"Optimizing Energy Efficiency in Buildings-bigEE Initiative

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...towards global sustainable development

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Introduction and Background

This report highlights the discussions during the one day workshop on "bigEE initiatives on energy efficiency in India" Center for Research on Sustainable Building Science (CRSBS), TERI and Bureau of Energy Efficiency (BEE) in partnership with Wuppertal Institute, Germany, organized a one day stakeholder workshop on "bigEE initiative for optimmizing energy efficiency in buildings" on 17th November at Amaltas hall, India Habitat Center. Bridging the information gap on Energy Efficiency (bigEE) in buildings is an international initiative by research institutes for technical and policy advice and public agencies in the field of energy and climate, co-ordinated by the Wuppertal Institute, Germany. The outcome of the partnership is to create an international web-based knowledge platform for energy efficiency policies in buildings, building-related technologies, and appliances in the world's main climatic zones

The Workshop received an overwhelming response from the participants and panelists.

Workshop Background

The overall objective of this stakeholder capacity building workshop, was on advancing energy efficiency policies in buildings to:

- Highlight the opportunities and benefits of optimizing energy efficiency in buildings through policies for the target country.
- Raise the capacity of the policy-makers to develop and implement holistic strategies for energy efficiency in buildings.
- Stimulate discussions on how to strengthen local policies for energy efficiency in buildings.
- Introduce the bigEE knowledge platform and demonstrate its added value for policymakers' strategic and operational level decisions.



Contents

AUTHORS III
Authorsiii
INTRODUCTION AND BACKGROUND IV
Workshop Backgroundiv
SESSION 1
Opening remarks by Mr. Sanjay Seth, Senior Director, Sustainable Habitat Division,
TERI, India
Key Note address by Dr. Stefan Thomas, Director, Energy Transport and Climate Policy
Group, Wuppertal Insititute, Germany6
Benefits of energy Efficiency in India by Mr. Sanjay Seth, TERI, India7
Technical Session 1: Demonstration of bigEE platform for buildings and appliances
sector by Mr. Sriraj Gokarakonda, Reasearch Fellow, Energy Transport and Climate
policy Group, Wuppertl Institute, Mr. Deepak Singh Rana, Research Associate CRSBS,
TERI and Ms. Disha Sharma, Research Associate, TERI
Indira Paryavaran Bhawan Case Study presentation by Mr. Deependra Prasad, Architect
and Planner, Architect Design Ecologic Planning9
TECHNICAL SESSION 2
Demonstration of bigEE policy Template by Dr Thomas, Director,WI
Demonstration of bigEE policy template- India by Mr. Yatin Choudhary, Fellow, TERI12
Presentation on Energy Efficiency Building Code (ECBC) implementation in State's by
Mr. Abdullah , UNDP and Mr. Ashu Gupta, Co founder Design2occupancy
Stakeholder Discussion, moderated by Mr. Sanjay Seth
ANNEXURE: AGENDA



Session 1

Opening remarks by Mr. Sanjay Seth, Senior Director, Sustainable Habitat Division, TERI, India

Mr. Sanjay Seth welcomed all speakers and participants to the workshop on behalf of TERI.Mr. Seth talked about the key initiatives taken up by the government of India in the sector of building energy efficiency and discussed about India's INDC and NDC. He also highlighed how getting primary data is an issue in the country and briefed the participants about the data collection process taken up by TERI in consultation with BEE for completing the tasks for bigEE website.



Mr. Sanjay Seth, Senior Director, TERI

Key Note address by Dr. Stefan Thomas, Director, Energy Transport and Climate Policy Group, Wuppertal Insititute, Germany

Dr. Thomas Talked about energy efficiency in buildings sector and briefed participants that energy efficiency in buildings is not only a key to climate change but also to comfort and productivity of people working in buildings, and affordable energy bills. He informed participants that a large scale energy efficiency project may save 1.5%, or higher and energy efficiency might quadruple energy savings from fuel savings

He also explained that efficient technologies will also alleviate energy poverty and energy efficiency will contribute to almost 50% of savings in carbon dioxide emissions needed to stabilize the climate

He then briefed the participants abouthe inspiration behind the bigEE platform was that a lot of information is gathered, but is not easily available and collection, exchange and dissemination of information is important for implementation of energy efficiency policies The objectives of the workshop, which are, to raise awareness about the various benefits of energy efficiency, close gaps in scattered information by collection and providing it in a transparent way were discussed by Dr. Thomas



Dr. Stefan Thomas, Director, Energy Transport and Climate policy Group, Wuppertal Institute

Benefits of energy Efficiency in India by Mr. Sanjay Seth, TERI, India

Mr. Seth discussed about the benefits of energy efficiency in India, focusing on the current policy initiative and programs on energy efficiency, active in the country. He stressed on the point that the time is right to focus on green building guidelines for the residential sector, which consumes almost 17% of the total energy consumption. He then informed the participants about the current ECBC code and its notification and implementation in country informing participants that out of 36 states and union territories already 10 states have notified the code and many are in the process. He also talked about various issues while implementing energy efficiency projects like lack of proper MVE mechanism, availability of correct data etc.



