**Day 1: Inaugural Session**

In his Welcome Address, Mr Saurabh Kumar, Managing Director, EESL, India, traced BEE's history and EESL's importance in terms of the variety of initiatives (lighting, water pumping, cooling, merging demand and supply sides) it undertook.

Ambassador Satish C Mehta, Senior Advisor, EESL, cited the distribution of 277 million LEDs, retrofitted buildings, and railway stations. He said that the success of these activities was due to transparency in operations, the large volumes involved, innovative marketing, and outreach. The conference would produce the next new ideas, not just production and technology, but in terms of cooperative implementation, which is of great importance.

In his Special Address, Mr John Roome, Senior Director at the World Bank commented upon the remarkable range and credibility of participants at the conference, pointing out the huge opportunities that climate change presented along with the challenge it posed to life as we know it today. He flagged three points from the COP meeting in Bonn: (i) The Paris Agreement is a victory since all countries are on board (ii) grave warning by 15,000 climate scientists that implementation of the Accord is nowhere near what is needed, and, (iii) technological advances had taken place but scaling up was urgently needed; enormous participation by the private and public sector was very encouraging.

With 2/3 of GHG emissions from energy-related activities, EE is clearly the key to the future not least because of the massive co-benefits in terms of health, employment, environment and security. The main question now is how to move forward in the face of big market barriers, and this conference will discuss related issues such as financial mechanisms, policy, regulation. The key message is not so much technology as about creating supporting institutions and markets. Being the world's 3rd largest consumer of energy what happens in India matters, as also, in terms of opportunities and examples to follow: the EESL, BEE, Ministry of Power are on the cutting edge of EE in India and are spoken about in international gatherings. As far as the World Bank is concerned, it is aware that climate change will result in poverty among 100 million people if nothing is done, and EE is central to the effort towards positive action. The World Bank will support innovative instruments, credit lines, risk guarantees, performance standards.

The next five years are critical: SCALE and URGENCY (speed) are the cornerstones. The question to be asked is: if not us here, at the conference, then who??

Mr Abhay Bakre, Director-General, Bureau of Energy Efficiency, in his keynote address said that BEE had moved to equipment now from its start in 2001 with appliances but supportive policies and programmes are needed, which is why EESL, the Ministry of Power, etc., are involved. He was optimistic about the futures because the current rate of adoption of EE was way larger than anyone had envisaged. The BEE is working on raising the level of partnership from state governments, and programmes and implementation must be driven there. At Central level, the PAT scheme has met with success, and SME engagement was very important, but without compromising their competitiveness. India could lead in the buildings sector, with an EE code already in place. All these schemes cannot be accomplished without a free-flow of finance, and obvious benefits to consumer, with adoption translating into minimum barriers and quick implementation. If the schemes and actions do not make business sense, resultant delays will not permit an advantageous snowballing effect. India is being watched by the whole world right now to see how it moves ahead on this path. Electric vehicles are an area of big change with India's ambitious targets in mobility. EVs will also have to get involved in the EE movement and overall, for the government, stakeholder consultation is critical.

Launch of coffee table book.

In his Inaugural Address, Mr Ashok Jain, Chief Secretary, Government of Rajasthan, stated that green energy and a focus on EE focus are obvious alignments with global concerns about GHG emissions. At the national level, there are several climate change-related action plans dealing with water, solar, energy, sustainable habitats, etc. Electricity generation, security and availability are key priorities, while promoting EE is better than increasing generation capacity. With its large consumption of electricity by the agricultural sector, water and electricity efficiency have to be optimized.

Main points of Inaugural Session

1. Importance of cooperative implementation of EE
2. Promoting EE is better than increasing generation capacity
3. For government, stakeholder consultation is critical
4. Need to raise level of participation and partnership from states in India
5. More important than technology is creation of supporting institutions and markets
6. Scale and urgency are cornerstones of EE
7. India's EE performance, progress are being watched by the world.
8. EE plans must make business sense.

**Day 1 Keynote Session**

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 delivered the Keynote Address: *How big is the energy-efficiency resource?*

He began with an analogy from geology: identified deposits are only small part of the larger resource base, but where EE is concerned, the resource is huge but hidden from view, so no one really talks about it. Ores are limited but opportunities for EE aren't: modern EE can produce expanding returns, and so EE is certainly not a declining resource. He cited calculations suggesting that a decrease in the intensity of energy has about 30 times the impact that renewable energy does, but energy savings are hidden. They key, in his opinion, was technology and design together, moving EE to a new place altogether, with efficiency opportunities getting bigger and cheaper. Integrated design could take care of retrofit at the right time and implement the right steps in the right order; to ensure that it is used, integrated design must be rewarded, with task comfort, rather than space comfort being delivered, for example. Dr Lovins gave the example of vehicles, in which 7/8th of energy consumed never reaches the wheels. 95% of fuel goes into moving body of car, so aim should be to first reduce traction load. This should be a priority in India and a move made from PIGS (personal internal combustion gas steel) to SEALS (shareable electric autonomous lightweight). He stressed the need for bigger, bolder, faster EE, making the point that saving misspent power sector capital could finance much other development work.

