

# **BIG BETS**

FOR THE

# **GREEN TRANSITION**

2018-19 in Review | September to August





“

**Can we increase growth,  
create jobs,  
expand opportunities,  
but also make it socially,  
economically and  
environmentally  
sustainable and equitable  
for the present and for  
future generations?”**

**ARUNABHA GHOSH**

An excerpt from, Grand Bargain for Sustainable Growth,  
*Business Standard* | Inflexion Points column |  
25 December 2018



Ranked the best in South Asia with an annual operating budget of less than USD 5 million, six years in a row. Among top 100 out of 8,200+ think tanks in eight categories.

**[ 2018 Global Go To Think Tank Index ]**

Ranked the best in South Asia among 'Top Energy and Resource Policy Think Tanks'.

**[ 2018 Global Go To Think Tank Index ]**

Ranked 2<sup>nd</sup> in the 'International Energy' category for its pioneering study on solar-powered healthcare.

**[ Prospect Think Tank Awards 2018 ]**





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# BIG BETS FOR THE GREEN TRANSITION



For the world outside, we want to explain—and change—the use, reuse and misuse of resources. For the world inside, we want to be the platform to build careers in public policy. And the way to measure our impact is by periodically asking a simple yet existential question: What would have been different if CEEW did not exist?

We rely on data, integrated and interdisciplinary analysis, and strategic outreach. We have now begun to make big bets to transform markets, technologies, business models, policies and individual behaviour - in India and in other emerging economies.

Our flagship ACCESS survey is now the largest panel dataset in the world on energy access. Our continuing analysis of jobs in renewable energy brings the energy transition closer to social and economic development imperatives. We have designed new business models for distributed energy, for the rural and urban economies. Our analytical capabilities have been demonstrated in other emerging economies. We have integrated power sector reform strategies with reforms in subsidies. We have examined exciting new technological options for industrial sustainability, while supporting enhanced transparency and better planning for low-carbon pathways at the national and state levels. We have cleared the smog in understanding the sources of air pollution as well as on-ground realities in implementing solutions. We have been privileged to co-draft the *India Cooling Action Plan* (the first of its kind in the world) and in finding new insights for India's ambitious transition to sustainable mobility. And to top it all off we launched the pathbreaking CEEW Centre for Energy Finance.

In order to fulfil our purpose, we have to be able to speak truth to power. And be prepared to listen to the truth as well. We have connected with farmers, industries and households in addition to policymakers. We have drawn parliamentarians and legislators into our conversation. We have created new platforms—*Energy Horizons*—for representatives from many countries to discuss the global energy transition. And we have turned the mirror inwards to measure ourselves against gender KPIs.

Institutions have the power to effect change. While change can come from force of principle, the zeal of individuals or the necessity of crisis, we cannot rely on principles, persons or problems, alone, to drive sustained progress. Only institutions can deliver that.

Institution building is about people, process and purpose. Without hesitation, we can say that CEEW's team is its greatest accomplishment. We also strive hard to maintain, add, simplify and improve processes, in line with our growing footprint. But people and process will flounder without purpose. Without clarity of purpose, people remain uninspired, at best, and become selfish, at worst; process seems onerous, at best, and gets bypassed and corrupted, at worst.

We believe that CEEW would be a success if it could withstand, survive and thrive through crises; and CEEW would be a success if our values and our methods became worthy of emulation for others. In short, we have to be both resilient as well as remarkable. CEEW is a work in progress. But after nine years of operations, we have a sense of how to get it right!

**JAMSHYD N. GODREJ**

Chairperson  
Council on Energy, Environment and Water

**ARUNABHA GHOSH**

Chief Executive Officer  
Council on Energy, Environment and Water



# STRATEGIC OUTREACH

Convening and engaging with influencers



1



2

**1. Dharmendra Pradhan**  
Hon'ble Minister of Petroleum  
& Natural Gas and Minister of  
Steel, at *Energy Horizons*,  
18-19 July 2019.



3



4

**2. Fatih Birol**  
Executive Director, IEA, at  
*Energy Horizons*,  
18-19 July 2019.

**3. H.E. Ambassador André  
Aranha Corrêa Do Lago**  
Ambassador of Brazil to India,  
at *Energy Horizons*,  
18-19 July 2019.

**4. Anand Kumar**, Secretary,  
Ministry of New and Renewable  
Energy (MNRE), at *Energy  
Horizons*, 18-19 July 2019.



5



6

**5. Jamshyd N. Godrej**  
Chairman, CEEW, at the  
CEEW-IIASA dialogue, *On Air:  
Pathways to Achieving India's  
Ambient Air Quality Standards*,  
29 March 2019.

**6. Geeta Menon**  
Joint Secretary, MoEFCC, GoI,  
at the CEEW-NEA national  
dialogue, *Phasing Down  
HFCs in India: Incentives and  
Regulatory Approaches*,  
7 March 2019.



**7. Montek Singh Ahluwalia (L),** Trustee, CEEW and **Sharmila Chavaly (R),** Principal Financial Advisor, Northern Railways, at *Energy Horizons*, 18-19 July 2019.

**8. H.E. Ambassador Nils Ragnar Kamsvåg,** Former Ambassador of Norway to India, at the CEEW-NEA national dialogue, *Phasing Down HFCs in India: Incentives and Regulatory Approaches*, 7 March 2019.

**9. Hon'ble members of the Indian parliament, L to R: Vincent Pala, Jairam Ramesh, and Sanjay Jaiswal,** at *Energy Horizons*, 18-19 July 2019.

**10. Tarun Das,** Founding Trustee, CEEW, at *Energy Horizons*, 18-19 July 2019.

Images: CEEW

## Convening and engaging with influencers

**11. Suresh Prabhu**  
Prime Minister Narendra Modi's Sherpa for the G20 Summit, at *Energy Horizons*, 18-19 July 2019.



**12. Ashutosh Jindal**  
Joint Secretary, Cabinet Secretariat, Gol, at the CEEW-Shakti report launch, *Access to Clean Cooking Energy and Electricity: Survey of States 2018*, 21 November 2018.



**13. Arun K. Verma**  
Former Joint Secretary, Ministry of Power, at the CEEW-Shakti report launch, *Access to Clean Cooking Energy and Electricity: Survey of States 2018*, 21 November 2018.



**14. Rajashree Ray** Economic Adviser, Ministry of Finance, Gol, at the CEEW-AU conference, *Road to the IPCC Sixth Assessment Report: Fostering Deeper Engagement with Industry, Finance and Civil Society*, 15 January 2019.



**15. Rana Adib**  
Executive Secretary, REN21, at *Energy Horizons*, 18-19 July 2019.





Image: Organisers

16



Image: Ananta Centre

17



Image: CEEW

18

16. Arunabha Ghosh (1<sup>st</sup> row, 2<sup>nd</sup> from left) at the 3<sup>rd</sup> China-India Dialogue, Beijing, 21-23 March 2019.

17. L to R: Senator Frank James Sensenbrenner Jr.; Arunabha Ghosh; John David Podesta Jr., former White House Chief of Staff and current Chair, Center for American Progress; Ajay Mathur, TERI; Anne Marie Yastishock, USAID; and Jamshyd N. Godrej at the India-US forum, 16-17 August 2019.

18. J. R. Bhatt (R), Adviser, Ministry of Environment, Forest and Climate Change (MoEFCC), GoI, and Jim Skea (L), Co-Chair, IPCC WG III, Imperial College London, at the CEEW-AU conference, *Road to the IPCC Sixth Assessment Report: Fostering Deeper Engagement with Industry, Finance and Civil Society*, 15 January 2019.



# ENERGY ACCESS

Enabling access to energy for homes, livelihoods, and community well-being



CEEW's **Sasmita Patnaik** at the Sustainable Energy For All charrette, in Amsterdam, 18-20 June 2019.



ACCESS, based on the world's largest panel-data on multidimensional energy access, has become the default resource to understand on-ground realities related to electricity and clean cooking energy access in rural India. Going beyond households, we will soon launch a multi-million dollar programme in collaboration with Villgro to scale up decentralised renewable energy solutions for rural livelihoods."

**ABHISHEK JAIN**, Senior Programme Lead, and team lead.



ACCESS  
2018

Mapping the state of rural communities' access to electricity and clean cooking energy

In November 2018, we released the second edition of our flagship publication, *Access to Clean Cooking Energy and Electricity: Survey of States* (ACCESS), with support from the Shakti Sustainable Energy Foundation and the National University of Singapore (NUS). The study, based on a CEEW-ISEP-NUS survey, covered rural areas' access to energy in six of India's major energy access-deprived states - Bihar, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal. We found that both the Government of India flagship programmes on electricity and LPG access—*Saubhagya* and *Ujjwala*—had made on-ground impact, but reliability of electricity supply and affordability of LPG remained key bottlenecks.



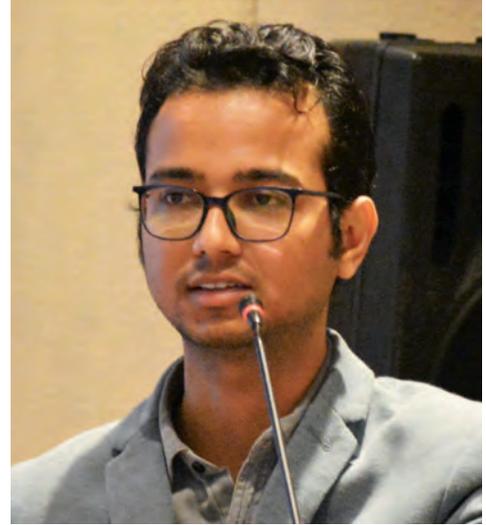
**Ashutosh Jindal**, Joint Secretary, Cabinet Secretariat, in a panel discussion, *Beyond Ujjwala: Towards the sustained use of clean cooking energy*, at ACCESS 2018 launch, 21 November 2018.



POWERING  
LIVELIHOODS

Through the *Initiative for DRE and Efficiency innovations to Support Incomes in the Rural Economy* (I-DESIRE) programme, we uncovered a market potential of more than USD 50 billion for clean energy innovations for livelihoods in India. Currently, only about 20 such innovations exist. Their deployment on the ground is limited, as entrepreneurs struggle to scale up at the pace required to address market needs. **We will soon launch the *Powering Livelihoods* initiative, in collaboration with Villgro, to unlock the market potential of this sector.** Powering Livelihoods will bridge the commercial valley of death by providing financial and capacity building support to enterprises with field-tested technologies to undertake large-scale commercial pilots.

CEEW's **Sunil Mani** sharing ACCESS 2018 findings for the state of Uttar Pradesh at a workshop with policymakers in Lucknow, February 2019.



CEEW's **Shaily Jha** presenting on women's participation in the rooftop solar sector at *Energy Horizons*, 18-19 July 2019.



A CEEW-SEforALL-ODI-CAFOD workshop was conducted to study the access and impact of cooking energy subsidies on the poorest and most marginalised, 25 June 2019.



