Alliance for an Energy Efficient Economy

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EESL
ENERGY EFFICIENCY SERVICES LIMITED
A JV of PSUs Under The Ministry of Power

INSPIRE

INSPIRE 2017 REPORT

सत्यमेव जयते
Department of Science and Technology
Ministry of Science and Technology
Government of India

MacArthur Foundation

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ENERGY IS LIFE
BEE
CONSERVE IT

International Symposium to Promote Innovation & Research in Energy Efficiency (INSPIRE)

An International Conference on Showcasing Innovation and Implementation of Best Practices in Energy Efficiency Technologies, Policies and Financing

www.inspire.ind.in

27th November – 1st December, 2017

Hotel ITC Rajputana
Jaipur, India

Organized by

Energy Efficiency Services Limited (EESL),
Alliance for an Energy Efficient Economy (AEEE) and
The World Bank

Supported by

Bureau of Energy Efficiency (BEE)
The Energy & Resources Institute (TERI)
Department of Science & Technology (DST), Govt. of India
MacArthur Foundation
American Council for an Energy-Efficient Economy (ACEEE)

TABLE OF CONTENT

STEERING COMMITTEE

Abhay Bakre	Director General, Bureau of Energy Efficiency (Co-Chair)
Ajay Mathur	Director General, The Energy Resource Institute (Co-Chair)
Ashok Sarkar	Senior Energy Specialist, The World Bank Group
Ashutosh Sharma	Secretary, Department of Science and Technology, Government of India
Brian Motherway	Head, Energy Efficiency Division, International Energy Agency
Ranganath N. Krishna	Managing Director, Grundfos
Satish Kumar	Interim Executive Director, AEEE (Convener)
Saurabh Kumar	Managing Director, Energy Efficiency Services Limited (Co-Chair)
Steven Nadel	Executive Director, American Council for an Energy-Efficient Economy
Upendra Bhatt	Managing Director, cKinetics

INSPIRE CORE TEAM

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4	**Vinod Chauhan**	Office Manager	
5	**Akshay Pandey**	Research Associate	

2. INSPIRE PROGRAMME

DAY 1
November 27th

Inaugural Session followed by Keynote Speech by Dr. Amory Lovins and Executive Panel Discussions

10:00 – 10:45 AM Venue: Suryavanshi Mahal, Ground Floor	**Inaugural Session** 1. **Welcome Address :** Mr. Saurabh Kumar, Managing Director, Energy Efficiency Services Ltd., India 2. **Address :** Amb Satish C. Mehta, I.F.S., (Retd.), Sr. Advisor, EESL 3. **Special Address :** Mr. John Roome, Senior Director – Climate Change, The World Bank 4. **Key Note Address :** Mr. Abhay Bakre, Director General, Bureau of Energy Efficiency (BEE), India 5. **Launch of EESL's Coffee Table Book and Mobile App:** Mr. Ashok Jain, I.A.S, Chief Secretary, Govt. of Rajasthan 6. **Inaugural Address :** Mr. Ashok Jain, I.A.S, Chief Secretary, Govt. of Rajasthan 7. **Vote of Thanks :** Dr. Satish Kumar,Executive Director (Interim), Alliance for an Energy Efficient Economy (AEEE), Convener INSPIRE, India
10:45 – 11:30 AM	**Press Conference: EESL, BEE, The Energy and Resources Institute, The World Bank**
10:45 – 12:00 PM	**Tea/Networking Break – Area Adjoining Suryavanshi Mahal**
12:00 – 1:00 PM Venue: Suryavanshi Mahal, Ground Floor	**Keynote Session: Reinventing Fire for India - Opportunities for India to leapfrog in the new energy landscape.** **Description:** This Opening Plenary session will set the context for the theme of the international conference. The keynote presentation by Dr. Lovins will talk about the globally-evolving clean energy scenario and where the big energy efficiency opportunities lie. With energy efficiency as its cornerstone and needing its pace redoubled, climate protection depends critically on seeing and deploying the entire efficiency resource. This opportunity requires focusing less on individual technologies than on whole systems (buildings, factories, vehicles, and the larger systems embedding them), and replacing theoretical assumptions about efficiency's *diminishing returns with practitioners' empirical evidence of expanding returns* 1. Setting the Context and Introduction of Speaker: Mr, John Roome, Senior Director – Climate Change, The World Bank 2. Keynote Speech: Dr. Amory Lovins, Cofounder and Chief Scientist, Rocky Mountain Institute (RMI), USA 3. Q&A Session
1:00 – 2:00 PM	**LUNCH - Area Adjoining Suryavanshi Mahal**

2:00 – 3:30 PM Venue: Suryavanshi Mahal, Ground Floor	**Executive Panel Discussion #1: Transitions in Energy Efficiency - Shifting the Global Energy Paradigm** **Description:** This Executive Discussion showcases experiences from across the globe that have brought about a paradigm shift in energy efficiency. The session will highlight the best practices, energy efficiency policy solutions, programme implementation models and delivery mechanisms that have already started triggering large-scale market transformation around the world. **Co-Chairs: Dr. Brian Motherway, International Energy Agency & Mr. Simon Stolp, The World Bank** 1. Mr. Benoit Lebot, International Partnership for Energy Efficiency Cooperation, France 2. Mr. Mark Lister, Copenhagen Centre on Energy Efficiency, Denmark, (via skype / phone), 3. Mr. Christian Zinglersen, Clean Energy Ministerial , France 4. Ms. Christine Egan, CLASP, USA
3:30 – 4:00 PM	**Tea/Networking Break - Area Adjoining Suryavanshi Mahal**
4:00 – 5:30 PM Venue: Suryavanshi Mahal, Ground Floor	**Executive Panel Discussion #2: Energy Efficiency Development in Asia – The Evolving Landscape** **Description:** This Executive Discussion shifts the focus to Asia and energy efficiency policies, financing and implementation models that have set new benchmarks not just at the country/regional level but for the global energy efficiency community to replicate. **Co-Chairs: Dr. Demetrios Papathanasiou, The World Bank** 1. Mr. Chartdanai Chartpolrak, Energy Conservation Center of Thailand 2. Mr. Soumya Garnaik, Energy Efficiency Services Limited (EESL), India 3. Mr. Md. Abdullah Al Mamun, Sustainable and Renewable Energy Development Authority (SREDA), Bangladesh 4. Mr. Asad Mahmood, National Energy Efficiency and Conservation Authority (NEECA), Pakistan (via phone)
	Entertainment Programme/Networking Opportunity Followed by Dinner - Poolside

DAY 2
November 28th

Plenary Session followed by Executive Panel Discussions and Spotlight Sessions

9:30 – 11:00 AM
Venue: Suryavanshi Mahal, Ground Floor

Plenary Discussion: Show Me the Money - Innovative Financing that Works

Description: The Energy Efficiency Financing landscape in India has started to improve in the last couple of years. This plenary will present India and global experiences on how for the potential for energy efficiency can be converted into investments at a scale, estimated to be over $400 billion per year to reach the SE4ALL Goals by 2030. The focus will be on innovative and commercial financing instruments using public finance mechanisms to mobilize the private sector capital.

Co-Chairs: Mr. Jorgen Thomsen, Macarthur Foundation & Mr. Gailius J. Draugelis, The World Bank

1. Mr. Kenichi Yokoyama, Asian Development Bank, India
2. Mr. Jigar Shah, International Finance Corporation
3. Dr. Steven Fawkes, EnergyPro Limited, United Kingdom
4. Mr. Rajat Misra, Asian Infrastructure Investment Bank, China
5. Ms. Anubha Prasad, Small Industries Development Bank of India (SIDBI), India

11:00 – 11:30 AM — **Tea/Networking Break - Area Adjoining Suryavanshi Mahal**

11:30 – 1:00 PM
Venue: Suryavanshi Mahal, Ground Floor - Section A

Executive Panel Discussion #3: Energy Efficiency Market Transformation – International Experiences and Success Stories

Description: This Executive Discussion focuses on international success stories and best practices for successful market transformation through specific national policies, global programs and other initiatives, to scale up energy efficiency implementation around the world.

Chair: Dr. Ashok Sarkar, The World Bank

1. Mr. Inchul Hwang, Korea Energy Agency, Korea
1. Mr. Mohamed Zied Gannar, National Agency for Energy Conservation (ANME), Tunisia
2. Ms. Laura Van Wie McGrory, Alliance to Save Energy, USA
3. Mr. Alexander Farsan, Carbon Trust, United Kingdom
4. Ms. Anjali Jaiswal, Natural Resources Defense Council (NRDC), USA

Venue: Suryavanshi Mahal, Ground Floor – Section B

Spotlight Session: Featured Technical Papers (3 papers, 30 minutes each)

Chair: Mr. Soumya Garnaik, EESL, India

Speakers:

Enabling Policies to Advance Energy Productivity in India
Mr. S. Padmanabhan, AEEE, India

Building energy disclosure policy for Indian cities and states
Dr. Saket Sarraf, psCollective, India

The need for a business enablement entity for the fledgling Indian ESCO market
Dr. Satish Kumar, AEEE, India

1:00 – 2:00 PM — **LUNCH - Area Adjoining Suryavanshi Mahal**

2:00 – 3:30 PM (Venue: Suryavanshi Mahal, Ground Floor – Section A)	**Executive Panel Discussion #4: EE Market Transformation – Success Stories from India** **Description:** This discussion focuses on EE Market Transformation in India: Transition from Conventional to Best Available Technologies (BAT) in EE through policies, institutional development and market mechanisms. **Chair: Mr. Soumya Garnaik, EESL, India** 1. Mr. Rajneesh Rana, EESL, India 2. Dr. Ashok Kumar, BEE, India 3. Mr. Girja Shankar, EESL, India
Venue: Suryavanshi Mahal, Ground Floor – Section B	**Spotlight Session: Featured Technical Papers** (3 papers, 30 minutes each) **Chair: Mr. Venkat Garimella, Schneider Electric, India** **Speakers** **Generic Evaluation Framework for Energy Efficiency Programs in India – Evaluating EE policies and programmes in India** *Mr. Aditya Chunekar, Prayas Energy Group, India* **Smart Manufacturing Components, Collaborations, and Case Studies** *Mr. Ethan Rogers, American Council for An Energy Efficient Economy (ACEEE), USA* **Development and Adoption of Voluntary Lighting Specifications to Drive Efficacy and Assure Product Quality** *Ms. Christina Halfpenny, Design Lights Consortium, USA*
3:30 – 4:00 PM	**Tea/Networking Break - Area Adjoining Suryavanshi Mahal**
4:00 – 5:30 PM Venue: Suryavanshi Mahal, Ground Floor – Section B	**Executive Panel Discussion #5: Capturing the Co-benefits of Energy Efficiency towards Sustainable Development: Enabling Universal Energy Access and Creating Green Jobs** **Description:** Like many other countries, India is blessed with a demographic dividend and Govt. of India's current focus is on skill development and job creation. This session will discuss and highlight how innovation in energy efficiency and other clean energy technologies can not only scale up energy access but also create 10 million green jobs and result in other co-benefits. **Chair: Mr. Steven Nadel, ACEEE** 1. Dr. Rahul Walawalkar, Indian Energy Storage Association (IESA), India 2. Mr. R. Subramanian, Saint-Gobain, India 3. Mr. Sanjeev Seth, Ingersoll Rand, India 4. Dr. Chetan Solanki, Indian Institute of Technology (IIT) Bombay, India 5. Mr. S. Raghupathy, Confederation of Indian Industry (CII), India

Venue: Suryavanshi Mahal, Ground Floor – Section A	**Executive Panel Discussion #6: Smarter and Efficient Grids: Enhancing Energy Security through Integration of 100 GW of Energy Efficiency as the "First Fuel" in India** **Description:** Public and Private Sector must work together to mainstream demand side energy efficiency as the "first fuel" and jointly set a goal of 100 GW of avoidable power generation through energy efficiency and utility demand side management. This session will focus on what has worked in other countries and what regulatory and policy changes are required in India to capture its EE potential along with the transition towards advanced technologies in demand response, smart grids, energy storage, e-mobility and renewable energy integration. **Chairs: Mr. Upendra Bhatt, AEEE** 1. Ms. Neelima Jain, EESL, United Kingdom 2. Dr. Amol Phadke, Lawrence Berkeley National Laboratory (LBNL), USA 3. Mr. Ammi Amarnath, Electric Power Research Institute, USA 4. Dr. Pankaj Agarwal, Panitek Power AG, Switzerland
5:45 PM - 6:15 PM Venue: Suryavanshi Mahal, Ground Floor	**Special Remarks: New Frontiers in Energy Efficiency** 1. Remarks by Mr. Saurabh Kumar, Energy Efficiency Services Limited 2. Remarks by Dr. Demetrios Papathanasiou, The World Bank Networking Opportunity over Hi-Tea- Area Adjoining Suryavanshi Mahal Site Visit to Jaipur's EESL-implemented LED Streetlight Project and Facade Lighting at Police Commissionerate at 6:30 PM

DAY 3
November 29th

Two Plenary Sessions followed by Executive Discussions and Spotlight Sessions

9:30 – 11:00 AM
Venue: Suryavanshi Mahal, Ground Floor

Plenary Session: Role of Technology, Innovation and Business Models in Enabling Energy Efficiency as a Resource

Description: While it is an accepted fact that private sector needs to complement the public policy initiatives to realise the full potential of energy efficiency, it is often not clear how public-private partnerships construct can benefit from the technology development and innovations taking place in companies. The Business leaders of leading Indian and international companies will share their ideas and perspectives on how this can be done.

Co-Chairs: Dr. Ajay Mathur, TERI & Dr. Amory Lovins, RMI

1. Mr. Ravi Purushothaman, Danfoss Industries, India
2. Mr. Ajay Durrani, Covestro, India
3. Mr. Venkat Garimella, Schneider Electric, India
4. Ms. Jennifer Layke, World Resources Institute (WRI), USA
5. Mr. Dhiraj Wadhwa, United Technologies Corporation (UTC), India

11:00 – 11:30 AM — **Tea/Networking Break - Area Adjoining Suryavanshi Mahal**

11:30 – 1:00 PM
Venue: Suryavanshi Mahal, Ground Floor

Plenary Session: Global R&D Experiences Leading to Technological Innovations and Visionary Policies

Description: The plenary will focus on how public-funded R&D efforts around the world has a) led to technology development that has made a significant contribution in pushing the energy efficiency envelope; b) helped policy formulation and implementation organisation in coming up with visionary policies that has led to low-carbon and sustainable development (e.g. building and habitat energy efficiency, sustainable and smart space cooling, etc.)

Chair: Dr. Rajiv Sharma, Secretary, Science and Engineering Research Board

1. Dr. Daniel Shah, Research Council UK
2. Prof. Ashok Lall, Sustainable Architect and Professor, India
3. Prof. Rangan Banerjee, IIT Mumbai, India
4. Dr. Amol Phadke, LBNL, USA
5. Prof. Rajan Rawal, CEPT University, India

1:00 – 2:00 PM — **LUNCH - Area Adjoining Suryavanshi Mahal**

2:00 – 3:30 PM
Venue: Suryavanshi Mahal, Ground Floor – Section A

Executive Discussions (Parallel Sessions):

1. Putting the Spotlight on Indian States (Led/Organized by BEE and Designated State Agencies with the World Bank, ACEEE, AEEE)

Venue: Suryavanshi Mahal, Ground Floor – Section B

2. Energy Efficient Technology Roadmap for India (Led/Organized by Technology Information, Forecasting and Assessment Council with TERI, CII and AEEE)

Venue: Residents Lounge, Level 1

3. Lessons learned from International Experiences for Enabling the ESCO Industry in India (Led by AEEE)

3:30 – 4:00 PM — **Tea/Networking Break - Area Adjoining Suryavanshi Mahal**

4:00 – 5:30 PM	**Spotlight Sessions – 3 concurrent tracks featuring 4 presentations based on peer-reviewed and accepted papers in each track**
Venue: Suryavanshi Mahal, Ground Floor – Section A	**Buildings, Systems and Technologies** **Chair: Dr. Archana Walia, CLASP, India** **Energy Efficient Building Envelope for Multi-Storey Residential Buildings** *Saswati Chetia, Indo-Swiss Building Energy Efficiency Project (BEEP), India* **Life Cycle Assessment of High-Rise Residential Building in India and Comparative Analysis of environmental impacts with Alternate Wall Materials,** *Shiva Krishna Pavuluri, L&T Construction, India* **Passive Design Indices: Quantifying the Potential of Passive Strategy in a Climate** *Jaydeep Bhadra, CEPT University, India* **Comfort and Energy Assessment of Low-cost Public Housing Scheme in Ethiopia** *Belay Zeleke Ayele, IIT Roorkee, India*
Venue: Residents Lounge, Level	**Business, Industry and Finance** **Chair: Mr. S. Padmanaban, AEEE** **Increasing the flow of investment into energy efficiency** *Steven Fawkes, EnergyPro Ltd., UK* **Financing Models for Scaling Up Energy Efficiency Implementation in the Public Sector** *Dilip Limaye, SRC Global Inc., USA* **Innovative methods for Public procurement of Energy Efficiency Services** *Girja Shankar, EESL, India* **Engaging Customers to Adopt Distributed Energy Resources,** *Marisa Uchin, Oracle Utilities, USA*
Venue: Suryavanshi Mahal, Ground Floor – Section B	**Codes, Standards and Policies** **Chair: Dr. Mahesh Patankar, MP ENSystems, India** **How to have your code and implement it too** *Rajkiran Bilolikar, ASCI, Hyderabad* **An evaluation framework for assessing state level progress in energy efficiency in India** *Sangeeta Mathew, AEEE* **Energy efficiency for climate resilience in Asian cities** *Olga Chepelianskaia, France* **Mainstreaming Energy Efficient Building Design Practices in State Public Works Departments** *Vernica Prakash, Indo-Swiss Building Energy Efficiency Project , India*
7:00 PM onwards	**Traditional Rajasthan Cultural Programme Followed by Dinner - Poolside**

DAY 4
November 30th

Executive Panel Discussion followed by Spotlight Sessions, Techno Buzz and Special Session hosted by Ministry of Environment, Forest and Climate Change (MoEFCC)

9:30 – 11:00 AM
(Venue: Suryavanshi Mahal, Ground Floor)

Executive Panel Discussion #7: How IoT, Big Data & Analytics, Sensors and Smart Metering are Transforming the Energy Efficiency Landscape

Description: Energy efficiency, when combined with IoT, Big Data & Analytics and Sensors and Smart Metering are transforming the energy efficiency landscape. This plenary session will give a glimpse of how the next generation of technologies are helping transform the energy markets and opening up many opportunities in the energy efficiency space.

Chair: Dr. Rahul Tongia, Brookings India and Dr. Shivkumar Kalyanaraman, IBM, India

1. Mr. Balachandar Jayaraman, Siemens, Singapore
2. Mr. Rudy Vielvoye, Engie, France
3. Prof. Krithi Ramamritham, Center for Urban Science and Engineering, India
4. Mr. Punit Desai, Infosys Limited, India
5. Dr. Amarjeet Singh, Zenatix, India
6. Mr. Umesh Bhutoria, EnergyTech Ventures, India

11:00 – 11:30 AM — **Tea/Networking Break - Area Adjoining Suryavanshi Mahal**

11:30 – 1:00 PM — **Spotlight Sessions – 3 concurrent tracks featuring 4 presentations based on peer-reviewed and accepted papers in each track**

Venue: Suryavanshi Mahal, Ground Floor – Section A

Buildings, Systems and Technologies

Chair: Dr. Sanjay Bajpai, DST

Generating Negawatts through Curricula Change in Architecture Colleges in India
Vivek Gilani, cBalance Solutions, India

Embodied Energy of Different Design Configurations of Mass Affordable Housing
Saswati Chetia, Greentech Knowledge Solutions Pvt. Ltd., India

Vidyut Rakshaka (Electricity Saviour) - A citizen led initiative for saving electricity in households
Sumathy Krishnan, TIDE, India

Energy Efficiency Enhancement – How understanding people's behaviour can drive policies
Chillayil Jayaraman, Amrita Vishwavidyapeetham University, India

(Venue: Residents Lounge, Level 1)

Business, Industry and Finance

Chair: Mr. Girish Sethi, TERI

Moving to Monitoring-Based Commissioning
Aalok Deshmukh, Schneider Electric, India

Data Analytics unlocks Substantial Energy Savings for waste energy recovery based Captive Power Plants
U. Sreenivasamurthy, ITC Infotech, India

'Energy Accounting'; a statistical model to improve overall plant Performance Monitoring
Sibaji Pattanaik, Aditya Birla Management Corporation Pvt.Ltd., India

Optimizing Assets for Best Performance in an Industrial Manufacturing Environment
Pushkar Kumar, EcoEnergy, Canada

Venue: Suryavanshi Mahal, Ground Floor – Section B	**Codes, Standards and Policies** **Chair: Mr. Saurabh Diddi, BEE** **How to implement building codes as an effective tool to save energy? Experiences in Europe.** *Frances Bean, Buildings Performance Institute Europe, Belgium,* **Rethinking Energy Conservation Building Code (ECBC) Implementation Strategy in States and Cities** *Mohini Singh, AEEE, India* **Establishing a Commercial Buildings Energy Data Framework for India – Approaches, Use Cases and Institutions** *Sangeeta Mathew, AEEE* **Demonstrating leadership of cities on efficient buildings- Lessons from the Building Efficiency Accelerator** *Sumedha Malaviya, WRI, India*
1:00 – 2:00 PM	**LUNCH - Area Adjoining Suryavanshi Mahal**
2:00 – 3:30 PM Venue: Suryavanshi Mahal, Ground Floor – Section B	**Techno Buzz / Speed Innovation for Businesses/Companies : Siemens, Schneider Electric, UTC, Grundfos, Saint Gobain, Danfoss, Covestro, etc.** will be talking about latest technological innovations that can lead to disruption or transformation in energy efficiency
Venue: Suryavanshi Mahal, Ground Floor – Section A	**Energy Efficiency at the Heart of the National Cooling Action Plan (Led by MoEFCC, BEE and DST With Support from AEEE, TERI, EESL, NRDC, LBL, CEEW) –** Addressing the national imperative of developing a sustainable and smart cooling action plan that looks at the topic in a holistic fashion and seeks ideas on a stakeholder engagement model and the scope of the effort.
3:30 – 4:00 PM	**Tea/Networking Break - Area Adjoining Suryavanshi Mahal**

4:00 – 5:30 PM	**Spotlight Sessions – 3 concurrent tracks featuring 4 presentations based on peer-reviewed and accepted papers in each track**
Venue: Suryavanshi Mahal, Ground Floor – Section A	**Buildings, Systems and Technologies** **Chair: Dr. Sameer Maithel, Greentech Knowledge Solutions Pvt. Ltd., India** **Future cities – Hot and Smart: urban heat, impacts, risk and resilience in India** *Komali Yenneti, University of New South Wales, Australia* **Holistic approach to achieving indoor thermal comfort for all in India by advocating smart and sustainable space cooling policies** *Satish Kumar, AEEE, India* **Case Study of an Energy Efficient Commercial Building: Validating Design Intent & Energy Simulation Results with Monitored Performance Data** *Prashant Bhanware,* *Indo-Swiss Building Energy Efficiency Project (BEEP), India* **Cool Roof Implications on Thermal Adaptation in Built Environment** *Kopal Nihar, IIIT Hyderabad, India*
Venue: Residents Lounge, Level 1	**Business, Industry and Finance** **Chair: Mr. Nagahari Krishna, Danfoss, India** **Strategic Energy Management: Moving from a transactional to a consultative delivery model for energy efficiency** *Sneha Sachar, National Grid, USA* **Enterprise Energy Management: The Schneider Electric India Story** *Rohit Chashta, Schneider Electric, India* **Energy and resource efficiency opportunities across the value chain** *Rajat Batra, STENUM Asia Sustainable Development Society, India* **Energy Efficiency through different design approach- Dual loop system** *Seemant Sharma, Johnson Controls, India*
Venue: Suryavanshi Mahal, Ground Floor – Section B	**Codes, Standards and Policies** **Chair: Dr. Meredydd Evans, Pacific Northwest National Laboratory, USA** **The impact of measurement and verification option choice on financial returns for clients in Energy Performance Contracts** *Paul Ruyssevelt, University College London, UK* **ESCerts Trading Market under PAT Scheme: A critical review** *Rahul Ravindranathan, ICF Consulting, India* **Energy, Emissions and Economy-wide impacts of adopting appliance efficiency measures** *Saket Sarraf, psCollective, India and Surabhi Joshi, Regulatory Assistance Project, India*
7:00 PM onwards	**Entertainment programme, followed by gala dinner - Poolside**

