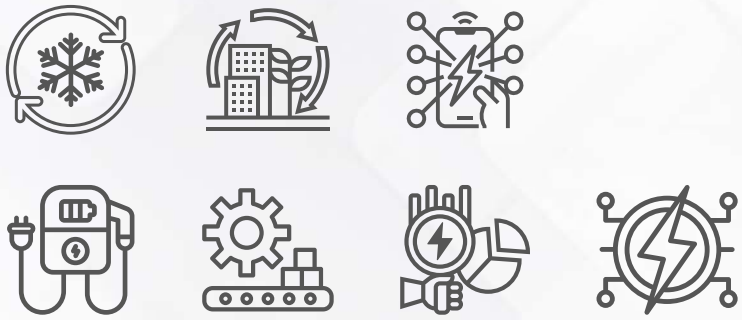
Alliance for an Energy Efficient Economy

Year
2022-2023

Annual REPORT



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Looking Ahead with AEEE

It is my privilege and pleasure to present the 2022-23 Annual Report of the Alliance for an Energy Efficient Economy (AEEE), a testament to our unwavering commitment towards a sustainable and energy-efficient future.

As global efforts towards decarbonisation intensify, energy efficiency emerges as a crucial key for our country's just and secure energy future. In alignment with over 90 countries, India has embraced a net-zero goal, emphasising equitable, accessible, and sustainable energy solutions as pivotal for long-term climate resilience.

In 2022, India revised its Nationally Determined Contributions (NDC) goals, and aimed to curtail emissions intensity by 45 per cent before 2030, based on 2005 levels. The consequential 'Lifestyle for Environment (LIFE)' movement, initiated by the Prime Minister, underscores the integration of sustainable lifestyles and climate justice for vulnerable populations, permeating every facet of our nation's growth and progress. AEEE is an active catalyst in this transition, championing energy efficiency as the linchpin of a clean, affordable, and smart energy source.

AEEE's proactive approach revolves around the triple-sector framework, uniting Government, Industry, and Civil Society to drive policy, standard, and market transformations crucial for India's net-zero target. Collaborating closely with the key players, AEEE has become a hub for sharing technical insights and fostering dialogues across stakeholders.

In FY 2022-23, AEEE forged strategic Memorandums of Understanding with the governments of Uttar Pradesh and Maharashtra. These partnerships were instrumental in directing efforts towards impactful subnational initiatives. We also solidified our role as a key knowledge partner to the Bureau of Energy Efficiency (BEE), towards the Energy Transition Working Group (ETWG) under India's G20 presidency. This collaboration demonstrated AEEE's pivotal role in contributing expertise and insights to shape forward-looking energy strategies. AEEE's comprehensive efforts in compiling the State Energy Efficiency Index for the year 2021-22 showcased its dedication to benchmarking and enhancing energy efficiency across states. Furthermore, AEEE extended its influence by actively shaping the landscape of sustainable cooling through its work on District Cooling Guidelines.

The year proved transformative for AEEE, as it continued to catalyse impactful collaborations, provide invaluable knowledge, set benchmarks, and provide solutions for energy efficiency, low-carbon and sustainable practices.

Our remarkable team and our partners, members, and donors continue to fuel our progress. Their unwavering dedication to a just energy transition inspires us daily, and we extend our heartfelt gratitude for their steadfast support.

This report showcases our collective strides in shaping a greener tomorrow. Together, we're poised to usher in a future where energy efficiency isn't just a choice but a way of life.

Chirag Baijal

Chairperson (August 2021-August 2023)

Looking Ahead with AEEE

In the face of relentless global challenges, India stands at the forefront of energy transition and climate change. As discussed in "Path to Developed and Decarbonized India", we at Schneider Electric recognise that India's rapid growth and development would be built with technologies from the 21st century and would pass through the route of decarbonisation. More importantly, India's sustainable development model can become a "template" for other emerging economies.

At the Alliance for an Energy Efficient Economy (AEEE), we have been working with government, peer organisations, and members of civil society to ensure that commitments are made to reach net-zero emissions. India has along with various other countries shared net zero targets.

Further, we recognize that equitable, accessible, and sustainable energy solutions for all in India are critical to building climate resilience in the long term.

Working with the government on various programs, AEEE has successfully created the space to share technical expertise while also encouraging dialogue amongst different stakeholders on providing cost-effective, low-carbon energy designs, technologies, and solutions while complementing them with energy-efficient policies. Going forward we aim to strengthen and embolden this.

When it comes to a fast developing and tropical country like India, sustainable cooling solutions are of utmost priority. Hence, we see this subject also finding a strong voice in the upcoming COP28 in UAE later this year. We, at AEEE, work on efficient and sustainable cooling solutions for countries experiencing high temperatures and requiring air conditioning. Going forward this requirement is going to be even more cross-sectoral and an essential part of economic development, especially for countries like ours. As cooling demands are set to rise in the near future, AEEE's research on this topic will come in immensely useful.

Similarly, it is now imperative to note that access to cooling for attaining thermal comfort is no longer a luxury, rather a necessity for enhancing the overall quality of life, productivity, and well-being. In this space too, AEEE has done compelling work by mainstreaming super-energy efficient, affordable and sustainable space cooling solutions in India's academic institutions to bring in systemic changes and ensure Thermal Comfort for a Billion Lives (TCBL). In the coming year, AEEE also hopes to play a vital role in sub-national action plans in various fields.

I hope we continue our efforts and endeavour shoulder-to-shoulder to strengthen a more energy-efficient and decarbonised future for India.

Venkat Garimella

Vice Chair (August 2021-August 2023)
Chairperson (August 2023 onwards)

Message from the President and Executive Director

In the transformative year of 2022-23, the Alliance for an Energy Efficient Economy (AEEE) not only scaled its vision and operations but also solidified its position at the forefront of India's energy revolution. As we evolved to meet the dynamic demands of the energy ecosystem, our commitment to Sustainable Development Goal 7 and India's Nationally Determined Contribution became ever more evident, championing the cause of affordable and clean energy.

Our focus this year was two-fold. First, we aimed to establish energy efficiency as the 'first fuel'. To this end, we have created a framework to track energy savings, monitor the inflow of finance promoting energy efficiency, and will be keeping a pulse on the green job landscape. Our data-driven approach serves as the backbone of our efforts, helping us inch closer to our goal.

The relentless heatwaves that gripped India became a poignant reminder of the importance of sustainable cooling solutions. We responded with fervor, initiating advanced cooling technologies and propelling the District Cooling and Cooling as a Service (CaaS) models. But we didn't stop there. The agrarian heart of India beckoned, and AEEE delved into developing energy-efficient cold-chain solutions for our rural landscapes. This initiative is aligned with the nation's drive to fortify food security and uplift farmer incomes.

A key highlight of the year was India's G20 presidency. While AEEE actively supported the meetings of the Energy Transitions Working Group, our influence extended further. Collaborating closely with the Ministry of Power (MoP) and the Bureau of Energy Efficiency (BEE), we are playing an instrumental role in crafting the Strategic Plan for Advancing Energy Efficiency Across Demand Sectors by 2030. This joint endeavor with SEForAll and International Energy Agency, under the guidance of the Bureau of Energy Efficiency, showcases our integrative approach and emphasises the importance of cross-sectoral partnerships in achieving India's energy goals.

In the realm of innovation, the Solar Decathlon India (SDI) program became a beacon of hope, challenging students to envision a future with net-zero building solutions. Furthermore, our partnership with Symphony Ltd. to launch the SAHARA programme underscored our dedication to melding sustainable cooling solutions into the academic arena, targeting systemic change and ensuring thermal comfort for every Indian citizen now and in future.

As we reflect on the year, our heart swells with gratitude for our members, partners, and all supporters who've walked this journey with us. Together, we're not only envisioning an energy-efficient India but are laying down the very bricks to build it.

Dr Satish Kumar

President and Executive Director, Alliance for an Energy Efficient Economy

About Us

Who We Are

Alliance for an Energy Efficient Economy (AEEE) supports policy implementation and enables the energy efficiency market with a not-for-profit motive. AEEE promotes energy efficiency as a resource and collaborates with industry and government to transform the market for energy-efficient products and services, thereby contributing toward meeting India's goals on energy security, clean energy, and climate change. AEEE collaborates with diverse stakeholders such as policymakers, government officials, businesses and industries, consumers, researchers, and civil society organisations. We believe that our work speaks for itself and we hold Respect, Integrity, Synergy and Excellence as central to our efforts.

Our Vision

To be a leader in the responsible use of energy to transition to a climate-resilient, energy-secure future.

Our Mission

Foster a culture of energy efficiency in India

Enable energy transition in collaboration and cooperation with the government, industry and civil society organisations

SDG Linkages

Contributing to 12 of the 17 SDGs

Accelerate impact as an ecosystem enabler through research, thought leadership and implementation to meet India's 2030 Nationally Determined Contribution (NDCs) and the United Nations' Sustainable Development Goals (SDGs)

Our Core Values

Our values are rooted in principles of human rights and equity, inspired by the vision of a sustainable, energy-efficient future.

Impact and Research Landscape

Our Focus Areas

Sectoral Focus Areas

Sustainable Cooling & Refrigeration

Facilitate thermal comfort, well-being, and food security for India, while creating a low carbon and resilient infrastructure.

Sustainable Cold-chain

Promote sustainable cold-chain development for reducing food loss, ensuring food security and farmers welfare.

Space Cooling

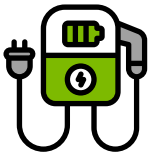
Strive towards India's thermal comfort needs by promoting innovation, deployment and market adoption of advanced and energy efficient space cooling technologies.

Low Carbon Built Environment

Enable pathways toward India's net zero commitment through climate resilient and energy efficient built environment in buildings and communities.

Smart & Resilient Power Distribution

Smart management of electricity consumption with demand as a resource for grid decarbonisation.



eMobility

Support decarbonisation of the transport sector and facilitate just transition.

Low Carbon Technologies & Solutions

Enable the market and promote the use of low carbon technologies and business models for Industries.

Cross-Sectoral Focus Areas

Data Analytics & Modelling

Advanced end-use energy data analytics and visualisation to enable the design, implementation, and monitoring of energy efficiency interventions.

State & Local Action

Support sub-national government and local bodies to expand and accelerate energy efficiency actions through effective policy implementation, stakeholder collaboration, and institutional strengthening.

