

**Closed-door roundtable discussion on
'Implementation strategies for India Cooling Action Plan'
01 February, 2022, 10:00 AM – 11:30 AM (IST)**

BACKGROUND

The India Cooling Action Plan (ICAP), launched in March 2019 by the Ministry of Environment, Forest & Climate Change (MoEF&CC), is a seminal policy document that provides a synergistic approach to address cooling holistically. It provides a 20-year perspective on the cooling needs of India as well as the actions needed to provide sustainable cooling across sectors, including space cooling, cold-chain and refrigeration, transport air-conditioning, refrigeration and air-conditioning servicing sector, indigenous production of refrigerants, and R&D in the cooling domain. While ICAP addresses cooling and cooling-related practices outwardly, its rationale lies in delivering far-reaching socio-economic benefits to Indians, including thermal comfort and nutritional food for all.

KEY TAKEAWAYS

A total of 25+ representatives from ICC members joined the roundtable, organized as part of [Forum on Energy Efficiency and Decarbonization \(FEED\) 2022](#). The members had a comprehensive discussion on the ongoing initiatives that can support MoEF&CC towards ICAP implementation across various thematic areas. They deliberated on how MoEF&CC can call upon the cumulative and combined expertise of all members to undertake cutting-edge research, create consensus around data and assumptions, and run national campaigns.

Keynote address by Shri Jigmet Takpa, Joint Secretary, Ministry of Environment, Forest and Climate Change (MoEF&CC)

- Shri Jigmet Takpa highlighted that India is the first country to launch a comprehensive cooling action plan with a long-term vision to address the cooling requirement across sectors. He mentioned that the MoEF&CC has recently launched an action plan for implementing the recommendation of ICAP for thematic areas, including space cooling in buildings which can significantly contribute to achieving the set goals of ICAP.
- Various government departments and agencies have been identified for wider adoption of ECBC, including low-income housing projects under PM Awas Yojna, commercial buildings including educational, hospitals, airports, offices, railways & metros, as well as awareness and sensitisation of both the construction community and user regarding energy efficiency.
- He also highlighted that various studies had been undertaken for the capacity building and awareness generation of different departments and agencies which are based on the needs of ICAP, including (i) a study on the cold-chain sector in India, (ii) a study on public procurement policy of refrigeration and air conditioning equipment using non-ODS based refrigerants, (iii) a booklet of good servicing practices of room air conditioners, and (iv) a study on the adoption of passive cooling strategies in India upcoming affordable housing with AEEE. Ozone Cell is planning to further undertake several such studies towards achieving the goals of ICAP.
- He concluded his remarks by highlighting the goals of ICAP, including reducing cooling demand by 20% to 25%, reducing refrigerant demand by 25% to 30%, and reducing cooling energy requirements by 25% to 40% by the year 2037-38. This can be achieved through a robust policy framework and implementation strategies aligned with the ongoing government schemes. He invited the recommendations of delegates to streamline the implementation of ICAP further.

Ongoing initiatives towards ICAP implementation by India Cooling Coalition members

Dr Satish Kumar (Alliance for an Energy Efficient Economy)

- Dr Kumar presented key AEEE's initiatives related to cooling, including driving the agenda of thermal comfort and energy efficiency in residential buildings. He highlighted AEEE's work on supporting BEE and the Ozone Cell, MoEF&CC in implementing the ICAP with regard to energy-

efficient district cooling systems. In the appliances energy efficiency sector, AEEE has been advocating scaling up Super Energy Efficient Appliances & Low Energy Cooling Systems.

- He also spoke about AEEE's support in developing National Cooling Action Plan (NCAP) methodology in collaboration with UNESCAP, KCEP, and Cool Coalition. The NCAP methodology is currently being piloted in Cambodia and Indonesia.
- Another focus area of AEEE's cooling work is the analysis of energy efficiency opportunities in cold storage and pack-houses to reduce food loss, enhance farmers' incomes and improve the handling of perishable products through a climate-friendly cold-chain.
- Highlighting the need for behaviour change, especially with respect to cooling, he also presented AEEE's work on deploying consumer-focused campaigns to drive the adoption of efficient practices to achieve cooling energy reduction.
- To conclude, he highlighted that the Forum on Energy Efficiency and Decarbonization (FEED) Conference brings together industry experts and changemakers from the private sector, including RATA, RAMA, ICA, ISHRAE, thereby leveraging private sector engagement for ICAP implementation.

