CEEW

THE COUNCIL

RAISING THE BAR

YEAR IN REVIEW
2017 - 2018
(September - August)

Ranked the best in South Asia with an annual operating budget of less than USD 5 million, five years in a row. Among top 100 out of 6,846 think tanks in eight categories.

Global Go To Think Tank Index, 2018

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

Prospect Think Tank Awards, 2018

Ranked 2nd in India, 4th outside Europe and North America, and 20th globally out of 240 think tanks.

ICCG Climate Think Tank's standardised rankings, 2016

Cover and inside cover image: CEEW

CEEW

THE COUNCIL

A policy research institution undertakes research to advise on policy matters in the public interest. The importance of such institutions is not to claim a monopoly over truth. Their importance lies in building trust.

DR ARUNABHA GHOSH

CEO, Council on Energy, Environment and Water (CEEW)

WELCOME TO THE COUNCIL'S NEW OFFICES

Our new office, built with hand-picked sustainability features, was inaugurated on 30 April 2018 with some of our trustees and well-wishers.

Image: CEEW

CEEW's TRUSTEES WITH THE CEO at Sagarmāthā, our conference room.

L to R: TARUN DAS, MONTEK SINGH AHLUWALIA, JAMSHYD N. GODREJ, ANIL KAKODKAR, S. RAMADORAI, and ARUNABHA GHOSH.

JAMSHYD N. GODREJ

Enjoying an anecdote at Sagarmāthā.

ANIL KAKODKAR

Sharing a joke with the team.

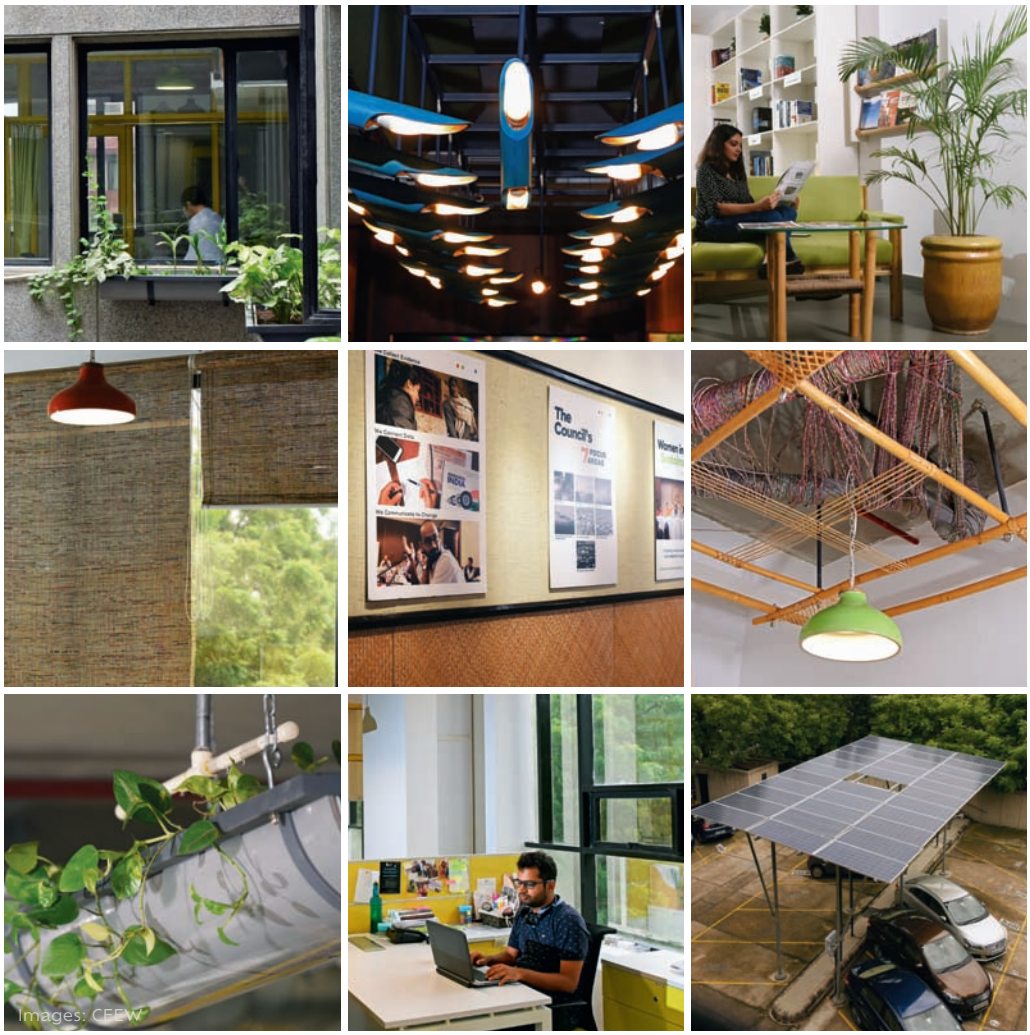
Our meeting rooms are named after the tallest peaks of each continent.

Images: CEEW

ELBRUS, the CEEW library, has been designed to give team members a working-cum-reading space. Books, plants, and ideas abound at this summit.

Image: CEEW

OUR NEW OFFICE IS HOME TO SEVERAL LITTLE AND BIG STEPS WE HAVE TAKEN TO WALK THE SUSTAINABILITY PATH.



Images: CEEW

Our work areas are designed to make the best use of space, while allowing for ABUNDANT NATURAL LIGHT. In the common areas, furniture and book racks are all made of BAMBOO, as are ceiling frames and light shades in the cabins and the conference room. Walls are dotted with HANDMADE EARTHEN PLANTERS fired in CEEW colours to hold INDOOR PLANTS. The pin-up boards use block-printed cotton and NATURAL FABRICS. We have also designed CANE-BACKED white boards. In SAGARMĀTHĀ, our conference room, a CANE WALL PANELING reduces the amount of cement needed while giving an aesthetically earthen look. We are especially proud of our HANDMADE BLINDS, made from BANANA FIBRE and RECYCLED NEWSPAPERS. Look up, and you see RECYCLED PLASTIC ROPES covering exposed pipes. Our main work space has suspended plants that improve indoor air quality. We take care of their nutrition through a TIMED, DRIP IRRIGATION SYSTEM and a COCO PEAT BASE. Other features like CONTROLLED WATER-USE FAUCETS, SENSOR-BACKED LIGHTS, and a FLOOR MADE OF KOTA STONES are choices we have made to embed sustainability into smart. And at the end of the day, we continue our practice of WASTE MANAGEMENT, and (thanks to the building management) have a CAR PARK COVERED WITH SOLAR PANELS.

Do visit! We will be happy to show you around.

Images: CEEW

FROM THE CHAIRMAN AND THE CEO

Handcrafted lamps illuminate our workstations.

Image: CEEW

LEADERSHIP IS FOR INSTITUTIONS

As public policy professionals, we measure our work and we try to measure our impact. Outputs and outcomes are related, but different. CEEW demostrates continued growth (200 research projects), more peer-reviewed publications (133), 184 other publications, more instances of being sought out by governments and international organisations (490), and steady engagements through our public seminars and conferences (243).

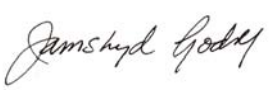
The past year has also shown, without doubt, that we can have impact at a global scale. Developing a financial risk mitigation instrument for solar energy, with our partners, on behalf of 17 countries and having three heads of state/government call for its implementation is nothing short of remarkable. Having our huge database on energy access put to use to inform the design of a flagship nationwide programme is deeply satisfying. That our research results in one of India's poorest states winning an international award for its work on distributed energy for public health services is inspiring. To be the only think tank in the world invited to depose before UN Environment on the governance of climate engineering is proof that our over-the-horizon thinking is critical and is noticed.

There have been changes on the home front too. In April 2018, we shifted to a new office. It is a labour of love, designed to showcase our commitment to sustainability and to building a vibrant platform for young professionals. We introduced a new logo, to emblemise our values and the ways in which we work. We have launched a revamped website to make our research and our scholars more accessible. In line with deepening work in the field and in various states (from agriculture to climate risks to power), we have opened a project office in Uttar Pradesh.

In eight years, many bright stars have joined the CEEW tribe, many projects delivered, and several programmes launched. CEEW has developed its own ethos, culture, and identity, which amount to more than the sum of these parts. As we take new leaps of faith, we are keen to preserve what we hold dear.

The most important indicator of a strong institution is depth of leadership. The problems that we encounter will change with time. What will matter is if there are more and more professionals with skin in the game, who can be trusted to deliver – end to end. To be conscious of our choices, to contemplate their impact on others, and to challenge oneself is what mindful leadership is all about. A leader is an individual; leadership is for institutions.

CEEW is growing up. In an uncertain world, many wonder if we'll ever reach our goals. Many even wonder what the goals are. Equally, in an uncertain world, it takes time to pave roads that have never been built. *There is no shame in not knowing the final destination. There is shame in not walking at all.*



JAMSHYD N. GODREJ
Chairperson
Council on Energy, Environment and Water

DR ARUNABHA GHOSH
CEO
Council on Energy, Environment and Water

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Indoor plants at the workspace for fresh air and a burst of green. A timed drip irrigation system keeps them watered.

Image: CEEW

DRIVING THE COUNCIL

3 VALUES

INTEGRATED
INTERNATIONAL
DEPENDENT

9 TEAMS

ENERGY ACCESS

RENEWABLES

POWER SECTOR

INDUSTRIAL SUSTAINABILITY AND COMPETITIVENESS

LOW-CARBON PATHWAYS

RISKS AND ADAPTATION

TECHNOLOGY, FINANCE AND TRADE

OPERATIONS

OUTREACH

46 PROFESSIONALS

AND COUNTING

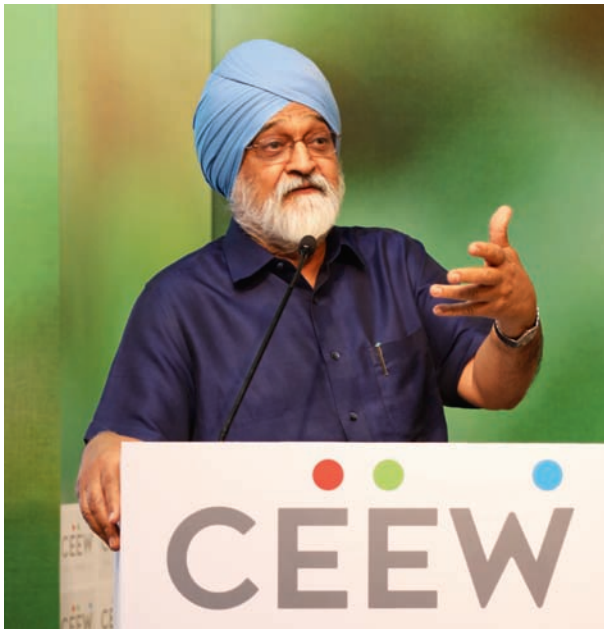
STRATEGIC OUTREACH

Release of the CEEW-SIFF 'Zero Budget Natural Farming' issue brief at the World Economic Forum, Davos, January 2018.

L to R: ARUNABHA GHOSH, CEO, CEEW; ERIK SOLHEIM, Executive Director, UN Environment; CHANDRABABU NAIDU, Chief Minister of Andhra Pradesh; and SATYA SUNDAR TRIPATHI, Chairperson, Sustainable India Finance Facility (SIFF).

Signing an MoU with the Norwegian government to work on phasing down hydroflourocarbons in India.

L to R: H.E. NILS RAGNAR KAMSVÅG, Norwegian Ambassador to India, and ARUNABHA GHOSH, CEO, CEEW.



MONTEK S. AHLUWALIA

Former Deputy Chairman of the Planning Commission, and CEEW Trustee, delivering the keynote address at the CEEW 'Dialogue on India's Energy and Climate Policy: Pathways towards NDC and Mid-Century Strategy' April 2018.

SURESH PRABHU

Union Minister for Commerce and Industry, and Civil Aviation, Government of India, delivering the keynote address at the CEEW 'RE Dialogue' June 2018

Climate change engagement with the Fiji government, post COP23.

AIYAZ SAYED-KHAIYUM

Cabinet Minister and Attorney-General, Fiji with ARUNABHA GHOSH, CEO, CEEW.

Images: CEEW

H.E. ALEXANDRE ZIEGLER

Ambassador of France to India at the CEEW-ISA 'Dialogue on Renewable Energy and the International Solar Alliance' December 2018.

PRAVEEN KUMAR

Additional Secretary, Ministry of New and Renewable Energy, at the CEEW 'RE Dialogue' June 2018.

DAVID TURK

Acting Director, Directorate of Sustainability, Technology and Outlooks. International Energy Agency (IEA) at the CEEW 'RE Dialogue' June 2018.

MANOJ KOHLI

Executive Chairman, SB Energy, SoftBank Group at the CEEW 'RE Dialogue' June 2018.

Images: CEEW

AMITABH KANT

CEO, NITI Aayog, at the CEEW-SDC-Shakti 'National Dialogue on Solar for Irrigation' January 2018.

GYANESH BHARTI

Joint Secretary, Ministry of Environment, Forests and Climate Change, at the CEEW-Shakti 'Roundtable on Phasing Down HFCs' October 2017.

BIYIKA LAURENCE SONGA

Ugandan Member of Parliament at the CEEW-ISA 'Dialogue on Renewable Energy and the International Solar Alliance' December 2017.

PANKAJ BATRA

Chairperson, Central Electricity Authority, at the CEEW Seminar 'Transition to a Clean Power Generation-Mix – Challenges and Opportunities' April 2018.

Images: CEEW

ENERGY ACCESS

“

For a few years now, we have continuously provided policy inputs on issues such as 24x7 power for all and solar-powered irrigation. The government giving significant attention to these issues through the *Saubhagya* and *Kusum* programmes feels particularly satisfying.

ABHISHEK JAIN

Senior Programme Lead | Mechanical Engineer | Chevening Scholar.

He leads the Energy Access research @ The Council.

Image: CEEW

MOVING THE NEEDLE

SCALING UP SOLAR-POWERED IRRIGATION SYSTEMS IN RURAL INDIA

India has an ambitious deployment target of 1 million solar pumps by 2021. However, only 1,42,000 solar pumps have been deployed so far. Building on our earlier research, we studied the deployment of solar-powered irrigation systems (SPIS) from different aspects. What do farmers think of SPIS? How can its deployment be better planned?

Through primary surveys of 1,600 farmers in Uttar Pradesh, India's largest state, we identified barriers and enablers to SPIS adoption. Other research included a comparative assessment of deployment strategies and financing strategies to scale up SPIS deployment sustainably. **An online, district based, decision-making tool (SP-TOOL) also emerged from this research. This is helping policymakers, financiers, and other experts make context and geography-specific deployment choices.**

CLEAN ENERGY INNOVATIONS TO BOOST RURAL INCOMES

Distributed renewable energy (DRE) and energy efficiency (EE) innovations could raise rural incomes by improving energy access. We examined the business potential of these applications and ecosystem gaps by analysing nationally representative datasets, through field visits, and interviews with more than 90 stakeholders including entrepreneurs, innovators, incubators, and rural economy experts. **We found just 20-odd DRE-powered livelihood appliances** (*dal* mills, milking machines, sewing machines, etc.) **in operation across India.** To strengthen the ecosystem and encourage greater adoption of these innovations, more technical, policy, financial, and market support is key. Hence, in the coming year, we will collaborate with philanthropic organisations, impact investors, incubators, corporates, and policymakers to successfully commercialise and scale up clean energy innovations for rural livelihoods.