Linking Food-Energy-Climate Change Nexus with Farmer's Livelihood

AEEE recognises the vital role of a well-crafted cold-chain action plan in enhancing farmer's economic well-being. By focusing on low to passive energy and renewable powered solutions, we aim to optimise energy usage and reduce operational costs for smallholder farmers. These solutions are designed to incorporate localised and shared cooling services for short-term preservation of produce, facilitating market linkages, and creating opportunities for farmers to upskill in good agricultural and post-harvest management practices. This integrated approach involves streamlining the supply chain, implementing efficient refrigeration technologies, and minimising wastage at every stage.

AEEE adopts a circular and a value-chain approach by combining government schemes with private investments and CSR initiatives to establish viable business models and bridges financial gaps. We strive to provide opportunities to expand and sustain a market for low-cost, low-energy, and climate-friendly refrigeration technologies in rural and off-grid communities.

AEEE seeks to ensure the widespread adoption of sustainable cold-chain solutions and encourages the replication of successful cold-chain models, enabling more farmers to access and benefit from these solutions. Rigorous evaluation of the deployed solution is also carried out to assure its effectiveness.

We strive towards this vision by a dedicated focus on the following areas:

- **Integrating Energy Efficiency in Cold-chain Policy Framework:** AEEE works with key government bodies and schemes such as Ministry of Agriculture and Farmer's Welfare; Ministry of Food Processing Industries; National Horticulture Board (NHB); Mission for Integrated Development of Horticulture (MIDH), etc., with an aim to incorporate energy efficiency aspects into the current policy framework for cold-chain development. This involves developing guidelines and standards, as well as mapping existing cold-chain initiatives and schemes to identify gaps.
- **Promoting Clean Energy Solutions:** AEEE is committed to understanding sector needs and identifying low-climate impact, smart and affordable technologies through a tailored combination of renewable and energy efficient solutions. We implement these solutions through lighthouse projects, agri-hubs at the village/Taluka level, and retrofitting of cold storages.
- **Innovative Business Models for Scaling Up:** To ensure widespread adoption of cold-chain solutions, AEEE continuously explores innovative business models that provide market access to small-scale farmers. Through active collaboration with Farmer Producer Organizations (FPOs), we bolster and optimize the foundational backend connectivity. We also develop strategies for scaling up and replication so as to expand the impact of sustainable cold-chain technologies.
- **Creating Awareness and Training:** AEEE understands the critical role of awareness and training in cold-chain development. The organization aims to educate farmers, infrastructure owners, and government officials about the importance of cold-chain operations, maintenance, and technological advancements.

Our Goal

To develop sustainable, climate-friendly and tailored cold-chain in India for reducing food loss, ensuring food security and augmenting farmer's welfare.

Our Levers

Mapping and integrating energy efficiency in cold chain policies

Evidence based and tailored solutions

Business expansion and multiplication models

Awareness and skill development

SDG linkages

AEEE's collaboration with government, industry, and research bodies in various Indian states, such as Andhra Pradesh, Haryana, Bihar, Gujarat, Karnataka, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, and West Bengal, has been instrumental in advancing cold-chain development.

Key Projects and Activities

Improving Rural Livelihoods Through Energy-Efficient Cooling & Refrigeration in India: Implemented with support from the Good Energies Foundation (GEF), the project serves as a dynamic catalyst aimed at curtailing food loss by propelling the advancement and implementation of efficient cost-effective and low-energy cold-chain infrastructure. The project's core objectives revolve around the integration of energy-efficient cooling and refrigeration solutions/technology in off-grid and weak-grid rural communities, seeking to mitigate food loss through the widespread adoption of agricultural applications, including pre-cooling, staging cold rooms, and cold storage. It also focuses on establishing cold storage amenities within rural health centers, and cultivate supplementary income avenues for productive rural enterprises.

AEEE is gearing up for more such deployments in Bihar in the next year.

To witness the impact first-hand, view the video here

Scaling-up Investment in Clean and Efficient Cold-chain in India: To support the ICAP implementation, the United Nations Environment Programme (UNEP), in collaboration with AEEE, has developed a cold-chain support programme in India to accelerate the development of sustainable and integrated cold-chain. This programme addresses critical gaps in the cold-chain sector, help achieve India's target of doubling farmers' income, reduce greenhouse gas emissions and support the Sustainable Development Goals. The programme is being delivered under the framework of the Cool Coalition with support from the Government of Denmark, under the India-Denmark Green Strategic Partnership and the Clean Cooling Collaborative over the period of 2021-2025. It supports the national government and selected states (Bihar & Haryana) to mainstream efficient, renewable, climate-friendly cold-chain infrastructure.

Development of Standards and Labelling (S&L) Program for Walk-in Cold Rooms in India: The Bureau of Energy Efficiency (BEE), has already launched the S&L program for several cooling and refrigeration appliances, such as refrigerators, room air conditioners, ceiling fans, and chillers. BEE has been looking to explore the next set of policy opportunities for driving energy efficiency in the cold-chain sector and supporting ICAP implementation. In this context, AEEE and CLASP initiated a comprehensive market and technical assessment study to develop a Standards and Labelling (S&L) program for walk-in cold rooms in India.

Facilitating Sustainable Cold-chain Development in Uttar Pradesh: AEEE in collaboration with the Department of Environment, Forest and Climate Change (Uttar Pradesh), initiated a programme on India's subnational climate action in Uttar Pradesh. The programme aims to facilitate the development of low-carbon, energy-efficient development through sectoral interventions in buildings, industries and cold-chain. The focus under the cold chain area will be to develop a state cold-chain action plan, demonstrate energy-efficient cooling solutions, and conduct awareness and capacity-building programs.

Just, Clean and Smart Energy Transition

The role of demand side interventions in the energy transition has emerged as a critical factor for smart and sustainable energy management. India's energy sector is witnessing exponential growth in demand, necessitating a re-evaluation of traditional approaches to demand-supply management. Decarbonisation and effective management of consumption side is highly significant for a clean energy transition. Technological breakthroughs in energy storage solutions are also crucial for enhancing the reliability and scalability of renewable energy sources. Equally necessary, is to ensure inclusivity in all of these efforts and a multi-pronged approach that involves all stakeholder. Together, these efforts will reduce the pressure and dependency on conventional fossil fuel power plants and pave the way for a more dynamic, sustainable and resilient grid system.

AEEE actively work towards redefining the role of demand side interventions in the energy transition and facilitates resilient and smart energy management through following focus areas:

Smart and Resilient Power Distribution: AEEE promotes market enablement for demand flexibility and seeks to optimize electricity consumption in response to varying supply and demand conditions. We support utility-driven demand-side management programs that empower consumers to actively participate in demand response initiatives, and foster smart energy consumption patterns. We work with electricity distribution companies (DISCOMs) towards novel smart grid technologies and solutions that further enable customers to optimize their energy usage, reducing carbon emissions while ensuring a resilient power distribution network.

Innovation in Low-Carbon Transport: AEEE drives innovation in low-carbon transport technologies, actively supporting research and development in the transport sector. By promoting efficient electric vehicles (EVs) over traditional internal combustion engine (ICE) vehicles, we accelerate the transition, reducing the transport sector's carbon footprint. Additionally, we actively foster market transformation for EVs and deployment of smart charging strategies and solutions to optimize EV charging and minimize strain on the grid.

All-inclusive Mobility Planning and Partnerships: To ensure a just transition towards smart mobility, AEEE fosters all-inclusive mobility planning and decision-making processes. With this approach, we seek to address the needs of all segments of society and provide equitable access to clean transportation options. Collaborative partnerships between government, private sector, and civil society are forged to drive sustainable transportation initiatives. AEEE is dedicated to redefining the energy transition pathway, fostering inclusivity and advancing resilient and efficient energy management. Through incisive research and knowledge sharing, we strive to bridge critical knowledge gaps and foster regulatory reforms. We make concerted efforts to bring all stakeholders on board for a greener and a smarter energy future for the country.

Our Goal

To facilitate a just and clean energy transition by promoting smart energy management and establishing demand as a valuable resource in grid decarbonization

Our Levers

Market enablement for demand flexibility

Utility-driven demand side management

Low-carbon transport

Inclusive mobility solutions

SDG linkages

Key Projects and Activities

Customer Engagement—A tool for Utility driven Demand Side Management: In the current landscape, two critical developments have emerged as game-changers in the energy sector: the pressing need to decarbonise the power industry and the shift towards a transactive model. This creates a push for utilities to actively involve customers in their decarbonisation efforts. This report developed in collaboration with Oracle Energy and Water delves into the essential context surrounding the significance of customer engagement for utilities today. It emphasizes that engaging and empowering customers can serve as a potent tool for promoting energy efficiency by fostering positive changes in their behavior. This, in turn, leads to substantial energy savings and a noticeable reduction in peak demand.

Roadmap for Demand Flexibility in India: The application of demand response, a proven demand management tool, can effectively help DISCOMs in India handle their increasing future electricity demand and operate reliably in a greener grid. This paper developed in collaboration with Oracle Energy and Water discusses demand response value proposition for the distribution grid and the steps to unlocking this value.

Market Transformation of for e-2 and e-3 Wheelers in India: This collaborative work between AEEE and International Copper Association (ICA) India aims to foster market transformation for e-2 Wheelers (e-2W) and e-3 Wheelers (e-3W) in India. This project undertakes dedicated research and support to tackle the key socio-economic barriers to e-2W and e-3W adoption. To ensure a robust domestic manufacturing industry this initiative focus on strengthening the supply side. Assessment of supply chain and technologies for critical auto components including batteries and motors is an important action point. As part of the project, review of the existing schemes from central and state governments are being carried out and key recommendations for strengthening plans and strategies are being collated.

Towards Climate-responsive and Low Carbon Development: Transitioning to Green Mobility in Public Bus Space – A Case Study of Uttarakhand State: Electrification of the bus fleet in Uttarakhand is critical for the decarbonisation of transport in the state. This study addresses the transport-related emission in the state of Uttarakhand by facilitating the rollout of electric public buses on identified intra-city or inter-city routes which are currently catered by ICE run buses. A white paper was developed with technical support from the International Association of Public Transport (UITP) as part of this project supported by the National Mission on Himalayan Studies (NMHS), focussing on electric bus planning and deployment strategy, along with capacity building workshops and training for stakeholders

Electrification of Fleet Transport in the Himalayas—Focus on North East India: The project focuses on the potential electrification of commercial and public transport fleets in the North Eastern states of India. It considers various factors, including the policy ecosystem, ensuring an inclusive transition that involves women and differently abled individuals, promoting tourism, and streamlining vehicle registrations. AEEE collaborates closely with local authorities and partners in the region to drive this initiative. The initial phase of the project is concentrated in Assam and Meghalaya and receives support from the Government of Meghalaya, as well as local assistance from Barefoot Trust. In the subsequent phase, AEEE plans to expand its involvement to other North Eastern states, fostering even stronger collaboration with local stakeholders.