**32  
MILLION**

rural households moved up from the bottom of the energy-access ladder across Bihar, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal from 2015 to 2018

**50  
BILLION USD**

the market opportunity for clean energy innovations that can power livelihoods in rural India

**75%**

rural households surveyed in ACCESS, relied on grid electricity for their primary lighting needs in 2018, up from 42% in 2015

*All data points: CEEW analysis*

## KEY RESEARCH

### Clean Energy Innovations to Boost Rural Incomes

Report | October 2018

<https://bit.ly/2yJT55E>

### Access to Clean Cooking Energy and Electricity:

Survey of States 2018

Report | November 2018

<https://bit.ly/2DT1x7w>

### State of Electricity Access for Primary Healthcare Centres in India: Insights from (DLHS-3 and DLHS-4)

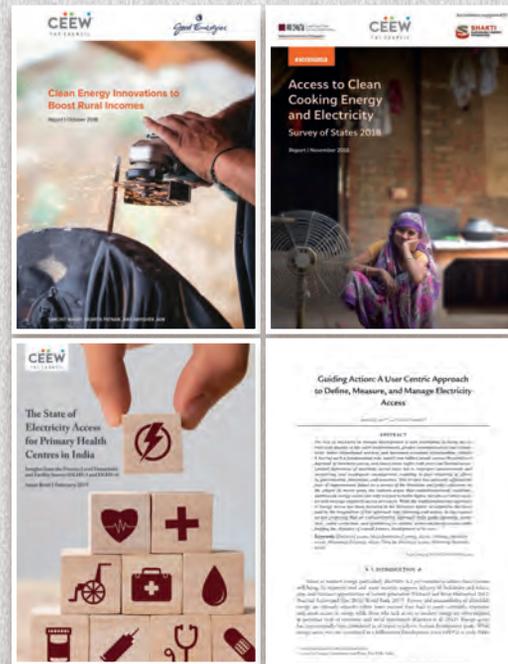
Issue Brief | February 2019

<https://bit.ly/2jZKV5J>

### Guiding Action: A User Centric Approach to Define, Measure, and Manage Electricity Access

Journal Paper | Economics of Energy & Environmental Policy, Vol. 8, No. 1. | 2019

<https://bit.ly/2IF9THV>



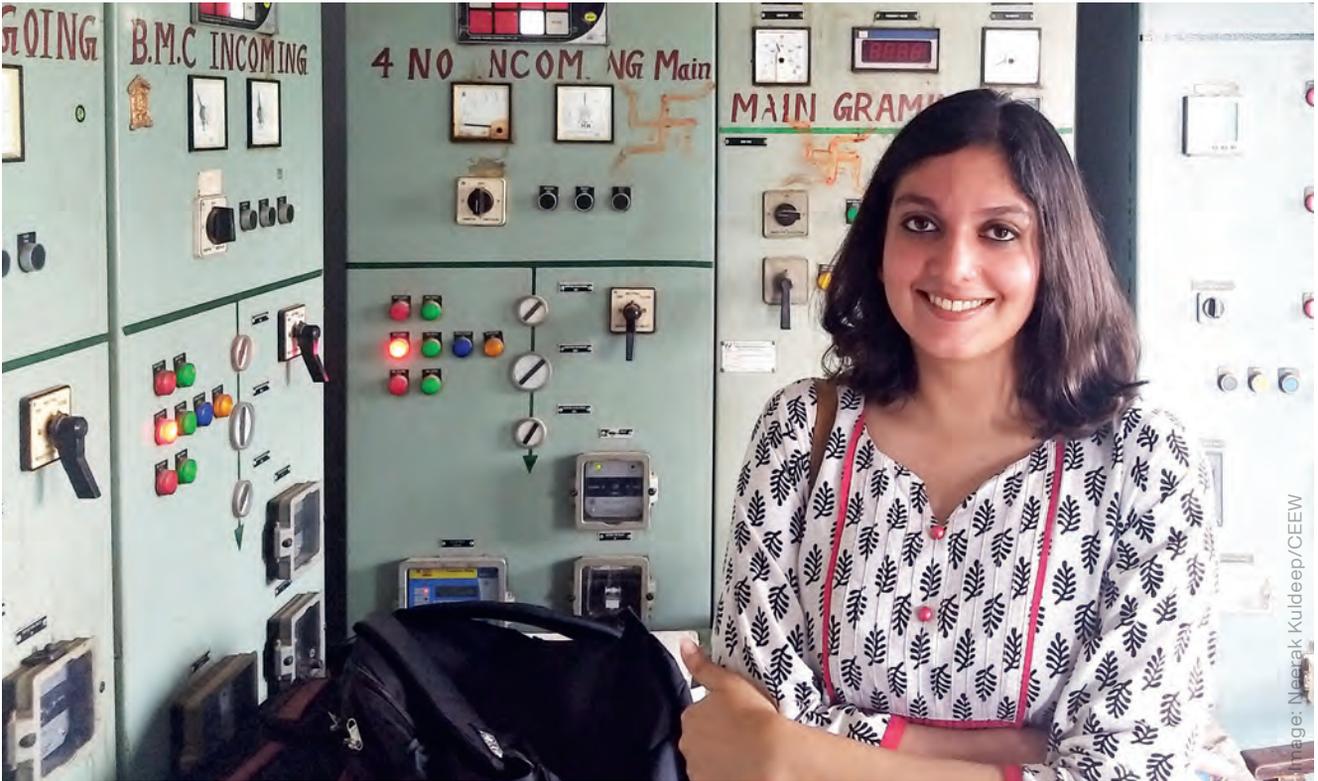
## THE TEAM

**KARTHIK GANESAN**, Research Fellow; **ABHISHEK JAIN**, Senior Programme Lead; **SHAILY JHA**, Research Analyst; **WASE KHALID**, Research Analyst; **SUNIL MANI**, Programme Associate; **SASMITA PATNAIK**, Programme Lead; and **ANAS RAHMAN**, Programme Associate.

CEEW would like to thank Sanchit Waray, Tauseef Shahidi, Saurabh Tripathi, Saumya Gupta, and Karishma Pradhan for contributing to research in energy access during 2018-19.

# RENEWABLES

Driving the energy transition



CEEW's **Selna Saji**, examining the feasibility of disom-led installations of community solar models at the feeder level to scale rooftop solar in Bihar.



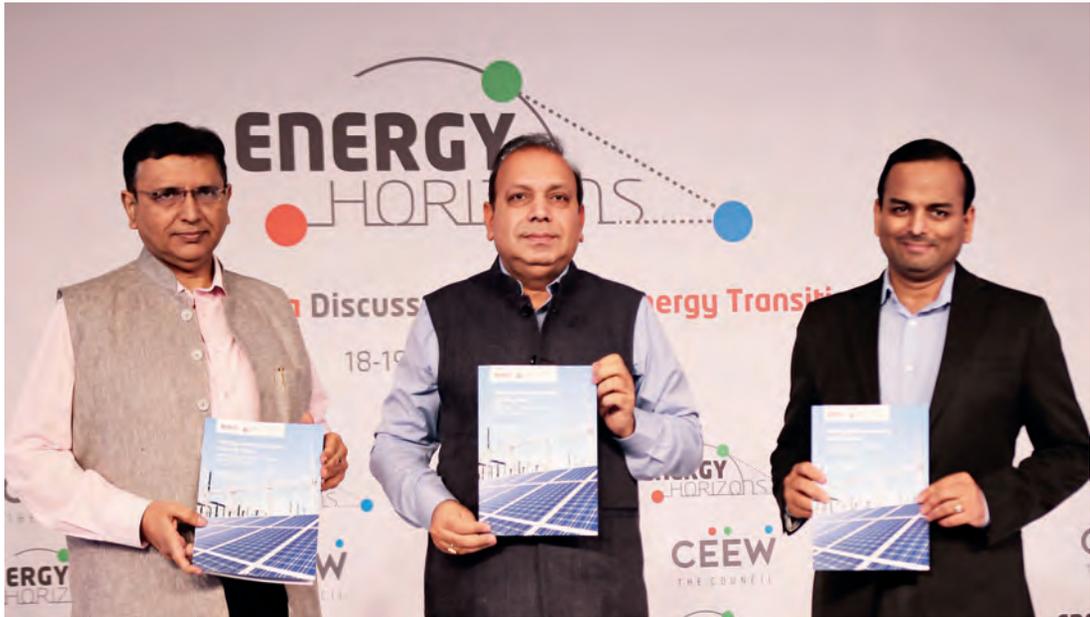
The RE team strives to provide thought leadership to support renewable energy markets and bring the energy transition closer to communities. Our research has contributed in charting alternative pathways to accelerate wind installations, bringing greater consensus among stakeholders on the net-benefit of rooftop solar to discoms, understanding consumer behaviour to create a democratic demand for household participation in the energy transition, and in underscoring the co-benefits in terms of growth and gender equity in jobs and skills.”

**NEERAJ KULDEEP**, Programme Lead.



## ROOFTOP SOLAR

In collaboration with BSES Rajdhani Power Limited (BRPL), an electricity utility in Delhi (discom), CEEW developed a framework to estimate the aggregate benefits that could accrue to BRPL and other discoms from rooftop solar. This cost-benefit analysis is being shared with discoms across the states to help them profile areas where rooftop solar promotion could benefit their clean energy and improved revenue goals.



**Anand Kumar** (C), Secretary, MNRE; **Gopal Saxena** (L), CEO, BRPL; and **Abhishek Ranjan** (R), AVP-System Operations, BRPL, launching the assessment framework, Valuing Grid-connected Rooftop Solar (VGRS) at *Energy Horizons*, 18-19 July 2019.



CEEW's **Akanksha Tyagi** presenting findings on how discoms can assess the cost and benefit of deploying rooftop solar, at *Energy Horizons*, 18 July 2019.

Images: CEEW



## PPAs

In 2018-19, we showcased evidence of the adverse impact of policy uncertainty on India's RE sector and analysed potential barriers to capital flows. Recommendations were also made to develop a more robust 'change in law' clause in RE power purchase agreements (PPAs) to improve their bankability and generate both investor and developer confidence.



## JOBS & GENDER

In collaboration with the International Energy Agency (IEA), Power For All, Natural Resources Defense Council (NRDC), and the Skills Council for Green Jobs (SCGJ), CEEW mapped the development benefits of the energy transition, specifically in the form of jobs created and gender inclusion across the renewable energy value chain. We found that **the solar and wind sector would provide employment to 330,000 people** if India were to achieve the 160 GW of wind and solar targets by 2022.



CEEW's **Kanika Chawla**, at the CEEW-IISD workshop, *Role of Government Support and Market-Based Financing in India's Clean Energy Transition*, 27 March 2019.



## REWG

In 2018-19, we convened more than five editions of the CEEW-Shakti High-Level Working Group on Renewable Energy Policy and Finance (REWG) with its collective of fifteen experts from industry and policy. The recommendations from the group were submitted to the Ministry of New and Renewable Energy.