DESIGNING A ROADMAP TO PROMOTE CLEAN COOKING ENERGY IN INDIA

Access to clean cooking energy for all Indian households is an important developmental goal. The *Pradhan Mantri Ujjawala Yojana* is a crucial first step. The focus now needs to be on ensuring the sustained use of clean cooking energy across households.

Hence, we assessed the demand-supply challenges and various existing policies to argue for a multi-fuel, multi-dimensional, and multi-stakeholder approach to improving clean cooking energy access. This year, we have provided inputs to NITI Aayog to design a clean cooking energy roadmap for the country. Also, as the knowledge partner for the Clean Cooking Forum 2017, a global gathering of experts working to accelerate the production and use of cleaner, more efficient cookstoves and fuels, we published a study highlighting the current scenario in India, existing policies, and strategies for the way forward.

FROM RESEARCH TO ACTION

ENCOURAGING INNOVATIONS AT THE IIT BOMBAY CAMPUS

December 2017

More than 500 young innovators from Bangladesh, India, Iran, Jordan, and the United States submitted ideas to power rural economies using clean energy innovations, as part of the CEEW-IIT Bombay's 'International Sustainability Challenge' at Techfest 2017. The first prize winners were a solar-powered, low-cost onion grader by Chandan Sreedharamurthy, NID Ahmedabad, and a Mogra cutter and head lamp by Shreenet Rathi.

A DECISION-SUPPORT TOOL TO DEPLOY SOLAR-POWERED IRRIGATION SYSTEMS IN INDIA (SP-TOOL)

May and June 2018

Translating our SPIS research recommendations to guide action on SPIS deployment, we developed the SP-TOOL. It is a free, online, map-based, interactive decision support tool that categorises India's 613 districts as per their suitability for SPIS deployment. It is aiding policymakers deploy appropriate processes to ensure the adoption of solar-based irrigation, keeping in mind differing regional challenges. It is also supporting public and private financiers, entrepreneurs, and other business professionals to identify and target districts with a high potential for SPIS.

The Energy Access team demonstrated the SP-TOOL to financiers, policymakers, and SPIS manufacturers across Kolkata, Lucknow, and New Delhi.

> I congratulate CEEW and Shakti Sustainable Energy Foundation on the release of the solar for irrigation studies. These are policy pertinent research studies and present actionable recommendations.

AMITABH KANT

CEO, NITI Aayog, delivered a keynote address at the CEEW-SDC-Shakti 'National Dialogue on Solar for Irrigation' January 2018.

> I would like to congratulate the CEEW team on behalf of NABARD Kolkata. This (SP-TOOL) is something we would make use of going forward.

B. MAJUMDER

AGM, NABARD

Image: CEEW

KHUSHI RAM SAINI, a farmer from Uttar Pradesh, spoke at the CEEW-SDC-Shakti 'National Dialogue on Solar for Irrigation' January 2018. This was a one-of-its-kind event bringing together farmers, researchers, policymakers, financiers, and rural entrepreneurs on one platform.

Image: Sumita Patnaik/CEEW

DRE innovations at work. A solar-powered flour mill in Maharashtra.

Direct interviews were conducted with 1,600 farmers to understand their perspectives on SPIS in Uttar Pradesh.

Image: Abhishek Jain/CEEW

USD 41 BILLION

priority market for DRE-based product innovations in India's farm sector; USD 13 billion in the non-farm sector

4.3 MILLION

rural micro-enterprises in India cite energy access as a key bottleneck to their business growth

2% FARMERS

of the 1,600 surveyed, had heard of government schemes related to solar pumps

All data points: CEEW analysis

Image: Chandan Singh/Flickr

KEY PUBLICATIONS

Access to Clean Cooking Energy in India: State of the Sector

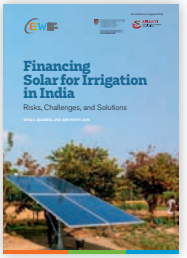
Report | October 2017

https://bit.ly/2NGk4Ft

Adopting Solar for Irrigation in India: Farmers' Perspectives from Uttar Pradesh

Report | Jan 2018

https://bit.ly/2MOjIAb



Financing Solar for Irrigation in India: Risks, Challenges, and Solutions

Policy Brief | Jan 2018

https://bit.ly/2PwurMr

Solar for Irrigation: A Comparative Assessment of Deployment Strategies

Report | Jan 2018

https://bit.ly/2C97blF

KEY OPINION EDITORIALS PUBLISHED

UJWALA YOJANA: DEVIL IS IN THE DETAIL

Deccan Herald | October 2017

Saurabh Tripathi and Sasmita Patnaik on how the *Ujjwala Yojna* can grow beyond just providing LPG connections to BPL families, to ensuring their sustained use.

https://bit.ly/2vLRvPc

TOWARDS SOLAR-POWERED AGRICULTURE

The Hindu | January 2018

Abhishek Jain on how India can leverage solar-powered irrigation systems to meet unmet irrigation needs, especially for small and marginal farmers.

https://bit.ly/2AL7EKf

CLEAN ENERGY CAN BOOST RURAL ECONOMY

Business Standard | June 2018

Sanchit Waray and Arunabha Ghosh on how rural economy in India and elsewhere can witness a clean energy awakening.

https://bit.ly/2OfBDvP

THE ENERGY ACCESS TEAM

Lack of access to energy is a barrier for households, communities, and enterprises in reaching their desired potential. The Energy Access team envisions removing this barrier by using evidence-based, on-ground research to inform policies and businesses. The team does this through the collection and analysis of primary data, evaluation of policies and programmes, the design of interventions, and the development of collaborative platforms that enable equitable access to modern energy for human development.

“

Co-creating, sponsoring, and evaluating the ‘International Sustainability Challenge’ for students at IIT Bombay’s Techfest 2017, was a highpoint for me.

SANCHIT WARAY

Programme Associate, is working on I-DESIRE.

“

The day after my op-ed ‘Towards Solar-powered Irrigation’ was published in ‘The Hindu’ I received 46 emails. The response was overwhelming! And best of all, an ex-professor of JNU mailed saying he wanted to donate his entire personal library to me. It was most heartening!

ABHISHEK JAIN

Is working on I-DESIRE and ACCESS 2018.

“

Training enumerators for ACCESS 2018, India’s largest energy access survey focusing on six states, was a personal highlight. Their questions helped me understand the survey instrument, its motivations and purpose better. These were invaluable interactions because the integrity of the data we were to get depended on each one of them.

SAURABH TRIPATHI

Research Analyst, is working on ACCESS 2018.

CEEW would like to thank Rajdeep Dasgupta and Shaily Jha for contributing to research on energy access during 2017-18.

Are we being ‘rigorous’ enough for the world to base their actions on our words?

TAUSEEF SHAHIDI

Research Analyst, is working on scaling up solar-powered irrigation and ACCESS 2018.

Are we always best able to represent the perspectives of the end-user who is at the core of our research?

SASMITA PATNAIK

Programme Lead, is working on I-DESIRE and creating a roadmap for access to clean cooking energy.

Being nominated at The Council to present our research on ‘Solar for Healthcare’ to global experts at the UNESCO Tech4dev conference was my best day yet.

SUNIL MANI

Research Analyst, is working on ACCESS 2018 and solar-powered healthcare.

L to R: Sunil Mani, Karthik Ganesan, Abhishek Jain, Sanchit Waray, Saurabh Tripathi, Tauseef Shahidi, and Sasmita Patnaik.

Image: CEEW

RENEWABLES

“

Our research this year focussed on plotting evidence-based market trends, identifying existing, imminent, and prospective challenges, and designing a suite of bespoke interventions in response to market needs to enable the renewable energy (RE) ecosystem to adapt and correct the challenges impeding the growth of the sector.

KANIKA CHAWLA

Senior Programme Lead |
M.Sc. Economics and Development Economics | Commonwealth Scholar.

She leads the Renewables research @ The Council.

Image: CEEW

MOVING THE NEEDLE

DE-RISKING INVESTMENTS IN SOLAR - COMMON RISK MITIGATION MECHANISM

Sixty five to seventy per cent of the cost of solar power in India is the cost of financing. This number is even higher in the emerging economies of Africa and Southeast Asia. To de-risk investments and unlock finance for solar projects, The Council, together with CII, TCX, and TWI, developed the Common Risk Mitigation Mechanism (CRMM), under the aegis of the International Solar Alliance (ISA).

CRMM pools multiple risks – political, off-taker, and foreign exchange risks – and has many participating countries, capitalised through multiple sources of international public money. **CRMM was officially announced at the International Solar Alliance Summit in New Delhi in March 2018 by Prime Minister Narendra Modi and the French President Emmanuel Macron.** It has already received initial support from several member countries and aims to create a global solar market, boosting confidence among the international development community and private and public institutional financiers to invest in countries with high solar potential. The Council served as the Secretariat of the CRMM taskforce. The CRMM is being further developed and will be operationalised by the World Bank Group in 2019.

SOLUTIONS TO DEEPEN RE MARKETS

India has committed to a 175 GW (and growing!) RE target by 2022. To reach there and keep the momentum going beyond 2022, India needs to create a deep and well-functioning renewable energy market. Tracking national and international developments in the RE sector we published four pieces of research this year.

Curtailing the risk of curtailment: We developed a two-part solution to address the risk of curtailment, which can be implemented individually or together. One is a specific grid-integration guarantee and the other is a restructuring of RE power purchase agreements (PPAs), to balance out the risks pertaining to curtailment between the parties responsible for its occurrence.

India's clean energy investment trends: In collaboration with the International Energy Agency (IEA), we produced a joint report studying India's clean energy investment trends to map bottlenecks and opportunities to investments in RE. In a first-of-its-kind report, we assess project level data for all capacity additions between 2014 and 2017, to clearly understand market developments based on evidence.

Rooftop Solar: In partnership with BSES Yamuna Pvt. Ltd. (BYPL), we developed business models that enable utilities to facilitate the adoption of residential solar rooftops. Designed to address the market risks and high costs plaguing the adoption of solar in this sector, these business models have been well-received and are now being tested for feasibility.

Risks to renewable energy investment in emerging economies: We focused on South Africa and Indonesia, surveying them from a financier, policymaker, and developer's perspective, to understand the risks inhibiting the deployment of solar and wind energy in these emerging markets.

FROM RESEARCH TO ACTION

CEEW - SHAKTI 'RE DIALOGUE' 2018 | 35 SECTOR SPECIALISTS | 200 PARTICIPANTS

June 2018

CEEW organised the second edition of the Renewable Energy Dialogue on 28 and 29 June 2018, with a special focus on market creation and market trends. The 'RE Dialogue' had five institutional partners, bringing together pre-eminent voices on renewable energy globally. The partners included the Shakti Sustainable Energy Foundation (SSEF), the Government of India's Ministry for New and Renewable Energy (MNRE), the International Energy Agency (IEA), the International Solar Alliance (ISA), and the Renewable Energy Policy Network for the 21st Century (REN21).

The keynote speech was delivered by Union Minister for Commerce and Industry, and Civil Aviation, Government of India, Suresh Prabhu. Other notable speakers included Montek Singh Ahluwalia, David Turk, Upendra Tripathy, Praveen Kumar, Manoj Kohli, and Manu Srivastava.

MANU AGGARWAL

Programme Associate, presenting research on curtailment guarantees, at the CEEW 'RE Dialogue' June 2018.

The RE team with JITENDRA NALWAYA, Additional Vice President, BSES, Delhi (centre), releasing the CEEW report 'Scaling Rooftop Solar: Powering India's Renewable Energy Transition with Households and DISCOMs' at the CEEW 'RE Dialogue' June 2018.

Industry captains and global experts at the 'India Energy Transitions Debate' at the Dialogue, June 2018.

L to R: VINEET MITTAL, Chairman Avaada Group; KANIKA CHAWLA, CEEW; SUNIL JAIN, CEO and Executive Director, Hero Future Energies Limited; NITIN PRASAD, CEO, Shell India; DR PAOLO FRANKL, Head of Renewable Energy Division, International Energy Agency and ARUNABHA GHOSH, CEEW.

> We had an excellent experience of working with CEEW as our knowledge partners to develop various alternatives for rooftop solar. They provided valuable insights by designing various practical, utility-centric models keeping in consideration the interests of all stakeholders.

P.R. KUMAR

CEO, BSES Yamuna Pvt. Ltd.

Images: CEEW

CONVENING THE RENEWABLE ENERGY WORKING GROUP (REWG)

The CEEW – Shakti 'High Level Working Group on Renewable Energy Policy and Finance' is a collective of fifteen experts that meet every eight weeks to deliberate on the developments of the sector. The wide range of perspectives represented in the REWG helps us build coherence in the sector and stay abreast with the latest developments.

CEEW-ISA DIALOGUE ON RENEWABLE ENERGY AND THE INTERNATIONAL SOLAR ALLIANCE

ISA's National Focal Points from different countries, ISA's leaders, senior members from IEA, and CEEW at the CEEW-ISA 'Dialogue on Renewable Energy and the International Solar Alliance' New Delhi, December 2017.

AT THE RASHTRAPATI BHAVAN

> In energy, the only way forward is dialogues like these. Established energy sources would like to ensure that nothing exists to challenge them. For the foreseeable future, there is room for both to go on till a time conventional sources do not exist. It's an inevitable process.

