

COUNTRY POLICY INSIGHTS TOWARDS ZERO CARBON: BUILDINGS POLICIES IN INDIA 2022





INTRODUCTION

India, the fourth fastest-growing economy globally, has seen the combined processes of rapid industrialization and population growth in the last few decades. Such growth has significantly affected the urban climate of major Indian cities and other developing cities.

One of the sectors that has fuelled such imbalance is the building sector. Undoubtedly, the building sector contributes immensely to the growth of the Indian economy, but due to its non-sustainable nature of construction, it is responsible for approximately 40% of the overall CO2 emissions.¹

As 70% of the buildings (residential and commercial) are yet to be built in India and to avoid any further imbalance, India's government (GOI) has drafted several green/energy efficient/sustainable building policy packages. These codes/guidelines/schemes/programmes aim to introduce green concepts and techniques in the building sector, to sustainably aid growth. Such concepts and techniques can help address national issues like water efficiency, energy efficiency, reduction in fossil fuel use for commuting, handling consumer waste and conserving natural resources. Most importantly, these concepts can enhance occupant health, productivity, and wellbeing.

As this report is being developed, the Energy Conservation (Amendment) Bill, 2022 was introduced in Lok Sabha. The purpose of the Bill is to amend the Energy Conservation Act of 2001, which regulates the energy consumption of equipment, appliances, buildings, and industries. If passed the Bill will give the central government authority to specify building energy conservation codes and extend it to include an 'energy conservation and sustainable building code'. This new code will establish standards for energy efficiency and conservation, the use of renewable energy, and other green building requirements. The new energy conservation and sustainable building code will also apply to office and residential buildings that meet a set criteria. The Bill also gives state governments the authority to lower load thresholds.



OVERVIEW OF THE BUILDINGS SECTOR POLICY ENVIRONMENT



The Government of India (GOI) has developed guidelines, codes, schemes, and programmes towards decarbonization in the building sector.² The figure below shows those efforts to improve the building sector's energy consumption levels.



Figure 1: Guidelines, Codes, Programmes, Schemes and Rating Systems for Green/Energy Efficient Building sector

Table 1: Details of Guidelines, Codes, Programmes, Schemes and Rating Systems for Green/Energy Efficient Building sector³

Name	Туре						Status		Applicability				Implementation type			
	G&Co	S	Р	RS	Year of	Year of	Written	In Force	R		С		Voluntary	Mandatory	Responsible	
					adoption	amendment			L	Ν	E	Ν			Ministry	
ENS	Y				2018		Y	Y		Y			Y		BEE, MoP MoHUA	
ECBC	Y				2007	2017						Y	Y	in few states	BEE, MoP MoHUA	
UJALA		Y			2015		Y	Y	Y				Y		BEE, MoP	
PAT (Hotels)		Y			2017		Y	Y			Y			Y (for notified DCs)	BEE, MoP	
S&L – Residential			Y		2018		Y	Y		Y					BEE, MoP	
S&L – Appliances			Y		2006		Y	Y	Y	Y	Y	Y	Y	Y	BEE, MoP	
BEEP			Y		2017		Y	Y			Y		Y		MoP	
BEE Star Rating				Y	2016	2020	Y	Y			Y				BEE, MoP	
IGBC				Y			Y	Y	Y	Y	Y	Y	Y		ULBs	
GRIHA				Y			Y	Y	Y	Y	Y	Y	Y		ULBs	
LEED				Y			Y	Y	Y	Y	Y	Y	Y		ULBs	
Climate Smart City Assessment Framework	Y				2020		Y	Y	Y	Y	Y	Y	Y		MoHUA	

Comments at the sub-national level⁴

The Ministry of Power (MoP) and the Bureau of Energy Efficiency (BEE) have recognized energy efficiency in buildings to be critical for India's

National Action Plan on Climate Change (NAPCC) and global climate commitments like India's Nationally Determined Contribution (INDC). States and local governments play a crucial role in the implementation and enforcement of energy-efficient measures and programmes in the building sector as it requires coordinated efforts of multiple stakeholders at different levels.

