SHAKTI
SUSTAINABLE ENERGY
FOUNDATION

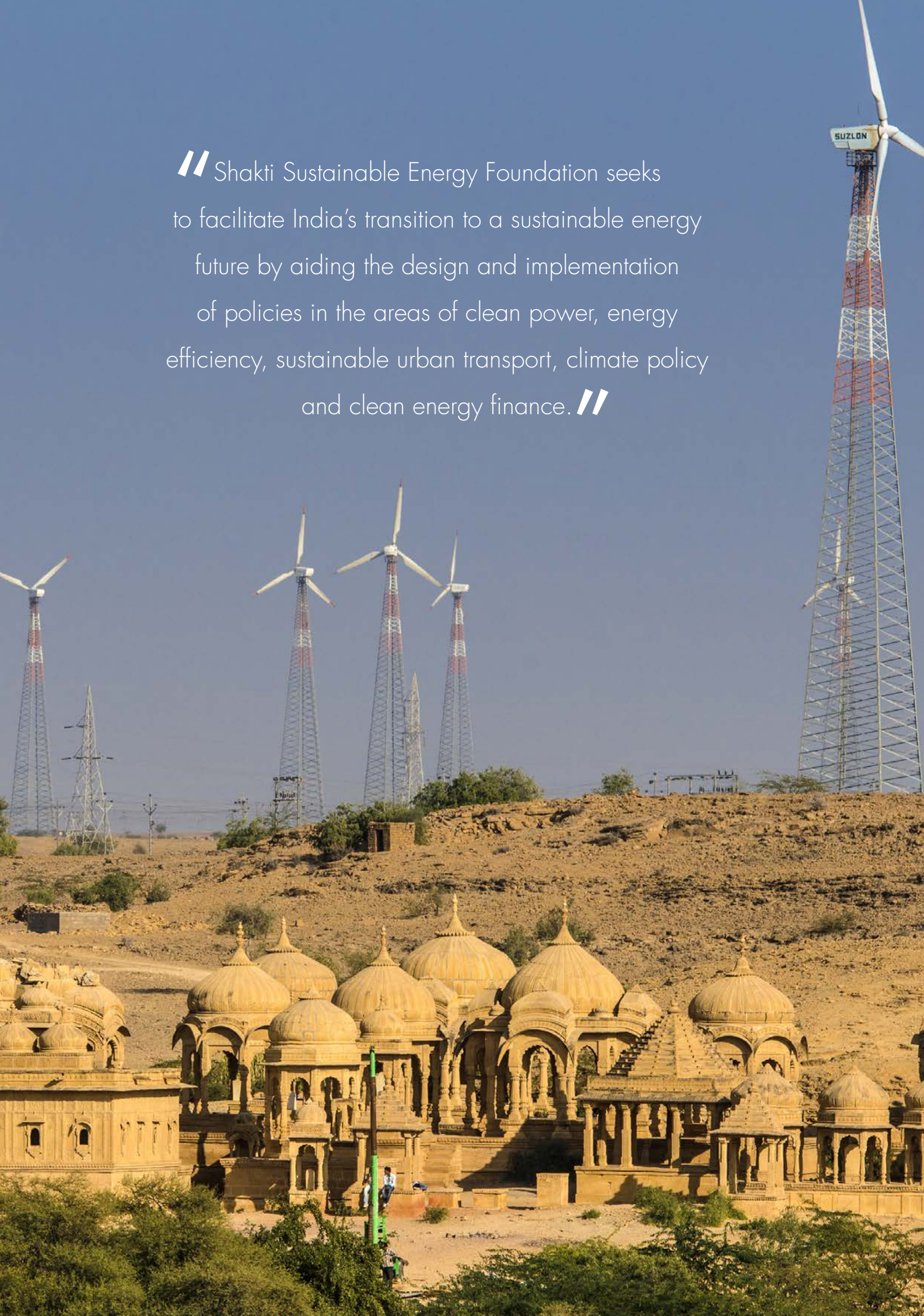
EnergyMatters

NEWS FILES 2020

A CLEAN AND SECURE ENERGY FUTURE

KEY HIGHLIGHTS

- Navigating COVID-19 and the road to recovery COVID-19
- BSPCB, Shakti and DA Sign MOU for Carbon Neutrality in Bihar's Construction Sector
- India Roadmap on Low Carbon and Sustainable Mobility unveiled by Union minister Shri Nitin Gadkari
- Boosting Transit-Oriented Development through better financing
- The India Energy Transformation Platform: Showing the path to low-carbon energy systems 2050
- Optimal cooling pathways: An implementation framework for the India Cooling Action Plan
- A roadmap for climate risk pricing for financial institutions
- Fostering alignment and solutions for India's electric mobility transition



"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 areas of clean power, energy efficiency, sustainable urban transport, climate policy and clean energy finance."

Message from the CEO

Dear Friends and Colleagues,

In 2020, we experienced an unprecedented global health crisis. From the ensuing public health challenges to the toll on economies, 2020 has been a year that none of us will soon forget. Yet, I am very optimistic that the years ahead offer the promise of a better and cleaner future for India. Despite pandemic disruptions, India's renewable energy sector is primed for growth. Major technological breakthroughs and policy initiatives are driving bright forecasts for the use of solar powered projects and electric vehicles in India. With industry and transport restarting after the lockdown forced by the COVID-19 pandemic, there is immense potential to immediately control GHG emissions.

As I look back on 2020, I am grateful for the resilience of the Shakti team that worked remotely to confront new realities. We built new systems from the ground up, defined new and innovative ways to work together with our partners and strengthened our commitment to clean energy and climate action.

We provided comments on India's Biennial Update Report (BUR) to the United Nations Framework Convention on Climate Change (UNFCCC) and supported the development of the India Roadmap on Low Carbon and Sustainable Mobility. We were part of a multi-stakeholder National Action Roundtable that identifies solutions for better rural health outcomes powered by clean energy and contributed to the development of a joint policy brief.

Our support led to the development of the India Power Outlook Series, that provides stakeholders a crisp overview of the power sector. We also supported the development of a first-of-its-kind study that maps the landscape of green finance in India for FY 2017 – FY 2018. We ended the year on a high note by signing a tripartite Memorandum of Understanding with the Bihar State Pollution Control Board to initiate a study on achieving carbon neutrality in Bihar's construction sector.

We will continue to build upon our work in 2021. In the wake of the rebuilding post the COVID-19 pandemic, there is tremendous opportunity to "build back better" and facilitate a green recovery for India.

I would like to thank our Board, funders, and grantees for their support during these during these exceptional times.

I am happy to share with you our ***EnergyMatters 2020,*** a compilation of our work over the last year, as we continued to work in collaboration with key decision-makers across government, civil society, academia, and industry.

Sincerely,
Anshu Bhardwaj,
Chief Executive Officer
Shakti Sustainable Energy Foundation

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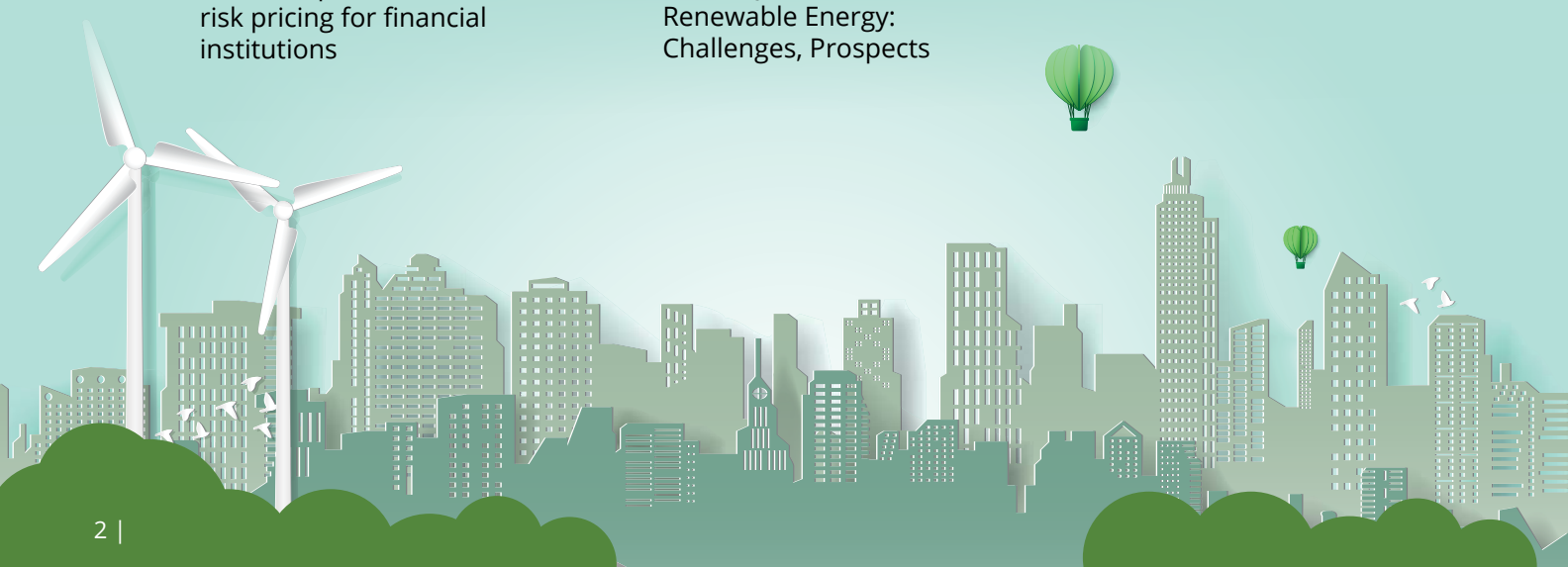


DECEMBER 2020

BSPCB, Shakti and DA Sign MOU for Carbon Neutrality in Bihar's Construction Sector

The Bihar State Pollution Control Board (BSPCB), Shakti Sustainable Energy Foundation and Development Alternatives signed a tripartite Memorandum of Understanding (MoU) in December 2020 to initiate a study on achieving carbon neutrality in Bihar's construction sector.

Bihar's economy is growing fast with major investments planned in energy and other sectors. This is expected to increase GHG emissions significantly and contribute to the state's burgeoning carbon footprint. With Bihar already very vulnerable to the impact of climate change, the State Government has set the goal of achieving carbon neutrality by 2040. The construction sector in Bihar has an enormous energy and resource footprint, and the study undertaken under the MoU will contribute to meeting the state's goal.