DAY 5
Decemeber 1st

Spotlight Sessions followed by Valedictory Session

9:30 – 11:00 AM

Spotlight Sessions – 3 concurrent panels featuring 4 presentations based on peer-reviewed and accepted papers in each track

Venue: Suryavanshi Mahal, Ground Floor – Section A

Buildings, Systems and Technologies

Chair: Prof. Rajan Rawal, CEPT University

How IoT solutions are unifying operations, catalysing efficiency, and boosting uptime in buildings
Aalok Deshmukh, Schneider Electric, India

Lighting Energy Saving Potential in India by 2030 - GHG abatement potential through efficient lighting fixture market penetration road map
Govinda Somani, GIZ, India

Simulating Natural Ventilation in Residential Buildings using Water Table Apparatus
Monisha Royan, CEPT University, India

Embodied Energy Database for Bricks & Blocks in India using Process Analysis Methodology
Ananthakrishnan Ravi, Greentech Knowledge Solutions Pvt. Ltd., India

Venue: Residents Lounge)

Business, Industry and Finance

Chair: Mr. R. Virendra, National Productivity Council

Energy Efficiency Services: Opportunities and Business Models for the Private Sector
Dilip Limaye, SRC Global Inc., USA

Enhance MSMEs Access Commercial Finance
Rajiv Kumar, SIDBI, India

Energy efficiency improvement in Reformer of Hydrogen Unit at Numaligarh Refinery
Geetali Kalita, Numaligarh Refinery Limited, India

Energy efficient technologies and best operating practices for improving resource efficiency in small scale foundry
E. Nand Gopal, TERI, India

Venue: Suryavanshi Mahal, Ground Floor – Section B	**Codes, Standards and Policies** **Chair: Dr. Radhika Khosla, Center for Policy Research** **Evaluating National Energy Efficiency Policy Adoption and Outcomes** *Shruti Vaidyanathan, ACEEE, USA* **Legal and policy support to the development and implementation of energy efficiency legislation for the building sector in India – The role of ACE:E2 project** *Rajeev Ralhan, PwC, India* **Institutional Governance and Frameworks for Energy Efficiency-Global Experience** *Apoorv Nagpal, Tetra Tech, India* **Transition to Energy Efficient Biomass Cook Stoves for Summative Point Source Emissions Reduction and Improved Respiratory Health.** *Lalit Kumar Joshi, Malaviya National Institute of Technology, India*
11:00 – 11:30 AM	**Tea/Networking Break - Area Adjoining Suryavanshi Mahal**
11:30 – 1:00 PM	**Spotlight Sessions – 3 concurrent tracks featuring 4 presentations based on peer-reviewed and accepted papers in each track**
Venue: Suryavanshi Mahal, Ground Floor – Section A	**Buildings, Systems and Technologies** **Chair: Dr. Vishal Garg, International Institute of Information Technology, India** **Identifying and Analyzing Passive Design Strategies for India under different climate conditions** *Sakshi Nagpal, CEPT University, India* **Outdoor Thermal Comfort Analysis at a Sustainable University Campus** *Mujesira Bakovic, Istanbul Technical University, Turkey* **Impact of Climate Change on Building Energy Consumption** *NVSK Manapragada, IIIT Hyderabad, India*
Venue: Residents Lounge, Level 1	**Business, Industry and Finance** **Chair: Dr. Jyotirmay Mathur, Malaviya National Institute of Technology, India** **Mainstreaming Energy Efficiency for Market Transformation and Economic Productivity** *Koshy M Cherail, AEEE, India* **Modernisation of Indian Brick Manufacturing Sector: Use of Energy Efficient Technologies** *Sachin Kumar, TERI, India* **Energy efficient technologies and best practices for energy conservation in cement industry** *Rajendra Giri, Mangalam Cement Ltd., India* **Energy efficient downdraft kiln for small-scale refractory industries** *E Nand Gopal, TERI, India*

Venue: Suryavanshi Mahal, Ground Floor – Section B	**Business, Industry and Finance** **Chair: Mr. Aalok Deshmukh, Schneider Electric, India** **Transforming Energy Efficiency Market - Necessity of Partial Risk Sharing Facility (PRSF)** *Rajiv Kumar, SIDBI, India* **The M&V 2.0 Opportunity And Challenges** *Rohit Chashta, Schneider Electric, India* **Energy Audit –Tool For Energy Efficiency** *I V Ramesh Kumar, Maruti Consultants, India* **Sustainable energy efficiency through digitalization** *Amal Apurv Jaiswal, Siemens Ltd., India*
1:00 – 2:00 PM Venue: Suryavanshi Mahal, Ground Floor	**Valedictory Session and Conclusion of INSPIRE 2017** **Description**: Recognizing top 3-5 Transformative Ideas Emerging from the INSPIRE for inclusion in the Energy Efficiency Policy and Implementation Recommendation Publication 1. Amb Satish C. Mehta, I.F.S., (Retd.), Sr. Advisor, EESL 2. Dr. Ritu Singh, Regional Manager, EESL 3. Mr. Steven Nadel, ACEEE 4. Dr. Satish Kumar, AEEE
2:00 – 3:00 PM	**Lunch - Area Adjoining Suryavanshi Mahal followed by Dispersal**

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3. SPEAKERS

Dr. Pankaj Agarwal

CEO, Panitek Power AG

Dr. Pankaj Agarwal is a cleantech expert, entrepreneur and investor with focus on financing, business development and innovative business models. He is the Founder and CEO of Panitek Power AG, an investment firm, based in Liechtenstein, Switzerland and India. He is India Director of Leclanche SA, a Switzerland based Li-ion battery technology company. In 2007 he co-founded Indian Energy Limited, an India focused renewable energy IPP which listed on the London Stock Exchange. Pankaj has a Ph.D. in Chemical Engineering from University of Florida, Gaines-ville, MBA from the Rotterdam School of Management and Bachelors in Chemical Engineering IIT, Kanpur.

Mr. Ammi Amarnath

Senior Technical Executive- Energy Utilization Research Area, Electric Power Research Institute (EPRI)

Mr. Amarnath leads the research, development, deployment and market transformation efforts with a team of engineers and scientists in the Energy Efficiency & Demand Response program area. Some of the technologies demonstrated include: advanced space conditioning systems for residential and commercial buildings, heat pump water heaters, high performance/low energy buildings, advanced end-use smart technologies that integrate with the smart grid, and industrial process efficiency improvements. He also manages R&D activities focused on advanced demand response (DR) technologies.

Dr. Sanjay Bajpai

Department of Science & Technology

Dr. Sanjay Bajpai is a graduate in mechanical engineering from Malaviya National Institute of Technology (MNIT), Jaipur and MBA from University of Rajasthan. He did his doctoral thesis on 'Alternative Fuels for Internal Combustion Engines' from Indian Institute of Technology - Delhi. He is currently leading the Water and Clean Energy Initiative of DST. During his career in DST spanning around two and half decades, he has steered various Science and Technology Promotion Programmes viz. State Science and Technology Programme, Technology Systems Programmes, Biofuels Programmes, Technology Development Board, Joint Technology Projects and of late Mission Programmes on Water and Solar Energy. Besides fulfilling the promotional role expected of the above programmes, he made exceptional pro-active efforts towards safe drinking water and clean energy in recent years.

Mr. Abhay Bakre

Director General, Bureau of Energy Efficiency (BEE)

Mr. Abhay Bakre belongs to the 1988 Batch of Indian Railways Electrical Engineering Services, Ministry of Railways. He has worked in several Railway projects including Delhi Metro & Kolkata Metro extension projects. He has also taken up nationwide media campaign through PCRA and other oil companies to generate awareness among consumers on adoption of simple fuel saving measures in day to day life. Before joining BEE, he has worked as Executive Director in the newly created Environment Directorate of Ministry of Railways. He was the nodal officer for developing INDC for the Railway.

Mr. Rangan Banerjee

Head of Department- Energy Science and Engineering, IIT Bombay

Mr. Rangan Banerjee is also the Forbes Marshall Chair Professor at IIT Bombay. His areas of interest include energy management, modeling of energy systems, energy planning and policy, hydrogen energy and fuel cells. He has been the Dean (R&D) of IIT Bombay. He is also an Adjunct faculty (Honorary) in the Department of Engineering & Public Policy, Carnegie Mellon University. Mr. Banerjee has received the Excellence in Teaching Award from IIT Bombay and is a Fellow of the Indian National Academy of Engineering.

Mr. Upendra Bhatt

Managing Director, cKinetics

Mr. Upendra Bhatt leads cKinetics, a leading Sustainability Insight, Innovation & Capital Advisory Firm. He is the Chairperson of the AEEE Executive Council and he is also a member of several task forces constituted by industry bodies. In addition, he chairs the Sustainable Business Leadership Forum, an Industry practitioners group focused on resource sustainability and ESG issues through multi-stakeholder working groups. He holds a Masters in International Relations from Thunderbird – The American Graduate School of International Management, a Master of Business Administration from NMIMS-Mumbai, (India) and an engineering degree from Delhi College of Engineering (India).

Mr. Umesh Bhutoria

Founder & CEO, EnergyTech Ventures

Mr. Umesh Bhutoria is also Director, E-Cube Energy, and has 10+ years of experience in the energy markets. He is a recognized leader in use of Data Analytics to advance Energy Efficiency/Productivity in Industries and SMEs. He has done some pathbreaking work in Energy Analytics across India, Bangladesh and Malaysia and has handled clients like The World Bank Group, IFC, Welspun, LNJ Bhilwara Group, NALCO, Aditya Birla Group and Tata Motors.

Mr. Chartdanai Chartpolrak

Executive Director, Energy Conservation Center, Thailand

Mr. Chartdanai Chartpolrak has 25 years of experience in government in fields of renewable energy and energy efficiency; 10 years of experience in financial institution and 20 years' experience in consulting services. He has been instrumental in developing Thailand's 20 years energy efficiency implementation plans and 15 years alternate energy development plan. He has Msc. In Mechanical Engineering (UK).

Mr. Rohit Chashta

Senior Engineer, Schneider Electric, India

Mr. Rohit Chashta is working as a Senior Engineer with the Energy Efficiency Team at Schneider Electric India, Gurgaon. He is a certified ISO 50001 Lead Auditor with around 4 years of experience in the field of O&M and Energy Efficiency. He has done his graduation in Electrical Engineering and Masters in Energy Systems. He is passionate about energy efficiency and topics associated with it. He has co-authored articles for Schneider Electric on various subjects related to energy and sustainability. He has also published a paper on 'A Smart Building Automation System' in the International Journal of Smart Home (IJSH).

Dr. Vaibhav Chaturvedi

Research Fellow, Council on Energy Environment and Water (CEEW)

Dr. Vaibhav Chaturvedi is a Research Fellow at the Council on Energy Environment and Water (CEEW), and leads the Council's 'Low Carbon Pathways' research. Prior to joining the Council, he was a Postdoctoral Research Associate at the Joint Global Change Research Institute, a collaboration between the Pacific Northwest National Laboratory and the University of Maryland, College Park, USA. His research focuses on Indian and global energy and climate change mitigation policy issues within the integrated assessment modelling framework of the Global Change Assessment Model (GCAM). He actively publishes in, and reviews articles for, leading international energy and climate policy journals.

Mr. Milind Chittawar

Managing Director, SEE-Tech Solutions Pvt. Ltd.

In Mr. Milind Chittawar's entrepreneurial journey, he has conceptualized knowledge based software solutions See-UtiSave & See-ThermiSave. His passion is to develop and demonstrate 150 energy conservation measures at SEE-Tech's Regional Energy Efficiency Centre. He has received Prime Minister's MSME special recognition award for Outstanding Entrepreneurship. His present focus is to deliver 20% energy cost savings in commercial Building Sector (Hotels, Data Centre, IT/BPO, hospitals & offices). He has received training in Japan, USA & Germany. He has been part of Indian Team to World Bank's 3 Country Energy Efficiency project to China & recently to Saudi Arabia.

Mr. Aditya Chunekar

Prayas Energy Group

Mr. Aditya Chunekar has been working with Prayas (Energy Group) since 2010. His work focuses on improving energy efficiency, particularly in India's residential sector. His analysis and advocacy cover the techno economic, policy, and behavioral issues that hinder market wide adoption of energy efficient appliances. He is also interested in understanding the appliance usage and ownership patterns to study the growth and nature of future residential demand for electricity in India.

Mr. Milind Deore

Director, Bureau of Energy Efficiency (BEE)

Mr. Milind Deore as a Director is leading a team at the Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India for implementation of the Energy Conservation Act, Policies & Schemes of the Govt. of India into Industries & other commercial sectors. He has developed and has been actively involved in implementation of various National level energy efficiency and demand side management schemes & programs like Perform, Achieve & Trade (PAT) scheme for the Industrial sector, Bachat Lamp Yojana (BLY) for domestic sector, Agriculture DSM, Energy Efficiency for SMEs, etc.

Mr. Punit H Desai

Head Smart Campus Practice, Retrofits Practice and Green Building Design Projects, Infosys

Mr. Punit Desai works with the Infrastructure & Green Initiatives team at Infosys as Regional Manager Infrastructure. He heads the Smart Campus practice, Retrofits practice and drives green building design projects at Infosys. His goal is to make every campus at Infosys a smart and sustainable campus, enhancing occupant and hence business productivity, while consuming minimum energy and resources. Mr. Desai has over 15 years of experience in Smart Buildings, Green Building design, Industrial and Comfort cooling systems. He is a chemical engineer with a post-graduation in marketing management.

Mr. Aalok Deshmukh

General Manager and Head – Energy Efficiency, Schneider Electric India

Mr. Aalok Deshmukh, General Manager and Head – Energy Efficiency, Schneider Electric India; has over 17 years of experience spanning contributions to more than 125 projects in 11 countries, including energy efficiency implementation, consulting and research in the corporate, government and non-profit sectors. In 2016, he was recognized as a Leadership in Energy and Environmental Design Fellow (LEED Fellow), the highest professional credential awarded by Green Business Certification, Inc., USA. He has experience in sustainability strategy, green buildings, building energy benchmarking and energy code implementation assistance, building simulation, energy auditing, building commissioning and retro-commissioning, as well as measurement and verification.

Mr. Saurabh Diddi

Director, Bureau of Energy Efficiency (BEE)

Mr. Diddi is a Mechanical Engineer with a Masters in Business Administration in Finance. In BEE, he is incharge of Energy Efficiency in Buildings, Standard & Labeling programme, Awareness and International Cooperation. Earlier, he was instrumental in development of Perform, Achieve and Trade (PAT) mechanism. He led and carried out number of energy efficiency policy initiatives and also studies addressing various facets like Demand Side Management, sectoral studies, preparation of reference manuals, cluster and unit level projects as well as capacity building initiatives. He has also worked with Price waterhouse Coopers and National Productivity Council, India and has wide experience in energy/ resource conservation studies.

Mr. Gailius Draugelis

Lead Energy Specialist, The World Bank

Mr. Gailius Draugelis is a Lead Energy Specialist with the World Bank's Energy and Extractives Global Practice. Currently, he is responsible for assisting the regional manager in leading the South Asia lending and advisory services engagements through a range of supporting roles and key responsibilities include regional initiatives and contributing to the India program. He has been the World Bank's energy sector coordinator in China and Indonesia, respectively, responsible for strategy and oversight of lending, technical assistance and policy advisory services in those countries' energy sectors. He also was Program Leader, Energy, Climate Change, Environment and Agriculture for the World Bank's China and Mongolia portfolio.

Mr. Ajay Durrani

Managing Director–Indian Sub-Continent, Covestro India Private Limited

Mr. Ajay Durrani has over 23 years of experience in the chemical industry with a focus on achieving continuous and improved business performance. Mr. Durrani joined Bayer in October 1997 as Regional Sales Manager. He supervised the completion of the Polyurethanes Systems House building which is a major breakthrough in the business of Bayer Material Science. Mr. Durrani then, as Country Head & General Manager for the Polyurethane Business Unit and BaySystems, was responsible for driving growth and product visibility.

Ms. Christine Egan

CEO, CLASP

Over 15+ years of leadership, Ms Christine Egan has grown CLASP from a small program to a well-respected international non-profit organization with offices and teams around the world. Ms. Egan is an expert in consumer energy behavior and energy efficiency label design. She pairs extensive domestic and international technical experience with a strong knack for building strategic coalitions and high-performing teams. Under her guiding vision, CLASP has served at the epicenter of collaborative and ambitious efforts to mitigate climate change and the global movement for clean energy access.

Mr. Alexander Farsan

Head, Business Services India, Carbon Trust

Mr. Alexander Farsan helps organisations shape sustainability strategies that address their impact on the environment while providing a platform for commercial success and growth. Prior to his role in India, Mr. Farsan worked as an experienced consultant and project manager out of Carbon Trust's London office for over 5 years, advising businesses from SMEs to global industry leaders and across a broad range of sectors. Prior to joining the Carbon Trust, he worked as a policy researcher at the Potsdam Institute of Climate Impact Research, with a focus on emerging markets.

Dr. Steven Fawkes

Director, EESL EnergyPro Assets Ltd.

Dr. Steven Fawkes has over 30 years' experience in energy efficiency including delivering large-scale energy management programmes, co-founding two energy service companies, implementing innovative energy services deals, and advising governments. Current roles include: Senior Adviser to the Investor Confidence Project, Independent member of the Investment Committee of the London Energy Efficiency Fund and Project Manager for the EEFIG Derisking Project, and Director of EESL EnergyPro Assets Ltd, a JV between EnergyPro and EESL and a Trustee of the National Energy Foundation. He was recently awarded the American Council for an Energy Efficient Economy's "Champion of Energy Efficiency 2017 Award".

Mr. Narender Gandhi

Zonal Head – North & East (Applied, Services & Controls) Environmental Champion, Ingersoll Rand, India

Mr. Narender Gandhi is the Zonal Head of North & East for Applied, Services & Controls of Ingersoll-Rand Climate Solutions Business. In his current role, he is responsible for providing strategic leadership for all aspects of the Climate Solutions business that includes growth through innovation and focus on growth excellence, operational excellence and building organizational capability. Also he is a part of Ingersoll Rand Global Environmental Council and represents as Environmental Champion for IR India. He has over 20 years of rich and varied experience across HVAC Projects execution and driving businesses of Equipment, Services and Controls.

Mr. Mohamed Zied Gannar

Deputy Director of Energy Efficiency in New Buildings, National Agency for Energy Conservation (ANME), Tunisia

Mr. Mohamed Zied Gannar is an Energy Engineer, and is in charge of energy efficiency programs in the building sector including in particular: the development and implementation of the Tunisian Energy Efficiency Building Code, the management of the Energy Audit on Plan Program, the management of the capacity building program in the field of energy efficiency in the building sector and the promotion of energy-efficient building materials, products, components and technical equipment.

Mr. Venkat Garimella

Head- Strategy & Alliance, Schneider Electric

A prolific business leader with 24 years of experience in running and managing businesses across domains & customer segments, Mr. Garimella has been working with Schneider Electric for 13 years. He has a proven track record in leading and turning around businesses to consistently drive revenue and profitable growth through General management, Strategy, S&M, Business development etc. His primary focus is on M&A in India & neighbouring countries. He is responsible for Energy Efficiency Programme of the company to promote EE & sustainability. Additionally, Mr. Garimella oversees CSR & is a board member for Schneider Electric India Foundation.

Mr. Soumya Prasad Garnaik

Chief General Manager (Technical), Energy Efficiency Services Ltd.

During his 25 years of professional career, Mr. Garnaik has served in Government, Private and International consulting organizations in various capacities in the field of energy policy, energy management, resource conservation etc. Mr. Garnaik holds a Bachelor's degree in Electrical Engineering from Utkal University, India and Post Graduate in Plant Engineering from India's National Productivity Council. He is a Certified Energy Auditor from Bureau of Energy Efficiency (BEE), Govt. of India, Certified from Effi-ciency Valuation Organization (EVO) as IPMVP Professional and Certified Lead Auditor in ISO 18001.

Ms. Christina Halfpenny

Executive Director, DesignLights Consortium

As Executive Director of the DesignLights Consortium (DLC), Ms. Halfpenny drives success through strategic planning, stakeholder engagement and collaboration, and continuous improvement of business systems. Tina established the DLC as an independent nonprofit with the mission to drive efficiency through advanced lighting. As the ED, she works to identify opportunities for broad scale energy savings and innovation that can be realized with applied planning and implementation tactics. Tina has more than 15 years of experience in energy efficiency and clean energy policy and practice.

Mr. Inchul Hwang

Team Manager, Korea Energy Management Corporation & Director, Korea Energy Agency, Korea

Mr. Inchul Hwang has 23 years of experience in implementing policies and measures on energy efficiency, renewable energy, and climate change mitigation. He has been managing green ODA programs such as establishment of EE standard and labeling in Cambodia in coop-eration with ASEAN Center for Energy. He has been collaborat-ing with World Bank and UNIDO in providing capacity build-ing to developing countries in Asia and Africa region. He has He participated in APEC LCMT phase 5-Bitung, Indonesia as an expert in Low Carbon Building.

Mr. Anil K. Jain, I.A.S.

Additional Secretary, Ministry of Environment Forest and Climate Change, Government of India (MoEFCC)

Mr. Anil Kumar Jain I.A.S. is an Additional Secretary at Ministry of Environment Forest and Climate Change. He was formerly Adviser (Energy, Climate Change and Overseas Engagements) of NITI Aayog (former Planning Commission), Government of India. Mr. Jain has over 25 years' of administrative experience at the field and policy formulation levels in various Ministries/Departments in the state and central governments. He has published several of papers and articles on the energy sector, including a book on natural gas policy framework in India. He is a Visiting Senior Research Fellow at the Oxford Institute for Energy Studies, Oxford. Mr. Jain has a BA with Economics, an MBA with Marketing from Punjab University and a Post-Graduate Diploma in International Trade from IIFT, New Delhi.

Mr. Ashok Jain, I.A.S.

Chief Secretary, Government of Rajasthan

Mr. Ashok Jain took over as Chief Secretary, Government of Rajasthan in June 2017. He is a 1981 batch IAS officer. Previously, Mr. Jain was Additional Chief Secretary of social justice and empowerment department. He has held top posts including that of Chief Electoral Officer, Rajasthan. He has also held many important portfolios in the state bureaucracy.

Ms. Neelima Jain

Regional Head- UK & Europe, Energy Efficiency Service Ltd.

Ms. Neelima Jain is responsible for the overall strategic direction, business development and operational management of EESL's operations in UK and Europe. Prior to this, Ms. Jain was the National Program Manager for EESL's LED lighting program UJALA. She has 14 years of program management and consulting experience across energy efficiency, carbon finance, power, and gas industries. She has also led operation-al planning and strategy for one of the largest CDM programs in the world, and implemented smart grid initiatives at the likes of National Grid, Scottish and Southern Energy, Tata Power, etc. Ms. Jain is also a member of IEA's Energy Efficiency Board.

Ms. Anjali Jaiswal

Senior Attorney, Founder & Director, NRDC India Initiative on Climate Change and Clean Energy

In leading the India Initiative, Ms. Jaiswal collaborates with local partners to advance energy efficiency in buildings and appliances, solar energy, and plans to protect communities from climate change impacts, such as extreme heat and air pollution. In connection with her work, Ms. Jaiswal was a fellow in the Nehru-Fulbright Indo American Environmental Leadership Program in 2005, based in New Delhi. She graduated from the University of California, Hastings College of Law and received her Bachelor's Degree in Environmental Sciences from the University of California, Riverside.

Mr. Balachandar Jayaraman

Vice President and Business Line Head - BPS, Siemens

An entrepreneurial leader with over 20 years' experience in the Building Technologies industry, Mr. Jayaraman is an expert on Building Performance and Sustainability (BPS). He is in charge of the Middle East and Asia Pacific markets, and has been with Siemens for more than five years. Throughout his career, he has worked in countries such as USA, India, and Singapore, covering fields such as Fire, Security, Building Automation, and Sustainable Energy Management. He received his Master's in International Affairs, International Business from Columbia University's School of International and Public Affairs, and Masters in Science, Industrial Engineering and Management from Oklahoma State University.

