

Summary IEA-BEE Webinar on Roadmap for Mainstreaming Energy Efficiency in Indian Residential Buildings.

Held 18th September 2020. Slides and webinar recording are available here:

<https://www.iea.org/events/bee-iea-roadmap-for-mainstreaming-ee-in-residential-buildings-in-india-kick-off>

Highlights

The key takeaways from the webinar are summarised below:

- Large-scale affordable housing programmes under Housing for All could be vehicles for mass building of energy efficient homes, as is underway in Andhra Pradesh.
- Energy efficiency is a movement not a programme.
- Thermal comfort a key driver for implementing energy efficiency measures.
- Some excellent success stories exist from states receiving close technical assistance, with learnings to be replicated elsewhere.
- What is required to enable the mainstreaming of energy efficiency in the buildings sector:
 - bringing down the marginal cost of efficient materials and construction techniques
 - capacity building is required at all levels to facilitate the implementation of EE measures and awareness-raising regarding the benefits to gain:
 - top-level decision makers in ULBs and SDAs
 - officials administering building permits
 - designers, labourers, skilled and unskilled
 - home-owners and occupants
 - stakeholders that may not be direct beneficiaries, eg. Energy utilities
 - Continuous dialogue is required between all levels of government, with strong leadership and close technical assistance, particularly in the beginning
 - Automation of the compliance process, and platforms for knowledge-sharing would support large scale adoption of the ENS code
- Recommendations for the IEA-BEE Roadmap included:
 - Clear actions need to be defined for next 2-3 years
 - Increased dialogue with the private sector, developers, designers and consumers.

Proceedings:

Welcome remarks by Ms. Melanie Slade, *Senior Programme Manager, IEA*

Ms. Melanie Slade welcomed the participants to the webinar and introduced the broad aims of the Roadmap for Mainstreaming Energy Efficiency in Residential Buildings in India. Building on the IEA's work on the GlobalABC Regional Roadmap for Buildings and Construction in Asia, it aims to identify and prioritise measures to mainstream energy efficiency in the Indian residential buildings sector. She highlighted the success of the Government of India in developing an energy efficiency code for commercial buildings and more recently for residential buildings. She informed the participants that the current roadmap will focus on identifying measures in addition to the compliance approach adopted in the existing codes to motivate stakeholders at local, regional, state and central level to mainstream energy efficiency in the construction of new residential buildings. She emphasised the fact that energy efficiency offers huge potential for jobs and economic recovery in the current times, as highlighted by recent IEA analysis.

Opening remarks by Mr. Abhay Bakre, *Director General, BEE:*

Mr. Bakre spoke about the importance of energy efficiency in the building sector, stating that amongst different sectors, buildings have the most potential to offer, as each individual house offers a potential to save energy through innovative approaches. He also highlighted that buildings do not only offer solutions for the governments but also for individuals by selecting different technological options for appliances, using locally available materials, or integrating low carbon construction techniques, among others. He also suggested that since the buildings sector offers such a large playing field to integrate energy efficiency measures, policy makers should be conscious and flexible in designing approaches to maximise the benefit from the sector while keeping in mind the challenges posed.

Opening remarks by Ms. Natalie Toms, *Chief Economist, British High Commission:*

Ms. Toms noted that the UK, as one of the founding members of the IEA's Clean Energy Transitions Programme, is pleased to collaborate with the IEA and BEE. She commended the UK and India's efforts on climate action, and drew attention to the severe effects that events can have when the relationship of humans and nature breaks down and, thus, the importance of working together for a clean and resilient recovery. She highlighted the impressive action India has taken and the UK's commitment to supporting India's energy transition and climate goals, the IEA's CETP programme being a key vehicle in this regard. In addition, she mentioned the valuable and historical association between the UK government and BEE for knowledge-exchange on industrial energy efficiency. Ms. Toms noted the UK's recent ambitious net-zero buildings target, and suggested that IEA can draw up on some of these international experiences while developing the roadmap for residential energy efficient buildings in India. Finally, she mentioned the COP26 and the Product Energy Efficiency



Initiative, and thanked India and the IEA for their support. This initiative is focusing on key energy consuming products such as air conditioners, refrigerators, electric motors and lighting, and aims to lead a global trajectory to doubling the efficiency of these four key products by 2030.

Mr. Saurabh Diddi, *Director, BEE:*

Mr. Diddi spoke about the current energy scenario in India and what role energy efficiency could play moving towards a cleaner environment and sustainable future, in which views of the Himalayas from large cities would remain, beyond pandemic-related lockdowns. India is looking to decouple GDP growth from energy consumption yet primary energy demand is still expected to increase significantly over the next decade. He also informed the participants about the BEE's roles and responsibilities and various energy efficiency programmes across different sectors, sharing that these activities resulted in energy savings of about 24 Mtoe and 150 Mt of avoided carbon emissions in 2018-2019.