Images: CEEW

**13%**

of solar power generation coincides with BRPL's peak electricity demand

**11%**

of the workforce in India's rooftop solar sector are women

**6-10%**

estimated reduction in solar tariffs if Safeguard Duty were not levied

All data points: CEEW analysis

## KEY RESEARCH

### Women Working in the Rooftop Solar Sector

A Look at India's Transition to Clean Energy  
CEEW-IEA Report | February 2019  
<https://bit.ly/2Tm0inI>

**What is the Safeguard Duty Safeguarding?** Analysing Impact on Solar Manufacturing and Deployment in India  
Policy Brief | June 2019  
<https://bit.ly/2IF9khr>

**Rethinking Renewable Energy Power Purchase Agreements:** Appraising the Change in Law Clause  
Policy Brief | June 2019  
<https://bit.ly/2ky3n5D>

**Powering Employment Growth with Green Energy**  
CEEW-NRDC-SCGJ Policy Brief | July 2019  
<https://bit.ly/2LWfuok>

**A Second Wind for India's Wind Energy Sector**  
Pathways to Achieve 60 GW  
Policy Brief | July 2019  
<https://bit.ly/2m4Y0vc>

**Powering Jobs Census 2019: Focus on India**  
Power For All-Schneider Foundation-Rockefeller Foundation-CEEW Issue Brief | July 2019  
<https://bit.ly/32zjil1>

**Valuing Grid-connected Rooftop Solar:** A Framework to Assess Cost and Benefits to Discoms  
CEEW-BRPL Report | July 2019  
<https://bit.ly/33PZk5q>

**Scaling Rooftop Solar**  
Understanding Consumer Perspectives in East Delhi  
Report | July 2019  
<https://bit.ly/2kzDK4q>



## THE TEAM

**KANIKA CHAWLA**, Director, CEEW-CEF; **ARJUN DUTT**, Programme Associate; **ARUNABHA GHOSH**, CEO; **NEERAJ KULDEEP**, Programme Lead; **SELNA SAJI**, Research Analyst; and **AKANKSHA TYAGI**, Research Analyst.

CEEW would like to thank Sugandha Somani Gopal, Manu Aggarwal, Nayantara Srinivasan, Anurag Banerjee, Saloni Nalwaya, Kumaresh Ramesh, Radhika Trivedi, Karishma Pradhan, and Alan Dominic for contributing to research in renewables during 2018-19.



# CEEW CENTRE FOR ENERGY FINANCE

Deepening Markets | Increasing Transparency | Attracting Capital



CEEW-CEF team.



The CEEW Centre for Energy Finance (CEEW-CEF), acts as a non-partisan market observer and driver that monitors, develops, tests, and deploys financial solutions to advance the energy transition in emerging economies. CEEW-CEF is helping deepen markets, increase transparency, and attract capital in the clean energy sectors of emerging economies, by comprehensively tracking, interpreting, and responding to developments in the energy markets while also bridging gaps between governments, industry, and financiers.”

**KANIKA CHAWLA**, Director, CEEW-CEF.



“I am very happy to learn of the CEEW Centre for Energy Finance. Developing financial mechanisms to support the large-scale deployment of clean energy is of critical importance in India, and globally, and this is an area in which the CEEW and the IEA have a strong history of cooperation. Given our mutual interest in this area, there is a great opportunity for our two organisations to continue to work collaboratively on this topic.”

**FATIH BIROL**, Executive Director, IEA.



“We’re excited to support this new initiative (CEEW-CEF) that is going to help lenders, investors, and policymakers implement climate solutions in India and beyond.”

**MARILYN WAITE**, Program Officer - Climate Finance (Environment Program), William and Flora Hewlett Foundation.



“The CEEW Centre for Energy Finance will provide solid intellectual leadership and support to policymakers and industry captains alike. With its independent analysis and deep domain knowledge, the Centre’s solution-centric approach could help to create new lending structures, reduce forex risks, and attract new investors from India and abroad. I welcome the Centre’s launch and look forward to its support in lowering costs and risks related to renewable energy in India.”

**SUMANT SINHA**, Chairman & CEO, ReNew Power.

## Supporting the energy transition in emerging economies

CEEW-CEF's **Kanika Chawla** led the team to South Africa and Indonesia in April-May 2019, to advise key officials and experts on risks and opportunities in financing the clean energy transition.



Image: CEEW

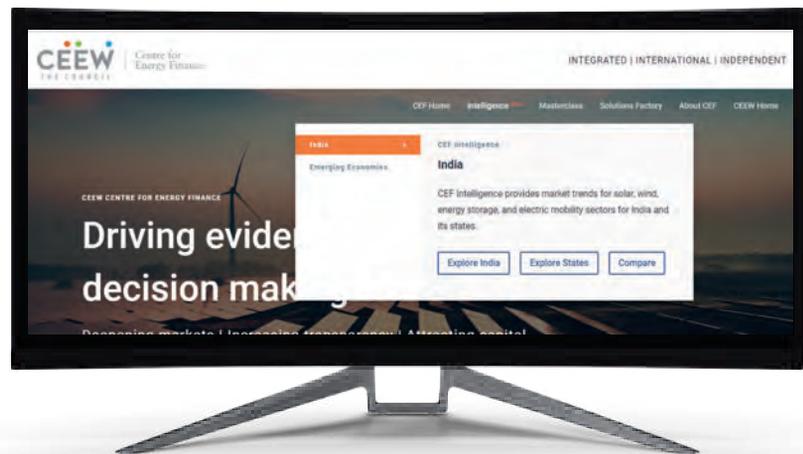
CEEW-CEF's **Rishabh Jain** sharing learnings from India's RE sector at the *Solar Show*, Vietnam, 4 April 2019.



Image: Solar Show

## cef.ceew.in

CEEW-CEF has a dynamic data portal that provides real time updates on changes in the clean energy markets and supports evidence-based decision making. Focusing on emerging economies around the world, and all Indian states, the dashboard provides market trends for solar, wind, energy storage, and electric mobility sectors.



## CEEW-CEF'S **JOURNEY IN NUMBERS**

**8**-member team

**5** peer-reviewed publications

**19** CEF policy memos

**55** countries and 28 Indian states in CEF Intelligence

**4** international workshops organised

### KEY

### RESEARCH

**Financing Clean Energy Innovation: Case for an Indian Business Demonstration Facility**  
Feasibility Study | July 2019  
<https://bit.ly/2Tqcty>

**Deepening Renewable Energy Markets in South Africa: Lessons for and from the Indian Renewable Energy Market**  
Report | July 2019  
<https://bit.ly/20QwNdF>

**Accelerating Investments in Renewables in Indonesia: Drivers, Risks, and Opportunities**  
Report | July 2019  
<https://bit.ly/2ZUANUV>

**Grid Integration Guarantee: A Financial Buffer to Address Renewable Energy Curtailment**  
Issue Brief | July 2019  
<https://bit.ly/2TrIqPs>

**Clean Energy Investment Trends 2019: Evolving Risk Perceptions for India's Grid-Connected Renewable Power Projects**  
CEEW-IEA report | July 2019  
<https://bit.ly/33qBzBK>

**Financing India's Energy Transition: A Guide on Green Bonds for Renewable Energy & Electric Transport**  
CEEW-CBI Report | July 2019  
<https://bit.ly/2MhdVla>



### THE TEAM

**KANIKA CHAWLA**, Director; **RISHABH JAIN**, Manager; **SALONI JAIN**, Analyst; **ANUSHREE MAJUMDAR**, Consultant; **NIKHIL SHARMA**, Associate; **GAGAN SIDHU**, Advisor; **VAIBHAV PRATAP SINGH**, Senior Analyst; **SHREY SOOD**, Analyst, **KARAN TAKHAR**, Intern, and **MEDHA SINGH**, Intern.

CEEW would like to thank Sakshi Balani for contributing to research for CEEW-CEF during 2018-19.



# POWER SECTOR

Enhancing **Governance** and **Discom Health**



In 2018, CEEW conducted a primary survey of 1,800 urban and rural households in Uttar Pradesh to gauge the state of power supply, barriers, and consumer satisfaction. A discussion at the home of the Gram Pradhan, Allupur panchayat, Malihabad block, Lucknow. L to R: CEEW's **Kanika Balani**, **Prateek Aggarwal**, a resident, and **Karthik Ganesan**.



The power sector is facing head-winds from emerging issues such as RE integration, EVs, emissions standards and the smart-meter roll out. However, the team's main focus over the last year was to address the historic issues that the sector has failed to address despite numerous targeted attempts. We focused on highlighting the challenges with billing and accounting for electricity sold and recommended means to reduce power procurement costs."

**KARTHIK GANESAN**, Research Fellow, and team lead.





## POWER REFORMS

In December 2018, our power sector team published a study on the average cost of power supply and procurement in Uttar Pradesh. We found a lack of disaggregation between interstate and intrastate transmission losses in the total loss figure reported. **This resulted in the state regulator reviewing the processes being followed by discoms in accounting for their losses.** This has also resulted in a changed reporting of losses, as an interim solution.

The second study, *Electricity Consumers and Compliance: Trust, Reciprocity, and Socio-economic Factors in Uttar Pradesh*, conducted in collaboration with the Initiative for Sustainable Energy Policy (ISEP), was based on a primary survey of 1,800 electricity consumers across urban and rural households. **Our researchers identified poor metering, infrequent billing, and inefficient collection of dues as accounting for far greater losses to discoms compared to those incurred on account of unauthorised electricity usage and meter tampering.**



Senior officials from Uttar Pradesh Power Corporation Limited (UPPCL), Madhyanchal Vidyut Vitran Nigam Limited (MVVNL), and Uttar Pradesh Electricity Regulatory Commission (UPERC) at the launch of our consumer perception study in Lucknow, 13 February 2019.

“The survey conducted by CEEW (in UP) recommends improving consumer satisfaction and using technology for billing. This could reduce human intervention leading to an efficient and punctual billing process. I also find the survey findings very helpful for both discoms and regulators as they provide insights to consumer perspectives and way forward for discoms.”

**VIKAS CHANDRA AGARWAL**, Director (Distribution), UPERC.



Images: CEEW



## SMART METERS

CEEW installed smart meters across 100 urban households in Mathura and Bareilly, Uttar Pradesh, to collect real-time supply and consumption data of consumers. This will help understand electricity usage patterns of households, temporal variation in demand, and its key drivers. It will also **help identify the opportunities for demand management and energy efficiency in residential electricity use.**



Image: CEEW

CEEW's **Sunil Mani** (R) and **Shalu Agrawal** (C) with an electrician installing smart meters, Mathura, April 2019.



## ELECTRICITY BILL

Our team, in collaboration with the Citizen Consumer and Civic Action Group (CAG), is **examining the potential of an electricity bill as an instrument of raising consumer awareness and strengthening their engagement with power distribution companies.** Our current focus is on Tamil Nadu.