Dr. Shivkumar Kalyanaraman

Program Director- Special Initiatives, IBM Research, India

Dr. Shivkumar Kalyanaraman heads the Cognitive Industry Solutions department at IBM Research India. He has served as the Chief Scientist of IBM Research – Australia. His current research interests are in large scale cyber physical systems addressing problems like clean energy, sustainable use of natural resources, and the application of ideas from computing, machine learning, wireless, IoT and networking in these domains. He is a Fellow of the IEEE (2010), Fellow of Indian National Academy of Engineering (2015), ACM Distinguished Scientist (2010), and was recognized by MIT's Technology Review Magazine in 1999 as a TR100 young innovator.

Mr. Ayaz Kamil

Sales Head- Building Performance & Sustainability Division, Siemens BT

Mr. Ayaz Kamil is a Mechanical Engineer with MBA in Marketing having 16 years of experience in HVAC Industry. He has held several positions in project management, product & solution sales. He is also a certified LEED AP from USGBC.

Dr. Ashok Kumar

Director, Bureau of Energy Efficiency

Dr. Ashok Kumar is primarily involved in the implementation of National Mission on Enhanced Energy Efficiency, a component of National Action Plan for Climate Change of India. Under the mission, he is involved in the coordination of the Perform, Achieve and Trade, the flagship program which involves development of energy consumption norms and standards for energy intensive industrial sectors. He is also the lead for climate change activities and has been a part of Indian Delegation to various international forums.

Mr. Harendra Kumar

Joint Adviser, NITI Aayog

Mr. Harendra Kumar is working as Joint Adviser joined NITI Aayog (Erstwhile Planning Commission) Government of India since Feb 1998. Prior to NITI Aayog, he has worked as a Geologist. In 20 years of professional career in Planning Commission/NITI Aayog, he has been involved in planning for energy sector, especially, coal sector by carrying out long and short terms demand projection for Five year and Annual Plans. He is actively associated with Ministry of Coal for policy formulations for development of coal sector. He also looks after work related to Energy efficiency and works in close coordination with BEE and think tanks.

Dr. Satish Kumar

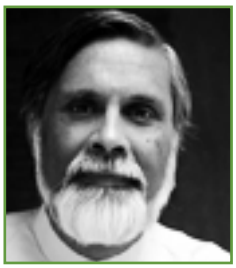
Interim Executive Director, Alliance for an Energy Efficient Economy (AEEE)

Other than his position at AEEE, Dr. Satish Kumar also serves as Senior Advisor to Lawrence Berkeley National Laboratory. He was Senior Advisor and Energy Efficiency Ambassador at Schneider Electric India Pvt. Ltd. His 25+ years of career has focused on making a business case for energy efficiency and renewable energy, sustainability and climate change through business leadership, development of energy efficiency standards and protocols, fostering innovative and collaborative partnerships and policy advocacy. Dr. Kumar holds a PhD in Building Science from Carnegie Mellon University and is a LEED Fellow.

Mr. Saurabh Kumar

Managing Director, Energy Efficiency Services Limited (EESL)

Mr. Saurabh Kumar is an Indian Revenue Service officer of the 1992 batch and has worked in various capacities in the Income Tax Department, Ministry of Power, and Bureau of Energy Efficiency (BEE). He was Secretary, BEE during 2007-2010. He proceeded on a UN Deputation to Bangkok in the last 2 years and handled environmental issues in the Asia - Pacific region.



Dr. Ashok Lall

Architect, Ashok B. Lall Architects

Dr. Ashok Lall is an architect practicing in Delhi since 1981. His practice specializes in environmentally and socially sustainable design. He has researched and written on the subject of sustainability extensively. He has also been involved with architectural education since 1984. He was the Dean of Studies at the TVB School of Habitat Studies, New Delhi and at present he is the Design and Technology Chair at KRVIA, Mumbai.

Ms. Jennifer Layke

Global Director, Energy Program, World Resources Institute, USA

Ms. Jennifer Layke oversees initiatives and projects that aim to expand access to clean and affordable energy that will reduce climate risks and strengthen communities. She leads a global team of experts in energy access, renewable energy and energy efficiency in China, India, Indonesia and the US. She founded The Green Power Market Development Group which developed innovative energy procurement paths for corporate use of clean energy in the U.S. and Europe. Ms. Layke's experience includes leading Johnson Controls' Institute for Building Efficiency and consult-ing for the World Bank and the U.S. EPA.

Mr. Benoit Lebot

Executive Director, International Partnership for Energy Efficiency Cooperation, France

Mr. Benoit Lebot has had an extensive career in the fields of Energy Efficiency, Climate Change Mitigation, and Clean Energy Policies. Beginning as a Research Engineer, Mr. Lebot worked at the Energy Efficiency Division of the Lawrence Berkeley National Laboratory, in California from 1987 to 1990. Between 1990 and 1997, he was part of the French National Energy and Environmental Agency. Mr. Lebot worked at the International Energy Agency as an advisor within the Energy Efficiency Policy Analysis Division. He also worked as a Climate Change & Sustainable Energy Policy Advisor for the United Nations Development Programme.

Mr. Mark Lister

Head of Centre, Copenhagen Centre on Energy Efficiency, Denmark

Mr. Mark Lister has a diverse background in sustainability, finance and energy policy. He has specialised in energy efficiency almost 20 years ago and is a leading advocate for both public and private sector action. He has worked in government in Australia, headed an ESCO industry association, founded a cross sectoral NGO and worked on grassroots projects in sub-Saharan Africa. Mr. Lister has also done a stint with ADB in the Philippines working to facilitate and scale up climate technology and energy efficiency investments. His focus now is on doubling the rate of global EE improvement by 2030.

Dr. Amory Lovins

Cofounder and Chief Scientist, Rocky Mountain Institute, USA

Physicist Dr. Amory Lovins is consultant to business and government leaders. He has written 31 books and 600 papers, and received the Blue Planet, Volvo, Onassis, Nissan, Shingo, Zayed, and Mitchell Prizes, MacArthur and Ashoka Fellowships, 12 honorary doctorates, the Heinz, Lindbergh, Right Livelihood, National Design, and World Technology Awards, and Germany's Officer's Cross of the Order of Merit.

Mr. Asad Mahmood

Trainer & Consultant, National Energy Efficiency and Conservation Authority, Pakistan

Mr. Asad Mahmood is associated with the energy sector since last twelve years and played a vital role in the approval process of the National Energy Efficiency & Conservation Act 2016. He has conducted numerous onsite trainings on various topics pertaining to energy efficiency, mitigation and clean technologies for industrial professionals, university and school students across Pakistan along with result oriented Energy Audits. His efforts with the support of his team led to successful launch of the ESL Regime in Pakistan. His passion is to learn about making a difference in the society with practical solutions.

Mr. Gitansh Malik

National Manager- Business Development and Strategic Key Accounts, Danfoss

Mr. Gitansh Malik is an accomplished professional with more than 9 years of experience in HVAC Domain. He has been working for Danfoss for 9+ years in various roles from Channel Management Strategy to Key Account handling and currently heading the Business Development Team for HVAC Drives Segment. He is a B.Tech in Electronics Engineering with an MBA in International Business from Symbiosis Institute of International Business, Pune.

Mr. Md Abdullah Al Mamun

Assistant Director (Energy Audit and Accreditation) Sustainable and Renewable Energy Development Authority (SREDA), Power Division,Ministry of Power, Energy and Mineral Resources, Bangladesh

Mr. Md Abdullah Al Mamun responsibilities include Developing Energy Audit Regulation, conducting pilot Energy Audit in commercial & residential sector, Collecting information from the Designated Consumers Assessing various reports/ papers related to energy efficiency and energy management system & Renewable Energy, Cooperating the development of green building rating system, Developing the energy efficiency labelling programs for electrical appliances, Developing and revision of necessary policies, rules and regulations related to EE and RE.

Mr. M.D. Manjunath

United Technologies Corporation, India

Mr. M D Manjunath is the India lead for AdvanTE3C Solutions the energy solutions vertical of Carrier. AdvanTE3C is a group of global experts in efficiency and environment domain focused on developing sustainable building solutions. AdvanTE3C takes a total systems approach to develop building solutions in which everything works together seamlessly from heating and cooling, to elevators and escalators, to lighting to accessibility, safety and security. Mr. Manjunath has over 18 years of Work experience and is a US Green Building Council LEED accredited professional. He is also an Indian Green Building Council Accredited Professional.

Dr. Ajay Mathur

Director General, The Energy & Resources Institute (TERI)

Dr. Ajay Mathur, other than his role as DG-TERI, is a member of the Prime Minister's Council on Climate Change. He was Director General of the Bureau of Energy Efficiency in the Government of India responsible for bringing energy efficiency into our homes, offices, and factories, through initiatives such as the star labelling programme for appliances, the Energy Conservation Building Code, and the Perform, Achieve and Trade programme for energy intensive industries. He has been a key Indian climate change negotiator, and was also the Indian spokesperson at the 2015 climate negotiations at Paris.

Ms. Laura Van Wie McGrory

Vice President- Strategic Initiatives, Alliance to Save Energy, USA

For more than two decades, Ms. Laura Van Wie McGrory has been designing and carrying out energy efficiency programs in the United States, Asia, Africa, SE Europe, and Latin America. As at the Alliance, she manages the Systems Efficiency Initiative and other domestic and international energy efficiency programmatic activities. Her work has focused on inter-national energy productivity, building systems efficiency, building code implementation, energy efficiency policy and regulatory reform, utility demand side management capacity building, municipal energy efficiency programs and financing, energy efficient transportation, gender and climate change, and water and energy efficiency in water supply and wastewater system.

Ambassador Satish C. Mehta I.F.S. (Retd.)

Advisor, Energy Efficiency Services Limited

Ambassador Satish Mehta is presently serving as Senior Advisor to the Minister of Power of India and of EESL since February 2016. He joined the Indian Foreign Service in 1983 and retired as Director General, Indian Council for Cultural Relations (ICCR) in September, 2015. He has represented India in many international conferences, including on disarmament. He was India's delegate to the UN General Assembly from 1997 to 2002. He has handled a variety of work, including political and disarmament as well as economic and commercial during his career. He did his education in Jaipur, and is a qualified Chartered Accountant.

Mr. Rajat Misra

Principal for Private Sector Investments- South Asia, Asian Infrastructure Investment Bank, China

Mr. Misra has worked for 18 years at SBICAP which is amongst the top 5 global MLA. He has extensive experience in originating and executing deals across debt, equity and advisory space across South Asia, Middle East and Europe. He worked as a Design Engineer for 6 years at BHEL and was a member of key committees formed by the Government / Regulators and Industry bodies. Mr Misra also served in CII and FICCI National Committees on Power for past 5 years and headed Maharashtra State CII Panel on Energy for Year 2016.

Dr. Brian Motherway

Head- Energy Efficiency Division, International Energy Agency, France

Dr. Brian Motherway oversees a range of analytical and outreach programmes supporting energy efficiency globally. Prior to joining the IEA, Dr. Motherway was Chief Executive of the Sustainable Energy Authority of Ireland. He holds a Bachelor's and Master's degrees in engineering and a PhD in Sociology.

Mr. Steven Nadel

Executive Director, American Council for an Energy Efficient Economy (ACEEE), USA

Mr. Nadel has worked at ACEEE for nearly 30 years serving as Deputy Director and Director of ACEEE's Utilities and Buildings programs prior to his promotion to Executive Director in 2001. Before ACEEE, he planned and evaluated energy efficiency programs for New England Electric, a major electric utility; directed energy programs for the Massachusetts Audubon Society, Massachusetts' largest environmental organization; and ran energy programs for a community organization working in the poorest neighborhoods of New Haven, CT. Mr. Nadel has worked in the energy efficiency field for 35 years and has over 200 publications on energy efficiency subjects.

Mr. Padu S Padmanaban

Energy Efficiency Specialist

Mr. Padu S. Padmanaban is the former Program Director of the South Asia Regional Initiative for Energy Integration (SARI/EI) and Senior Energy Advisor for USAID/India's bilateral program. He served with the World Bank as an Energy Specialist in advancing alternative energy programs in Asia. He is a visiting researcher with KAPSARC, Saudi Arabia working on energy productivity issues in the GCC countries. He has significant experience in clean energy and energy access projects. He is the recipient of the Hall of Fame Award by the Indian Green Building Council, the All India Power award and the Energy Professional Development award.

Mr. Zhiming Pan

Building Energy Efficiency Specialist, NRDC, China

Mr. Zhiming Pan leads NRDC's building initiatives in China, focusing on energy efficiency research and advocacy. Prior to joining NRDC, he worked at China's Ministry of Housing and Urban-Rural Development as a researcher. At MoHURD, he also served as the project manager of the End Use Energy Efficiency Program, a United Nations Development Programme flagship project on improving energy efficiency in China. He holds a Master's degree in building structural engineering from China's Wuhan University of Technology and an Engineering bachelor's degree from Henan University. He is based in Beijing.

Dr. Demetrios Papathanasiou

Practice Manager, Energy and Extractives Global Practice, South Asia Region, The World Bank

Dr. Papathanasiou has worked for more than 15 years with the World Bank Group on Energy and Infrastructure in several countries of Africa, Latin America, East Europe and the Balkans, South Asia, and East Asia and the Pacific Islands. He has contributed to developing energy policies in several countries and worked on power generation projects using diverse technologies: thermal, hydropower, solar, wind, and geothermal. He has led large teams on complex utilities and sector reforms, as well as public private partnership transactions. A professional Electrical Engineer, he holds an MSc in Environmental Technology and a PhD in Energy and the Environment from Imperial College in London, UK.

Dr. Amol Phadke

Research Scientist, Lawrence Berkeley National Laboratory, USA

Dr. Amol Phadke is a Scientist and Group Leader at the International Energy Studies Group, Energy Analysis and Environmental Impacts Department at the Lawrence Berkeley National Laboratory. Currently, his work is focused on energy in the India power sector and appliance and equipment efficiency in several emerging economies. Amol has published over 40 journal articles, research reports, and conference papers. Amol regularly advises the national government, utilities, and regulators in India on energy policies and programs. Amol has a Bachelor of Engineering degree from Government College of Engineering, Pune, India, and a M.S. and Ph.D. from the Energy and Resources Group, from UC Berkeley

Ms. Anubha Prasad

DGM, Small Industries Development Bank of India

Ms. Prasad is presently looking after International Cooperation, Green Climate & Sustainable Development Verticals. She has held key positions like Head of SIDBI offices at Noida and Jaipur and Team Leader in Centralised Loan Processing Cell. She has been involved with structuring, appraisal and implementation of numerous cred-it proposals involving a wide range of financial products. A regular faculty at SIDBI's in-house programmes and several B-Schools in NCR, her interests include mentoring startups & women entrepreneurs.

Mr. Ravichandra Purushothaman

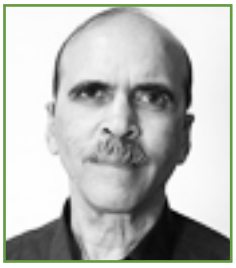
President, Danfoss India

Mr. Purushothaman is a member of the Danfoss global management team. He has over 25 years of experience in various roles ranging from Sales & Marketing, Strategy, General Management and globalizing businesses across Asia pacific, Europe & India. He has been a key member in building and executing the Danfoss India strategy and building / expanding distribution, R&D and Global supply chain for Danfoss in India. He heads the CII Tamil Nadu state council as Chairman, chairs the CII National task force on Cold chain development, is an executive member of Green Building Council and is on the Executive Council of AEEE.

Mr. Sundaresan Raghupathy

Deputy Director General, Con-federation of Indian Industries (CII)

Mr. Raghupathy is the Deputy Director General of CII and also heads 9 CII Centres of Excellence. He is current Chair of Asia Pacific Network of World Green Building Council. He has 32 years of work experience in the areas of energy management, green buildings, water management, waste management, renewable energy. Under his leadership, IGBC has catalysed 4,300 green building projects, amounting to 4.68 billion sq.ft of registered footprint, thereby making India the 2nd Country in the world in terms of largest registered green building footprint. Mr. Raghupathy is a Gold Medallist in Chemical Engineering from Annamalai University (1976-81).



Prof. Krithi Ramamritham

Professor- Computer Science and Engineering, IIT Bombay

Prof. Ramamritham has spent almost equal lengths of time at the University of Massachusetts, Amherst, and at IIT Bombay as a Chair Professor in the Department of Computer Science and Engineering. His current research involves applying computational approaches to energy management, based on the SMART principle: Sense Meaningfully, Analyze, and Respond Timely. He is a Fellow of the IEEE, ACM, Indian Academy of Sciences, National Academy of Sciences, India, and the Indian National Academy of Engineering. He was honored with a Doctor of Science by the University of Sydney. He is a recipient of the Distinguished Alumnus Award from IIT Madras.

Mr. Rajneesh Rana

General Manager,
Energy Efficient Services Limited

Mr. Rana is the General Manager for Business Development & Contracts at EESL and he also leads the Agriculture Demand Side Management and Solar programmes.

Prof. Rajan Rawal

Project Director (India), Indo-US Joint Clean Energy R & D Centre - Building Energy Efficiency Sector

Prof. Rajan Rawal is a faculty member at CEPT University. He teaches energy efficient built habitat, energy modeling, energy policy at post graduate level. His work emphasis is on 'energy performance of buildings and cities' and 'architectural science education'. He is also Executive Director of "Centre for Advanced Research in Building Science and Energy (CARBSE)" at CEPT University. He is principal investigator for several national and international research projects and advisor to many organizations.

Mr. A. Chandra Sekhara Reddy

CEO, State Energy Conservation Mission, Andhra Pradesh

Mr. Chandrasekhar Reddy is the Chief Executive Officer, State Energy Conservation Mission for the Government of Andhra Pradesh. He is also the Media Advisor for the Energy and Infrastructure and Investments (I&I) Departments of the Capital Region Development Authority. He is credited with successfully popularizing energy efficiency activities in Andhra Pradesh. Chandrasekhar Reddy has rich experience of over two decades in handling media in various departments, government of AP and effectively implementing communication strategies for various power sector programs such as 24x7 Power-For-All Scheme and the development of green power including energy conservation and energy efficiency.

Mr. Ethan Rogers

Program Director, American Council for an Energy Efficient Economy (ACEEE), USA

Mr. Ethan Rogers directs the day-to-day activities of ACEEE's Industry Program, coordinates the organization's work on intelligent efficiency, and is the program lead for the bi-annual Summer Study on Energy Efficiency in Industry. The team analyzes and authors reports on policies affecting energy use in the industrial sector, on opportunities to increase the use of combined heat and power (CHP) to meet the nation's energy needs, and the ability of intelligent efficiency to transform all sectors of the economy. The team works collaboratively with businesses, government agencies, and public interest groups to advance sound energy efficiency policies and programs.

Mr. John Roome

Senior Director, Climate Change, The World Bank

Mr. John Roome leads a team of specialists and works across the World Bank Group to advance the institution's climate change agenda. He previously served as Director for Sustainable Development in the Bank's East Asia and the Pacific Region, responsible for working with 22 client countries in the region. He also worked as Operations and Strategy Director in the Bank's South Asia region and as Operational Quality Director in the Bank's Africa region for five years.

Dr. Ashok Sarkar

Senior Energy Specialist, The World Bank

Dr. Ashok Sarkar manages clean energy and energy efficiency (EE) operations in World Bank's Global Energy Practice in Washington since 2006. He established WB's EE Community of Practice, worked in 35+ countries, and is currently engaged in Poland, Saudi Arabia, Qatar, Yemen, Pakistan, India (several projects, including with EESL). He earlier worked in ADB-Manila; USAID-India; RMA-USA; and BHEL-India. He has an undergraduate degree from Delhi College of Engineering, MS-Energy from AIT-Thailand, and Ph.D., University of Wisconsin-Madison, USA. Dr. Sarkar served as Member, UNF-CCC-CDM Meth Panel (2005-07) and Chair, UNEP's Experts Task Force on LED Lighting (2015-17).

Dr. Saket Sarraf

Founder Principal, psCollective

Mr. Saket Sarraf is passionate about issues related to sustainable development and built environment. He is the founder and Principal at ps Collective, a platform for advocacy, research, policy analysis and consultancy. He also serves as the Doctoral Program coordinator at the Faculty of Planning, CEPT University, Ahmedabad. His research interests include decision support systems for policy making, spatial dynamic modeling, energy efficiency, and urban and regional growth simulations. He is currently working on developing building energy transparency policy for Indian cities and empirically driven decision making in the power sector. Saket is formally trained as an architect from the Indian Institute of Technology, Kharagpur and as an Urban and Regional Planner from the University of Illinois at Urbana Champaign, USA. He was conferred the outstanding PhD. award for his work in 2005-2006 on social drivers of land-use change.

Mr. Sanjeev Seth

India Country Leader – HVAC & Transport, India & SAARC Markets, Ingersoll Rand

In his current role as Business Leader, Mr. Sanjeev is responsible for growth & Innovation of Trane and Thermo King Businesses that form part of the Climate Solutions sector at Ingersoll Rand. Trane and Thermo King are Ingersoll Rand's strategic brands and world leaders in Heating, Ventilating, Air-Conditioning and Refrigeration (HVACR) industries that serve Residential, Commercial, and Transport and Marine markets. Mr. Seth has degree in Mechanical Engineering from Delhi College of Engineering and is Six Sigma Green Belt. He is an active member at several international and national industry forums like ISHRAE, ASHRAE, AMCHAM, and IGBC & RAMA.

Mr. Jigar Shah

Principal Industry Specialist, International Finance Corporation, USA

Mr. Jigar Shah facilitates investments related to climate business. Previously, he was the Executive Director of the Institute for Industrial Productivity (IIP), an international non-profit organization with a mission to improve energy efficiency in industry. He has considerable global experience in industry and clean energy. Mr. Shah has a PhD in Chemical Engineering and has taught graduate courses on clean energy as an Adjunct Professor at McMaster University, Canada, and George Washington University, USA.

Mr. Daniel Shah

Director, Research Councils UK, UK

Mr. Shah is responsible for delivering a vision for a stronger and deeper UK-India research and innovation partnership, working with Indian and UK collaborators to achieve excellence with impact. Previously, he led the international policy work of Universities UK International, the membership body for UK universities, and initiated the international and EU strategy for the Russell Group of universities. He worked on research funding and university-business interactions for the UK Government's Department for Business Innovation and Skills, and in social enterprise. He studied Politics,Philosophy and Economics in Oxford and Philosophy in New York.

Mr. Girja Shankar

Additional General Manager- Tech, Energy Efficiency Services Limited (EESL)

Mr. Girja Shankar is currently working as Additional General Manager Tech in Energy Efficiency Services Limited (EESL) and heading the LED Street Lighting National Programme (SLNP) and Municipal Energy Efficiency Programme (MEEP)-AMRUT project in Rajasthan. He has worked in Bureau of Energy Efficiency (BEE) and Public Works Department and has about 20 years of experience in building technologies and energy efficiency. He is a Fellow Member of the Indian Society of Lighting Engineers (ISLE) and a Member of the Indian Society of Heating, Refrigeration & Air-conditioning Engineers (ISHRAE).

Dr. Rajiv Sharma

Secretary, Science & Engineering Research Board -Government of India

Dr. Rajiv Sharma has a multifaceted career spanning more than 32 years of conceptualizing, implementing and monitoring programs in the science & technology arena through various assignments at the Department of Science and Technology of the Government of India. He has the distinction of being the first Indian Co-Chair of the Indo-German Science & Technology Centre and of the US-India Science and Technology Endowment Board. He is Scientist 'G' & Head of the Technology Missions Division of the Department of Science & Technology, Government of India.

Dr. Amarjeet Singh

Co-Founder, Zenatix

Dr. Amarjeet Singh received his MS and Ph.D. in Electrical Engineering at University of California, Los Angeles (UCLA) in 2007 and 2009 respectively and BTech from IIT Delhi. He has published in diverse venues of repute in the domains of sensor networks, robotics, data analytics, artificial intelligence and environmental science. Zenatix is engaged in providing IoT based Automation for Retail Chains and BFSI segment helping them with energy efficiency, improved compliance and better asset management supported by predictive and preventive maintenance for their geographically distributed 100s of outlets.