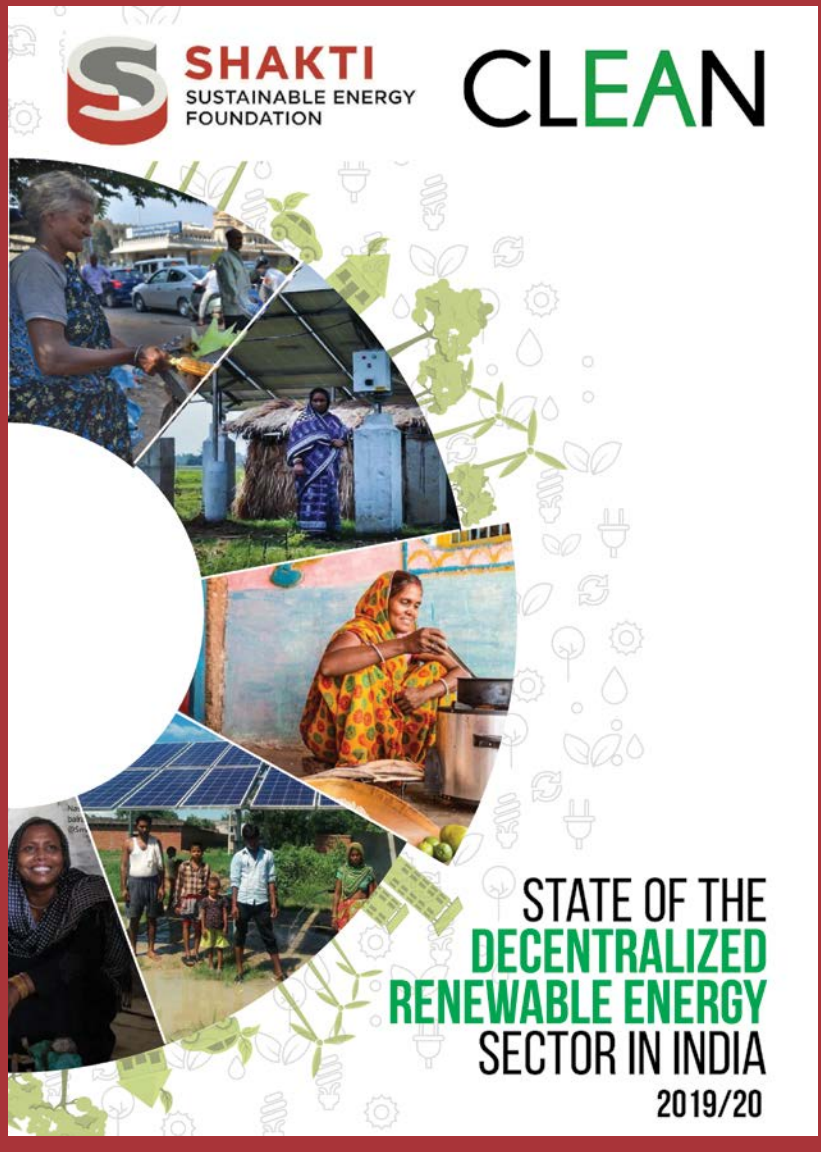
The MoU was signed in Patna on 11th December 2020 in the presence of Dr. Ashok Kumar Ghosh, Chairman BSPCB and Shri Dipak Kumar Singh, Principal Secretary, Department of Environment, Forests and Climate Change, Government of Bihar.

Over the last few years, Shakti, through its grantee partner, Development Alternatives has supported a series of initiatives in order to increase the adoption of cleaner brick making technologies in Bihar, particularly fly ash bricks. We look forward to this important collaboration to explore and enable clean and carbon neutral solutions for Bihar's construction sector. In addition, Shakti has been invited to provide similar assistance towards the decarbonization of Bihar's transport sector.

CLEAN Report Shows DRE Enterprises Profitable in 2019-20, But Also Impacted by COVID-19

The fourth edition of the "State of the Decentralized Renewable Energy (DRE) Sector in India 2019-20" report was recently launched by the CLEAN network at a webinar held on 25th November 2020. Surveying 63 organizations including CLEAN members, financiers, NGOs, think-tanks and government representatives, this edition (like the previous three editions) presents an overview of the developments in the DRE sector for the financial year.

DRE can contribute to 24×7 reliable and quality energy supply for all Indian households and small and medium sized enterprises. This report features 23 impactful case studies of innovative financing models, technologies, best practices and productive use of DRE applications. It also captures the impact of COVID-19 on the DRE businesses surveyed.



A few highlights from the report are as follows:

- At least 62% of the members surveyed reported that they have been profitable in FY 2019-20 as compared to 45% of members in FY 2018-19. In addition, 86% of the members were able to meet their projected revenue.

- Enterprises reported lights and solar home systems (SHS) as their highest selling products. Other products such as solar pumps, improved cookstoves, and cold storages are also popular. Although most enterprises reported sales of less than 100 units for their products, low-priced products such as solar lights, improved cookstoves, and SHS recorded sales of more than 10,000 units.

- The survey revealed that the DRE sector was not immune to the impact of COVID-19. Around 50% of the members reported increased revenue loss between Quarter 4 of FY 2019-20 and Quarter 1 of FY 2020-21. Members stated that to overcome the adverse economic effects of the pandemic, various sources of debt and CSR funds could be helpful.

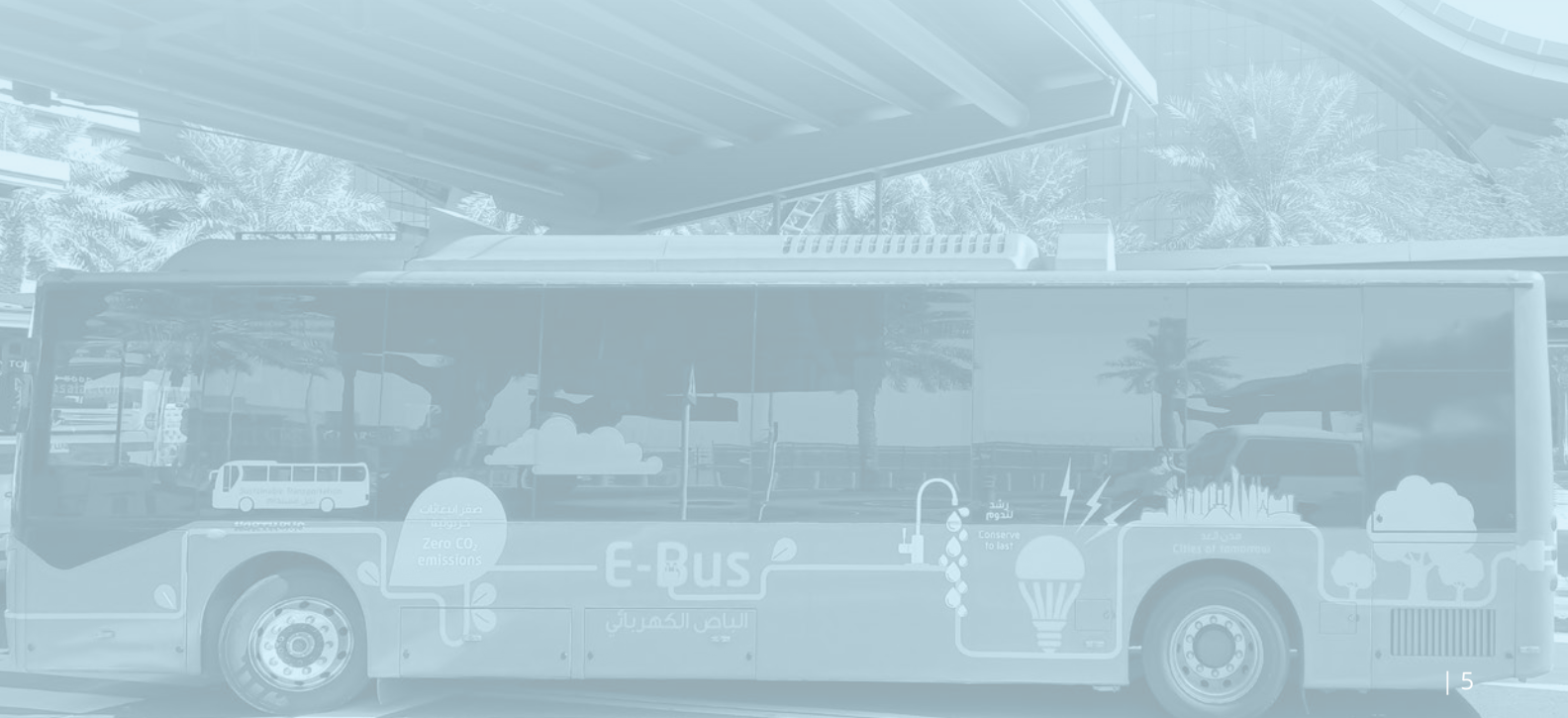
A Way Forward for Better Procurement and Performance Evaluation Practices for E-Buses

India launched the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme in 2015 to accelerate electric vehicle (EV) adoption in the country. The second phase of this scheme is currently underway. Under the second phase of FAME, prior to the COVID-lockdown a total of 5,595 e-buses had already been sanctioned for which 3,500 tenders were placed, and procurement process for 2,450 e-buses completed. Their deployment will begin as India gradually recovers from COVID-19.

With e-buses set to increase on the roads, it becomes important to evaluate their performance in order to improve their operations and procurement practices. Two reports supported by Shakti Sustainable Energy Foundation and developed by UITP India are contributing to this discourse:

- *Performance Evaluation Framework for Electric Buses in India,* which provides guidance to service providers to review at e-bus performance across different charging technologies, business models, and operating conditions.
- *Electric Bus Procurement under FAME-II: Lessons learnt and recommendations for Phase-II,* which provides insights for policy makers and authorities tendering out e-buses, based on learnings from tenders carried out under FAME-I.

Both reports were released at stakeholder webinar held on 26th November 2020. Dr Ravi Gadepalli, UITP India presented an overview of the reports and Dr. Anshu Bharadwaj, CEO, Shakti provided the opening remarks highlighting the benefits and potential of India's EV policies.

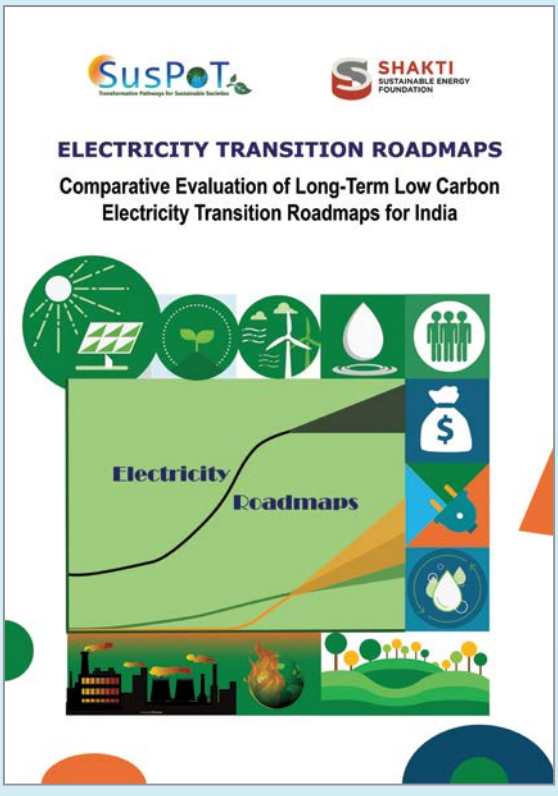


Comparing Routes for India's Low-Carbon Electricity Transition

Low-carbon electricity transition roadmaps can inform the development of climate mitigation strategies in India. Several modelling studies have been released in the last few years but varied in predictions and scenarios. Also, the uncertainties about future electricity demand, supply options, costs, and technological advancements can make electricity modelling a complex exercise.

