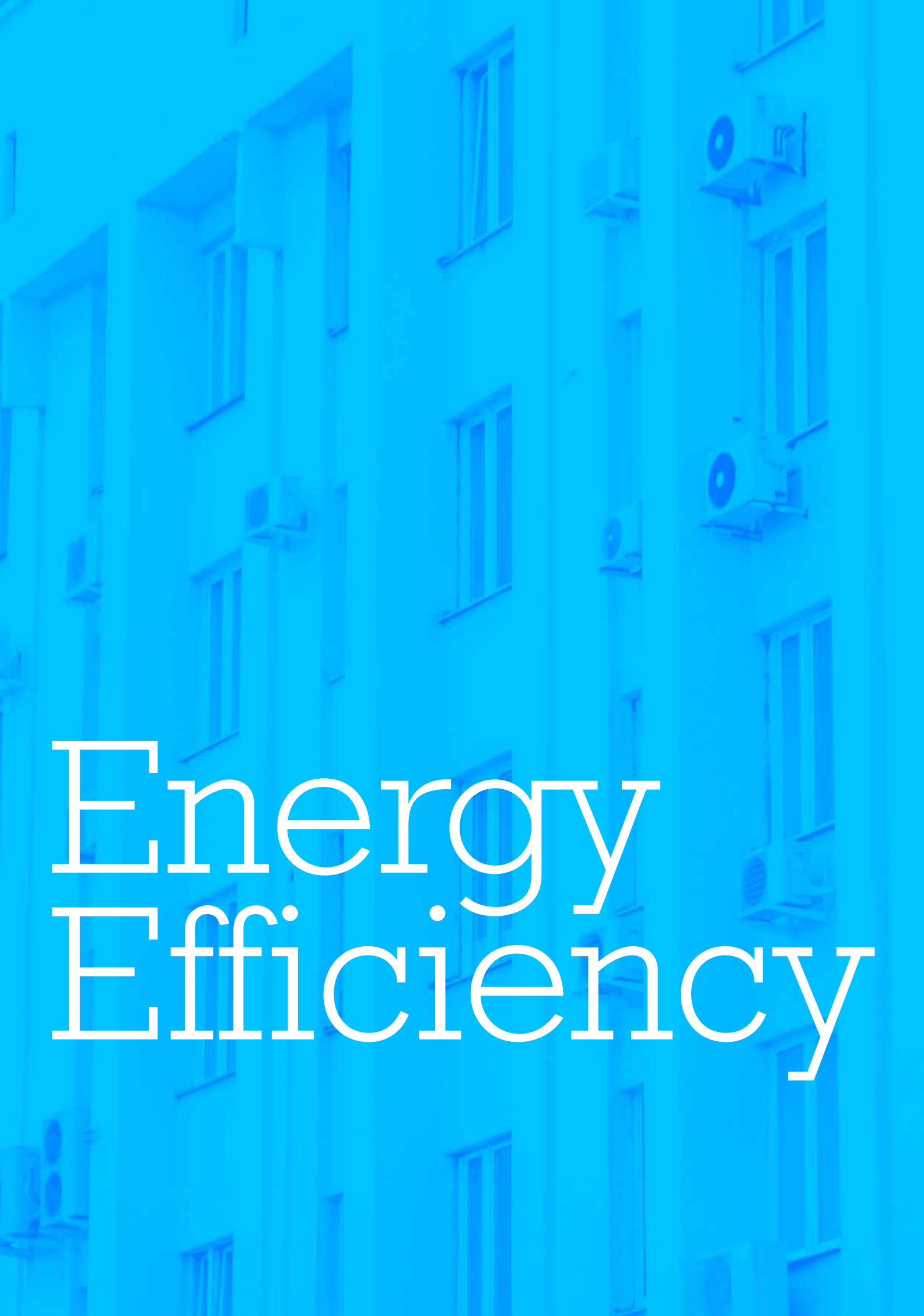
A study supported by Shakti caters to the charging demand of an e-bus fleet by providing a roadmap to facilitate the transition of public bus mobility in a Tier-I or Tier-II city in India to fully electric.

technology companies. Perspectives and inputs from the workshop are now feeding into the design of a communication strategy to ensure stakeholders are aware and capable of making informed decisions.

## Charging India's Bus Transport

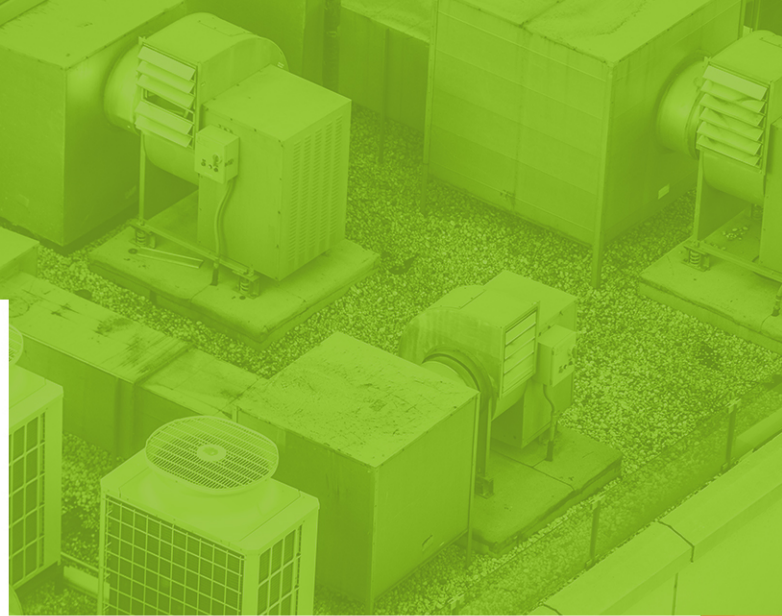
The transition to electric buses from conventional diesel-run buses augurs well for the government considering state-owned public bus fleets account for about 14% of total diesel consumption in the transport sector. The recent approval of the FAME-II scheme has been a major boost to the electrification drive in the public bus segment. Going forward, charging stations must be deployed in a planned way so that bus service providers can operate more efficiently. In order to support this process, a study supported by Shakti caters to the charging demand of an e-bus fleet by providing a roadmap to facilitate the transition of public bus mobility in a Tier-I or Tier-II city in India to fully electric. Its findings provide insights into e-buses and the charging technology market as well as recommendations for setting up the charging infrastructure for an intra-city e-bus fleet.





