

ICAP India Cooling Action Plan

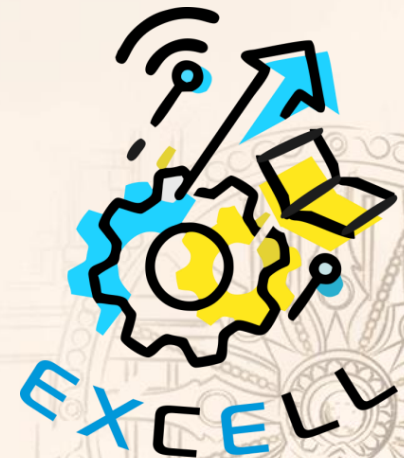
2019

Presentation by Vikram Murthy,
President ISHRAE



MISSION

ISHRAE's mission is to protect the Environment, conserve Energy and promote healthy Indoor Environment Quality by creating Standards , conducting Research & providing continuing Education in HVAC & related Building Services .



ISHRAE Standards -



Coming soon

- AHUs
- Filters

Standards Development

Accreditation for ISHRAE to be an SDO (Standards Development Organization) will soon be granted



ISHRAE RESEARCH

Indoor Environment Quality
– measured parameters for
benchmarking

Corrosion in Condenser Coils

CO₂ as a secondary
Refrigerant - operating in a
Natural cycle – for Cold
Stores

SROs for 2019

OPTIMISE ENERGY PERFORMANCE OF HVAC
SYSTEMS

LOW ENERGY COLD STORAGE CONSTRUCTION
TECHNOLOGIES

MAINTAINING IEQ IN SPACES

IMPROVED SYSTEM EFFICIENCY OF HVAC&R
COMPONENTS FOR RELIABILITY

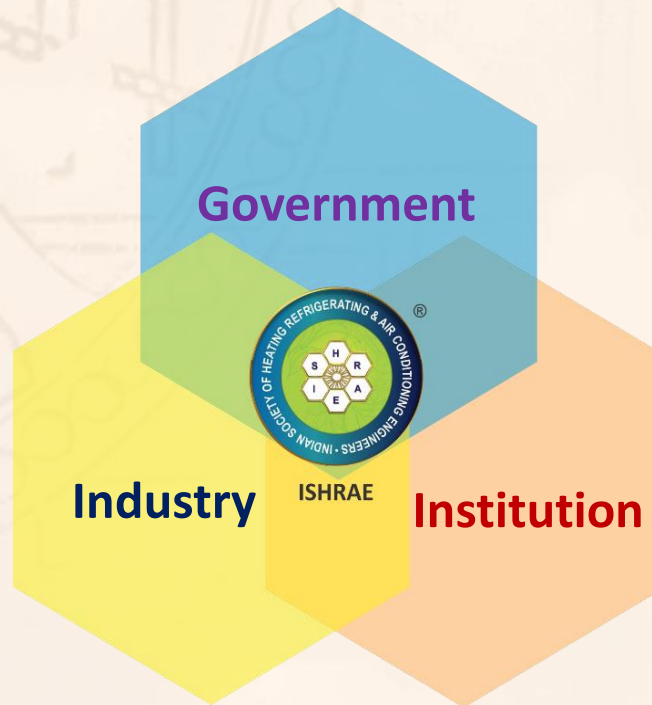
SOLAR ENERGY COOLING SYSTEMS

APPLICATION OF NATURAL & LOW GWP
REFRIGERANTS

Advocacy

Government

- BIS - ISHRAE Standards
- BEE – ISHRAE Resource Reference
- **MoEFCC- Ozone Cell – Low GWP Refrigerants Global Cooling Prize**
- Dept. of Science and Technology – Industry Interconnect
- **EESL – Solar ,District Cooling , Urjavarán**
- **ISHRAE Chapter - State Capital Driven Advocacy**



Connect with Institutions

- IIT, Madras
- Anna University
- MNIT, Jaipur
- College of Engineering Pune
- CEPT, Ahmedabad
- Chitkara University, Chandigarh

Industry - Government – Institution - Interface

The ICAP released on 8 March 2019, sets goals of reducing overall cooling demand by 25 per cent and reducing refrigerant demand by 30 per cent, and seeks to certify 100,000 service sector technicians by the year 2023

The Plan shall involve multiple stakeholders linking energy efficiency and the transition to low global warming potential (GWP) refrigerants sourcing nationwide data and inputs from cooling experts.