Image: CAG

Focus group discussions with consumers in Tamil Nadu to better understand what they would like to see in their electricity bills, June 2019.



## INDIA'S ENERGY TRANSITION

In 2018-19, CEEW published three independent studies in collaboration with the Institute for Sustainable Development (IISD). These studies focused on the impact of the Goods and Services Tax on solar photovoltaic and coal power, energy subsidies, and the cost of meeting air pollution standards in the coal-fired electricity sector.

**39%**

of Uttar Pradesh's (UP) households are metered, billed, and pay their electricity dues

Source: CEEW analysis

**86%**

consumers in UP paid their electricity bills when billed monthly, this reduced to 73% when billed bi-monthly or longer

Source: CEEW analysis

**52 PAISE PER UNIT**

the expected average increase in power tariffs if pollution norms are met and plants are retrofitted to mitigate SOX, NOX and PM

Source: CEEW-IISD analysis

## KEY RESEARCH

**India's Energy Transition: Subsidies for Fossil Fuels and Renewable Energy, 2018 Update**  
Report | December 2018  
<https://bit.ly/2EyUgcm>

**India's Energy Transition: The Impact of the Goods and Services Tax on Solar Photovoltaic and Coal Power Costs**  
Issue Brief | March 2019  
<https://bit.ly/2oczkRw>

**Electricity Consumers and Compliance: Trust, Reciprocity, and Socio-economic Factors in Uttar Pradesh**  
Report | February 2019  
<https://bit.ly/2TLgWuL>

**India's Energy Transition: The Cost of Meeting Air Pollution Standards in the Coal-fired Electricity Sector**  
Issue Brief | August 2019  
<https://bit.ly/2kzz8eq>



## THE TEAM

**SHALU AGRAWAL**, Programme Lead; **PRATEEK AGGARWAL**, Programme Associate; **KANIKA BALANI**, Research Analyst; **KARTHIK GANESAN**, Research Fellow; **SUNIL MANI**, Programme Associate; **DANWANT NARAYANASWAMY**, Research Analyst; and **A.R.VISHNUVARDHAN**, Intern.

CEEW would like to thank Kapardhi Bharadwaj, Avinash Kumar, Aditya Kumar, and Kshitij Singh for contributing to research in the power sector during 2018-19.



# INDUSTRIAL SUSTAINABILITY & COMPETITIVENESS



Image: iStock



Lack of reliable data is a major barrier to effective policymaking. At CEEW, we have developed India's most comprehensive database on industrial energy-use and greenhouse gas emissions. This helped us understand the linkages between industrial activity, structural make-up, and energy-use performance enabling us to provide critical policy insights to decarbonise the sector.”

**TIRTHA BISWAS**, Programme lead.



Image: CEEW



## GREEN HYDROGEN

In November 2018, CEEW and IEA conducted a workshop on *Renewable Hydrogen for Industry and Beyond*. Notable experts from the Government of India, academia, and industry attended this workshop.

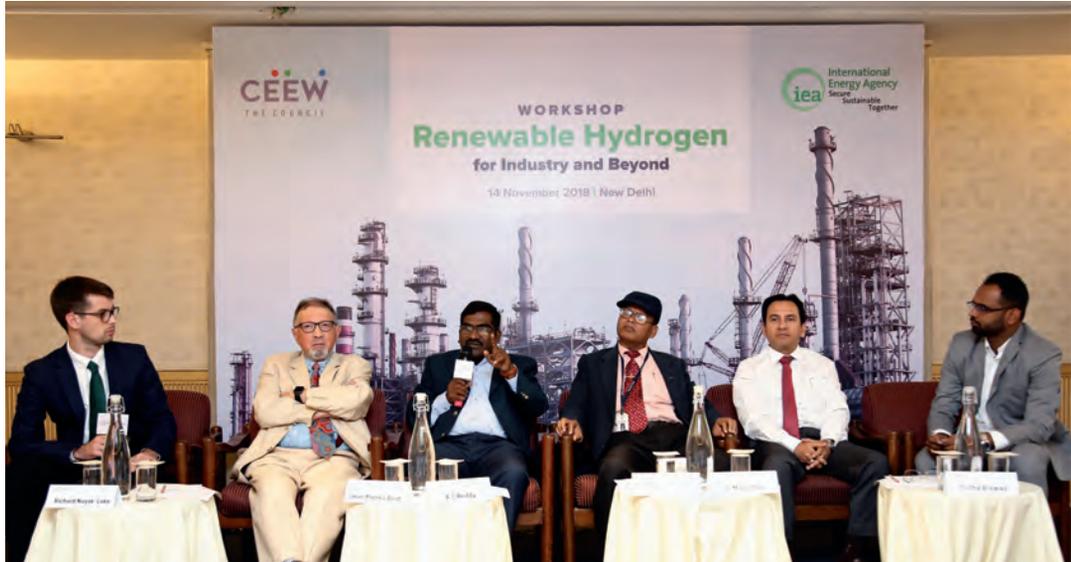
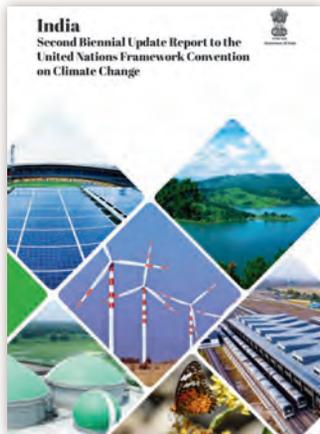


Image: CEEW



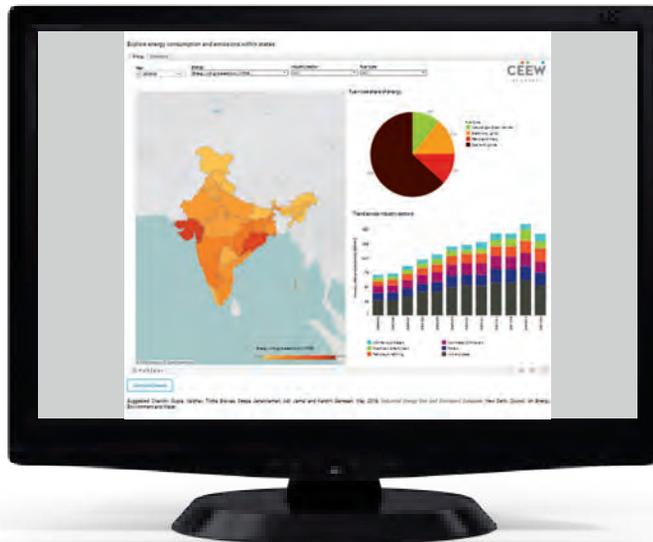
## BUR



CEEW contributed significantly to a dedicated chapter on Measurement, Reporting and Verification (MRV) of India's national climate actions in India's second *Biennial Update Report* (BUR) submitted to the UNFCCC.



## DATA @CEEW



Using our comprehensive database on industrial energy-use and GHG emissions, we developed a visual dashboard tracking energy consumption and related emissions across 200,000 formal Indian manufacturing enterprises.

**The dashboard is now live at <https://www.ceew.in/data/industrial-energy-emissions-dashboard>.**

CEEW's **Tirtha Biswas** discussing energy utilisation of MSMEs at a stakeholder meeting in New Delhi, December 2018.



### STATE CAPACITIES

Our team is working with state government officials in Gujarat and Madhya Pradesh to examine the impact of existing state action plans for mitigation actions and make suitable revisions. In addition, we are supporting Madhya Pradesh's Environmental Planning and Coordination Organisation to decarbonise industry by building GHG inventories and identifying mitigation potential.

### ENHANCED TRANSPARENCY

Enhanced transparency in reporting on climate action is a mandate of the Paris Agreement. But defining what the reporting capacities are and ascertaining how developing countries can exercise flexibility still remain contentious in climate negotiations. To address this gap, **CEEW developed an assessment tool—A Capacity Building Assessment Matrix (CBAM)—to help quantify capacity building efforts and the gaps therein.**



A multi-stakeholder group evaluated the CBAM framework in May 2019.



CEEW's **Sumit Prasad** explaining the potential of CBAM at a stakeholder consultation in New Delhi, 3 May 2019.

**74%**  
of industrial GHG emissions  
is from iron & steel, cement  
and chemical industries

*Source: CEEW analysis*

**14%**  
**IMPROVEMENT**  
in the industrial emissions  
intensity of GVA between  
2005 and 2015

*Source: CEEW analysis*

**40 USD**  
**PER TONNE CO<sub>2</sub>**  
is the estimated carbon  
tax required to make green  
hydrogen-based steel  
production cost-competitive  
with conventional blast  
furnace processes by 2030

*Source: CEEW-IEA analysis*



#### THE TEAM

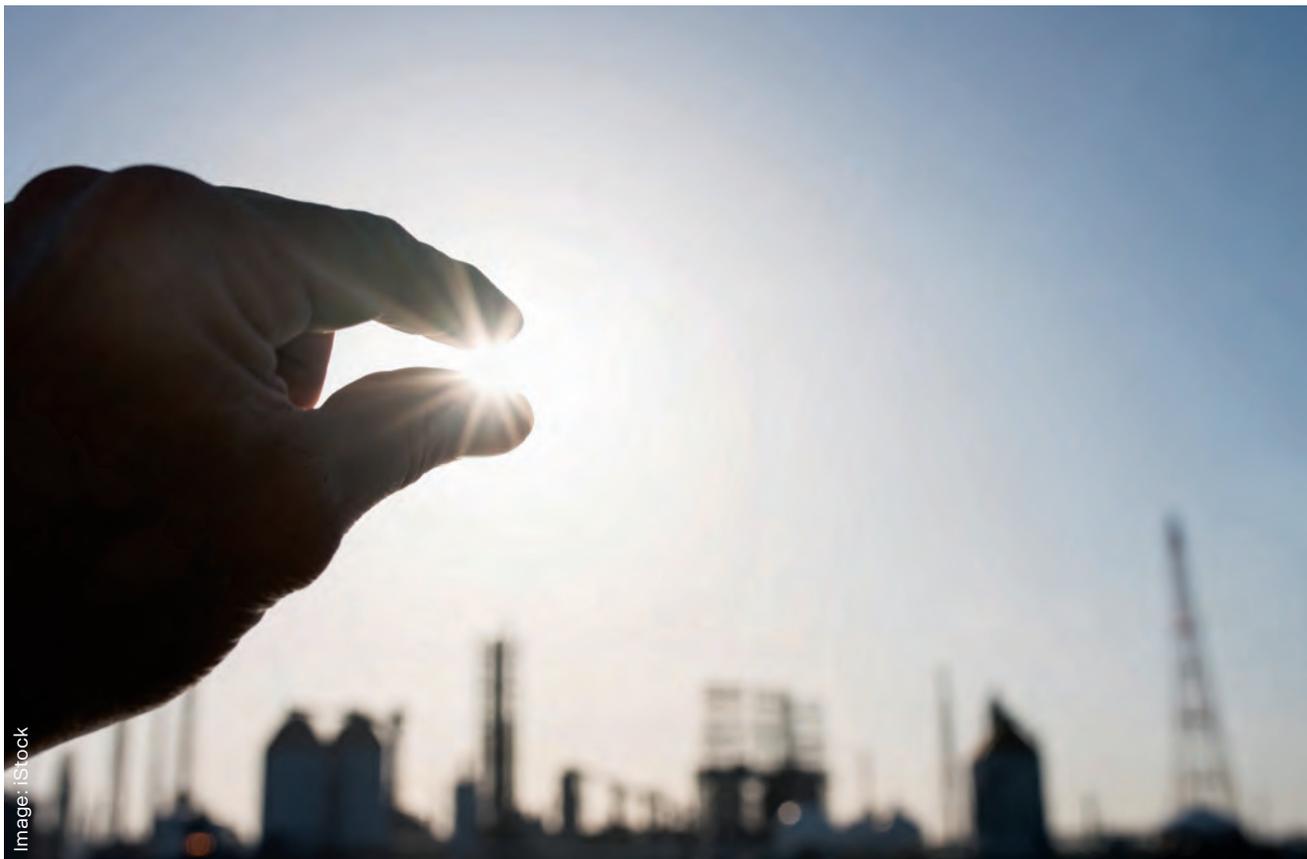
**TIRTHA BISWAS**, Programme Lead; **KARTHIK GANESAN**, Research Fellow; **DEEPA JANKIRAMAN**, Research Analyst; **NITIN MAURYA**, Programme Associate; **SHANAL PRADHAN**, Research Analyst; **SUMIT PRASAD**, Research Analyst; and **DEEPAK YADAV**, Programme Associate.