# Energy Efficiency



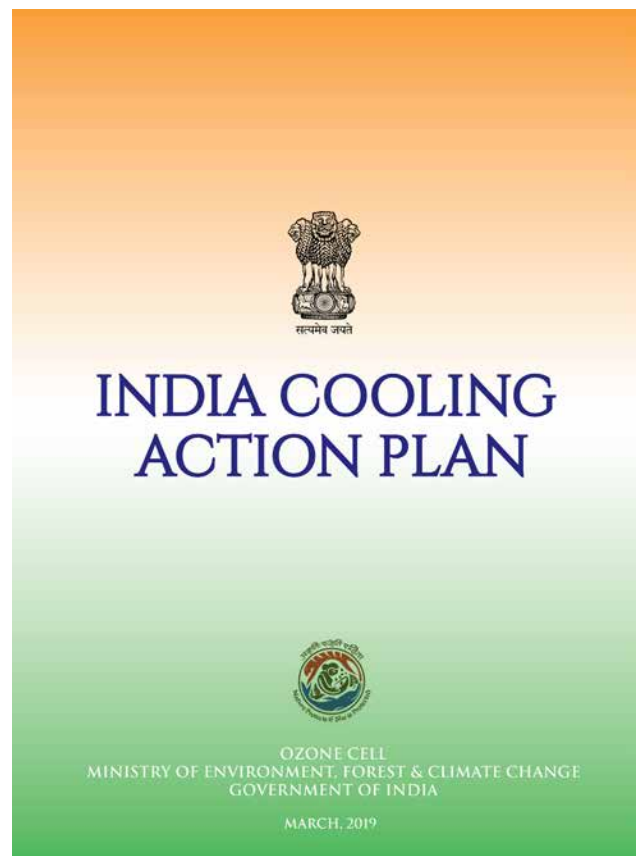


**A**ccording to the International Energy Agency (IEA), India's energy use is expected to more than double by 2040. Energy efficiency is a key opportunity for India to save energy and costs and to achieve India's climate environmental and climate goals. Shakti works with stakeholders in the government, academia, civil society, and industries to aid the design and implementation of policies that lead to low carbon growth in the three sectors: Industry, Buildings and Cooling.

### **The India Action Cooling Plan is drafted and released**

With India facing record high extreme temperatures events each year, the need for cooling solutions is greater than ever before. India's cooling demand is expected to grow eightfold in 20 years. As living standards rise, this enormous demand will strain India's electric grid, increase fuel imports, and magnify the impact of climate change.

Recognizing this imperative, the Ministry of Environment, Forest and Climate Change moved forward with the new comprehensive India Cooling Action Plan (ICAP)—the first of its kind for any country in the world that is aimed at meeting the country's rapidly growing cooling needs sustainably while addressing climate concerns.



Shakti contributed immensely to the extensive stakeholder consultation process that culminated in the draft of the ICAP. Over the last two years, Shakti-supported grantees helped to build a solid analytical foundation on areas like space cooling, thermal comfort in buildings, the implications of an HFC phase down and alternative refrigerant. Shakti also helped to form a 12-member civil society coalition on cooling to consolidate varied technical work and to engage meaningfully with key policy making bodies.

When the Ministry prioritized the need for a national cooling plan, our grantees were part of the six thematic working groups were created by the Ministry to draft it. Being fully prepared by being part

of the coalition, our grantees led four of the thematic working groups working on the ICAP and were represented across all six working groups.

With much of the groundwork already laid, our grantees develop their drafts in a short timeframe of five months. The final ICAP was released in March 2019. It is designed to be far-reaching and includes considerations ranging from thermal comfort, energy efficiency through building design, and standards and labelling for appliances and behavioural change in order to manage India's growing cooling demand.

## Shakti Supports the Global Cooling Prize Launch for Breakthrough Innovations in Cooling Technology

Shakti is a co-sponsor of the Global Cooling Prize, which aims to find innovative and climate-friendly technologies for residential cooling. By 2030, over half of the world's population will live in hot climates with increasing exposure to potentially dangerous heat conditions. Residential cooling demand will boom three times globally, and increase by five times in developing nations by 2050.

The Global Cooling Prize is intended to incentivize the development of a residential cooling technology that will have at least five times less climate impact than current standard Room Air Conditioning (RAC) units. The winning air conditioning technology could prevent up to 100 gigatons of carbon dioxide (CO<sub>2</sub>) equivalent emissions by 2050 and put the world on a pathway to prevent up to 0.5°C of global warming by 2100.

