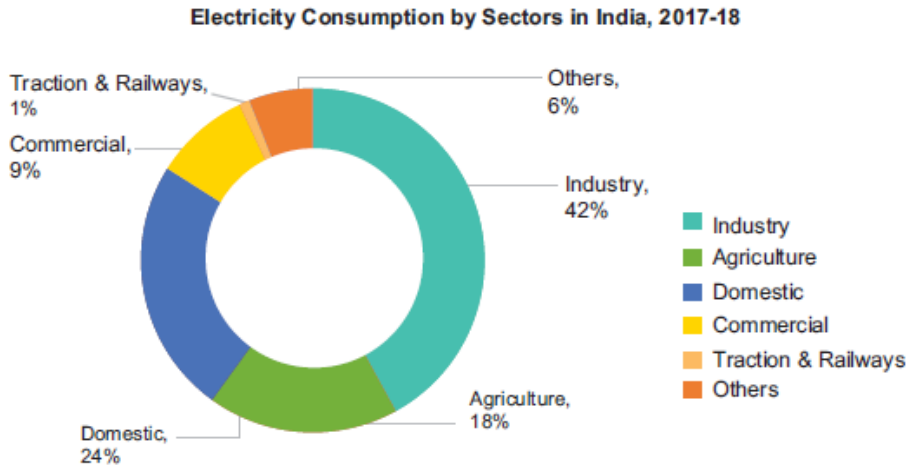
Roadmap for Mainstreaming Energy Efficiency in Residential Buildings in India

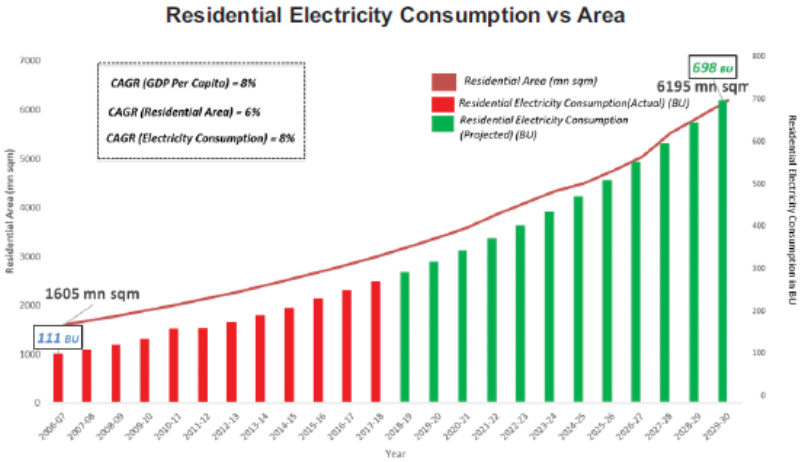
Maxine Jordan, Energy Efficiency Division of the International Energy Agency

18th September 2020

Why residential buildings

Residential buildings' electricity consumption (left) and forecast for residential floor area growth and electricity consumption (right)