ISHRAE



Space Cooling in
Buildings



Air-conditioning
Technology



Cold-chain and
Refrigeration



Transport Air-
conditioning



Refrigeration and Air-
Conditioning Servicing
Sector



Refrigerant Demand and
Indigenous Production



Research &
Development

Four ISHRAE Committees / sub Committees shall drive it -
Technical , Standards , Research and Education

1.5 Unique Features of ICAP

- A synergistic approach to holistically address cooling requirement
- Multiple stakeholder involvement across sectors (Figure 1.5)
 - Synergize energy efficiency and the transition to low GWP refrigerants
 - Takes a holistic view of policy interventions and their interdependencies
 - A balanced perspective recognising that India's cooling growth is in alignment with its developmental needs
- Identifies the scale and impact of the growth of cooling
- Collects and collates best available nationwide data and inputs from domain experts on various thematic areas of cooling.



The India Cooling Action Plan was developed by Multiple Groups working with MoEFCC – The Ministry of Environment, Forests & Climate Change

Ministry of Agriculture and Farmers' Welfare

Ministry of Housing and Urban Affairs

Ministry of Power

Ministry of Road Transport and Highways

Ministry of Skill Development and Entrepreneurship

Department of Industrial Policy and Promotion (DIPP)

Department of Science and Technology



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OZONE CELL

जहाँ है हरियाली ।
वहीं है खुशहाली ॥

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Bureau of Energy Efficiency (BEE)

Council for Scientific and Industrial Research (CSIR)

Energy Efficiency Services Limited (EESL)

Electronic Sector Skill Council of India (ESSCI)

National Centre for Cold-chain Development (NCCD)



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Alliance for an Energy Efficient Economy (AEEE)
Council on Energy, Environment and Water (CEEW)
Centre for Science and Environment (CSE)
The Energy and Resources Institute (TERI)



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Automobile Component Manufacturers Association (ACMA)

Confederation of Real Estate Developers Association of India (CREDAI)

Indian Polyurethane Association (IPUA)

Indian Society for Heating Refrigeration and Air-conditioning Engineers (ISHRAE)

Refrigeration and Air-conditioning Manufacturers Association (RAMA)

Refrigerant Gas Manufacturers Association (REGMA)

Refrigeration & Air-conditioning Servicing Sector Society (RASSS)

Society for Indian Automotive Manufacturers (SIAM)