Dr Sanskriti Menon (Centre for Environment Education)

- Dr Menon presented CEE's work on 'Understanding rural cooling needs' and 'Supporting green and socially sound recovery in the farm sector.'
- The aim of the [Rural Cooling Needs Assessment](#) (2019-20) was to develop a study methodology and run design charettes to develop models of integrated rural cooling solutions in three rural clusters in Nashik and Satara districts of Maharashtra with Yuva Mitra and BAIF.
- CEE's ongoing work on 'Green and socially-sound recovery in the farm sector aims to (i) Document pandemic-induced changes, stresses, (ii) Identify opportunities in agriculture, allied rural sectors to promote green growth (Bihar, Gujarat, Maharashtra), (iii) Assess the state of the art of industrial processes and climate impacts (e.g., in cooling, processing, packaging, transport), and (iv) Identify options for the greening of rural industrialisation linking to existing schemes, other opportunities.

Shikha Bhasin (Council on Energy, Environment and Water)

- Ms Bhasin presented CEEW's Cooling Programme, including CEEW's work in India's cooling transition through support across Kigali Agreement, R&D programme, India Cooling Action Plan, RPL Scheme in the Servicing Sector with MoEF&CC and ESSCI, PIL Scheme for Industrial Growth with DPIIT, and enhancing long-term AC efficiency with Bureau of Indian Standards (BIS)
- For regulatory frameworks, CEEW's work cuts across India Cooling Action Plan, policy framework to phase-down India's HFC use, regulatory framework for recycling and managing end-of-life of refrigerants, cooling needs assessment across India and modelling India's HFC emissions.
- CEEW has also been working in enhancing the servicing sector through (i) Formalisation, (ii) Enhancing job security and livelihood, (iii) Increasing/change in jobs and (iv) Consumer Awareness and Behaviour Change.
- In the R&D and Industrial Growth sector, CEEW has been working towards (i) Competitiveness and R&D capacity in India's HVAC sector, (ii) Collaborative R&D institutional mechanisms: national and international, (iii) India's HVAC innovation initiative(s), (iv) Financing/business models to enhance sustainable cooling technology deployment, (v) Cooperative governance of solar radiation management under the Montreal Protocol.

Kishore Kumar (CLASP)

- Mr Kumar presented CLASP's work on supporting India's cooling and refrigeration sector. CLASP has been providing technical support to the Bureau of Energy Efficiency (BEE) on the Standard and Labeling program for appliances for over a decade. They have been working on various short-term and medium-term recommendations of ICAP on the Space Cooling and Refrigeration segment for the last two years.
- CLASP is working with BEE to develop energy efficiency policies for eight appliances in 2022. Currently, CLASP is working on five appliances used in space cooling and commercial

refrigeration to develop voluntary policies (Visi Cooler, Display Cabinet, Water Cooler, Table Fans, and Pedestal Fans). These policies are expected to mitigate CO₂ emissions of more than 53 million tons by 2030.

- CLASP is also working on three appliances used in space cooling and commercial refrigeration to develop mandatory appliances (Deep freezer, Chillers, and Light Commercial Air Conditioners). These policies are expected to mitigate CO₂ emissions close to 11.2 Million tons by 2030.
- CLASP will support BEE in developing energy efficiency policies for two cooling and refrigeration appliances used in cold chain systems except for refrigerated transportation. These policies are expected to mitigate CO₂ emissions close to 8.5 Million tons by 2030.

Jai Asundi (CSTEP)

- Dr Asundi highlighted that CSTEP is working on a sustainable future for India with MoEF&CC, including net-zero scenarios.
- The objective is to identify the cooling load and energy requirement for buildings in the future and the implications of alternative building materials on the energy load of the residential sector.
- He also highlighted that CSTEP is looking to work with ICC members to develop policies and ideas to achieve India's Cooling Action Plan.