This is why it becomes important to harmonize, compare and interpret the results of different modelling studies within a single framework – particularly in light of the goals to be achieved under the NDCs and to strengthen the power sector overall. A recent study supported by Shakti and developed by the Center for Sustainability, Policy and Technology Management (SusPoT) reviews the key differences between major electricity transition roadmaps and scenarios developed for India. It looks at co-benefits and trade-offs from multiple sustainability perspectives within these roadmaps and also compares the roadmaps with other emerging and developed economies in the world.

The study was launched at a webinar held on 27th November 2020 attended by representatives from over 60 institutions. Dr. Anshu Bharadwaj, CEO, Shakti delivered the keynote speech and Mr. Mitavachan Hiremath (CEO, SusPoT) presented the key findings of the analysis. This was followed by expert comments from India and Germany.



Increasing Consumer Participation in India's Electricity Sector

Access to reliable and quality electricity supply has increased considerably in India over the last few years. Yet there is a gap between cities and smaller towns and villages. One way to address this gap is to increase consumer participation and voice in the power sector. This can help policy makers make more informed and equitable decisions, and also give distribution companies an opportunity to improve their services, demand, and profit.

In 2018, Shakti Sustainable Energy Foundation, through a grant to CUTS International and the Bask Research Foundation, supported the establishment of six Consumer Assistance Cells (CONASCs) in four districts of Rajasthan with the help of local consumer and self-help groups. The cells worked to increase consumer awareness on their rights and responsibilities and grievance redressal processes by acting as a liaison with the local discom.

Several interesting insights emerged after the first year of the project. For example, surveys showed that billing and metering cases were in plenty, followed by cases related to theft and misuse of electricity. Interestingly, many billing and metering grievances could be solved by educating consumers on policies related to rebates or waivers. In 2019, Shakti provided further support to CONASCs to build their capacity to engage more actively with discoms.

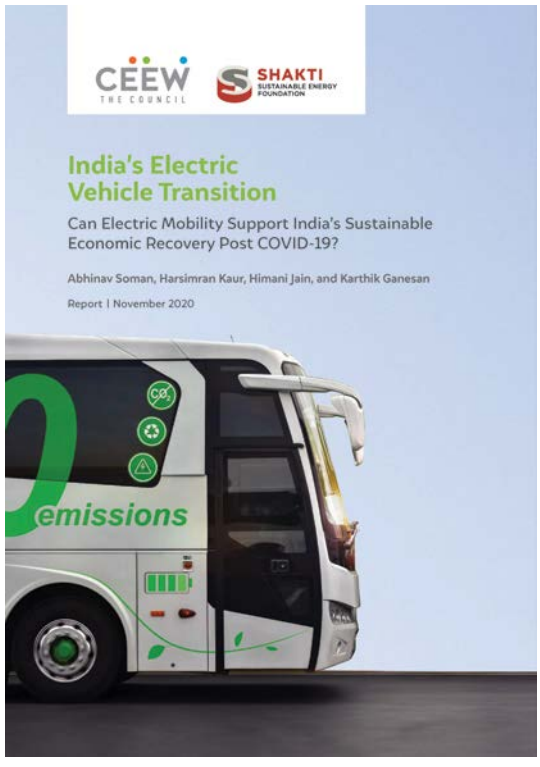
Insights from this initiative informed a webinar on "Transforming Power Distribution: Consumers, Governance and Technology" held on Thursday, 26th November, 2020. Participants, drawn from industry, academia, policy making agencies, think tanks, and media, discussed ways to ensure that interventions in the power sector come together as a coherent strategy to benefit consumers as well as strengthen the sector.

Can Electric Mobility Support India's Sustainable Economic Recovery Post COVID-19?

In a post-COVID scenario, India will need to take concerted action to grow the economy and create jobs. The transition to electric vehicles (EV) has immense potential for investment and rapid market growth. India has set a goal of 30% penetration of EV in new sales by 2030.

A new report supported by Shakti Sustainable Energy Foundation and authored by the Council on Energy, Environment and Water (CEEW) explores the impact of this transition on India's economic recovery. It examines the impact of a 30% EV sales share in 2030 on domestic value-addition, jobs, crude oil imports, revenue generated from taxes, local pollution and greenhouse gas (GHG) emissions. In addition, the study quantifies these impacts in different mode-share scenarios - (i) high public transport scenario, (ii) high private vehicle scenario, and (iii) shared mobility scenario.

The report was launched by CEEW at a webinar on "Scaling local value-addition and jobs from EV manufacturing in India" held on 09 November 2020. The report findings informed the discussion as experts reviewed strategies to scale investments into EV component manufacturing and the role of stable and long-term policies.



Side Event at COP12/MOP32 On Safety Standards for Natural Refrigerants

Shakti Sustainable Energy Foundation and International Forum for Environment, Sustainability and technology jointly hosted a side-event at COP12/MOP32 on safety standards for natural refrigerants on 23rd November 2020.

India's refrigeration and cooling sector is on the verge of a leapfrog transition. The technologies required to facilitate this transition exists the most promising being natural refrigerants such as hydrocarbons (propane and isobutane) and ammonia. Another promising recent development is the adoption of new national safety standards for closed circuit ammonia refrigeration systems.

The webinar shed light on how developments like these can open up India's home and industrial cooling market to natural refrigerants and the next phase of regulatory reform. An expert panel comprising Mr Anil Gulanikar (Director DAG-Tech Services), Dr Daniel Colbourne (Fellow, Re-phridge), Mr Rajneesh Khosla (Head of the Mechanical Engineering Department,Bureau of Indian Standards) and Dr Sukumar Devotta (Former Director CSIR-NEERI, Nagpur) deliberated on the future of natural refrigerants in India.

Launch of a New Energy and Climate Seminar Series

Shakti Sustainable Energy Foundation is delighted to host a new seminar series featuring research, innovation and opportunities for intervention in India's clean energy and climate action space. We would like to thank our guest speakers and experts for sharing their knowledge and expertise:

- Dr. Ajay Mathur, Former Director General, The Energy and Resources Institute on *Energy transition in India: Grid integration imperatives are now more important than price reductions*
- Professor Sachchida Nand, Department of Civil Engineering at IIT-Kanpur on *Nationwide sensor- based monitoring, real time source apportionment and capacity building under the National Clean Air Mission*
- Mr. Upendra Tripathy, Former Director General of the International Solar Alliance (ISA) on *ISA - Leading a global solar revolution*
- Professor Peter Adams, Department Head, Engineering and Public Policy, Carnegie Mellon University on *Reduced-complexity air quality models: Tools for nimble policy assessment*

OCTOBER 2020

Green Finance Grows in India, But Transformational Changes Still Required

Achieving India's ambitious renewable energy target as well as tackling climate change will require massive financial investments. India's Nationally Determined Contributed (NDCs) alone will require around USD 2.5 trillion from 2015 to 2030, or roughly INR USD 170 billion per year. In the aftermath of the COVID-19 pandemic, it is more critical to scale green funds for long-term, sustainable impact. Understanding the nature and volume of green financial flows in India therefore becomes critical for planning and implementing green investments.

A new, first-of-its-kind study supported by Shakti Sustainable Energy Foundation and developed by Climate Policy Initiative maps the landscape of green finance in India. The report tracks green investment flows measuring both public and private sources of capital for FY 2017 – FY 2018.

On an encouraging note, the study reveals green sectors are outpacing overall Indian GDP growth. It estimates that green investments in India grew by 24% between 2016 and 2018, whereas the Indian GDP grew by 7.4% over the same period. Still, this falls short of the transformational change required for India to meet its dual economic and environmental goals. Against the USD 170 billion requirement each year, total green finance over the last few years stood at a little over 10% in India, about USD 19 billion on average, across sectors.

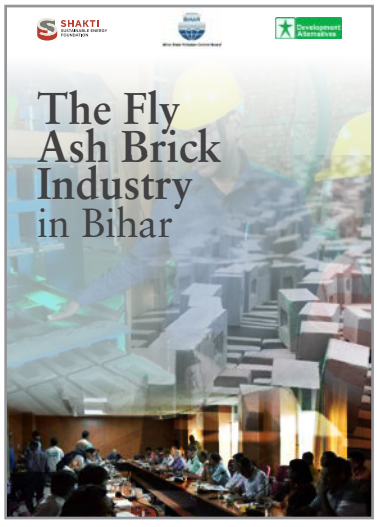
This study was released by Shri Dinesh Jagdale, Joint Secretary, Ministry of New and Renewable Energy at a webinar on September 11, 2020 in the presence of key stakeholders from the sector. The study findings were discussed in detail along with recommendations for upscaling of green finance across all low-carbon sectors in India. As a benchmark of the level of green finance in the Indian economy, the study is a valuable tool for policy makers and FIs to make more informed decisions towards scaling up investments for transformational impact.

Greening the Brick Sector in Bihar

Over the last few years, Shakti Sustainable Energy Foundation has supported critical efforts to enable Bihar's brick sector to transition to the use of cleaner and more energy efficient brick kiln technologies, including fly ash bricks. These bricks are lighter, cost-effective and resource efficient.

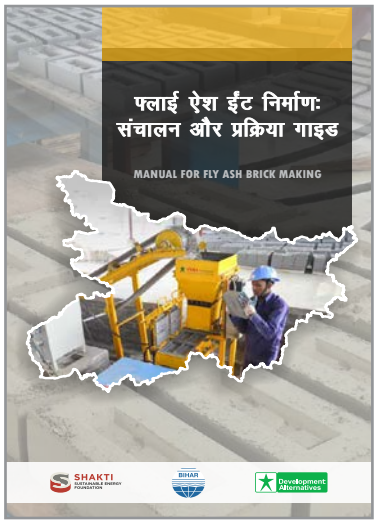
On 8 September 2020, our grantee partner Development Alternatives (DA) in association with the Bihar State Pollution Control Board (BSPCB), and with our support, hosted a virtual event on "Greening the brick sector of Bihar in a post COVID scenario." The event brought together public officials, fly ash brick manufacturers and experts to identify ways to address barriers and opportunities to improve brick production efficiency and reduce environmental impacts.

Shri Sushil Kumar Modi, Deputy Chief Minister of Bihar delivered the opening remarks at the event



and launched the Fly Ash Brick Training Manual and Status Report on The Fly Ash Brick Industry in Bihar. Both publications have been authored by Development Alternatives with our support.

The status report reveals that even though the current rate



of utilisation of fly ash in Bihar has slightly increased in 2018 (43%) as compared to the previous year 2017 (32%), it is still low in comparison to the national level (67%). It provides recommendations to both improve and augment the supply of fly ash bricks in the state.

A Roadmap for Climate Risk Pricing for Financial Institutions

India is facing the consequences of severe climate change. It is estimated that India lost over USD 80 billion in economic losses over the last two decades. Globally, this number stands at over USD 1.2 trillion. Increasingly, it is becoming important for financial institutions (FIs) to re-think their financing strategies to factor in climate risk in their policies.

Climate risk assessment, mitigation and pricing are relatively new domains for FIs and investors in India. There are varied perceptions of climate risk and no standardized approaches to risk mitigation strategies within financial portfolios in order to promote clean energy investments.