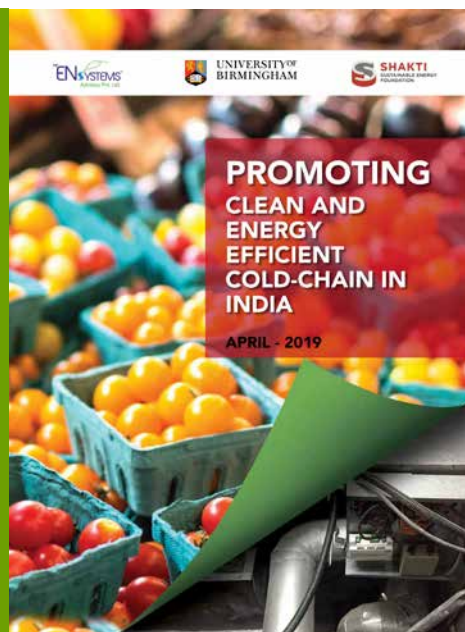
The Global Cooling Prize is led by Mission Innovation, the Government of India through the Department of Science and Technology (DST) and its partner organizations, the Ministry of Power, Bureau of Energy Efficiency, and Ministry of Environment, Forests and Climate Change. It will be administered by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

So far, the prize has received almost 450 submissions from innovators across 56 different countries around the world — reinforcing the truly global scope and nature of this Prize. These include submissions from many of the major industry participants along with the work of notable universities and research institutions.

## Towards cleaner and more energy efficient cold chains

Cold chains play a fundamental role in creating a higher shelf-life for produce, reducing post-harvest food loss and increasing farmer incomes. Unfortunately, around 40% of perishable food in India is lost between the farm gate and retail outlet due to inefficiencies in the cold chain. A robust cold-chain network is necessary to meet the Sustainable Development Goals (SDGs), particularly those relating to ending poverty and hunger. Cold chains also need to be cleaner and more efficient in light of India's climate commitments and in order to meet India's target of doubling farmers' income by 2022 through productivity gains.

Shakti is a co-sponsor of the Global Cooling Prize, which aims to find innovative and climate-friendly technologies for residential cooling.



A Shakti-commissioned report titled “Promoting clean and efficient cold chains in India report was an important input to the discourse on this transition. Prepared in collaboration with the University of Birmingham and MP Ensystems Private Limited, this report assesses the cooling needs of farmers in the states of Haryana, Punjab, Maharashtra and Karnataka, and provides a four point roadmap to reduce the environmental impact of much-needed food cooling. The recommendations include promoting new business models, establishing “Living Labs”, creating infrastructure for training and outreach, and facilitating hackathons and IT based agri-supply chain solutions.

In April 2019, the second Clean Cooling Congress launched this report where it was a key input to the dialogue on sustainable cooling policies. The second Clean Cooling Congress is hosted by the University of Birmingham with the World Bank Group, the UK Department of Business Energy and Industrial Strategy (BEIS), and Mission Innovation.

SAMEEKSHA was jointly set up by the Bureau of Energy Efficiency, Swiss Agency for Development and Cooperation and the Ministry of Micro, Small & Medium Enterprises (MoMSME), with The Energy and Resources Institute acting as the platform’s secretariat. With India’s MSME sector India contributing enormously to the economy, SAMEEKSHA’s role and the resources it provides are being viewed an increasingly important. SAMEEKSHA was recently acknowledged in India’s second Biennial Update Report (BUR) submitted to the UNFCCC, as an important intervention contributing to the implementation of the convention.

## Knowledge hub for MSMEs recognized in India’s second Biennial Update Report

The economic significance of Micro, Small, and Medium Enterprises (MSMEs) is immense — MSMEs that are engaged in manufacturing account for 45 per cent of India’s total industrial output and eight per cent of the national GDP. According to estimates, their energy saving potential is around 3.5 MTOE.

To help achieve this potential, the Shakti-supported Small and Medium Enterprises Energy Efficiency and Knowledge Sharing (SAMEEKSHA) is serving as a knowledge sharing platform for the sector. SAMEEKSHA pools and shares the knowledge of institutions and key stakeholders that work towards promoting energy efficiency in India’s MSME sector.

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IS NO  PLANET B





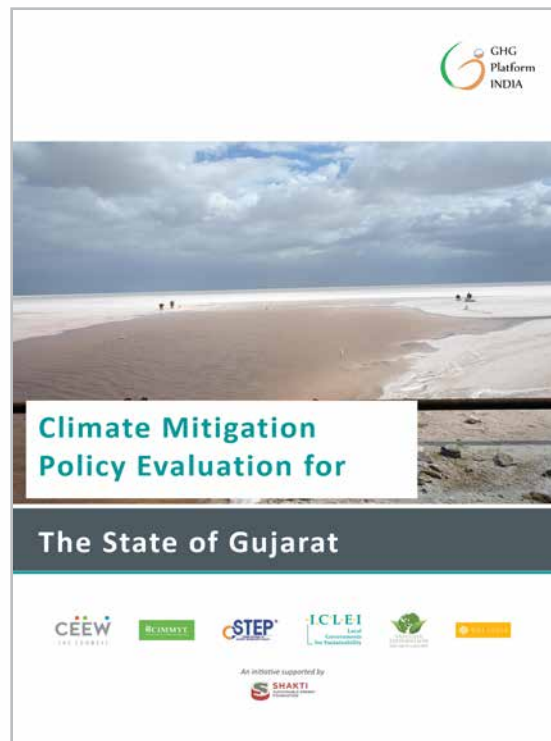
India has made a strong commitment to achieve the goals set under the Paris Agreement. Its pledge lays out a comprehensive approach that brings together actions at both the national level and in states to limit the impact of the climate crises while endeavoring to foster economic growth, energy access and jobs, and improve air quality. Shakti is supporting these efforts in order to enable India to transition faster towards a low-carbon pathway and exceed its Paris pledges.