Empowering India's States and Union Territories to Lead Local Climate Action

In the pursuit of achieving India's ambitious Nationally Determined Contributions (NDCs) on climate change, the significance of state and Union Territory (UT) level action cannot be overstated. It is imperative for each region to take charge of their climate initiatives and emerge as leaders in implementing these actions at the local level. Notably, energy efficiency plays a pivotal role in India's mission to reduce the emissions intensity of its GDP by 45 percent between 2005 and 2030. Hence, the incorporation of energy efficiency measures into sustainable development policies at the state and UT level becomes a strategic necessity.

AEEE is committed to empowering states with the institutional capacity to leverage data in identifying and monitoring energy efficiency interventions. The State Energy Efficiency Index, a valuable tool that aids states in fostering and strengthening their energy efficiency efforts is an initiative of the Bureau of Energy efficiency developed with technical support from AEEE. Our primary objective is to promote energy efficiency as an integral component of each state's development policy, aligning it with environmental, economic, and livelihood goals that correspond to the state's socio-economic priorities. Additionally, we act as facilitators, supporting states in formulating energy efficiency policies and providing a convening platform for collaboration between State Designated Agencies and industry stakeholders.

The following areas represent the core focus of our efforts in driving state and local action towards energy efficiency:

- **Integrating Energy Efficiency in State Sustainable Development Plans:** AEEE supports seamless integration of energy efficiency initiatives into the state's sustainable development plans, ensure that energy efficiency is recognised as a smart and the first choice for all and becomes a cornerstone of the region's growth trajectory.
- **Developing a Robust State-Level Ecosystem for Energy Efficiency:** AEEE actively works towards creating a dynamic market for energy-efficient products and services at the state level. This involves engaging various stakeholders to foster innovation, increase availability, improve the affordability of energy-efficient technologies and awareness on energy efficiency as the first fuel.

Our Goal

To empower and support states and union territories in India to become frontrunners in energy efficiency and climate action.

Our Levers

State-level policy formulation and integration

Capacity building and knowledge sharing

Market development and collaboration

Facilitate financing

SDG linkages

- **Strengthening Sub-national Capacity for Energy Efficiency Adoption:** Recognizing the unique challenges and opportunities that each state or UT presents, AEEE is dedicated to enhancing local capacity in adopting energy efficiency practices. This involves targeted training, workshops, and knowledge sharing to empower local entities in their energy efficiency initiatives.
- **Facilitating public and private financing for energy efficiency:** Access to finance is crucial for scaling up energy efficiency projects. AEEE plays a critical role in enabling both public and private sector financing mechanisms, making it easier for states to invest in and implement energy-efficient solutions.

In FY 2022-23, AEEE made significant strides in empowering the state of Uttar Pradesh and initiated steps towards similar efforts in Maharashtra.

Key Projects and Activities

State Energy Efficiency Index: The State Energy Efficiency Index (SEEI) is an annual index developed by the Bureau of Energy Efficiency (BEE) with technical support of AEEE. The index tracks and measures progress in energy efficiency policies and regulations, institutional capacities, financial investments, programmes, resultant savings and provides insights for improved adoption and implementation at the state and Union Territory (UT) level.

SEEI was initiated in 2018 and the fourth edition was developed for 2021-22 which comprised of an updated framework to include 50 quantitative, qualitative and outcome-based indicators across 7 sectors namely Buildings, Industry, Municipalities, Transport, Agriculture, DISCOMs, and Cross-sector. Programme-specific indicators were included this year to track outcomes and impacts of state-level energy efficiency initiatives.

In SEEI 2021-22, 5 states - Andhra Pradesh, Karnataka, Kerala, Rajasthan and Telangana, are in the Front Runner category (>60 points) while 4 states - Assam, Haryana, Maharashtra, and Punjab, are in the Achiever category (50-60 points). Further, Karnataka, Andhra Pradesh, Assam and Chandigarh are the top-performing states in their respective state groups. Telangana and Andhra Pradesh showed the most improvement since the last index.

The SEEI 2021-22 outlines the following recommendations to help states drive change in EE which will contribute towards the fulfilment of Sustainable Development Goals (SDGs) and NDCs:

- Enabling fiscal assistance for energy efficiency in the focus sectors
- Developing institutional capacity in states and Union Territories (UTs) to address emerging needs and challenges in energy efficiency implementation
- Enhancing cross-functional collaborations across financial institutions, energy service companies, and energy professionals in large-scale energy efficiency implementation in states
- Mainstreaming energy data reporting and monitoring across sectors

Ensuring robust stakeholder support was a pivotal aspect. A series of orientation webinars for SEEI 2021-22 were strategically designed to acquaint State Designated Agencies (SDAs) and other State departments with the indicator framework. These sessions not only clarified doubts but also showcased the data collection portal in action. The webinars offered a comprehensive understanding of indicators and the data gathering process. With the active participation of diverse stakeholders such as State Electricity Regulatory Commission (SERC), Urban Development Department including the local bodies, Transport, DISCOMs, Industry, Micro, Small & Medium Enterprises (MSME), and Agriculture, the aim was to foster inclusive engagement and enhance the accuracy of data submissions by the States.

State Energy Efficiency Mission: AEEE signed an MoU with the Department of Environment, Forest and Climate Change (DoEFCC), Uttar Pradesh, to develop a multi-year State Energy Efficiency Mission (SEEM) for energy savings and emissions reduction to contribute towards the NDC goals of India. The primary objective is to translate existing energy efficiency plans into actionable programs with a strong focus on practical implementation, consistent monitoring, and long-term progress tracking.

As part of this collaborative effort, AEEE is working with Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA) to strengthen existing approaches and introduce pertinent policy options, programs and best practices for energy efficiency acceleration across different demand sectors. AEEE supports UPNEDA in the adoption of programmes and help mobilize financing for energy efficiency and energy conservation initiatives in the state.

Empowering Sustainable Cooling for a Billion Lives

AEEE continues its relentless pursuit of a sustainable future through pioneering efforts in the realm of cooling solutions and technologies. One of our core work focus revolves around Sustainable Cooling, with an ambitious goal - to bring cooling justice to a billion lives. We ardently champion the cause by fostering innovation, facilitating deployment, and driving market adoption of cutting-edge and smart space cooling technologies and solutions. As the lead partners of the Ministry of Environment, Forest and Climate Change (MoEFCC), we played a pivotal role in developing the India Cooling Action Plan (ICAP) and are currently driving its implementation. Through ICAP, we address critical issues such as heat stress, productivity and health improvement, and the adoption of super energy-efficient appliances and technologies. Our work harmonizes seamlessly with the heat-stressed Indian context, and we realise our goal of facilitating India's thermal comfort needs through the following focus areas:

- **Facilitate Policy Development and Technological Standards:** AEEE is at the forefront of formulating pioneering policies, guidelines, and standards for emerging cooling technologies and appliances. By aligning our work with the India Cooling Action Plan (ICAP) recommendations, we actively contribute to the establishment of a robust regulatory framework that facilitates the integration of energy-efficient cooling solutions into the Indian landscape.
- **Catalysing State-Level Cooling Initiatives:** Through collaborative partnerships with State entities, we are driving the adoption and adaptation of ICAP. Our engagement with state-level cooling programs extends ICAP's reach, ensuring its effective implementation and impact across diverse regions.
- **Deploying Advanced Cooling Solutions:** Our commitment to innovation translates into on-ground action as we facilitate the deployment of novel and advanced cooling solutions. By promoting for the adoption of super energy-efficient appliances and technologies, we address pressing concerns like heat stress, productivity enhancement, and health improvements. AEEE adopts a lean-mean green approach that extends to large scale solutions for thermal comfort. We are pioneering the research and implementation mechanisms for District Cooling Systems that promote efficient cooling on a district level.
- **Inspiring Behavioural Transformation:** Change begins at home. Through our initiatives, we're igniting a behavioural shift towards embracing energy-efficient practices. By instilling a culture of responsible and smart consumption, we strive to bring green, smart and affordable cooling for all.
- **Market Transformation and Stakeholder Engagement:** AEEE brings together key stakeholders from the cooling sector to foster market enablement of sustainable cooling solutions and technologies; promote cooling as a critical focus area; and amplify the voice for sustainable cooling and thermal comfort for all. We promote cooling as a service business model, revolutionizing the way clients access new-age and smart cooling technologies. This forward-thinking business model eliminates the requirement for an initial upfront investment, allowing clients to enjoy the advantages of advanced cooling solutions.

Our Goal

Facilitate India's thermal comfort needs by driving innovation, widespread adoption, and market penetration of cutting-edge and energy-efficient space cooling technologies.

Our Levers

Policy development and technological standards

Regional cooling initiatives

Advanced cooling solutions – research and deployment

Behavioural transformation

Market transformation and stakeholder engagement

SDG linkages

Key Projects and Activities

Energy Efficient Cooling (EE-Cool): The Energy Efficient Cooling (EE-Cool) project is a bilateral project being carried out by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Affairs and Climate Action (BMWK) and the Bureau of Energy Efficiency, India. The project supports the BEE and the Ozone Cell, MoEF&CC in the implementation of the ICAP with regard to energy-efficient district cooling systems. AEEE supports the project as the PMU for all the major research and knowledge outputs. The project focus on removing the identified barriers and developing techno-economic viable solutions and innovative business models to implement the DC system in India successfully.


Aerial view of District Cooling Plant, GIFT City, Gujarat

As part of this project, AEEE has been working on drafting the District Cooling (DC) Guidelines. The instructive guidebook will offer essential guidance for the implementation of district cooling systems and present a roadmap to facilitate their widespread adoption in India.

Passive and Low-energy Cooling Strategies for Achieving Thermal Comfort in India's Upcoming Affordable Housing: The study developed for Ministry of Environment, Forest, and Climate Change (MoEF&CC), provides a fundamentally prescriptive set of recommendations in line with a national standard or code like the Eco Niwas Samhita (ENS) for affordable housing. Recommendations were provided based on expert stakeholder consultations, with architects and developers for affordable housing projects across India can adopt these.