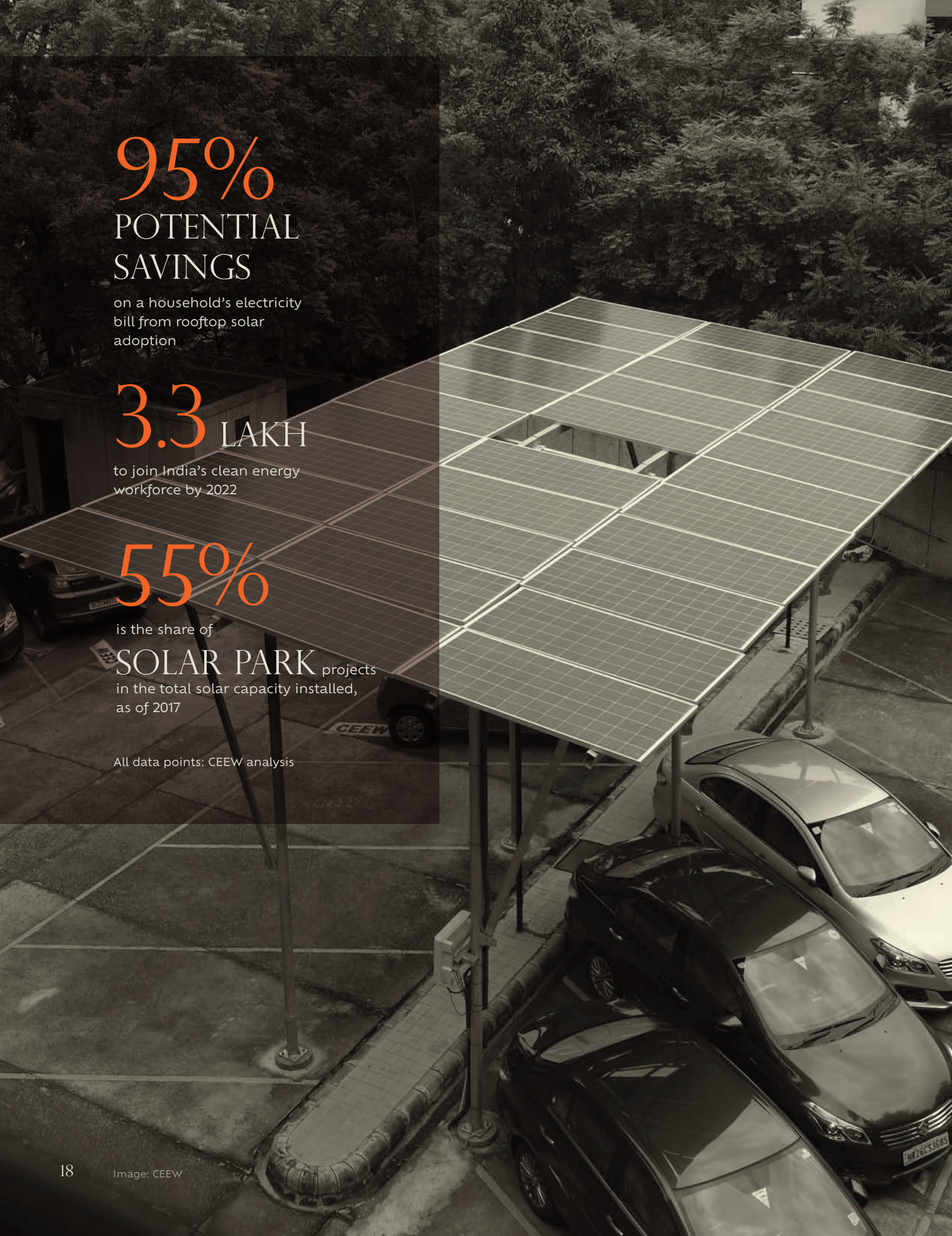
ARUNABHA GHOSH

Chaired a ministerial session on low-cost financing at the International Solar Alliance Founding Conference, at Rashtrapati Bhawan, New Delhi, March 2018.

SURESH PRABHU

Union Minister for Commerce and Industry, and Civil Aviation, Government of India, delivering the keynote address at the CEEW 'RE Dialogue' June 2018

Images: CEEW



95%
POTENTIAL SAVINGS

on a household's electricity bill from rooftop solar adoption

3.3 LAKH

to join India's clean energy workforce by 2022

55%

is the share of **SOLAR PARK** projects in the total solar capacity installed, as of 2017

All data points: CEEW analysis

Image: CEEW

KEY PUBLICATIONS

Common Risk Mitigation Mechanism: Feasibility Study

Report | November 2017

https://bit.ly/2LzxLEk

Scaling Rooftop Solar: Powering India's Renewable Energy Transition with Households and DISCOMs

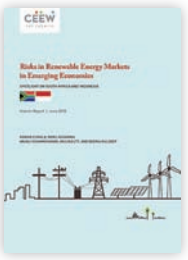
Report | June 2018

https://bit.ly/2LqUMJq

Clean Energy Investment Trends: Evolving Investment Landscape for Grid-Connected Renewable Energy Projects in India

Interim Report | June 2018

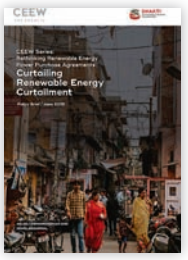
https://bit.ly/2MWhOwo



Risks in Renewable Energy Markets in Emerging Economies: Spotlight on South Africa and Indonesia

Issue Brief | June 2018

https://bit.ly/2Lue7Ju



CEEW Series: Rethinking Renewable Energy Power Purchase Agreements: Curtailing Renewable Energy Curtailment

Policy Brief | June 2018

https://bit.ly/2BZcxAe

KEY OPINION EDITORIALS PUBLISHED

CLEAN ENERGY AMBITION NEEDS MORE MONEY

Mint | January 2018

Kanika Chawla on the need for increasing national expenditure on clean energy to meet India's climate and development ambitions.

https://bit.ly/2wpnpSL

A SOLAR GEAR SHIFT

The Hindu | March 2018

Manu Aggarwal and Anjali Viswamohanan on the need for the government to reduce uncertainties for India's RE market.

https://bit.ly/2PH9jUI

DISCOM'S ROOFTOP MOMENT

Business Line | April 2018

Arjun Dutt and Neeraj Kuldeep on how rooftop solar can become a paying proposition for discoms.

https://bit.ly/2ogNeQ5

THE RENEWABLES TEAM

The Renewables team supports India's – and the world's – clean energy transition. It does so through timely, research-based interventions based on extensive policy, regulatory, and market analyses. The team also assesses, through surveys, India's renewable energy jobs potential and skills requirement, the risks facing renewable energy investments, and designs strategic financial mechanisms to address identified risks.

"Two months into my internship, I was offered an analyst's position to work on the solar rooftops project. There could have been no better appreciation of my work than this.

SELNA SAJI

Research Analyst, is working on a decision-support tool to scale up rooftop solar.

"In public policy, research is just 30 per cent. What are we doing with the evidence we have gathered? Is it reaching the right people? We need to communicate effectively, support efficiently, and reflect deeply to have real impact.

KANIKA CHAWLA

Is working on addressing risks to investments in India's RE sector.

"In the past year, each of us in the team had conceptualised some wild, out-of-the-box research ideas. Today, when I look at what we have achieved with our restructuring power purchasing agreements (PPA) and the grid guarantee research, my lesson for this year is to think bigger and wilder!

ANJALI VISWAMOHANAN

Programme Associate, worked on rethinking power purchase agreements (PPAs).

CEEW would like to thank Florentine Oberman, Kanika Kharbanda, Priyanka Kachru, Upendra Dwivedi, and Anjali Viswamohanan for contributing to research on renewables during 2017-18.

A stakeholder consultation is real time peer-review! Stakeholders add considerable value to research in terms of developing a more nuanced understanding of issues as well as testing the validity of the research output.

ARJUN DUTT

Programme Associate, is working on analysing the opportunities and challenges for green bonds in India.

Achieving any significant change in public policy does not only come from great ideas but from a very high degree of tenacity, hard work, patience, and powers of persuasion.

MANU AGGARWAL

Programme Associate, is working on de-risking utility-scale renewable investments.

Am I learning enough or ideating enough to identify the next problem to face the sector? This keeps me up at nights, and pushes me to do more.

NEERAJ KULDEEP

Programme Associate, is working on scaling up rooftop solar.

Standing L to R: Arunabha Ghosh, Selna Saji, Kanika Chawla, Anjali Viswamohanan, and Arjun Dutt. Sitting L to R: Neeraj Kuldeep and Manu Aggarwal.

Image: CEEW

POWER SECTOR

Our state-focussed programme on power sector reforms in Uttar Pradesh commenced this year to assist stakeholders in establishing a more accountable and sustainable electricity distribution sector. Also, for the first time at The Council, we were invited to contribute to 'The World Energy Outlook 2018' as authors of the India section focusing on electricity in the overall energy mix.

KARTHIK GANESAN

Research Fellow | Civil Engineer | Masters in Public Policy.

He leads the Power Sector research @ The Council.

Image: CEEW

MOVING THE NEEDLE

FORWARD LOOKING TARIFFS FOR C&I CONSUMERS IN KEY POWER DISTRIBUTION CIRCLES

The foundation of the utility business model in India is one of cross-subsidy. Commercial and industrial (C&I) consumers subsidise agricultural and residential consumers. In the wake of alternatives to utility-based supply for C&I consumers, we conducted research to understand the possible tariff trends in the next decade in four distribution companies (discoms) – BESCOM, MSEDCL and the utilities in Mumbai, and Bengaluru.

Our studies present insights for emerging actors in the electricity supply space on how grid-tariffs could evolve and the gains to be had. Our research also alerts discoms of an impending future, where they could play a subdued role in the future electricity system, given the baggage public discoms carry by way of cross-subsidies and technical inefficiencies.

FOCUS INDIA – WORLD ENERGY OUTLOOK 2018

As part of an MoU signed with the International Energy Agency (IEA) and CEEW, Karthik Ganesan authored a chapter of the 'World Energy Outlook (WEO) 2018'. Within the electricity focus section of the WEO, he wrote a chapter highlighting the issues India's electricity system faces in its transition to a low-carbon economy. He also presented insights on coal supply and flexibility in the context of power generation assets in India.

SHAPING AN AFFORDABLE, RELIABLE, AND ACCOUNTABLE POWER SECTOR IN UTTAR PRADESH

In a first for CEEW, we set up a state-level project office in Lucknow earlier this year to support Uttar Pradesh's (UP) power sector reforms. The state presents many challenges such as low household electrification, high levels of operational inefficiencies, and few civil society organisations focusing on power sector reforms.

The Council envisions that by 2022, the financial performance of discoms will no more be the primary focus of policymakers when addressing power sector challenges. At the heart of these efforts will be the designing of a strategy to help bridge the gap between consumers, discoms, and regulators, to create an environment conducive for reform. This is being done by addressing three core issues in the state: creating a responsive consumer base, enabling institutional reforms in discoms, and restructuring power procurement and retail tariffs' stucture.

Our team has already completed a survey covering 1,800 rural and urban households to study their perceptions on discom services, compliances, and power theft in the state. We are now putting together a submission to the Regulatory Commission to help drive more accountable practices in the operations of UP's discoms.

FROM RESEARCH TO ACTION

SURVEY OF PEOPLE'S PERCEPTIONS ON DISCOM SERVICES, COMPLIANCES, AND POWER THEFT IN UTTAR PRADESH

March 2018

CEEW conducted a household survey to record people's perceptions and drivers of electricity theft across 1,800 urban and rural households of Uttar Pradesh.

Images: Morsel

"CEEW's power sector team is working towards building a formal, institutionalised approach to bring consumer perspectives, outlooks and interventions into the governance of the sector. The household survey on electricity theft is a fresh outlook on the issue. Consumers have clearly voiced their opposition against electricity theft, which is a major hurdle for the power sector in UP. It is appreciable that CEEW involved all the stakeholders in each and every step of their study.

VIKAS CHANDRA AGARWAL

Director (Distribution), Uttar Pradesh Electricity Regulatory Commission (UPERC).

ENGAGING WITH DISCOM OFFICIALS IN UP

Images: CEEW

R to L: KANIKA BALANI, Research Analyst, CEEW and PRATEEK AGGARWAL, Programme Associate, CEEW, discussing preliminary findings from the survey with Dakshinanchal Vidyut Vitran Nigam Ltd (DVVNL) discom officials in Mathura.

CEEW SEMINAR 'TRANSITION TO A CLEAN POWER GENERATION-MIX – CHALLENGES AND OPPORTUNITIES'

April 2018

At this seminar, experts from IIT Bombay, ExxonMobil, World Resources Institute (WRI), GE Energy, the Central Electricity Agency, and other leading organisations discussed the impact of high-RE penetration on the grid, emissions standards for thermal power plants, and water consumption and GHG emissions associated with power generation.

L to R: KARTHIK GANESAN, and KAPARDHI BHARADWAJ, Programme Associate, at the seminar, April 2018.

L to R: SUSHIL SOONEE, Advisor, Power SyPower System Operation Corporation Ltd. (POSOCO) ; (centre) PANKAJ BATRA, Chairperson, Central Electricity Authority (CEA); VAIBHAV CHATURVEDI, Research Fellow, CEEW; ESTHER KAMALA, Asst. Director, CEA, at the seminar, April 2018.

Images: CEEW

43%

is what C&I consumers CONSUME of the total BESCOM electricity demand, while their revenue share is 62%

4-9%

expected increase in retail tariffs for industrial consumers of MAHARASHTRA by 2024-25

38%

of UTTAR PRADESH'S rural households had a meter to measure electricity consumption and 86% of urban households surveyed had a meter installed

All data points: CEEW analysis

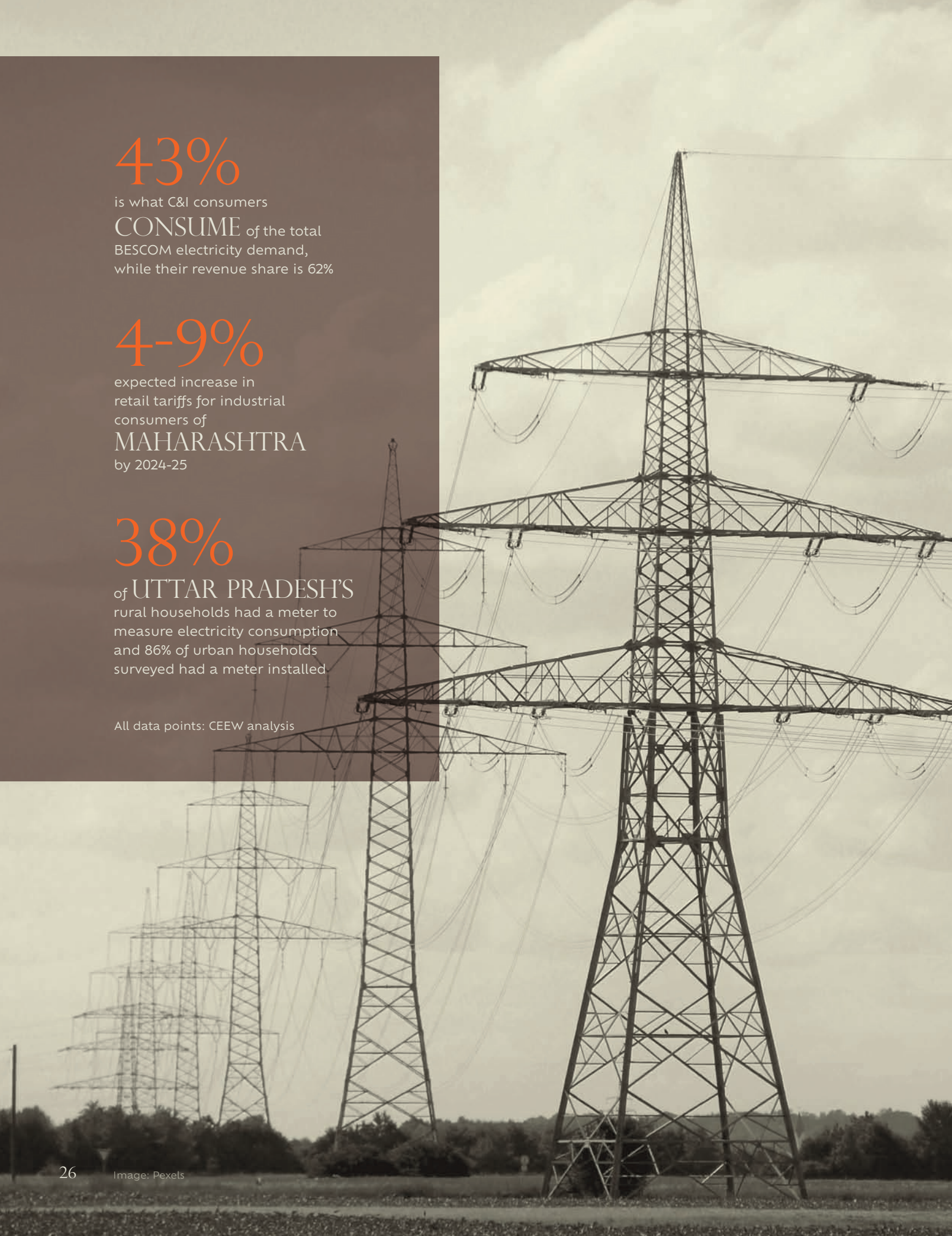


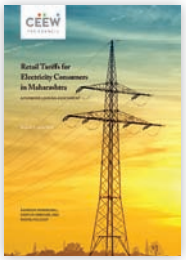
Image: Pexels

KEY PUBLICATIONS

Retail Tariffs for Electricity Consumers in Bangalore: A Forward-Looking Assessment