### Helping to meet India's MRV needs

Now that India must take concerted action to deliver on its NDCs, a major thrust will be to develop robust Monitoring, Reporting and Verification (MRV) systems that will assess whether India's efforts to address climate change are making a difference. A starting point to robust MRV systems is the measurement and tracking of GHG emissions. Shakti is prioritizing two efforts in this direction:

- Shakti is supporting the establishment of the GHG Platform India ([www.ghgplatform-india.org](http://www.ghgplatform-india.org)), a collaborative

platform of civil society organizations to prepare GHG emission estimates at the national level and for states. The Platform is addressing a critical data gap—the lack of updated, reliable, and publicly accessible GHG inventories for the country across key sectors of Energy, Industry, Agriculture, Livestock, Forestry, Waste and Land-use and Land-use Change and Waste.



The Platform has already prepared emission estimates for the years 2005-2015 and carried out a trend analysis of state level GHG emissions for 28 states and 7 union territories. When the Government of Madhya Pradesh initiated the process of revising its state climate action plan, the GHG Platform India stepped in to work with the state's Department of Environment to assist in the revision of the plan's mitigation components.

In early 2019, the Platform's efforts were recognized in India's second Biennial Update Report (BUR), which is an important requirement towards the fulfilment of India's reporting obligation to the UNFCCC.

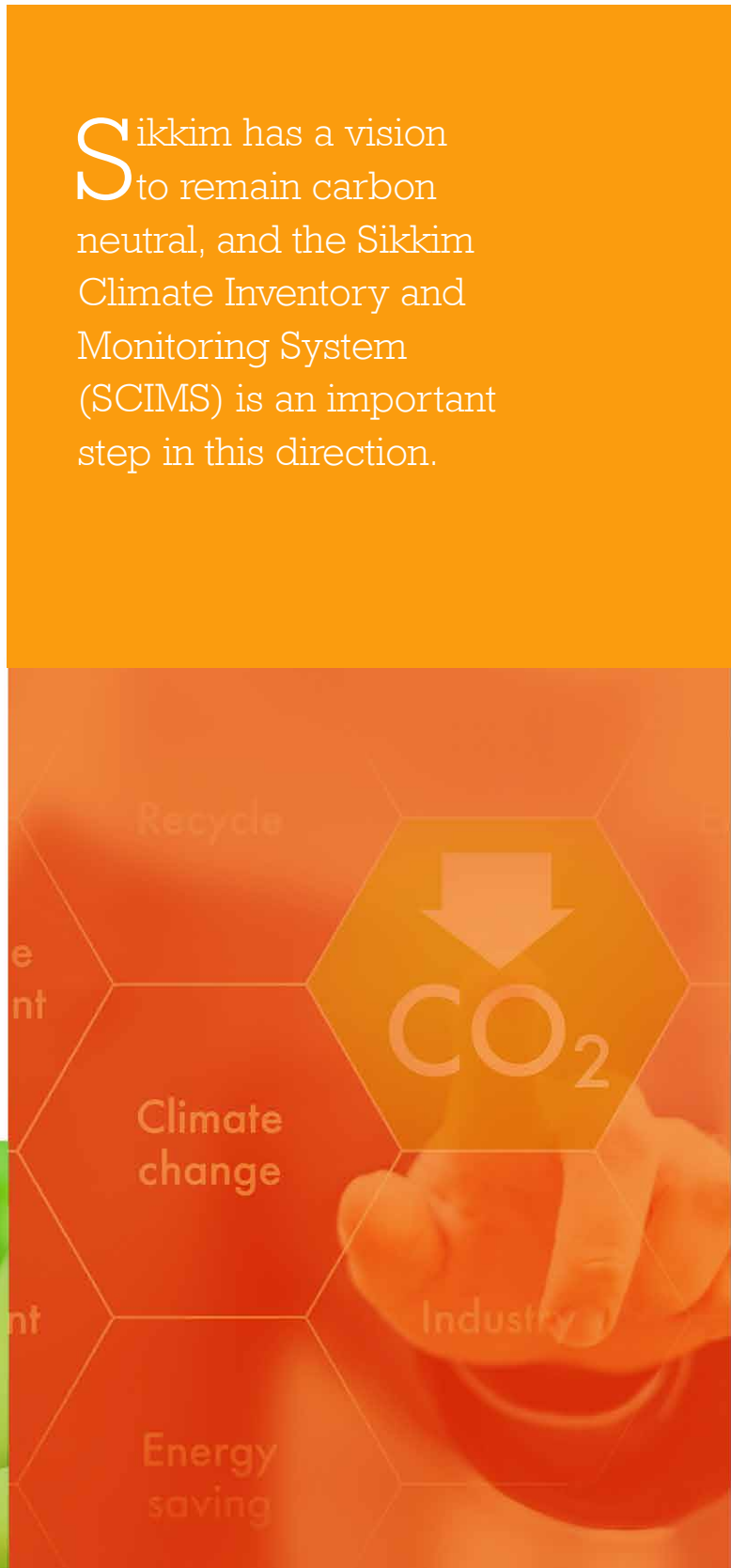
- To strengthen MRV at the sub-national level, Shakti facilitated the development and deployment of the Sikkim's Climate Inventory and Monitoring System (SCIMS).



The SCIMS is the first of its kind custom designed web-based dashboard consisting of the state's GHG inventory that also allows the state to conduct its own climate MRV. Sikkim has a vision to remain carbon neutral, and the SCIMS is the first step for Sikkim in this direction. It was officially launched by the Chief Minister of Sikkim on World Environment Day 2019 at a high-profile event attended by government officials and other important stakeholders.