This is why Shakti Sustainable Foundation commissioned Intellecap Advisory Services Private Limited to produce a first-of-its-kind roadmap on climate risk pricing approaches for investment portfolios in India. This report maps the understanding of FIs in India on climate risk mainstreaming as well as implementation strategies for addressing both physical and transition risk by FIs.

Key insights from the report were discussed during a virtual workshop held on 13th August 2020, which saw extensive participation from banks, credit rating agencies, insurance agencies, equity investors, intermediaries, amongst other stakeholders. This was followed by a panel discussion on the challenges and opportunities in adopting potential climate risk mainstreaming approaches that could help streamline its adoption in investment decisions.

The India Cooling Coalition Explores Way Forward for the Implementation of the Icap

The India Cooling Coalition hosted its first webinar on implementation strategies for the India Cooling Action Plan (ICAP) on 2nd September 2020. The Coalition is a multi-stakeholder platform working to fast track the implementation of the ICAP, a critical effort launched by India to holistically address the country's address cooling needs over the next 20 years.

The ICAP assumes significant relevance in delivering far-reaching socio-economic benefits to Indians, as we grapple with the COVID-19 pandemic. It is within this context that the webinar delivered key insights on implementing the ICAP in India and its role in supporting a clean and resilient recovery from the pandemic.

The webinar featured eminent speakers like Shrimati Geeta Menon, Joint Secretary, Ministry of Environment, Forests and Climate Change, Ms. Lily Riahi, Coordinator, Cool Coalition Energy and Climate Branch, United Nations Environment Programme, and Mr Abhay Bhakre Director General, Bureau of Energy Efficiency. It brought to light several recommendations on sensitizing the larger professional community on the ICAP, role of various stakeholders and future implementation plans for the ICAP.

The Coalition is supported by Shakti Sustainable Energy Foundation, and the Alliance for an Energy Efficient Economy functions as its secretariat

The Electricity Sector in the Post COVID Scenario: Insights from the Distribution Utilities Forum

On September 23, 2020, the Distribution Utilities Forum (DUF) hosted a virtual event on strengthening India's electricity distribution sector, with a focus on addressing challenges in a post-COVID 19 scenario. The event saw participation from 27 distribution companies (discoms) from across 20 states and one union territory.

The presence of dignitaries from the Ministry of Power (MoP) and the Ministry of New and Renewable Energy (MNRE) provided great impetus to the discussions. Shri Sanjay Malhotra, IAS, Additional Secretary, MoP and Shri Dinesh Jagdale, Joint-Secretary, MNRE inaugurated the opening session, and Shri Vishal Kapoor, Director, MoP participated in the panel discussion.

The event also saw the release of reports on cost of supply, open access and electric vehicles, developed under the Forum, as well as the release of the Discom Electricity Forecasting Tool.

The Distribution Utilities Forum is supported by Shakti Sustainable Energy Foundation with The Energy and Resources Institute acting as the secretariat.

Optimal Cooling Pathways: An Implementation Framework for the India Cooling Action Plan

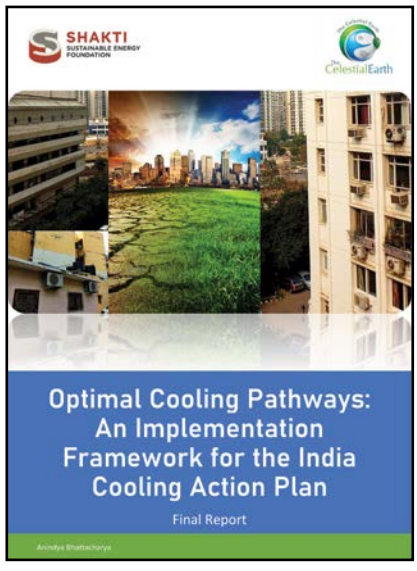
Wider access to cooling can benefit human development and economic productivity. The India Cooling Action Plan was launched to meet India's burgeoning cooling needs in clean and sustainable ways. As cooling needs increase, so will the demand for energy. This in turn can potentially increase the use of Hydrofluorocarbons (HFCs), which have high global warming potential (GWP).

Therefore, it is important to identify the best low-carbon pathway with an optimal mix of efficient technologies in order to meet the goals set under the ICAP. It is against this backdrop that Shakti Sustainable Energy Foundation commissioned a study to identify the least-cost pathway towards this. The study shows that alternate cooling technologies will impact long-term energy planning in India, as well as their impact on both investment and GHG emissions. The study also quantifies high GWP refrigerant demand under various scenarios.

The findings of the study indicate that without aggressive low-carbon policy adoption in buildings, 360 MTOE (estimated) of additional primary energy will be required by 2037 to achieve the target of cooling for all with 26 degree centigrade set point temperature. Approximately 80% of this additional energy requirement may come from coal.

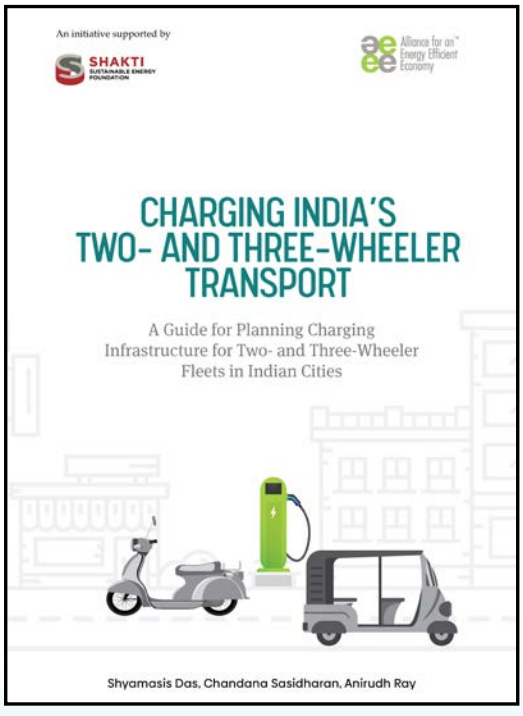
However, the good news is that this additional energy demand can be completely nullified— by providing thermal comfort for all in a sustainable development scenario by adopting passive cooling methods, efficient active cooling technologies and enabling behavioural change.

The study was launched on 28th August 2020 via a webinar where experts discussed the implementation of the ICAP as well as the ICAP Decision Support Tool developed under this study.



A Guide for Planning Charging Infrastructure for Two- and Three-Wheeler Fleets in Indian Cities

Together, two-wheelers and three-wheelers constitute about 83% of all vehicles in India. The electrification of these light electric vehicles is a low-hanging fruit for clean mobility owing to their market readiness, cost-competitiveness, ease of charging as well as emission reduction potential. India's FAME-II scheme includes a significant budgetary allocation for incentivizing the demand for electric two wheelers (e-2Ws) and three-wheelers (e-3Ws).

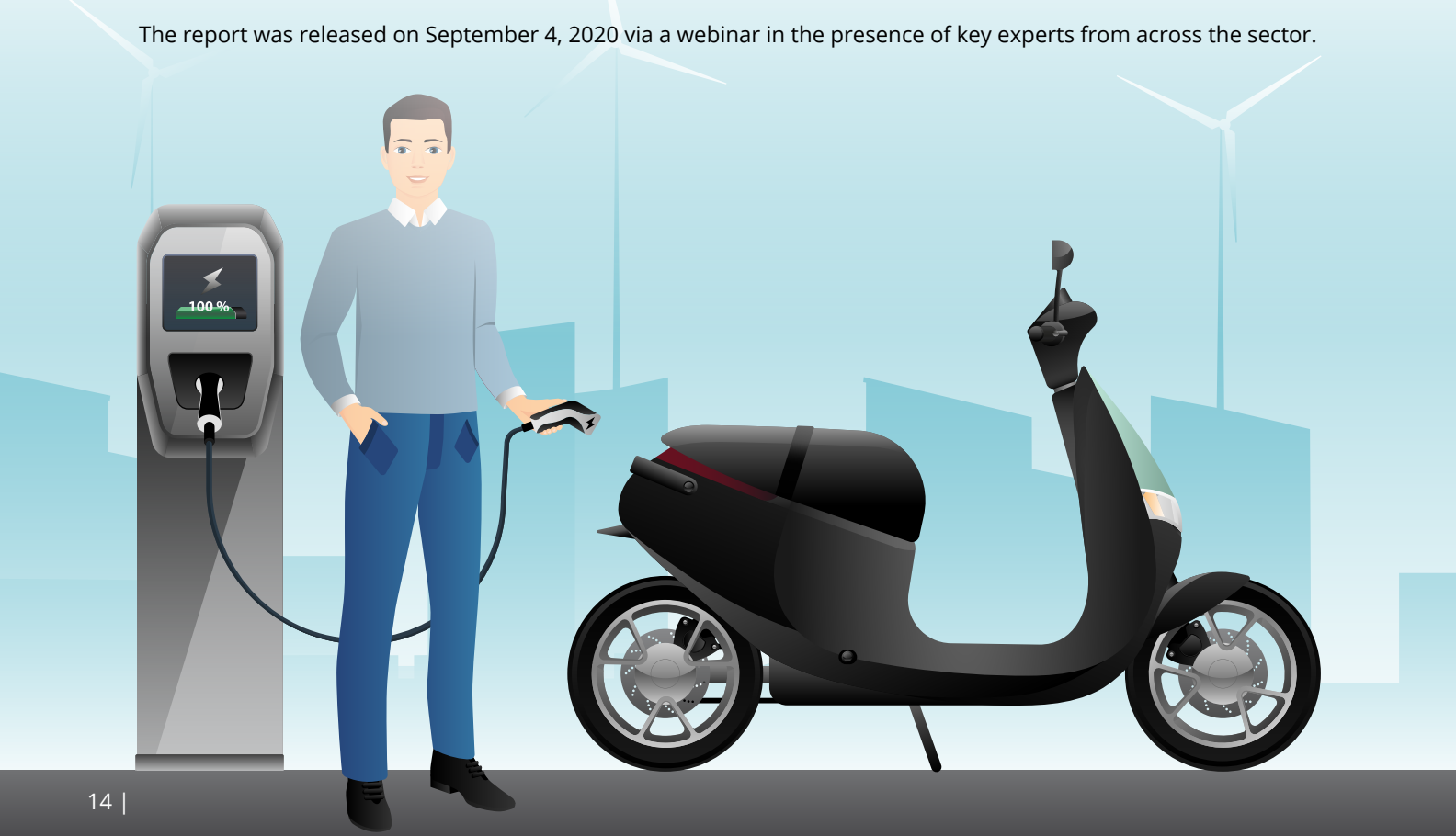


It is in this context that Shakti Sustainable Energy Foundation has supported the development of a guideline for planning charging infrastructure for these vehicle categories. This is the fourth report in a series of research efforts around strong decision-making frameworks for EV charging infrastructure in India, undertaken by the Alliance for an Energy Efficient Economy (AEEE). Earlier research features the charging of electric buses and electric four wheelers and EV tariffs.

This report seeks to facilitate the establishment of charging facilities for commercial light electric vehicle fleets in Indian cities. It maps the charging practices associated with commercial e-2W and e-3W fleets and provides useful guidance for the setting up of their charging facilities.

The actionable takeaways from this report are a go-to reference point for urban development authorities, charge point operators, fleet managers and other relevant stakeholders as they set up public charging infrastructure across Indian cities.