According to the state energy efficiency index 2019, the top-performing states in the building sector are **Haryana, Kerala, Telangana and Karnataka**. Though the Policy and Regulation of ECBC-2017 and ENS 2018 was developed by the Union Government, the effective implementation and enforcement of the code lie with states' Urban/Rural Development Departments and Local governments (Urban Local Bodies - ULBs). **Andaman & Nicobar Islands, Andhra Pradesh, Haryana, Himachal Pradesh, Karnataka and Telangana** have amended the code to suit their regional and local conditions and have notified the code along with ECBC Rules- 2018 in the state's official gazette. Most states have notified their draft version for public and stakeholder recommendations and are waiting for the respective state cabinet approvals. **Andhra Pradesh, Karnataka, and Telangana** have gone one step ahead and incorporated ECBC 2017 in their municipal building bylaws. **Kerala** too has incorporated ECBC 2017 in their municipal building bylaws, though the notification of the code is still in the final stages. **Chhattisgarh, Haryana, Kerala, Madhya Pradesh, Odisha, Puducherry, Rajasthan, and Telangana** have incorporated energy efficiency norms in public procurement guidelines for lighting and appliances.

Andhra Pradesh, Delhi, Gujarat, Karnataka, Maharashtra, Odisha, Punjab, Rajasthan and Uttar Pradesh have started making some progress in the adoption of ECO Niwas Samhita 2018 - Energy Conservation Building Code for Residential Buildings, with some of them receiving support from Indo-Swiss and Indo-German bilateral programs.

On enforcing mandatory energy audits and reporting in the building sector, **Gujarat, Haryana, Kerala, Madhya Pradesh, Maharashtra, Rajasthan and Telangana** have made **energy** audits mandatory for certain categories of commercial building consumers. States now need to ensure that energy auditing happens periodically, and they also need to ensure that energy savings potential identified through energy audits are translated to actual savings through the implementation of energy efficiency measures.

OTHER SECTOR POLICIES/SCHEMES/PROGRAMME THAT INFLUENCE THE BUILDINGS SECTOR

The focus of this section is to provide the audience a clear description and insights on commitments or policies in other sectors that indirectly affect the buildings sector. Following sectors and relevant policies have been identified for this section.



Table 2: List of policies/schemes/programme from other sectors that indirectly influence the building sector

				About	Indirectly affecting the building sector by						
Name of the sector	Applicable policy/ programme/ scheme	Year (Implemented)	Nature	Goals	Targets	Incentives	Maintaining minimum requirements for the conditions in the building	Maintaining health and wellbeing of its occupants	Maintaining & Improving the productivity of its occupants	Influencing job creation	Promoting use of recycled and reused materials at the end and/or at the start of its lifetime
	Unnat Jyoti by Affordable LEDs for All (UJALA)	2015	Central Govt's scheme for non- subsidized LED lamp distribution.	UJALA scheme aims to promote efficient use of energy at the residential level.	770 million inefficient light bulbs to be replaced by LED.	Scheme provides LEDs to end users at 40% the market price.	\checkmark	\checkmark	\checkmark	\checkmark	Х
Appliances	BEE standard & labelling (S&L) programme	2006	Central Govt's scheme (Mandatory and Voluntary)	Assist consumer in making informed choices about the energy saving of appliances/equipment.	Cover more appliances for mandatory MEPS compliance.	NA	\checkmark	\checkmark	\checkmark	\checkmark	Х
	Sustainable procurement for RACs by UNEP and MoF	2009									
Renewable Energy	Rooftop Solar P.V. (SPIN)	2014	Voluntary, phase wise scheme	Promote the grid connected SPV in residential buildings.	40 GW Rooftop Solar (RTS) power project by 2022[1].	Subsidy through SERC for grid connected rooftop solar PV installation.	Х	Х	Х	\checkmark	Х
Power sector	Utility DSM for EE ACs	2018	Voluntary (Delhi presently, BSES)	Promote Energy efficiency in households & reduction in the summer peak load.	Target No. of replacements: 10,000 ACs	Exchange old ACs with 5-star rated ACs at a discount for up to 64%	~	\checkmark	\checkmark		Х