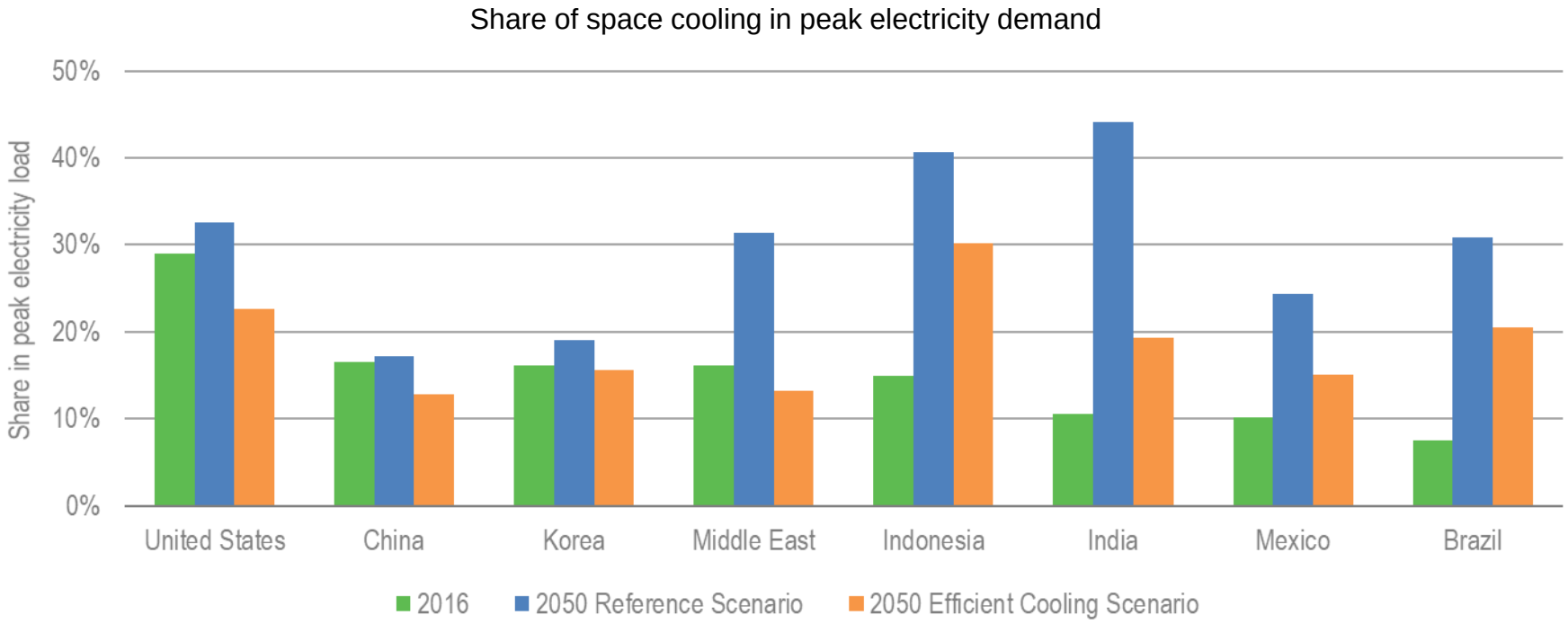


Source: (BEE, 2020) *Impact of Energy Efficiency Measures 2018-2019*

As demand for additional floor area and per capita electricity consumption continue to rise, total electricity consumption could double in ten years. Risk of locking in inefficient buildings for decades.

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Share of cooling in electricity system peak loads