Report | October 2017

https://bit.ly/2PfFFoy



Retail Tariffs for Electricity Consumers in Maharashtra: A Forward-Looking Assessment

Report | June 2018

https://bit.ly/2PKQ9gF

KEY OPINION EDITORIALS PUBLISHED

THE DISCOM IS DYING, LONG LIVE THE DISCOM

Business Standard | April 2018

Arunabha Ghosh and Karthik Ganesan ask if centralised power distribution could deliver quality and affordable electricity to everyone? And is our electricity pricing conducive to industrial growth?

https://bit.ly/2wi3Bj4

CAN STATES MEET CENTRE'S ELECTRIFICATION TARGETS?

Mint | June 2018

Kapardhi Bharadwaj and Saurabh Tripathi recommend that policies on electrification need to account for the current financial state of discoms and carefully plan for the sustainable expansion of the distribution grid.

https://bit.ly/2whwAU7

REDUCE EMISSIONS AT LOWER COSTS

Business Standard | July 2018

Karthik Ganesan and Arunabha Ghosh indicate that a successful reduction in emissions from power plants will depend on factors such as whether plant operators invest in retrofits, and whether bulk procurement costs for utilities can decline fast enough.

https://bit.ly/2Lh7sCD

THE POWER SECTOR TEAM

The power sector team supports ongoing national and state-level regulatory and institutional reforms in the sector and analyses accountability measures associated with the operation of electricity utilities. This largely state-focused effort aims to encourage greater civil society participation and improve data quality and accessibility. Nationally, the team supports India's transitions in power generation by examining the role of thermal power in a RE-rich scenario, the economic and environmental impacts of thermal generation assets, and RE integration into the grid.

"

Being a native of Uttar Pradesh, I have seen power cuts persist since my childhood. Working in the sector now, it has become my personal agenda to support and ensure 24x7 power for all.

"

The financial losses of electricity distribution utilities passed on as a consumer burden is a recurring problem across most Indian states. I split my time contemplating the slow pace of progress and scoping for effective interventions.

KANIKA BALANI

Research Analyst, is working on regulatory governance and capacity building issues in the UP power sector.

KAPARDHI BHARADWAJ

Programme Associate, is working on power sector transitions to cleaner, more affordable systems.

CEEW would like to thank Medha Kapoor for contributing to research on the power sector during 2017-18.

Why are plant load factors falling? Is power going to be affordable and reliable for the underserved? How do we tackle the problem of stranded assets across the value chain? These are burning questions. And they need to be addressed soon to successfully enable India's energy transitions.

PRATEEK AGGARWAL

Programme Associate, is working on improving regulatory processes in the UP power sector.

Driving transparency and clarity in the debates on India's electricity system is my main interest in the sector. Interlinking the evolving issues, without losing sight of the traditional challenges in the sector has not been an easy one.

KARTHIK GANESAN

Is working on data-driven approaches to enable more informed decision making in the power sector.

L to R: Neeraj Kuldeep, Prateek Aggarwal, Kanika Balani, Karthik Ganesan, and Kapardhi Bharadwaj.

Image: CEEW

INDUSTRIAL SUSTAINABILITY AND COMPETITIVENESS

This year, our research unveiled fresh insights on energy data improvements; energy and GHG emission profiles of industries; and enhanced transparency and its associated capacity building for climate negotiations. I am proud that we have helped shape the policy discourse at, both, national and international levels.

VAIBHAV GUPTA

Senior Programme Lead | Environmental Engineer | Young Leader – Asian Forum on Global Governance.

He leads the Industrial Sustainability and Competitiveness research @ The Council.

Image: CEEW

MOVING THE NEEDLE

INFORMING CLIMATE GOVERNANCE AND NEGOTIATIONS

To make the Paris Agreement operational, all signatories need to jointly develop a rulebook of modalities and guidelines by the end of 2018. Capturing the challenges and opportunities associated with developing the Paris Rulebook, our working paper on the role of non-party institutions published by the Centre for International Governance Innovation (CIGI) **made a case for states to institutionalise the participation of non-party stakeholders in the making and reviewing of the Rulebook,** as well as investing in building their capacities to do so. Our issue brief on shaping the global stocktake process under the Paris Agreement collated views of developing country parties on the stocktake process highlighting their demands for flexibility in the reporting requirements. We have also briefed senior Fijian and Polish delegates on crucial matters of climate governance.

CREATING INDIA'S LARGEST DATABASE OF INDUSTRIAL ENERGY CONSUMPTION AND ASSOCIATED GHG EMISSIONS

We have created India's largest database of industrial energy consumption (estimates) and associated GHG emissions, covering nearly two lakh formal sector manufacturing enterprises. **This is, by far, the most extensive and detailed set of estimates available for India on a yearly basis.** These analytics are available under a civil society collaborative – the GHG Platform India – where the founding partners, including CEEW, collaborate and collate research on emission inventories. On the back of this research, **CEEW's Vaibhav Gupta has been nominated as a member in the inter-ministerial working group on 'Energy Data Management' set up by NITI Aayog.** Our research on the informal sector's energy use and emissions presented interesting insights. In 2015-16, out of the total estimated coal consumption by the sector, the contribution of brick kilns was the most significant (~ 49 per cent) at 26 million tonnes. We recommended a more in-depth study of the sector to have a clearer quantification of its energy consumption and the associated emissions.

INCREASING THE UPTAKE OF ENERGY EFFICIENCY MEASURES IN THE MSME SECTOR

Micro, small and medium enterprises (MSMEs) are the key drivers of Indian industry. They account for nearly 45 per cent of the manufacturing value addition, represented by 90 per cent of the overall industrial units. The state of their energy use, therefore, has a significant bearing on India achieving its economic and climate goals.

We conducted a primary survey of 429 enterprises across 11 energy-intensive clusters in eight states to assess their awareness, perception, and responsiveness to energy efficiency initiatives and map factors influencing their energy efficiency investments. We found that only 35 per cent of the 429 MSMEs had conducted an energy audit within the last three years, while less than one-fifth had participated in an energy efficiency workshop. Also, MSMEs competing with larger industries were more likely to invest in energy efficient technologies and energy audits versus those competing with other MSMEs. Our researchers recommend increasing enterprises' awareness about energy efficiency, improved technology demonstrations, and rolling out pilot projects as crucial steps to improving energy efficiency across MSMEs.

FROM RESEARCH TO ACTION

CEEW'S SURVEY TO MAP ENERGY EFFICIENCY UPTAKE AMONG INDIAN MSMEs

January - March 2018

CEEW's primary survey to map the awareness and utilisation of energy efficiency initiatives among MSMEs was conducted across 11 energy-intensive manufacturing clusters in eight states of India.

Image: Sachin Sharma/CEEW

CEEW AT THE OECD CONFERENCE

Paris | September 2017

CEEW conducted a breakout group session on 'Transparency of Reporting on Mitigation: Country experiences with Reports' at the conference, with ARUNABHA GHOSH moderating the session.

SUMIT PRASAD

Research Analyst, at the OECD conference.

Images: Vaibhav Gupta/CEEW

DRAWING ATTENTION TO CRITICAL MINERALS

VAIBHAV GUPTA, at the ASSOCHAM 'Mining Summit 2018' presenting on 'Critical Minerals Resources for India: A Make in India Perspective'. This was one of the many public engagements where our research on critical minerals helped draw attention to this crucial resource security challenge. **As a result of our pioneering analysis, Indian policymakers now have indigenous data to stragtegise and secure minerals needed for electric vehicles and strategic industries of the future.**

TIRTHA BISWAS

Programme Associate, presenting findings from the CEEW research on increasing the uptake of energy efficiency initiatives by Indian MSMEs, at the SAMEEKSHA coordination platform meeting, Kolkata, August 2018.

96

CLUSTERS

out of the ~ 400 energy intensive clusters have so far been mapped in India on their energy consumption in the MSME sector

3%

DECREASE in industrial emissions intensity during 2007-12

17%

of India's **INDUSTRIAL COAL CONSUMPTION** is in the informal sector

All data points: CEEW analysis

Image: iStock

KEY PUBLICATIONS

Greenhouse Gases Emissions Estimates from the Manufacturing Industries in India – State level estimates: 2005 to 2013

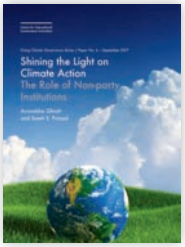
Report | September 2017-2018

https://bit.ly/2plz9BC

Shaping the Global Stocktake Process Under the Paris Agreement

Issue Brief | September 2017

https://bit.ly/2Odult1



Shining the Light on Climate Actions: The Role of Non-party Institutions

Paper | September 2017

https://bit.ly/2CO0oyo

Greenhouse Gas Emission Estimates for India's Informal Manufacturing Sector

Issue Brief | May 2018

https://bit.ly/2QLGQh8

Factors Influencing the Uptake of Energy Efficiency Initiatives in Indian MSMEs

Report | August 2018

https://bit.ly/2NpewCZ

KEY OPINION EDITORIALS PUBLISHED

THE ESSENCE AND SPIRIT OF PARIS

Business Standard | November 2017

Arunabha Ghosh and Vaibhav Gupta observed that instead of retaining the essence and spirit of the Paris Agreement, the COP23 summit seemed to be veering away from it in the wake of the US announcement to withdraw from the agreement.

https://bit.ly/2C0h7hj

A WILD WEST FOR MINERALS?

Business Standard | March 2018

Arunabha Ghosh says that minerals that support a low-carbon future would impact the commodities supply chain widely.

https://bit.ly/2Lsy4k3

THE INDUSTRIAL SUSTAINABILITY AND COMPETITIVENESS TEAM

The Industrial Sustainability and Competitiveness team aims to optimise three inherent elements of the manufacturing sector – energy use, resource use, and carbon emissions – to support the country's growth as well as sustainability aspirations. The focus is on improving the management and dissemination of energy, emissions, and productivity related statistics around industries; assessing information gaps and associated challenges; and informing climate negotiations to aid enhanced transparency and capacity building among parties. The team supports strengthening the ecosystem for future-ready manufacturing with an emphasis on sustained value creation, securing critical resources, and minimising the environmental footprint.

"

Having our recommendations on enhanced transparency provisions recognised and echoed by global delegates of the Climate Change Expert Group (CCXG) at the OECD was, for me, a big high point as a researcher.

"

Attending an actual COP proceeding as an observer on behalf of the Research and Independent NGOs (RINGO) group at the COP 23, was a thrilling first, for CEEW as well as myself.

SUMIT PRASAD

Research Analyst, is working on climate governance and negotiations.

VAIBHAV GUPTA

Is working on all aspects related to climate, industrial growth, and critical minerals.

CEEW would like to thank thank Sachin Sharma, Kritika Gulati, and Vivek Garg for their contribution to research on industrial sustainability and competitiveness during 2017-18.

“

Being invited by Dr V.K. Saraswat, Member, NITI Aayog, for a briefing on India’s critical minerals and its implications on domestic manufacturing of EV batteries was great recognition for our research and a privilege too.

TIRTHA BISWAS

Programme Associate, is working on energy efficiency, emissions, and critical minerals.

Clockwise from top: Karthik Ganesan, Tirtha Biswas, Vaibhav Gupta, and Sumit Prasad.

Image: CEEW

LOW-CARBON PATHWAYS

“

The highpoint for the team was the culmination of an intense, 24-month long, uncertainty and integration cost-based assessment of India’s progress towards its Nationally Determined Contribution (NDC) and long-term carbon dioxide mitigation. Our first-of-its-kind research is based on more than 200 uncertainty-based scenarios to meet our climate commitments.

DR VAIBHAV CHATURVEDI

Research Fellow | Doctorate in Economics | Integrated Assessment Modelling.

He leads the Low-Carbon Pathways research @ The Council.

Image: CEEW

MOVING THE NEEDLE

200-PLUS SCENARIOS FOR INDIA TO ACHIEVE ITS NDC TARGETS, AND INSIGHTS FOR MID-CENTURY DECARBONISATION STRATEGY

In the lead up to the 2015 Paris Agreement, India committed to cutting its CO_2 emissions intensity (EI) of GDP by 33 to 35 per cent below 2005 levels and to achieving 40 per cent of its electricity generation capacity from non-fossil sources by 2030. But in recent years, India's power generation sector has changed significantly, driven by a substantial decline in the costs of solar-based electricity and multiple developments in the end-use sectors. Therefore, analysing scenarios for India's achievement of its 2030 targets as well as what its 2050 (Mid-Century Strategy) targets could be, needed to factor key uncertainties.

Our and India's **first in-depth modelling-based analysis of India's energy and climate policy in the country, presented** insights from uncertainty assessments of 200-plus scenarios. Some key findings were as follows.

As the share of variable renewable energy (VRE) in total electricity generation in India exceeds 15 per cent, the **cost of integration and its implications could become non-trivial.**

Solar-based electricity generation would grow rapidly for at least the next three decades. Non-fossil sources, largely due to the rapid growth of solar energy, would garner at least 48 per cent share in India's electricity generation capacity by 2030. The **electricity and industrial sectors would play a major role in India's energy sector related CO_2 emissions,** with respective shares of 40 per cent and 32 per cent in 2050. CO_2 emissions from India's transportation sector would grow the fastest. However, its share in India's CO_2 emissions would be lower, 19 per cent in 2050, compared to other sectors.