Mr. Pradeep Kumar Singh

Manager- Technical & BD, ETIHAD ESCO, UAE

Mr. Kumar is an experienced energy manager with a demonstrated history of working in the energy industry. Skilled in ESCO projects, Measurement & Verification, Business development, HVAC, and Energy Efficiency. He is a strong engineering professional having CEM, CEA CMVP, LEED GA & PMP Certification.

Dr. Ritu Singh

Regional Manager, Energy Efficiency Services Limited

Dr. Ritu Singh is the Regional Manager of Energy Efficiency Services Limited. She has previously worked at TERI. Her expertise lies in clean energy from a behavioural aspect.

Mr. Sanjeev Sirsi

Head – Business Development (Water Utility), Grundfos Pumps India Pvt. Ltd

Mr. Sanjeev Sirsi joined Grundfos in February 2007 and handles the development business of Water supply, treatment, reuse and the Renewable portfolio for Grundfos in India, Bangladesh, Bhutan and Maldives. He has more than 24 years of industry experience covering marketing, sales, design, and project management. Apart from this, he also has 13 years of international experience working in the Middle East and Australia with renowned pump companies. Mr. Sirsi has a Degree in Production Engineering from Walchand Institute of Technology and a Post-Graduation degree in Marketing Management from Narsee Monjee Institute, Mumbai.

Mr. Manish Sisodia

National Head- Glass Future, Saint Gobain India

Mr. Manish Sisodia is a Management Graduate with an Engineering degree in Mechanical. He has been working in building material industries for almost 13 years. A LEED Green Associate with interest in green and sustainable buildings materials, his major responsibilities include developing market opportunities for high end technological products like Dynamic glass, Switchable glass, Printable glass and many more.

Dr. Chetan Singh Solanki

Professor- Department of Energy Science and Engineering, IIT Bombay

Dr. Chetan Singh Solanki, a Professor at the Department of Energy Science and Engineering, IIT Bombay, specializes in solar cell technologies and PV systems. He is an educator, innovator, researcher, entrepreneur, author and philosopher. He received his Ph.D. from IMEC (Ketholik University) Leuven, Belgium, and currently leads National Centre for Photovoltaic Research and Education (NCPRE, www.ncpre.iitb.ac.in) and Million Solar Urja Lamp project. Dr. Solanki has authored several books on Solar Photovoltaic technologies and published more than 100 research papers. He has been awarded the Young Scientist Award from EMRS and IIT Bombay.

Mr. Simon Stolp,

Lead, Energy Sector, The World Bank, India

Mr. Simon Stolp has led the World Bank's energy sector engagement in Iraq, Palestine and Lebanon, providing technical assistance projects to the energy sector in the Middle East. He joined the World Bank as its Country Manager in Iraq, and managed the Bank's engagement with the Government of Iraq during a period of intense political upheaval, advising on critical decisions about Iraq's national energy strategy. The World Bank's energy sector engagement in India is growing rapidly and providing significant financing and technical support for India's renewable energy development, and to investments aimed at turning around India's financially stressed distribution sector.

Mr. R. Subramanian

Managing Director- Glass & Solutions Business, Saint-Gobain India Private Ltd

Mr. R. Subramanian has been with the Saint-Gobain group in India for over a decade and has played a leading role in the emergence of Saint-Gobain, not only as a reliable provider of innovative and high-quality building products and solutions but also a progressive proponent of sustainability in the built habitat. He is the Chairman of the Glazing Society of India and has been vigorously promoting the cause of more testing infrastructure and certification mechanisms along with having rich experience in the area of standards, testing and certification. He has been actively involved bringing three world class glass testing and research facilities to India.

Mr. Vivek Taneja

Business Head - Ash Management, Thermax Limited

Mr. Vivek Taneja specializes in conceptualization and Incubation of new businesses. He is a seasoned sales and marketing professional with key strengths in business development, marketing, brand building, policy initiatives in clean energy, key account management and channel management. He has spoken at more than 50 International level conferences - mainly on clean technologies across China, Indonesia, Philippines, Vietnam, USA, Ghana, Kenya and India. Mr. Taneja is responsible for global strategic imperative, building relations with FI's / Govt./ Semi Government bodies, Seeking M&A and strategic tie up opportunities, Giving long term perspective to business for sustenance and growth, Seeking new business opportunities - short term and long term, Seeking new markets, Policy intervention for market creation, Process improvement, Operational excellence, Brand creation and sustenance. He acts as techno commercial economist for the Projects group Large multi Million dollar based projects for turnkey / LSTK / EPC basis.

Mr. Jorgen Thomsen

Director, MacArthur Foundation's Climate Solution's Program, USA

Prior to joining the foundation in 2009, Mr. Jorgen Thomsen spent 14 years with Conservation International as Senior Vice President of the organisation's Conservation Funding Division and as Executive Director of the Critical Ecosystem Partnership Fund, which included leading a $260 million grant-making and partnership development facility for civil society organizations in the most biodiversity rich areas of the world. Before this, he, as the chief executive of TRAFFIC, an organization that monitors trade in natural resources, held positions at WWF and IUCN, and in the Danish ministry of environment. Mr. Thomsen holds an MSc in Zoology.

Dr. Rahul Tongia

Fellow, Brookings India

Dr. Rahul Tongia is a scholar and researcher in areas of technology and policy, especially sustainable development, and a Fellow at Brookings India, where he leads energy and sustainability studies. His areas of research are broad with expertise in energy and power. He was the founding Advisor to the Smart Grid Task Force, Govt. of India, and the India Smart Grid Forum. He is also an Adj. Professor, Carnegie Mellon University. Dr. Tongia has a Ph.D. in Engineering & Public Policy from Carnegie Mellon University in 1998 and a Sc.B. in Electrical Engineering from Brown University.

Mr. Rudy Vielvoye

Business Support, BtoB Metier – Engie Corporate, France

Mr. Rudy Vielvoye has 30 years'experience in the B2B business, with 25 years' experience in Energy Efficiency. He joined the Suez Group in 2001, which later became Engie. He has occupied several positions such as Head of EPC projects, Head of Design Office, Manager of Master Agreements for Energy Efficiency. Throughout his career he has mainly worked in the field of Energy Efficiency, managing or participating to key projects in the industrial or tertiary sectors (industrial manufacturing plants, hospital, museums, administrative and commercial buildings, district heating & cooling network).

Mr. Mijo Vodopic

Senior Program Officer, Climate Solutions, Macarthur Foundation, USA

Mr. Mijo Vodopic came to the Foundation from the U.S. Government Accountability Office, where he led evaluations on the Basel II Accord's impact on global and domestic banking competition and the effects of eminent domain actions on property owners and communities. Previously, he was director of property and asset management at Heart-land Housing Incorporated, Earlier, he advocated on behalf of homeless families during a period of welfare reform while at the Los Angeles Coalition to End Hunger and Homelessness. Mr. Vodopic received his Master's degree in Public Policy Studies from the University of Chicago.

Mr. Dhiraj Wadhwa

Director – Integrated Solutions & Key Accounts – CCS India, United Technologies Corporation (UTC)

Mr. Dhiraj Wadhwa (Director – Integrated Solutions & Key Accounts – CCS India) works for United Technologies Corporation – Climate Controls & Security group. He joined Carrier in 2005 and has managed various responsibilities over last 12 years which includes growing and establishing the VRF business and consolidating the commercial applied business for the corporation. A mechanical engineer by qualification with a Post Graduate Diploma in Business Management, he brings industry experience of over 20 years primarily in the HVAC business spread over the light commercial and commercial products. He is currently responsible for Energy Solutions and Strategic Projects Business for UTC – CCS India .

Dr. Rahul Walawalkar

President & MD, Customized Energy Solutions India Pvt. Ltd & Executive Director, India Energy Storage Alliance

Dr. Walawalkar leads the Emerging Technologies practice for Customized Energy Solutions globally with focus on energy storage, renewables, demand response and smart grid technologies. He is the Executive Director of India Energy Storage Alliance. He was a Board member for Energy Storage Association, USA during 2009-15. He has served on EC of AEEE during 2011-13 and 2016-17. He served as member of national taskforce for renewable integration by Central Electricity Authority & Ministry of Power during 2013-14. He holds a Ph.D. in Engineering and Public Policy from Carnegie Mellon University, M.S. in Energy Management from NYIT and B.E. from Walchand College of Engineering.

Mr. Kenichi Yokoyama

Country Director India, Asian Development Bank

Mr. Yokoyama has been ADB Country Director in India since 2017. Prior to his current appointment, he was Country Director in Nepal. Mr. Yokoyama was also Principal Water Resources Specialist in ADB's South Asia Department, responsible for developing water resources projects in South Asian countries including Bangladesh, India, and Nepal. He joined ADB in 1999.

Mr. Christian Zinglersen

Head, Clean Energy Ministerial Secretariat, France

Mr. Zinglersen has previously served as Deputy Permanent Secretary at the Danish Ministry of Energy, Utilities and Climate, as a member of the Ministry's Executive Board, with responsibility for the energy policy portfolio. He was also the Danish government's representative and Vice-Chair of the IEA's Governing Board. Mr. Zinglersen started his career in the Danish Foreign Service, working primarily on EU policy and law. Before moving to the energy field, he served as Lead Negotiator for Denmark in the UN climate change negotiations.

4. SPOTLIGHT SESSIONS CHAIRS AND PRESENTERS

Mr. Belay Zeleke Ayele,

IIT Roorkee

Mr. Belay Zeleke is a PhD student at the Department of Architecture & Planning in Indian Institute of Technology Roorkee. He was working as Lecturer in Architecture and Urban Planning department at Wollega University, Ethiopia from 2011 to 2015 and served as Head of Department for two years. Belay holds an MSc Degree in Urban Design & Development from Ethiopian Institute of Architecture, Building Construction & City Development (Addis Ababa University). Additionally, he earned his first degree in Architectural Design Technology from Adama University, Ethiopia.

Ms. Mujesira Bakovic

Istanbul Technical University, Turkey

Ms. Mujesira Bakovic obtained her Bachelor Degree from Middle East Technical University (Ankara), Department of City and Regional Planning in 2015. Currently being a master student at Istanbul Technical University, Urban Design Program - Graduate School of Science, Engineering and Technology. Since 2016, she is being project assistant at research project 1115Y225 “Post- occupancy evaluation of outdoor spaces in campus buildings with spatio temporal mapping method” funded by TUBITAK (The Scientific and Technical Research Council of Turkey).

Mr. Rajat Batra

STENUM Asia Sustainable Development Society

Mr. Rajat Batra is passionate about empowering enterprises to do better with less and work towards sustainable growth through the Resource Efficient Cleaner Production (RECP) approach. He leads the team at STENUM Asia Sustainable Development Society (an organisation he co-founded in 2007) in training, consultancy, audit and implementation support for enterprises. He has been actively practicing RECP at various levels for over a decade including undergoing extensive training on sustainable development in Europe. With over 20 years of experience managing manufacturing operations, also as an entrepreneur, he brings to STENUM Asia a deep understanding of the issues and challenges businesses face.

Ms. Frances Bean

Project Manager, Buildings Performance Institute Europe, Belgium

Ms. Frances Bean is Project Manager at the Buildings Performance Institute Europe (BPIE), with over 10 years of experience working on energy efficiency, climate change and the wider environmental policies. She currently manages projects on smart buildings and building performance policies. She was Policy Director at Stefan Scheuer Consulting, working on energy efficiency policies. Since graduating with a degree in Environmental Science from the University of East Anglia in the UK, she has worked for the UK Government Department for Environment, Food and Rural Affairs, the UK electricity and gas regulator and the UK Energy Saving Trust (EST).

Mr. Jaydeep Bhadra

CEPT University

Mr. Jaydeep Bhadra is currently working as an Energy Efficiency Consultant in Waterhouse-Coopers Pvt. Ltd, India. He has a Master's degree in Building Energy Performance, from CEPT University. He has over one year of experience in the field of energy efficiency and 2 years of experience in the construction industry. He has been a key member in consultancy services for removing barriers for Energy Efficiency in Cabo Verde Building sector. As a part of this research, he has developed passive design indices and a tool to quantify the potential of passive design strategies for 59 Indian cities. His key area of interests is energy efficiency in buildings, passive and low energy cooling and driving energy efficiency programs in developing countries.

Mr. Prashant Bhanware,

Indo-Swiss Building Energy Efficient Project

Mr. Prashant Bhanware is an energy engineer with core expertise in building energy simulation, energy efficiency, and renewable energy. He is a BEE certified Energy Auditor & ECBC Master Trainer. He has more than 13 years of experience in the energy sector in research and consultancy. He is working at Greentech Knowledge Solutions Pvt. Ltd. for past 9 years and part of Indo- Swiss BEEP PMTU since its inception. He has worked with The Energy and Resources Institute & International Institute for Energy Conservation where he worked on projects on renewable energy, resource assessment, energy master planning, demand side management, energy efficiency, and energy audits.

Mr. Rajkiran V Bilolikar

Associate Professor- ASCI

Mr. Rajkiran V Bilolikar is currently working as an Associate Professor in Energy Area, in the Centre for Energy, Environment, Urban Governance and Infrastructure Development of Administrative Staff College of India, Hyderabad. Mr. Bilolikar has been working in various capacities from last 16 years in Electricity Distribution Management, Energy Conservation and Energy Efficiency in Buildings, Techno economic feasibility studies, Regulatory affairs of Electricity Industry, Tariff analysis, Annual Performance analysis of Power utilities, IT application development in utilities and Renewable Energy and its integration in India. Government of Andhra Pradesh appointed him as a member its of Technical Committee.

Ms. Olga Chepelianskaia

Uniciti, France

Ms. Olga Chepelianskaia is an international sustainability expert. She specializes on sustainable and climate resilient urban development in Asian cities, climate change and clean energy. Over 13 years of her professional engagement, she managed 5 major international programs, covered over 20 cities and 40 countries, and worked with 7 top international institutions. Her focus is on helping Asian cities become vibrant, sustainable, climate resilient, economically dynamic, inclusive and unique. At present, she assists UNDP Asia-Pacific with developing the Regional Urban Climate Resilience Initiative and leads the scoping program SEHER INTACH: Sustainable Cities through Heritage Revival within the Indian National Trust for Art and Culture Heritage.

Dr. Koshy M Cherail

President, Alliance for an Energy Efficient Economy

Dr Koshy Cherail worked with the Core Team of CEOs and partner organizations to incorporate AEEE. He is the nominated President of the AEEE Secretariat, and is the Secretary to the Board of Directors (the Executive Council). He has over 28 years of experience in program implementation, policy analysis and consulting with various bilateral and multilateral agencies, including World Bank, USAID and GTZ. He has a PhD in Economics from University of Madras.

Ms. Saswati Chetia

Sr. Programme Officer, Greentech Knowledge Solutions

Ms. Saswati Chetia holds a Bachelor's degree in Architecture from NIT, Bhopal and Master's degree in Environmental Planning from SPA, Delhi. She has previously worked as a green building consultant and is a certified GRIHA trainer and evaluator.

Dr. Meredydd Evans

Integrat Analys & Dec Sci Team Scientist, Pacific North-west National Laboratory, USA

Dr. Meredydd Evans is an energy policy and finance expert with over 20 years of international experience. She has worked on energy efficiency and clean energy policies and projects in numerous countries. She is a senior staff scientist at the Pacific Northwest National Laboratory, where she is managing a program on international sustainable energy, including efforts on building energy efficiency, policies and mechanisms to reduce short lived forcers, and energy data for policy and clean energy investments, among others.

Dr. Vishal Garg

Associate Professor, International Institute of Information Technology (IIIT), Hyderabad

Dr. Garg's areas of interest are, Task control of lighting, heating, air-conditioning using fuzzy logic, smart occupancy sensors, fuzzy logic based protocol for wireless sensors network, intelligent building, I.T. in building science(CBS, EERC). He has a Ph.D. from IIT Delhi.

Mr. Vivek Gilani

cBalance Solutions

Mr. Vivek Gilani is an Ashoka Fellow, an Environmental Engineer with consulting experience in GHG mitigation, energy conservation, water and wastewater treatment, and a BEE Certified Energy Auditor. His is the co- founder of the India-specific carbon footprinting body for individuals: no2co2.in. He is the Director of cBalance Solutions and has been appointed for conducting GHG Inventory and Green Roadmap Development of the IPL and Shanghai World Expo by the UNEP. He is the co-creator of the 'Fairconditioning' program which integrates building sustainability and efficiency into architectural and HVAC-engineering curricula, architecture & HVAC consulting firms, and commercial enterpises through capacity building activities.

Mr. Rajendra Giri

Mangalam Cement Ltd.

Mr. R Giri has 38 years of working experience in the industry, out of which 35 years were at M/s. Mangalam Cement Limited, Aditya Nagar, Morak. He is presently working as Vice President (Electrical & Instrumentation) and is responsible for overall management of Electrical, Instrumentation and Technical Cell departments. His interest lies in implementation of Energy conservation measures and plant optimization. He works as a TPM Coordinator for implementation of TPM activities in the plant and also coordinates for Functional Improvement Teams of different sections of plant working for optimization of Process.

Mr. E Nand Gopal

The Energy & Resources Institute, (TERI)

Mr. E Nand Gopal is an Associate Fellow in the Industrial Energy Efficiency Division at The Energy and Resources Institute (TERI) in New Delhi. The division undertakes research projects on energy efficiency improvement and low carbon technologies promotion among large and small-scale industries. He has five years of experience in the energy and environment sectors with TERI. Mr. Gopal has conducted energy efficiency studies in over 200 foundries across India and had international exposure in Japan and Indonesia. He has been part of several research projects in these fields and has published numerous articles in international and national forums.

Mr. Amal Jaiswal

Business Development Manager, Siemens Ltd.

Mr. Amal Jaiswal is the Business Development Manager for Building Performance & Sustainability under Siemens Building Technologies BU. With over 7 years of experience in HVAC and 3 years in Energy Conservation through Automation, he has wo the best Energy Efficiency Solution in ACREX 2017; and played a key role for growth of BPS business by 4 times.

Mr. Chillayil Jayaraman

Amrita University

Mr. Jayaraman has 28 years of industrial experience. Currently, he is pursuing his PhD in Energy Management from Amrita University. He was a recipient of the Fulbright Nehru Environment Leadership Fellowship (2010), has received an award from the government of Kerala for Individual Contribution in Energy Conservation (2009) and the P S Gopinathan Nair memorial Environment Award (2013). He is one of the founder members of the first professional body of certified energy managers and auditors SEEM (Society of Energy Engineers and Managers). He is a certified energy auditor and has conducted more than 50 energy audits.

Mr. Lalit Kumar Joshi

Senior Consultant, Rajasthan Renewable Energy Corp. Ltd.

Mr. Lalit Joshi has been working in the area of energy conservation as Senior Consultant (PAT) at Rajasthan Renewable Energy Corp. Ltd, Jaipur. An Electrical Engineering graduate from MNIT, he has done his M.Tech. in Environmental from the same institute. The research and academic interests include energy efficiency in buildings, water use optimisation & recycling, renewable energy. He is also a BEE energy auditor and has served through various assignments, numerous industries and institutions. He has handled multi-disciplinary engineering management functions during more than three decades of experience with industries. He is pursuing his PhD (Environment and Energy) at MNIT Jaipur.

Ms. Geetali Kalita

Senior Manager (Technical Services), Numaligarh Refinery Limited

Ms. Geetali Kalita is the Senior Manager (Technical Services), Numaligarh Refinery Limited which delivers service in the energy section. Her keen interests are in energy optimization, benchmarking study of fuels refinery and alternative and renewable energy sources for energy security. She is a certified Energy Auditor from BEE. She has an experience of 18 years in Quality control and Production planning and Technical Services.

Ms. Vernica Prakash Kapoor

Officer, Indo-Swiss Building Energy Efficiency Project

Ms. Vernica Kapoor is a Project Officer with the Indo-Swiss Building Energy Efficiency Project (BEEP), which is a bi-lateral cooperation between the Government of Switzerland and Government of India. She is an architect by basic training and holds a master's degree in Public Policy & Sustainable Development from TERI University, New Delhi. She is also an IGBC Accredited Professional. Her primary role in BEEP is to manage and implement technical activities under the project in the selected states. In this regard, she works closely with the Bureau of Energy Efficiency and the state PWD's for the implementation of EE measures in the public buildings under this programme.

Dr. Radhika Khosla

Fellow, Centre for Policy Research

Dr. Radhika Khosla works on the integrated nature of India's energy sector to examine the linkages between energy, development and climate change, particularly in urban areas. She also focuses on the demand side of Indian energy, with attention to the technological, institutional and behavioural aspects of energy use and its lock in to a rapidly growing built environment. In addition, her work examines the analytic and strategic dimensions of India's energy and climate policies. She is a Visiting Scholar at MIT's Energy Initiative, and a Visiting Scholar at the Kleinman Center for Energy Policy, University of Pennsylvania in the fall of 2017.

Mr. Nagahari Krishna L

Director, Danfoss

Mr. Krishna leads the Corporate Communications, Marketing and Industry Affairs function at Danfoss India. In this capacity with a leadership role, he focuses on Business Development and knowledge positioning of Danfoss India. He is one of the key members to support the company's continued growth expansion in the country. He is an expert in brand marketing, corporate communications/ public affairs, and is a corporate strategy specialist. He is a mechanical engineer with marine and controls specialization and is an alumnus of IIM Calcutta. He is a member of the CII National Task Force on cold chain and plays an active role in energy efficiency committees at various industry and governance forums.

Ms. Sumathy Krishnan

Executive Director, Technology Informatics Design Endeavour (TIDE)

Ms. Sumathy Krishnan is the Executive Director at Bangalore based NGO, Technology Informatics Design Endeavour. She has been in the development sector since 2010 after 13 years in corporate holding various applied technology related positions. At TIDE, she conceptualizes programs in which Science & Technology solutions impact communities positively and sustainably. VidyutRakshaka literally translating to 'Saving electricity' is her brainchild. It is a simple, technologically sound and highly effective intervention leading to voluntary reduction in electricity consumption. The success of this model indicates her belief that technology solutions can deliver tremendous societal impact, when leveraged appropriately.

Mr. I V Ramesh Kumar

Maruthi Consultants

Mr. Kumar, since 1990 is the Chief Executive of Maruthi Consultants, Hyderabad. His core competencies are in energy efficiency studies, safety audits, due diligence studies and he has recognized expertise and experience of about 30 years in this field. He has handled projects of World Bank, Asian Development Bank and also international agencies viz. USAID, UNIDO, UNEP etc. He is the accredited energy auditor of Bureau of Energy Efficiency (BEE), Govt of India. He is a faculty member for training programmes on Energy Management and Green Productivity.

Mr. Pushkar Kumar

GM, EcoEnergy

Mr. Pushkar Kumar is a serial entrepreneur and business leader with over 15 years in the fields of strategic business development and manufacturing. He is currently the GM & Industrial Practice head of EcoEnergy, a division of United Technology, CCS and also serves on board of a different manufacturing and technology companies. Earlier he had founded a CleanTech/ Chemical company (GreenMantra) and as its President and CEO raised multi-million dollars and grew a lab scale waste-to-value technology to a fully operational commercial business with a robust sales pipeline.

Mr. Rajiv Kumar

Small Industries Development Bank(SIDBI)

Mr. Rajiv Kumar is presently, deputed to India SME Technology Services Limited (ISTSL), a Joint Venture of SIDBI and four banks i.e. State Bank of India, Oriental Bank of Commerce, Indian Bank and Indian Overseas Bank. He has worked over 25 years in Small Industries Development Bank of India (SIDBI) and Allahabad Bank (AB). He headed the Energy Efficiency Centre of SIDBI for almost 7 years till July 2017. He has been involved in developing & operating innovative financial products for MSMEs in the area of Energy Efficiency / Cleaner Production / Renewable Energy, etc. through international partners.

Mr. Sachin Kumar

The Energy & Resources Institute (TERI)

Mr. Sachin Kumar is working as Fellow in Industrial Energy Efficiency Division at TERI, Delhi, India. He has more than 18 years of experience in the field of energy conservation and environment improvement in industrial sector and has been with TERI for the past 13 years. He has successfully executed a number of projects related to energy efficiency, technology demonstration, policy, management and capacity building in different industry sectors. He is closely involved with the clay-fired brick sector on various aspects related to energy, environment and social domain.