CEEW would like to thank Vaibhav Gupta, Adil Jamal, and Naman Matta for contributing to research in industrial sustainability and competitiveness during 2018-19.



# LOW-CARBON **PATHWAYS**

For India's growth with decarbonisation



CEEW's research on low-carbon pathways (LCP) focused on developing state-level modelling capabilities, which are critical in developing state-level energy and climate action plans for India. Simultaneously, the LCP team shepherded a high level 'Working Group on Mitigation Instruments (WGMI)' to develop a framework for the choice of mitigation instruments, appropriate for the Indian context. Analytical insights, and deep stakeholder engagement, will be instrumental in informing an energy secure and environmentally sustainable development trajectory for India and its states."

**VAIBHAV CHATURVEDI**, Research Fellow, and team lead.



## MITIGATION INSTRUMENTS



CEEW and EDF convened a Working Group on Mitigation Instruments, comprising multi-sectoral experts to collaboratively develop a framework for choosing appropriate GHG mitigation instruments in the Indian context.



## IPCC

CEEW, in collaboration with the Ahmedabad University, **organised a conference to facilitate deeper engagement between the Intergovernmental Panel on Climate Change (IPCC) and leaders from Indian industry, finance, and academia.** The sessions showcased the IPCC assessment process and discussed ways in which the assessments could be more relevant for industry and financiers.



Images: CEEW



**Speakers from the government and associated enterprises at the conference**

**1. J. R. Bhatt**  
Adviser, Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India.

**2. Rajasree Ray**  
Economic Adviser, Ministry of Finance (MoF), Government of India.

**3. Chintan Shah**  
Director (Technical), Indian Renewable Energy Development Agency (IREDA).

**IPCC representatives and authors**

**4. Jim Skea**  
Co-chair, IPCC WG III, Imperial College London.

**5. P. R. Shukla**  
Co-chair, IPCC WG III, Ahmedabad University.

**6. Mikiko Kainuma**  
Lead Author, IPCC Report on 'Global Warming of 1.5°C', Institute for Global Environmental Strategies (IGES).

**7. Shobhakar Dhakal**  
Coordinating Lead Author, IPCC WG III AR6, Asian Institute of Technology (AIT).

**8. Joyashree Roy**  
Coordinating Lead Author, IPCC WG III AR6 and IPCC Report on 'Global Warming of 1.5°C', Asian Institute of Technology (AIT) / Jadavpur University.

**9. Navroz Dubash**  
Coordinating Lead Author, IPCC WG III AR6; Centre for Policy Research (CPR).

**10. Minal Pathak**  
Senior Scientist, IPCC WG III Technical Support Unit, Ahmedabad University.

**Industry representatives**

**11. Mahendra Singhi**  
Managing Director and CEO, Dalmia Bharat Cement Ltd.

**12. Chanakya Chaudhary**  
Vice President of Corporate Services, Tata Steel Ltd.

**13. Anirban Ghosh**  
Chief Sustainability Officer, Mahindra Group.

Images: CEEW



**THE TEAM**

**VAIBHAV CHATURVEDI**, Research Fellow; **ANKUR MALYAN**, Research Analyst; and **POONAM NAGAR KOTI**, Programme Associate.

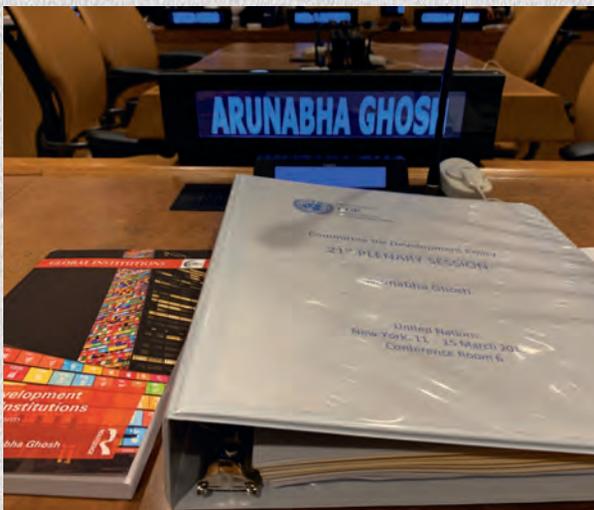
CEEW would like to thank Pallavi Das, Reetika Arora, and Siddharth Subudhi for contributing to research in low-carbon pathways during 2018-19.



## The UN Secretary-General nominated Arunabha Ghosh to the prestigious United Nations Committee for Development Policy in 2019

Arunabha Ghosh is one of the 24 members, and the only Indian, to be nominated by the Secretary-General to the United Nations Committee for Development Policy (UNCDP). The UNCDP is the only expert committee whose recommendations are mandated to be tabled at the UN General Assembly.

Arunabha's three-year membership, which began on 1 January 2019, involves advising the United Nations Economic and Social Council (ECOSOC) on a range of emerging economic, social and environmental issues relevant to the design and implementation of the United Nations Sustainable Development Agenda and to strengthen international development cooperation.



**Membership**  
The 24 members are nominated in their personal capacity by the Secretary-General, and are appointed by ECOSOC for a period of three years. Membership is geared to reflect a wide range of development experience as well as geographical and gender balance.

**Current CDP Members**  
(1 January 2019 – 31 December 2021)

- ✦ Adriana Abdenur, Brazil
- ✦ Debapriya Bhattacharya, Bangladesh
- ✦ Winifred Byanyima, Uganda
- ✦ Ha-Joon Chang, Republic of Korea
- ✦ Diane Eison, UK
- ✦ Marc Fleurbaey, France
- ✦ Sakiko Fukuda-Parr, Japan
- ✦ Kevin Gallagher, USA
- ✦ Arunabha Ghosh, India
- ✦ Sen Gong, China
- ✦ Trudy Hartzenberg, South Africa
- ✦ Rashid Hassan, Sudan
- ✦ Iolph van der Hoeven, Netherlands
- ✦ Stephan Klasen, Germany
- ✦ Tina Mama, Nigeria
- ✦ Ariana Mazzucato, Italy
- ✦ Alicia Merino, Mexico
- ✦ Jueline Musilitwa, Zambia
- ✦ An Nurse, Trinidad and Tobago
- ✦ Antonio Ocampo, Colombia
- ✦ Taylor, Papua New Guinea






# RISKS & ADAPTATION



CEEW's **Kurinji L.S.** and **Niti Gupta** discussing ways to reduce stubble burning in Ludhiana, October 2018.



Working towards breathable air quality and restoring blue skies was a key focus last year. To capture polluting activities, we integrated the use of satellite monitoring technology with on-ground perspectives of various actors. Our findings on crop residue burning in Punjab, farmers' perspectives, and variances in Delhi's emission inventories, informed the Prime Minister's office, the Environment Pollution (Prevention and Control) Authority as well as concerned stakeholders on action points needed to combat pollution."

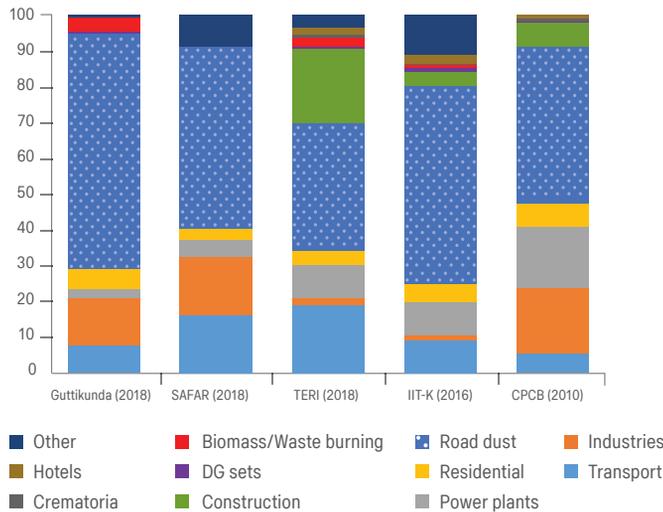
**KURINJI L.S.**, Research Analyst.



## AIR QUALITY

Like rural India, rural Punjab too has no significant ground monitoring of air quality. **CEEW installed 48 low-cost air quality monitors, to measure the concentration of particulate matter near paddy fields**, in October 2018. We examined the extent and spread of rural air pollution in Punjab during the paddy stubble burning period by combining this data with freely available, satellite-based, monitoring data. Through interviews, **CEEW researchers also recorded farmers' perspectives on stubble burning and on pollution control measures**. Further, in collaboration with IIASA, we modelled pathways for India to achieve its national ambient air quality standards (NAAQS).

### Comparative analysis of sector-wise contribution to PM<sub>10</sub> emissions in Delhi (in %)



Another CEEW study on pollution in Delhi evaluated the discrepancies in the existing emission inventories specific to Delhi NCR and attempted to understand the gaps and opportunities to develop an emissions inventory for source apportionment studies.

Source: CEEW analysis, 2019



## ON AIR

CEEW and IIASA organised a dialogue with scientists, policymakers, researchers, civil society experts, journalists, and farmers to discuss pathways for achieving India's ambient air quality standards, crop-residue burning, and emissions inventories.