Energy sector CO_2 emissions intensity will decline by at least 48 per cent between 2005 and 2030, on the back of significant developments in energy efficiency of end-use sectors such as residential, transportation, and industrial sectors. To be consistent with the 2°C target, **India will need to cut its CO_2 emissions by at least 4.5 per cent per annum** post 2030.

INDIA'S LONG-TERM ELECTRICITY GENERATION AND ASSOCIATED WATER DEMANDS

We published the first analysis of India's long-term electricity generation and its associated demands on increasingly scarce water resources, across five shared socio-economic pathways (SSPs).

SSPs describe different visions of the future world, based on analysis of underlying social, economic, and technological drivers. Our analysis found that water use by India's inland thermal power plants would increase by 4 - 5.6 per cent per annum in the absence of dry cooling technology, between 2015 and 2050. Seventy five per cent of seawater-based coal power plant capacity and 100 per cent of gas power-based capacity in India currently depend on cooling tower systems. Hence, in order to manage our water resources better, India must shift from water-intensive cooling towers to water-efficient dry cooling.

FROM RESEARCH TO ACTION

CEEW ROUNDTABLE ON 'SUSTAINABLE DEVELOPMENT, UNCERTAINTIES, AND INDIA'S CLIMATE POLICIES: PATHWAYS TOWARDS NATIONALLY DETERMINED CONTRIBUTION AND MID-CENTURY STRATEGY'

February 2018

Prior to the launch of its NDC pathways study, CEEW organised a roundtable of experts from academia, industry, policy making bodies, media, and civil society organisations to discuss key findings and India's low-carbon growth strategies.

L to R: SIMI THAMBI, Young Professional, NITI Aayog; and DR SUMAN BERY, Trustee, Shakti Sustainable Energy Foundation, and former Chief Economist, Shell, at the Roundtable.

RITU MATHUR, Director, Integrated Assessments & Modelling, TERI, at the Roundtable.

"While there has been international research on the cost of the integration of renewables in the power generation mix, CEEW's research is the first credible study in the Indian scenario.

AMIT KULSHRESHTHA

Additional General Manager, NTPC

"Whether the Paris gamble has paid off will be determined by modelling studies like these. Though this study is 2050 based, it is important in shifting the politics.

NAVROZ K. DUBASH

Professor and Coordinator - Initiative on Climate, Energy, and Environment, Centre for Policy Research (CPR)

"I am quite in awe of your attempt to include uncertainty while addressing your key research questions.

PURNAMITA DASGUPTA

Chair Professor and Head, Environmental and Resource Economics Unit, Institute of Economic Growth (IEG)

Images: CEEW

CEEW DIALOGUE ON 'INDIA'S ENERGY AND CLIMATE POLICY: PATHWAYS TOWARDS NDC AND MID-CENTURY STRATEGY |

April 2018

The CEEW study 'Sustainable Development, Uncertainties, and India's Climate Policy: Pathways Towards Nationally Determined Contribution and Mid-Century Strategy' was released at the Dialogue. Dr Anil Kakodkar, Trustee, CEEW, and former Chairman, Atomic Energy Commission, and Montek Singh Ahluwalia, Trustee, CEEW, and former Deputy Chairman, Planning Commission, Government of India, delivered key addresses.

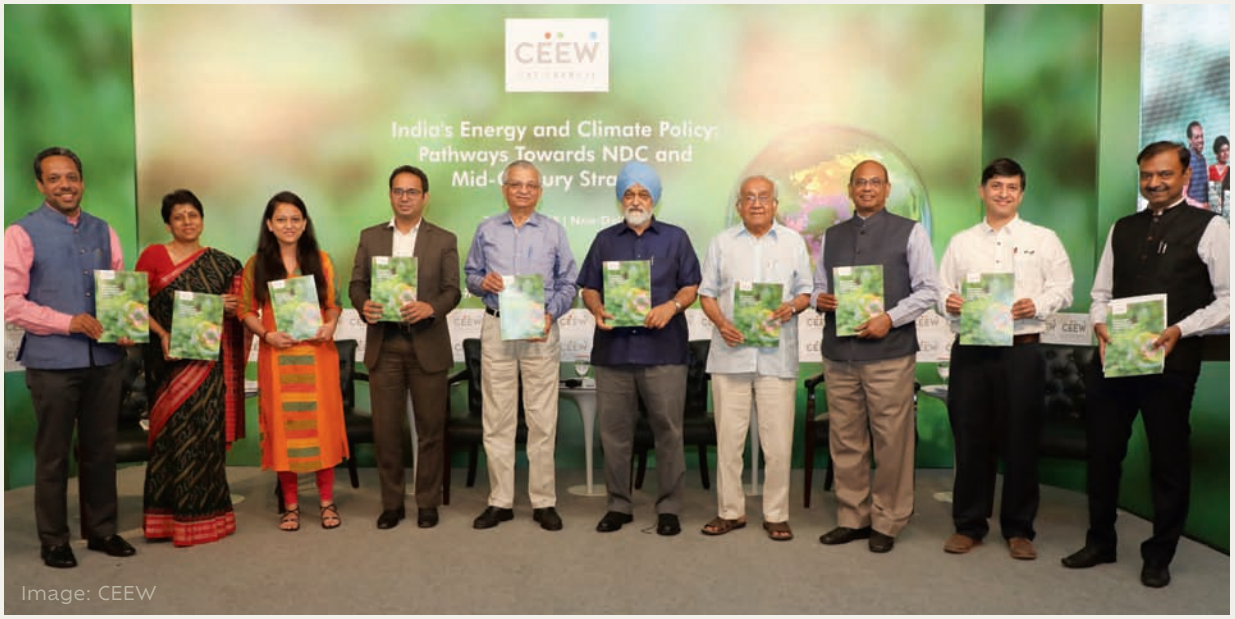


Image: CEEW

L to R: ARUNABHA GHOSH; PURNAMITA DASGUPTA, Chair Professor and Head, Environmental and Resource Economics Unit, Institute of Economic Growth (IEG); POONAM NAGAR KOTI, Research Analyst and co-author, CEEW; VAIBHAV CHATURVEDI, co-author, CEEW; ANIL KAKODKAR, Trustee, CEEW; MONTEK SINGH AHLUWALIA, Trustee, CEEW; KIRIT PARIKH, Chairman, Integrated Research and Action for Development (IRADe); AJAY MATHUR, Director General, TERI, NAVROZ K. DUBASH, Professor and Coordinator- Initiative on Climate, Energy, and Environment, Centre for Policy Research (CPR); and AMIT KULSHRESHTHA, Additional General Manager, NTPC.

CONVENING THE WORKING GROUP ON MITIGATION INSTRUMENTS (WGMI)

The Working Group on Mitigation Instruments is a joint initiative of CEEW and the Environmental Defense Fund (EDF), with support from the Shakti Sustainable Energy Foundation. The essential purpose of the Working Group, comprising senior experts from think tanks, academia, and industry, is to develop an informed and balanced narrative to address mitigation and development priorities simultaneously.

30.8

BILLION KILOLITRES

of water withdrawn from source against the total power generation in FY 2016-17; equivalent to 68% of the total water use for domestic purposes

48%

Estimated decline in **CO_2 EMISSION** Intensity of GDP between 2005 and 2030 driven by significant energy efficiency improvements

48%

Estimated share of **NON-FOSSIL SOURCES** in India's electricity generation capacity mix in 2030; 59 per cent in 2050

All data points: CEEW analysis

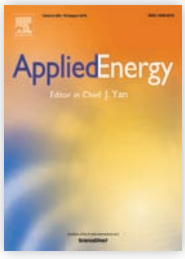
Image: iStock

KEY PUBLICATIONS

Implications of shared socio-economic pathways for India's long-term electricity generation and associated water demands.

CEEW Working Paper | September 2017

https://bit.ly/2NGI23r



Water for electricity in India: A multi-model study of future challenges and linkages to climate change mitigation.

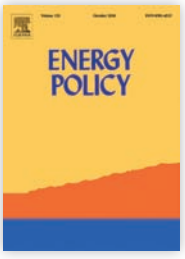
Book Chapter| Applied Energy Vol 210 | January 2018

https://bit.ly/2ouCDkE

Sustainable Development, Uncertainties, and India's Climate Policy: Pathways towards Nationally Determined Contribution and Mid-Century Strategy.

CEEW Report | April 2018

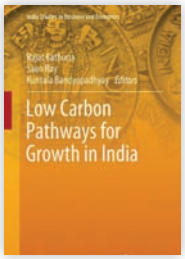
https://bit.ly/2or2FW6



A multi-model assessment of energy and emissions from India's transportation sector through 2050.

Book Chapter | Energy Policy Vol 116 | May 2018

https://bit.ly/2N9DhCa



Cost of Inaction on Mitigating Climate Change: A Preliminary Analysis.

Book Chapter | Springer | August 2018

https://bit.ly/2LRrFzi

THE LOW-CARBON PATHWAYS TEAM

The Low-Carbon Pathways team seeks to deliver robust quantitative and qualitative analysis for an improved understanding of low-carbon transition pathways within the context of the sustainable development goals (SDGs), national priorities, and global climate commitments. The team has strong capabilities in integrated assessment modelling, examining cross-sectoral synergies and trade-offs (energy-water-food-climate nexus, SDGs, the political economy of transition), and in sector-specific analyses (power, transport, agriculture, industry, etc.).

I am here to see my research translate into action. Our findings and data have to be woven into a storyline and a context for policy makers to be able to take action.

It's at the state-level that all the action on climate commitments will be taken, yet, my biggest worry is India's lack of deep analytical and modelling capacities. Nationally, there are only five well-established modelling teams. The states need similar academic capacities to generate trustworthy data.

POONAM NAGAR KOTI

Research Analyst, is working on mitigation instruments.

VAIBHAV CHATURVEDI

Is working on improving understanding of policies and plans for facilitating India's progress towards NDC targets.

CEEW would like to thank Sakshi Chamola for contributing to research on low-carbon pathways during 2017-18.

“

I am a few months old at CEEW. I actually wonder whether our future energy systems can be completely decarbonised, given what I see as a lack of urgency in the pace at which the world is moving towards integrating and adopting low-carbon pathways.

PALLAVI DAS

Research Analyst, is working on modelling the future of rooftop solar PV for 2030 and beyond.

“

Within the first few months of joining the organisation, I have got a unique opportunity to liaise with the Indian Railways and learn about the workings of this complex public enterprise from close quarters.

ABHINAV SOMAN

Programme Associate, is working on decarbonising the Indian Railways.

Clockwise from left: Pallavi Das, Abhinav Soman, Vaibhav Chaturvedi, and Poonam Nagar Koti.

Image: CEEW

RISKS AND ADAPTATION

Our work on informing water security debates, evaluating socio-economic and environmental outcomes of a natural farming technique, and furthering government and civil society engagement on improved health outcomes from solar-powered primary healthcare, headlined this year.

DR HEM DHOLAKIA

Senior Research Associate | Doctorate in Public Systems | Climate Change Adaptation.

He leads the Risks and Adaptation research @ The Council.

Image: CEEW

MOVING THE NEEDLE

ZERO-BUDGET NATURAL FARMING TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS

Zero Budget Natural Farming (ZBNF) is a low-input, climate resilient farming practice where farmers use low-cost, locally-sourced inputs, eliminating the use of artificial fertilisers and pesticides. ZBNF inputs are natural concoctions, inoculums, and decoctions prepared with cow dung, cow urine, jaggery, lilac, green chillies, and other natural ingredients.

In January 2018, we published a study mapping the potential social, economic, and environmental impacts of the Government of Andhra Pradesh's ZBNF programme vis-à-vis the Sustainable Development Goals.

Chandrababu Naidu, Chief Minister of Andhra Pradesh, and Erik Solheim, UN Environment's Executive Director, released the CEEW study on the sidelines of the World Economic Forum in Davos.

Andhra Pradesh's ZBNF programme will be scaled across all six million farms in the state with support from the Sustainable India Finance Facility (SIFF), World Agroforestry Centre, and BNP Paribas. CEEW is a research partner of SIFF.

THE PERFECT STORM AND DYING TRADITIONAL WATER BODIES IN INDIA

Given India is home to 17 per cent of the world's population and only four per cent of its freshwater resources, equitable and efficient water management is essential to sustain our growth and development goals.

Our study 'The Perfect Storm: Pathways to Managing India's Water Sector Sustainably' published in collaboration with the United Nations, identified challenges and highlighted key priority areas to improve water security.

At a micro level, our study 'Dying Traditional Water Bodies of India' focused on Meerut in Uttar Pradesh, a city once famous for its lakes.

Water from 120 ponds were tested and 500 residents interviewed to map the state of the water bodies, the reasons behind their neglect, and what needed to be done to revive them.

BETTER HEALTH + CLEAN ENERGY THROUGH SOLAR-POWERED PRIMARY HEALTHCARE CENTRES

Last year, our report on 'Primary Healthcare through Solar in India - Lessons from Chhattisgarh' showcased how solar-powered healthcare centres demonstrated better health outcomes for the communities they served. Furthering this research, our latest policy brief 'The State of Electricity Access for Primary Healthcare in India' analyses data from District Level Household and facility Survey (DLHS) to discuss the infrastructural challenges faced by primary healthcare centres (PHCs) across India in ensuring quality health service delivery.

FROM RESEARCH TO ACTION

Farmers with produce grown through Zero Budget Natural Farming (ZBNF) in Andhra Pradesh, January 2018.

YURI AFANASIEV, UN Resident Coordinator and UNDP Resident Representative in India (left), and ARUNABHA GHOSH, visit a ZBNF farm in Andhra Pradesh that uses solar-powered irrigation, June 2018.

A CEEW roundtable with stakeholders to share findings from the research on 'Powering Primary Healthcare through Solar in India: Lessons from Chhattisgarh' September 2017.

"

CREDA is thankful to CEEW for their evaluation of the solar-powered primary healthcare centres in Chhattisgarh that were set up by CREDA. The CEEW study established that providing energy through solar, improved health outcomes. As a result of the CEEW study, The Ashden Trust, London, recognised CREDA's effort and awarded us the 'International Award 2018' under the Sustainable Health and Energy category.

SANJEEV JAIN

Chief Engineer, Chhattisgarh Renewable Energy Development Agency (CREDA).

KANGKANIKA NEOG

Research Analyst, speaking on the circular economy of wastewater at the 'World Water Summit' March 2018.