Main points of Keynote Address

1. EE resource is hidden and hence unsung
2. Integrated design is key concept
3. Encourage thoughtful step-wise design by rewarding EE resulting from it
4. Bigger, bolder, faster EE implementation.

**Q and A**

Q. What can countries like India do to adopt ID over the solitary technology approach?

A. Invest more in human capital – no institutions in India offering engineering education with a stress on EE in curriculum. This is a struggle in China and US, too.

Institutional setting needs repair: reward DISCOMs not for raising sales of electricity, but for cutting bills. If there is, say a 10% savings, allow company to add it to profit, so both, consumer and company, benefit. Reward design professionals for improving EE: turn it from a transaction to a relationship. Speak to developers in India to get CPI<100.

Q. Are there concerns we have not yet invested in battery technology?

A. Battery technology is moving very rapidly, so the adoption of any particular technology by India, say, Li, might carry a risk because it might become obsolete as newer technologies come in so India should remain agile.

Q. What makes RMI successful and which of these ingredients can be replicated in India?

A. RMI has a lot of Indian staff members and we hope to grow in India where there is much scope, but our style of working is to give to others whatever we have - we don't want ever to make the client dependent on us.

Q. Can we drive results beyond research to the shop floor?

A. Yes, in building practice, particularly, enough has been done for this to happen. We should institute prizes for the most constructive errors pointed out, which led to maximum positive change. India has a huge competitive advantage in its IT strength; sometimes you don't even need too much research – if you start to pay for savings, the best designs will rise to the top. Integrated project delivery would be very useful in India.

If there is greater market transparency in how designs perform and how to improve, change will emerge. These considerations should enter the training and education system in India.

**Executive panel discussion #1**

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

Dr Brian Motherway, International Energy Agency, and Mr Simon Stolp, The World Bank introduced the session outlining the need to deepen policy, in view of the fact that improvements to energy efficiency had enormous financial, environmental, health and economic benefits. Progress was headed in the right direction but was based on old policies which could lead to a slowdown in the pace of energy efficiency implementation. While the question five years ago was, '*why* energy efficiency', the questions now are: '*how*', '*what policies are available?*', '*what suits us best*?' and '*how should we implement it*?'. India's experience and example had a lot for other countries to learn from, and vice versa.

Mr Benoit Lebot of the International Partnership for Energy Efficiency Cooperation, France,

said that 17 out of 20 G20 nations were collaborating on energy efficiency but even the most advanced countries needed to do more. Industry, finance and data collection should be brought together, with financing agencies needing to understand the value of EE. The focus must be on human capacity in different streams put together. He spoke of the 6 Ds of EE being: Decoupling, Decarbonization, Digitalization, Decentralization (not only for national level policy but also for local implementation, where, again, human and institutional capacity would be needed), Democratization (access to energy as enshrined in SDG 7), Desirable (a change must be desired for it to occur). If money wasn't spent on all these capacities mentioned, the conditions for investment in EE will never be realized. The capacity to engage the transition is needed, above all.

Mr Mark Lister, Copenhagen Centre on Energy Efficiency, Denmark, described his organization's role as that of a facilitator and coordinator of EE implementation. It accomplished this by assisting policy change in countries and cities accelerating EE through innovation in delivery models and raising the profile of EE. He spoke of the need for a shift in the paradigm from EE as an add-on, to EE as a way of life, which would be driven by a coupling together of higher-level policy, with ground-level work. Capacity on the ground would be needed together with investment-oriented programmes, and relevant changes in the technical education sector.

Mr Christian Zinglersen of the Clean Ministerial Secretariat in France referred to the latest World Energy Outlook Report saying that India was clearly key in any talk of energy consumption, also pointing out its collaboration in the Clean Energy Ministerial (CEM), leading 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. He pointed out the latest evidence of interest in CEM countries as being increasing consumer awareness through the use of apps, labelling schemes, etc., space conditioning and the interplay between EE policy and other policies such as those relating to renewable energy. He stressed that this was a global discussion and systems thinking must underlie all activities.

Ms Christine Egan, CLASP, USA, focused on appliances, pointing out that her organization had found 1400 product policies available for relative energy use and that the carbon dioxide emissions from the combined use of appliances amounted to a significant figure. She looked for broader policies that covered more products, commercial and industrial; deeper policies that would set more stringent standards, and faster policies that would shorten the time for implementation. Economic, health, environmental and financial outcomes would all improve with more attention to energy efficiency and standards and labelling were the two needs.