					About		Indirectly affecting the building sector by					
Applicable Name policy/ of the sector programme/ scheme		Year (Implemented)	Nature	Goals	Targets	Incentives	Maintaining minimum requirements for the conditions in the building	Maintaining health and wellbeing of its occupants	Maintaining & Improving the productivity of its occupants	Influencing job creation	Promoting use of recycled and reused materials at the end and/or at the start of its lifetime	
Environment	Green Buildings Rating Systems	GRIHA IGBC LEED GEM EDGE	2007 2001 1998 2016 2014	Voluntary	Quantify aspects of sustainability and wellbeing in habitats.	NA	Extra FAR (3-10%) in many states to buildings complying with the green rating system.	√	~	~	\checkmark	\checkmark
	Climate Smart City Assessment Framework		2020	Central Govt's scheme, Voluntary	Provide roadmap for building climate actions in cities	100 Smart Cities + Capital Cities + 5,00,000 Population	Implementation of Guidance, Tools , linkages to partners and support to implement actions and possible funding through the other initiatives within ministry of housing and urban affairs	√	\checkmark	\checkmark	\checkmark	\checkmark
	Circular Economy		2018	Voluntary	Shift from linear to circular value chains enabling efficient resource utilization.	NA	NA	\checkmark	\checkmark	X	\checkmark	\checkmark
Finance	Partial Risk Guarantee Funds for Energy Efficiency		2016	Voluntary	Ease credit risk of financial institutions that extend loans to ESCOs for implementing EE projects.	MSMEs in 4 ECO-Cities, 20 million USD target.	Up to 50% of loan amount or Rs. 10 crore per project, whichever is less.	√	\checkmark	\checkmark	√	X

POLICY PROCESS



The main institutions involved in energy efficiency policy making and implementation in India are shown in the figure below.



Figure 2: Key institutions involved in energy efficiency policy making and implementation

There are three levels of Government in India within these institutions that mandate policies related to the building sector (Central > State > Local).



To mandate any national-level policy related to the building sector, the Central Government requests respective departments of state and local government to provide them with relevant information. Based on the received information, the central government prepares a policy (with the help of technical committee and/or working groups) and proposes it to the lower house. Once the lower house approves the policy, the same is discussed in the upper house and when they approve the proposed policy, it then becomes a national regulation.

In India, the buildings and the power sector are state-specific subjects. The central government makes model guidelines, and state government (in consultation with local bodies) amends (as per their requirements) the same. The steps to mandate building policies in India are:



NATIONALLY DETERMINED CONTRIBUTIONS AND NATIONAL ADAPTATION PLANS⁵



National Adaptation Plans

To address the National Adaptation Plan process under the United Nations Framework Convention on Climate Change (UNFCCC), India launched the National Action Plan on Climate Change (NAPCC) in 2008, which outlines eight missions to mitigate climate change. The missions are:

- National Water Mission: To ensure water security and improve access to the resource by integrated water resource management systems.
- Mission for Sustaining the Himalayan Ecosystem: To develop management measures and bridge gaps for sustaining and safeguarding the Himalayan glacier and ecosystem.
- National Solar Mission: To enhance solar electricity generation capacity.
- National Mission for Enhanced Energy Efficiency: To improve energy efficiency and meet energy demands of the country.
- National Mission on Sustainable Habitat: To reduce emissions in cities.
- National Mission for Strategic Knowledge on Climate Change: To address the challenges of climate change through knowledge exchange and technology development.
- National Mission for Sustainable Agriculture: To instrument strategies for climate resilience in agriculture through new and traditional technology amalgamation and deploying climate finance and insurance.
- National Mission for a Green India: Addition of carbon sinks by emphasizing forestation.

These missions act like consolidated policy instruments to integrate climate change in national decision making to promote inclusive growth and economic and environmental objectives.

Nationally Determined Contributions (NDC)

The National Adaptation Plan of the country is the critical component of India's NDCs. Though not legally binding, India's quantifiable NDC targets are mitigation based, and are to be achieved by 2030. India's NDCs are:

- Reduce emissions intensity of the GDP by 33-35% from the 2005 baseline.
- Increase India's share of non-fossil fuel-based electricity generation capacity to 40%
- Creation of carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover.

India's NDCs pertain to sustainable climate change adaptation and investment in responsible and inclusive development plans in sectors vulnerable to climate change like agriculture, forestry, water and more. The country's national priorities and development strategies are linked to the SDG targets too. Several flagship programmes have been established that aim to improve SDGs, including but not limited to: poverty, sustainable growth, health, nutrition, gender equality, and quality education. This highlights India's commitment to leave no one behind in sustainable development.

PROGRESS TOWARDS ENERGY EFFICIENCY

This section lists the components that were covered by the policies in this insight.