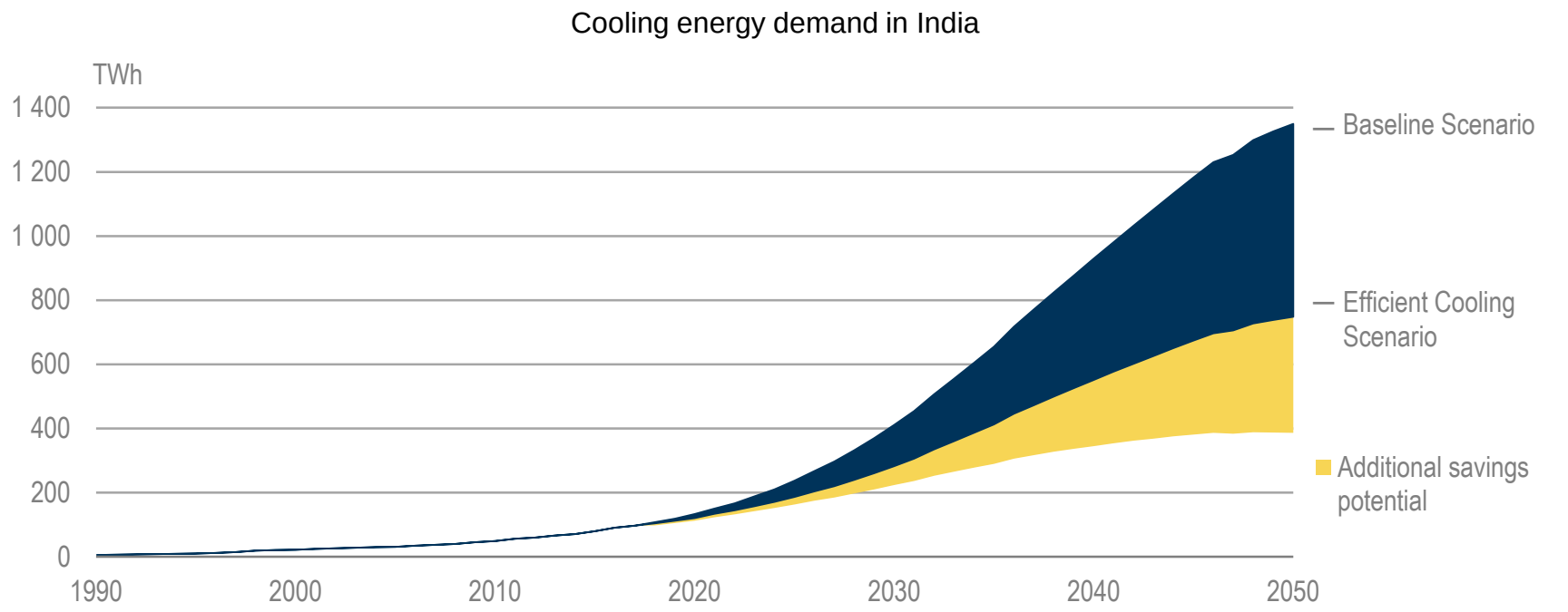


Source: IEA (2018), *The Future of Cooling*

In 2016, India was one of the countries with a low share of cooling in peak electricity load. But by 2050 without significant energy efficiency improvements, India could top this list.

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Buildings have a huge potential for savings