Supporting Affordable Heat Action for Resilient Academic Institutions (SAHARA): The SAHARA program builds upon AEEE's previous research, 'Decoding Evaporative Air Coolers', highlighting the absence of thermal comfort infrastructure and sustainable cooling technologies in Indian academic institutions. Building on the narrative, AEEE launched the SAHARA program to mainstream super energy-efficient and sustainable cooling solutions in Indian educational institutions, bringing about a systemic shift in perceptions and awareness whilst prioritising enhanced thermal comfort for a billion lives, underscoring the transformative role schools can play in this ambitious endeavour.

In 2022, the SAHARA Symphony project was launched in partnership with Symphony Ltd. under the SAHARA program. A whitepaper has been drafted under the project to present a case for prioritising the thermal comfort needs of students in the Indian educational landscape. The analysis has been strengthened by mapping the on-ground reality of thermal comfort in selected academic institutions in Uttar Pradesh and Rajasthan via survey findings. A pilot demonstration of sustainable cooling solutions (such as Evaporative air coolers) at selected schools has also been facilitated by AEEE with support from Symphony Ltd. in these states to improve classroom thermal comfort.

Lastly, strategic recommendations have been proposed based on the analysis of the present-day institutional and regulatory landscape to inform the future thermal comfort discourse in academic institutions. The whitepaper is proposed to be published in the coming year, along with a set of upcoming pilot demonstrations of energy-efficient fans in selected schools of Uttar Pradesh.

India Cooling Coalition: India Cooling Coalition (ICC) is a growing multi-stakeholder group of organizations led by representation from non-profits, academic and research institutions, and industry associations engaged extensively in sustainable cooling research and application. 22 organizations are members of this coalition at present. The Coalition aims to fast-track the implementation of India Cooling Action Plan (ICAP) to ensure thermal comfort, health, and food security for all through knowledge exchange and policy interventions.

As the Secretariat for the Indian Cooling Coalition, Alliance for an Energy Efficient Economy (AEEE) along with the Coalition members, catalyses the movement to achieve the Coalition's vision and work to successfully support the implementation of the ICAP.

Scan QR code to know more

Low-carbon, Smart and Climate-resilient Built Environment

India's building sector is undergoing remarkable growth, with an anticipated addition of 35 billion square meters of new floor area by 2050. However, this rapid expansion poses significant challenges, as current building practices struggle to cope with rising temperatures, leading to heightened energy consumption, increased cooling demand, and a subsequent surge in carbon emissions. Recognizing the urgency to address these issues, AEEE is on a mission to propel India towards a net-zero, climate-resilient, and energy-efficient built environment.

Our primary focus is on reducing the carbon footprint of buildings through the promotion and stringent enforcement of energy-efficient building practices and energy code compliance across diverse regions and building types. Working in close collaboration with policymakers, industries, and other stakeholders, AEEE acts as a crucial data-driven policy enabler, supporting the implementation of energy conservation building codes such as the Energy Conservation Building Code (ECBC) and the Eco Niwas Samhita (ENS). Our comprehensive data analytics and benchmarking for different building types feeds into future frameworks and building codes, ensuring significant impact on transition to net-zero.

AEEE actively empowers and creates opportunities for building industry professionals to foster smart and sustainable building practices. Collaborating with manufacturers, vendors, and suppliers in the materials supply chain, we strive to enhance material and energy efficiency in the built environment, and drive appropriate market transformation, for the same.

A core commitment of AEEE is ensuring thermal comfort for all, with a particular focus on vulnerable communities. By integrating considerations of thermal comfort and energy efficiency into policy frameworks, we have been contributing to improve the quality of life for individuals residing in marginalized and overlooked areas. Developing replicable tools and region-specific strategies, AEEE empowers communities to construct climate-resilient homes with a lean-mean-green approach and revolutionize building and construction practices.

AEEE's efforts are channelled into five key areas, each essential for achieving this goal:

Our Goal

To ensure climate-resilient, efficient and sustainable built environment in India: Footsteps towards our net zero commitment by 2070

Our Levers

New frameworks and implementation of codes, standards, policies

Smart and low-energy/passive building solutions

Building-wide carbon management

Collaborations, business models, and financing

Energy data analytics and benchmarking

SDG linkages

- **New Frameworks and Implementation of Codes, Standards, Policies:** AEEE works diligently to facilitate the widespread adoption of national and state building energy codes and standards. We also contribute in formulation of new building codes and mechanisms for their effective compliance.
- **Smart, and Low-energy/Passive Solutions and Techniques:** We enhance the energy efficiency of both new and existing buildings, including affordability and access to new technologies and solutions. We actively enable the stakeholders to promote smart choices and practices amongst its end-users by generating awareness and fostering behavioural shift towards energy consumption.
- **Embodied and Operational Carbon Management:** We place emphasis on managing both embodied carbon and operational carbon through comprehensive assessments of building construction materials, and technologies, identifying sustainable alternatives and material and innovative construction design and practices, AEEE aims to reduce the overall carbon impact of buildings throughout their lifecycle. We also engage in industry collaborations and associations in this process and creating prototypes and pilot testing of alternate materials and technologies.

- **Collaborations, Business Models, and Financing:** Partnering with various stakeholders through the triple-sector leadership model, we explore a 360-degree view of the building and construction industry and work towards innovative business models and financing options to accelerate the transition to a smart and sustainable built environment.
- **Energy Data Analytics and Benchmarking:** AEEE works on advance end-use energy data analytics, to design and implement energy efficiency interventions in the built environment, thereby guiding the steps and pathway for the building industry transition to net-zero.

Key Projects and Activities

A Policy Strategy for Decarbonising the Building Sector: The project focuses on developing an online platform for building professionals to enable the adoption of Eco Niwas Samhita in design and achieve compliance through execution. It Intends to handhold building professionals throughout the building design, approval, construction and compliance processes. Developed in partnership with the Global Buildings Performance Network (GBPN), this initiative centres on formulating a comprehensive ENS implementation framework, construction of a user-friendly web platform dedicated to simplifying the incorporation of ENS, and enhance the efficiency of administrative procedures related to the implementation process.

Towards Climate Responsive and Low Carbon Development: Addressing the Critical Urban Issues in Residential and Transport sector in Uttarakhand: This project was an initiative of AEEE with support from the Ministry of Environment, Forests & Climate Change, Government of India (MoEF&CC) under the National Mission on Himalayan Studies (NMHS). Indian Institute of Technology, Roorkee (IITR) and GB Pant National Institute of Himalayan Environment (NIHE) were key technical and implementation partners of this project that addressed the critical urban issues in the residential sector in Uttarakhand. This project adopted a state-specific multi-pronged approach involving review of international best practices and policies for sustainable building design practices; assessing national policies and interventions needed to promote climate-responsive residential sector development in Uttarakhand; conducting surveys on building typologies, construction materials, thermal performance, energy consumption patterns, and socio-economic conditions in different regions of Uttarakhand; identifying key interventions for building envelopes using whole building energy simulations; analysing the advantages of using energy-efficient water; and space heating appliances, and exploring the potential of utilizing solar energy. Capacity building programs and stakeholder consultations were held in different regions of Uttarakhand as Tehri, Almora and Dehradun with sectoral stakeholders as part of the project.

Towards Climate-Smart Hospitals in India: In partnership with Centre for Chronic Disease Control (CCDC), AEEE designed and undertook the first-ever nationwide hospital energy survey in India as a step towards climate-smart healthcare, driven by 'Health Care Without Harm'. The survey covered ~600 hospitals across 5 climate zones and 18 states and comprise 75+ data points per hospital. These data points included operational characteristics; business metrics; building-level energy consumption and onsite generation; and end-use system characteristics. The survey data will be useful or different stakeholder groups to effect positive changes at the ecosystem level:

- Policymakers: Develop and update energy benchmarks, codes, and standards for different hospital typologies; mainstream the use of renewable energy in rural hospitals to improve healthcare delivery.
- Hospital owners: Benchmark against peers to manage energy consumption and strengthen Environment, Social and Governance (ESG) goals.
- Energy efficiency businesses: Work with hospital owners to identify and implement climate-smart solutions.

Sustainable Green Airports Mission (SUGAM): AEEE along with the Airports Authority of India (AAI) conducted world's first-ever nationwide benchmarking of airports through the Sustainable Green Airports Mission (SUGAM). By benchmarking their energy use, valuable insights into consumption patterns, identification of inefficiencies, and targeted strategies for energy reduction and management at Indian airports were revealed. This ground-breaking initiative paves the way for benchmarking of different building types in India, contributing significantly to a greener and more sustainable future.

Solar™ Decathlon India

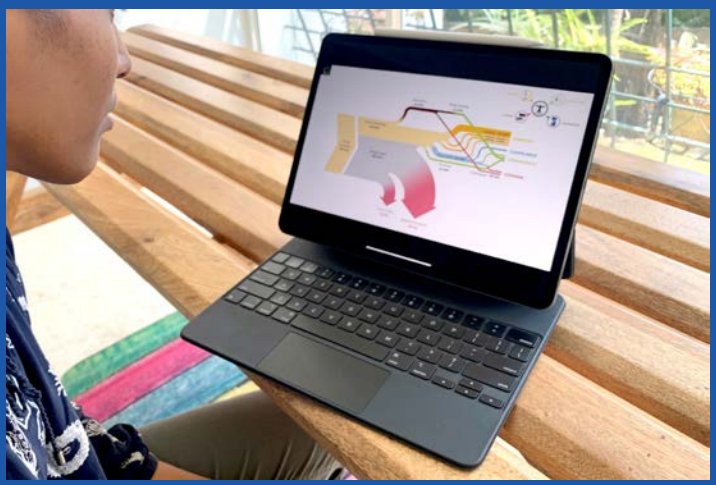
Scan QR code to know more

Solar Decathlon India (SDI) is playing a crucial role in nurturing innovators who will be at the forefront of combating climate change in the building industry. SDI is the largest net-zero building challenge in the world. It gives students an opportunity to learn and create net-zero building solutions that are climate-friendly, efficient, and affordable. During the competition, the student teams collaborate with leading real estate project partners and work on their live building projects.

In 2022-23, SDI provided online distance learning with deep, hands-on application to students in 18 states and 50 cities across India. The participation increased by 40% compared to the previous year with participation of 1,780 students and 179 faculty members. The participating students get access to high quality learning modules on building science, professional grade simulation tools, access to expert mentors, and develop soft skills that are valued by the industry.