Mr. Dilip Limaye

President & CEO,
SRC Global Inc., USA

Mr. Dilip Limaye is President and CEO of SRC Global Inc. and is internationally recognized as a pioneer and an entrepreneur with over 45 years of experience in energy efficiency (EE), renewable energy (RE), and energy service companies (ESCOs). He is a senior advisor and consultant to the World Bank, Asian Development Bank, IFC, IEA, UNEP, UNDP, USAID and other donor agencies on financing and implementation of clean energy to mitigate climate change impacts. He has extensive experience in India over the last 25 years, including assistance in the development of the Energy Conservation Act, 2001 and development of guidebooks for financing energy efficiency and renewable energy. He has also completed the Executive Program on Global Climate Change and Economic Development at Harvard University.

Dr. Sameer Maithel

Director, Greentech Knowledge Solutions

Dr. Sameer Maithel is the Founder Director at Greentech Knowledge Solutions. He holds BE (Mech) from MNIT, Jaipur followed by M. Tech. & Ph.D. degrees in Energy Systems Engineering from IIT, Bombay. His main areas of interest are energy planning, monitoring and analysis of renewable energy and energy efficient technologies, building energy efficiency, dissemination of clean energy technologies. He has around 23 years of experience in industry, research and consulting. Prior to starting Greentech, he has worked with ONGC and TERI (The Energy and Resources Institute) and was the Director of Energy Environment Technology Division at TERI from 2003 to 2006.

Ms. Sumedha Malaviya

Senior Project Associate, World Resources Institute

Ms. Sumedha Malaviya is a Senior Project Associate with the WRI India's Energy Program. Her primary focus at WRI is energy efficiency where she is working to expand WRI's building efficiency work in India. She also supports India Energy Programs' efforts in improving energy access, scaling up renewable energy deployment and Integrated Resource Planning. She previously worked at ICF International providing consultancy on energy efficient appliances, Demand Side Management and Low Emissions Development projects. She also has some research experience working at the Indian Institute of Science on climate change vulnerability and adaptation and has published articles in peer reviewed journals.

Mr. Naga Venkata Sai Kumar Manapragada

IIIT Hyderabad

Mr. Naga Venkata Sai Kumar Manapragada has completed his Bachelor in Architecture in 2016 from Jawaharlal Nehru Architecture and Fine Arts University in Hyderabad, Telangana. He worked with Ar. Hsieh Ying Chun to design earth quake resistant vernacular envelope for post earthquake housing project in Katunje, Nepal. Presently, he is doing MS by research in building science on the topic 'Impact of Climate Change on Urban Residential Energy Demand in Tropics' with the guidance of Dr. Vishal Garg.

Ms. Sangeeta Mathew

Program Manager, Alliance for an Energy Efficient Economy

Ms. Sangeeta Mathew joined AEEE as a Program Manager in October 2014, after a 20 year career in the telecom industry. She conducts policy research in buildings & appliances. Her most recent work includes policy research to promote sustainable space cooling, building energy performance data frameworks, Energy Efficiency scorecards, assessment of the Standards and Labelling program for energy efficient appliances, M&V application guide for energy efficient street lighting and utility DSM initiatives. In her 20 year career in Information and Communication Technology she developed network products and operational support systems, and performed data analytics to improve efficiency in network repair and customer support.

Dr. Jyotirmay Mathur

Professor, Malaviya National Institute of Technology, Jaipur

Dr. Mathur works in the field of energy planning and modeling, building energy simulation, energy conservation in buildings, and life cycle assessment of renewable energy systems. He has in his credit 65 journal papers, more than 150 talks, and several research projects including 3 international collaborative projects besides having supervised 10 Ph.D. scholars. Current activities include studies on adaptive thermal comfort, modeling of passive and low energy cooling systems, development of standards and codes for energy efficiency, long term energy system modeling penetration of renewable energy. He has a Ph.D. from University of Essen, Germany and M. Tech. from IIT Delhi.

Mr. Apoorv Nagpal

Associate, Tetra Tech

Mr. Apoorv Nagpal is an Associate with Tetra Tech. He has over 5 years of experience in the field of Energy Efficiency (EE) and Renewable Energy (RE). He has previously worked with Emergent Ventures and Indus Environmental Services. He has worked across a wide range of sub-sectors in the field EE and RE, including but not limited to consulting, project development, feasibility studies and Technology Needs Assessments. His experience includes project execution, research and analysis, stakeholder consultations, preparing feasibility reports, market surveys, etc.

Ms. Sakshi Nagpal

CEPT University

Ms. Sakshi Nagpal is an architect by profession and is currently working with Arteform Design Pvt. Ltd. in Gurgaon. She has completed her masters' in Interior Architecture and Design with specialization in Building Energy Efficiency from CEPT University in July 2017. She believes in creating spaces that are climate responsive. Her interest in Interior architecture over the period has made her believe that the interiors of a place are like the ingredients of a dish that makes it taste delicious.

Ms. Kopal Nihar

International Institute of Information Technology

Ms. Kopal Nihar is currently pursuing a dual degree program in Building Science and Engineering from IIIT Hyderabad, under the guidance of Dr Vishal Garg. Her areas of interest include building physics, cool roof, calibrated building simulations, demand response strategies and analysis of distributed energy sources in a microgrid.

Dr. Mahesh Patankar

Managing Director, MP Ensystems Pvt. Ltd.

Dr. Mahesh Patankar has over 20 years extensive experience in the energy and environmental fields and is the Founder and Managing Director at MP Ensystems Advisory Private Limited. He is a Member of Energy Committee of Indian Merchant Chambers, Executive Council Member of Alliance for Energy Efficient Economy, participating member of the DSM Consultation Committee of MERC. He is an international energy policy expert with direct experience with several donor and financing entities. He has worked extensively with Indian regulators and utilities in India and outside India with specific clean energy related experience with the private sector companies.

Mr. Sibaji Pattanaik

Aditya Birla Management Corporation (P) Ltd

Mr. Sibaji Pattanaik is currently working with Aditya Birla Management Corporation (P) Ltd. He is an accredited energy auditor by the Bureau of Energy Efficiency (BEE). He is an associate member of the IE (India) and is a certified M&V professional by EVO (US). He has work experience in energy auditing in industries & commercial building, power quality audit, electrical safety audit and commercial building green facilitation as per TERI Griha, commissioning documentation as per LEED for green buildings. He has worked on energy projects in the chemical, textile, pharmaceutical, and the food processing industry sectors.

Mr. Shiva Krishna Pavuluri

L&T Constructions

Mr. Shiva Krishna Pavuluri at present, holding Assistant Engineering Manager in Centre for excellence & Futuristic department (CEFD), Building & Factories IC, L&T Construction. He has been working in the field of energy audits, life cycle assessment, life cycle costing, energy optimization of a building and thermal comfort analysis for the last 3 & half years. He is also actively involved in carbon foot print analysis in residential and commercial buildings. He is proficient in using building simulation and analysis tools like Gabi, Energy plus, Design Builder, Ecotect, etc. He is also facilitating green building projects.

Mr. Rajeev Ralhan

Director, PwC

Mr. Rajeev Ralhan has developed the business plan of 1st Super ESCO in India, which is paving way for various market transformation initiatives. He is an international expert on advising governments on standards & labelling program designs/implementations. He has advised policy makers in India, Ghana, Bangladesh, Maldives, Egypt, Bhutan, Cambodia, European Commission and more.
Mr. Ralhan has extensive experience in designing and implementing standard & labelling program for air conditioner program/HVAC program in India. He is also leading the "AC Challenge program" in India. This is a prestigious initiative of US-DoE as part of India- US Cooling Collaboration. This program targets to reward super efficient air conditioners sold globally promotes innovation.

Mr. Ananthakrishnan Ravi

Greentech Knowledge Solutions Pvt. Ltd.

Mr. Ravi is working with GKSPL on technology evaluation of alternate walling materials, performance of brick kilns and training and capacity building. Prior to this, he has worked in a cement industry for 2 years in the fields of process and energy optimization. He holds a Bachelor's (Energy) from NIT-Bhopal.

Mr. Rahul E Ravindranathan

ICF Consulting

Mr. Rahul E Ravindranathan is an energy efficiency and DSM professional with about 7 years of experience in the field. He has worked extensively on project appraisal and feasibility analysis of energy efficiency projects for municipalities, agriculture, industries, buildings, etc. He has also worked with the governments as well as donor agencies on framework and policy development related to energy efficiency in India and few other Asian countries. He has completed his Bachelors in Technology (Electrical Engineering) from National Institute of Technology, Calicut (India) and M.B.A. in Energy & Environment from Symbiosis International University, Pune (India).

Ms. Monisha Royan

CEPT University

Ms. Monisha Edwina Royan G is an architect, currently working as an assistant professor at C.A.R.E school of Architecture, Trichy. She holds an International Masters of Interior Architectural Design, specialised in Building Energy Efficiency from CEPT University, Ahmadabad, 2017 and Bachelors of Architecture from Thiagarajar college of Engineering, Madurai. She was a part of a studio design project "PAGOZILLA" at HFT, Germany which was featured in "Stuttgarter Wochenende", 2017. Her project on "Green Junctions" won jury commendation for the urban innovation challenge at the 12th International conference & exhibition on emerging trends in sustainable habitat and integrated cities 2014, Gujarat.

Prof. Paul Ruyssevelt

Chair of Energy & Building Performance-Bartlett School Environment, Faculty of the Built Environment- University College London

Mr. Paul Ruyssevelt is an architect with 30 years' experience in the field of low energy and sustainable buildings. In 1984 designed a group of superinsulated houses which he went on to help build, live in and monitor for 3 years. He has run an energy monitoring company and, for ten years, managed the energy team at the major engineering consultancy. He was UK MD at Energy for Sustainable Development Ltd from 1999 and in 2008 he became Strategic Projects Director for ESD's parent Camco. Prior to joining UCL he worked with the Technology Strategy Board.

Ms. Sneha Sachar

National Grid, USA

Ms. Sneha Sachar is an energy professional with significant experience in energy efficiency, utility DSM, and strategic energy management. She is passionate about developing market transformation strategies that influence how energy decisions are made at micro and macro levels. She has about 20 years of professional experience, working in the United States and in India. Until recently, she was working with National Grid USA, developing Energy Efficiency programs and integrated energy solutions for commercial and industrial sector. Presently, she is working with AEEE. In her current role as the Senior Program Lead, she manages AEEE's portfolio of technical projects and research supporting an energy efficient built environment and urban infrastructure.

Mr. Girish Sethi

Senior Fellow and Senior Director, The Energy and Resources Institute (TERI)

Mr. Girish Sethi leads and manages the programme on promoting efficiency in the industrial sector, encompassing both large industries and Small and Medium Enterprises (SMEs). He has more than 23 years of experience in the field of energy conservation and environment improvement in the industrial sector and has been with TERI for the past 15 years. He is a Chemical Engineer with Masters in Energy Studies from IIT, New Delhi. He has also completed a multi disciplinary Masters course on "Technology in the Tropics" from University of Applied Sciences, Cologne, Germany.

Mr. Seemant Sharma

Johnson Controls

Mr. Seemant Sharma is a member of ISHRAE and ASHRAE and has been associated with air conditioning industry for over 25 years in the field of Sales, System Design, Projects & Service of HVAC equipment, Building Automation and Refrigeration equipment. Has been working with Johnson Controls for past 18 years with last assignment as Director Sales, India and presently working as Director, Product Portfolio Management for Chiller Solutions, supporting Asia and Application Engineering for Middle East countries. Mr. Sharma has been actively involved in various industry initiatives like Chiller Standards and ECBC 2017 on behalf of RAMA. He was the Chairman of ECBC2017 -RAMA Sub Committee and is also an Active Member – RAMA-ISHRAE committee for forming new India Chiller Performance Standards.

Ms. Mohini Singh

Alliance for an Energy Efficient Economy

Ms. Mohini Singh's work focuses on low carbon urban growth through sustainable and energy efficient initiatives in residential and commercial buildings. At AEEE, she is involved in projects focusing on sensitising the Indian States and UTs on building energy efficiency policies and building sector cooling demand, its management and energy savings potential. Prior to AEEE, she worked with Synurja, on developing energy data framework for commercial buildings. She has also been a part of GRIHA team and was involved in developing GRIHA Large Development (LD) rating version 2015, GRIHA LD heat island impact calculator, evaluating GRIHA, GRIHA LD and GRIHA pre certification projects; and conducting GRIHA workshops across India. She is an architect by training with graduation from NIT Jaipur and postgraduate specialisation in Environmental Planning from CEPT University and is a GRIHA Evaluator and an EDGE expert.

Mr. Govinda Somani

Technical Expert - Energy Efficiency Building Programme, GIZ

Mr. Govinda Somani is a post graduate in M.Sc. Environmental Design and Engineering from Bartlett (BSGS), University College London, UK and a graduate in Architecture from Indian Institute of Technology (IIT) Kharagpur. He has over seven years of experience in policy design, market assessment, sustainability, technical analysis, financial analysis, project management, and strategies & implementation. Currently, he is working as a Technical Expert at GIZ-India energy efficiency in residential buildings. His key focus areas are energy efficiency code development, code implementation, policy design, standards and labelling, and energy efficient building design & implementation.

Mr. Umashankar Sreenivasamurthy

ITC Infotech

Mr. Umashankar S. is currently a Principal Consultant in the Energy Analytics practice of Business Consulting Group at ITC Infotech India Limited, Bangalore. He has 13 years of experience in manufacturing and consulting, covering areas of production, energy efficiency audits, environmental management and policy analysis. He is involved in leveraging data analytics to help businesses optimize resource use. He published a book on the comprehensive environmental rating of Indian steel industries for the United Nations Development Programme (UNDP) and the Environment Ministry, Government of India. Umashankar holds an MPhil degree in Engineering for Sustainable Development from University of Cambridge, UK.

Ms. Marisa Uchin

Head of Global Regulatory Affairs, Oracle Utilities

Ms. Marisa Uchin is Head of Global Regulatory Affairs for Oracle Utilities where she leads a team that is responsible for expanding markets for Oracle's utility solutions, and shaping regulatory and legislative policy that advances utility investment in technology innovation. She has engaged as a utility and policy expert in multiple regulatory proceedings related to grid modernization, incentive based ratemaking, utility business model transformation, and demand side resource planning. Prior to this, Marisa was at Pacific Gas and Electric Company, where she held a variety of roles including Sr. Manager of Customer Energy Solutions and Manager of Federal Affairs where she led policy strategy on a broad set of issues including climate change, natural gas distribution and transmission, energy efficiency, renewables, and transportation electrification. She is a graduate of Wesleyan University and holds a MBA from the Ross School of management.

Ms. Shruti Vaidyanathan

American Council for an Energy Efficient Economy, USA

Ms. Shruti Vaidyanathan is Senior Advisor for Research at ACEEE and helps coordinate research efforts organization wide. She has 10 years' experience in transportation efficiency issues and her work has most recently focused on improving mobility at the state and local levels and on evaluating the life-cycle emissions of vehicles as lead analyst for ACEEE's Greenercars.org. In addition to her Transportation expertise, She also leads International research for ACEEE. She holds a Master's of Science in public policy and management from the Heinz College at Carnegie Mellon University and a bachelor of arts in economics and environmental studies from Grinnell College.

Dr. Archana Walia

Director, India Programs, CLASP

Dr. Walia is a development professional with 23 years of experience on policy & program strategies in the field of energy and environment. As Director- CLASP/India, she provides leadership and strategic direction to all programs to ensure the efficient use of resources and achievement of results and overseas India's participation in the Global programs under CEM. She served as the deputy director, Energy and Environment, USAID providing intellectual leadership to programs on clean energy, sustainable landscape and water, which includes financial, institutional, technological and environmental costs and benefits analysis of various regulatory and policy measures.

Dr. Komali Yenneti

University of New South Wales, Australia

Dr. Komali Yenneti, PhD (Human Geography), M.Plan (Environmental Planning), B.Arch, RACA, is New Generation Network (NGN) Scholar in the Faculty of Built Environment, University of New South Wales and an Honorary Fellow at the Australia India Institute based at the University of Melbourne. Her research focuses on low carbon development, urban vulnerability and resilience, and energy transitions in the Asia-Pacific. She has international experience working with reputed organisations, including Chinese Academy of Sciences, German Development Institute (DIE), and Institute for Global Environmental Strategies (IGES) and is the founding chair of International Geographical Union (IGU) – Young and Early Career Geographers Task Force.

5. SESSIONS OVERVIEW

List of Acronyms

ACEEE	American Council for an Energy Efficient Economy
ADB	Asian Development Bank
AEEE	Alliance for an Energy Efficient Economy
BAT	Best Available Technologies
BEE	Bureau of Energy Efficiency
CEM	Clean Energy Ministerial
CII	Confederation of Indian Industry
CLASP	Collaborative Labeling and Appliance Standards Program
CPR	Centre for Policy Research
CSR	Corporate Social Responsibility
DSM	Demand Side Management
DST	Department of Science and Technology
ECBC	Energy Conservation Building Code
EE	Energy Efficiency
EESL	Energy Efficiency Services Limited
EPC	Energy Performance Certificates
ESCERTs	Energy Saving Certificates
ESCO	Energy Service Company
GDP	Gross Domestic Product
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HFO	Hydrofluoroolefin
IEA	International Energy Agency
IESA	Indian Energy Storage Association
IFC	International Finance Corporation
IIIT	International Institute of Information Technology
IIT Bombay	Indian Institute of Technology Bombay
INSPIRE	International Symposium to Promote Innovation & Research in Energy Efficiency
IoT	Internet of Things
IPEEC	International Partnership for Energy Efficiency Cooperation
ISEER	Indian Seasonal Energy Efficiency Ratio
ISHRAE	Indian Society of Heating, Refrigerating and Air Conditioning Engineers

List of Acronyms

JICA	Japan International Cooperation Agency
KEA	Korea Energy Agency
LBNL	Lawrence Berkeley National Laboratory
MICRO	Microgrid Initiative for Campus and Rural Opportunities
MNIT	Malaviya National Institute of Technology
MoEFCC	Ministry of Environment, Forests and Climate Change
MSME	Ministry of Micro, Small and Medium Enterprises
NCAP	National Cooling Action Plan
NDC	Nationally Determined Contributions
NPC	National Productivity Council
NRDC	National Resources Defense Council
ODS	Ozone Depleting Substances
PAT	Perform Achieve Trade
PRSF	Partial Risk Sharing Facility
RMI	Rocky Mountain Institute
SERB	Science and Engineering Research Board
SIDBI	Small Industries Development Bank of India
SME	Small and Medium-sized Enterprises
SoUL	Solar Urja Lamps
SREDA	Sustainable and Renewable Energy Development Authority
TERI	The Energy and Resources Institute
TIFAC	Technology Information Forecasting and AssessmentCounci
USAID	United States Agency for International Development
UTC	United Technologies Corporation

Introduction

A. Background and objectives

India is undergoing rapid urbanisation - nearly 590 million will live in urban regions of India by 2030. By then, urban growth will likely account for 70 - 75 % of the Gross Domestic Product (GDP) of the country. This magnitude of urbanization will accelerate the infrastructure led development that India is already pursuing and exert substantial pressure on the energy and environmental resources. To reap the advantages of urbanisation and economic development, and simultaneously tackling negative energy and environmental externalities, energy efficiency is a constructive and an economically pragmatic way forward. Using energy judiciously is a critical part of the solution for meeting India's rapidly increasing energy needs, for addressing the energy security challenges, and for fulfilling India's global climate change commitments through Nationally Determined Contribution (NDC) targets under the Paris Accord.

Against this backdrop, Energy Efficiency Services Limited (EESL), Alliance for an Energy Effi cient Economy (AEEE) and the World Bank, along with several other supporting organizations and institutions – the Bureau of Energy Efficiency (BEE), The Energy and Resources Institute (TERI), the Department of Science and Technology (DST) under the Government of India, and MacArthur Foundation - organized the "International Symposium to Promote Innovation & Research in Energy Efficiency 2017 (INSPIRE-2017)".

Public sector organizations along with think tanks and other public and private sector and civil society organisations, supported by bilateral and multi-lateral development banks, have been working proactively to scale up and transform the energy efficiency markets and policies in India. This fla gship conference for the energy efficiency community offers a unique platform where discussions on energy efficiency policies, market transformation strategies, emerging technologies, delivery and business-model driven transformations can occur within an analytical framework facilitated by technical papers and thought-provoking dialogue. The 5-day confluence of global and national thought-leaders and implementers is designed to expand perspectives on energy efficiency and spur ideas and solutions that will help leverage the full potential of energy efficiency and bring its multiple co-benefits to the fore.

B. Organization of the conference

In its first edition, this conference, held in Jaipur at the Hotel ITC Rajputana, was inaugurated on the 27th of November, 2017 and closed on the 1st of December, 2017. There were over 300 participants from ministries and departments under Government of India, State Designated Agencies, officials from energy efficiency services around the world, think tanks from a variety of countries, Indian and international academic and research institutions, multilateral development financing institutions, bilateral development agencies and foundations, financial institutions, private sector technology companies and end-use customers from the government, build-ings and industrial sectors. The conference featured 31 session chairs, 61 speakers and four plenaries.

The Inaugural Session on 27th November consisted of addresses by a range of senior-level speakers from the Government of India, The World Bank, Government of Rajasthan, EESL, BEE, and AEEE.

The Inaugural Session was followed by a Keynote Address by Dr. Amory Lovins of the Rocky Mountain Institute, which set the tone of the conference by reinforcing the vast magnitude of energy efficiency as a resource, and highlighting empirical evidence that energy efficiency can produce expanding returns. Over a period of five days, the conference featured four plenaries, seven Executive Panel Discussions, and 64 technical papers organized in three parallel tracks: 1. Buildings, Systems and Technologies 2. Business, Industry and Finance 3. Codes, Standards and Policies.

Additionally, the conference featured topics of special interest, such as the Ministry of Environment, Forest and Climate Change-led stakeholder workshop discussing the development path of a National Cooling Action Plan and a techno-buzz session featuring technology innovations. Other activities included: a press conference, a site visit, and an evening of local cultural entertainment for participants.

DAY 1 Inaugural Session followed by Keynote Speech by Dr. Amory Lovins and Executive Panel Discussions

Inaugural Session

Mr. Saurabh Kumar, Managing Director, Energy Efficiency Services Ltd. (EESL), India
Ambassador Satish C. Mehta, I.F.S. (Retd.), Senior Advisor, EESL
Mr. John Roome, Senior Director, Climate Change, The World Bank
Mr. Abhay Bakre, Director General, Bureau of Energy Efficiency (BEE), India
Mr. Ashok Jain, I.A.S., Chief Secretary, Government of Rajasthan
Dr. Satish Kumar, Executive Director (Interim), AEEE, India

In his Welcome Address, Mr. Saurabh Kumar traced BEE's history and EESL's importance in terms of moving the market for energy efficiency through several initiatives led by the LED revolution, and expected replication in sectors such as water pumping and cooling.

Ambassador Satish C Mehta highlighted EESL's successful market transformation tactics through demand aggregation, citing the example of distribution of 277 million LEDs that helped offset carbon emissions by 27 MT a year. The success of this initiative was due to transparent operations, large volumes, innovative marketing, and outreach. He expressed hope that the conference would generate the next set of new ideas for cost reduction, new technologies and most importantly, collaboration while implementing projects. In his Special Address, Mr. John Roome, pointed out the huge opportunities that climate change presented along with the challenge it posed to life as we know it today. Noteworthy points from the COP meeting in Bonn, early in November, 2017, that set the context for activities oriented towards energy efficiency were: (i) The Paris Agreement had all countries on board (ii) a grave warning had been sounded by 15,000 climate scientists that implementation of the Accord was not on the required scale (iii) technology had advanced but the limited scale of implementation was a major challenge (iv) encouraging participation by both the private and public sector. With two-thirds of GHG emissions from energy-related activities, energy efficiency is clearly the key to the future, promising massive co-benefits in terms of health, employment, environment and security. Important questions remain though in the face of significant market barriers, financial mechanisms, policy, regulation.

As the world's third-largest consumer of energy, the path India takes in the direction of energy efficiency is of significant importance for tackling global warming. Cognizant of the fact that climate change will result in poverty among 100 million people in the absence of concerted action, the World Bank has initiated action, centering its efforts on energy efficiency. The World Bank will support innovative instruments, credit lines, risk guarantees, performance standards. The next five years are critical in terms of scale, urgency and this conference is the most appropriate forum for setting the stage.