Policies for New Buildings	Policies for Renovations					
Performance Approach (holistic understanding of buildings)	Residential Buildings					
Performance including all energy	Public Buildings					
Energy Efficiency & Renewable Energy	Code Requirements					
Zero Energy Target for the future	Labelling Schemes					
Regular and frequent code revision cycles	Incentive Schemes					
Certification to support codes	Utility-Funded Programmes					
Policy Packages supporting codes	Market Instruments					
Renewable Energy Systems	Training and Education					



INSIGHTS-INTO-ACTION

The cross-sectorial nature and impact of decarbonization of the building sector in developing the economy make energy conservation and efficiency in the building sector a vital developmental necessity. Decarbonization of the building sector requires a multi-pronged approach where the upcoming building stock requires sustainable development and resource-efficient operation. In parallel, it is vital to look at the existing built stock and strategies to enhance the occupants' energy efficiency, comfort, and well-being. The development and implementation of building energy code for new and existing building stock is the primary step towards the sector's decarbonization.

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Effective policy adoption requires the following process:



- <u>Formulation</u> In India, the formulation of a policy is predominantly taken up at the National level based on the identified goals and objective.
- Implementation The first step is to mandate the adoption of the building policy in the state. Post notification in the official gazette, the policy is integrated into the building permit or by-laws of the state to mandate its adoption. Once integrated into the building by-laws, the policy will be enforced at the ULB level as devised and decided by the state.
- Enforcement and Monitoring The enforcement of a policy is ensured through the administrative process and compliance verification of the code.
- <u>Revision</u> Monitoring policy compliance helps identify issues and concerns and may call for its revision and update to enhance or reduce the policy's stringency and amend its implementation strategy.
- Implementation feasibility A feasible implementation model for code compliance is essential for code adoption. Even though a standard implementation mechanism developed at the centre level (ECBC Rules 2018), code compliance is a hurdle for "ease of doing business" for many states.

Elaborate and downscaled roadmaps at the Urban Body Level (ULB) can support implementing energy efficiency measures for the building sector in consultation with stakeholders and implementing departments. Strengthening the code compliance verification and scrutiny will ensure adoption. Weak regulatory capacity of the urban local bodies and lack of clear guidelines on parameters like energy efficiency, materials, and thermal comfort in the building by-laws can be rushed, leading to weak scrutiny and compromises on code compliance.

Lateral strategies:

- <u>Market Instruments</u>: Incentives and models encouraging uptake of the code.
- Compliance Tool: Online user-friendly compliance tool for verification backed by a detailed material specification of local materials listing.
- <u>Code compliance demonstration and training</u>: Demonstration improves confidence in the feasibility, performance, energy, environmental and economic benefits of code compliance. Training and certifying professionals for verification of code compliance once the code is enforced can provide support.
- Availability of Financing: Institutions on-board for co-financing and subsidization of loan interest and monetary support for unique construction as a part of demand-side interventions.
- <u>Supply-side interventions</u>: Factor in solid participation by the private sector.
- Integration with other Government schemes: Infrastructure development (CPWD, PMAY, ARHC), Housing/Infrastructure loan approval, business licences may mandate code-compliant buildings for approvals and financial aid. Energy Conservation Code (Commercial and Residential) coupled with Star Labelling and residential labelling programme (for existing buildings) can ensure that the building sector is designed, constructed, and operated efficiently.
- <u>Induction and sensitization about Code features</u> and their integration in the building design, energy-saving potential, and other improvements affecting the occupant.
- <u>Design Guidelines</u>: Create guides for climate/location-specific ready design as part of building code compliance.

CONCLUSION



There are a number of the guidelines, codes, schemes & programmes in India to improve the building sector's energy consumption levels in India which align to the country's National commitments. However, there are a number of strategies that could be adopted to improve their implementation like improvement in administration processes, creating incentives, revising and ensuring implementation feasibility and more. Such strategies can help address national issues like water efficiency, energy efficiency, fossil fuel use, consumer waste and natural resource use while also enhancing occupant health, productivity, and wellbeing.

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¹Bureau of Energy Efficiency, India

²The building sector is divided into Commercial (C) and Residential (R) buildings. The said categories have a set of Existing (E) and upcoming/new buildings (N).

³Table prepared using information available from Bureau of Energy Efficiency, India

⁴Source: State Energy Efficiency Index 2019, BEE https://www.aeee.in/state-energy-efficiency-index-2019-portal/wp-content/uploads/2020/01/State-Efficiency-Index-2019.pdf

⁵Sources: www.adaptationcommunity.net/wp-content/uploads/2019/04/giz2019-en-factsheet-nap-india-low-res.pdf

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