16.8%

DECREASE in the area covered by ponds in Meerut

50%

of Meerut's water bodies were SEVERELY POLLUTED (2015)

50%

HIGHER INSTITUTIONAL DELIVERIES and round-the-clock services at PHCs with solar power in Chhattisgarh

All data points: CEEW analysis

Image: Pexels

KEY PUBLICATIONS

The Perfect Storm: Pathways to Managing India's Water Sector Sustainably

White Paper | CEEW - United Nations| June 2018

https://bit.ly/2LzxLEk

Dying Traditional Water Bodies in India Struggling to Survive against Unplanned Development

Journal Paper | Journal of Water Resource and Protection | June 2018

https://bit.ly/2P4DTqg

Solar-powered Healthcare in Developing Countries

Comment | Nature Energy | July 2018

https://go.nature.com/2wfVXGS

KEY OPINION EDITORIALS PUBLISHED

Imagining Water-secure Cities

Business Standard | September 2017

Arunabha Ghosh and Kangkanika Neog on how India can aim for safe, secure, and affordable water for all.

https://bit.ly/2o887wO

How Solar Power can Improve Healthcare Services: Lessons from India

ESI Africa | November 2017

Sunil Mani and Sasmita Patnaik on how states across India and other developing countries can learn from Chhattisgarh's effort to introduce solar-power at power-deficit primary healthcare centres.

https://bit.ly/2Lh7sCD

Powering Rural Healthcare

The Hindu | December 2017

Sunil Mani and Hem Dholakia make a case for scaling up solar-powered PHCs.

https://bit.ly/2ByZPrr

THE RISKS AND ADAPTATION TEAM

The Risks and Adaptation team examines local and global environmental risks – air pollution, climate change, water security – to develop strategies to mitigate them. The team especially analyses the impact of climate risks on health, agriculture, and urban infrastructure, the links between clean energy, air, and water, and other human development priorities, and designs effective responses.

“

The poor efficiency of water utilisation across sectors has dire consequences on both its quantity and quality, as reflected in the ever-increasing demand-supply gap. This is often exacerbated by erratic climate events. We have to channelise all efforts to maximise the productivity of each drop. How we will do this, is a constant preoccupation of mine.

SUMIT K. GAUTAM

Senior Programme Lead, is working on integrated water and wastewater management.

“

Seeing the award-wining documentary ‘A Plastic Ocean’, screened by CEEW’s Women in Sustainability initiative, and engaging in the ensuing public discussion was memorable. For someone who had just joined the organisation, it told me that I was in a place that enjoyed conversations and encouraged a solution-finding culture.

NITI GUPTA

Research Analyst, is working on climate-risk financing instruments.

“

Technology can get you to places you don’t even plan for. After the webinar on our solar-powered PHCs’ research, we suddenly had people from across the world showing interest. The UN Foundation was one of them. I am now a part of the working group known as ‘Powering Healthcare’ where we strive to improve energy access for healthcare globally.

HEM DHOLAKIA

Is working on ZBNF, air pollution, and heat stress.

CEEW would like to thank Sanya Prakash for contributing to research on risks and adaptation during 2017-18.

I see ordinary citizens consuming toxic air and water every day. It bothers me. I want my research to see tangible action so that no one has to live with such pollution anymore.

KURINJI L.S.

Research Analyst, is processing satellite data to monitor air pollution.

All it takes is one person, one powerful lobby, to push back years of positive policy-making efforts. It's like seeing your work go down. And then I come here, and feel it's not time for such despair yet.

ISHITA JALAN

Research Analyst, is working on air pollution and heat stress.

As someone greatly influenced by P. Sainath's development journalism, which constantly examines the consequences of policies that are always not thought through or understood, I'm constantly questioning if I've been able to see the problem holistically. And what if I've missed something? What will it cost us?

KANGKANIKA NEOG

Research Analyst, is working on wastewater management, water conflicts, and irrigation governance.

Standing L to R: Kurinji L.S., Sumit K. Gautam, Niti Gupta, and Hem Dholakia.
Sitting L to R: Kangkanika Neog, Karthik Ganesan, and Ishita Jalan.

Image: CEEW

TECHNOLOGY, FINANCE, AND TRADE

For technology to drive sustainability, we need policy and governance, understanding of finance and economics, and opportunities for trade and investment. The TFT work programme focuses on all three. CEEW was the only think tank invited to brief UN Environment's Committee of Permanent Representatives on the governance of climate geoengineering. On phasing down HFCs, our work on training service technicians evolved into a joint programme of the ministries of environment and skill development. Our examination of India's trade dependence for critical minerals needed for electric vehicles got attention at NITI Aayog. And as part of the Expert Committee on Energy Storage, we helped draft India's proposed National Mission on Energy Storage.

ARUNABHA GHOSH

CEO | D.Phil. International Relations |
UN Secretary-General nominated member of the
UN's Committee for Development Policy.

He leads the Technology, Finance, and Trade (TFT) research @ The Council.

Image: CEEW

MOVING THE NEEDLE

GEARING INDIA'S TRANSITION TO HFC-FREE REFRIGERANTS AND THE 2028 HFC PHASE-DOWN

Having pioneered extensive India-specific analytics on hydrofluorocarbons (HFCs) and drawn policy and industry attention on it in the past, this year we evaluated the state of India's preparations to meet its 2028 HFC-freeze commitment.

To support the sourcing of low global warming potential (GWP) HFC alternatives, we built on our earlier research, about a dedicated R&D platform, and presented an institutional design of this multi-stakeholder platform.

To review the transition-preparedness of the air-conditioning service sector (it consumes about 40 per cent of India's refrigerants) we surveyed 642 technicians in the residential, mobile, and commercial air-conditioning sectors in New Delhi, Jaipur, and Madurai to gauge the skill levels of servicing technicians on good service practices in equipment and refrigerant management. The Ministry of Environment, Forest and Climate Change (MoEFCC) and Ministry of Skill Development and Entrepreneurship (MoSDE) have recently entered into an MoU to provide refresher training to 200,000 air-conditioning servicing technicians to enhance their understanding of new refrigerants coming in the market.

To explore how regulatory provisions could accelerate and support India's transition to low-GWP refrigerants, CEEW entered into a partnership with the Norwegian Environment Agency (NEA) and began its first phase of work on studying incentives and regulatory approaches to recommend appropriate policy instruments to the Indian government.

ON EXPERT COMMITTEES: NATIONAL COOLING ACTION PLAN AND NATIONAL MISSION ON ENERGY STORAGE

Members from our team are on the Steering Committee of the National Cooling Action Plan as well as on the Expert Committee of the National Mission on Energy Storage. For the former, along with consultations on the overall plan document, we are the lead authors on the chapter dedicated to the air-conditioning servicing industry. For the latter, we contributed to the formulation of the mission document based on our past and ongoing studies on energy storage.

PERSPECTIVES ON CLIMATE GEOENGINEERING GOVERNANCE

Studying developments in the solar-geoengineering field has helped deepen our understanding and engagements on this controversial subject. Since 2011, CEEW has organised three international conferences to draw expert and policy attention on the need for India to actively develop regional and global governance frameworks for geoengineering research and technologies. This year, CEEW was the only global think tank invited to brief UN Environment's Committee of Permanent Representatives on the governance of climate geoengineering, at Nairobi, in May 2018.

FROM RESEARCH TO ACTION

CEEW-SHAKTI ROUNDTABLE ON 'PHASING DOWN HFCS IN INDIA: BUILDING AN R&D ECOSYSTEM AND ADDRESSING SERVICING SECTOR CHALLENGES'

October 2017

Image: CEEW

DR AMIT LOVE

Joint Director, Ozone Cell, Ministry of Environment, Forests and Climate Change at the CEEW-Shakti roundtable.

Image: CEEW

VAIBHAV CHATURVEDI

At the CEEW-Shakti roundtable.

Image: © IASS - Dirk Enters

ARUNABHA GHOSH

Speaking on issues related to promises and challenges associated with public engagements in climate engineering, at the 'Climate Engineering Conference - 2017' Berlin.


Image: © IASS - Dirk Enters

ANJALI VISWAMOHANAN

Programme Associate, speaking on developing starting-and-stopping rules for climate engineering research at the 'Climate Engineering Conference - 2017' Berlin.

Members of CEEW's TFT team on a study tour to Norway and Sweden to understand how incentives and regulatory measures to enable the HFC phasedown, have performed in these countries, December 2017.

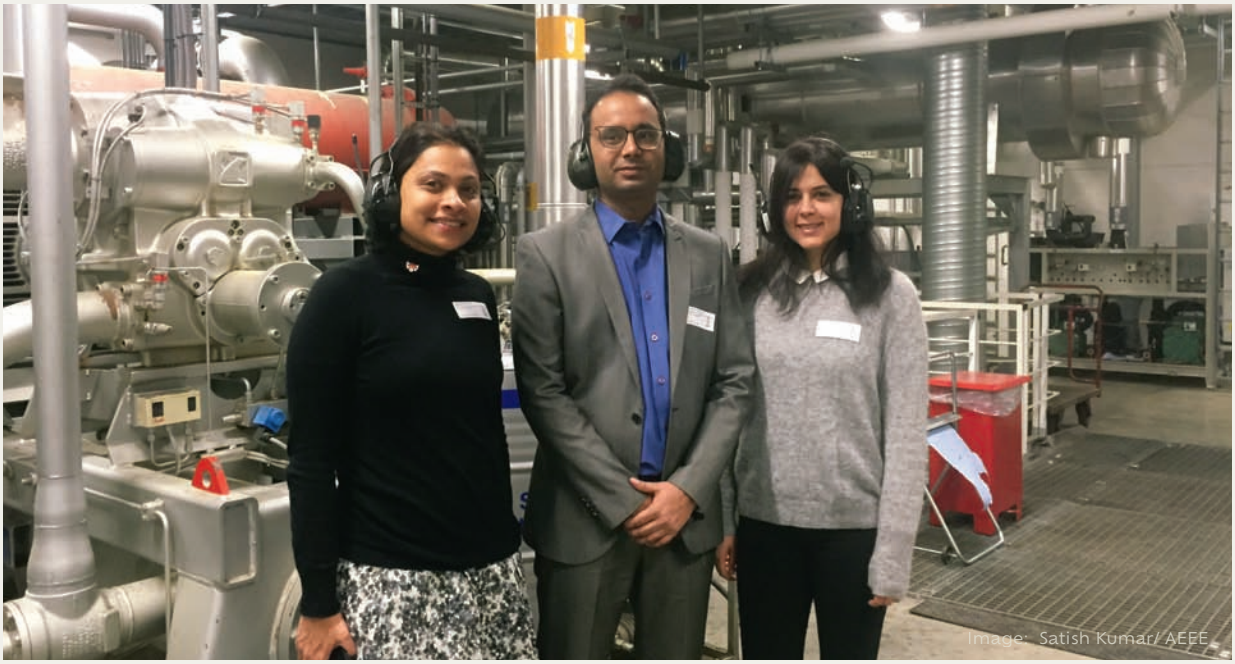


Image: Satish Kumar/ AEEE

Image: CEEW

200,000

ANNUAL FULL-TIME EMPLOYMENT POTENTIAL

in the operation of biomass pellet-based power plants and production of biomass pellets in India

CEEW analysis

75%

OF AC SERVICING TECHNICIANS

in the informal sector have not received AC servicing training

CEEW analysis

5

MEGA TONNES OF SULFUR DIOXIDE

injected into the stratosphere each year could keep global warming below 2°C

Nature | Vol 556 | 'Developing countries must lead on solar geoengineering research'

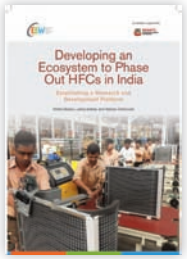
Image: Satish Kumar/ AEEE

KEY PUBLICATIONS

Can India's Air Conditioning Service Sector Turn Climate Friendly?

Report | October 2017

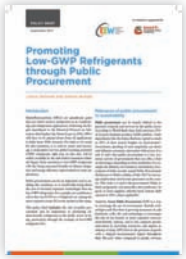
https://bit.ly/2Od3e19



Developing an Ecosystem to Phase Out HFCs in India

Report | October 2017

https://bit.ly/2COrmpw



Promoting Low-GWP Refrigerants through Public Procurement

Policy Brief | September 2017

https://bit.ly/2NEcvSA

Developing Countries must Lead on Solar eoengineering Research

Comment | Nature | April 2018

https://go.nature.com/2JqJSmY

KEY OPINION EDITORIALS PUBLISHED

HFC Phasedown will be a Climate Win for India

India Climate Dialogue| December 2017

Lekha Sridhar and Shikha Bhasin urge for India to make a mark in global environmental leadership by phasing down chemicals that contribute to global warming.

https://bit.ly/2i5ZcsS

AI, Inequity, and Our Choice and Agency

Business Standard | August 2018

Arunabha Ghosh on how we should anticipate our interactions with technology.

https://bit.ly/2My1QcC

THE TECHNOLOGY, FINANCE, AND TRADE TEAM

The Technology, Finance, and Trade team focuses on enabling the global economic architecture to support sustainable development. The team examines the governance of emerging technologies, supports technological partnerships between India and other countries, analyses barriers and incentives for desired technology futures, works on sustainability finance, and designs climate-friendly mechanisms for international trade and commerce.

“

Learning is a constant at CEEW. I always thought of myself as a good listener. But watching my peers ask questions and come up with very different perspectives during discussions just tells you what good listening really entails. It’s something I’ll be working on until I get there!

“

About two weeks into my role as a research analyst here, I interacted with service technicians in the air conditioning sector. One month in, I met with the Joint Secretary of MoEFCC and the Joint Director of the Ozone Cell. It is not just heads down work at The Council. It is also learning through engagement.

“

Communicating research is not just about putting across numbers and findings. We need to be able to draw a picture for the audience. Connect the dots. Contextualise the solution to their problems.

ABHINAV SOMAN

Programme Associate, is working on sustainable mobility.

APURUPA GORTHI

Research Analyst, is working on regulatory provisions to phasedown HFCs.

NEERAJ KULDEEP

Programme Associate, is working on energy storage technologies.

CEEW would like to thank Lekha Sridhar, Harsimran Kaur, and Anjali Viswamohanan for contributing to research on technology, finance, and trade during 2017-18.

The world trade environment has weakened. This is impacting the flow of technology from where it is produced to where it is needed the most. What keeps me up at nights is one burning question. How will India get to that avant-garde position where we develop technology for sustainable development that everyone wants?

ARUNABHA GHOSH

Is working on governance of climate engineering, energy storage, and artificial intelligence.

You are just one research paper or conference away from developing an interest in a completely new area that can take over your life!

ANJALI VISWAMOHANAN

Programme Associate, worked on climate geoengineering governance.

COP23 was a seminal milestone for us. CEEW showcased the significance of its independent research efforts in contributing to action at the forefront. Being there and working with colleagues in India and in Bonn round-the-clock in the lead up to, and during COP23, to contribute positively to the negotiations is what research and teamwork is all about.

SHIKHA BHASIN

Programme Lead, is working on the HFC phasedown and the National Cooling Action Plan.

L to R: Neeraj Kuldeep, Apurupa Gorthi, Abhinav Soman, Arunabha Ghosh, Anjali Viswamohanan, and Shikha Bhasin.

Image: CEEW

OPERATIONS

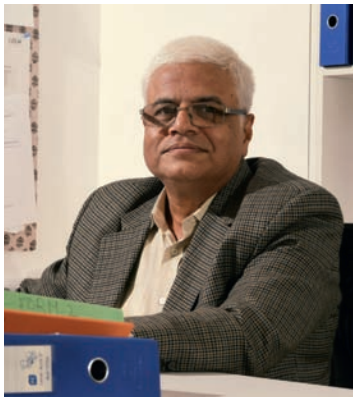
The Operations team holds the CEEW ship together. It ensures smooth day-to-day operations at The Council by adopting and implementing best practices in administration, finance and treasury, human resources, information technology, and Board management. The team also focuses on continuously strengthening governance and compliance processes to support the organisation's rapid growth.