GN Gohul Deepak (Glazing Society of India)

- Mr Deepak presented GSI's initiatives towards ICAP implementation in terms of 6Cs, including **C**apacity Building, **C**ertification, **C**odes, **C**onformity, **C**ompliance, and **C**itation.
- He highlighted that GSI is working on New Standards for Coated Glass (Energy Efficient Glass) in India. In addition, GSI is working towards "Establishing the need for and Suitable Energy Efficient Glass and Glazing for Affordable Housing" and "Development of Evaluation and Compliance mechanism of Glass and Glazing as per ECBC and implementation in the States" along with TERI.
- GSI's proposed initiatives include "Study on Reducing Carbon Footprint by using Energy Efficient Glass and Glazing" in India and "Establishing the Optimum and suitable Energy Efficient building envelope solutions" for Indian Buildings.

Vikram Murthy (ISHRAE)

- Mr Murthy highlighted that active air conditioning is not the only means to provide adequate thermal comfort during summer. He emphasised the need to develop and apply conscious and responsible behaviour to reduce building energy use and drastically prevent destructive climate change.
- He presented sustainability features of the Central Vista Project, including large & recessed windows for daylight (and yet reduce solar gain), sun breakers to diffuse solar radiation, water-soaked hedges that create a local microclimate, native trees providing shade and evaporation, and ISHRAE's HVAC Commissioning Standard Compliance.
- He also talked about ISHRAE's technical groups on Thermal Comfort, Evaporative Cooling, District Cooling, Radiant Cooling, and HVAC Commissioning.

Prima Madan, NRDC

- Ms Madan presented that cooling & efficiency have been one of the work areas of NRDC in India since 2010, with a focus on cooling in buildings. Since 2015, more emphasis has been on refrigerant, issues related to the Montreal Protocol and Kigali Amendment, and more recently on ICAP implementation
- NRDC is working on cooling energy efficiency through three interrelated strategies: 1) HFC Phase Down: Montreal Protocol & ICAP, 2) Efficient Appliances: Standards & Business Case, 3) Reducing Cooling Demand: Efficient Building & Cool Roofs
- They are ready to partner on a robust HFC phase-down strategy for India; they have recently developed a long term Kigali implementation scenario for India and will be happy to share and discuss the finding with the ICC members.
- NRDC is exploring US India engagement in technology and finance to meet the ICAP targets; there is also an opportunity for highlighting sustainable cooling at COP27 in Egypt.

- NRDC is working with high impact states such as Gujarat and Maharashtra on the adoption of the Energy Conservation Building Code (ECBC), tapping on the lessons from Telangana and Andhra Pradesh; they are also working with cities on cool roof programs in Ahmedabad and Hyderabad

Aditya Chunekar, Prayas

- Mr Chunekar highlighted that the Prayas group works on policy and regulatory issues in the energy sector (focus on electricity). They broadly work on two themes, 1) to understand and model consumer behaviour through surveys, energy monitoring, bottom-up modelling 2) to use these insights to inform policy and governance of energy efficiency in India.
- The Prayas Group's work also focuses on facilitating market transformation to energy-efficient appliances (both super energy-efficient equipment programs and utility-driven programs)
- They closely follow BEE's S&L program and provide inputs on revision schedules, improving test standards and strategies on financial aspects

Sumedha Malviya, WRI

- Ms Malviya presented that WRI India is a research organisation that works at the nexus of environment, economic opportunity and human well-being.
- At the state level, WRI is assessing the role of cooling in states' clean energy transition, focusing on Tamil Nadu and Kerala. They are trying to understand the gaps and challenges of implementing ICAP at the subnational/state level.
- At the city level, WRI is supporting several cities on city climate action plans, working with Tamil Nadu on clean energy action plans, and with the Kerala government to promote clean energy interventions, including sustainable cooling strategies through training and capacity building
- WRI focuses on two key areas –
 - Space cooling: they are supporting EMC Kerala to benchmark buildings in Kerala under the Oorjayan program and guidelines to promote sustainable cooling for existing and new buildings
 - Cold chain: they are engaging with the seafood cluster, dairy cluster and food processing units in Kerala to identify clean energy interventions for cold storage.
- They highlighted some of the following challenges and opportunities from their work at the state/city level -
 - Cooling is a low priority sector at the local scale, and there is limited knowledge of ICAP at the state level
 - There are knowledge gaps and limited awareness of non-mechanical cooling technologies across stakeholder group
 - There is over-dependence of ACs for thermal comfort by consumers with purchase power
 - There is a need to integrate ICAP measures into city/local climate action plans and to develop standardised intervention sets tailored to different climate conditions
 - There is a need to define "thermal comfort" and its adoption in different housing guidelines, including affordable housing
 - Lastly, it is essential to promote energy-efficient ceiling fans and passive cooling technologies through financing mechanisms and incentives