He then informed that the buildings sector is responsible for consuming almost 33% of the total electricity consumption, with the residential sector responsible for 24%. He also highlighted that the building sector is projected to surpass the energy consumption from the industrial sector by 2030, due to another 1 billion m² and 3 billion m² floor area expected to be added in the commercial and residential sectors respectively by 2030, as well as rising demand for energy services such as space cooling as incomes continue to grow.

He also presented the initiatives taken up by BEE to cater to the rising demand from the buildings sector and informed the participants about the different buildings programmes, such as:

- Energy Conservation Building Code (ECBC) for Commercial Buildings and star rating of Commercial buildings
- Support for demonstration projects
- Eco Niwas Samhita (ENS) for residential buildings and Residential building labelling
- Buildings Material Directory
- Replicable building design and compliance tool
- Smart Home Program (technology assessment study and pilot design)
- Preparation of a database and adaptive thermal comfort model
- ENS design and compliance tool

Ms. Maxine Jordan, *Policy Analyst, IEA:*

Ms. Jordan introduced the concept for the India roadmap for energy efficient residential buildings. She highlighted the impact as well as the unique opportunities that the buildings sector offers. Passive solutions and more efficient air conditions could drastically reduce the growth of buildings' electricity demand, while still allowing more of the population to have better access to thermal comfort. In addition, she stated that the multiple benefits of energy efficiency are key to sustainable development, for example, having huge potential for creation of jobs and economic development as suggested by the IEA's Sustainable Recovery



report. Ms. Jordan introduced the GlobalABC Regional Roadmaps for Asia, Africa and Latin America which were developed by the IEA and in collaboration with many stakeholders across the value chain of buildings. The Roadmaps aim to identify the measures that will unlock these benefits and be key to reach net-zero carbon buildings. Lastly, she introduced the intended methodology for the present project, which relies on identifying where the sector is today, what is the common vision that all stakeholders would align to, and what the strategies for reaching this vision are, including defining indicators for tracking progress. Ms. Jordan reminded the audience of the project timeline, which will include stakeholder consultations and document reviews between now and early 2021, and encouraged the participants to join the project [LinkedIn Group](#).

Panel Discussion:

Mr Ajay Jain, Principal Secretary to the Government, Housing Department, Andhra Pradesh

Q: BEE published the first addendum to the Eco-Niwas Samhita (residential building code) in 2018. However, for the code to become successful, participation from the ULBs to adopt the code and implement it is required. What are the strategies you think best work at the municipal level for adoption of buildings energy efficiency policies, such as Eco-Niwas Samhita (ENS)?

What are some of the suggested policy measures to overcome the significant lack of human resources required for implementation?

Mr. Jain highlighted that the energy consumption of residential buildings is a very relevant topic in the entire globe, as well as in India. Mr. Jain informed that Andhra Pradesh (AP) has recently implemented ECBC for commercial buildings and compliance with ECBC is required to construct any new commercial building. The housing department in AP is undertaking the construction of 3 million affordable houses under the Housing for All initiative by the GoI in the next three years and is working with BEE and Indo Swiss program to ensure they are compliant with ENS within the budget of 9 billion USD. They have adopted strategies like appropriate window-to-wall ratio, window-to-floor ratio, natural lighting and ventilation using passive design measures and providing 5-star rated energy efficient appliances. However, the biggest challenge faced by the housing department is to bring down the cost of such construction. The housing department believes that it is important for the public sector to lead such initiatives to motivate the private sector to move in this direction.

AP recognises that energy efficiency is a movement, not a programme. AP has formed a secretariat for each ULB consisting of 10 staff, including one assistant engineer for every 2000 inhabitants. In addition to the government support, for every 50 households a volunteer supports the delivery of government schemes and programmes to the local population. Mr. Jain suggests that lack of human resource is not the main issue, as a total of approximately 130,000 people support the delivery of municipal programmes. The challenge lies in capacity building for this workforce. He suggested that it is important for both BEE and individual states to organise appropriate capacity building, training and awareness generation campaigns and workshops to familiarise them with the benefits and concepts of energy efficiency, including how to implement the ENS code.

Mr. Vipin Sharma, Commissioner, Thane Municipal Corporation

Q: Maharashtra has been one of the most active states in notifying the ENS building energy code and developing strategies to incorporate energy efficiency at ULB level as well. What are the opportunities present at ULB level and how can ULBs benefit to and from the implementation of the code?