The report was released on September 4, 2020 via a webinar in the presence of key experts from across the sector.



AUGUST 2020

National Knowledge Network to Support the NCAP

Shakti Sustainable Energy Foundation is supporting the Indian Institute Technology-Kanpur (IIT-K) to spearhead the National Knowledge Network (NKN) under the National Clean Air Programme (NCAP). The NKN comprises technical and academic institutions that serve as knowledge partners to State Pollution Control Boards (SPCBs) and non-attainment cities under the NCAP. In accordance with this, an umbrella alliance of IITs and other universities has been created across 18 states with IIT-Kanpur designated as the nodal agency.

The network held its first workshop in Lucknow from 14-15th October 2019. The second workshop was held virtually on May 29, 2020 which saw the participation of nine states—West Bengal, Bihar, Jharkhand, Uttar Pradesh, Punjab, Haryana, Rajasthan, Uttarakhand and Jammu and Kashmir.

A key discussion point at the meeting was how the lock-down had led to better air quality and how this could be sustained. The fact that clear blue skies are attainable in a short period of time gives us the opportunity to look at the multiple sources of air pollution and envision solutions for cleaner air. It also allows us to evaluate specifically which solutions will be effective, how, and at what scale.

India Roadmap on Low Carbon and Sustainable Mobility Unveiled by Union Minister Shri Nitin Gadkari

On June 23, 2020, Union Minister of Road Transport and Highways Shri Nitin Gadkari, via video-conferencing, released the report India Roadmap on Low Carbon and Sustainable Mobility.

The roadmap is a joint effort between the Paris Process on Mobility and Climate, the Federation of Indian Chambers of Commerce and Industry (FICCI), along with World Wide Fund (WWF) as a knowledge partner. It charts an integrated approach to decarbonise India's transport sector in the short term (2022), medium term (2030) and long term (2050).

Shakti Sustainable Energy Foundation supported the development of this roadmap, which was prepared through a collaborative stakeholder approach that included industry, government, civil society, and transport and planning professionals. It is a culmination of the collective effort of 45 professionals from 36 organisations spread over nearly 24 months.

An important contribution to the decarbonisation discourse, the roadmap provides a concrete vision and operational focus for all transport modes (people and freight, urban and rural) with the goal of supporting India's climate commitment at Paris as well as for building the economy.

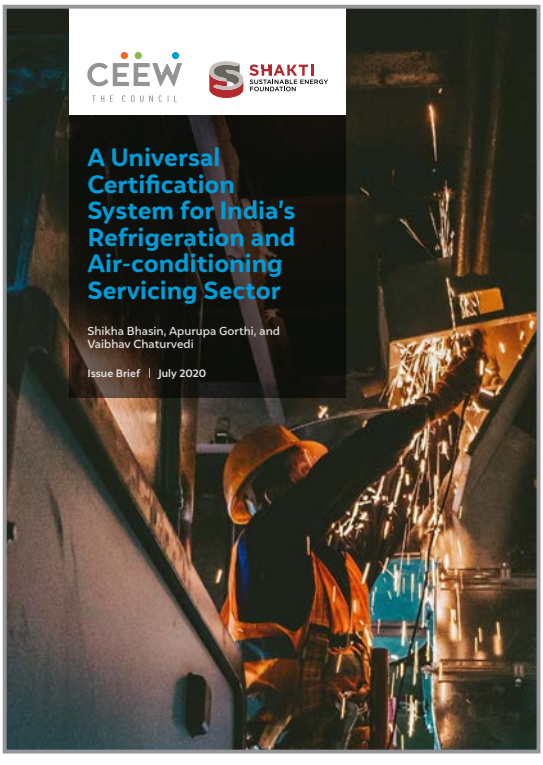
During the launch, Shri Nitin Gadkari stated that the government will play the role of a facilitator and support the private sector in its initiatives for developing sustainable transportation systems. He also highlighted the need for industry to look at public private partnerships and to decongest metro cities, amongst other important themes.

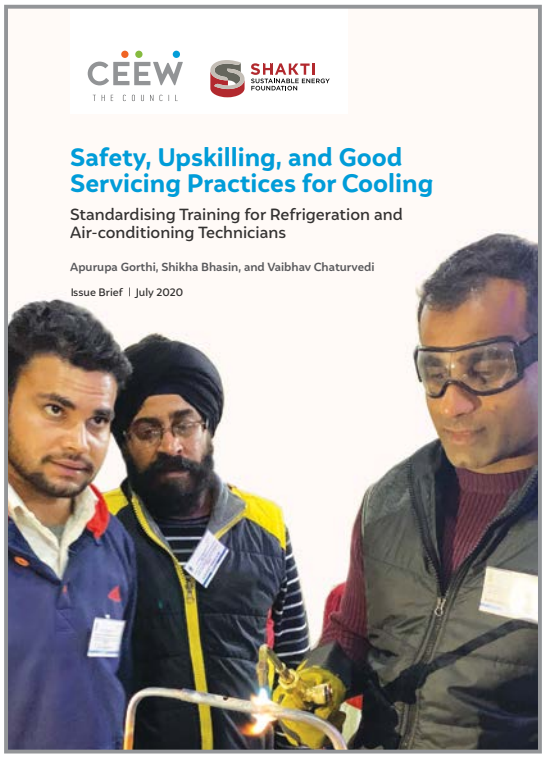
Low-GWP Readiness: Training and Certification of Servicing Sector Technicians

Shakti Sustainable Energy Foundation (SSEF) and the Council on Energy, Environment and Water (CEEW) hosted the OEWG42 side-event on 'Low-GWP Readiness: Training and Certification of Servicing Sector Technicians', on 16th July 2020.

The training and certification of technicians is a key need in emerging and developing economies in order to prepare the Heating, ventilation, and Air Conditioning (HVAC) sector for the impending refrigerant transition. The session featured research findings from two new studies - *A Universal Certification System for India's refrigeration and Air-Conditioning Servicing Sector and Safety, Upskilling, and Safety, Upskilling, Good Servicing Practices for Cooling*. SSEF has supported CEEW to develop both studies.

The discussion focused on the training and institutionalising of certification systems that can support technicians, increase energy efficiency, and lead to a smoother transition towards alternative refrigerants in line with the Kigali Agreement. Study findings were discussed between Professor Radhey S. Agarwal from the Ozone Cell, India, Ms Laura Estela Berón from the Ministry of Environment and Sustainable Development, Argentina, Dr Cornelius Rhein from the European Commission, and Ms Shikha Bhasin from CEEW. The conversation brought out current challenges being faced in streamlining trainings and certifications in Argentina, India and Europe—and the broader lessons and barriers going forward.





BYPL Makes 5-Star ACs More Affordable

With the demand for cooling set to rise dramatically in India, there is a need to rapidly transition to high efficiency and low GWP based cooling systems. At the same time, these cooling systems must be made more affordable and accessible for consumers. The BSES Yamuna Power Limited (BYPL) is now making this possible through its programme "Ek Kadam - Transition to BEE's 5 Star Energy Efficient ACs."

This programme is designed for BYPL domestic consumers to exchange their old, energy guzzling air conditioners with new and energy efficient BEE 5 star rated ones. The BYPL, using an innovative bulk procurement model, has partnered with leading air conditioner manufacturers like Daikin, Godrej, Hitachi, LG and Voltas, to purchase options to consumers at substantial discounts—of up to 64%, in order to make the 5 star ACs affordable. The programme will replace ACs that are up to 3 star rated, and is applicable for 1, 1.5 and 2 ton ACs. It is expected to be open to BYPL consumers till June 2021.

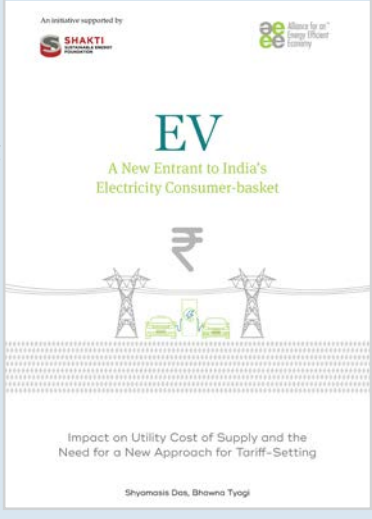
Shakti Sustainable Energy Foundation (SSEF) provided the support required to design and pilot this programme with PricewaterhouseCoopers (PwC India) as a knowledge partner.

The programme was launched via webinar on 12th July 2020 by Shri Sameer Pandita, Director, Bureau of Energy Efficiency (BEE). It saw representation from discoms, non-profits, AC manufacturers and delegates from various residential welfare associations from BYPL's coverage area. It also included a panel discussion on the role of energy efficient and climate friendly appliances in reducing energy demand.

With the current market share of high efficiency climate friendly ACs being only 2%, steps like these can boost the market and meet India's cooling needs in cleaner ways.

EV: A New Entrant to India's Electricity Consumer-basket

Charging infrastructure for electric vehicles (EVs) is expected to bring a transformation in electricity distribution, with major implications for distribution companies (discoms). Going forward, discoms will have to factor in future EV charging demand in resource and investment planning. EV tariffs will need to be designed in a way to allow the discom to recover its costs while making EV charging cost-effective and commercially viable.



A new report EV: A New Entrant to India's Electricity Consumer-Basket informs this discourse by providing a detailed analysis on the design of EV

tariffs for India. The report has been developed by the Alliance for an Energy Efficient Economy (AEEE) as part of research being conducted by AEEE on the development of strong decision-making frameworks for EV charging infrastructure. Earlier research features the charging of 1) electric buses and 2) electric four wheelers. Shakti Sustainable Energy Foundation is supporting this research effort.

This new report was released at a webinar on 31st July 2020, which was attended by key stakeholders from across the sector. It evaluates the impact of the additional load of EV charging on a discom's cost of supply and presents a framework for determining appropriate tariffs for EV charging. Select recommendations from the report include:

Initially, state regulators can offer promotional EV tariffs to encourage EV adoption.

Use of Time-of-Day Rates (ToD) or Time-of-Use (ToU) tariffs would enable discoms to make use of time flexibility to avoid network upgradation and reduce technical losses. Charging service providers can potentially reduce their energy expenditures by strategizing their charging plan.

ToD rates could be used to coincide EV charging with renewable energy (RE) generation, thereby enabling the higher offtake of RE for EV charging.

The launch of the report was followed by a panel discussion on this theme, which was moderated by Dr. Pramod Deo, Former Chairman of the Central Electricity Regulatory Commission.

Towards Net Zero Energy Buildings in India

India's building sector consumes a significant amount of energy. Adopting Net Zero Energy concepts in the built environment can help reduce GHG emissions as well as environmental impact. A Net Zero Energy Building (nZEB) offers significant operational savings and deploys renewable energy sources to off-set grid energy use.

Shakti Sustainable Energy Foundation (SSEF) is supporting the Indian Green Building Council (IGBC), part of the Confederation of Indian Industry (CII-IGBC), to increase the uptake of nZEBs by enabling the development of policy mechanisms and a supporting ecosystem.

Over the last year, awareness programmes targeted at stakeholders including builders, developers, owners, engineers, architects and green building consultants have been held across five cities (one in each climatic zone), each attended by approximately 270 participants. Discussions have been facilitated with nine property developers and building owners to aggregate renewable energy demand from proposed nZEBs across four states.