A dialogue on **Pathways to Achieving India's Ambient Air Quality Standards**  
29 March 2019

**Balveer Singh**, a farmer from Ludhiana, sharing observations on crop burning during *On Air*.



**Dr Jaswinder Kaur**, Department of Agriculture, Punjab, speaking on pollution control challenges during *On Air*.



Images: CEEW



ZBNF

### Gains from Zero Budget Natural Farming

We conducted an on-ground survey of 639 farmers across six districts in Andhra Pradesh to understand the potential savings in fertiliser consumption and government subsidies if ZBNF were scaled up. We are also examining the reduction in GHG emissions from the manufacturing of chemical fertilisers.



Image: Niti Gupta/CEEW

Training local survey enumerators for primary research on ZBNF farming in Andhra Pradesh.



WATER VULNERABILITY

### Developing a tool with CSIRO to predict water conflicts



Image: Sumit Gautam/CEEW

CEEW's **Kangkanika Neog**, conducting a focus group discussion in Keonjhar district, Odisha, to understand water conflict vulnerability in water-stressed areas, October 2018.

## 674 MILLION CITIZENS

likely to breathe air with high concentrations of PM<sub>2.5</sub> in 2030, even if India were to comply with its existing pollution control policies and regulations

Source: CEEW-IIASA analysis

## 36% HIGHER YIELDS

reported by ZBNF groundnut farmers compared to their non-ZBNF counterparts

Source: CEEW analysis

## 30%

additional investments required to make infrastructure in Amaravati climate resilient

Source: CEEW-UEA-Mott Macdonald analysis

## KEY RESEARCH

### Pathways to Achieve National Ambient Air Quality Standards (NAAQS) in India

CEEW-IIASA Report | March 2019

<https://bit.ly/2Fluq6b>

### Alternative Methods to Monitor Air Pollution: A Study of Crop Residue Burning in Punjab

Issue Brief | March 2019

<https://bit.ly/2lYzB3A>

### Paddy Residue Burning in Punjab: Understanding Farmers' Perspectives and Rural Air Pollution

Issue Brief | March 2019

<https://bit.ly/2GrgHAK>

### Amaravati: Building a Path Towards Climate Resilience

CEEW-UEA-Mott MacDonald Report | May 2019

<https://bit.ly/2m5T2OP>

### What is Polluting Delhi's Air?

Understanding Uncertainties in Emissions Inventories

Issue Brief | March 2019

<https://bit.ly/2V1ULRD>



## THE TEAM

**HEM H. DHOLAKIA**, Consultant; **KARTHIK GANESAN**, Research Fellow; **TANUSHREE GANGULY**, Programme Associate; **NITI GUPTA**, Research Analyst; **ABINASH MOHANTY**, Programme Lead; **KANGKANIK A NEOG**, Programme Associate; **KURINJI L.S.**, Research Analyst, and **INDRANUJ PATHAK**, Intern.

CEEW would like to thank Sumit Gautam, Maria Jose V., Aggie Suman, and Ishita Jalan for contributing to research in risks and adaptation during 2018-19.



# TECHNOLOGY, FINANCE & TRADE

Informing the governance of **existing, emerging and over-the-horizon technologies**



CEEW's **Shikha Bhasin** at the CEEW-NEA roundtable, *Regulating HFCs in India: Challenges and Ways Forward*, New Delhi, 11 October 2018.



CEEW continued to lead work in India on climate geoengineering governance. We briefed the UN Environment Programme's Committee of Permanent Representatives in Nairobi in May 2018 and then delegates to the fourth UN Environment Assembly in March 2019 when a crucial proposal was debated. Our research on how to structure international cooperation on geoengineering research continued to inform global debates."

**ARUNABHA GHOSH**, Founder and CEO, and team lead.



ICAP

CEEW research has guided policymaking on India's impending phase-down of hydrofluorocarbons since 2013.

**CEEW researchers contributed to the designing of India's Cooling Action Plan (ICAP) by providing key inputs and authoring the chapters on the servicing sector and R&D.**

As part of the Steering Committee on ICAP, they will now guide on-ground implementation and lead working groups on the servicing sector and R&D.



Image: Akash Goenka/AEEE

Launch of the *India Cooling Action Plan*: Contributing authors from CEEW, TERI, and AEEE join **Dr Harsh Vardhan** (former) Minister of Environment, Forest and Climate Change, current Minister of Science and Technology; **Mr Anil Kumar Jain** (former) Special Secretary, MoEFCC, current Secretary, Ministry of Coal; **Ms Geeta Menon**, Joint Secretary, MoEFCC; and **Dr Amit Love**, Joint Director, Ozone Cell, MoEFCC.





## HFC PHASE-DOWN

CEEW, in collaboration with the Norwegian Environment Agency, published a study, which **provides insights on creating an ecosystem for a successful refrigerant transition, top regulatory options that India could adopt, and how policy certainty about the phase-down could lead to gains for domestic priorities across India's growth sectors.** The insights were based on in-depth interviews with more than 60 industry stakeholders including primary refrigerant consumers (these are original equipment manufacturers and B2B companies), refrigerant manufacturers and suppliers, component manufacturers and suppliers, industry association representatives, consultants and service providers, and commercial users of products.

Images: CEEW



*Phasing Down HFCs in India: Incentives and Regulatory Approaches* was launched with stakeholders from the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, Norwegian Embassy, and the HVAC industry on 7 March 2019.



## CEEW FILM

### India's HFC Phase-down: A Call to Action





## GEOENGINEERING GOVERNANCE

CEEW-Forum for Climate Engineering Assessment roundtable on *Governing Solar Radiation Management: The Role of Developing Countries*, 10 April 2019.



## INFORMING THE AC SERVICING SECTOR

Our **current research focuses on formalising India's residential air conditioning sector to maximise energy-efficiency gains, minimise refrigerant emission leakages, and secure livelihoods.** As part of this study, a detailed survey across four cities – Meerut, Madurai, Baroda, and Dhanbad – is underway to gauge consumer awareness on energy efficiency and AC servicing best practices. We are also engaging with stakeholders in the technician training space to inform India's training and certification system.



Images: CEEW

Surveys underway to record AC owners' maintenance practices and awareness of good servicing practices during May-June 2019.



**SUSTAINABLE  
MOBILITY**

Our sustainable mobility team has been **exploring the impacts of an electric vehicle (EV) transition on India's auto industry, economy, and environment**. This includes conducting a life cycle analysis of GHG emissions of internal combustion engines against EVs. Further, they are examining the preferences and perceptions of urban Indians towards urban transportation, including environment-friendly options.



Image: CEEW

CEEW's **Abhinav Soman** training enumerators to conduct a pan-India telephonic survey of more than 3,600 urban citizens on their transport choices, June and July 2019.



Image: istock

**<60%**

stakeholders found subsidies desirable for shifting to low-GWP refrigerant products

**70%**

stakeholders interviewed, preferred and found impactful, a policy that would impose an upper limit on the GWP of refrigerant gases

All data points: CEEW analysis

## KEY RESEARCH

**Acting on Many Fronts: Incentives and Regulations to Phase-down HFCs in India**

CEEW-NEA Report | March 2019

<https://bit.ly/2SVog64>

**Geoengineering Our Climate?**

Ethics, Politics, and Governance, 1<sup>st</sup> Edition | CRC Press  
Book Chapter “*Environmental Institutions, International Research Programmes, and Lessons for Geoengineering Research*” | September 2018

**Climate Ambition Needs Targeted Technology Collaboration**

Book chapter in *20 Years of G20*, Springer | May 2019

**Geoengineering: The need for governance**

Paper | C2G2 | February 2019



## THE TEAM

**SHIKHA BHASIN**, Programme Lead; **VAIBHAV CHATURVEDI**, Research Fellow; **ARUNABHA GHOSH**, CEO; **APURUPA GORTHI**, Research Analyst; **NANDINI HARIHAR**, Research Analyst; **HARSIMRAN KAUR**, Research Analyst; and **ABHINAV SOMAN**, Programme Associate.

CEEW would like to thank Narayan Shyamal Gopinathan, Nitin Chauhan, and Jyotesna Maurya for contributing to research in technology, finance and trade during 2018-19.



# WOMEN IN SUSTAINABILITY (WIS)

For a  
**gender-inclusive public policy sector**

To foster safe and enabling professional work environments for women at all levels in public policy, CEEW launched the *Women in Sustainability (WiS)* initiative in 2017.

Since then, through gender sensitivity trainings, film screenings, book readings, curated talks, and team discussions, **WiS has facilitated conversations on gender sensitivity and inclusion within CEEW and across the wider sector.**

## Learning from Women in Public Policy

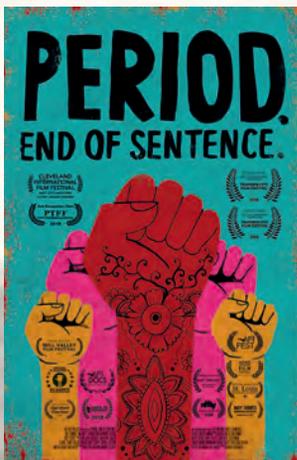
**Kelly Sims Gallagher**  
Professor, Energy and Environmental Policy, The Fletcher School, Tufts University, at CEEW, 7 March 2019.



**Annie Notthoff**  
California Advocacy Director, National Resources Defense Council (NRDC), at CEEW, 13 February 2019.



Images: CEEW



**CONFRONTING BIASES**  
Film screening | 8 March 2019

**Period. End of Sentence**, the winner of the Best Documentary (Short Subject) at the 91<sup>st</sup> Academy Awards, was screened at the CEEW office on Women's Day. The screening was followed by an internal team discussion on facing up to personal biases, myths, and facts about menstruation and how these colour perceptions about women at workplaces.



## DIALOGUE

### Breaking Barriers and Building Careers for Women in Sustainability

4 June 2019

On the eve of World Environment Day, WiS invited senior professionals—men and women from think tanks, field NGOs, government departments, and academia—to **discuss workplace challenges and biases women face**. Best practices to address these challenges were also discussed.

Break-out sessions with participants **helped harvest ideas such as instituting gender-based KPIs, gender audits and flexible HR policies for young parents**.

The event also marked **Women in Sustainability's second anniversary**.



1. **Yamini Aiyer**, President and Chief Executive, Centre for Policy Research.
2. **Ritu Lal**, Senior VP & Head - Institutional Relations, Amplus Solar.
3. **Smita Mohanty**, Integrator, Human Resources, PRADAN.
4. **Parveen Dhamija**, Adviser, Skill Council for Green Jobs (Formerly Adviser / Scientist G, Ministry of New & Renewable Energy, GoI).
5. **Kanika Chawla**, Director, CEEW-CEF.
6. **Rajat Kathuria**, Director and Chief Executive, Indian Council for Research on International Economic Relations (ICRIER).

Images: CEEW



**7. Kangakanika Neog**, Co-chair, Women in Sustainability.

**8. Sasmita Patnaik**, Co-chair, Women in Sustainability.



In 2018, CEEW formulated nine key performance indicators (KPIs) to track and promote gender inclusion within the institution.