Mr. Sharma shared that Maharashtra is one of the largest urbanised states in the country and has taken up several initiatives both at state and ULB levels to incorporate energy efficiency in the buildings sector. The state is in the final stages of notification of ENS. He highlighted the importance of ULB level engagement in mainstreaming energy efficiency in the residential sector as ULBs have direct regulatory authority in giving permissions for construction activities. He spoke about different challenges faced by the state government in the construction of energy efficient buildings such as the lack of a large and accessible market for energy efficient and low carbon materials. He also spoke about the lack of skilled labour to incorporate energy efficient construction practices and suggested that more training and capacity building campaigns are required. These are required both for labourers and for government officials within ULBs. He also stressed on the fact that it is not enough to construct an energy efficient building, it is also important to communicate the benefits of energy efficiency to the local population so that occupants operate their buildings in an energy efficient way, and highlighted the importance of awareness generation campaigns.

He spoke about the Unified Development Control Regulation (UDCR) document of Maharashtra, which includes the features of ECBC and ENS, and once published, will act as modal guidelines for town planners in the state and uplift energy efficient construction.

Q: From your vast experience of working both with the SDAs in past and currently working with the ULB, what would you suggest are mechanisms to better coordinate activities between SDAs and ULBs?

Mr. Sharma suggested that to better coordinate activities between ULBs and SDAs, there is a requirement for continuous comprehensive dialogue between these two levels and this could come in form of joint meetings, presentations, webinars etc. He spoke about the communication gap, which lies between the two levels and suggested setting up a special cell in ULBs to make them more aware about the activities undertaken by SDAs and how ULBs can benefit from them and vice-versa.

Mr. Hanumanthrayappa, Assistant General Manager, Karnataka Renewable Energy Department

Q: The housing demand in India is expected to grow in the coming decade, and particularly in Karnataka, with such a large built up area yet to be constructed. What do you suggest will act as motivation for the ULBs to adopt building energy codes? In addition, what do you see as the main opportunity for integrating energy efficiency in this sector?

Mr. Hanumanthrayappa informed that the building sector in Karnataka is responsible for consuming about 35% of the total electricity in the state. The figures for residential and commercial sector are 22 and 13% respectively.

He spoke about the different challenges faced by the state in mainstreaming energy efficiency in the sector such as:

1. There is need for market transformation leading to development of a market for locally available and cost effective yet energy efficient materials for the buildings. Current policy measures by the central government do not support such initiatives.
2. It is also important to support local emerging start-ups for building management and operation
3. More pilot demonstration should be taken up by the state and central government to showcase the benefits of energy efficiency buildings in terms of electricity savings, carbon reduction and comfort strategies.
4. Incentives in terms of reduced home loans, property tax reduction, more FAR should be given by regulatory authorities to motivate private developers

He also spoke about the importance of stakeholder consultations, bringing all building practitioners together from policy makers to regulators to architects and developers, to understand the complexity of the sector and devise a common policy towards a common vision.

Mr. Rajkiran V Bilolikar, Associate Professor, Energy Area of Administrative Staff College of India

Q: Andhra Pradesh is amongst the first states to adopt building codes and implement them. What are the lessons learned and challenges faced? What recommendations would you give to other states embarking on integrating EE in building byelaws for the first time?

Mr. Rajkiran spoke about the different challenges states face in implementing energy efficiency and what are the lessons they could learn from the state of AP and Telangana:

- He suggested that the most important step is the constant leadership support, which lays down the foundation of policy and programme guidance. It is important to convince the top government to buy-in to the concept of energy efficiency which then leads to continuous stakeholder engagement;
- Second is stakeholder consultations: bringing stakeholders from different departments including ULBs, SDAs, electricity departments to develop a consensus over the policy framework and its adoption, including those that might not be a direct beneficiary such as real estate developers and energy utilities;
- Third is the requirement for effective outreach, creating a pool of experts not only who understand the benefits of energy efficiency but also of town planning and regulation, to converge the policy outcomes, demonstrate benefits, and create tools. Outreach also needs to include architects, engineers, skilled and unskilled labour force, and building occupants; and lastly,
- Providing continuous support. It is as important to guide the local workers and stakeholders during the construction process, as it is to adopt the energy efficient building policies to convert the efforts from a programme to a movement.

He also stated that the key challenges remain cost and material availability.

Dr. Anand Shukla, Senior Thematic Advisor, Swiss Agency for Development and Cooperation

Q: As well as being instrumental in the development of the ENS code, the BEEP India project of the SDC has been working with the SDAs of three states to implement ENS. In your work, the team has been working with many different stakeholders including architects, engineers,

skilled labour and informal sector. What does the SDC team suggest as some of the best mechanisms to facilitate the integration of energy efficiency in both public sector construction and private sector development?

Dr. Shukla pointed to the importance of making the code mandatory at state level in order to increase the adoption of the code. However, he stressed the importance of expediting the entire building compliance process, and of the code being simple and practical, while being effective and based on robust analysis. This was the strategy for the development of the ENS code, where state officials were invited to test its practicality. He also spoke about how crucial it will be to strengthen the supply chain for energy efficiency materials and construction technologies in order to enable the adoption of the code, and stressed on the importance of providing technical support to the states and cities, at least during the initial years.