Mr. Abhay Bakre described BEE's wide range of activities from appliances to industry, supported by the necessary policies and programmes under the Ministry of Power. The current rate of adoption of energy efficiency has been very encouraging, and state-level implementation in India would be the next step. In the industrial sector, the perform-achieve-trade (PAT) scheme had begun on a positive note as was evident from the recent launch of EScerts, while in the buildings sector, India had designed codes and would now implement them. Minimizing barriers and speeding implementation could be brought about by streamlined finance, and revealing the benefits to owners; economically sensible schemes and actions would create a multiplier effect. In the transportation sector, the advantages from electric vehicles would further push energy efficiency in the mobility sector. In summary, government and stakeholder consultation are critical for making the above ideas a reality.

In his Inaugural Address, Mr. Ashok Jain pointed out the clear alignment between energy efficiency and global and national concerns about greenhouse gas emissions. Prioritizing electricity generation, reliability and availability and promoting energy efficiency would preclude the need for augmenting generation capacity. In agriculture, optimization of efficiency would be necessary given the sector's large consumption of electricity.

Keynote Session: Reinventing Fire for India - Opportunities for India to leapfrog in the new energy landscape

Most economic theorists assume that energy efficiency is a limited and dwindling resource whose adoption, driven by policy and price, will deplete its potential and raise its cost. Influenced by that model, most traditional analysts and deployers of energy efficiency see and exploit only a modest fraction of the worthwhile efficiency resource, saving less and paying more than they should.

Dr. Amory Lovins, Cofounder and Chief Scientist, Rocky Mountain Institute (RMI), USA

Dr. Lovins proposed that most traditional analysts and deployers of energy efficiency see and exploit only a modest fraction of the worthwhile efficiency resource, saving less and paying more than they should. This is because most economic theorists assume that energy efficiency – like many other resources – is a limited and dwindling resource whose adoption, driven by policy and price, will deplete its potential and raise its cost.

Dr. Lovins used several examples – across building, transportation and industrial sectors – to show how empirically, modern energy efficiency is an expanding-quantity, declining-cost resource. He explained how the adoption of energy efficiency is constrained by major but correctable market failures and increasingly motivated by positive externalities. Most importantly, he stressed that the available quantity of energy efficiency is several folds larger (and its cost lower) than most in the climate community realize. Dr. Lovins pro-pounded that the efficiency resource far exceeds the sum of individual savings because artfully choosing, combining, sequencing, and timing fewer technologies can save more energy at lower cost than deploying dis-integrated and randomly timed technologies. Such "integrative design" techniques are seldom used but well proven, rapidly evolving, and gradually spreading. Yet the same economic models that could not predict the renewable energy revolution also cannot recognize most of the efficiency resource. This analytical gap makes climate-change mitigation look harder and costlier than it really is, diverting attention to inferior options. The central message of Dr. Lovins' talk was that profitable climate protection depends critically on seeing and deploying the entire efficiency resource. This needs us to redouble the pace of energy efficiency deployment by making energy efficiency the cornerstone of climate protection. This opportunity requires focusing more on whole systems (buildings, factories, vehicles, and the larger systems embedding them) than on individual technologies, and replacing theoretical assumptions about efficiency's diminishing returns with practitioners' empirical evidence of expanding returns.

Executive Panel Discussion #1: Transitions in Energy Efficiency - Shifting the Global Energy Paradigm

This Executive Discussion showcased experiences from across the globe that had brought about a paradigm shift in energy efficiency and highlighted best practices, energy efficiency policy solutions, programmed implementation models and delivery mechanisms already triggering large-scale energy efficiency market transformation around the world.

Co-chairs: Dr. Brian Motherway, International Energy Agency, Ireland and Mr. Simon Stolp, The World Bank, USA
Mr. Benoit Lebot, International Partnership for Energy Efficiency Cooperation, France
Mr. Mark Lister, Copenhagen Centre on Energy Efficiency, Denmark, (via skype / phone),
Mr. Christian Zinglersen, Clean Energy Ministerial, France
Ms. Christine Egan, CLASP, USA

Dr. Brian Motherway outlined the need to deepen policy measures, in view of the fact that improvements to energy efficiency have enormous financial, environmental, health and economic benefits. Earlier policy initiatives had run their course and newer, stronger policies were needed. He emphasised on rephrasing the questions to guide the policy and market outcomes - from *' Why energy efficiency', to: 'How?', 'What policies are available?', 'What is most appropriate?' and 'How should they be implemented?'*

In the international arena, while most of the G20 nations were collaborating on energy efficiency, there remained scope for even the most advanced countries to do more. Industry, finance and data analytics would have to be brought together. Financial institutions would have to appreciate the value of energy efficiency.

Mr. Lebot spoke of the 6 Ds of energy efficiency: Decoupling; Decarbonization; Digitalization;Decentralization (not only for national level policy but also for local implementation, where human and institutional capacity will be needed); Democratization (access to energy as enshrined in SDG 7); and, Desirability (the change must be desired for it to occur). He opined that investments in energy efficiency are a function of how well these capacities are developed.

Mr. Mark Lister highlighted that the role of the Copenhagen Centre on Energy Efficiency was that of a facilitator and coordinator of energy efficiency implementation. This is being accomplished by assisting policy change in countries and cities through innovation in delivery models and by raising the profile of energy efficiency. There is need for a shift in the paradigm from energy efficiency as an add-on, to energy efficiency as a way of life, which would be driven by coupling of high-level policy with ground-level work. Capacity on the ground, together with investment programmes are the need of the hour.

Reference was made to the latest World Energy Outlook Report and India's key position in terms of energy consumption; India was a collaborator in the Clean Energy Ministerial (CEM), based in the IEA in Paris, and led the power system workstream and the energy-efficiency workstream. Members of the CEM aimed to collaborate by sharing experiences and country-specific efforts with respect to areas such as greening the grid, electric vehicles and power systems. As shared by Mr. Christian Zinglersen, member countries in CEM showed interest in energy efficiency, demonstrated by increasing consumer awareness through the use of consumer awareness apps, standards and labelling schemes; evidence also came from the interplay between energy efficiency and renewable energy policy. Discussions and activities on energy efficiency were of global relevance and should be underpinned by systems thinking.

CLASP's work focused on appliances: 1400 product policies had been found available for relative energy use. Carbon dioxide emissions from the combined use of appliances was significant and broader policies covering more commercial and industrial products advocated. Policies setting more stringent standards were needed as were policies that would shorten the time for implementation. Significant economic, health, environmental and financial outcomes can be achieved by focusing on energy efficiency as would investments in standards and labelling programmes.

Executive Panel Discussion #2: Energy efficiency development in Asia – the landscape

With the focus on energy efficiency policies in Asia, this session dealt with financing and implementation models that have set new benchmarks for the country/region as also the global energy efficiency community to replicate.

Chair: Mr. Demetrios Papathanasiou, The World Bank, USA
Mr. Chartdanai Chartpolrak, Energy Conservation Center, Thailand
Mr. Soumya Garnaik, Energy Efficiency Services Limited (EESL), India
Mr. Mohammed Abdullah Al Mamun, Sustainable and Renewable Energy Development Authority (SREDA), Bangladesh
Mr. Asad Mahmood, National Energy Efficiency and Conservation Authority, Pakistan (on Skype)

The country practices discussed by this panel showed a range of projects and policies. In Thailand, the government has targeted reducing energy intensity by 30% by 2036 using programmes that are compulsory or supportive. In India, the consumption of energy had almost doubled, between 2000 and 2011, but there has been a reduction in energy intensity attributable to reduction in losses (and increased energy efficiency), and also a broader shift, from manufacturing to services. The Energy Efficiency Services Limited (EESL) supplements the Bureau of Energy Efficiency's programmes. Enactment of the Energy Conservation Act in 2001 has created the main impact even though market transformation was not complete. Schemes such as the Perform-Achieve-Trade (PAT) has placed industrial efficiency on a sound trajectory in addition to several initiatives at state and central level; municipalities have also volunteered to participate in some programmes without subsidies. Public-private partnerships, energy service companies (ESCOs) and indigenous technologies are all part of the implementation process.

In Bangladesh, the Sustainable and Renewable Energy Development Authority's (SREDA) vision was to build an energy-conscious society, ensure energy security and reduce carbon emissions. The largest hurdle in this domain in Bangladesh has been the shortfall in capacity, for which it sought cooperation from other countries in implementing plans. Several policies and action plans for energy efficiency are in place, including programmes for energy management, awareness-building through labeling, energy-efficient buildings, and financial incentives.

Pakistan's move towards energy efficiency began with a USAID project in 1985 but now a National Energy Efficiency and Conservation Act 2016 is in place, having passed and notified in the gazette in 2016. The National Energy Efficiency and Conservation Authority, is working to encourage efficiency in appliances and institute an energy conservation fund. It is also looking at different ways to encourage and promote energy efficiency such as promoting indigenous manufacturing of energy efficient products and separating the classification of energy efficient imports.

Experience with respect to raising funds for energy efficiency has been similar across these countries. Majority of these countries continue to witness a risk-averse response to greater investment in energy efficiency, even where industry has the needed expertise. For instance, in Bangladesh the government is providing funds for capacity-building but not injecting funds directly into projects, which has been a deterrent to spur-ring energy efficiency projects.

In Pakistan, directives are being made to create a market for renewable energy products and energy efficiency through financial institutions. However, these are not mandatory.

Increasing the confidence of financial institutions for bigger investments in energy efficiency projects remains a challenge in India too, although attempts to encourage investments in energy efficiency have been addressed through shorter payback periods of three years or less. Other solutions that can bring more banks and financial institutions on board include standardized evaluation processes for projects to help assess their viability.

DAY 2 Plenary Session followed by Executive Panel Discussions and Spotlight Sessions

Plenary discussion: Show me the money – innovative financing that works

The Energy Efficiency Financing landscape in India has started to improve in the last couple of years. This plenary presented Indian and global experiences on how the potential for energy efficiency can be converted into investments of a scale, estimated to be over $400 billion per year, to reach the SE4ALL Goals by 2030. The focus was on more innovative and commercial financing instruments using public finance mechanisms to mobilize private sector capital.

Chairman: Mr. Gailius Draugelis, The World Bank, USA
Mr. Jigar Shah, International Finance Corporation, USA
Mr. Steven Fawkes, EnergyPro Limited, UK
Mr. Rajat Mishra, Asian Infrastructure Investment Bank, China
Ms. Anubha Prasad, Small Industries Development Bank of India (SIDBI), India
Mr. Kenichi Yokoyama, Asian Development Bank (ADB), India

Mr. Gailius Draugelis opened the discussion by highlighting on the key role of energy efficiency in keeping global warming below 2 degrees. However, despite much effort in the form of deals and negotiations, energy efficiency programmes and policies are yet to reach the desired scale. Renewable energy projects seem to attract larger investments although experts have argued that deployment of renewable energy creates more returns when coupled with energy efficiency.

IFC's work focuses mostly on the private sector with an emphasis on investment in green buildings, renewable energy, energy efficiency and climate-smart agriculture. One of the tools that IFC has developed, EDGE, an innovation assessment tool, is being used successfully for benchmarking green buildings.

The Small Industries Development Bank of India (SIDBI), is a pioneer where financing for energy efficiency initiatives and has been the apex bank for the MSME sector since 1990. SIDBI's energy-efficiency initiative started simply with the bank giving loans through lines of credit extended by organizations/institutions such as KfW, JICA, and the World Bank, to about 8000 MSMEs. However, since 2009 energy efficiency has become a full-fledged niche area for the bank. To counter the common reluctance to investing in energy efficiency ventures, SIDBI has tried to bring a change by devising instruments related to cash-flow and insurance.

The World Bank supported SIDBI in developing risk-mitigating strategies such as Partial Risk Sharing Facility (PRSF) to increase bank lending for energy efficiency.

In the case of UK, the most significant barrier was making energy efficiency projects 'investible' even when large sum of finance was available, especially for 'green' investment. Broadly, the success of programmes could be attributed to four factors: project finance and development finance; large pipelines (energy efficiency projects were much smaller compared to capital costs); standardization (the key to aggregation, and which would help banks reduce risk); and, building capacity (to develop bankable projects), and bundling of projects for expanding the size of investments.

The Asian Development Bank (ADB) will be doubling its annual climate financing to USD 6 billion by 2020, of which USD 4 billion will be dedicated to mitigation actions such as support for renewables and energy efficiency. Although, ADB envisions investing more on the demand side, but bankability of projects continues to be a challenge. It has identified sound policy framework and holistic view to overcome hurdles in an otherwise dynamic area. A partnership agreement has recently been signed between the Government of India and ADB to tap into the large energy efficiency markets.

Executive Panel Discussion #3: Energy-efficient market transformations – international experience and successes.

A discussion on international success stories and best practices for successful market transformations through specific national policies, global programmes and other initiatives to scale up energy efficiency implementation around the world.

Chair: Dr. Ashok Sarkar, The World Bank
Mr. Inchul Hwang, Korea Energy Agency (KEA), Korea
Mr. Mohammad Gannar, National Agency for Energy Conservation, Tunisia
Ms. Laura McGrory, Alliance to Save Energy, USA
Mr. Alexander Farsan, Carbon Trust, UK
Ms. Anjali Jaiswal, Natural Resources Defense Council (NRDC), USA

Improving energy efficiency is essential for maximizing the outputs from public money spent in energy related projects. Although the value associated with energy efficiency activities is large, implementation of policies, programmes and projects is complex, and the ability to attract investment depends upon a specific country's policy framework.

The Korea Energy Agency (KEA), an implementation agency, shared the constituents of its exemplary performance: a dedicated fund (in terms of subsidies and loans) and tax incentives; institutional capacity, strong regulations, standards and labelling programme, and strong building codes. KEA is sensitive to its stakehold-ers, with a high level of trust between the market and government - a vital component that ensures strong compliance and strict punishment for defaulters.

In Tunisia, the National Agency for Energy Conservation, there are strong frameworks in the form of institutions and incentives, along with regulatory structures and political will. Between 1985 and 2015, the agency had developed into the ministry. Supporting infrastructure in the form of laboratories for tests and parameters are in place, in addition to an incentive framework to promote energy efficiency (National Fund for Energy Conservation), and an Energy Transition Fund that was set up in 2015.

The Alliance to Save Energy viewed energy efficiency as a great resource. In the United States, between 1980 and 2014, energy productivity has increased with the economic output from one unit having doubled and resulting in the much-desired decoupling. While past policies have resulted in significant achievements, the organisation is discovering ways to encourage new and robust policies. Two strategies suggested to this end were: (i) focusing on co-benefits and measurable economic benefits, and (ii) creating public and private sector coalitions to build capacity. The Alliance's Systems Energy Initiative looks upon optimizing energy efficiency in the context of integrated design.

In the experience of the Carbon Trust, UK, a general lack of awareness, confidence (in suppliers and technology) and funding prevails with respect to energy efficiency. The organization has started a large-scale programme to tackle the barriers in energy efficiency projects between 2002 and 2012, based on the following approach: Find (opportunities), Demonstrate (the business case), Implement (projects), and Finance. The Carbon Trust has developed an analytical tool to design and evaluate energy efficiency finance programmes that allows the user to develop bankable projects. The tool addresses the following questions: (i) What is the market and what are the key motivators? (ii) Are there drivers for actions, subsidies? (iii) Is there a supply chain to provide service, finance, technology?

The Natural Resources Defense Council (NRDC), USA targets cities as a hub of action because of the presence of a large building stock where energy efficiency retrofits and codes can bring significant outcomes. NRDC emphasised on the role of strong advocacy in bringing a constructive change on the ground. California's first energy efficiency standards for computers and monitors that were approved as a consequence of pressing calls for action by NRDC and its partners was cited as an example. NRDC noted its support for adoption of similar standards in India which will also contribute significantly towards the Kigali Amendment's goal of phasing out HFCs from air-conditioners.

Executive Panel Discussion #4: Energy efficiency market transformations – success stories from India.

This discussion focused on energy efficiency market transformation in India, looking at transitions from conventional to best available technologies (BAT) in energy efficiency through policies, institutional development and market mechanisms.

Chair: Mr. Soumya Garnaik, Energy Efficiency Services Limited (EESL), India
Mr. Rajneesh Rana, Energy Efficiency Services Limited (EESL), India
Dr. Ashok Kumar, Bureau of Energy Efficiency (BEE), India
Mr. Girja Shankar, Energy Efficiency Services Limited (EESL), India

Three presentations in this session tracked the development of policy and related institutions in India, since the adoption of Energy Conservation Act of 2002. EESL's activities in tapping energy saving potential through pertinent programmes, their modalities and operating details were described in detail.

In the view of the Bureau for Energy Efficiency, co-benefits of PAT scheme beyond energy savings and emission reduction were discussed. These included enhanced capacity of energy engineers accredited energy auditors, cost savings and infusion of latest technology in place of the old infrastructure in industrial sector. Further, the process for issuing ESCerts was outlined. Lastly, the institutional structure of pertinent bodies and other active public policy schemes related to the Energy Conservation Act, National Action Plan on Climate Change and Nationally Determined Contributions were discussed. As an example, the Jaipur LED Streetlight project was described - with a special focus on its implementation, expected energy savings in all three phases, measures for maintenance of the infrastructure, and EESL's role.

Executive Panel Discussion #5: Capturing the co-benefits of energy efficiency towards sustainable devel-opment: enabling universal energy access and creating green jobs.

India is blessed with a demographic dividend and the government's current focus is on skills development and creating jobs. This session discussed how innovation in energy efficiency and other clean energy technologies can help to create 10 million green jobs, scale up energy access, and result in other co-benefits.

Chair: Mr. Steve Nadel, American Council for an Energy Efficient Economy (ACEEE), USA
Dr. Rahul Walawalkar, Indian Energy Storage Association (IESA), India
Mr. R Subramanian, Saint Gobain, India
Mr. Sanjeev Seth, Ingersoll Rand India
Dr. Chetan Solanki, IIT Bombay, India
Mr. S Raghupathy, Confederation of Indian Industry (CII), India

The Indian Energy Storage Association's MICRO (Microgrid Initiative for Campus and Rural Opportunities) programme was described, along with the relevance of this programme for rural and small townships. The end goal of this program of creating 24/7 access for everyone by 2019 was also highlighted.

Saint Gobain, India, is developing an e-learning, curriculum development and delivery initiatives for students of architecture and civil engineering. Their view is that inlusion of humanities in technical fields of study would help the students understand the behavioural aspects of using energy and other resources. Digital methods of learning through augmented reality and simulations were discussed for adequately studying human behaviour and energy use.

Energy efficiency is closely tied to co-benefits such as jobs, public health and wellbeing and is an important segue to achieving sustainable development. To realise jobs in this field, additional training and certification is needed.

A detailed description of the SoUL (Solar Urja Lamps) project was made. SoUL has resulted from localised assembly and maintenance actions where the village community was directly involved. The discussion further noted the conflict between India's need for development and infrastructure which increases the energy consumption and oil import, and finally the need to think about energy access from the bottom up, rather than top-down.

Executive Panel Discussion #6: Smarter and efficient grids: enhancing energy security through integration of 100 GWof energy efficiency as the 'first fuel' in India.

Public and private sector must work together to mainstream demand-side energy management as the 'first fuel' and jointly set a goal of 100 GW of avoidable power generation through energy efficiency and utility demand-side management. The session focused on what has worked in other countries and what regulatory and policy changes are required in India to capture it energy efficiency potential along with the transition towards advanced technologies in demand response, smart grids, energy storage, e-mobility and renew-able energy integration.

Chairman: Mr. Upendra Bhatt, Alliance for an Energy Efficient Economy (AEEE), India
Ms. Neelima Jain, Energy Efficiency Services Limited (EESL), UK
Dr. Amol Phadke, Lawrence Berkeley National Laboratory (LBNL), USA
Mr. Ammi Amarnath, Electric Power Research Institute (EPRI), USA
Dr. Pankaj Agarwal, Panitek Power AG, Switzerland

In the context of impactful demand side management, this discussion brought some key concepts to the fore: market shifts catalyzed by the internet-of-things, the need for a step-change in equipment efficiency, the role of energy storage, and the need for enhanced and future-ready electricity grids.

The internet-of-things is enabling a shift in the market towards "prosumers", that is, dynamic and informed consumers of the future. Robust data analytics, coupled with advanced technologies is presenting not only new solutions, but also new market models for consumers and suppliers of electricity.

As energy efficient solutions move to the next level, consumers become better informed (prosumers), and there is greater penetration of decentralized energy, two aspects become very important: 1) solutions to make the electricity grid more robust and efficient and 'smart'; 2) energy storage as a potential game changer. The evolution of energy storage will present new kinds of solutions and opportunities.

The discussion also pointed out that price is not necessarily co-related to technological efficiency. This was highlighted by citing Japan and Korea as examples, where the air-conditioner efficiency increased significantly while the inflation-adjusted prices came down. Such examples show that active policy can push equipment efficiency.

This argument was further supported by the demand aggregation model of EESL, which also played an important role in advancing equipment efficiency cost-effectively. EESL's Super Efficiency Air Conditioning Programme in India rolled out a tender for 100,000 super-efficient ACs in March 2017.ISEER rating of 5.2, better than currently available 5-star AC at 4.5, and at prices 25-30% lower than the average market price of the 5-star ACs.

Through these examples, the panelists made a case that by innovatively combining and leveraging policy and market forces, price can be decoupled from equipment efficiency, in order to effectively advance energy efficiency. Markets and regulators have to synchronise their actions to drive the market towards step-changes in energy efficiency.

The panel also discussed that the DSM programs have worked in other countries with sustained incentives in place, but the existing regulatory framework in India has not supported scaling up of utility-DSM. The discussion touched upon the importance of exploring what role the utilities in India can and should play. There was consensus that the utilities have to be a part of this conversation.

Special Remarks: New Frontiers in Energy Efficiency

Mr. Saurabh Kumar, Energy Efficiency Services Limited, India
Dr. Demetrios Papathanasiou, The World Bank, USA

Making energy efficiency visible is key for it adoption and proliferation, and one of the easy ways to increase visibility is by showing that energy efficiency brings financial gains.

The absence of a clear association between value and energy efficiency practices holds back investors; to instill confidence on a larger scale than currently prevalent and promote financing and investments in energy efficiency projects, regulators must allow the profit to be made, to be apparent. In other words, recognizing the value and making it financially attractive.

The role and scope of energy efficiency for an ESCO such as EESL are new and powerful, particularly because of the technical and financial aspects that have been brought under one roof, reducing inefficiencies normally associated with such organizations.

Spotlight Sessions

Day 2 also featured six technical papers covered in two parallel tracks covering topics such as enabling policies, the Indian ESCO market, evaluation frameworks, smart manufacturing components and voluntary lighting specifications. Abstracts for the Spotlight Sessions are available at the INSPIRE website.

DAY 3 Two Plenary Sessions followed by Executive Discussions and Spotlight Sessions

Plenary Session 1: Role of technology innovation and business models in enabling EE as a resource.

While it is an accepted fact that the private sector needs to complement public policy initiatives to realize the full potential of energy efficiency, it is often not clear how public-private partnerships can benefit from technology development and innovations taking place in companies. Business leaders of leading Indian and international companies shared ideas and perspectives on how this can be done.

Chair: Dr. Ajay Mathur, The Energy and Resources Institute (TERI), India
Mr. Ravi Purushothaman, Danfoss Industries, India
Mr. Ajay Durrani, Covestro, India
Mr. Venkat Garimella, Schneider Electric, India
Ms. Jennifer Layke, World Resources Institute (WRI), USA
Mr. Dhiraj Wadhwa, United Technologies Corporation (UTC), India

With respect to energy efficiency, technology today allows the bar to be raised for new products and entrants into the market, with the challenge lying in accelerating this dovetailing with policy, 'nudging' in the right direction to 'push' the market and 'pull' the demand.

The economic model associated with energy efficiency could be seen as being composed of energy, technology and business models. While technology is widely available, it is not being harnessed optimally, and price is a challenge. There is little grasp of energy hybridization (connecting supply and storage) and new business models will have to be built to address this.

Sustainability taken into account across the entire organization will lead to the emergence of a host of opportunities as taking the entire value chain into account would make the best business sense. Mega trends, such as digitization (connectivity and IoT) and urbanization, will create an impact in terms of large-scale demand for energy. Demand can be met via digital means. Overall, large percentages of energy efficiency potential remained untapped in industry (58%), infrastructure (79%) and buildings (82%) to combat this.