The launch was marked by a large-scale training programme for state government officials in order to familiarize them with the functioning and utility of the system. The tool will be integrated within the official portal of the Sikkim Government. Sikkim is the first state in India to host such a system and sets an important precedent for other states to follow.

Sikkim has a vision to remain carbon neutral, and the Sikkim Climate Inventory and Monitoring System (SCIMS) is an important step in this direction.





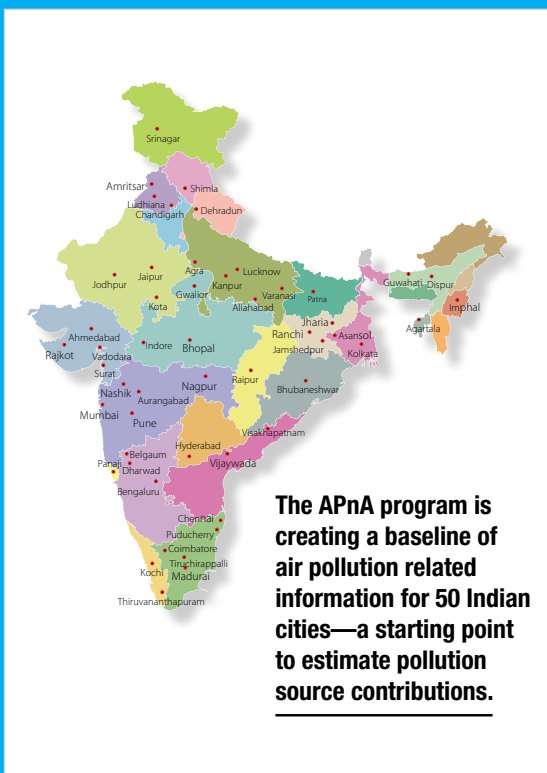
# Air Quality Management





## Air Pollution Knowledge Assessment city programme

With rapid urbanization and migration, major metropolitan cities as well as tier-2 cities are witnessing a rise in population, infrastructure and energy needs. There have been attempts to quantify the impact of air pollution and its sources for metropolitan cities like Delhi, Chennai, and Mumbai. But there is little data available for other Tier 1 and 2 cities. To remedy this information gap, the Shakti facilitated the establishment of the Air Pollution Knowledge Assessment (APnA) city program has developed a baseline of air pollution related information for 50 Indian cities, which can lead to an estimate of pollution source contributions—this is a necessary starting point to chart out strategies for better air quality. For most of the cities in this study, this is the first time an emissions inventory has been developed, followed by a dispersion modelling exercise to assess the particulate pollution trends and identify source contributions. Therefore, this is a valuable reference point for city governments and stakeholders.



## Patna, Surat and Bengaluru to get clean air action plans

Shakti, through its grantees, is engaging with several State Pollution Control Boards to support the development of action plans for improving air quality in cities.

In 2018, we supported research and stakeholder engagement activities for developing a comprehensive clean air action plan for Patna. Deputy Chief Minister of Bihar, Shri Sushil Kumar Modi launched the plan in November 2019 making Patna the first city in Bihar to have a comprehensive plan to tackle air pollution backed by a rigorous scientific methodology. The plan is both timely and relevant for Patna, one of the five most polluted cities in the world. It is also listed as a non-attainment city (i.e. those which do not meet the prescribed national ambient air quality standards) under the National Clean Air Programme. Based on extensive research on major polluting sectors, the plan proposes control measures as well as their techno-economic feasibility. This has helped to identify measures with the highest potential to reduce pollution.

Shakti is currently supporting the action plan development for Surat and Bengaluru.

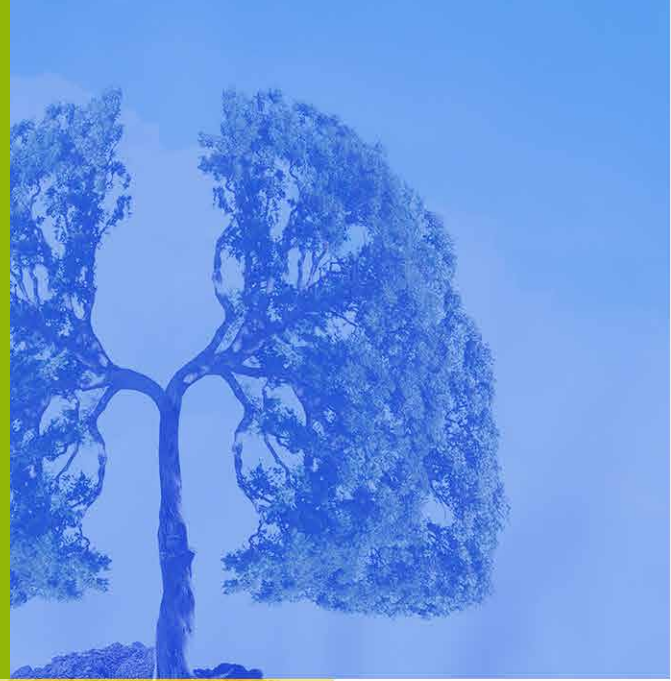
## Making the brick sector cleaner and more resource efficient

Despite the availability of cleaner technologies, the majority of bricks in India are produced from polluting kilns, which are a significant source of GHG and black carbon emissions. With the construction sector booming, the demand for bricks will increase significantly. This is why Shakti is working towards making brick kilns cleaner and resource efficient through better policy and technology solutions.

In the past, efforts facilitated by Shakti contributed to Bihar's notification for brick kilns to move to cleaner technologies. Bihar became the first Indian state to do so, and as a result around 20% of brick kiln owners in Bihar have upgraded to cleaner brick production technologies.