Technical Session 1: Demonstration of bigEE platform for buildings and appliances sector by Mr. Sriraj Gokarakonda, Reasearch Fellow, Energy Transport and Climate policy Group, Wuppertl Institute, Mr. Deepak Singh Rana, Research Associate CRSBS, TERI and Ms. Disha Sharma, Research Associate, TERI.

Mr. Sriraj explained the bigEE buildings and appliance template to the audience. He briefed the methodology adopted by the bigEE team to present the data in these templates. The buildings and appliance templates for India were presented by Ms. Disha Sharma and Mr. Deepak singh Rana respectively. There were few suggestions and comments pointed out by the audience mentioned below to enhance the data presented on the webportal.



Mr. Sriraj Gokarakonda, Research Fellow, WI Comments on Appliance tEmplate

- Mr Sanjay Seth pointed out that the four climate zones in which India has been divided for the purpose of the study must be revised as they are not in agreement with ECBC or NBC, which may result in distortion in the research outcomes.
- Mr Thomas clarified that although the bigEE climatic zones are not in agreement with AHSRAE's classifications either, the design recommendations and comparisons with international good practices in buildings will still remain relevant for designers for implementation in actual buildings.
- Mr Gautam Nagar, Assistant Manager at PWC pointed out a misrepresentation of the Indian map.



• On the appliances guide page Mr Sanjay Seth pointed out that to keep the data up to date a link to the BEE's application can be provided on the webpage.

COMMENTS ON BUILDINGS TEMPLATE

- It was noted again that there needs to be a mechanism for data to be updated on the bigEE platform.
- Also, it was noted that seasonal variations in the energy consumption data of buildings must be accounted for. Municipalities and DISCOMs need to be approached for collection of needed data.
- Where examples of energy efficient buildings are provided a rider must be given mentioning any assumptions that may have been made in the reported data.
- The data provided in the examples need to be updated and consistent.
- Dr Thomas reiterated that the building examples need not be very big in numbers but detailed presentations need to be made so that investors can compare their scenario with best practices.



Ms. Disha Sharma and Mr. Deepak Singh Rana, Research Associate, TERI

Indira Paryavaran Bhawan Case Study presentation by Mr. Deependra Prasad, Architect and Planner, Architect Design Ecologic Planning

Mr. Prasad presented the case study of India's first nearly net zero building, Indira Paryavaran Bhawan. The presentation drew the interest of all the participants. Some of the salient features of the building are



- Areas that have a low daylight requirement, like auditoriums, cafeterias and exhibition spaces, were placed at the ground floor
- The staircases were designed to be naturally ventilated. Further, he explained how the building concentrated on people who walked to the site.
- The Indira Paryavaran Bhawan has three levels of parking, the top one being a manual parking and the bottom were automated
- Listing out the features that helped making the structure near net-zero, he said that a window-wall ratio (WWR) of 25 per cent was maintained, with walling done by AAC blocks, achieving a lighting power density half that of the prescribed ECBC benchmark.
- The roof of the building has a solar capacity spread over an area of 6000m2, with a generating capacity of 930 kWp.
- All the essential spaces through the building are air conditioned with a set point of 26°C being targeted.
- The cooling system employs chilled beams
- For air conditioning a geothermal cooling system is employed, with u-shaped pipes carrying condenser water running vertically into the ground, effectively achieving a temperature difference of 7°C.
- Other features contributing to the net-zero target entailed usage of either 3 or 5 star rated appliances throughout the building, and the provision of remote computing for employees is currently in the tendering process with all the data being stored on a server, cutting down on UPS loads.
- Mr Prasad ended by saying that eventually zero additional cost must be targeted, highlighting the importance of constructing a net-zero building at no additional cost from a conventional building.





Mr. Deependra Prasad



Technical Session 2

Demonstration of bigEE policy Template by Dr Thomas, Director, WI

Dr. Thomas demonstrated the Policy Package Guide on bigEE platform. The various features and the need to build the policy guide were showcased, which included barriers, addressed by the policies which were majorly on minimum energy performance criteria, the concrete design and standards followed by the policies and also a separate impact section which included the information on the potential and achieved energy and cost savings after the implementation of the policies, cost of policy implication and optimum standards. The policy package also included key information of the policies and the summary of policies from other countries proving energy efficiency in new buildings.

Demonstration of bigEE policy template- India by Mr. Yatin Choudhary, Fellow, TERI

Mr. Yatin Choudhary demonstrated the India page for the policy package, which included the targeted information for different regions of India, the demonstration projects like Bachat Lamp Yojna, DELP now known as UJALA, the SEEP program and the details on the standards and labelling program and the policies like ECBC being taken up by the states. Various financing schemes and other mechanisms included by the policies were also illustrated. The pool made by the BEE for the certified energy auditors and the energy efficiency awards being given by BEE was also showcased on the page. He mentioned about the upcoming policy pages and the structure that it would include regarding the details that would be included in the upcoming pages, the key information, design and implementation, target groups and the impact studies.