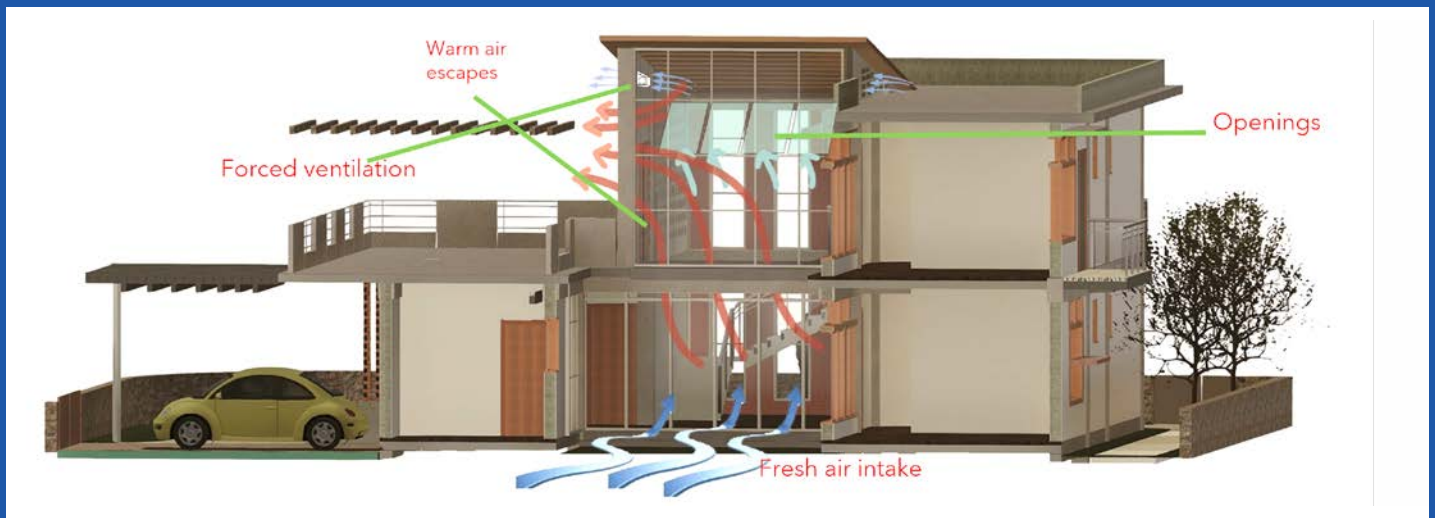
Within three years, SDI has created an ecosystem of 3,800 industry-ready students from 150 architecture and engineering colleges, with 200 faculty members, hundreds of real estate developers and building industry experts, who are all enthusiastic about working on resilient, net-zero buildings. They recognise the importance of collaboration and will act as champions of sustainability to shape the future of the industry.

Designed with a visionary perspective, this program equips future engineers and architects with the expertise to design net-zero buildings and advance construction practices. It prudently complements the academic curriculum, offering learning modules and opportunities for youth to collaborate on real-world building projects, driving innovative solutions. Solar Decathlon India stands as a herald of change, nurturing India's youth to provide pragmatic design solutions for communities vulnerable to climate change impacts.



Year 2 (2021-22) | 99 Teams Registered		Year 3 (2022-23) | 154 Teams Registered
1200+ STUDENTS		1700+ STUDENTS
165 FACULTY MENTORS		179 FACULTY MENTORS
109 INSTITUTIONS		126 INSTITUTIONS
67 REAL ESTATE PARTNERS		83 REAL ESTATE PARTNERS
60 INDUSTRY PARTNERS		79 INDUSTRY PARTNERS

Solar Decathlon India is conducted by the Indian Institute for Human Settlements (IIHS) and the Alliance for an Energy Efficient Economy (AEEE) under the aegis of the Indo-US Science and Technology Forum (IUSSTF). It is supported by the Department of Science and Technology, Government of India. ISHRAE is an affiliate of Solar Decathlon India.



Capacity Building and Mobilising Private-Sector Partnerships

In its role as the world's third-largest energy consumer, India grapples with the substantial challenge of meeting its energy demand in a sustainable and efficient manner. To confront these challenges head-on, harnessing private-sector partnerships for energy efficiency has emerged as a pivotal strategy. By capacity building of stakeholders and collaborating with private enterprises, India can harness innovation, expertise, and financial resources to champion energy efficiency initiatives across diverse sectors.

The Indian government has taken proactive strides to bolster energy efficiency and galvanize private sector involvement. Principal initiatives encompass the National Mission for Enhanced Energy Efficiency (NMEEE) and the Perform, Achieve, and Trade (PAT) scheme. These initiatives incentivize industrial sectors to enhance energy efficiency and engage in energy-saving certificate trading. Unleashing this potential through private-sector partnerships can result in substantial energy savings and consequential cost reductions.

At the forefront of driving this transition, AEEE adopts a robust Triple-Sector Leadership model. Within this framework, AEEE dedicates a pivotal role to the industrial and private sectors, allowing them to leverage their prowess and enhance their capacities:

Empowering Energy Service Companies (ESCOs): ESCOs play a central role in executing energy efficiency projects, providing invaluable expertise in conducting energy audits, proposing efficiency measures, and implementing energy-saving solutions. AEEE actively advances the market enablement of ESCOs in this domain and supports them in building necessary knowledge and skills.

Collaborative Policy and Market Empowerment: AEEE engages in and spearheads partnerships between the government and private sector stakeholders, fostering a conducive policy environment, facilitating funding access, enabling market growth, and ensuring effective project execution.

Our Goal

To catalyse a comprehensive and impactful transformation of India's energy landscape through capacity building and dynamic private-sector partnerships

Our Levers

- Industrial Working Groups
- Partnerships, Alliances and Coalitions
- Syndicated Research
- Trainings and Workshops

SDG linkages

Pioneering Research and Technological Advancements: AEEE consistently collaborates with private sector entities to research on the development of cutting-edge technologies and solutions, that incorporate advanced energy-efficient equipment, Internet of Things (IoT) enabled devices, and data analytics to optimize energy consumption.

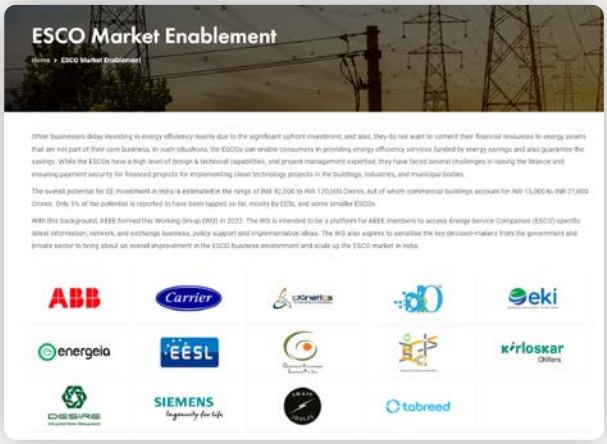
Dynamic Industrial Working Groups, Alliances, and Coalitions: AEEE fosters a collaborative approach to advance smart and sustainable progress. Through the establishment of targeted working groups and models for private sector cooperation, AEEE enhances innovation, facilitates the exchange of knowledge, and optimizes resource utilization, propelling the shift towards a more energy-efficient industrial landscape. In this endeavour, AEEE not only cultivates a potent synergy among its members but also triggers a wider societal transformation towards a smarter, greener and more resilient future.

Trainings and Capacity Building: Recognizing the paramount importance of staying at the forefront of rapidly evolving energy landscapes, AEEE's comprehensive training initiatives are meticulously designed to empower participants with the latest insights, innovative strategies, and practical tools necessary to navigate the intricacies of the energy industry. These programs not only cater to the diverse needs of participants but also foster a vibrant community of learning and exchange. Furthermore, AEEE's approach to capacity building is underpinned by a multi-stakeholder collaboration ethos, that facilitates an inclusive and holistic approach to training, wherein a cross-section of perspectives converges to create a rich and multifaceted learning experience.

Key Activities

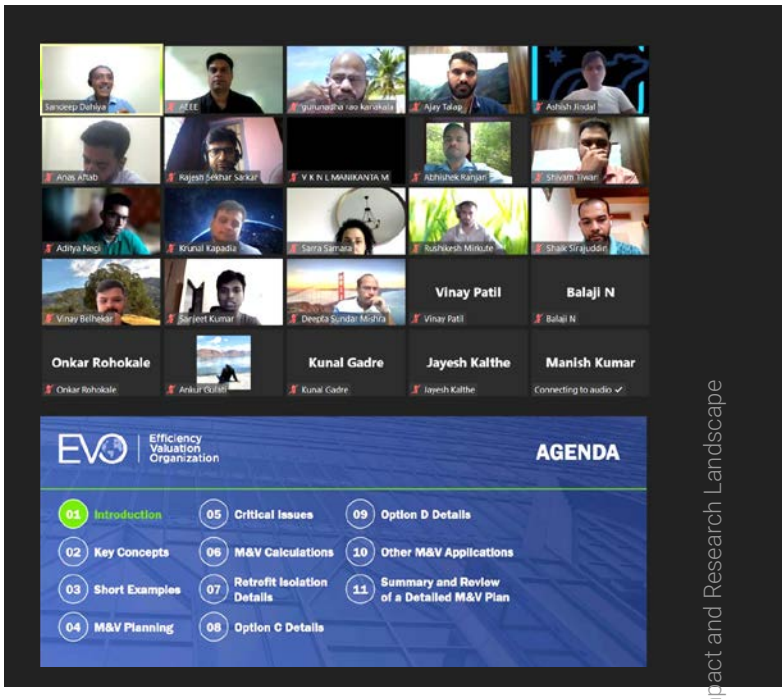
Industrial Working Group on District Cooling Systems: The Industrial Working Group on District Cooling Systems is intended to be a platform for AEEE members to generate awareness and create new opportunities for stakeholders to access District cooling technology-specific information, networking, exchange business, policy support and implementation ideas, capacity building, etc. This would also act as a platform for the key DCS industry players to deliberate and explore upcoming opportunities in the District Cooling sector, in addition to being heard as one voice regarding DCS. In the long-term, the outcome of this working group can be utilized to create a DCS Business Centre/Solution Exchange and catalyse the technology's development and implementation in India.

Industrial Working Group on ESCO Market Enablement: The Industrial Working Group on ESCO Market Enablement is intended to be a platform for AEEE members to access Energy Service Companies (ESCO)-specific latest information, network, and exchange business, policy support and implementation ideas. This also aspires to sensitise the key decision-makers from the government and private sector to bring about an overall improvement in the ESCO business environment and scale up the ESCO market in India.