Efforts facilitated by Shakti have helped the Bihar Government's an inter-departmental Task Force to promote the use of cleaner brick making technologies and alternative building materials. In order to position fly ash bricks as an alternative

Shakti is working towards making brick kilns cleaner and resource efficient through better policy and technology solutions.



building material, Shakti has facilitated the development and testing of a Fly Ash Brick Quality Rating System (FABQRS) to address concerns around the quality of fly ash bricks available in the state. This is also meant to increase the large-scale acceptance and demand creation of fly ash bricks. As a result of these efforts, the number of fly ash brick enterprises in Bihar increased from 25 (in 2014) to 152 (in 2018).

### **Reducing emissions from the transport sector by reducing the share of diesel fleet**

Over the last few years, Shakti has been engaging with its grantees to reduce the share of the diesel car fleet. Our initial efforts were aimed at eliminating diesel price control which artificially priced diesel lower than petrol. Diesel prices were decontrolled starting in October 2014. Then, subsequently, working to equalize the excise taxes between diesel and petrol, where petrol was being taxed at a lower rate than diesel. We also supported efforts in the Delhi capital region by CSE not to allow diesel vehicles more than 10 years old to be run, as well supported the move

from BS II/III to BS IV, and then to BS VI standards over the past years. As a result of these efforts, the price difference between diesel and petrol narrowed considerably over the past few years, reducing the incentive to purchase diesel cars.

### **Survey to assess the health risk from air pollution**

Shakti is supporting two critical studies to highlight the impact of air quality on public health. We supported district level primary surveys to generate data evidence at local levels to help design targeted actions for air pollution and the associated mitigation of health risks. In addition, we are also supporting a comparative study that will clinically assess the impact of air pollution on the lung function of adolescent school children in select Indian cities—this is the first of its kind in India and will cover 3,000 children across six cities. Both studies are expected to add to a growing body of evidence about the health impact of air pollution, reinforcing the call for urgent clean air interventions in India.

The image features a solid orange background. In the foreground, three small green seedlings with two leaves each are positioned in a row, increasing in size from left to right. Each seedling is planted in a stack of gold coins. The stack of coins is tallest under the largest seedling on the right and shortest under the smallest on the left. The text 'Clean Energy Finance' is overlaid in white, with 'Clean' on the top line, 'Energy' on the middle line, and 'Finance' on the bottom line.

# Clean Energy Finance

**T**he Government of India has made it a national priority to drive clean energy and tackle climate change. But financing these efforts will be a challenge. India requires close to a trillion dollars of investment to attain its energy goals under its Nationally Determined Contribution by 2030. Meeting the 100 GW solar target alone requires \$131 billion over the next three years. To put that figure in context, the Indian financial system's exposure (2017) to the infrastructure sector as a whole stands at \$137 billion. Given the scale at which sustainable financing is required in India, a variety of investors both domestic and international need to be attracted to India's clean energy investment market. Shakti's Clean Energy Finance programme aims to catalyze increased investment in this sector through an emphasis on greening India's financial system.



### Speaking a common parlance

A major hurdle in the growth of green finance in India is the lack of a commonly agreed upon set of definitions to provide conceptual clarity on what constitutes 'green' investments. To better align financial sector stakeholders with long-term sustainability goals, Shakti is facilitating research that aims to establish a consensus on the definitions of terms such as 'green' and 'climate' finance. A common language can help to strengthen the expanding green finance market and give investors and companies more confidence in green financial arrangements.

**A** common language can help to strengthen the expanding green finance market and give investors and companies more confidence in green financial arrangements.

## Innovative financing instruments to promote investment in green infrastructure



Battery subscription facility



Financing for Low-Carbon Auto Rickshaws



The Residential Rooftop Solar Accelerator

The India Innovation Lab for Green Finance provides financing solutions to promote investment in green infrastructure by launching ideas that can be replicated and scaled up rapidly. In 2017, three ideas were selected and have—over the past two cycles—been grown and refined towards unlocking green finance at scale:

The India Innovation Lab for Green Finance is growing and refining ideas that can unlock green finance at scale

- The Residential Rooftop Solar Accelerator - To date, India has achieved 2.5 GW of rooftop solar installations, mostly on commercial and industrial roofs. The residential market has vast potential, but progress still has to be made. Customers face high upfront costs and perceived performance risk and developers face difficulties in identifying customers, high customer acquisition costs, limited access to commercial finance and long payback periods. The Residential Rooftop Solar Accelerator employs innovative features to overcome these barriers and mobilize the adoption of residential rooftop solar in uncharted smaller-sized cities in India. It designed to facilitate standardized product offering, easy financing, and efficient execution at scale.