Mr.Yatin Choudhary, Fellow, TERI

Presentation on Energy Efficiency Building Code (ECBC) implementation in State's by Mr. Abdullah , UNDP and Mr. Ashu Gupta, Co founder Design2occupancy.

Mr. **Abdullah N Siddiqui**) stated that the energy efficient buildings are those which take care of three broad categories of comfort, safety and energy conservation are called energy efficient buildings. He demonstrated the structure of the ECBC and mentioned the powers and functions of BEE and the state government. He also talked about the minimum energy efficiency standards and the energy savings achieved by the states implementing ECBC. He also mentioned about the pilot projects taken up by ECBC and the training and capacity building workshops which helps in strengthening the capacities of the SDA's. The key outcomes of the projects taken up by UNDP for promoting ECBC, included market assessment of energy efficient building materials, amendments and notifications and the institutional framework for supporting the states, the master trainer program, enhanced simulation software and the construction of 1million meter sq. of ECBC compliant commercial space and National Energy Benchmarks.

His presentation was followed by Mr. Ashu Gupta. In his presentation Mr. Gupta talked about the Implementation of ECBC in states. He mentioned about two approaches followed in ECBC, the prescriptive and whole building design for the implementation of the ECBC in buildings and stressed upon what states have done to implement ECBC. He also quoted that the involvement of third party for the assessment of ECBC would take the implementation to the next step.





Mr.Ashu Gupta, Co founder, Design2Occupancy



Stakeholder Discussion, moderated by Mr. Sanjay Seth

The technical sessions were followed up by stakeholder sicussions. Some of the important discussion points mostly talked about during the workshop to enhance neefgy efficiency are mentioned below

- Enhancement and updating of the information is required to keep the portal Live.
- The number of examples for each building type in different climate zones could be increased.
- To prioritize recommendations according to their impact ranking (High, Moderate & Low).
- To need for the resources if more data and examples are needed.
- Support for the data can be taken by rating bodies like GRIHA in India.

Recommendations and Recap by Mr. Sriraj:

- The Map of India needs to be re-checked and edited
- Climate zone map change needs clarification
- Adding the app links from BEE & GRIHA to the bigEE page.
- The metadata if available, can be integrated with the platform and periodic updates can be made.
- Recommendations can be changed subject to the inputs from India (Indian ECBC Cells/Teams).
- The possibilities of the incorporation of the Energy Performance Index should also be explored.
- In the building section for the India page the possibility of making the buildings data available according to the climate zone neds to be explored .

In the concluding remarks Mr. Thomas informed the participants about the option for downloading the PDF's or the online recommendations section that can be used by the practitioners all over the world.







Annexure: Agenda

One Day Workshop on "bigEE Initiative for Energy Efficiency in Buildings Sector"		
17th November 2016		
Venue-Amaltas Hall, India Habitat Centre, New Delhi		
Time	Agenda for the Workshop	
09:30 AM	Registration	
Inaugural session		
	Welcome note and Introduction to the workshop agenda Mr. Sanjay Seth, Senior Director, Sustainable Habitat Division, The Energy and Resources Institute (TERI)	
10:00AM-11:00 AM	Keynote Address – Dr. Stefan Thomas, Director, Energy Transport and Climate Policy Group, Wuppertal Institute	
	Presentation on Benefits of Energy Efficiency in building sector in India and its supporting policies <i>Mr. Sanjay Seth, Senior Director, Sustainable Habitat Division, (TERI)</i>	
11:00 AM- 11:15AM	Tea	
Technical session		
11: 15 AM- 11:45AM	bigEE Platform Demonstration for Buildings and Appliances Guide Mr. Sriraj Gokarakonda, Research Fellow, Energy Transport and Climate Policy Group, Wuppertal Institute Mr. Deepak Singh Rana, Research Associate, (CRSBS), TERI	
11:45AM- 12:15 PM	Green building case study presentation of Indira Paryavaran Bhawan Mr. Deependra Prashad, Architect and Planner, Architect Design Ecologic Planning	
12:15 PM- 12:30 PM	Open discussion	
12:30 PM- 13:30 PM	Lunch	
Policy Session		
13:30 PM-14:00 PM	bigEE Platform Demonstration for Policy Package Guide Dr. Stefan Thomas, Director, Energy Transport and Climate Policy Group, Wuppertal Institute	
14:00 PM-14:30 PM	Energy Conservation Building Code implementation in states Mr Ashu Gupta,Co founder Design2Occupancy	
14:30 PM-14:45 PM	Open discussion	
14:45 PM- 15:00	Теа	
15:00 AM- 15:45PM	Stakeholder Discussion Moderator:	
	Mr. Sanjay Seth, Senior Director, Sustainable Habitat Division, (TERI) Dr. Stefan Thomas, Director, Energy Transport and Climate Policy Group, Wuppertal Institute	
Concluding session		
15:45– 16:15	Closing Remarks - Mr. Sanjay Seth, Senior Director, Sustainable Habitat Division, (TERI) Dr. Stefan Thomas, Director, Energy Transport and Climate Policy Group, Wuppertal Institute	