The private sector has a significant role to play in the implementation of government-led policy. There is need for stakeholders working with the government to project the value proposition of energy efficiency to customers clearly and change the equation around risk and reward. Measurements, data collection and tracking progress is essential for the success of projects related to energy efficiency.

Plenary Session 2: Global R&D experiences leading to technological innovations and visionary policies.

The session focused on how public-funded R&D efforts around the world has, a) led to technology development that has made a significant contribution in pushing the energy efficiency envelope b) helped formulation and implementation of visionary policies organizations come up with leading to low-carbon and sustain-able development (for example, building and habitat energy efficiency, sustainable and smart space cooling etc.)

Chair: Dr. Rajiv Sharma, Secretary, Science and Engineering Research Board (SERB), Department of Science and Technology

Dr. Daniel Shah, Research Council, UK
Professor Ashok Lall, Ashok B. Lall Architects, India
Professor Rangan Banerjee, IIT Bombay, India
Dr. Amol Phadke, Lawrence Berkeley National Laboratories (LBNL), USA
Professor Rajan Rawal, CEPT University, India

The government of the UK and India are collaborating on a variety of research programmes which includes clean growth and artificial intelligence.

In view of urbanization overtaking the country there is need for research findings to feed into policy, particularly in the context of low-carbon sustainable development. In the current Indian setting, research should look at resource-use efficiency and low carbon growth and affordability. The government should seek/push for research in certain areas which is, at present, blind spots (energy and water-efficient evaporative cooling; hybrid cooling systems; and mechanically-assisted ventilation). A combination of resource-efficient, compact, low-rise rooftop solar PV, low-carbon city transport will produce affordable urban systems.

With respect to policies- creating a roadmap, baselines and targets would help researchers deliver in conjunction with industry and academia. Holding competitions is a successful method for attracting students to produce ideas for path-breaking changes in design and fabrication in the Indian context. Suggested areas for research are materials and sensors for use in India.

It is important to drastically cut down the time required to move an innovation from the laboratory to the field. Energy modeling can be used to inform the research community, and research can be made more strategic by, for example, asking utilities to sponsor programmes related to energy efficiency. Policies should be formulated to accelerate innovation as well as deployment, and to set strict standards which would bring about a real change.

Stakeholders need help to adopt policy which, in turn, should be backed by research and development. Changes in academic curriculum is necessary with a focus on practical outcomes of research.

Executive Discussions (three parallel sessions)

1. Putting the spotlight on Indian States (led and organized by BEE and Designated State Agencies, with the World Bank, ACEEE and AEEE).

Chair: Mr. Milind Deore, Director, Bureau of Energy Efficiency (BEE), India
Mr. Harendra Kumar, NITI Aayog, India
Mr. Steve Nadel, American Council for an Energy Efficient Economy (ACEEE), USA
Mr. Mijo Vodopic, MacArthur Foundation, USA
Mr. Chandrasekhara Reddy, Government of Andhra Pradesh, India
Dr. Satish Kumar, Alliance for an Energy Efficient Economy (AEEE), India

To accelerate the progress towards energy efficiency, Indian states need help- especially in view of the development of the State Energy Efficiency Index framework.

The NITI Aayog, India, has helped BEE in policy development through its many initiatives such as Integrated Energy Security Scenarios development and ECBC implementation in all states. The fact that coal was the mainstay of India's energy supply and was associated with worrying emissions underlined the need for developing newer practices. Allocations to states can be based on energy efficiency performance but large variations in the economic activity of the states (some being dominated by industry and others by agriculture) would not make for a fair comparison.

The principles of the ACEEE scorecard developed for American states and the rankings it brought out were detailed. The ranking was divided into policy categories such as transport, utilities, industry and rankings for improvements over the previous year were also published. Requests for data were sent to state energy offices and state public utilities after which rankings were computed. The ACEEE is now working on new appliance efficiency standards.

The MacArthur Foundation has tried to incorporate energy efficiency into multi-family housing projects in the United States. There is need for objective, non-partisan data and evidence-based comparisons. The benefits of energy efficiency are seen in higher productivity creation of equity. A different pace of adoption should be allowed for constituencies with limited access to capital.

The Government of Andhra Pradesh has taken several steps to promote energy efficiency. Although they were constrained by tight budgets, the UJALA scheme, (providing domestic consumers in Vijayawada with low-cost LEDs) was a success mainly because of support from senior government and political leaders as well as the public. The government has run a pilot project on water pumps and energy efficient ceiling fans and has entered into an agreement with Gram Panchayats for street lighting by 2019.

Work on the State Energy Efficiency Index began early in 2017 with guidance from BEE, NITI Aayog with an effort to make it as objective as possible. As data and feedback became available, a strategic energy conservation action plan can be drawn. It will also become possible to set targets for energy-saving for states. Comments from State Designated Agencies were sought in this matter.

2. Energy efficient technology roadmap for India (led/organized by Technology Information Forecasting and Assessment Council (TIFAC), with TERI, CII and AEEE)

Chair: Dr. Ajay Mathur, The Energy and Resources Institute (TERI), India

Prof. Rangan Banerjee, IIT Bombay, India
Sr. S Raghupathy, Confederation of Indian Industry (CII), India
Dr. Brian Motherway, International Energy Efficiency (IEA), France
Dr. Aalok Arvind Deshmukh, Schneider Electric, India
Dr. Amol Phadke, Lawrence Berkeley National Laboratory (LBNL), USA
Dr. Satish Kumar, Alliance for an Energy Efficient Economy, (AEEE), India

This discussion explored which technologies need to be in the market by 2020-25. The panel stressed on the importance of identifying breakthrough research globally which is relevant in India's context and figuring out how we should get technologies from the laboratory to the field as early as possible.

The discussion underscored the need to understand why existing efficient technologies have not been used or deployed on a large scale. This would give a view into the practical challenges on the ground and how it can be tailored for meaningful adoption.

It was pointed out that industrial processes are shifting increasingly to electricity as electric engines are more efficient than internal combustion engines- ergo, it is important to keep energy efficiency front-and-center.

3. Lessons from international experiences for enabling the ESCO industry in India

Session co-chairs: Mr. Upendra Bhatt, cKinetics, India and Mr. Steven Fawkes, EnergyPro Limited, UK

Panel A: International ESCO Market Models

Mr. Zhiming Pan, NRDC-USA, China
Mr. Prem Kumar Singh Etihad ESCO, UAE
Mr. Jayaraman Balachandran, Siemens, Singapore
Mr. Dhiraj Wadhwa, UTC-Carrier, India

Panel B: India ESCO Market Challenges

Ms. Anubha Prasad, SIDBI, India
Mr. Milind Chittawar, SEETech, India
Mr. Vivek Taneja, Thermax, India

The question central to this discussion was how do we create a self-evolving ESCO market. The discussion also explored the trust deficit in the market, and strategies to match the ESCO services with the potential energy-efficiency market.

The evolution of China's ESCO market was discussed as a possible example for India to emulate. In early 2000, China had 3 ESCOs and around $ 100 million in revenues- the market is now worth $15 billion with 6000 ESCOs. This growth was the outcome of government targets, subsidies and the creation of an ESCO association for information exchange, capacity building, annual pulse surveys and investor connections. India needs a similar structure created through organizations such as EESL and AEEE. Key market enabling aspects need to be in place such as standardization of measurement and verification protocols and ease of financial support for the ESCOs. Furthermore, innovative service models should be explored and ESCOs need not be limited to do EPCs. Remote monitoring services can open up an untapped market potential.

The panel agreed that while financing no longer seems to be the primary challenge, at least in India, opportunities and pipelines need to be created. ESCOs, end-users and financial institutions should start coming together to create projects. Large, product-agnostic, non-vendor ESCO projects are needed to transform the current market. For example, SIDBI created a scheme that discounts lending rates for green buildings- "green" was built into their credit rating.

It was pointed out that neutral enabling entities such as AEEE should work with ESCOs and financial institutions and bridge the techno-commercial gap. Key performance indicators at the user end have to be aligned with energy efficiency. The possibility of ESCOs coming into green-field projects should be explored and a market-making platform created to identify opportunities. Sector-specific hubs would allow people to come together and contribute to the good of the community.

Spotlight Sessions

Day 3 featured twelve presentations based on peer-reviewed and selected technical papers in three concur-rent tracks:

1. Business, Systems and Technologies (Chair: Dr. Archana Walia, CLASP, India)
2. Business, Industry and Finance (Chair: Mr. S Padmanabhan, AEEE, India)
3. Codes, Standards and Policies (Chair: Dr. Mahesh Patankar, MP Ensystems, India).
   The topics covered in these presentations include energy efficiency in buildings, passive design indices, investment flows and financing models, evaluation frameworks and energy efficiency for climate resilience. Abstracts for all sessions are available at the INSPIRE website.

DAY 4 Executive Panel Discussion followed by Spotlight Sessions, Techno Buzz and Special Session hosted by Ministry of Environment, Forest and Climate Change

Executive Panel Discussion #7: How IoT, Big data & Analytics, Sensors and smart metering are transforming the EE landscape.

Energy efficiency when combined with IoT, Big Data and Analytics is transforming the landscape. This plenary gave a glimpse into how the next generation of technologies are helping to transform the energy market and opening up opportunities in the energy efficiency space.

Co-chairs: Dr. Rahul Tongia, Brookings India, and Dr. Shivkumar Kalyanaraman, IBM, India
Mr. Amarjeet Singh, Zenatix, India
Mr. Balachandar Jayaraman, Siemens, Singapore
Mr. Rudy Vielvoye, Engie, France
Professor Krithi Ramamritham, IIT Bombay, India
Mr. Punit Desai, Infosys Limited, India
Mr. Umesh Bhutoria, EnergyTech Ventures, India

Panel discussants were asked for insights into business models in the context of the limited popularity (perhaps on account of market issues, standards or policy) of technology-based solutions for energy efficiency.

A compelling theme has to be found for energy efficiency in business cases. Data is obtainable from devices such as air conditioners, but it is a challenge to make it useful on a day-to-day basis.

Uber, Airbnb, Whatsapp and Dropbox are examples of disruptive technologies that used connectivity. Could IoT and data similarly bring about disruptions leading to $ 100 billion worth energy efficiency enterprises? Would ESCOs drive data-driven opportunities? The possibility of creating financing models for installing IoT hardware needed to be considered- that cost would be far lower than retrofitting equipment for energy efficiency.

In light of the fact that 40% of global energy consumption was due to commercial buildings, data combined with goals and application could bring about a transformation. However, the winning combination would consist of people, technology and services and not data alone.

In France, IoT and smart metering are being used in the business-to-business arena in areas such as energy saving performance contracts, private finance initiatives and digitally-operated energy efficiency platforms. Information obtained from IoT has to be 'digested' to become useful but automated set-ups allows interventions by the company even before the client contacts it.

The need for optimal automation is clear but soft sensors are better than physical ones. To convince humans of the need and importance of energy efficiency, the message has to be communicated clearly, but the same purpose can be performed by automation which would also collect data and information.

Data collected by Infosys in its offices is used to benefit in more ways than only financial, with improvements resulting in the general level of happiness of its staff, transparency and accountability.

Analytics is a decision concerning business transformation and policy has a limited role to play. The need to move towards energy efficiency will drive the industry towards it. For SMEs which are not highly developed, DIY can offer help by setting up meaningful activities in terms of energy efficiency.

Special session hosted by Ministry of Environment, Forest and Climate Change (MoEFCC): Energy Efficiency at the heart of the National Cooling Action Plan (NCAP)

This special session addressed the national imperative of developing a sustainable and smart cooling action plan that looks at the subject holistically and sought ideas on a stakeholder engagement model and deliberated upon the scope of the effort.

Chair: Mr. Anil Jain, Ministry of Environment, Forest and Climate Change, India
Dr. Sanjay Bajpai, Department of Science and Technology (DST), Government of India
Dr. Vaibhav Chaturvedi, Council on Energy Environment and Water (CEEW), India
Mr. Saurabh Diddi, Bureau of Energy Efficiency (BEE), India
Dr. Amol Phadke, Lawrence Berkeley National Laboratory (LBNL), USA
Mr. Narender Gandhi, Ingersoll Rand, India
Dr. Amit Love, Ozone Cell - Ministry of Environment, Forest and Climate Change (MoEFCC), India
Dr. Satish Kumar, Alliance for an Energy Efficient Economy (AEEE), India

Mr. Anil Jain introduced the National Cooling Action Plan, announced in July 2017, saying that it was far-reaching from several points of view. The question it sought to find answers to was how to provide thermal comfort to citizens after taking into account poverty and an unreliable supply of power. India's cooling requirements are huge, and the electricity needed to power these will be massive too. Unmanaged cooling demand, under business-as-usual, will lead to a need for additional power plants, signifi-cant increase in emissions, urban heat islands, and not to mention, health and well-being impacts to citizens. India's peak electricity requirement might receive an addition of more than 300 GW by 2050 from cooling energy requirement without a comprehensive strategy! India's cooling challenge provides a significant opportunity where cooling industry, research organizations and universities can produce innovative ideas, solutions and research for new refrigerants and enhanced energy efficiency of appliances and technology. To facilitate this, a small group has been created, comprising representatives from energy sector Ministries, industry and subject-matter experts, to develop a 20 year outlook on how cooling demand in India will evolve and grow and outline strategies and actions in order to develop a robust eco-system that promotes sustainable and smart cooling practices across the nation while mitigating adverse impacts. The National Cooling Action Plan will be a multi-year plan to provide thermal comfort to all the citizens in a cost-effective manner, with minimum impacts on the power sector and environment. The broad approach will be to integrate all cooling efforts in the areas of technology, manufacturing, efficiency and environmental considerations.

Energy efficiency in India is embedded in the Climate Action Plan, with consideration for Ozone Depleting Substances (ODS) and Global Warming Potential (GWP). In the recent 29th Meeting of the Parties to the Montreal Protocol, held in Montreal, India effectively positioned the harmonisation between energy efficiency and phase-out of ODS gases and phase-down of HFCs. At this forum, India also announced its plans to develop the NCAP, as a roadmap to meet its international climate change commitments.

As India gears up to proactively address its escalation cooling energy needs, the NCAP will serve the need for an evidence-based report on India's cooling roadmap, and recommend strategies that will comprehensively consider financial and market implications on the air-conditioner industry, manufacturers of refrigerants, as well as the consumers. Some points flagged during the discussion were:

- Refrigerants are an important component in cooling the commercial and residential establishments, the automobile industry, and also in cold chains, and as such will hold significant importance in the discussions around the Cooling Action Plan.
- Technician training is an important issue with maintenance being the weak link. Little training is provided to technicians resulting in huge leakages of ODS with large global warming potential during use and servicing. Consumer, as well as technician awareness has to be raised in parallel to mitigate emissions from poor maintenance and service practices.
- Technology that maximizes all-around benefits has to be identified making R&D a critical factor in achieving energy efficiency as well as GWP goals. Public-private partnerships will facilitate this effort.
- Patent regimes, for instance for migration from HFCs to HFOs will have to be examined because at present, the technology is with select manufacturers.

Broadly, India's approach to addressing cooling demand can be seen as two-pronged 1) reduce cooling demand through efficiently designed built environment and behavioral adaptations; and 2) advance efficiency of cooling technologies and refrigerants. Regulations and rules recently notified are neutral in terms of technology, allowing all manufacturers to take part. In order to reduce demand, building codes will include thermal comfort considerations.

India's ambitious long-term policy is a laudable one and capable of delivery. There are many opportunities for India to show leadership and a relevant, supportive policy can make use of the rapidly-advancing technology. For instance, the IoT and similar applications can be applied perfectly to air-conditioning for optimal performance, and can also support integration of renewables with the grid.

Two significant points with respect to cooling that the discussion highlighted are: 1) India has effectively introduced energy efficiency in the cooling debate 2) there is increasing recognition that cooling, especially in the context of a developing nation like India, cannot be equated with air-conditioning. India's climate profile requires cooling technology in multiple areas including agri-products, health programmes, adaptive processes for protection from heat waves, in addition to space cooling.

Following the existing urban development model of cooling in other parts of the world (100+% penetration of air conditioning) will be highly emitting, and not an option that India wants to consider. India aspires to set a new development paradigm for the developing world, where cooling strategy includes actions beyond mere transition in the technology, and thermal comfort is provided for all without 100% penetration of air-conditioning for cooling.

Techno Buzz

The Techno-Buzz session was an opportunity for technology companies to present, to a small rotating audience of three to six people at a time, innovative high-efficiency technology that their company was most excited about. This format was very successful and effective on account of the focused time and attention of a small group of people. The participating companies have indicated their interest in adopting this Techno Buzz presentation format at other forums.

Participant organizations and their respective representatives in Techno Buzz were:

- Siemens BT: Mr. Ayaz Kamil, Sales Head - Building Performance and Sustainability Division
- UTC Carrier: Mr. M D Manjunath, India Lead- AdvanTE3C Solutions
- Grundfos Pumps India Pvt. Ltd.: Mr. Sanjeev Sirsi, Head- Business Development (Water Utility)
- Saint Gobain, India: Mr. Manish Sisodia, National Head- Glass Future
- Danfoss India: Mr. Gitansh Malik, National Manager- Business Development and Strategic Key Accounts
- Schneider Electric India: Mr. Rohit Chashta, Senior Engineer

Spotlight Sessions

Day 4 featured 23 presentations based on peer-reviewed and selected technical papers in three concurrent tracks:

1. Buildings, Systems and Technologies (Chairs: Dr. Sameer Maithel, Greentech Knowledge Solutions Private Limited, India; Dr. Sanjay Bajpai, Department of Science and Technology, Government of India)
2. Business, Industry and Finance (Chairs: Mr. Nagahari Krishna, Danfoss, India; Mr. Girish Sethi, TERI, India)
3. Codes, Standards and Policies (Chairs: Dr. Meredydd Evans, Pacific Northwest National Laboratory, USA; Mr. Saurabh Diddi, BEE, India).

Some of the topics covered included: cool roof implications, holistic approaches to achieving indoor thermal comfort, enterprise-wide energy management, the ESCerts trading market and impacts of adopting appliance efficiency measures. Abstracts for all sessions are available at the INSPIRE website.

DAY 5 Spotlight Sessions followed by Valedictory Session

Spotlight Sessions

Day 5 featured 23 presentations based on peer-reviewed and selected technical papers in three concurrent tracks:

1. Buildings, Systems and Technologies (Chairs: Professor Rajan Rawal, CEPT University, India; Dr. Vishal Garg, International Institute of Information Technology (IIIT), India)
2. Business, Industry and Finance (Chairs: Mr. R Virendra, National Productivity Council (NPC), India; Dr. Jyotir-may Mathur, Malaviya National Institute of Technology (MNIT), India)
3. Codes, Standards and Policies (Chairs: Dr. Radhika Khosla, Centre for Policy Research (CPR), India; Mr. Aalok Deshmukh, Schneider Electric, India).

Topics covered included IoT solutions and their impact, energy efficiency services, institutional governance and frameworks for energy efficiency, passive design strategies for India, energy conservation in the cement sector and the necessity for a partial risk-sharing facility. Abstracts for all sessions are available at the INSPIRE website.

Valedictory Session

Amb. Satish C. Mehta, Energy Efficiency Services Limited (EESL), India
Dr. Ritu Singh, Energy Efficiency Services Limited (EESL), India
Mr. Steven Nadel, American Council for an Energy Efficient Economy (ACEEE), USA
Dr. Satish Kumar, Alliance for an Energy Efficient Economy (AEEE), India

The conference concluded with a Valedictory Session. The session hosts summarized the key ideas emerging from INSPIRE that should be kept central as energy efficiency policy. These are incorporated in the Key Takeaways section below.

Download Paper Proceedings : http://www.aeee.in/inspire-paper-proceedings/

Download All Presentations : http://inspire.ind.in/presentations.html

6. KEY TAKEAWAYS

The dialogue and presentations at the conference reinforced the importance of the foundational aspects for enabling energy efficiency such as: the need for capacity-building at both professional and vocational level, innovative and accessible financing mechanisms, expanding the awareness about energy efficiency, and the importance of collaborative platforms and cooperative efforts directed at policy, implementation, and technology at both intra-country as well as international levels.

A common message that echoed through several of the discussions was the notion of positioning energy-efficiency in the broader context of climate change and climate resilience. This would not only draw in the right stakeholders and align efforts towards a common direction of meeting our national objectives as well as global climate change commitments, but would also help attract investor attention.

Summarized below are the key ideas that emerged at INSPIRE, which could meaningfully advance the momentum behind energy efficiency, and progress it towards its full achievable potential:

1. **Integrative design approach:** Dr. Amory Lovins refuted the notion that energy efficiency may be a diminishing resource. He stressed that the available quantity of energy efficiency is several folds larger (and its cost lower) than most in the climate community realize; and artfully choosing, combining, sequencing, and timing fewer technologies can save more energy at lower cost than deploying dis-integrated and randomly timed technologies. Such "integrative design" techniques are seldom used but well proven, and should underpin the activities oriented towards energy efficiency.

2. **Importance of Large Scale Programme and Policy Implementation in Scaling Energy Efficiency in Developing Countries:** Many sessions on the first two days discussed and highlighted the importance of large scale energy efficiency police and programme implementation that has been pioneered by Energy Efficiency Services Limited through the use of demand aggregation and bulk procurement and taking advantage of the scale and size of a national quasi-government entity which can enter into agreements and sign contracts with public sector enterprises in a way that private sector companies can't.

3. **Shift of focus from energy efficiency to energy productivity:** Energy efficiency being an intangible gain, often goes unreported. A focus on energy productivity with the broader gains in terms of job and business opportunities, economic growth, improved health, and low-carbon sustainable development can change this perspective and also help realize the full merit – that is, energy savings as well as the several co-bene· ts - of energy efficiency projects.

4. **Potential game-changers:** Some mega-trends that are already, or will in the near future be, changing the shape of our solutions and bringing about market-shifts:

   a. **Internet-of-Things (IoT) and big data** - The IoT is enabling a shift in the market towards "prosumers", that is, dynamic and informed consumers of the future. Robust data analytics, coupled with advanced technologies is presenting not only new solutions, but also new market models for consumers and suppliers of electricity.

   b. **Energy Storage** - As energy efficient solutions move to the next level with dynamic and involved consumers, and there is greater penetration of decentralized energy, two aspects become very important: 1) solutions to make the electricity grid more robust and 'smart'; and, 2) energy storage as one of the key elements of a smart grid, especially as more renewable energy comes online. The evolution of energy storage will present new kinds of solutions and opportunities for the industry.

   c. **Role of aggregators –** Demand aggregation could bring about some interesting shifts and solutions in the market. A recent example is EESL's 'commoditisation' of smart meters; their procurement of 5 million smart meters will help several utilities with their billing efficiency, as well as make the grid efficient. The aggregation of roof-top solar with storage is an emerging model in Europe. Such ancillary services become key to promoting a resilient grid.

5. Though provoking ideas: It is said that change happens when the status quo is challenged. Along these lines some noteworthy ideas that emerged at INSPIRE were:

a. Price may not necessarily be co-related with equipment efficiency. Active policy working in tandem with market factors – that is, a combination of push and pull forces - can effectively decouple price and equipment efficiency. This notion has been proven by some examples abroad, as well as in India through EESL's innovative demand aggregation initiatives. In the context of India's rapid urbanization and escalating cooling and energy needs, this notion is exceeding relevant and potent in terms of bringing about a step change in efficiency.

b. The time may be ripe for a paradigm shift from the age-old linear model of an electric grid (utility to consumer) to a networked system. India has the opportunity to leapfrog into a networked system since a good amount of new electrification is yet to come into place.

6. Powering the Journey Ahead: INSPIRE witnessed the announcements of some key initiatives that will further strengthen the foundation and the momentum behind energy efficiency:

a. The National Cooling Action Plan - The Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, recently announced plans to develop a National Cooling Action Plan (NCAP) that will provide a 20 year outlook on how cooling demand in India will evolve and grow and outline strategies and actions in the form of building and habitat design that show resiliency to climate change, innovations in technology, and constitution of a collaborative R&D platform, in order to develop a robust eco-system that promotes sustainable and smart cooling practices across the nation while mitigating adverse impacts.