In addition, virtual capacity building programme have been held for facilitating agencies for green buildings as well as mechanical, electrical and plumbing (MEP) and renewable energy consulting firms. The recent programme held from 13-16 July 2020 helped 15 organizations gain a greater awareness of concepts, practical challenges and the relevant solutions for net nZEB implementation. Mr Saurabh Diddi, Director, Bureau of Energy Efficiency (BEE), provided the opening remarks for this programme giving an overview of government initiatives in nZEBs. Going forward, CII-IGBC will prepare recommendations for policy makers to support nZEBs through the adoption of stronger renewable energy policies.

India's Power Sector - The Journey Till Date and Going Forward

India's Power Outlook Series developed by Vasudha Foundation with support from Shakti Sustainable Energy Foundation provides an overview of the current status of India's power sector with a focus on significant and emerging developments. This series aims to help stakeholders develop a more informed understanding of the power sector and acts as a tracking tool for them.

Volume I, State of Play-Power Sector in India, released earlier this year, focuses on the entire power sector value chain and captures the key trends and transitions shaping the sector.

Volume II, The Road to Clean Electricity was launched on 9th July 2020 during a webinar on India's power sector. This volume takes a deep dive into India's trajectory towards meeting the 175 GW renewable energy target by 2022.

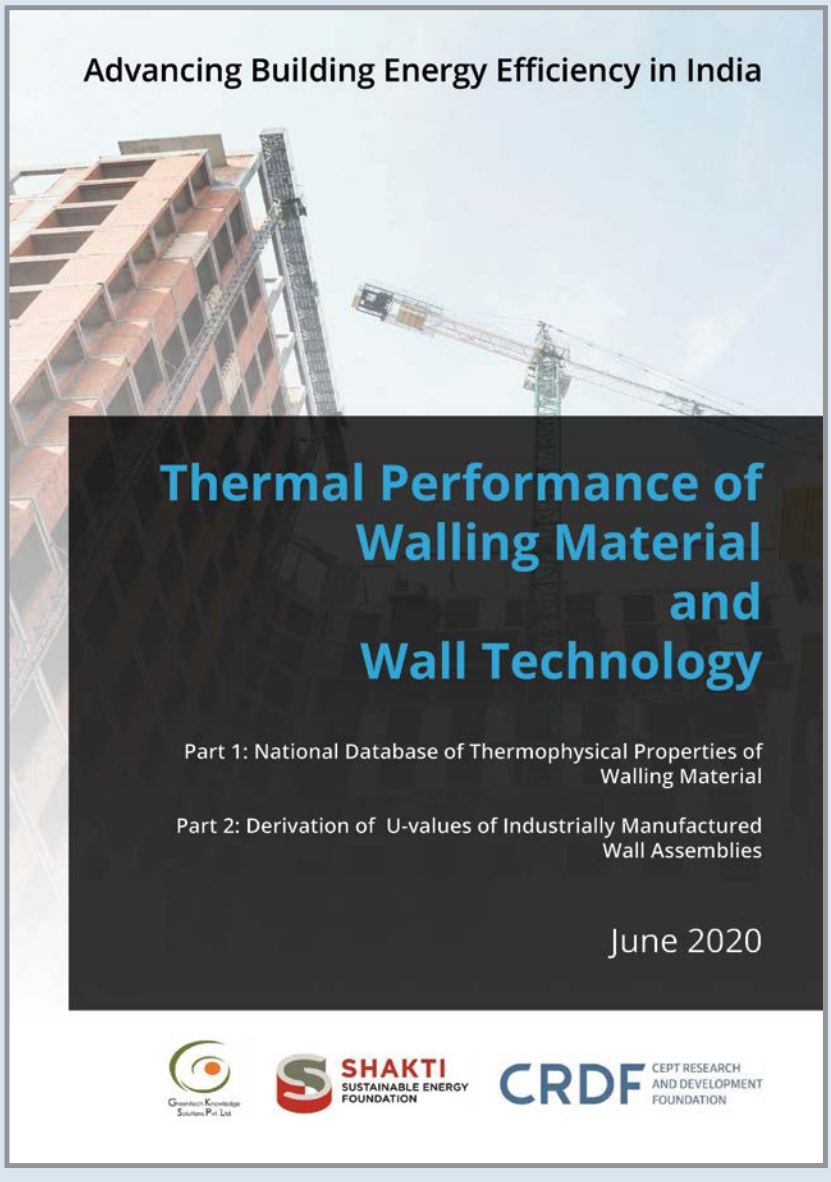
This findings from both volumes informed an insightful panel discussion on India's rapidly evolving power sector, attended by over 160 stakeholders. Shree V Subramanian, IAS (Retd), Former Secretary of the Ministry of New and Renewable Energy moderated the panel discussion highlighting the need for aggressive renewable energy policies, grid maturity and state-level grid integration strategies for a increased renewable energy and lower curtailment levels.

Database of Thermal Performance of Walling Materials and Technologies to Support India's Eco-Niwas Samhita

India's Eco-Niwas Samhita (ENS), the energy conservation building code for residential buildings, aims at reducing heat transmission from the building envelope. This in turn can improve thermal comfort and reduce the energy required for space cooling or heating. The ENS defines Residential Envelope Transmittance Value (RETV) as the parameter which accounts for heat gain from the building envelope. To a great extent, RETV is dictated by the thermal conductivity of an external wall.

Since a wide variety of masonry bricks and blocks are used in the construction of buildings across the country, it is imperative to develop a database to determine a building's RETV as we implement the ENS or seek to improve the energy performance of any new or existing building.

To address this need, Shakti Sustainable Energy Foundation supported the Centre for Advanced Research in Building Science and Energy (CARBSE) at CEPT University and Greentech Knowledge Solutions Pvt Ltd (GKSPL) to develop a nation-wide database of a wide range of walling materials used for construction. The research findings and report were launched the BEE and the Swiss Agency for Development and Cooperation (SDC) funded Building Energy Efficiency Programme (BEEP) webinar on July 9th, 2020, which was attended by over 250 participants, ranging from students, energy experts, building simulations, architects, engineers and housing boards.



Findings from this research are expected to supplement the compendium of prospective emerging technologies for mass housing brought out by the Building Materials Technology Promotion Council (BMTPC), which will be used to inform the construction of affordable mass housing in India.

MAY 2020

NAVIGATING COVID-19 AND THE ROAD TO RECOVERY

COVID-19 and Renewable Energy: Challenges, Prospects

The COVID-19 pandemic has adversely affected all sectors of the global economy. The International Monetary Fund (IMF) has revised its global GDP growth estimate from 3.3% from just three months ago to a contraction of 3%, something not witnessed since the Great Depression of the 1930s.

The energy sector has not been immune to COVID-19. The outbreak has contributed to a dampened demand for oil, where global oil demand is expected to fall by a record 9.3 mb/d year-on-year in 2020. The full range of consequences for the energy sector are yet to be revealed and are difficult to predict. However, it is already clear that the demand for energy resources has dropped, prices have plummeted and non-payment of utilities bills by end-consumers will have a detrimental effect on the overall value chain.

A similar trend of falling demand and price reduction has been observed in the electricity sector globally. We saw demand for electricity falling by 25% in Italy, 20% in France, 12% in the United Kingdom. It was a similar case in India too, where the electricity demand fell by almost 26% in the months of Feb – April 2020, mostly on account of reduced industrial and commercial load. The pinch of reduced demand is already being felt by the highly stressed electricity distribution sector and is bound to impact the renewable energy value chain in short and medium term.

Some of the immediate challenges that the renewable energy sector must grapple with are delays in the

construction of new projects, delays in financial closure, disruption of supply chains for projects under construction, payment defaults by renewable energy off takers, reduced offtake from the off taker due to reduced electricity demand for projects that are operational, and working capital shortages for small-sized projects.

While the situation is challenging, it provides ample opportunities for supporting the electricity sector in general and the renewable energy sector specifically. Measures taken by policymakers, regulators, and market participants can determine the well-being of the renewable energy value chain. Certain measures in some countries have already been taken to support the renewable energy sector. For example, extending deadlines for renewable energy producers for the commencement of sales within the auction system, as seen in Poland.

The duration of the COVID-19 crises is unknown in India, and we anticipate a shift in government priorities towards addressing socio-economic challenges post the crisis. This would certainly include addressing concerns of the energy sector in India and in particular the electricity sector. Clean energy will be at the heart of all incentive plans that are created and adopted to counter the negative impacts of the COVID-19.

The time is right for India to look at renewable energy as the energy source of the future beyond COVID-19. The opportunity exists for an increased focus on transitioning to clean energy in all the important economic sectors of the Indian economy—renewable energy is adopted as the primary electricity source for the health and education sector; renewable energy is modelled as the energy source to deal with all kinds of natural disasters; and higher renewable energy is used to contain CO_2 emissions from the electricity sector in India. Renewable energy, being already cost competitive, permits all this happen.

There are however a few necessary conditions to be achieved in order to seriously rejig our policy perspectives to cement renewable energy as the electricity source for future. A good starting point could be to revisit existing electricity subsidy mechanisms. Redirecting fossil fuel subsidies to the renewable energy sector coupled with practices such as the direct benefit transfer of the electricity subsidy will make electricity tariffs cost reflective across all consumer categories. This will only increase the affordability of renewables in long run. A separate renewable energy law or a policy would foster the further adoption of renewables. It is heartening to note that the recent proposed amendments in the Electricity Act discuss these and many other ways to mainstream renewable energy in India.

Authored by:
Vivek Sen
(Associate Director – Clean Power Program)

COVID-19: To Pause and Look Back to See the Future

The COVID-19 outbreak has deracinated life across the globe to expose the structural weaknesses of our system, such as income inequalities, weak healthcare systems, inadequate education, and the lack of global co-ordination. Throughout history, we have faced many deadly pandemics. Yet, after centuries of development, we stand at the crossroads witnessing human fatalities along with impacts on the global economy and the 17 United Nations Sustainable Development Goals (SDGs). Given this backdrop, we need to analyse the long-term effects of anthropogenic activities on the SDG targets and possible future shocks to streamline our efforts towards other undeniable challenges that face the world.

India, an agriculturally dominant economy, with low dependence on exports might cushion the economic and developmental slowdown. While financial support is essential to boost the affected sectors, we must redesign business models to make our systems more resilient. This presents a massive opportunity for the government to pre-empt such disasters and introduce flexible and adaptable systems.

The lockdown in India has further slowed down the already struggling transportation sector. However, post COVID-19, one expects that the transportation sector will witness three significant trends. First, there would be a considerable shift away from public transportation towards personal vehicles, owing to increased concern towards personal health and hygiene. Further, the possibility of job or salary cuts would weigh on the capacity to buy personal 4-wheelers, while creating a mass-market of 2-wheelers. Therefore, low energy public mobility options can take a back seat, which would make the goal of tackling air pollution, reducing congestion, and lowering carbon emissions more onerous.