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ସବୁ କୁ ସ୍ୱାଗତାର୍ଥେ ।





Figure 1.5: ICAP Multi-stakeholder Development Framework



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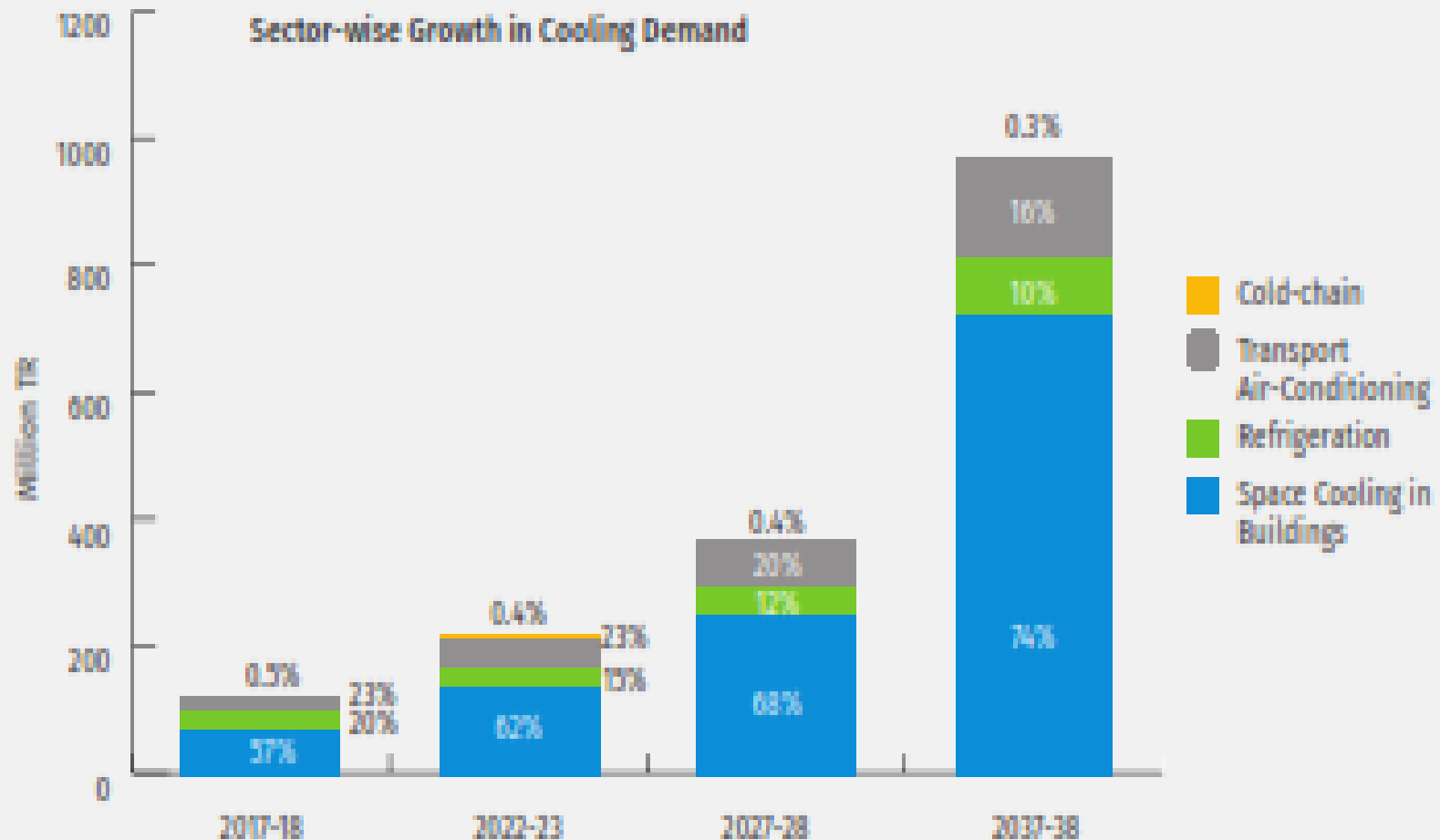