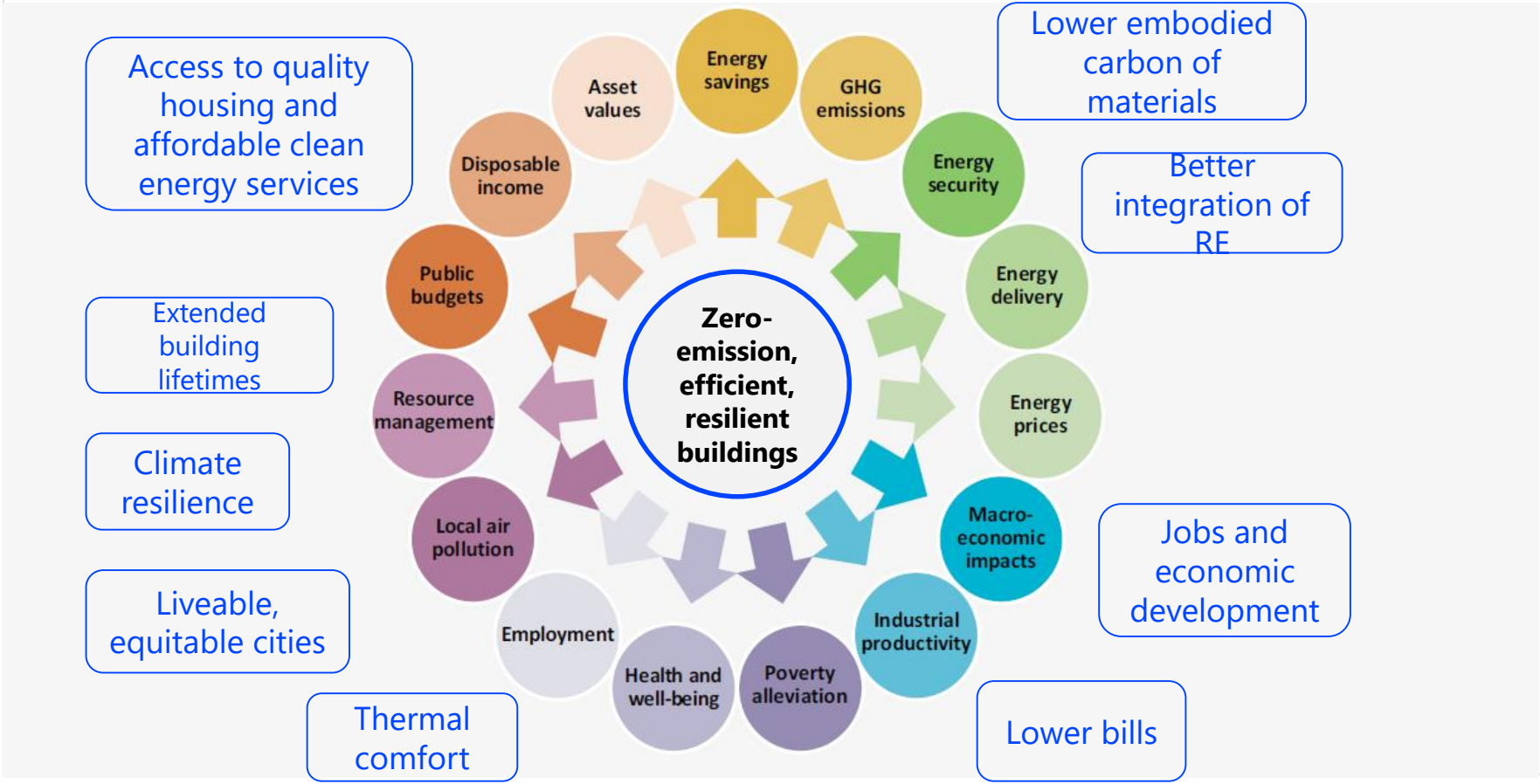


Source: IEA (2018), *The Future of Cooling*

Additional measures such as better building design and construction, can reduce cooling energy demand in India while also allowing millions of people better access to cooling.

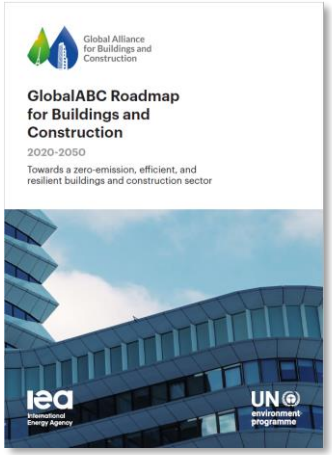
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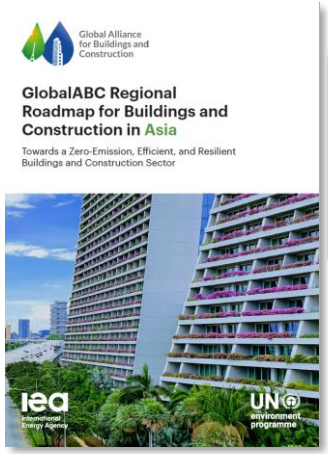
Buildings are also key for sustainable development



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GlobalABC Regional Roadmaps for Buildings and Construction





Out now!

- 1 Global Roadmap, 3 Regional Roadmaps: Asia, Africa, Latin America
- Extensive stakeholder engagement, over 700 people overall
- Feedback on targets and timelines, submission of best practice case studies, feedback on key actions
- Key findings include:
  - Ambition is there
  - Excellent examples of existing programmes
  - Need for capacity building, awareness raising, improved access to finance
  - Resilience and improved urban planning also critical
  - Significant information gaps for materials and resilience
  - A wide range of multiple benefits for range of stakeholders

	Current status (2020)	Recommended actions
Urban planning	Lack of integrated urban planning and sustainable development among existing major growth areas	**Prioritise sustainable urban planning and development** Use planning and development tools to support sustainable development and access to affordable housing, develop collaborative national and local urban plans
New buildings	Most construction occuring in places with some codes and mandatory minimum energy performance	**Prioritise new building energy codes and standards** Develop passive and affordable construction strategies, implement mandatory building energy codes, adopt passive designs and reduce cooling need
Existing buildings	Energy performance and quality of existing buildings low and few energy-driven retrofits	**Accelerate action on building retrofits** Develop and implement affordable low-energy decarbonisation strategies, increase renovation rates among high-density development, and encourage low-energy investment
Building operations	Some use of tools for energy performance, disclosure and management	**Develop and adopt operation and maintenance standards** Develop benchmarking and certification tools, and set performance standards for systems energy savings, adopt monitoring and energy management systems
Appliances and systems	Efficiency of appliances and systems lower than best available technology	**Stimulate demand for energy-efficient appliances** Strengthen and expand existing minimum energy performance requirements, support greater improvement in low-cost efficient cooling technologies
Materials	Very-high embodied carbon of materials, limited use of local materials, little data and information	**Promote the use of low-carbon materials** Promote adoption of low-carbon materials in high-density development, promote material efficiency, increase energy efficiency in manufacturing to reduce embodied carbon of materials over whole life cycle
Resilience	Lack of planning strategies for climate events, and limited resilience	**Build-in resilience for buildings and communities** Develop integrated risk assessment and resilience strategies for major coastal urban centres and integrate resilience into new construction for formal and informal areas
Clean energy	Significant use of fossil and biomass fuels. In Asia 43% no access to clean cooking, 6% no access to electricity	**Accelerate access to clean energy** Develop clear regulatory frameworks, provide financial incentives, encourage renewable energy procurement, accelerate use of clean cooking fuels to decarbonise electricity and heat