Ritika Jain, Shakti Sustainable Energy Foundation

- Ms Jain underscored that the Shakti Foundation works on the following key themes - clean cold-chain infrastructure, thermal comfort, refrigerant transition and HFC phase-down, climate-friendly cooling appliances, sustainable economic recovery and green jobs, and innovative business models.
- Some of the ongoing initiatives that Shakti is supporting are -
 - Refrigerant transition in India: Adoption of safety standards for natural refrigerants in India and building a coalition of low-GWP/natural refrigerant businesses
 - Green Economic Recovery in the Rural value-chains: Supporting clean cold chain development and identification of green industrialisation opportunities in rural areas
 - Supporting the India Cooling Coalition to foster knowledge exchange and push for collaborative research
 - Implementing ICAP goals at the Sub-national level: Initiating discussions on thermal

comfort requirement and affordable housing projects and support in developing state/city level action plans to meet cooling needs

Moderated discussion by Shubhashis Dey, Shakti Sustainable Energy Foundation

- How can cooling contribute towards the latest development, including the Ratification of the Kigali Amendment to the Montreal Protocol and India's Net-Zero Commitment at COP26, especially in reducing the projected carbon emissions by one billion tonnes by 2030
 - The uptake of appliances has not been as aggressive as expected because of the pandemic, which is going to cause a differential in the baselines numbers; there is a need to relook at the baseline and reassess when the peak is going to come
 - Many organisations are working on a bottom-up assessment to assess the future cooling demand – it will be essential to establish these to further work on net-zero aspects; also, we have to broaden the scope to incorporate programs such as energy-efficient fans, which is getting mandated this year
 - There is a need to create awareness and compliance at the local level where best practices/guidelines should be implemented
- What is the role of capacity building at the state and local government level, consumer awareness, research and development and, enforcement and compliance measures for the implementation of ICAP?
 - ICAP implementation strategies should be developed based on learnings from the subnational and state-level efforts
 - It is essential to streamline the efforts of various organisations and provide a common solution to the state and local body and incorporate it in their local climate action plans
- ICAP uses the three pillars of the society (public and private sector and non-profit and research organisations) and identifies the roles and responsibilities framework with lead government ministries for implementation. Can the same collaborative spirit with which ICAP was developed be invoked for its implementation?
 - Firstly, it is essential to distinguish between cooling and comfort. The industry still needs to accept credibility in working with CSOs, NGOs and academic institutes. This credibility gap can be bridged through more interactions in platforms such as India Cooling Coalition.

ATTENDEES

1. Shri Jigmet Takpa, MoEF&CC
2. Aditya Chunekar, Prayas Energy Group
3. Ashwini Mehra, ISHRAE
4. Bhairav Sharma, AEEE
5. Dhilon Subramanian, WRI
6. GN Gohul Deepak, GSI
7. Gaurang Patwardhan, CEE
8. Gerry George, AEEE
9. Jai Asundi, CSTEP
10. Jayanta Chaudhuri, AEEE
11. Kishore Kumar, CLASP
12. Prima Madan, NRDC
13. Navneet Wadkar, CEE
14. P.K. Mukherjee, CLASP
15. Poornima Kumar, CSTEP
16. Radhika Israni, AEEE
17. Rajan Rawal, CEPT University
18. Ritika Jain, Shakti Foundation
19. Sachin Kumar, Shakti Foundation
20. Sanskriti Menon, CEE
21. Satish Awate, CEE



22. Satish Kumar, AEEE
23. Shikha Bhasin, AEEE
24. Shubhashis Dey, Shakti Foundation
25. Simrat Kaur, AEEE
26. Sumedha Malviya, WRI
27. Tarun Garg, AEEE
28. Vikram Murthy, ISHRAE