Figure B: Sector-wise Growth in Cooling Demand

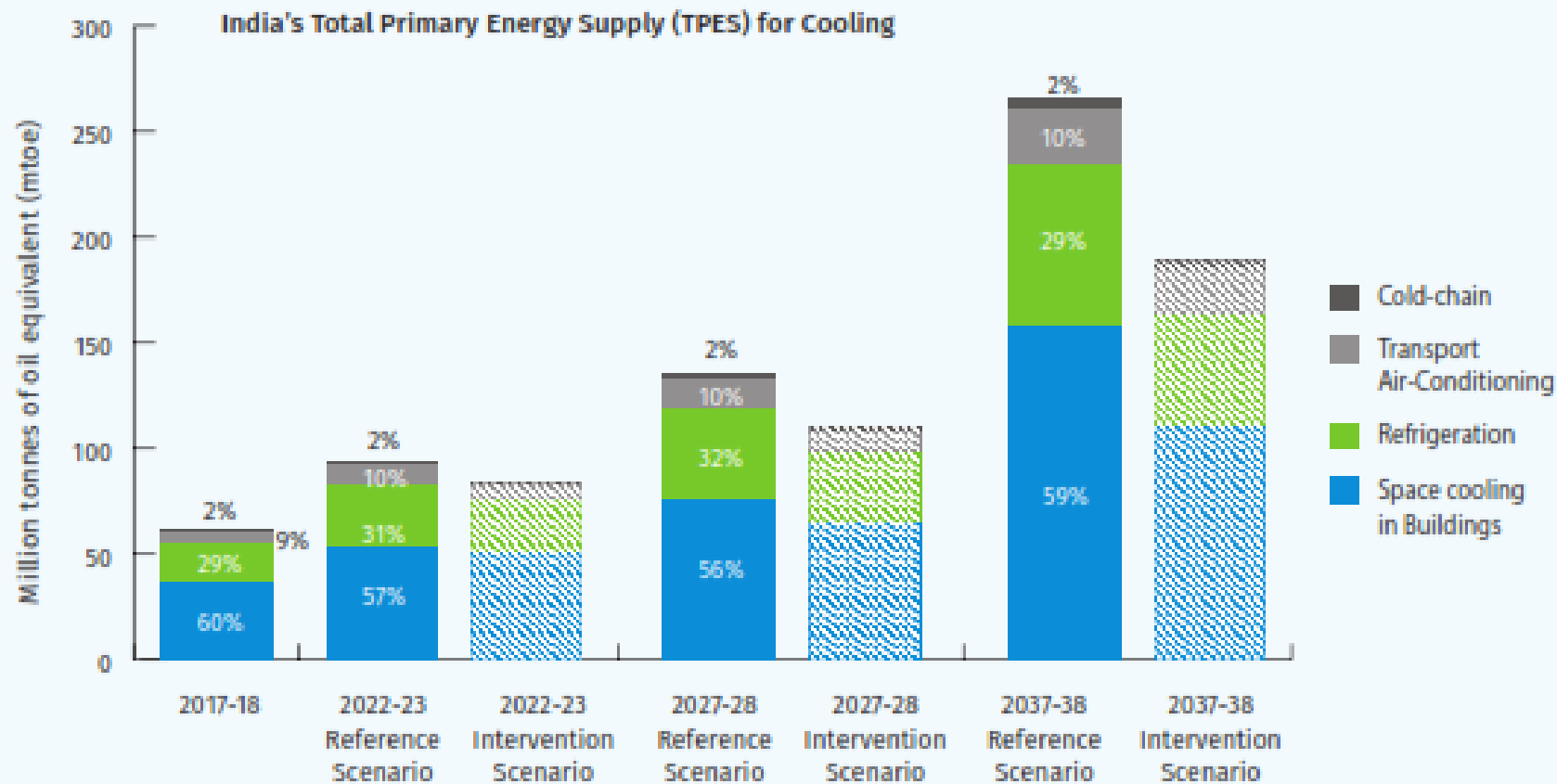


Figure C: India's Total Primary Energy Supply (TPES) for Cooling

Development of the India Cooling Action Plan

Within this context, the development of the India Cooling Action Plan (ICAP) has been a multi-stakeholder, integrated and consultative process in order to synergize actions for addressing the cooling demand across all sectors. The ICAP provides a 20-year perspective (2017-18 to 2037-38) and recommendations, to address the cooling requirements across sectors and ways and means to provide access to sustainable cooling.



A Promote development and commercialization of technology pathways, especially low-energy cooling technologies, which would reduce the energy footprint of active cooling: Through the right combination of policy and market drivers, the private sector must be enabled to lead the technology development through innovation and R&D. The technology pathways must include, inter alia, the evolution of not-in-kind technologies for scaled-up adoption.



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B Accelerate (i) reduction of the cooling load of the building sector through fast-tracked implementation of building energy codes, (ii) adoption of adaptive thermal comfort standards, (iii) ratchet-up energy efficiency of room air-conditioners and fans, and (iv) enhancing consumer awareness through eco-labelling of cooling products: In the light of significant increase (~3x) in building area by 2037-38 (over 2017-18 baseline), the role of climate appropriate design and building energy efficiency will become increasingly important in terms of reducing the cooling load requirements.



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C Public Procurement of (i) energy efficient cooling equipment and (ii) trained and certified RAC service technicians for public buildings.

D Further government support towards targeted programmes to enable thermal comfort for EWS and LIG: The Government is implementing schemes for building affordable housing such as under Pradhan Mantri Awas Yojana with the objective of providing housing for all. These schemes would benefit by use of climate appropriate and energy efficient building design for construction of houses under EWS and LIG segments. This would inter alia provide thermal comfort for all, reduce cooling load, and provide gains in terms of energy efficiency. In this regard, the energy efficient building envelope guidelines of ECBC-R could be enforced. In addition, funding and support, where required, for initiatives providing thermal comfort such as cool-roof programs, off-grid micro-systems for cooling, and localized heat-action plans could be provided.



सत्यमेव जयते

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E Drive skill-building of the service sector through training and certification: With major portion of refrigeration, air conditioning and heat pumping (RACHP) service technicians working in the informal sector, there is a need to bring the service technicians into the formal sector through training and certification programme. MoEF&CC should work together with other concerned ministries for up-skilling and certification of RACHP service technicians under Pradhan Mantri Kaushal Vikas Yojana. The ICAP takes cognizance of the training and skilling activities offered by the industry and government skilling activities should be in tandem with them – registering industry training centres under the National Skills Qualification Framework (NSQF) and drawing linkages with MSME-DIs are some recommended ways forward.