ENABLERS: capacity building, finance, multi-stakeholder engagement

Source: GlobalABC/UNEP/IEA, (2020), *GlobalABC Regional Roadmap for Buildings and Construction in Asia*

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A Roadmap for energy efficiency in residential buildings in India

- **Objectives:**
  1. Mainstreaming energy efficiency in **high-rise** residential buildings **and affordable housing sector** in India
  2. Facilitate **the adoption of the residential building code (ENS)** and the adoption of other voluntary green building standards and rating systems
  3. Promote the use of **low-carbon materials, more integrated urban planning, and clean energy** integration in new building design
  4. Develop **a strategy to reach nearly-zero** energy residential buildings in India
  5. **Strengthen the community of stakeholders** to help break down silos and foster collaboration

Priority areas

- **New buildings**
- Urban planning
- Embodied carbon
- Clean energy

Structure

- Key issues
- Existing policies and programmes
- Key stakeholders and **recommended actions**
- Tracking progress

Stakeholder convening

- Multiple benefits of EE
- Sustainable Development Goals
- GoI priorities
- Stimulus & economic recovery

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Roadmap methodology

The roadmap journey is about trying to get consensus from all stakeholders on:

Where we are **today**

- Current standard of new buildings
- Growth rate, trends
- How many are compliant vs non-compliant with mandatory or voluntary codes
- What initiatives are underway, who are the main actors
- What are current mechanisms that work

Where we want to get to - vision

- Net zero buildings? For what share of buildings? What timeline?
- 100% compliance with code?
- High efficiency for affordable energy services for all?
- Thermal comfort for all?
- Buildings that are integrated to power system? (RE, flexibility)
- Buildings that have a positive impact to their ecosystems/cities?
- Increased vertical coordination across different levels of government?

How do we get there

To work out with stakeholders!

- **Who** can do **what**, and what will best **motivate** them?
  - Increase market demand
  - Information campaigns
  - Demonstration projects
  - Capacity-building
  - Incentives
  - …
- Which indicators to measures progress
- Which short- medium- and long-term targets?

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Key findings and key questions so far

- **New buildings: achievements**
  - ✓ ENS **launched in 2018**, covering building envelope. Compliance tool to simplify enforcement
  - ✓ ENS compliant homes over **20%** on electricity bills, and reduce the need for cooling by about **20%**, when compared to a baseline, for minimal or no additional cost
  - ✓ Key **technologies are known**: insulation, WWR, glazing, shading devices
  - ✓ **Tools** for designers
  - ✓ **8** states working on implementation of ENS
  - ✓ BEE **Star rating** for residential buildings



How to increase adoption of ENS and other standards at voluntary or mandatory level?
How familiar are designers with the tools available? Are benefits recognised by all?
What would be the most appropriate indicator of progress?
How easily can these measures be applied to affordable housing?
What would an incremental strategy to net-zero buildings look like for this sector?
Will Covid-19 be a hindrance or an opportunity for accelerating progress?

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Key findings and key questions so far

- **Materials: achievements so far**
  - ✓ BEE & GiZ developing **materials directory**
  - ✓ Work underway on **low-carbon alternatives** eg. Cement
  - ✓ **Demonstration** projects

How to facilitate adoption of these tools in mainstream construction, all over the country?
What kind of support is required to industry to develop the market for low-carbon materials?
How to insert embodied carbon criteria in procurement decisions?