To curb this detrimental switch, we must adopt strategies of countries like China to revive the confidence of citizens to access public transportation, by deploying sizeable manpower for sanitisation of metros/buses and rapid monitoring at stations. Simultaneously, as people begin to go back to work, the need to maintain physical distance would cause a shift in preferred mode of commuting. People would cycle or walk to work, creating demand for sustainable, zero-carbon systems ranging from cycle lanes, wider pavements, non-motorized priority streets, etc. Traffic volumes will eventually go back up, but we must intervene here to decide how much of it to let back in and in what form, to make urban air safer to breathe. This hopefully would push for a paradigm shift towards compact, energy efficient and walkable neighbourhoods, suitably adapting the concepts of '15 minute Paris' and 'Superblocks Barcelona'; an area where India has been long struggling.

Thirdly, the sensitization of citizens on the drastic consequences of climate change may be seen as an attractive opportunity for electric vehicles (EVs). The adverse spill over effects of globalisation would encourage India towards indigenisation of manufactured parts, investing R&D for alternative battery/storage systems and diversification of sourcing countries. Given the predictable shift towards two-wheelers, the EV two-wheeler sector is expected to swiftly recover in the coming year, through availability of cheap financing options for the consumers.

The pandemic clearly depicts the critical need to provide 'healthy housing' as a basic necessity; both for the air-conditioned houses that foster infectious diseases, and the overcrowded shanties of the urban poor with inadequate ventilation. Additionally, climate change and heatwaves would worsen this situation. For improved liveability, and thermal comfort, post-pandemic interventions could witness greater intersectoral housing policies in collaboration with public health interventions. There will be increased attention to the overall hygiene of neighbourhoods' through access to decentralised and efficient municipal services. While the PMAY has primarily focused on speedy construction of affordable housing, there will now be a heightened focus on 'habitat' performance to ensure quality. The current standards of minimum carpet area would require stringent reviewing, considering household capacity, alongside standardisation for estimating housing shortage, which must include health, thermal comfort, and indoor air quality as a criterion to define congestion. It is expected that the pandemic jolts the bureaucracy to shun poor political governance around housing and push for institutional transformations.

As India's unemployment rate shot up 14.8% to reach 23.5% in April 2020 due to the lockdown, (according to the Centre for Monitoring Indian Economy), the government is focused on creating jobs. While the situation calls for immediate and rapid remediation, it also sets the platform to develop new labour markets to maximise the long-term benefits. Industries having incurred huge losses during this period, should reckon optimising and localising their operations by investing in financing energy efficient technologies, employing local manpower and resources. Industries must

build resilience against future pandemics, through improved economic competitiveness and reduced cost of compensation for emissions by adopting low carbon levers. Dr. Fatih Birol, the Executive Director of the International Energy Agency (IEA) highlights how including energy efficiency in targeted investments and stimulus programs can create jobs immediately and bring long-term benefits for consumers, businesses and the environment.

Similarly, India's clean energy sector aims to increase its renewable energy capacity to 450GW by 2030. The slow progress due to policy deadlocks, questions on grid stability coupled with disruptions in the supply chain, adversely impacts our renewable ambitions. The '9pm9minute' proved that our grid is capable of handling large demand fluctuations. The '9pm9minute' and import embargo can be an effective coping strategy, for higher renewable integration and leverage 'Make in India' campaign. In this regard, the decentralized renewable energy (DRE) sector fits in the in the nexus between 'energy for all' and 'healthcare for all', ensuring electrification of rural health clinics, household electricity and solar refrigeration for food and vaccines while creating jobs for rural poor.

The crisis implores us to consider adaptable business models that paves the path towards more resilient and smarter interventions, synonymous with sustainability. Though the COVID 19 pandemic is a temporary setback to our ongoing commitment towards a cleaner planet, our long-term commitment to sustainability must remain in place. As the world responds to this pandemic and seeks to restore prosperity, we must focus on addressing these underlying factors and deepen our efforts during this crucial decade to build back healthier.

Authored by:
Vaishali Sharma
(Assistant Program Manager – Energy Efficiency) and Shubhashis Dey
(Associate Director – Energy Efficiency)

Time for Big Bold Steps

As one sits down to write this piece, the number of COVID-19 cases in India is over 50,000, global infections have zoomed past 3.5 million, there is no vaccine in sight and scattered reports of new strains of the virus are emerging.

There is no denying that the pandemic poses, perhaps, the biggest economic challenge to independent India, with an estimated economic loss of Rs 32,000 crore per day, with only a quarter of the economy being functional. More than 50% of Indian businesses are expected to be affected by the pandemic and over 122 million people have lost their jobs.

The last such pandemic was the Spanish Flu in 1918, in the aftermath of World War I, when the country saw a dramatic fall in both demand and supply. India's GDP shrunk by 10.5% and inflation hit an all-time high in 1918. Will we go the same this time around too? Current forecasts for the Indian economy range from going into negative territory in 2021, to scenarios that predict growth between two to four per cent a year.

So, what has been the government's response? The first thing the government did was to try and put some money in the hands of the state governments and people at large, given the severe curtailment in economic activity. The finance ministry has allowed the states to borrow a cumulative Rs 3.20 lakh crore from the market, on the basis of 50 per cent the net borrowing ceiling fixed for the year 2020-21, in the first nine months of this fiscal (April-December). Most states have demanded more funds to meet the additional expenses arising out of the pandemic as most of their budgets will now be spent on caring for the infected, preventing further spread and supporting the migrant poor who've been rendered destitute by the outbreak and are clamouring to go home in the absence of assured food, shelter or work.

The government announced a massive Rs 1.7 lakh crore (trillion) stimulus package on 26 March 2020, which is expected to see the economic activity back on track once the lockdown is lifted. The package is targeted to provide immediate income and consumption support to the poor, women, and workers affected by the lockdown. Pending tax refunds to the tune of Rs 18000 crore were also released to individuals and businesses in the first half of April.

Is there a silver lining to this cloud? What opportunities has the pandemic thrown up?

Building health infrastructure in semi-urban and rural areas where little or none exists currently, and offering greater support to rural enterprises, including clean energy enterprises, thus advancing the country's clean energy transition, could be two big opportunities that the government can focus on in the coming months.

In its largest ever health sector support to India, the World Bank on April 2, approved a $1 billion fast-track project to help India create a COVID-19 emergency response and strengthen its public health preparedness to combat the pandemic. The loan will enable the Government of India to scale-up its efforts to limit human-to-human transmission, including reducing local transmission of cases and containing the epidemic from progressing further. In parallel, interventions to strengthen the healthcare system will be rolled out to improve capacity to respond to the COVID-19. The World Bank loan is targeted particularly to scale up district hospitals and designated infectious disease hospitals to deal with the epidemic. This could be the big opportunity for the government to put in place a comprehensive healthcare system in towns and villages that lack adequate medical care.

The Asian Development Bank approved $2.2 billion emergency funding for India on the heels of the World Bank, targeted at alleviating the economic impact of COVID 19 on informal sector workers, micro, small and medium enterprises, among others. With India set to witness a massive migration back to the villages as migrant workers with no jobs and money head back home (unemployment has risen to 26% from around 6% pre-COVID-19), this could be the chance to turn a probable health and economic disaster into an opportunity. By supporting rural enterprises – both new and existing ones, the government will be able to inject some new life into the rural agriculture-based economy which for the past several years has been stagnating, growing at less than two percent.

Already MGNREGA work, with priority for irrigation and water conservation, has been allowed, while food processing outside municipal limits and production of packaging material, jute industry, brick kilns have already been permitted. By extending the mandate of MGNREGA to building and maintaining healthcare centres and installing the necessary equipment, the government will be netting two birds with one shot.

Time is ripe for big, bold steps that will make a tangible difference to millions of people at the grassroots. For a government that envisaged electrifying all the households in the country, this too should be achievable.

Authored by:
Gayatri Ramanathan
(Associate Director – Projects)

Climate Communication in the Time of COVID-19

Communicating about climate change has never been easy. The subject is complex, marred by uncertainties and tends to evoke emotionally and politically charged responses. How then do we talk about climate change as the global community grapples with the COVID-19 pandemic today? How do we do this in a post-pandemic world?

In the last few years, climate change moved to the centre stage of global affairs gaining a significant amount of media and policy attention. Today, nations are mounting emergency responses to COVID-19 to save lives and to restrict the damage to their economies.

As priorities have shifted, climate leaders and communicators must consider how to continue to highlight the climate crisis. One may argue that this may not be the best of times to champion for climate change. Because of COVID-19, lives have been lost, and communities and nations turned upside down. The disruptions to health, economy, livelihoods, business and industry are expected to draw the focus away from climate change.

It may be some time before we can use the terms "climate emergency, crisis or breakdown" when nations across the world are singularly focused on "flattening the curve". We do not know how long it will be before Greta Thunberg and the "Fridays for Future" movement will take to the streets again. Nor can we be certain when clean energy and climate action will dominate the global discourse again.

Even so, there are still ways and possibilities to drive the climate change conversation in this new and evolving context.

Beyond direct health responses, nations are launching economic and fiscal stimulus programmes that can shape their future. If some of these programmes are designed and implemented through a climate lens, it is possible for the post-COVID world to be greener and more sustainable. The United Nations is already spelling this out—by calling on governments to seize the opportunity to "build back better" by creating more sustainable, resilient and inclusive societies. United Nations Secretary-General António Guterres, has emphasized the "need to turn the recovery into a real opportunity to do things right for the future", proposing climate-related actions that countries can take, to shape during their recovery process.

This is more so important given that before COVID-19 hit us, many nations were on the path to their Nationally Determined Contribution (NDC). We will need to quickly resume efforts in order not to lose the gains made since Paris 2015.

With healthcare now at the frontline, there is an opportunity to connect the COVID-19 crisis to climate change in order to identity common solutions. Robust and well-performing health systems can go a long way in protecting the public from health threats. This is where we can highlight the human cost of poor health systems when having to respond to any kind of crisis—whether it is COVID 19, the ongoing impact of climate change on health, or other factors such as the lack of basic water, sanitation and hygiene services than can weaken healthcare.

Population groups already struggling with poverty, marginalization, air and water pollution are disproportionately vulnerable to COVID-19. More than ever, we will need to talk about cross-sectoral solutions that can address the structural inequalities in economies that affect both crises.

This is also a time for communication that is people-centric and speaks to values of compassion and community. This is a time for communication to be sensitive. For instance, the lockdown has reduced economic activity, leading to localized improvements in air and water quality including the closing of the ozone hole over the Arctic. This is not a cause for celebration because the human cost of COVID-19 is so great. Equating this to a gain shows a disregard for people's wellbeing, and can even go against the cause of climate action. Instead, we need to talk about ways to hold on to some of these gains in a post-pandemic world.

As institutions devoted to the cause of clean energy and climate change in India, we must continue to advance our core missions. In the face of COVID-19, we will need to re-think our current role and contribution, continue to find relevant ways to communicate the cause, and come out on the other side more resilient and tougher than before.

Authored by
Aditi Sinha
(Associate Director – Communications)

MARCH 2020

Roadmap to Chart out Sustainable Mobility, as India Tackles Climate Change

2020 is expected to be a pivotal year for climate action with countries submitting their revised Nationally Determined Contributions (NDCs) under the Paris Agreement. The Paris Process on Mobility and Climate (PPMC) is developing a global macro-roadmap for decarbonized mobility with key partners of the global transport community.

