

Decarbonizing India's Building & Construction sector

India's Building & Construction sector – Growth, Resource demand and Emissions

GDP contribution

9%

annually

Market size

USD 1 Tn

for real estate by 2030

Urbanization

50%

by 2050

Floor area

~ 30 Bn m²

by 2037

Cement demand

3.6x

(2010-2050)

Steel demand

5x

(2018-2050)

Brick demand

3~4x

(2019-2039)

Energy demand

~60%

of India's total demand
(2018)

Current global scenario



Current India Scenario



Opportunities for decarbonizing buildings and construction

"REDUCE"
material demand
during construction

"REPLACE"
high embodied
carbon material with
low carbon
alternatives

"RECYCLE & REUSE"
of building materials
& components

"OPTIMIZE" Energy
Use

Material efficiency

Operational efficiency

Replace strategy

Alternate material	Emission reduction potential (w.r.t OPC)
Limestone calcined clay cement	30%
Geopolymer concrete	80%
Composite cement	56%
Magnesium oxides derived cements	>100% (Carbon negative)

Reduce strategy

Techniques	Material savings
Voided Concrete Slab	25~35%
Confined Masonry*	>55%
Avoid material overuse	15-25%
Prefabrication & precasting	20-35%
Design for deconstruction	Need to explore

Reuse & Recycle strategy

Techniques	Material savings
Utilization unhydrated cement from C&D waste**	30~40%
Renovation and refurbishment (Lifetime extension)	40%
Recycling and using C&D waste as aggregates	Need to explore

There is an Urgent need to explore and investigate above strategies and pursue-

- Identify emerging low carbon options & Develop a Roadmap for transitioning India's building & construction to net-zero by 2050
- Exploring Carbon Sequestration Solutions to REPLACE high embodied carbon materials

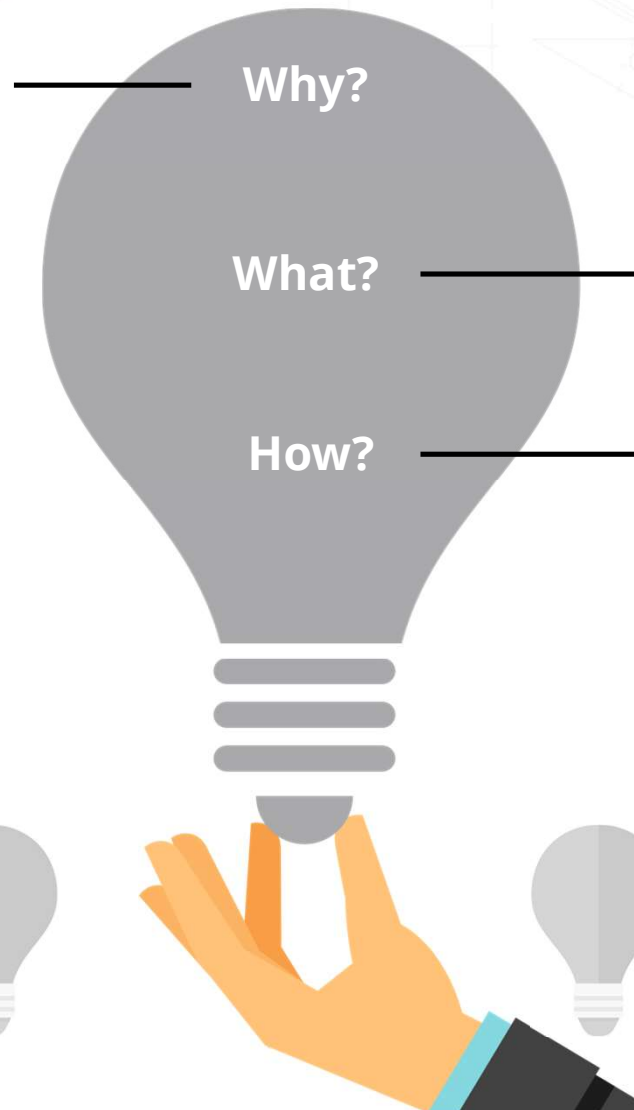
Efforts to Decarbonize the construction sector

1. Solar Decathlon India (SDI)

All roads to successful global clean energy transitions go via India. India is in a unique position to pioneer a new model for low-carbon, inclusive growth.

International Energy Agency

Resilience is important for the immediate future.



Why?

What?

How?

Change the DNA of entire building sector towards a climate resilient and net-zero future.



Change mindset and enable students and faculty



Engage and transform approach of industry



Bring about consumer demand

SDI - Impact



- A challenge for collegiate students to develop market-ready, net-zero-buildings with significant capacity building provided
- Work on live projects with real estate entity, with technology providers
- Gamification to create excitement, raise consumer awareness



Multi-Family Housing



Single-Family Housing



Educational Building



Office Building



Community Resilience Shelter



On-site construction worker housing



Business Charter – Launched on 10 February 2022



Mahindra LIFESPACES®



Value-chain Approach to Decarbonizing the Building and Construction Sector in India

150+

Stakeholders

4

Consultations

6

Priority Actions

Priority Action Points

1.

Design
Net-zero
Buildings

2.

Adopt
science-based
net-zero targets

3.

Improved
operational
efficiency for
net-zero buildings

4.

Mainstream
low-carbon
materials for
net-zero buildings

5.

Develop and
mainstream
climate-aligned
building codes
and standards

6.

Enabling
monitoring and
tracking
performance of a
net-zero building



Thank You

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<https://aeee.in/>

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