- **Urban planning & clean energy: achievements so far**
  - ✓ 100 cities participating in **Smart city** mission; Nation-wide **affordable housing** programme; Cool-roof state-wide policies
  - ✓ SDC working on integrating provisions for **renewable energy** through BEEP India

How to facilitate vertical and horizontal integration of government for urban planning decisions?
What is the role of the building code in including provisions for renewable energy, storage, and urban planning issues as compared to other policy mechanisms eg. Incentives?

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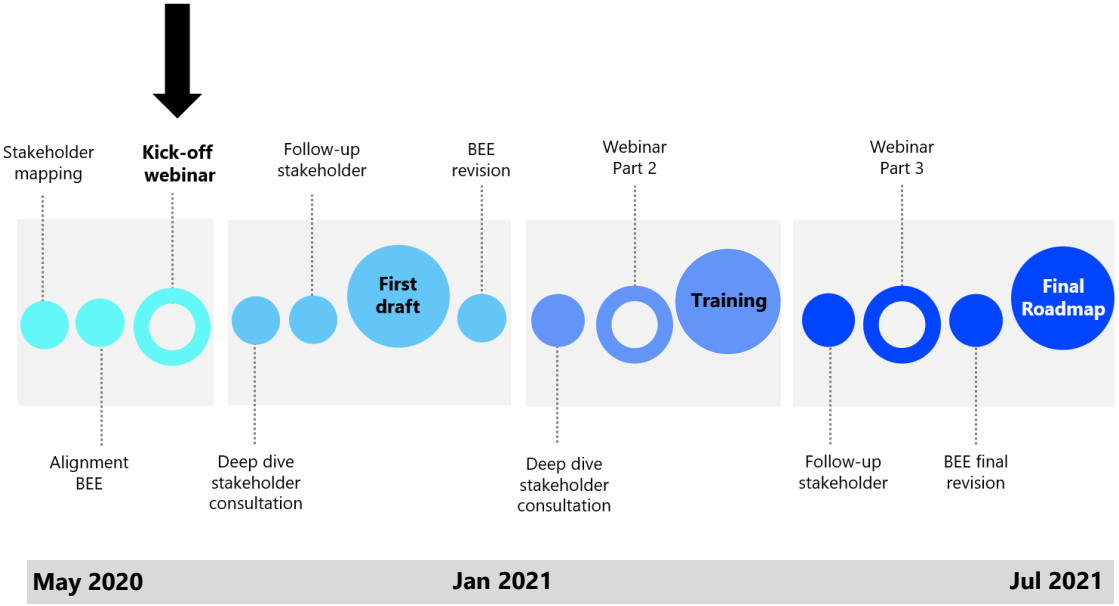
Next steps, timeline

Output:

- List of concise actions that could be taken by particular stakeholder groups
- Estimation of the multiple benefits at stake
- Indicators to track progress
- Short-, medium- and long-term goals

Method:

- Stakeholder consultations
- Webinars
- IEA Training
- Feedback on drafts
- LinkedIn community for continuous exchange



[Join the conversation in our LinkedIn Group](#)

Search "BEE-IEA Roadmap for mainstreaming energy efficiency in residential buildings in India"

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Tell us what you think

Go to www.menti.com and use the code 30 90 40 7

Please answer our Menti polls:

1) Which type of organisation do you represent?
2) Which policy instruments could better motivate voluntary adoption of green building measures (eg. ENS, GRIHA, LEED, star rating etc)
3) What is the biggest challenge faced by the industry in the construction of energy efficient buildings?
4) Rank the following multiple benefits of energy efficient buildings in order of their importance to you
5) Out of 10, how most useful to you would the following features of the IEA Roadmap be?

And send in your questions via the chat!

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What’s next?

- Distinguished panel of speakers
- Poll results
- Audience Q&A

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Panel discussion moderated by:
Ms. Maxine Jordan, *Policy Analyst, IEA,* & Mr. Saurabh Diddi, *Director, BEE*

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

2. Mr. Vipin Sharma, *Commissioner, Thane Municipal Corporation*

3. Mr. Sunit Mathur, *General Manager, Rajasthan Renewable Energy Corporation Limited*

4. Mr. Hanumanthrayappa. V, *Assistant General Manager, Karnataka Renewable Energy Department*

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

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

7. Mr. Vikash Ranjan, *Programme Manager for Buildings, GiZ*

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Results from Menti polling

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Thank you for joining us!

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