M&V Fundamentals and International Performance Measurement and Verification Protocol (IPMVP) Online Training and the Performance Measurement and Verification Analyst (PMVA) Certification program: Effective energy savings measurement and verification have emerged as essential prerequisites within various contexts such as the PAT programme, ECBC compliance, Standards & Labelling, DSM initiatives, BMS implementation, and the work of ESCOs. AEEE plays a pivotal role in providing comprehensive training on M&V Fundamentals and the globally recognized International Performance Measurement and Verification Protocol (IPMVP). This meticulously crafted online training and certification curriculum leads to the prestigious Performance Measurement and Verification Analyst (PMVA) certification accredited by the Efficiency Valuation Organisation (EVO). This certification not only acknowledges proficient energy efficiency practitioners but also fosters elevated benchmarks in the realm of measurement and verification.

The training encompasses a wide array of methodologies employed in the measurement and verification of Energy Efficiency undertakings, including the renowned IPMVP® framework. Tailored to cater to the needs of engineers, managers, energy auditors, and economists deeply involved in pivotal energy efficiency initiatives, this program provides a comprehensive understanding of the pivotal energy efficiency initiatives they oversee.



03 Training Programs

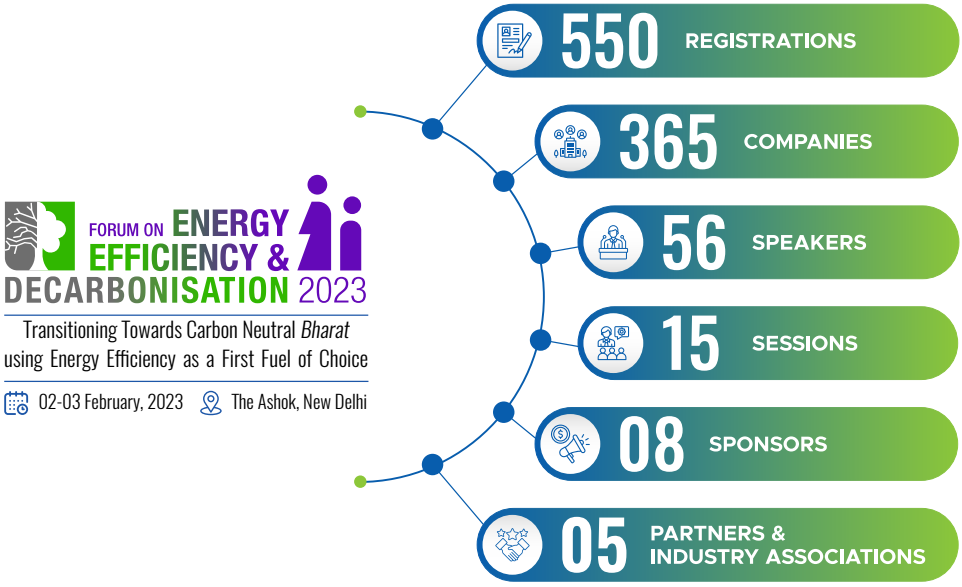
58 Professionals Trained

39 Organisations Reached

Forum on Energy Efficiency & Decarbonisation (FEED 2023)

The Forum on Energy Efficiency and Decarbonisation (FEED) is a curated platform that brings together thought leaders and industry experts spanning various sectors. Its purpose is to foster constructive dialogue aimed at propelling India's transformation into an energy-efficient powerhouse.

In its 2023 edition, FEED centered its efforts around a pivotal theme, '**Transitioning towards Carbon Neutral Bharat using Energy Efficiency as a First Fuel of Choice**.' This insightful two-day event took place on 2-3 February, 2023, in New Delhi. The forum prominently featured dialogues on eight distinct sub-themes, all geared towards the effective implementation of clean technologies and sustainable solutions. Moreover, the event strived to fortify collaboration mechanisms and expedite developmental initiatives, while ensuring the accessibility and affordability of these solutions for all segments of society.



Recommendations and Suggestions for Policy Interventions

Strengthen energy efficiency measures: The government should fast-track and strengthen the emphasis on energy efficiency measures in reducing consumption and emissions intensity. Specifically, it should accelerate the adoption of efficient appliances, provide clear investment guidelines for industrial users, and enable Energy Service Companies (ESCOs) to provide energy efficiency services.

Integrate Energy Efficiency with Decarbonisation: India must adopt a holistic approach that integrates energy efficiency measures with decarbonisation to achieve its net zero goal. It should encourage the adoption of renewable energy sources and energy-efficient technologies to reduce emissions across sectors such as transportation, buildings, and industry.

Provide Project-based Financing: Key implementation strategies for achieving the net zero emission goal include integrating energy efficiency with decarbonisation and providing project-based financing.

Decarbonise Hard-to-abate Sectors: India should focus on developing alternative options and electrification solutions to decarbonise the hard-to-abate cement and steel sectors. This will require significant investments in research and development to find new solutions.

Ensure Policy Stability: Policy stability is crucial for attracting investments in green business and decarbonisation. The government should ensure that its policies provide a stable and predictable regulatory environment to support the growth of decarbonisation business, which is set to grow 4 times faster than non-decarbonisation business.

THEMES

Low-Carbon Built Environment

Low Carbon Manufacturing

Sustainable Cooling and Refrigeration

Smart and Resilient Power Distribution

Energy & Emissions Benchmarking and Analytics

ESCO Market Enablement

Decarbonisation of the Transportation Sector

Energy Efficiency at the Sub-National Level

Foster a Culture of Energy Efficiency in the Younger Generation: India must increase the emphasis on energy efficiency in the academic curriculum to educate and foster energy-efficient practices in the upcoming generation of thinkers and leaders. This will ensure that the younger generation is equipped with the necessary skills to lead India towards a sustainable and net-zero future.

Strengthen Building Code and Standards: The implementation of a mandatory building codes and standards will ensure that new buildings are designed and constructed to high energy efficiency standards. This policy could also include mandatory labeling of energy-efficient appliances and equipment to incentivise consumers to buy more energy-efficient products.

Data Analytics and Benchmarking: The establishment of a national database of building energy performance data, along with a benchmarking system, will allow building owners and operators to identify areas of improvement and make data-driven decisions about energy efficiency upgrades.

Sustainable Cooling: The promotion of energy-efficient cooling technologies and practices, including low-energy or passive technologies, will help reduce the energy demand associated with cooling in buildings. This should also be accompanied with low GWP technologies for emissions management.

Thermal Comfort for All: Meeting the thermal comfort needs of a billion lives and across sectors will require an energy-intensive effort. The rapid growth of cooling in India over the next two decades call for identifying and promoting low-carbon, climate-friendly, and market-appropriate passive cooling technologies and solutions such as District Cooling Systems (DCS).

Electric Vehicles: The promotion of electric vehicles (EVs) through incentives such as tax credits, rebates, and subsidies will encourage the adoption of zero-emission vehicles. This could also include policies that require public buildings and businesses to provide EV charging infrastructure.

Embodied Carbon Management: In India, the building sector accounts for almost 30% of the country's total energy consumption, with most of this energy being used for cooling. Conventional building practices and materials contribute significantly to the heat island effect and emissions. A data-driven approach to design solutions for varied building typologies, such as residential, commercial, and industrial, and considering regional differences in climate and building design is vital.

Opportunities and Scope	Financing and Funding	Partnerships and Collaborations
Laydown groundwork for potential policy changes and shifts in 8 critical sectors within the Indian energy landscape	Forge partnerships to tap and drive new business opportunities	**Drawing in novel partners and affiliates capable of providing support in advancing AEEE's vision and mission**

Key Publications

PLI Scheme for ACs: A Step Towards AtmaNirbhar Bharat

This policy review document unfolds the Production-Linked Incentive (PLI) Scheme for Air Conditioners (ACs) introduced by the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India in April 2021. The review encapsulates the need, eligibility criteria, significance, and intended benefits of the scheme. It also captures the industry response to PLI scheme.

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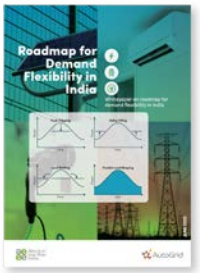

Roadmap for Demand Flexibility in India

The application of demand response, a proven demand management tool, can effectively help DISCOMs in India handle their increasing future electricity demand and operate reliably in a greener grid. This paper discusses demand response value proposition for the distribution grid and steps to unlock it.

AEEE Members comments on Draft Battery Swapping Policy

NITI Aayog released the draft Battery Swapping Policy on in April 2022. The policy has been formulated through inter-ministerial discussions and extensive stakeholder discussions. It is valid from the date of its public notification till 31 March 2025. The draft policy states that battery swapping de-links charging and battery usage, and keeps the vehicle in operational mode with negligible downtime. It is time, space, and cost-efficient. This Policy supports the adoption of battery-swapping primarily for light electric power train vehicles (LEV) of category L and E-Rickshaw/E-Cart. On behalf of its members, AEEE compiled and submitted suggestions and recommendations towards the effective implementation of this policy.

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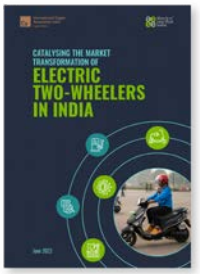
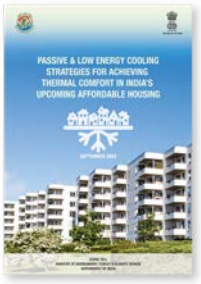


Catalysing the Market Transformation of Electric Two-Wheelers in India

Electric two-wheelers are poised to become the primary clean mobility alternative. Efforts to facilitate their adoption must be prioritised. There is an imminent need to address critical barriers in their value chain. AEEE and International Copper Association India (ICA India) collaborated to produce this whitepaper that identifies critical issues for facilitating the increased adoption of electric two-wheelers in India. For the whitepaper, a consumer perception consultation was conducted with Electric Vehicle (EV) users and Internal Combustion Engine (ICE) vehicle owner, along with stakeholder consultations. The recommendations comprise important aspects of the EV ecosystem, such as batteries, charging, financing, and manufacturing, as well as addressing the gaps in existing schemes and policies for original equipment manufacturers (OEMs) and servicing entities.

Passive & Low Energy Cooling Strategies for Achieving Thermal Comfort in India's Upcoming Affordable Housing

This report has been developed under the guidance of the Ozone Cell of the Ministry of Environment, Forest, and Climate Change (MoEF&CC), Government of India. The study focuses explicitly on HPMP Phase-II for affordable housing while aligning with ICAP recommendations. The objectives of the study were to examine and identify non-ODS and low-GWP alternative refrigerants and technologies for affordable housing, and to reduce the cooling demand through replicable building design features for affordable housing. The report has taken a unique study and analysis approach through expert stakeholder consultations to ensure its on-ground applicability and feasibility. Recommendations are laid out on priority grouping or ranking of passive and low-energy cooling strategies in terms of cooling load and cost. The report intends to serve as a building professional's quick reference and handbook to select strategies in cases where there is less or no funding for building energy performance studies.



