



Proceedings of webinar on R&I study on Low Embodied Energy Building Materials in India

27th May 2022



Background

The objective of the EU-India Clean Energy and Climate Partnership (CECP) (<https://www.cecp-eu.in/> and [@EU_India_CECP](#)) is to reinforce cooperation between the EU and India on clean energy and climate change with a view to ensure a secure, clean, affordable, and reliable energy supply for all and to progress in the implementation of the Paris Agreement.

Under the EU-India CECP, a study has been undertaken on identifying European and Indian research and innovation (R&I) initiatives that are focused on addressing the embodied energy and embodied carbon aspects of buildings and construction materials and identifying potential avenues for R&I collaboration between the EU and India.

The objective of the report is to identify the initiatives on low embodied energy building materials from Europe and India and identify possible areas of collaboration between them that can also benefit Indian policies and policymakers.

Inaugural session

Mr Edwin Koekkoek, First Counsellor, EU Delegation to India, welcomed the participants and introduced the EU-India CECP and the need of alternate building materials with low- embodied energy in the context of the clean energy transition. He highlighted the importance of stakeholder consultation for the study conducted.

Webinar: R&I study on Low Embodied Energy Building Materials in India

| Speaker | Topic |
|---|--|
| Mr. Ram Joshi, Senior Associate, PwC India | Insights from the R&I study on low embodied energy building materials in India and possible avenues for EU-India R&I collaboration |
| Dr. Reva Prakash, Deputy Team Leader and Project Coordinator, EU-REI | Presentation on Resource Flows in Indian Cities – a study conducted under the EU-Resource Efficiency Initiative (EU-REI) And possible comments on the study |
| Dr. Prabhjot Chani Professor, Indian Institute of Technology, Roorkee | Presentation on IIT Roorkee’s tool to estimate embodied energy for low carbon building construction and possible comments on the study |

Mr. Ram Joshi, Senior Associate, PwC India, delivered his presentation on the “R&I study on Low Embodied Energy Building Materials in India”

- Introduction to embodied energy of a building
- Indian initiatives covered under this study:
 - EU Resource Efficiency Initiative (EU-REI):
 - Study on fostering resource efficiency in the Indian building and construction sector
 - Strategy document on resource efficiency in construction and demolition (C&D) sector
 - BEE’s Energy efficient building materials directory
 - IFC’s India construction materials database of embodied energy and global warming potential
 - IIT Roorkee’s tool for estimation of embodied carbon of a building construction
 - CII’s GreenPro certification
 - UN-Habitat’s Decision Support Toolkit

- EU initiatives covered under this study
 - Buildings as Material Banks (BAMB) under Horizon 2020 -
 - Materials passports that consist of a set of data describing defined characteristics of materials
 - Reversible Building Design framework that enables re-use and recovery of building materials.
 - New business models for material circularity based on reverse logistics
 - Cradle-to-Cradle Certification
 - Level(s) - The European framework for sustainable buildings helps measuring the performance of buildings along their life cycle on – environmental aspects, health and comfort, life cycle cost and potential future risks to performance.
 - Horizon2020 projects focusing on novel materials including Eco-binder, Sus-Con and Biobuild
 - EU Green Public Procurement (GPP)
- Possible areas of R&I cooperation between EU and India
 - Technical solutions
 - Policy & regulatory instruments
 - Market-based solutions

Dr. Reva Prakash, Deputy Team Leader and Project Coordinator, EU-REI, Presented on Resource Flows in Indian Cities – a study conducted under the EU-Resource Efficiency Initiative (EU-REI) And possible comments on the study

- Key points from the Circularity Gap report 2022.
- EU- REI Phase -I and Phase -II: Foster the efficient and sustainable use of natural resources in India:
 - Result 1: Assessment of India’s current and future use of resources
 - Result 2: Partnerships and networking
 - Result 3: Awareness raising and promotion of best
- Life cycle approach to Renewable energy (RE) and circular economy
- Mainstreaming of RE and carbon emissions (CE) in buildings and construction sector
- Baseline assessment of India’s buildings and construction sector
- Material flow analysis for Indian cities
- Carbon footprint and estimated demand of different construction materials
- New construction trends in India, such as introduction of Autoclaved aerated concrete blocks, ready mix concrete, and precast technology,
- Case study on Ahmedabad, Odisha
- Ongoing initiatives:
 - Business plan and marketing strategy development, product LCA and green certification support for CE start-up to scale-up impact
 - Resource efficiency and circular economy course curriculum for architects with council of architecture

Dr. Prabhjot Chani Professor, Indian Institute of Technology, Roorkee, delivered his presentation on, ‘Assessment of Embodied Energy using SEER’

- The government of India targets to construct 20 million housing units by 2022.
- Housing constitutes for 60 % of the total building materials need.
- Carbon emissions in buildings

- Energy embedded in material
- Embodied energy values for different building materials
- Suggestions to reduce CE
- Embodied energy and embodied carbon in the context of developing and developed countries.
- Methodology to calculate embodied energy and schedule of embodied energy rates (SEER)
- Share of different materials in total carbon emissions
- Carbon trading under Kyoto protocol, 1997
- Achievable carbon credits (CER)
- Environmental benefits of CE reduction
- Integrated green construction framework

Question & answer/discussion session

- **Question for Mr. A. Lall:**

Based on your experience, what is the penetration of low-embodied energy materials in Indian construction practices? what could be the top 2 interventions that could help to increase the penetration of these materials? and how can EU and India's cooperation help in this regard?

Response from Mr. A. Lall

Currently, the penetration of low-embodied energy in India is negative because urbanization is causing a shift from traditional buildings to high rise, high density structures, which use high embodied energy materials. Some initiatives have been taken in the area of utilization of recycled materials, fly ash blocks, and stabilized earth blocks. In some regions use of a specialized bamboo in roof and structure is used, it has proven useful for some buildings.

India can benefit from EU's utilization measures for forest resources for construction purposes. The preferred model for urbanization would be to switch to a 3-4 storied, load bearing construction. This would decrease the use of steel and cement and will provide low-embodied energy material development with increase in the potential for use of recovered materials from regeneration of the city. The planning regulations should reduce the FSI from 3-4 to 1-1.5.

- **Question for Mr. Sanjay Prakash**

What were the challenges faced while utilizing low-embodied energy materials? How does the EU-India collaboration will help practitioners to incorporate these materials?

Response from Mr. Sanjay Prakash

Although, big companies support the use of low-embodied energy materials, the lack of codes and guidelines create challenge in its implementation.

Mr. Saurabh Diddi, Director BEE, shared his recommendations and concluding remarks:

He thanked all the presenters and the stakeholders for their participations. He emphasized on the need for the analysis of embodied energy of a building through its life cycle. He highlighted the possibility of a future collaboration with BMTPC and Mr. Chani on development of codes for regulating low-embodied energy materials.

The session ended with closing remarks and a vote of thanks by Mr. Ram Joshi.