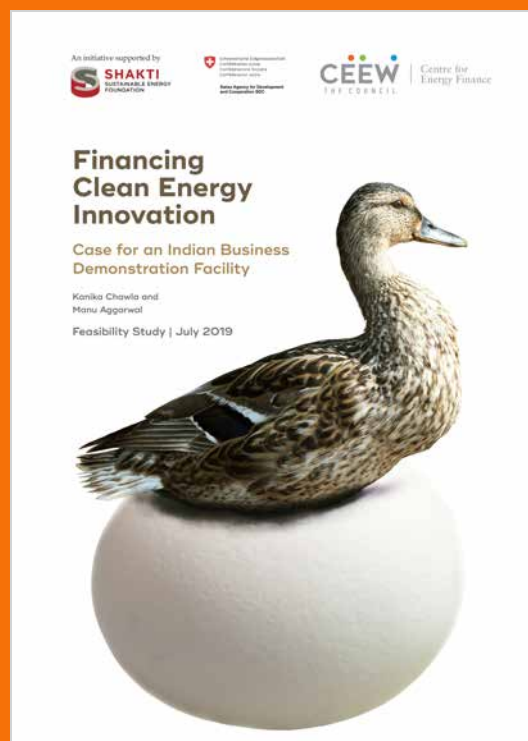


- Financing for Low-Carbon Auto Rickshaws - Auto-rickshaws contribute to vehicular emissions in Indian cities. Also, most auto-rickshaw drivers opt to rent their vehicles instead of owning them, due to the high cost of financing and a lack of suitable financing options for ownership. The move towards electric rickshaws can curb pollution as well as address issues of last mile connectivity. Financing for Low-Carbon Auto-Rickshaws is a loan product that allows drivers to purchase electric auto-rickshaws by providing debt financing for 100 percent of the purchase and lower interest rates with no collateral requirements. It is designed to incentivise drivers to switch from conventional auto-rickshaws to electric auto-rickshaws and enable driver savings of 20-30%.
- The Long-Term Debt Facility for Traction Batteries - The electrification of transport in India is crucial to meeting the nation's climate goals. The transport sector alone accounts for 13% of energy related carbon emissions and over 40% of the total particulate matter emissions in cities. The electrification of public buses is a good starting point. The Battery Subscription Facility aims to lower the upfront cost of electric buses in India by investing in batteries and providing them to bus operators on a subscription basis, charging for use on daily or per kilometer rates. A pilot project is underway in New Delhi, the results of which will help make a strong case when applying for funding to the Green Climate Fund.

### **Increasing the ability of public funding pools to leverage-in private green finance**

At the state level, India's climate policy is reflected in State Action Plans on Climate Change (SAPCC), which allows for localized efforts that customized to address vulnerabilities and capabilities. Unfortunately, a number of roadblocks hinder progress towards this goal—the most prominent of which are low awareness of and ability to tap into financing available to support a state's climate-based investments. Shakti is supporting research efforts to catalyze strategies for state actors to attract large-scale private sector investment into green infrastructure. This forms the cornerstone upon which the broader push towards greater leverage for public finance can foster industrial development and meet India's climate goals.

## **Scaling up innovative Clean Energy Technology businesses**



Within the business lifecycle of emerging technologies (i.e. R&D, followed by demonstration and then commercialisation), grants tend to fund technical R&D and pilot projects, while private funds are invested once large-scale profitability is achieved. But there is a considerable financial vacuum between these two events, where entrepreneurs must experiment with the business model of a technically proven innovation to demonstrate its profitability. Clean energy start-ups struggle in raising capital in what is identified as the 'second valley of death'—the prototype-to-market stage. The Shakti-supported Business Demonstration Fund is designed to address this gap. The Facility will leverage patient, low-cost, risk-friendly capital, raised predominantly from philanthropic sources to support clean energy innovations overcome this critical challenge. Establishing such a fund will create market depth in the sector and aid the transition to clean energy in India.

A glowing lightbulb with a green tint, set against a background of green foliage. The lightbulb is the central focus, with its filament visible. The background is a soft, out-of-focus green, suggesting a natural setting. The overall mood is bright and positive.

Convenings

## **Working Group on Renewable Energy Policy and Finance**

The Shakti-supported High-Level Working Group on Renewable Energy Policy and Finance convenes for strategic dialogue and action that can enable rapid growth of the sector. The goal of the group is to identify policy and market interventions that can solve immediate operational issues facing project deployment, and at the same time propose big ideas for policymakers to sustain the momentum in the long-term. The group comprises industry leaders, investors, lenders, financial institutions, and civil society. Over the last few months, the group has focused on assessing the impact of safeguard duty on imported solar cells and modules, and curtailment risk for solar and wind projects, amongst other themes.

## **India Energy Transformation Platform to advance decarbonization pathways by 2050**

The India Energy Transformation Platform is a multi-stakeholder initiative that is developing non-linear pathways for a decarbonised energy sector by 2050. The idea behind this platform is to align stakeholder priorities and actions as well as enable them to consider the advantages of new technologies and resources, and business models that can spur the growth of clean energy and balance the countries developmental priorities. The platform has identified sectors which are historically hard to decarbonise and where penetration of renewable sources has been low and where action could have tangible impacts on restricting temperature rise. In these sectors, the core group seeks to explore transformation solutions, involving technology, policy, market design and regulation.

## **Distribution Utilities Forum**

Distribution Companies (discoms) being at the tail-end of the electricity supply chain, are a crucial link in the implementation of the government's renewable energy plans. The Distribution Utilities Forum is providing key insights into the ground

level challenges faced by distribution companies (discoms). The Forum brings together CEOs and senior management of Distribution Utilities and provides a platform for knowledge and best practice sharing. Throughout the year, the Forum focussed on important themes such as the impact of rural electrification on discoms and rooftop solar in order to identify practical solutions to help create a financially viable and operationally robust electricity distribution sector. Recently, the Forum launched a framework for discoms to calculate the cost of supply, developed in consultations with stakeholders from across the sector. The Energy and Resources institute serves as the Forum's secretariat.

## **Donor-Grantee Convening – Aligning solutions on air quality management**

On 14-15th February 2019, Shakti and the Clean Air Platform convened health and climate grantees and funders with the goal of fostering alignment and coordination between them, in order to increase the momentum towards cleaner air in India. This grantee-donor convening was premised on the belief that strategically coordinating funding decisions as well as intervention measures can curb air pollution in a more effective and timely manner.