Adapting these ongoing global efforts to local needs, the PPMC has joined hands with the Federation of Indian Chambers of Commerce and Industry (India's industry body FICCI), along with World Wide Fund (WWF) as a knowledge partner, to chart a road map for sustainable mobility for the country. Shakti Sustainable Energy Foundation is supporting the development of this roadmap—a critical way forward document that is built on stakeholder inputs and consensus. The idea behind this roadmap is to lay out a comprehensive strategy for low-carbon, sustainable transportation in India.

The roadmap was featured at a kick-off event held in New Delhi on 13th February 2020. Speaking at the event, Shri Nitin Gadkari, Union Minister of Road Transport and Highways urged the Industry to focus on economically viable technologies and alternate fuel solutions to support public transportation. He also called for collaboration with the government for the proposed electric lane on the Delhi-Mumbai Expressway while promising to provide policy support to serious players.

The event was well attended by policy makers, industry associations civil society and received a significant amount of media attention.

Fostering Alignment and Solutions for India's Electric Mobility Transition

The second annual convening of the India Electric Mobility Initiative (EMI) hosted by Shakti Sustainable Energy Foundation was held through 13-14th February 2020 in New Delhi. The EMI is a joint philanthropic collaboration set up with the goal of advancing electric mobility in accordance with India's priorities.

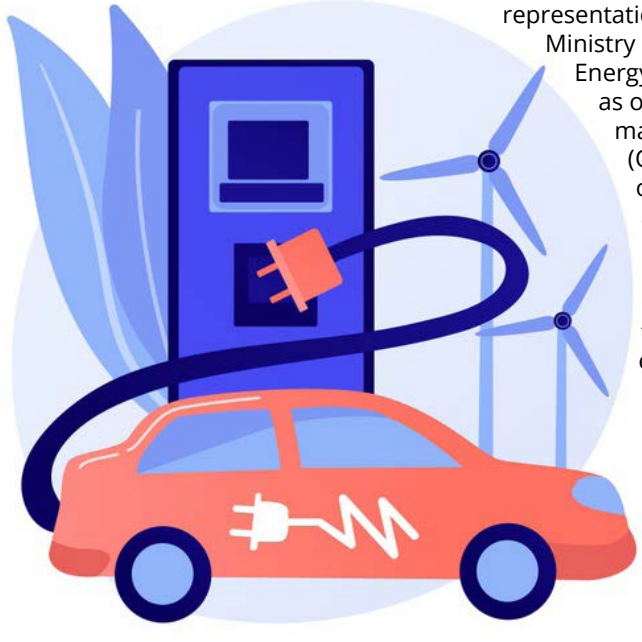
Over the course of the convening, more than 100 attendees from over 40 organisations, including grantees, donors and experts deliberated on the challenges and opportunities that India faces against the backdrop of recent developments in electric mobility.

Through a series of targeted discussions, priority areas were identified along with practical ways to advance national and state level mandates, charging infrastructure, electric buses, roles of distribution companies (discoms) and strengthening communications and advocacy, amongst other relevant issues. Together, participants explored the alignment of potential new initiatives.

So far, the initiative has already commissioned research and development projects in the areas of cost reductions strategies for electric vehicle batteries, charging pattern and the impact on discoms, and the implications for the auto industry.

BESCOM Hosts Distribution Utilities Forum on the Theme Electric Vehicles: Discoms' Perspective

With electric mobility gaining momentum, particularly through the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (EVs) in India (FAME) policy, discoms will play a pivotal role in building the electric mobility ecosystem. The sixth meeting of the Distribution Utilities Forum themed Electric Vehicles: Discoms' Perspective was both timely and relevant in this regard.



The meeting brought together the leadership of 23 discoms to deliberate on the challenges, opportunities, and way forward. The meeting also saw representation from the Ministry of Power, Bureau of Energy Efficiency, as well as original equipment manufacturers (OEMs), charge-point operators (CPOs) and manufacturers in order to consider diverse perspectives from within the ecosystem.

A roundtable discussion amongst discoms revealed specific challenges they faced in the EV transition and how they were addressing these challenges. The Energy and Resources Institute, which is the Forum's secretariat, presented its research on the impact of EV charging. Insights from two ongoing Shakti-supported studies on business models for electric vehicles were also shared.

This meeting was held on 18th February 2020 at the Bengaluru Electricity Supply Company Limited (BESCOM) headquarters under the leadership of Shri Gireesh Pradhan (Chairman of the Forum) and Shri M. B. Rajesh Gowda, Managing Director (BESCOM).

Onboard the Energy Efficiency Train

The Indian Railways is one of the world's largest railway networks and a significant growth engine for the Indian economy. It consumes over 20 billion kWh of electricity annually, which is around 2% of the India's total power consumption. With this electricity demand projected to increase in the next decade, the Railways realizes the potential for more sustainable and low-carbon growth. It is a Designated Consumer under the Perform, Achieve and Trade (PAT) scheme where 16 traction units and six production units have been assigned energy saving targets.

In 2017, Shakti Sustainable Energy Foundation supported the Confederation of Indian Industry (CII) to roll out energy efficiency measures in these six production units along with four workshops. During the first phase of this effort, over 150 energy efficiency projects were implemented, which led to energy savings of 17.85 million units and financial savings of Rs. 136.8 million. In addition, emissions to the tune of 15,914 tCO2 were prevented. Building on this effort, we are now supporting similar interventions in ten more railway manufacturing units. CII also arranged meetings with technology providers for railway officials to understand the technology options most suited for their units.

The findings of these efforts were shared at a high-profile workshop held in New Delhi on 21st February 2020. The workshop was presided over by eminent members of the Railway Board, Shri A K Tewari and Shri Shivendra Mohan, and attended by representatives from 20 Indian Railway units. The workshop also saw the launch of the Best Practice Manual on "Energy Efficiency in Indian Railways" published by CII with our support. The manual is designed to assist railway production units to improve their energy efficiency levels and to meet PAT targets.

For the second phase of the project, over 252 energy efficiency opportunities have been identified with an anticipated annual energy saving potential of 10.10 million units. This is expected to result in financial savings of Rs. 67 million and prevent emissions to the tune of 9,000 tCO2. Given the mammoth scale of rail operations in India, efforts such as these can contribute to greening the tracks for sustainable growth in India.

Boosting Transit-Oriented Development Through Better Financing

With India urbanizing rapidly, Transit-Oriented Development (TOD) is emerging as a promising strategy to ensure that our cities are designed to maximise the amount of housing, work and leisure that is within walking distance of high-quality public transport infrastructure. While Indian cities have begun implementing their first TOD projects, the sustainability of financing the high-quality infrastructure required in TODs has been a challenge. There is a strong need to develop suitable financing mechanisms and concrete policy frameworks that help create and sustain TOD.

Recognising this challenge, Shakti Sustainable Energy Foundation supported the National Institute of Urban Affairs (NIUA) to provide technical assistance to National Capital Region Transport Corporation (NCRTC) towards implementing TOD on the Delhi-Ghaziabad-Meerut RRTS corridor. NIUA provided targeted inputs on implementing this project incorporating the means to sustainably finance TOD through Value Capture Finance (VCF) mechanisms.

Based on the learning from this assistance, NIUA developed a process document, which captures various steps and considerations for effective implementation of VCF in a simple manner. The attempt through these knowledge products is to make a relatively niche subject area such as VCF for TOD, more accessible to a range of expert working in the field of sustainable transport and urban development

The knowledge products were launched by Shri Kunal Kumar, Mission Director - Smart Cities and Joint Secretary, Ministry of Housing and Urban Affairs at an outreach workshop held on February 11, 2020 in New Delhi with attendance from representatives of the government, implementing agencies, practitioners, and research organizations. In his remarks Shri Kunal Kumar highlighted the need for cities to adopt financial instruments that provide sustained funding of TOD projects.

FEBRUARY 2020

The India-U.S. Track II Dialogue on Climate Change and Energy

The India-U.S. Track II Dialogue on Climate Change and Energy held its ninth meeting in New Delhi from 3-5 February 2020. The meeting was convened by the Ananta Aspen Centre, India with support from Shakti Sustainable Energy Foundation.

Since its inception in 2010, this dialogue has convened 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 focused on key opportunities for strengthening the bilateral relationship, including Zero Emission Vehicle (ZEV) manufacturing, air quality, short lived climate pollutants and sustainable finance. It also featured a public panel on the role of citizens and governments in climate change mitigation.

The dialogue is co-chaired by Jamshyd Godrej, Chairman of the Board, Godrej & Boyce Mfg. Co. Ltd, John Podesta, Founder and Director, Center for American Progress and William Reilly, Former Administrator, US Environmental Protection Agency. The Ananta Aspen Centre serves as the Secretariat for the Dialogue.

The India Energy Transformation Platform: Showing the Path to Low-Carbon Energy Systems 2050

Under the Paris Agreement in 2015, India along with more than 150 governments, submitted its Nationally Determined Contributions (NDCs) by 2030. But even as India embarks on this transition, we must take advantage of emerging technology developments and innovation that can advance long-lasting and transformative changes, even beyond the NDCs.

The India Energy Transformation Platform (IETP) was formed to address this critical need. The IETP is an independent, multi-stakeholder platform that identifies non-linear, transformational technologies and policy and market-based solutions for low-carbon growth energy systems for 2050. Over the last year, IETP members have mentored research teams to identify high-impact opportunities in the areas of decentralised energy generation consumption and storage, industrial process heat, space cooling and renewable energy systems.

The findings of this research were presented at the launch of the IETP on 7th February 2020 in New Delhi. Dr. J R Bhatt, Advisor, Ministry of Environment, Forest and Climate Change and Dr. Ashok Kumar, Director, Bureau of Energy Efficiency (BEE) provided the opening remarks at the launch, which was well attended by bilateral and civil society organizations and research and industry.

The IETP is supported by the Swiss Agency for Development and Cooperation and Shakti Sustainable Energy Foundation. The Center for Study of Science, Technology and Policy serves as its secretariat. Visit http://ietp.in/ for more information.

India Air Quality Stakeholder Convening 2020

On 27 January 2020, Shakti Sustainable Energy Foundation and the India Climate Collaborative co-hosted the India air quality stakeholder convening bringing together philanthropies, civil society and experts to discuss priority actions to tackle air pollution and enable more comprehensive solutions for cleaner air in the country.

Air pollution in India is emerging as a long-term threat to health and environment as well as exacerbating climate change. Emissions from vehicles, open crop burning, waste sector, domestic and construction activities are on the rise. With the launch of the National Clean Air Program last year, some progress has been made, but efforts need to be scaled up significantly given the size and scale of the problem.

The convening shed light on the interventions, successes, challenges, learning so far and the critical investment opportunities that must be tapped into to reduce air pollution. A few common themes that emerged included setting pathways to meet the NCAP targets, gathering more indigenous data on the impact on human health, identifying quicker solutions to reduce industrial and agricultural emissions and fostering more citizen engagement. In-depth discussions were held on solving the air pollution problem in cities through strategies targeted at transport, agriculture, and industry.

Building on these themes, Shakti Sustainable Energy Foundation and the India Climate Collaborative will identify immediate and long-term priority areas strengthen air quality management in India starting 2020.

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