92
DAYS
fitout of new office – from a basic slab-and-pillar structure to a full service, functional work place

1 DAY salary turn-around time from close of timesheets

25
NEW HIRES + 16 new interns

200+
TRAVEL TICKETS booked



"The year has seen the beginning of a new chapter for the Operations team. Among the several firsts that were put in place, the big move towards efficient management was the bringing together of the administration, human resources, and finance units as a team. This enabled us to function as a cohesive unit to achieve The Council's infrastructural, financial, and human resources targets.

RAMESH NAVALADI

Director Operations | MBA | Non-Profit Project Management.

He leads the Operations team @ The Council.

"New IT applications, a webex platform, increasing network integration and security, setting up the CCTV, biometrics and G-suite domain, there is much we put in place this year and much more to do.

SACHIN KAUNDAL

IT Specialist

CEEW would like to thank Aarti Katyal, R. Sunita, and Alka Gusain for their contributions to operations during 2017-18.

CEEW is a team of workaholics. But I like that we find time for team retreats and for our personal and professional development as well. Everyday is a day of intense activity. It's a work culture that enables you to meet your own as well as the organisation's growth objectives.

KAMAL SINGH

Finance & Accounts Executive

I find the version control and document filing system at CEEW quite amazing. This helps managing records more efficiently. Also, when there are questions, CEEW's remarkably young team is ever ready to find a solution.

PADARBINDA SAMAL

Assistant Administrative Officer

I had a lot of freedom to explore how office processes could be automated, even though finance and accounts is what I am here to manage. I see automation enabling better oversight and documentation and reducing human effort on routine tasks. CEEW's human resource information management system began this year under my oversight. I am proud to be its custodian.

VIKAS PANDEY

Senior Finance Officer

Front row L to R: Kamal Singh; Sandhya Singh, Alka Gusain, Bhabani Chetry, Ajay Kumar, Sachin Kaundal, and Ramesh Navaladi.
Back row L to R: Veena Janet Basil, Vikas Pandey, and Padarbinda Samal.

Image: CEEW

OUTREACH

The Outreach team is responsible for positioning CEEW as a leading global think tank and ensuring every research output finds its voice, and is heard. It does so by developing a branding and communication strategy, overseeing publishing and media relations, organising events, creating a strong digital presence, and embracing innovative communication solutions. The team also supports internal communications and capacity building on communication skills.

35+
PUBLICATIONS
produced

250+
MEDIA STORIES featured
CEEW research

50+
EVENTS
organised

100,000+
PAGES VIEWED on ceew.in

30
OP-EDS
published

This was the year of significant transitions and many firsts in the look, feel, and visibility of CEEW. We expanded the team with handpicked talent, introduced a new logo, revamped our website, improved several communications processes, hosted our first international press briefing, organised our first webinar, and designed our first communication training workshop. All in year's work. Here's to raising the bar in 2018-19.

MIHIR SHAH

Strategic Communications Lead | MBA - Communications Management.

He leads the Outreach team @ The Council.

From conceptualising and executing large-scale events to setting new benchmarks with each outreach engagement, you experience a steep learning curve at CEEW.

SAHIL KHILLAN

Communications Associate

CEEW would like to thank Alma Hirschhofer for her contributions to outreach and the Women in Sustainability initiative during 2017-18.

Applying best communication practices to publicise research is as exacting as it is exciting. Watch this space for more.

ALINA SEN

Communications Specialist

How can we maintain the fine line between heroing our work and heroing ourselves? The former is the cornerstone of what places an institution at the forefront of issues, and the latter could lead to complacency. It's a constant challenge to 'fight ignorance, stay true, and raise the bar' as we say here at CEEW.

AAKANKSHA VARMA

Communications Associate

There's a lot that goes into a piece of research. It is for us to tell its stories and create connections, and it's not an easy endeavour. We are stepping up to new challenges, connecting with different audiences, experimenting with new mediums, and chasing deadlines, every day. Ardent, spirited, together. That's outreach for me at CEEW.

ARSHEEN KAUR

Communications Specialist

Sitting L to R: Aakanksha Varma and Sahil Khillan.
Standing L to R: Arsheen Kaur and Alina Sen.

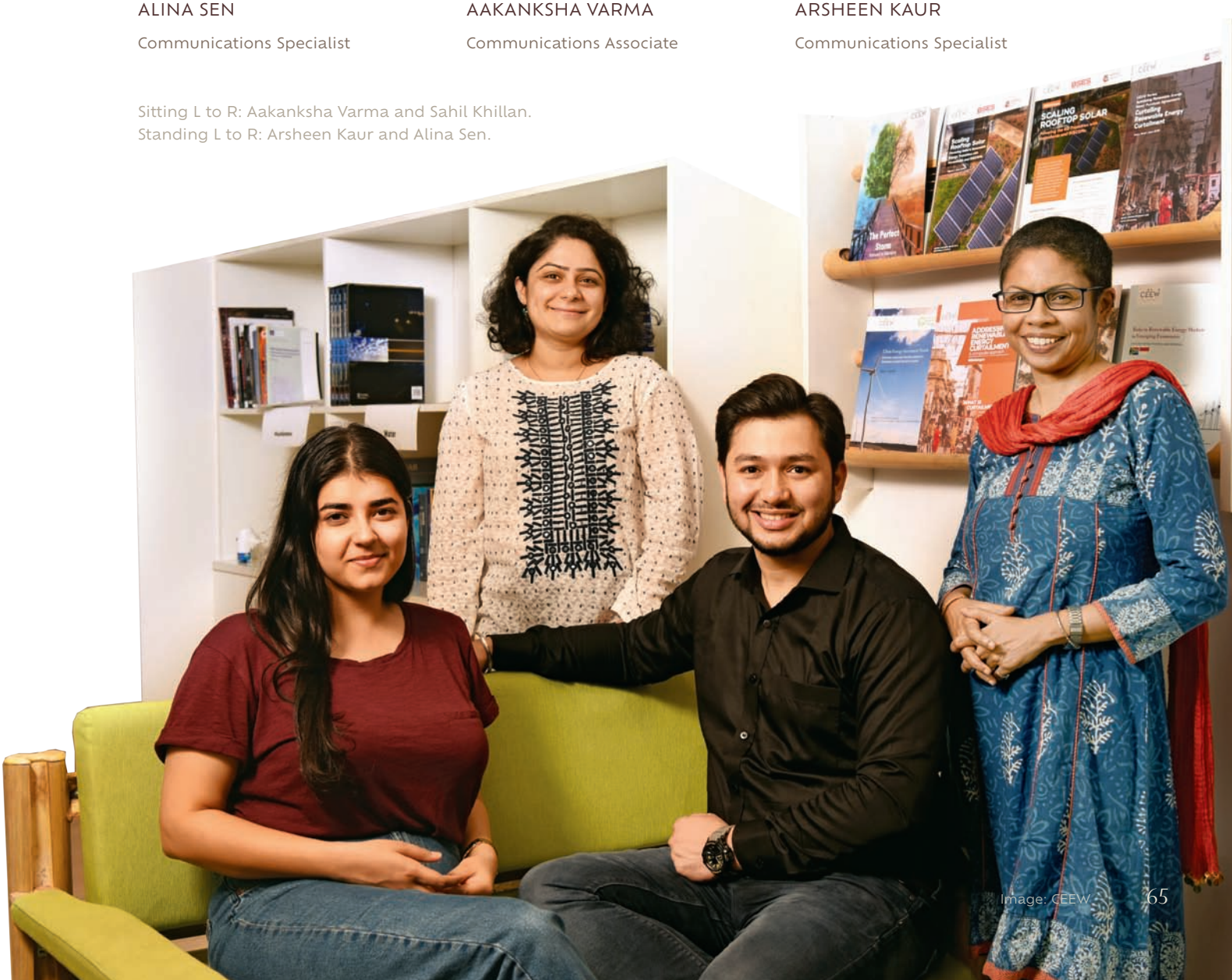


Image: CEEW

WOMEN IN SUSTAINABILITY (WiS)

RAISE WOMEN'S PARTICIPATION AND LEADERSHIP IN PUBLIC POLICY

NATASHA ZARINE at CEEW

Image: CEEW

"When we exclude women from public policy and positions of power, we limit our voice, we limit our perspectives, and we limit our future. Unless otherwise oriented, workplaces in the sustainability sector too tend to reinforce unequal societal gender norms and inhibit women from reaching their full potential.

SASMITA PATNAIK and KANGKANIKA NEOG
Co-chairs, WiS

TO BE THE CHANGE WE WANT TO SEE, THE COUNCIL LAUNCHED THE WIS INITIATIVE IN 2017.

WiS is a network of individuals and institutions to promote greater participation, inclusiveness, and visibility of women at all levels of the public policy workforce. We want to lean in for those women who lean in for the planet.

"For an organisation to institutionalise the need for a feminist perspective, amidst prevalent systemic biases and societal barriers, is rare. 'Women in Sustainability' at CEEW is a leap forward in this direction. I am glad it began here.

ARSHEEN KAUR
Communications Specialist

WiS CONVERSATIONS

LEARNING FROM A 'UN CLIMATE HERO'

ROSALIND "ROZ" SAVAGE I MBE FRGS | Ocean rower | Environmental advocate | Writer & speaker

ROZ SAVAGE, the only woman to have rowed across the Atlantic, Pacific, and Indian oceans, visited The Council's offices in December 2017, for a WiS talk on her life-changing experiences as a woman in the world of rowing. Roz is a passionate environmental campaigner, who gave up her career as a management consultant to row across the Atlantic in 2005. She now focuses on sustainability and ending plastic pollution.

Image: Arsheen Kaur/CEEW

DEHUMANISING WORK CULTURES KEEP WOMEN FROM REALISING THEIR FULL POTENTIAL

NATASHA ZARINE | Founder, CARPE and EcoSattva

WiS hosted NATASHA ZARINE, a Young India Fellow, from Aurangabad, for a talk in February 2018 on her work in urban waste management and experiences with local civic authorities. Stories of how she translated her experiences of facing gender bias into creating an accommodating and enabling work culture for all employees, found many cheerleaders within the audience.


Image: Sahil Khillan/CEEW

LISTEN WELL. STAND UP TO BULLIES. DO YOUR BEST

RWITWIKA BHATTACHARYA | Founder-CEO, Swaniti Initiative

WiS commemorated Women's Day with a discussion on 'Women in Public Policy' with RWITWIKA BHATTACHARYA. Through tales of Swaniti's birth and work across states, religions, and cultures, Rwitwika shared her experiences of the challenges gender poses, and what she and her team do to bash on regardless.

Image: Sahil Khillan/CEEW

ABOUT WiS

A VOLUNTARY INITIATIVE, open to all genders

Provides a PLATFORM FOR WOMEN in India's sustainability sector to share their stories and meet role models.

MENTORS WOMEN sustainability leaders of tomorrow.

Organises readings, talks, and discussions to understand GENDER ISSUES impacting the workplace.

Is developing a set of GENDER-BASED key performance indicators for CEEW

WiS LEADERSHIP

The WiS initiative at CEEW is led through a voluntary rotation of chairperson responsibilities.

KANGKANIKA NEOG
Current WiS Co-Chair

SASMITA PATNAIK
Current WiS Co-chair

KANIKA CHAWLA
WiS Chair
June 2017 to March 2018

INTERNAL COMPLAINTS COMMITTEE (ICC) AT CEEW

CEEW's Internal Complaints Committee held two meetings during the period in review. Meetings of the seven-person committee chaired by Kanika Chawla were attended by all members. A detailed draft of SOPs was presented for discussion to facilitate speedy and consistent redressal of complaints if and when they arise. The SOPs are currently under review and further detailing. It was also suggested to conduct a gender sensitisation workshop for all staff and a detailed training on ICC clauses and provisions for all ICC members. **No complaints were received during the period under review.**

A PLANET WITHOUT PLASTIC

On 4 June 2018, the eve of the UN World Environment day, WiS organised a special screening of the award-winning documentary 'A Plastic Ocean' for partners and interested citizens. This was followed by an engaging and provocative discussion with environmentalists, from the government and civil society, who are working to end plastic pollution through research, implementation, and advocacy.

Film Screening | Open-house discussion with sustainability experts on the eve of the UN World Environment Day.

"One person can make a difference. With vision and courage, one person taking a stand to stop single-use plastic can start a movement.

PINKY CHANDRAN

Director, Jain University; Member, Solid Waste Management Roundtable (SWMRT).

Images: CEEW

THE COUNCIL @ COP23

CEEW's VAIBHAV GUPTA (far right) at the Transparency, Governance, and Accountability for Mitigation and Adaptation discussion.

At the Conference of Parties held in Bonn (COP23), The Council, granted observer status by UNFCCC, organised six events with global partners. In addition, CEEW researchers presented analysis and data on climate leadership, decarbonising transport, de-risking RE finance, health and climate change, and the Paris Rulebook at eight public sessions and forums.

Plotting the CRMM basics

L to R: **UPENDRA TRIPATHY,** Interim Director General, ISA; **JEAN-PASCAL** Pham-Ba, Terrawatt Initiative; **KANIKA CHAWLA,** CEEW; and **ARUNABHA GHOSH,** CEEW.

UNFCCC screenshot

ARUNABHA GHOSH

At the CEEW-organised UNFCCC press briefing.

Images: CEEW

KANIKA CHAWLA

Presenting findings from the CRMM feasibility study.

CEEW researchers were quoted by leading national and international media agencies during COP23.

BS Business Standard · BusinessLine e-Paper · ET Energyworld From The Economic Times · The Washington Post · INDIA CLIMATE DIALOGUE

EVENTS ORGANISED

DIFFUSED LEADERSHIP AND THE PARIS AGREEMENT: THE INDIA STORY (PRESS BRIEFING)

Organiser: CEEW

CEEW organised a press briefing at the official UNFCCC press rooms, where NRDC's Han Chen, TERI's Sanjay Seth, and CEEW's Arunabha Ghosh discussed India's climate leadership, its climate commitments, and domestic and international climate actions. Over thirty journalists attended the briefing.

POOL RISKS TO PUSH CLEAN ENERGY (COP23 ENDORSED EVENT)

Organiser: CEEW

CEEW's Kanika Chawla and Arunabha Ghosh presented the Common Risk Mitigation Mechanism (CRMM), a multilateral market platform designed to leverage billions of impact capital to catalyse USD one trillion of domestic and international private institutional capital and transform global renewable energy markets.

LEADERSHIP IN THE CLIMATE REGIME WITHOUT THE U.S. FEDERAL GOVERNMENT

Organisers: CEEW and the University of Texas

Arunabha Ghosh was part of a panel of experts highlighting perspectives from India, China, EU, and the US on ongoing climate actions, national and regional ambitions, and assuming climate leadership in the absence of the US Federal government.