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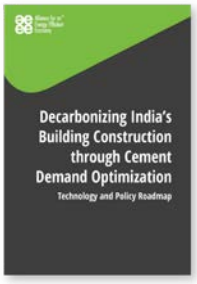
India Cooling Action Plan: Operationalizing Cold-Chain Recommendations

This report was launched on the '28th World Ozone Day' on 16 September 2022, organised by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in collaboration with the Department of Environment and Climate Change, Government of Maharashtra. It was launched by the honourable Union Minister for Environment, Forest and Climate Change and Labour and Employment, Mr Bhupendra Yadav; Maharashtra Chief Minister and the Minister of State for Environment, Forest and Climate Change, Mr Eknath Shinde; and the Minister of Consumer Affairs, Food and Public Distribution, Mr Ashwini Kumar Choubey. This strategic report developed with AEEE's technical expertise highlights the synergies of the recommendations with the ongoing government programmes and schemes handled by different ministries of the government and inputs provided by members during Cold-chain Thematic Working Group meetings. Additionally, the report indicates key action points to be taken by different ministries in operationalising ICAP recommendations.

Scan QR code to read

Decarbonizing India's Building Construction through Cement Demand Optimization: Technology and Policy Roadmap

This paper estimates the demand for new building stock in India and the associated demand for cement by 2047. It explores the potential of various alternate low carbon cement materials, and demand optimisation techniques to reduce cement consumption for meeting future building construction demand in India. It evaluates existing policies to assess their intent to support building decarbonisation. The analyses show that existing low carbon strategies would reduce the embodied carbon but are not sufficient enough to fully decarbonise the future building stock. It provides recommendations to accelerate deployment of market ready low carbon solutions and encourage innovation and research on carbon neutral materials to achieve building construction decarbonisation.



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India Cooling Action Plan: Lessons in Integrated Cross-sectoral Policymaking

A team of experts AEEE were intimately involved in the ICAP development process from inception to completion. AEEE led two of the seven Working Groups established for sector-specific analysis and supported the Ozone Cell in synthesis and integration of all working-group outputs into a cohesive ICAP report, providing strategic guidance during steering and the inter-ministerial committees. This paper showcases the experience of the AEEE ICAP team, in terms of the lessons garnered from the innovative ICAP development process that can find broad applicability in integrated and cross-sectoral energy efficiency policymaking for long-term socio-economic benefits and synergies, in not just cooling but also other end-uses that cut across multiple government portfolios.

Scan QR code to read

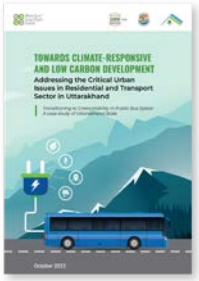
Access to Standardised, Transparent, and Granular Electricity Consumption Data: A Novel Engagement Model for the Indian Consumer

This paper attempts to answer two key questions – Does the consumer have sufficient, straightforward and standardised electricity consumption data to make informed decisions? What are the potential value propositions for different consumer types? This paper aimed to develop a standardised end-use data-sharing framework. It also infers from how end-use energy data is shared with consumers in other countries and with consumers across India's different sectors. The findings here help develop better energy efficiency interventions such as effective demand response programmes and customer engagement strategies.

Scan QR code to read

Towards Climate-Responsive and Low Carbon Development

Electrification of Uttarakhand's bus fleet is critical for decarbonisation of transport in the state. This study addresses transport-related emission in Uttarakhand by facilitating the rollout of electric public buses on identified intra-city or inter-city routes which are currently catered by ICE run buses. The white paper was developed as part of the project focussing on electric bus planning and deployment strategy, along with capacity building workshops and training for stakeholders



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Delineating The Implementation Of Residential Building Energy Codes In India

This paper aims to enhance the government's ongoing initiatives by offering practical instructions to states regarding implementation of the Energy Conservation Code for residential buildings, i.e., Eco-Niwas Samhita (ENS). It also emphasizes on the need to establish a comprehensive framework that serves as a guiding reference for urban local bodies involved in the implementation of this code. Based on the ENS, the paper delves into potential obstacles anticipated during its implementation. Drawing insights from research and engaging with stakeholders, the paper proposes viable approaches to ensure effective enforcement, suitable applicability, seamless compliance, and robust verification processes.

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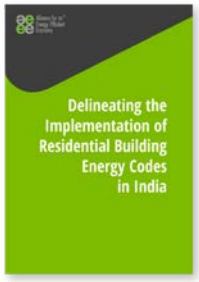


Prescriptive Approach For Achieving Energy Efficiency in India's Upcoming Affordable Housing

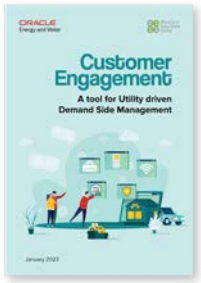
The Pradhan Mantri Awas Yojana (PMAY) by the Indian Government aims to offer affordable housing to low-income communities. This paper provides streamlined recommendations for enhancing energy efficiency and comfort in housing projects feeding into this initiative of the government. Recommendations are based on climate categories and were developed through literature reviews and expert consultations with experienced building professionals, architects, and developers. The suggestions cover priority passive cooling strategies, low-energy cooling technologies, and recommended building materials. These practical recommendations, considering factors like cost, time, and ease of implementation, are intended for widespread adoption by building professionals in India, filling the gap left by limited funding for dedicated energy efficiency consultations.

Scan QR code to read

Customer Engagement: A tool for Utility driven Demand Side Management

In the current landscape, two critical developments have emerged as game-changers in the energy sector: the pressing need to decarbonise the power industry and the shift towards a transactive model. This creates a push for utilities to actively involve customers in their decarbonisation efforts. This report delves into the significance of customer engagement for utilities today. It emphasizes that engaging and empowering customers can serve as a potent tool for promoting energy efficiency by fostering positive changes in their behavior. This, in turn, leads to substantial energy savings and a noticeable reduction in peak demand.

Scan QR code to read



Towards Climate-smart Hospitals: Methodology and Pilot of India's First Nationwide Hospital Energy Survey

India's healthcare infrastructure continues to expand and evolve amid a growing need for enhanced Indoor Environmental Quality in hospitals, accentuated by COVID-19 and frequent heatwaves, which will have serious implications for hospitals' energy use and energy-related GHG emissions. It is imperative to make hospitals in India climate-smart by using robust end-use energy data. This paper discusses the methodology and pilot of India's first-ever national hospital energy survey to characterize energy consumption, Scope I & II emissions, fuel types, and O&M practices. The survey across end-use systems in 10 public and private hospital typologies is based on 75 data points that will be collected from more than 1,000 hospitals covering all five climate zones of India.

Scan QR code to read

Key Partnerships and MoUs

Department of Environment, Forest & Climate Change (DoEF&CC), Government of Uttar Pradesh

This MoU focuses on supporting the Department of Environment, Forest & Climate Change (DoEF&CC), Government of Uttar Pradesh in advancing climate action initiatives in the state. It revolves around implementing specific strategies from the Uttar Pradesh State Action Plan for Climate Change (UPSAPCC) within the Green Energy Mission and Energy Efficiency Mission. These strategies, jointly agreed upon, aim to enhance energy efficiency in SME clusters; promote efficient cooling systems; transition water pumping systems to solar energy; and accelerate the adoption of electric vehicles in urban areas by 2030. The collaboration aims to drive tangible progress in these areas, contributing to a more sustainable and climate-resilient future for Uttar Pradesh.

JEEViKA *(An Initiative of the Government of Bihar for Poverty Alleviation)*

This MoU between JEEViKA, a poverty alleviation initiative by the Government of Bihar, and AEEE aims to boost farmer incomes by curbing post-harvest losses through sustainable cold chains. AEEE provides technical expertise to optimize packhouses, pre-cooling, and cold storage solutions, with a focus on pilot testing these solutions in select regions. This partnership strengthens JEEViKA's efforts to reduce poverty by enhancing agricultural practices and efficiency.

All India Institute of Local Self-Government (AIILSG)

AEEE and AIILSG joined forces to collaborate on a range of crucial thematic areas that includes promoting sustainability cooling; advancing research and development for climate-friendly & smart buildings; integration of demand response and grid interaction; driving clean mobility and seamless vehicle-grid integration; enabling energy efficiency financing through ESCOs; spearheading decarbonization efforts in industries and MSMEs; harnessing the power of data analytics for end-use energy consumption; and contributing to the State Energy Efficiency Index. This partnership aims to drive meaningful advancements and solutions across these vital sectors.

Refrigeration and Air-conditioning Manufacturers Association (RAMA)

RAMA and AEEE formed a collaborative partnership to enhance learning for their members by tapping into a wide network of industry experts. Their shared goal is to drive market transformation strategies that align with the country's sustainable development objectives. Through data-driven research and analytics on sustainable refrigeration and cooling practices, they seek to achieve productive outcomes that serve consumer interests.

The Refrigeration & Air-Conditioning Trades Association Ltd. (RATA)

RATA and AEEE joined hands to promote energy-efficient air conditioning technology and practices in India. They aim to exchange knowledge and experience to encourage the responsible use of air conditioning technologies among consumers and within the Air Conditioning & Refrigeration industry. Both organizations are dedicated to collaborating and sharing insights, enabling their members to learn from industry experts and upskilling technicians on emerging technologies and practices.

Energy Enablers

AEEE is a convening platform bringing together key energy stakeholders—industry, government, civil society organisations, think tanks, and professionals, to engage in a constructive dialogue, influencing effective and impact-oriented policies to build a robust ecosystem for effective implementation.

AEEE Members

AEEE had 46 Members as of 31 March 2023, representing diverse segments of the energy efficiency industry such as technology; equipment and service providers; research and academia; consulting companies; and varied energy end-users committed to energy efficiency. AEEE follows a participatory approach involving members and seeking guidance from its knowledge partners and peer organisations. With a host of benefits and customised services, the AEEE membership offers an exclusive opportunity to lead the growth and transformation of the energy sector, participate in policy dialogues, and enhanced visibility and credibility for all its members.