Over the course of the meeting, the more than 50 attendees, both donors (16 foundations and bilateral aid agencies, including the World Bank) and grantees (25+ organizations), deepened their understanding of the current landscape for air quality issues related to air quality data, monitoring, modelling, impacts, communications, advocacy, mitigation measures, and city action plans. Through a series of small-group discussions, they explored alignment of potential new initiatives. A key outcome was identifying ways to capture and share key lessons as currently funded initiatives move forward and new initiatives begin.

## US-India Track II Dialogue

Shakti is supporting the India-US Track II Dialogue, a civil society led initiative to complement bilateral cooperation between India and the United States on climate change and energy. The Dialogue held its eight meeting this year bringing together a diverse array of thought leaders from India and the United States – including former senior government officials, industry leaders, and heads of civil society organizations – to inform and encourage India-U.S. partnership at a strategic level and on climate and energy issues. This meeting of the dialogue focused on key issues in the bilateral relationship, including climate and energy policy in the United States and India, air quality, short lived climate pollutants, shared and electric mobility, financing the energy transition, and new frontiers in science and technology, which can assist both countries in short-term monitoring of environmental and climate impacts and long-term solutions.

## Evolving the narrative on electric mobility in India

In March 2019, Shakti supported a comprehensive analysis of communication in the electric mobility ecosystem in India and identified important and powerful narratives that are beginning to emerge around electric mobility in India. During this process, multiple organizations working in the space of electric mobility across sectors were identified and convened for a 2-day co-creation workshop to co-build a common vision and plan of action for accelerating adoption of electric mobility in India through information and unique communication strategies. Building a new electric mobility ecosystem requires the participation of diverse stakeholders to drive a broader vision, which can lead to systemic impact.

The workshop was a critical step for bringing these players together and arriving at a common road map. The participants were the leading experts on

electric mobility from different sectors —OEMs, think tanks, research institutes, journalists, shared mobility companies, and technology companies. Perspectives and inputs from the workshop are now feeding into a design of a communication strategy to ensure stakeholders are aware and capable of making informed decisions.

## The Electric Mobility Advisory Group Workshop

The transformative push for electric mobility is a much-needed development, for which a strong policy and implementation framework is required. In 2018, Shakti launched the Electric Mobility Initiative, a joint philanthropic collaboration aimed at supporting India's ambitious goal to usher in electric mobility in a big way. The initiative will facilitate knowledge transfer, policy analysis and research as well as capacity building and implementation efforts for the uptake of electric mobility solutions in India. As an important stepping stone to creating a way forward for the initiative, Shakti, in December 2018, brought together over 60 transport and civil society practitioners at a national workshop in New Delhi to discuss opportunities for near and long-term action, with a focus on charging and grid infrastructure, shared and connected mobility, air quality and electric buses. In focus groups, participants deliberated on the scale of ambitions, pathways to achieve the ambition and approach to work towards the future.

## Electric Mobility Forum

Honourable Vice President Shri Venkaiah Naidu launched the Shakti-supported Electric Mobility Forum at Connect Karo 2019 organized by World Resources Institute (WRI India) in New Delhi. The Electric Mobility Forum, led by WRI India, will convene policymakers, business, philanthropy and entrepreneurs to find solutions to electrify and decarbonize transportation in India.





## Our Donors

We thank our donors for their generosity and support over the years

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- IKEA Foundation
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- John D. and Catherine T. MacArthur Foundation
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- Swiss Agency for Development and Cooperation
- The David and Lucille Packard Foundation
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## Grantees

- Alliance for an Energy Efficient Economy
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- Brookings Institution India Center
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- Center for Study of Science, Technology and Policy
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- Centre for Environment and Energy Development
- Centre for Environment Education
- Centre for Environmental Planning and Technology (University)
- Centre for Policy Research
- Citizen Consumer and Civic Action Group
- Clean Energy Access Network
- Confederation of Indian Industry
- Consumer Unity and Trust Society
- Council on Energy, Environment and Water
- Federation of Indian Chambers of Commerce and Industry
- Foundation for Innovation and Technology Transport
- Gujarat Energy Research and Management Institute
- ICLEI – Local Governments for Sustainability (South Asia)
- India Resources Trust (WRI)
- Indian Institute of Technology – Bombay
- Indian Institute of Technology – Delhi
- Indian Institute of Technology – Madras
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- National Institute of Urban Affairs
- Nehru Foundation-Centre for Environment Education
- Parisar Sanrakshan Sanwardhan Sanstha



- Samarthyam
- Selco Foundation
- SEWA Bharat
- Small Scale Sustainable Infrastructure Development Fund
- Society for Development Alternatives
- TERI School of Advanced Studies
- The Associated Chambers of Commerce and Industry of India
- The Energy and Resources Institute
- Vasudha Foundation
- World Institute of Sustainable Energy

## Consultants

- AB Lall Architects
- Adapt Technologies and Consultancy Services India Pvt. Ltd.
- cBalance Solutions Pvt. Ltd.
- CEED India Development Pvt. Ltd.
- Centre for Energy, Environment and Resources Pvt. Ltd.
- cKinetics Consulting Services Pvt. Ltd.
- Clean Air Initiative for Asian Cities Center Inc.
- Climate Policy Initiative India Pvt. Ltd
- Creative Footprints
- Dalberg Development Advisors Ltd.
- Delhi Integrated Multi-Modal Transit Systems Ltd
- Deloitte Touche Tohmatsu India LLP
- Edelman India Pvt. Ltd.
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- Institute of Urban Transport
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- Unio n International Des Transports Publics (UITP)
- Urban Management Consulting Pvt. Ltd.











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