TRANSPARENCY, GOVERNANCE, AND ACCOUNTABILITY FOR MITIGATION AND ADAPTATION

Organisers: CEEW, Brown University, and SEI

CEEW's Vaibhav Gupta, along with other panellists, shared perspectives and experiences of developing countries to improve transparency, governance, and accountability in climate-related activities. The session highlighted common themes which could feed into recommendations for the enhanced transparency framework and the Paris Rulebook.

ENHANCED TRANSPARENCY FRAMEWORK FOR CLIMATE ACTIONS

Organisers: CEEW, Brown University, CIGI

This session, moderated by CEEW's Shikha Bhasin, brought together experts on climate finance, adaptation, and the legal aspects of the Paris Agreement. Vaibhav Gupta discussed developing countries' viewpoints that could inform the development of common Modalities, Procedures and Guidelines for the Paris Rulebook at this session.

INDIAN RAILWAYS ON A LOW-CARBON PATHWAY

Organisers: Ministry of Railways (GoI), CEEW, and TERI

This session, moderated by CEEW's Vaibhav Chaturvedi, highlighted how the Indian Railways had adapted and responded to climate change. The panel also discussed global best practices and case studies on how low-carbon transportation systems could be created and strengthened across the world.

CEEW researchers also spoke at events organised by CII, Federation of German Industries, German Chemical Industry Association, WWF, REN21, IRENA, Ministry of Health and Family Welfare (GoI), MNRE (GoI), and Terrawatt Initiative.

Images: CEEW

VAIBHAV CHATURVEDI

Moderating discussions on Indian Railways on a low-carbon pathway.

SHIKHA BHASIN

Moderating the session on Enhanced Transparency Framework for Climate Actions.

CEEW RESEARCH IN THE NEWS

INFORMING PUBLIC OPINION

Op-eds, quotes, and articles featuring CEEW's research and opinions of our researchers appeared across state, national, and international media during the period under review. Some snapshots.

CEEW RESEARCHERS QUOTED IN THE MEDIA

CEEW SOUND BYTES

KANIKA CHAWLA speaking about the significance of the International Solar Alliance during its first summit in India.

BBC World | News section | March 2018

ARUNABHA GHOSH (l) with KARTIKEYA SINGH (r), and RICK ROSSOW (c) discuss the strategic importance of US-India energy cooperation over a podcast at the Center for Strategic and International Studies (CSIS)

Washington D.C., March 2018

https://bit.ly/2ydR6a5

ARUNABHA GHOSH, speaking on air pollution in Delhi

AlJazeera | December 2017

ARUNABHA GHOSH speaks on cities facing water crisis in 'Shimla Faces Water Crisis, Is Your City Next?'

NDTV | Left, Right & Centre show | 3 June 2018

https://bit.ly/2QmvqzX

THE WEEK · BS Business Standard · ET The Economic Times · ఈనాడు · The Indian Express Journalism of Courage · The Times of India · The Hindu · The Guardian · NDTV · The Telegraph · CGTN America · India Climate Dialogue · BusinessWorld · The Gulf Today · BBC World News · FT Financial Times · The Washington Post · Los Angeles Times

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Former Chairman, Atomic Energy Commission; and former Secretary to the Government of India, Department of Atomic Energy

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Public Health Foundation of India (PHFI)
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Ricardo AEA, UK
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RESEARCH PUBLICATIONS

SEPTEMBER 2017 TO OCTOBER 2018

REPORTS/BOOKS

1. Shikha Bhasin, Lekha Sridhar, and Vaibhav Chaturvedi (2017) 'Establishing the HFC Alternatives R&D Platform: Developing an Ecosystem to Phase Out HFCs in India' October.

2. Lekha Sridhar, and Vaibhav Chaturvedi (2017) 'Can India's Air Conditioning Service Sector Turn Climate Friendly?: Evaluating the Skill Gap' October.

3. Vaibhav Gupta, Tirtha Biswas, and Karthik Ganesan (2017) 'Greenhouse Gases Emission Estimates from the Manufacturing Industries in India State level estimates: 2005 to 2013' October.

4. Sasmita Patnaik and Saurabh Tripathi (2017) 'Access to Clean Cooking Energy in India: State of The Sector' October.

5. Kapardhi Bharadwaj, Karthik Ganesan, and Neeraj Kuldeep (2017) 'Retail Tariffs for Electricity Consumers in Bangalore: A Forward-Looking Assessment' October.

6. Council on Energy, Environment and Water, Confederation of Indian Industry, The Currency Exchange Fund, and Terrawatt Initiative (2017) 'Common Risk Mitigation Mechanism' Feasibility Report, November.

7. Vaibhav Chaturvedi, Rudresh Kumar Sugam, Poonam Nagarkoti, and Kangkanika Neog (2017) 'Energy-Water Nexus and Efficient Water-Cooling Technologies for Thermal Power Plants in India: An Analysis within an Integrated Assessment Modelling Framework' November (Report submitted to NITI Aayog, Government of India).

8. Anne Raymond and Abhishek Jain (2018) 'Solar for Irrigation: A Comparative Assessment of Deployment Strategies' January.

9. Abhishek Jain and Tauseef Shahidi (2018) 'Adopting Solar for Irrigation: Farmers' Perspectives from Uttar Pradesh' January.

10. Tirtha Biswas, Karthik Ganesan, and Vaibhav Gupta (2018) Greenhouse Gas Emissions Estimate for India's Informal Manufacturing Industry', CEEW-GHG Platform India Report, May.

11. Vaibhav Chaturvedi, Poonam Nagar Koti, and Anjali Ramakrishnan Chordia (2018) 'Sustainable Development, Uncertainties, and India's Climate Policy: Pathways towards Nationally Determined Contribution and Mid-Century Strategy' April.

12. Kapardhi Bharadwaj, Karthik Ganesan, and Neeraj Kuldeep (2018) 'Retail Tariffs for Electricity Consumers In Maharashtra: A Forward Looking Assessment' June.

13. Narae Kim, Swastik Das, Kangkanika Neog, Rudresh K Sugam (2018) 'The Perfect Storm: Pathways to Managing India's Water Sector Sustainably' UN-CEEW White Paper, June.

14. Kanika Chawla, Michael Waldron, Arjun Dutt, Manu Aggarwal, Alberto Toril, and Yoko Nobuoka (2018) 'Clean Energy Trends: Evolving Investment Landscape for Grid-connected Renewable Energy Projects in India' OECD-IEA-CEEW Report, June.

15. Neeraj Kuldeep, Selna Saji, and Kanika Chawla (2018) 'Scaling Rooftop Solar: Powering India's Renewable Energy Transition with Households and DISCOMs' June.

16. Tirtha Biswas, Sachin Sharma, and Karthik Ganesan (2018) 'Factors Influencing the Uptake of Energy Efficiency by Indian MSMEs' August.

17. Arjun Dutt and Manu Aggarwal (2018) 'State of the Indian Renewable Energy Sector: Drivers, Risks, and Opportunities' September.

18. Sanchit Waray, Sasmita Patnaik, and Abhishek Jain (2018), 'Clean Energy Innovations to Boost Rural Incomes' October.

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1. Arunabha Ghosh and Sumit S. Prasad (2017) 'Shining the Light on Climate Action: The Role of Non-Party Institutions' CIGI Fixing Climate Governance Series - Paper No 6, September.

2. Vaibhav Chaturvedi, Poonam Nagarkoti, Rudresh Sugam, Kangkanika Neog, and Mohamad Hejazi (2017) 'Implications of shared socio-economic pathways for India's long-term electricity generation and associated water demands' September.

3. Chaturvedi V, Shukla P R, Ganesan K (2017). A perspective on the cost of nuclear energy. In: Janardhanan N, Pant G, Grover R.B. (eds) 'Resurgence of Nuclear Power - Challenges and Opportunities for Asia', Springer, New Delhi.

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6. L Sridhar and V Gupta (2018) Performance Evaluation of Global Environmental Impact Assessment Methods through a Comparative Analysis of Legislative and Regulatory Provisions in: C. M. Hussain (ed.), Handbook of Environmental Materials Management.

7. A. Atiq Rahman, Paulo Artaxo, Asfawossen Asrat, Andy Parker and 8 co-signatories (2018) 'Developing countries must lead on solar geoengineering research' Nature Comment, April.

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10. Chaturvedi V. (2018) Cost of Inaction on Mitigating Climate Change: A Preliminary Analysis. In: Kathuria R., Ray S., Bandyopadhyay K. (eds) Low Carbon Pathways for Growth in India. India Studies in Business and Economics. Springer, Singapore.

11. Rudresh Sugam, Bhawna Gupta, Diticha Deka (2018) 'Dying Traditional Water Bodies in India Struggling to Survive against Unplanned Development', Journal of Water Resource and Protection, 10, 539-558.

12. Purohit, P. & Chaturvedi, V. Biomass pellets for power generation in India: A techno-economic evaluation. Environmental Science and Pollution Research (2018) https://doi.org/10.1007/s11356-018-2960-8.

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15. Paladugula AL, Kholod N, Chaturvedi V, et al. 2018. A multi-model assessment of energy and emissions from India's transportation sector through 2050. Energy Policy 116, 10-18;.

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1. Lekha Sridhar and Shikha Bhasin (2017) 'Promoting Low-GWP Refrigerants through public procurement' September.

2. Saurabh Tripathi and Abhishek Jain (2017) '24x7 Power for All in Uttar Pradesh: Strategies for On-ground Action Based on ACCESS 2015' October.

3. Saurabh Tripathi and Abhishek Jain (2017) '24x7 Power for All in Odisha: Strategies for On-ground Action Based on ACCESS 2015' September.

4. Sasmita Patnaik, Sara Dethier, Saurabh Tripathi, and Abhishek Jain (2017) 'Access to Clean Cooking Energy in India: Beyond Connections, Towards Sustained Use' October.

5. Lekha Sridhar (2017) 'Standardising Practices in the Air Conditioner Servicing Sector' November.

6. Shalu Agrawal and Abhishek Jain (2018) 'Financing Solar for Irrigation in India: Risks, Challenges, and Solutions' January.

7. Saurabh Tripathi, Shruti Nagbhushan, and Tauseef Shahidi (2018) 'Zero Budget Natural Farming for the Sustainable Development Goals: Andhra Pradesh, India' January.

8. CEEW-C-STEP-GHG Platform India (2018) 'Approaches to Estimating GHG Emissions from India's Unorganised Sector' April.

9. Sean Leong, Johannes Urpelainen, and Abhishek Jain (2018) 'Using Solar Technologies to Increase Household Satisfaction with Power Supply' April.

10. Kanika Chawla, Manu Aggarwal, Anjali Viswamohanan, Arjun Dutt, and Neeraj Kuldeep (2018) 'Risks in Renewable Energy Markets in Emerging Economies: Spotlight on South Africa and Indonesia' (Interim Issue Brief) June.

11. Anjali Viswamohanan and Manu Aggarwal (2018) 'Rethinking Renewable Energy Power Purchase Agreements: Curtailing Renewable Energy Curtailment' June.

12. Victoria Plutshack (2018) 'Rural Electrification Policy and Enterprise Business Models in India: Responding to Change' October.

OTHER PUBLICATIONS

1. Council on Energy, Environment and Water (2017) 'Building the Paris Agreement Rulebook' Fact Sheet, November.

2. Council on Energy, Environment and Water (2017) 'Pool Risks to Push Clean Energy: CRMM', Fact Sheet, November.

3. Council on Energy, Environment and Water (2017), 'Indian Railways on a Low-Carbon Pathway' Fact Sheet, November.

4. Council on Energy, Environment and Water (2017) 'Risks of a Changing Climate' Fact Sheet, November.

5. Council on Energy, Environment and Water (2017) 'Solar Power Improving Public Healthcare in Rural India' Fact Sheet, November.

6. Council on Energy, Environment and Water (2017) 'International Solar Alliance' Fact Sheet, December.

7. Council on Energy, Environment and Water (2018) 'I-DESIRE - Supporting Clean Energy Innovations to Boost India's Rural Economy' Fact Sheet, February.

8. Council on Energy, Environment and Water (2018) 'Cooling the Climate: Paving the way to phase-down HFCs in India (HIIRA)' February.

9. Council on Energy, Environment and Water (2018) 'Addressing Renewable Energy Curtailment: A Composite Approach' Fact Sheet, June.

10. Council on Energy, Environment and Water (2018) 'Scaling Rooftop Solar: Powering the RE Transition with Households and DISCOMs' Fact Sheet, June.

LIFE @ CEEW

From the Friday team meetings and conversations with colleagues, there is so much I have learnt every day of my five months here. And, there is never a dull day at work when working with a CEO who has such immense energy and enthusiasm. The cherry on top is the love for food within the team. We not only enjoy eating food but also cooking and feeding others.

VEENA JANET BASIL
Executive Assistant to the CEO

It's been my responsibility to drive the CEO across Delhi-NCR. When I am not driving, I spend time on the computer learning to use MS Office. Arunabha and CEEW have supported my growth immensely. My years here have been the best ever.

BHABANI CHETRY
Transport & Logistics Assistant

“I received a lot of care and respect from my colleagues during my journey to motherhood. Human resources at CEEW is driven by ‘Human’.

SANDHYA SINGH
Administrative Assistant

“Helping set up CEEW events, I have learnt to have an eye for detail and systematically store CEEW publications. There is much I have learnt from my colleagues that I use in my day-to-day life. I have reduced plastic use at home and use water much more mindfully now.

AJAY KUMAR
Office Assistant

Images: CEEW

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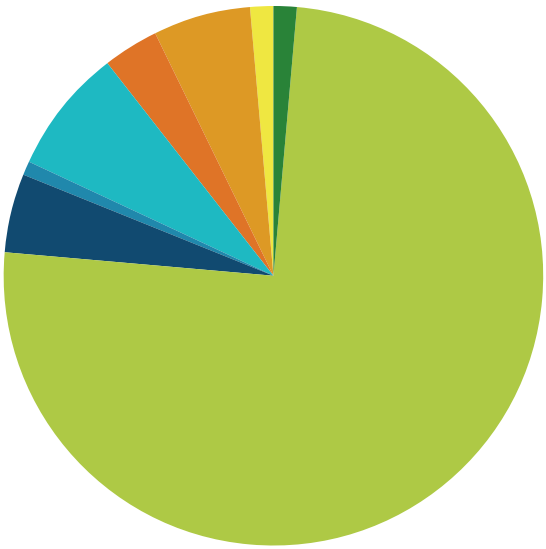
Source	Percentage	Value - INR million
Corporations	1.47%	1.48
Foundations	75.10%	75.87
Government	4.73%	4.78
International organisations	0.82%	0.83
NGO / Other institutions	7.59%	7.67
Bilateral donor agencies	3.12%	3.16
Interest and other Income	6.03%	6.09
Other reimbursements	1.14%	1.15
	100.00%	**101.03**



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WE COMMUNICATE TO CHANGE

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