The MoEFCC hosted a stakeholder workshop at INSPIRE to gather ideas, best practices and input from various experts towards a strong foundation and development path for the NCAP. The NCAP aims to bring together several key stakeholders and experts both in the cooling industry and in energy efficiency, and will help position India as a leader in using sustainable and smart cooling strategy linking Montreal Protocol to both mitigate climate change and support India's sustainable development goals.

b. Residential Energy Conservation Building Code (ECBC-R) – Bureau of Energy Efficiency (BEE) shared that they will be releasing the Residential Energy Conservation Building Code very soon. Following close on the heels of the commercial ECBC rollout, the ECBC-R rounds up the effort to reduce the energy footprint of our built environment. As a significant amount of housing stock, and particularly affordable housing, will be built in the next few years, the upcoming launch of ECBC-R is very timely as a means to enhance the thermal comfort of the housing stock.

c. State Energy Efficiency Index – AEEE, with inputs from NITI Aayog and BEE, has created a framework to index all states in India based upon their energy efficiency efforts and achievements. Work on the State Energy Efficiency Index began early in 2017, with the underlying objective to increase the visibility of energy efficiency and its impacts, and hence advance the momentum of energy efficiency initiatives nationwide. AEEE will collaborate closely with BEE and SDAs in reaching out to different state level actors, to collect data in the public domain and data residing within government departments. ACEEE, which has developed the highly successful US State EE Scorecard and International EE Scorecard, is also supporting AEEE in this initiative. The State EE Index will:

- Help drive EE policies and program implementation at state and local level
- Assess impact and effectiveness of various state initiatives
- Highlight best practices and encourage healthy competition among states
- Create a consistent framework to quantify energy savings and energy intensity

7. GALLERY

Inaugural Session
Left to Right - Mr. Saurabh Kumar, Mr. John Roome, Mr. Ashok Jain

Inaugural Session
Left to Right - Mr. Saurabh Kumar, Dr. Manjit Singh , Mr. Abhay Bakre, Mr. Ashok Jain, Mr. John Roome, Amb. Satish C. Mehta, Dr. Satish Kumar

Keynote Session: Reinventing Fire for India - Opportunities for India to leapfrog in the new energy landscape.
Left to Right - Mr. John Roome, Dr. Amory Lovins

Executive Panel Discussion #1: Transitions in Energy Efficiency - Shifting the Global Energy Paradigm
Left to Right - Mr. Christian Zinglersen, Mr. Simon Stolp, Dr. Brian Motherway, Mr. Benoit Lebot, Ms. Christine Egan

Executive Panel Discussion #2: Energy Efficiency Development in Asia – The Evolving Landscape

Left to Right - Mr. Chartdanai Chartpolrak, Mr. Soumya Garnaik, Dr. Demetrios Papathanasiou, Mr. Md. Abdullah Al Mamun

Plenary Discussion: Show Me the Money - Innovative Financing that works

Left to Right - Mr. Kenichi Yokoyama, Mr. Jigar Shah, Mr. Jorgen Thomsen, Mr. Gailius J. Draugelis, Dr. Steven Fawkes, Mr. Rajat Misra, Ms. Anubha Prasad

Executive Panel Discussion #3: Energy Efficiency Market Transformation – International Experiences and Success Stories
Left to Right - Mr. Inchul Hwang, Mr. Mohamed Zied Gannar, Ms. Laura Van Wie McGrory, Dr. Ashok Sarkar, Mr. Alexander Farsan, Ms. Anjali Jaiswal

Executive Panel Discussion #4: EE Market Transformation – Success Stories from India
Left to Right - Mr. Rajneesh Rana, Dr. Ashok Kumar, Mr. Soumya Garnaik, Mr. Girja Shankar

Executive Panel Discussion #5: Capturing the Co-benefits of Energy Efficiency towards Sustainable Development: Enabling Universal Energy Access and Creating Green Jobs

Left to Right Mr. Sanjeev Seth, Mr. S. Raghupathy, Mr. R. Subramanian, Dr. Rahul Walawalkar, Dr. Chetan Solanki, Mr. Steven Nadel

Executive Panel Discussion #6: Smarter and Efficient Grids: Enhancing Energy Security through Integration of 100 GW of Energy Efficiency as the "First Fuel" in India

Left to Right - Dr. Amol Phadke, Ms. Neelima Jain, Mr. Upendra Bhatt, Mr. Ammi Amarnath, Dr. Pankaj Agarwal, Mr. R. K. Bhanote

Site visit to Jaipur's EESL – implemented LED Streetlight Project and Facade Lighting

Plenary Session: Role of Technology, Innovation and Business Models in Enabling Energy Efficiency as a Resource

Left to Right - Mr. Ajay Durrani, Ms. Jennifer Layke, Amb. Satish C. Mehta, Dr. Ajay Mathur, Dr. Amory Lovins,Mr. A Chandra Sekhara Reddy, Mr. Dhiraj Wadhwa, Mr. Ravi Purushothaman, Mr. Rajkiran Bilolikar

Site visit to Jaipur's Facade Lighting at Police Commissionerate

Plenary Session: Global R&D Experiences Leading to Technological Innovations and Visionary Policies

Left to Right - Prof. Rangan Banerjee, Prof. Ashok Lall, Dr. Daniel Shah, Dr. Rajiv Sharma, Dr. Amol Phadke, Prof. Rajan Rawal

Executive Discussion: Putting the Spotlight on Indian States (Led/ Orga-nized by BEE and Designated State Agencies with the World Bank, ACEEE, AEEE)

Left to Right - Dr. Satish Kumar, Mr. A Chandra Sekhara Reddy, Mr. Harendra Kumar, Mr. Milind Deore, Mr. Steven Nadel, Mr. Mijo Vodopic

Executive Discussion: Lessons learned from International Experiences for Enabling the ESCO Industry in India (Led by AEEE)

Left to Right - Mr. Zhiming Pan, Mr. Pradeep Kumar Singh, Dr. Koshy Cherail, Mr. BalachandarJayaraman, Ms. Anubha Prasad, Mr. Upendra Bhatt, Dr. Steven Fawkes, Mr. Milind Chittawar, Mr. Vivek Taneja, Mr. Dhiraj Wadhwa

Session on National Cooling Action Plan

Left to Right - Dr. Amit Love, Dr. Vaibhav Chaturvedi, Dr. Satish Kumar, Mr. Anil Jain, Mr. Narender Gandhi, Dr. Sanjay Bajpai, Mr. Saurabh Diddi, Dr. Amol Phadke

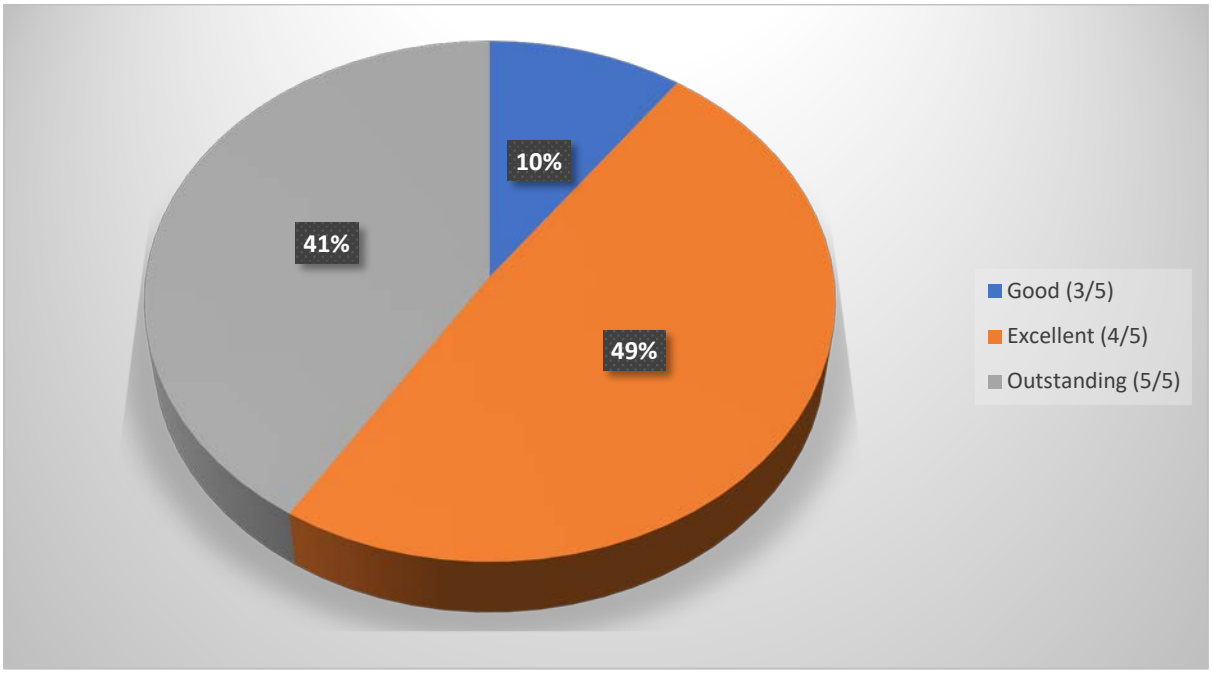
Executive Panel Discussion #7 : How IoT, Big Data & Analytics, Sensors and Smart Metering are Transforming the Energy Efficiency Landscape
Left to Right - Mr. Punit Desai, Dr. Shivkumar Kalyanraman, Mr. Balachandar Jayaraman, Dr. Rahul Tongia, Mr. Rudy Vielvoye, Prof. Krithi Ramamritham, Dr. Amarjeet Singh, Mr. Umesh Bhutoria

Techno Buzz / Speed Innovation for Businesses/Companies
Mr. Rohit Chashta

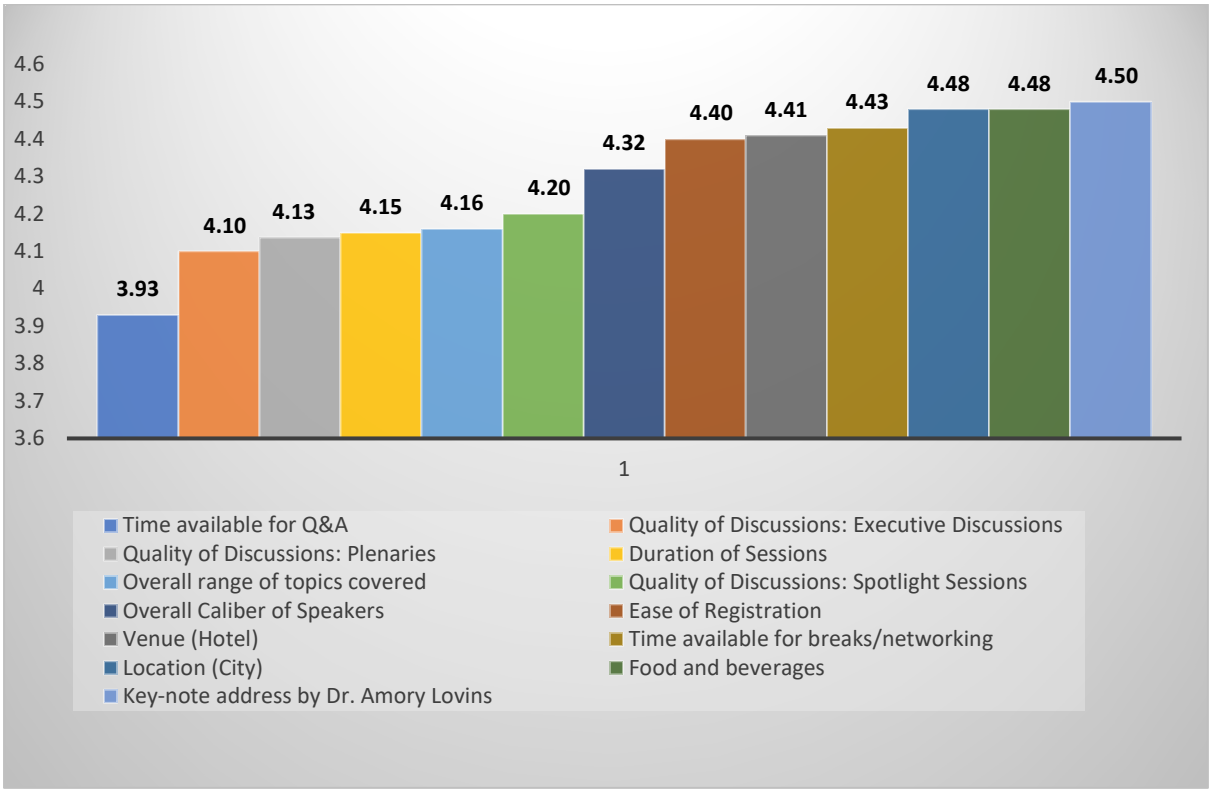
Valedictory Session and Conclusion of INSPIRE 2017
Left to Right - Dr. Satish Kumar, Mr. Steven Nadel, Amb. Satish C. Mehta, Dr. Ritu Singh.

Inspire Organizing Team

8. Feedback



Overall Rating of the Event (n=61)



Average rating of the programmatic aspects of the event on a scale of 1 to 5 (n=61)

View Feedback Form

Summary of comments and qualitative feedback from INSPIRE 2017 participants:

- **Aesthetics of the venue:** There should have been better spill over space - where people can form groups, organize event in more naturally ventilated (if possible) - day lit spaces. The background should have been subtle with better lighting.

- **Appropriateness of the venue:** Any event related to Energy Efficiency / Conservation, the venue should be chosen where the efforts are truly practiced. Conducting a low-carbon event (not merely a carbon 'offsetted' one) is imperative to continue retaining a moral high-ground.

- **Scope of discussion:** Paper presenters as well as all speakers in general need to be warned against using the platform to broadcast marketing pitches. There should have been more focus on commercially viable & replicable energy efficiency technologies. A vigorous discourse on limits to energy growth in various sectors- where efficiency would be a subset of the approaches, was needed.

- **Quality of discussion:** The highlight of the conference was the keynote address by Dr. Amory Lovins. The range of discussion and the expertise of speakers were appreciated.

- **Facilitating the networking opportunity:** While the breaks made for a great networking opportunity, there should have been a good conference app for connecting the participants during the event.

- **Scope of participants:** The diverse group of attendees from the government and academia to high level and technical experts from India and overseas was impressive. There should have been more representation from the end-user community, policy makers, students and companies doing research and development in the EE sector.

View Feedback Form

9. LIST OF DELEGATES

Name	Designation	Organization	Location
Y Aditya		UTC CCS Carrier	
Pankaj Agarwal	CEO	Panitek Power AG	Zurich, Switzerland
Vishnu Agarwal	M. Tech. Student	Malaviya National Institute of Technology	Jaipur, India
Jennifer Amann	Buildings Program Director	American Council for an Energy Efficient Economy	Washington DC, USA
Ammi Amarnath	Senior Technical Executive	Electric Power Research Institute	Palo Alto, USA
Tiger Aster	CEO	Toro Watt Corp	Pune, India
Amartya Awasthi	Consultant	Natural Resources Defense Council	New Delhi, India
Rajiv Awasthi	Chief Engineer	Himachal Pradesh State Electricity Board Limited	Himachal, India
MK Bairwa	Additional Chief Engineer	Director local bodies department of LSG	India
Anurag Bajpai	Director	GreenTree Building Energy (P) Ltd.	Noida, India
Sanjay Bajpai	Lead - Water and Clean Energy Initiative	Department of Science and Technology	New Delhi, India
Surendra Bajpai	Nodal Officer - Energy Management Program	MP Urja Vikas Nigam Ltd	Bhopal, India
Mujesira Bakovic	Master Student	Istanbul Technical University	Istanbul, Turkey
Abhay Bakre	Director General	Bureau of Energy Efficiency	New Delhi, India
Jayaraman Balachandar	Vice President, Building Performance and Sustainability	Siemens Ltd	Singapore, Singapore
Aparna Banerjee	Senior Manager, Communications	Alliance for an Energy Efficient Economy	New Delhi, India
Rangan Banerjee	Forbes Marshall Chair Professor and Head	Indian Institute Of Technology Bom-bay	Mumbai, India
Abhishek Barayach	M. Tech. Student	Malaviya National Institute of Technology	Jaipur, India
Rajat Batra	CEO	STENUM Asia Sustainable Development Society	Gurugram, India
Frances Bean	Project Manager	Buildings Performance Institute Europe	Brussels, Belgium
Ravi Beniwal	M. Tech. Student	Malaviya National Institute of Technology	Jaipur, India
Jaydeep Bhadra	Consultant	PricewaterhouseCoopers Private Limited	Ahmedabad, India
RK Bhanote	AGM - Technical	Energy Efficiency Services Limited	Noida, India

Name	Designation	Organization	Location
Prashant Bhanware	Principal Consultant	Indo-Swiss Building Energy Efficiency Project (Bureau of Energy EfficiencyP)	New Delhi, India
Richa Bhatnagar	Senior Consultant	Energy Efficiency Services Limited	Jaipur, India
Upendra Bhatt	Managing Director	cKinetics	New Delhi, India
Prachi Bhujbal	Project Assistant, Faircondi-tioning (ACIP)	cBalance Solutions Hub	Pune, India
Umesh Bhutoria	CEO	Algo EnergyTech Ventures Private Limited	Kolkata, India
Rajkiran Bilolikar	Associate Professor	Administrative Staff College of India	Hyderabad, India
Smita Chandiwala	Principal	Energe-se	New Delhi, India
Birdhi Chard	Additional Chief Engineer	Public Works Department	India
Chartdanai Chartpolrak	Executive Director	The Energy Conservation Center of Thailand	Bangkok,Thailand
Rohit Chashta	Senior Engineer	Schneider Electric India Pvt Ltd	Gurugram, India
Vaibhav Chaturvedi	Research Fellow	Council on Energy, Environment and Water	New Delhi, India
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Olga Chepelianskaia	Founder	Polarissa	Paris, France
Koshy Cherail	President	Alliance for an Energy Efficient Econ-omy	New Delhi, India
Saswati Chetia	Senior Programme Officer	Greentech Knowledge Solutions Pvt. Ltd.	New Delhi, India
Milind Chittawar	CEO	SEE-Tech Solutions Pvt. Ltd.	Nagpur, India
Shweta choudhary	Associate Dean	Vivekananda Global University	Jaipur, India
Aditya Chunekar	Fellow	Prayas Energy Group	Pune, India
Rhea Cordeiro	Consultant	MacArthur Foundation	New Delhi, India
Ankush Dabra	Student	Malaviya National Institute of Techn-logy	Jaipur, India
Shyamasis Das	Manager - Energy	Research Triangle Institute	New Delhi, India
Bhaskar Deol	Consultant	Natural Resources Defense Council	New Delhi, India
Milind Deore	Director	Bureau of Energy Efficiency	New Delhi, India
Punit Desai	Regional Manager	Infosys	Bangalore, India
Aalok Deshmukh	General Manager & Head: Energy Efficiency	Schneider Electric India	Mumbai, India
Shubhashis Dey	Program Manager - Energy Efficiency	Shakti Sustainable Energy Foundation	New Delhi, India

Name	Designation	Organization	Location
Shivraj Dhaka		Confederation of Indian Industry IGBC	Hyderabad, India
Darshi Dhaliwal	CTO	Toro Watt Corp	Canada
S Dhaliwal	CTO	Toro Watt Corp	Canada
Saurabh Diddi	Energy Economist	Bureau of Energy Efficiency	New Delhi, India
Willy Dr. Derichs	Lean Management leader	RWE Power	Aachen, Germany
Gailius Draugelis	Lead Energy Specialist	The The World Bank	Washington DC, USA
Ajay Durrani	Managing Director	Covestro(India)Pvt Ltd	Greater Noida, India
Christine Egan	Chief Executive Officer	CLASP	Washington DC, USA
Saber El-Hadary	General Manager	Ministry of Electricity and Renewable Energy	Egypt
Isaac Emmanuel	Head Industrial Marketing & Advocacy Indian Subcontinent	Covestro(India)Pvt Ltd	Mumbai, India
Meredydd Evans	Senior Staff Scientist	Pacific Northwest National Laboratory, JGCRI	Maryland, USA
Alexander Farsan	Head of Business Services, India	Carbon Trust	New Delhi, India
Steven Fawkes	Managing Partner	EnergyPro Ltd	London, United Kingdom
Kamlesh Gahal	Consultant	DOIT	India
Narender Gandhi	Zonal Head (North & East)	Ingersoll Rand	India
Mohamed Zied Ganner	Deputy Director	National Agency for Energy Conservation	Tunisia
Vishal Garg	Associate Professor	International Institute of Information Technology	Hyderabad, India
Venkat Garimella	Vice President	Schneider Electric India	Bangalore, India
Soumya Garnaik	Chief General Manager	Energy Efficiency Services Limited	Noida, India
Ankita Gaur	M. Tech. Student	Malaviya National Institute of Technlogy	Jaipur, India
Gerry George	Research Fellow	Alliance for an Energy Efficient Economy	New Delhi, India
Avijit Ghosh	Principal Technical Officer	Central Glass & Ceramic Research Institute	Kolkata, India
Vivek Gilani	Director	cBalance Solutions Hub	Pune, India
Rajendra Giri	Vice President(E&I)	Mangalam Cement Limited	Kota, India
Dinesh Goel	I.A.S.	Government of Rajasthan	India
Akash Goenka	Research Associate	Alliance for an Energy Efficient Economy	New Delhi, India
E Nand Gopal	Associate Fellow	The Energy and Resources Institute	New Delhi, India
Sanjay Prasad Gorkhali	Senior Programme Officer	GIZ	Lalitpur, Nepal
Arjun Gupta	Founder & CEO	Smart Joules Pvt. Ltd.	New Delhi, India

Name	Designation	Organization	Location
B L Gupta	Assistant professor	Government Engineering College	Bharatpur, India
Deepak Gupta	Sr. Engineer Sales	Grundfos	New Delhi, India
Shankar Haldar	Lead Technical Expert	Small Industries Development Bank of India (SIDBI)	New Delhi, India
Christina Halfpenny	Executive Director	DesignLights Consortium	Medford, USA
Phillip Hannam	Energy Economist (Young Professional)	The World Bank	Washington DC, USA
Inchul Hwang	Director	Korea Energy Agency	Yongin, Korea
Pierre Jaboyedoff	Associate	Effinart	Lausanne, Switzerland
Anjali Jain	Junior Research Fellow	Malaviya National Institute of Technlogy	Jaipur, India
Ashok Jain	Chief Secretary	Government of Rajasthan	Jaipur, India
C.P. Jain	Director	HPL Electric & Power Limited	Gurugram, India
Deepak Jain	Student	Malaviya National Institute of Technlogy	Jaipur, India
Neelima Jain	Regional Head	Energy Efficiency Services Limited	United Kingdom
Nitin Jain	Senior Project Coordinator	GIZ	New Delhi, India
Amal Jaiswal	Manager	Siemens Ltd	Mumbai, India
Anjali Jaiswal	India Program Director	Natural Resources Defense Council	San Francisco, USA
Kathryn Janda	Senior Research Fellow	University of Oxford	Oxford, United Kingdom
Chillayil Jayaraman	Past General Secretary	Society of Energy Engineers and Managers	Kochi, India
Anand Joshi	Student	Malaviya National Institute of Technlogy	Jaipur, India
Balawant Joshi	Managing Director	Idam Infrastructure Advisory Pvt. Ltd.	Mumbai, India
Jeetander Joshi	Accountant	DOIT	India
Lalit Joshi	Researcher	Malaviya National Institute of Technlogy	Jaipur, India
Surabhi Joshi	Coordinator & Advisor	Regulatory Assistance Project	Mumbai, India
Kajol K	Senior Project Associate	World Resources Institute	Bangalore, India
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10. APPENDIX

1. Overall, how would you rate the event ?

Interval scale question from very satisfactory (5) to very unsatisfactory (1)

5	4	3	2	1

2. Please rate the following programmatic aspects of the event:

Interval scale question from very satisfactory (5) to very unsatisfactory (1)

Particulars	5	4	3	2	1
Key-note address by Dr. Amory Lovins					
Overall caliber of speakers					
Quality of discussion: Plenaries					
Quality of discussion: Executive Discussion					
Quality of discussion: Spotlight Sessions					
Overall range of topics covered					
Duration of sessions					
Time available for Q&A					
Time available for breaks/networking					

3. What did you like most about the event?

4. What did you like least about the event?

5. Do you have any other suggestions or comments to help us improve our future events?

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