Premium Members

ABB, BSES Rajdhani Power Limited, Bosch Invented for life, Carrier, Danfoss Engineering Tomorrow, Eurovent Certita Certification, Denso Crafting the Core, Grundfos, Infosys, Life is On Schneider Electric, Saint-Gobain, Siemens, tabreed

Large Members

BASF We create chemistry, Kirloskar Chillers, Oracle Utilities, Symphony Refreshing Lives, Fortum charge & drive All lights green!

General Members

Armstrong, Baghirathi, CEPT University, cKinetics Accelerating Sustainability, EESL, eki Steering the planet to net zero, ENCON Energy Management Services Pvt. Ltd., MP ENSYSTEMS, GadgEon Engineering Smartness, Greentech Knowledge Solutions Pvt. Ltd., Plaksha University, PLUSS Technology for a better world, precog, Shakti Pumping Life, Smart Joules, STENUM Asia, Vasuki Experts in Power Solutions, xempla

Associate

75F, aeon, BSES Yamuna Power Limited, d2, energeia, GreenJams, GreenTree, Sunmeister Solar Integrators & Energy Auditors

Executive Council – Governing Body for AEEE

EXECUTIVE COUNCIL

Chairperson
Chirag Baijal

Vice Chair
Venkat Garimella

Treasurer
Sanjiv Bhatia

SUB - COMMITTEES

Management Committee
Chirag Baijal

Finance and Audit
Sanjiv Bhatia

HR and Compensation
Venkat Garimella

Programmes & Project
Rajan Rawal

Executive Director and President
Satish Kumar

Executive Council Members

Anil Rawal
Energy Efficiency Services Limited

Arjun P Gupta
Smart Joules Pvt. Ltd.

Chirag Baijal
Carrier Air Conditioning

Mahesh Patankar
MP Ensystems Advisory Pvt. Ltd.

Prabal Bose
Siemens Limited

Rajan Rawal
CEPT Research & Development Foundation

Sanjiv Bhatia
STENUM Asia

Satish Kumar
Alliance for an Energy Efficient Economy

Sudheer Perla
Tabreed India Pvt. Ltd.

Umesh Bhutoria
Algo Energytech Venture Pvt. Ltd.

Upendra Bhatt
cKinetics Consulting Services Pvt. Ltd.

Venkat Garimella
Schneider Electric

Vishal Garg
(Nominated)
Plaksha University

Outreach

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ALLIANCE FOR AN ENERGY EFFICIENT ECONOMY

BALANCE SHEET AS AT 31ST MARCH 2023

LIABILITIES	Note		As at 31 March 2023 (In ₹)		As at 31 March 2022 (In ₹)	ASSETS	Note		As at 31 March 2023 (In ₹)		As at 31 March 2022 (In ₹)
Corpus Fund	1		2,39,55,517		2,37,05,517	**Property, Plant and Equipment**	7				
						Project Related		1,09,06,969		1,01,54,269	
Capital Grant Reserve	2		1,09,06,968		1,01,54,268	Others		17,86,879	1,26,93,848	6,59,452	1,08,13,721
Current Liabilities and Provisions						**Investments in Fixed Deposits**			5,75,34,866		2,66,65,538
Sundry creditors and Expenses Payables	3	1,75,76,032		1,03,07,212							
Provisions	4	37,72,638		27,62,844							
Duties and Taxes	5	41,19,002		58,63,015		**Current Assets**					
Grant Balances	6	9,32,03,290	11,86,70,962	2,16,23,164	4,05,56,235	Interest accrued on FDRs/ Saving Bank Accounts			11,10,222		2,55,638
Membership Fees Received in advance			8,00,000		12,18,000	**Cash and Bank Balances**	8		7,74,42,820		2,98,73,449
Project Advance from GIZ			22,22,000		44,44,000						
						Other Current Assets					
Statement of Income and Expenditure						(Unsecured, Considered Good)					
Opening Balance		1,49,65,174		1,10,21,234		Prepaid Expenses		6,82,593		8,03,461	
Add: Excess of Income over						TDS Receivable	9	19,01,105		10,82,197	
Expenditure of Current Year		50,47,514	2,00,12,688	39,43,940	1,49,65,174	Income Receivable	10	1,94,97,016		2,30,30,079	
						Other advances	11	57,05,665	2,77,86,379	25,19,111	2,74,34,848
Total			**17,65,68,135**		**9,50,43,194**	**Total**			**17,65,68,135**		**9,50,43,194**

Significant Accounting Policies 12

The accompanying notes to accounts form an integral part of the financial statements

As per our report of even date attached
For Thakur, Vaidyanath Aiyar & Co.
Chartered Accountants
FR No. 000038N

K.N. Gupta
(Partner)
M. No. 009169
Place: New Delhi
Date: 22 AUG 2023

T.V.A. & CO. New Delhi Chartered Accountants

For Alliance for An Energy Efficient Economy

(Secretary)

Satish Kumar
Secretary
Alliance For an Energy Efficient Economy

(Chairman)

Chairperson
Executive Council
Alliance For an Energy Efficient Economy

ALLIANCE FOR AN ENERGY EFFICIENT ECONOMY

STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH 2023

EXPENDITURE	Year Ended 31st March 2023 (In ₹)	Year Ended 31st March 2022 (In ₹)	INCOME	Year Ended 31st March 2023 (In ₹)	Year Ended 31st March 2022 (In ₹)
FCRA Project Related Expenditure			**FCRA Projects Related Grants/ Other Receipts**		
General Purpose Grant - Energy efficiency projects	3,60,18,392	2,52,34,142	General Purpose Grant - Energy efficiency projects	3,60,18,392	2,52,34,142
Initiative for Energy Efficiency and Demand Flexibility	19,88,807	-	Initiative for Energy Efficiency and Demand Flexibility	19,88,807	-
Core grant for Energy efficient and low carbon built environment	40,67,364	-	Core grant for Energy efficient and low carbon built environment	40,67,364	-
Advancing the Communication, Outreach and Stakeholder Engagement for India Cooling	2,518	-	Advancing the Communication, Outreach and Stakeholder Engagement for India Cooling	2,518	-
India Subnational Climate Action (UP & Maharashtra)	1,36,64,133	-	India Subnational Climate Action (UP & Maharashtra)	1,36,64,133	-
Clean energy transition of the building sector in India	78,25,000	-	Clean energy transition of the building sector in India	78,25,000	-
A Policy Strategy for Decarbonizing the Building Sector	32,39,226	21,60,467	A Policy Strategy for Decarbonizing the Building Sector	32,39,226	21,60,467
Increasing Energy Access by using Super-Efficient Appliance in Rural Homes	70,37,129	1,50,04,069	Increasing Energy Access by using Super-Efficient Appliance in Rural Homes	70,37,129	1,50,04,069
Electrification of public bus fleets in Uttarakhand	-	22,31,424	Electrification of public bus fleets in Uttarakhand	-	22,31,424
	-	-	Grant Received (Unrestricted)	1,934	-
India Cooling Action Plan (ICAP)	-	2,08,96,663	India Cooling Action Plan (ICAP)	-	2,08,96,663
Green Vehicle Rating Phase II	-	28,11,270	Green Vehicle Rating Phase II	-	28,11,270
Interventions with Energy Efficiency as a tool for the implementation of Green Stimulus package in India	37,98,911	64,61,875	Interventions with Energy Efficiency as a tool for the implementation of Green Stimulus package in India	37,98,911	64,61,875
Enhancing Communication & Outreach for India Cooling Coalition	13,78,712	11,00,990	Enhancing Communication & Outreach for India Cooling Coalition	13,78,712	11,00,990
Electrification of fleet transport in Himalayas: focus on North East	57,10,543	-	Electrification of fleet transport in Himalayas: focus on North East	57,10,543	-
Activities for Implementation of the India Cooling Action Plan	47,58,248	-	Activities for Implementation of the India Cooling Action Plan	47,58,248	-
	8,94,88,983	**7,59,00,900**		**8,94,90,917**	**7,59,00,900**
Non- FCRA Project Related Expenditure			**Non- FCRA Projects Related Grants/ Other Receipts**		
Partnership and Support for the Global Cooling Initiative	-	2,90,200	Partnership and Support for the Global Cooling Initiative	-	2,90,200
PMU Energy Efficient Cool	3,51,97,043	2,72,90,530	PMU Energy Efficient Cool	3,54,39,484	2,76,03,739
Towards climate responsive and low carbon development	66,69,422	36,66,772	Towards climate responsive and low carbon development	66,69,422	36,66,772
CSR Grant for Enhancing Thermal comfort in India's Academic Institutions	29,00,000	-	CSR Grant for Enhancing Thermal comfort in India's Academic Institutions	29,00,000	-
CSR Grant for Solar Decathlon 2021-22 for 100 students	7,49,394	13,41,500	CSR Grant for Solar Decathlon 2021-22 for 100 students	7,49,394	13,41,500
Other Projects	1,06,98,871	85,24,347	Sponsorship / Other Receipts	1,57,28,362	1,30,33,132
Building High Level Support & National Capacities to enhance Climate and Ozone Protection through C. Efficiency	1,10,27,220	32,91,721	Building High Level Support & National Capacities to enhance Climate and Ozone Protection through C. Efficiency	1,10,27,220	32,91,721
			Membership Fees (New / Renewal)	23,68,495	21,70,000
	6,72,41,950	**4,44,05,070**		**7,48,82,377**	**5,13,97,064**
Other Overheads			**Other Income**		
Depreciation	27,25,768	21,56,336	Interest on Saving bank accounts	13,76,717	13,10,431
Administrative Expenses	54,46,869	50,52,316	Interest on FDRs	14,69,972	7,10,125
			Interest on IT Refund	-	37,185
			Interest on Gratuity Fund Investment	1,89,447	1,24,437
			Misc. Income	39,934	2,446
Excess of Income over Expenditure carried to Balance Sheet	50,47,514	39,43,940	Transfer from Capital Grant Reserve	25,01,720	19,75,974
Total	**16,99,51,084**	**13,14,58,562**	**Total**	**16,99,51,084**	**13,14,58,562**

The accompanying notes to accounts form an integral part of the financial statements

As per our report of even date attached
For Thakur, Vaidyanath Aiyar & Co.
Chartered Accountants
FR No. 000038N

K.N. Gupta
(Partner)
M. No. 009169
Place: New Delhi
Date: 22 AUG 2023

T.V.A. & CO. New Delhi Chartered Accountants

For Alliance for An Energy Efficient Economy

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(Secretary)

G. V. Venkatesh
(Chairman)

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Executive Council
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Alliance for an Energy Efficient Economy™

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