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F Ensure harmonization of policies: ICAP builds on the efforts of HCFC Phase-out Management Plan. There should be synergy between the existing plans to phase-out HCFCs and the new plans to phase-down the use of high GWP HFCs. ICAP is starting the new planning process to do an assessment of the timing of HCFC phase-out initiatives to ensure that costs are minimised and that the environmental benefits of both policies are maximised. Furthermore, the ICAP recommendations bring in synergies with on-going government programmes and schemes in order to maximize the social and economic co-benefits.



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G Create an ecosystem for promoting robust and collaborative R&D: A robust, comprehensive and R&D innovation ecosystem will be critically important for effectively addressing India's cooling requirement. In this context, the role of public-private-partnerships will become important.



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Implementation Framework

The ICAP serves to underscore the urgency of proactively and collaboratively addressing India's projected cooling growth and lays out sector-wide priorities and pathways for interventions. Given the crosscutting nature of cooling demand, the ICAP implementation will be best served by active collaboration among the relevant ministries as well as the private sector entities. Secondly, integration with on-going programs and initiatives will be key for achieving optimal benefits. Figure E provides a snap shot of multiple inter-linkages of cooling between different Government ministries/Departments/organizations along with the on-going programmes and initiatives, which intersect with the cooling agenda.



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The India Cooling Action Plan can be downloaded from a link on the home page of the Ozone Cell of the Indian Ministry of Environment Forests & Climate Change MoEFCC

ozonecell.com



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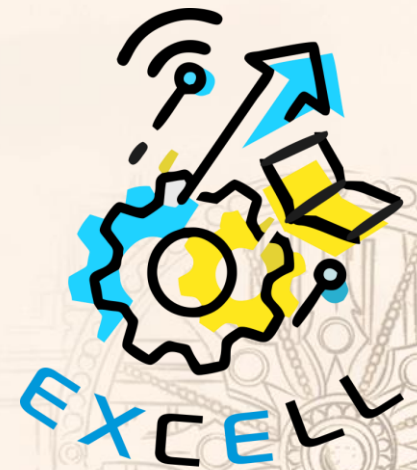
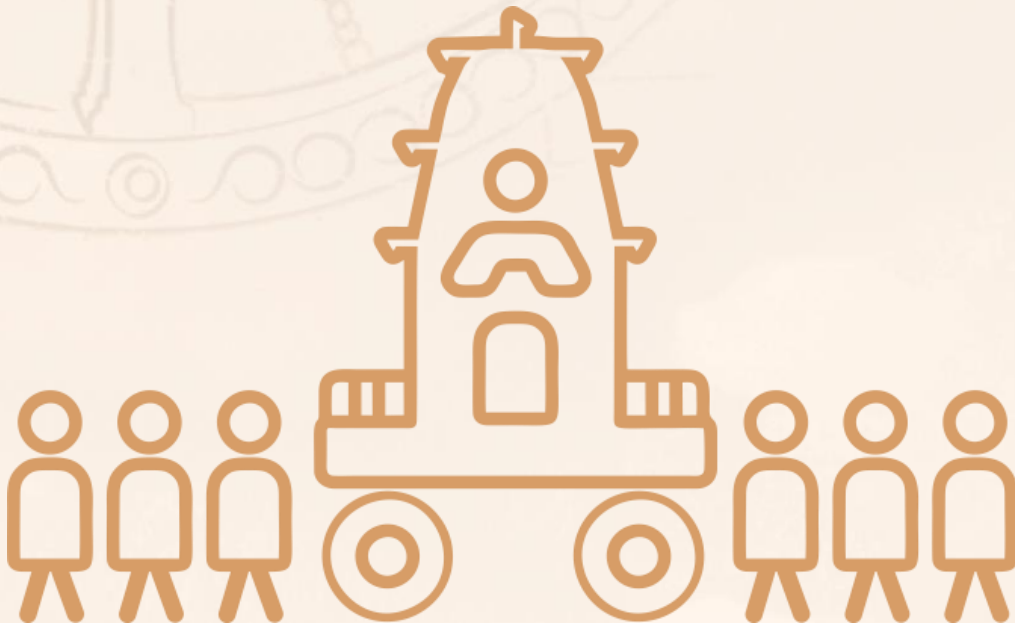


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**ISHRAE is like a large Chariot
With 1000s of Volunteers
committed to EXCELL**



THEME OF THE YEAR 2019-20



**ISHRAE is committed to work for the
success of
The India Cooling Action Plan**