**50:50** proportion of men to women in the organisation

**34%** of total salary disbursed to women

**1** woman team lead across **8** teams

**0** women on the CEEW governing board

**31%** research publications with women as lead authors

**30%** women speakers at CEEW panel discussions

**12%** women in CEEW programmatic advisory groups

**8%** instances of women researchers quoted in the press

**18%\*** opinion editorials published with women as first authors

**10%\*** opinion editorials published with women as second authors

\*Excludes opinion editorials written by the CEO.



### Report from the Internal Complaints Committee (ICC)

The ICC organised a workshop on gender sensitisation and training on the *Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013*, for all CEEW staff (including interns) in September 2018. This was followed by an intensive training only for ICC members in January 2019 on the details of *The Act* and appropriate internal procedures in the event a complaint is made.

With the departure of Vaibhav Gupta, an ICC member, Tirtha Biswas was invited to be on the Committee. The ICC also invited a new external member, Smita Mohanty, from PRADAN. She replaces Kiran Pasricha from Ananta Aspen Centre. Kanika Chawla was re-elected unanimously as chairperson of the ICC for a second term.

The ICC reports that it did not receive any complaints of harassment during the period in review.



# CEEW@COP24

Championing transparency, **showcasing the India story**



**CEEW  
PRESS  
BRIEFING**

**Living up  
to the deal:**  
Expectations  
from COP24

CEEW participated as an accredited observer at the 24<sup>th</sup> session of the Conference of Parties (COP24) to the UN Framework Convention on Climate Change (UNFCCC) in Katowice. COP24 was a crucial meeting, with the contentious rulebook for implementing the Paris Agreement being finalised at the end of the negotiations.

**We hosted four events at the COP and also presented findings from our research spanning enhanced transparency, power sector reforms, growth potential of renewables, mitigating GHG emissions, and low-carbon pathways at 24 other side events.**



Images: CEEW

CEEW's **Arunabha Ghosh** (C), with Alex Hanafi (Environmental Defense Fund), and **Axel Michaelowa** (Perspectives, RINGO Steering Committee), briefing international media on expectations from the COP24 negotiations, climate finance, the enhanced transparency framework and capacity building initiatives, the role of non-state actors, and pathways to achieving the 2-degree targets, 3 December 2018.



CEEW's **Kanika Chawla** (2<sup>nd</sup> from L) was a key speaker at IEA's *Policy Packages for the Clean Energy Transition* session, 11 December 2018.

CEEW's **Vaibhav Gupta** was a key speaker at the CEEW-CCCC's *Paris Agreement Rulebook: Actors, Actions, and Capacity Building for Enhanced Transparency* session, 4 December 2018.

CEEW researchers also spoke at side events organised by state, corporate and civil society stakeholders such as Yale University, Organisation for Economic Co-operation and Development (OECD), International Institute for Sustainable Development (IISD), World Resources Institute (WRI), United Nations Development Programme (UNDP), Ministry of Railways, (GoI), The Energy and Resources Institute (TERI), TATA Steel, International, and the Institute for Applied Systems Analysis (IIASA).

CEEW's **Vaibhav Chaturvedi** was a key speaker at, *The Paris Agreement and the Nexus of Water, Energy and Food: Policy Coherence and Serious Games*, organised by the Government of Greece, 14 December 2018.



# ENERGY HORIZONS

Where India discusses the global energy transition  
18, 19 July 2019

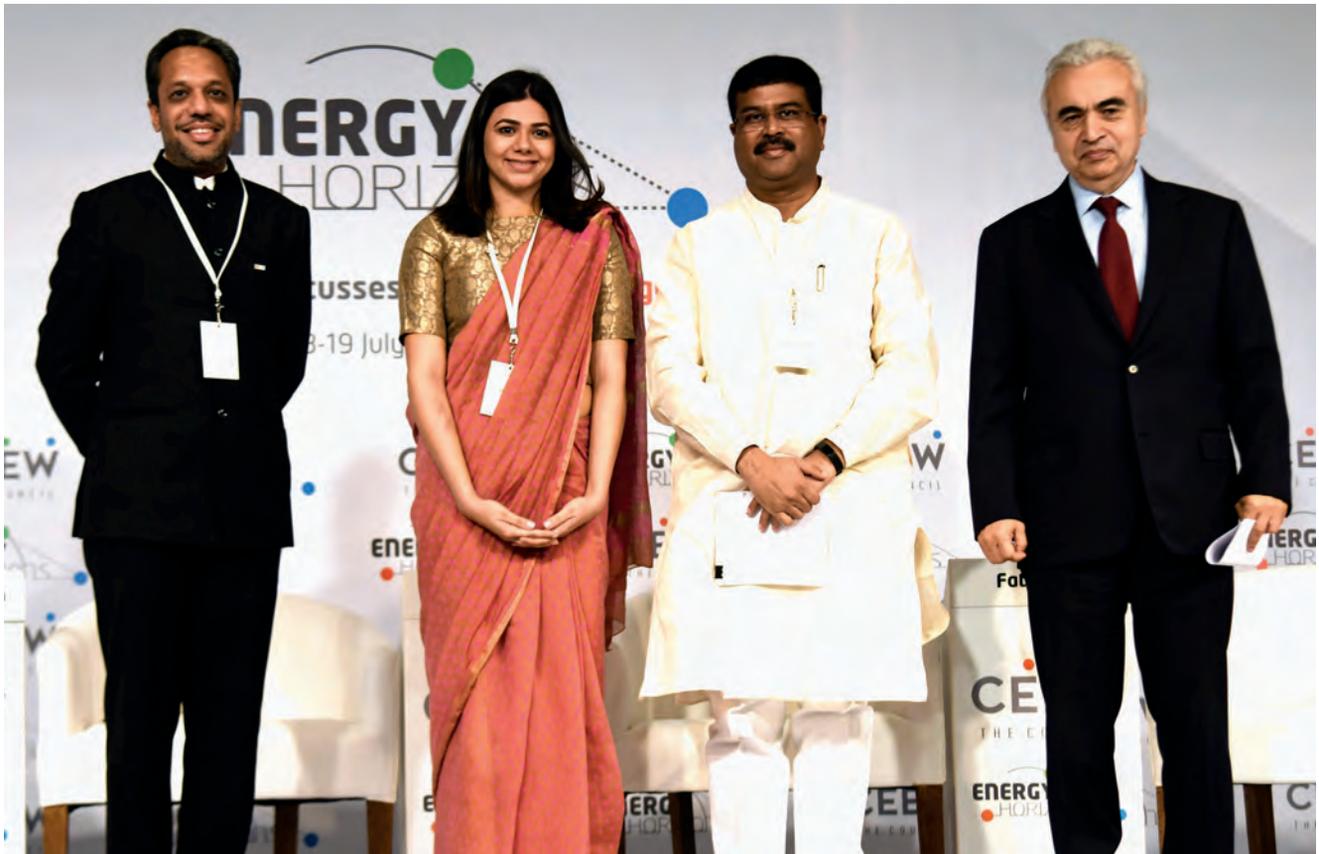


Image: CEEW

Hon'ble Minister, **Dharmendra Pradhan** and **Dr Fatih Birol**, IEA with CEEW's **Arunabha Ghosh** and **Kanika Chawla**, at *Energy Horizons*, New Delhi, 18-19 July 2019.

**550+** delegates

**150+** media mentions

**60+** speakers

**5000+** social media engagements

**14** conference & session partners

*Energy Horizons*, CEEW's flagship annual conference, is a global platform for thought and action leadership on the energy transition in emerging economies, with a focus on India.

Held on 18 and 19 July 2019, the conference had high-level discussions, plenaries, a curated CEOs' debate, masterclasses and solution factory sessions that covered issues ranging from power systems of the future, financing and business-model innovations, and next-generation technologies.



SESSIONS



Suresh Prabhu delivering a keynote address.



Plenary: Electricity systems of the future in the economies of the future.



**The CEOs' Debate:** The energy transition will make billions of millionaires.



**Masterclass:** Grid integration of rooftop solar - An economic loss or gain to discoms?



**Solutions Factory:** Speed dating on clean energy innovations.



**Solutions Factory:** Circumventing the challenge of grid integration.





TRENDING  
ON  
TWITTER



**PIB India** @PIB\_India · Jul 19

**Secure, Efficient, Affordable and Sustainable Energy** will have to be ensured to fuel the \$5 trillion economy: Union Minister @dpradhanbjp while delivering a keynote address at #EnergyHorizons 2019.

Read more: [pib.nic.in/PressReleaseSelf...](http://pib.nic.in/PressReleaseSelf...)



**Dharmendra Pradhan** @dpradhanbjp · Jul 19

**Delivered the keynote address at Energy Horizons 2019** organised by @CEEWIndia. Shared my views on trends that are crucial to India's **energy** transition and the significant role the **energy** industry would play in driving the Indian economy to the US\$ 5 trillion benchmark.



**Varun Sivaram** @vsiv · Jul 17

Congrats to @Kanikachawla8 on launching the Centre for Energy Finance at @GhoshArunabha's @CEEWIndia! She's fundraised globally, set an ambitious vision, & is assembling crucial datasets to speed India's energy transition. Excited to be a part of the launch #EnergyHorizons



**Umesh Bhutoria | #FEL100** @UmeshBhutoria · Jul 18

All the tweets on #EnergyHorizons give me a vry short term life goal. Being present at the next edition..:)

That would indeed need a lot more work!



**REN21** @REN21 · Jul 19

Exec Director of @IEA @IEABirol at the #energyhorizons opening session today: "There is a social and financial difference of coal fired power plants in industrialised and emerging and developing economies and this needs to be addressed in a fair way". @CEEWIndia

“I was very impressed. Indeed, deeply so, with EH. I hope to help all of you to make it stronger in 2020.”

**TARUN DAS**, CEEW, Founding Trustee.

“I was specifically impressed by the high-quality content and formatting of the sessions, be it a plenary or a masterclass. We, at CLEAN, definitely plan to incorporate some of these experiences to make our events engaging.”

**ADWAIT JOSHI**, Chief Executive Officer, CLEAN.

“Congratulations on a very successful *Energy Horizons* and the launch of the CEEW Centre for Energy Finance! It was an excellent program with many rich discussions. We very much value your partnership and look forward to our future collaborations.”

**ANJALI JAISWAL**, Senior Attorney, Senior Director, International Program, India Team, NRDC.

“Just wanted to take this opportunity to congratulate you for the grand success of *Energy Horizons*! As is clear from the excellent participation and the buzz *Energy Horizons* has managed to generate, it is very quickly becoming the most prominent energy sector dialogue in India!”

**PRASOON AGARWAL**, Regional Programme Officer - South & Central Asia, IRENA.

Conference partners



CEEW would like to thank Sahil Khillan, Arsheen Kaur, Aakanksha Varma, Naila Asim, Vidur Malik, and Nishtha Vishwakarma for supporting outreach efforts during 2018-19.