Main points of Executive Panel Discussion #1

1. Need to deepen policy
2. The focus must be on human capacity in different streams put together
3. The capacity to engage the transition is needed, above all.
4. Need to shift from EE as an add-on, to EE as a way of life, which would be driven by a coupling together of higher-level policy, with ground-level work.
5. Capacity on the ground together with investment-oriented programmes needed, and relevant changes in the technical education sector.
6. This is a global discussion and systems thinking must underlie all activities
7. Deeper, broader and faster policies needed.
8. No policy without pragmatism
9. Countries look to peers for examples – much to be gained from sharing.

Q and A

Q. Everyone spoke of collaboration and learning: how applicable are learnings from one country to another?

A. Countries value verification from other similar countries as well as from dissimilar ones.

Q. What are some universal rules for applying policy

A. The availability of test facilities and priority-setting are important in any context. Technical capacity-building is also vital, and in the end, a combination of political will and funding will address the issue.

Q. If we want to move fast and significantly, how should we be promoting policy?

A. Policy is important but not sufficient to see energy efficiency through. Aspirations must be translated into implementation which often doesn't happen owing to a deadlock between finance and technology. Resources are required to train locals in this direction.

Other points that emerged in the questions and answer session pertained to the importance of human capital and technical capital which would, in the long-term, bring about a change that the market would then respond to. Sometimes, an enabling policy did not exist at all.

It also happens that the people in government responsible for EE policy are different from those responsible for renewable energy policy, for example. This didn't matter a few years ago when buildings and RE (and their demand and supply considerations) codes were separated, but they are now aligned and both growing so, again, integrated thinking is needed to make progress on EE, and RE/EE policy should be considered together.

Chairs' conclusions: Well drawn-up policies might not get implemented at all for the lack of laboratories with testing facilities, rendering the policy toothless. There could be no policy without pragmatism. Countries will look to their peers for experience and examples – much could be gained from sharing. Mechanisms to understand successes and failures already exist.

Executive panel discussion #2: EE 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

Mr Chartdanai Chartpolrak, Energy Conservation Center of Thailand, introduced his country's vision for EE: its target is to reduce energy intensity by 30% by 2036. The programmes aimed at achieving that vision were presented, one, compulsory programmes and the other, supportive.

Mr Soumya Garnaik of Energy Efficiency Services Limited, India, introduced the EE landscape in India outlining how EESL supplements the Bureau of Energy Efficiency's programmes. He pointed out that while consumption of energy in India had almost doubled between 2000 and 2011, there had been a reduction in energy intensity attributable to reducing losses (and increased EE), and also a shift from manufacturing to services. The main impact came about after the enactment of the Energy Conservation Act in 2001, and while a market transformation is not complete, schemes such as the Perform-Achieve-Trade have created movement in the right direction. Initiatives have been taken at state level, as well as central level with municipalities also participating voluntarily in some programmes without subsidies, too. Public-private-partnerships, energy service companies, indigenous technologies are all part of the implementation.

Mr Mohammed Abdullah Al Mamun of the Sustainable and Renewable Energy Development Authority (SREDA), Bangladesh, said that his organization's vision was to build an energy-conscious society, ensure energy security and reduce carbon emissions. He pointed out that capacity was what Bangladesh lacked most and that cooperation was sought to help implementing plans. There were several policies and action plans related to EE in place. There were programmes for energy management, labelling, energy efficient buildings, financial incentives, and also awareness-building plans.

Mr Asad Mahmood of the National Energy Efficiency and Conservation Authority, Pakistan, traced the history or energy efficiency pointing out that the move had begun as a USAID project in 1985, and now published in Pakistan's gazette (2016). The Authority was working to encourage efficiency in appliances and provide an energy conservation fund. It was also looking at the evolution and role of different ways to encourage and promote energy efficiency such as promoting indigenous manufacture of EE products, separating the classification of EE imports, etc.

The chairman asked the panelists their country's experience with raising funds for EE. In Thailand, people were wary of investing money in EE though it appeared that industry had the needed expertise. More or less the same risk-averse situation prevailed in Bangladesh, with the government providing funds for capacity-building but not EE projects directly.

Pakistan was trying to issue directives to banks to make RE and EE products. While it was easier to understand RE since energy was generated, it was harder to grasp the concept of EE because nothing is actually generated. There is an attempt to ask large companies to invest in partnerships or work with the informal sector as part of their CSR activities. Banks run by the state have issued directions but these are not mandatory.

In India, although finance was a challenge, the general attempt to encourage investments in EE has been to keep payback periods under about three years. The standardization of evaluation processes is necessary without which banks/financial institutions do not feel encouraged to lend since they are unable to judge the project's viability. A relatively new phenomenon is the empanelment of financial institutions.

Main points from Executive Panel Discussion #2

1. Capacity-building is major issue to be tackled across Asian countries
2. People did not seem to value investment in EE but thought it risky.
3. Testing facilities/standardization of processes are vital to convince banks of viability of their loans.
4. Building awareness among people about EE is crucial.