Mr. Vikash Ranjan, Programme Manager for Buildings, GiZ

Q: The GiZ team is working with five SDAs to implement ENS through ENS Cells. Each of these states are at different levels of energy efficiency implementation. What learnings can you share, and more specifically, what role do you think peer-to-peer comparison and sharing success stories plays in motivating states? In addition, what would you say is a priority for mainstreaming energy efficiency in this sector?

Mr. Ranjan informed that GiZ is working with five states to help them implement the ENS code and other energy efficiency measures, all of which are at different levels, but have the common goal of wanting to increase energy efficiency. He also highlighted the importance of having simple code along with support measures such as the building directory to act as one-stop solution, promote a common vision and tackle the embodied carbon of building materials. He also suggested having systems and design measures that are easy to replicate and scale-up. He also spoke about needing strong awareness (both at top decision making level, and bottom-up) and capacity building activities at all levels of governance, increased coordination across Ministries, along with building confidence at ULB level to adopt the code by supporting them in their day-to-day operations. He mentioned the need for having financing schemes such as advantageous loans for developers to incentivise them to build more energy efficient buildings. Challenges remain around the cost of materials, or the perceived cost of more efficient materials. Mr Ranjan highlighted that countries like Germany have taken over 40 years to reach net-zero carbon codes, but India can and should make this transition faster.

Suggested priority actions for mainstreaming energy efficiency measures in this sector:

- provide incentive schemes to help with the upfront cost;
- get buy-in of states and ULBs regarding the lifecycle benefits of implementing EE measures;
- automation of compliance systems to reduce paperwork load.

Question to all panellists:

Could each of you give one piece of advice for the IEA-BEE team as we embark on the Roadmap process, in terms of key features, or key areas to focus on?

Mr Rajkiran Bilolikar: Having a strong awareness generation campaign strengthening both top-down and bottom up-approaches to achieve the benefits of all energy efficiency programmes.

Dr. Anand Shukla: Focus on priority actions for the next two to three years. It is important to stimulate demand for energy efficient homes among homebuyers, for example through media campaigns.

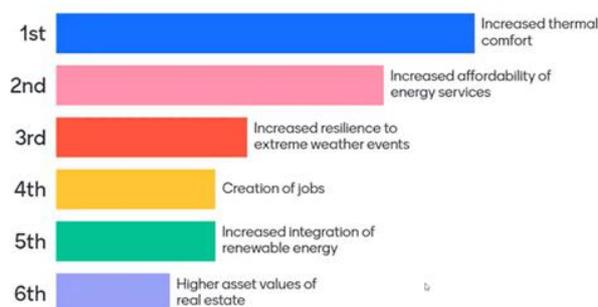
Mr. Vikash Ranjan: Create a knowledge-exchange platform imparting information to top and bottom levels, including clear strategies for technology application, as the buildings sector is a complex sector with many actors.

Results from Menti polls

The audience were asked five questions, via the online polling platform Menti:

1. **Which type of organisation do you represent?** The results showed that the majority of the audience were comprised of architects and engineers (43%) but also participants from national government (9%), urban local bodies – ULB (9%), international organisations/ NGO (9%), state designated agency – SDA (4%), civil society (4%) and other (22%).
2. **Which policy instruments could better motivate voluntary adoption of green measures?** The participants most responded that mandatory regulation (ex. through bye-laws) is important, followed by indirect financial incentives such as tax rebates and direct financial incentives such as grants and, lastly, non-financial incentives (e.g. increased scope or expedite permitting).
3. **What is the biggest challenge faced by the industry in the construction of energy efficient buildings?** The results pointed out that there are several important issues. In a rank from importance, the first one is the lack of understanding of benefits energy efficient buildings can bring, lack of guidelines about how to implement energy efficient measures, lack of market demand from homeowners, lack of adequately skilled workforce, also considering that the marginal cost is too high and finally, lack of access to appropriate finance.
4. **Rank the multiple benefits if energy efficient buildings in order of importance.** The audience feedback showed that the two most important multiple benefits are increased thermal comfort and affordability of energy services. They were followed by increased resilience to extreme weather and creation of jobs and increased integration of renewable energy. The last, was the higher asset value of real estate.

4) Rank the following multiple benefits of energy efficient buildings in order of their importance to you



5. **Out of 10, how useful to you would the following features of the IEA Roadmap be?** The feedback pointed out as most important are the identification of priority gaps in data as well as bringing examples of best practise technologies and policies from India. Other features considered relevant are presenting examples of best practice worldwide, establishing targets (short, medium and long) and indicators for assessing progress.

5) Out of 10, how most useful to you would the following features of the IEA Roadmap be?