# INFORMING PUBLIC OPINION

Some snapshots of op-eds, quotes and articles featuring CEEW's research and opinions of our researchers.



## INFLEXION POINTS | *Business Standard*

Since October 2014, Arunabha Ghosh has been writing a monthly column, **Inflexion Points**, for the *Business Standard*, one of India's leading business dailies.

## OVER THE HORIZON | *Hindustan Times*

Since January 2019, Arunabha Ghosh has also been writing a monthly column, **Over the Horizon**, for *Hindustan Times*, one of India's leading mainstream dailies.



ON TV

### What should be done to tackle the world's plastic waste?

Arunabha Ghosh as a panellist on the *Inside Story* | *Al Jazeera* | 15 July 2019

### India's water emergency

Arunabha Ghosh as a panellist on *We the People* | *NDTV* | 29 June 2019

### Human impact in the world (part 2)

Arunabha Ghosh as a panellist on *The Heat* | *China Global Television Network* | 3 June 2019





**IN THE PRESS**

### Why we need to fixate on clean energy

Kanika Chawla's interview in *Forbes India* | 27 August 2019

### Power for All: Modi govt misses deadline to electrify every home; over 10 lakh homes still in dark

Abhishek Jain quoted in *The Financial Express* | 2 January 2019

### Hinjewadi residents set up pollution monitoring system

Karthik Ganesan quoted in *The Times of India (Pune)* | 7 June 2019

### Beyond the smoke and the stubble: fighting Delhi's killer air needs sustainable, year-round solutions

CEEW research quoted in *The Economic Times* | 10 November 2018

### Smoke clouds obscure India's solar revolution

Kanika Chawla quoted in the *Financial Times* | 4 December 2018

### India's 'last electrified village' Leisang still fighting darkness

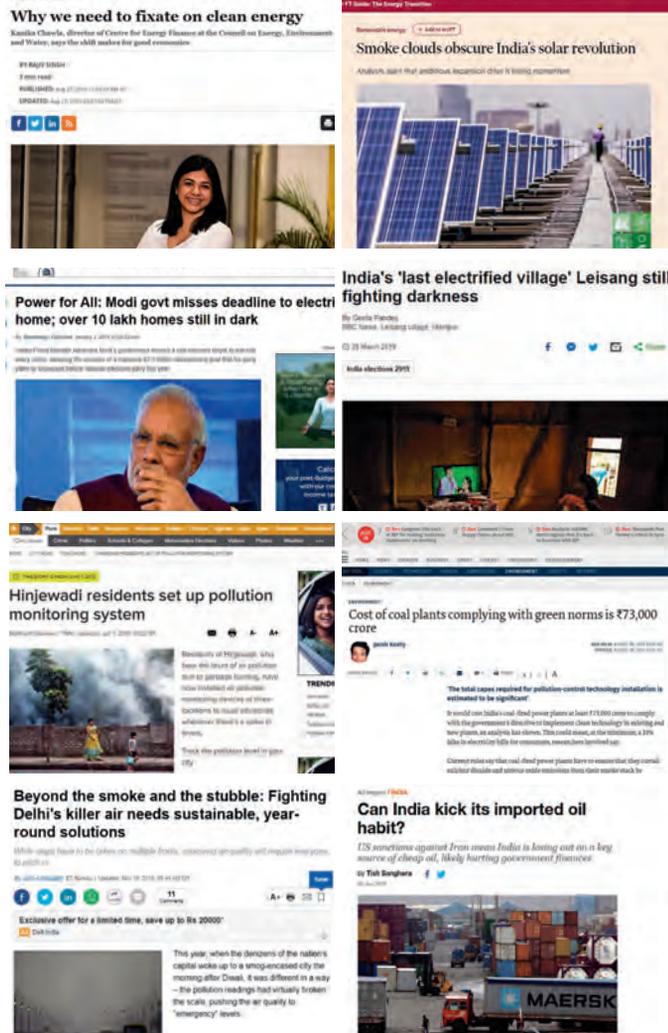
Abhishek Jain quoted on *BBC.com* | 29 March 2019

### Cost of coal plants complying with green norms is ₹73,000 crore

CEEW-IISD research quoted in *The Hindu* | 6 August 2019

### Can India kick its imported oil habit?

Karthik Ganesan quoted in *Al Jazeera* | 20 June 2019



**AUDIO BOOK**

### Women in Business | Episode 2

Kanika Chawla, featured in the second episode of Rukun Kaul's audiobook *Women in Business*.



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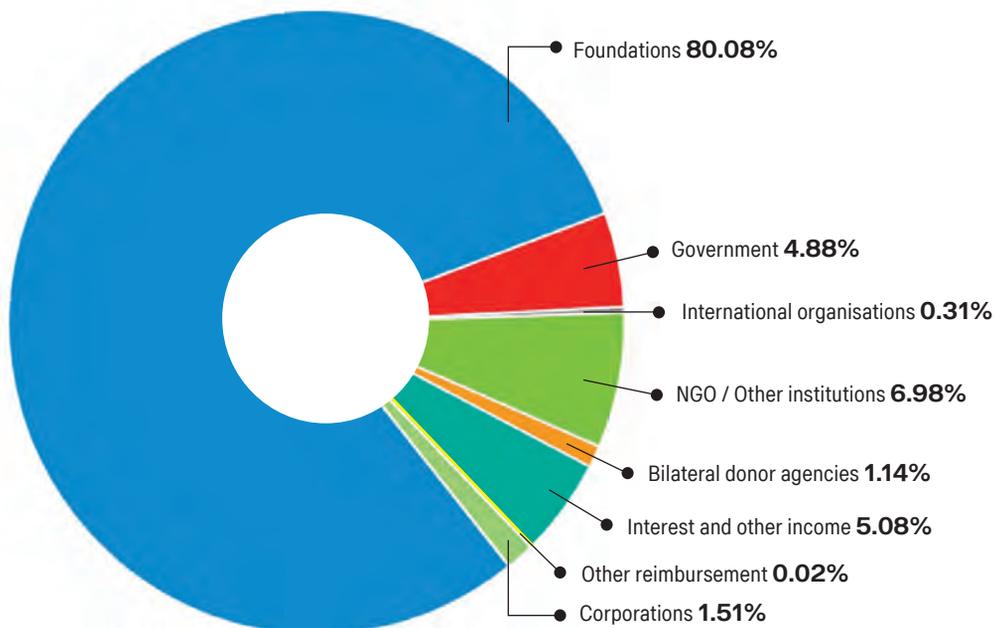
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## REVENUE SOURCES

FY 2018-19





TEDTALK

# CREATING A DEMOCRATIC DEMAND FOR CLEAN AIR



StarPlus  
TED Talks India  
Nayi Baat



StarPlus  
TED Talks India  
Nayi Baat

Every Sat-Sun  
9.30pm

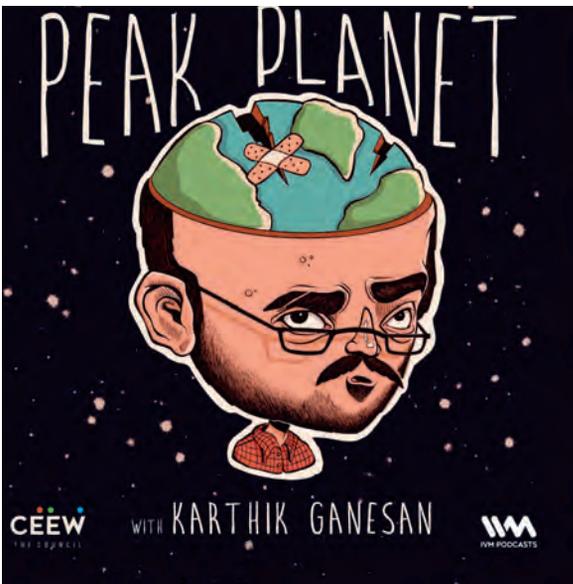
In May 2019, Dr Arunabha Ghosh recorded a talk for TED Talks India, hosted by Shah Rukh Khan. He outlined a plan 'Mission 80-80-80' to put India on the path to cleaner, safer air - and highlight how every citizen can play an active role in getting there.

By the time India turns 80 as an independent nation (in 2027), we should aim to reduce air pollution by 80% in 80 cities. He suggested five key measures to reach this goal: Educate oneself, become active monitors, be prepared to pay a price, build empathy for fellow citizens, and change one's lifestyle.

#TEDTalk in English  
<https://bit.ly/2RoMUyH>

#TEDTalk in Hindi (34:07 - 41:58)  
<https://bit.ly/36bsAVQ>

## CEEW'S PEAK PLANET PODCAST Season 1 on air pollution



*Peak Planet*, CEEW's new podcast, hosted by Karthik Ganesan deliberates on pressing everyday sustainability issues that affect us.

Recorded in early 2019, Season 1 deep dives into air pollution. Through four episodes, Genesis, Numbers, Lamentations, and Two Kings, Karthik unpacks myths, facts and perceptions about air quality through deliberations with researchers, journalists, pollution control officials, farmers, entrepreneurs, and small industry owners.

Tune in to Peak Planet on IVM Podcasts and all other popular platforms.

<https://www.ceew.in/news/podcast-peak-planet>







# 230+

research projects  
undertaken

# 520+

instances of being tapped as  
resource for official agencies  
(national & international)

# 290+

thematic roundtables &  
conferences organised

# 80

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# 160+

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CEEW  
TURNS  
9

The CEEW team at Sanjay Van as part of our 9<sup>th</sup> anniversary celebrations on 11 August 2019.



Last week, when hiking 16 km with my six-year-old daughter, she asked me,

*“Baba, when you say you’re building CEEW, how tall will the building be?”*

I responded, *“Umm, no, no, my colleagues and I are building an institution.”*

She replied, *“Yes, but are you and your friends wearing hard hats when building this institution?”*

Every time she speaks, my daughter gives me a perspective on things that makes me wiser.  
So today, I wrote this poem as a birthday gift to myself and my colleagues.

### **THE HARD HAT**

When today doesn’t turn out the way you expected,  
fix your gaze on the task at hand.

When tomorrow throws you a curve ball again,  
breathe deep and just don’t give a damn.

When this week brings no good news stories,  
know even more bad things will come.

When feet start sinking in cesspools of despair,  
pour the concrete: you’re in hard hat land.

They’ll say your principles will find no practice,  
you don’t really know how the world runs.

Then your actions will come up short in outcomes,  
there’ll be no refuge in the blazing sun.

They will throw at you many brickbats as bouquets.  
Pick’em up, for with bricks we build.

And when you hunker down to raise a floor,  
don that hard hat, you’re in a construction zone.

Some will try to mould your clay,  
claim a share or a pound of soul.

Be sure! They’ll plot to cordon off your dreams;  
no limit on how tall you’ll grow.

And when they strike you down with hammers,  
a tiny nail can fix another board.

Take a stand my friends, build my partners!  
When done, doff that hard hat and take a bow.

**ARUNABHA GHOSH**

21 June 2019

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