International Scenario
Building Codes Adoption, Implementation and Enforcement

Conserving Now, Preserving Future
International Intervention in Building Energy Efficiency

• Building Energy Efficiency together with Energy Efficiency standards for major appliance and equipment.
  • Recognised as necessary Government Intervention to capture the energy efficiency gains in Commercial, residential and public services sector

• Mandatory Energy Efficiency design requirement was first introduced in Europe and North America in early 1970s.

• Several Developing countries began similar efforts in 1990s and many joined pursuits in the last decade like Mexico, India, Egypt etc
Energy savings in buildings predicted between 2007 and 2020

Since the 70th, Germany became a leading country promoting new building material and technology.
Benefits perceived Internationally-Singapore

• First building envelope thermal performance code in 1979 for air-conditioned buildings. Extended in 2008 to cover residential buildings
  – Residential Envelope Transmittance Value (RETV) for residential buildings with main focus on reducing heat gains and optimizing natural ventilation
  – Supported by extensive research work on developing building envelope codes in hot and humid climates
  – Simple “deem to satisfy” approach, which does not involve energy modelling to be performed for code compliance

• Successful implementation with very high degree of compliance

Benefits perceived Internationally-Florida (USA)

The largest savings have occurred in space cooling, with significant improvements in both envelope efficiency requirements and air conditioning equipment efficiency over time.

Benefits perceived Internationally - CHINA

- Program: The Green Building Evaluation and Labeling (GBEL) Program, the Building Energy Efficiency Evaluation and Labeling (BEEL) Program
- Successful implementation with very high degree of compliance
- Studies have shown that compared to the business-as-usual case, energy codes could help reduce China’s building energy use and CO2 emissions by 14-22%, depending on the stringency and coverage of codes (Yu et al., 2014a).
82% of the economic potential to improve energy efficiency in buildings remains \textit{untapped} in the period to 2035.
Following the **Potential Target path** could help India save in total **4.6 billion of tCO2 emissions** (approx.) in next 33 years.
Enforcement

Compliance enforcement has been the biggest challenge to Building Energy Efficiency as enforcement remain uneven because of

• Variation in local government politic
• Level of Government commitments to energy efficiency
• Local resource support
• Robustness of the enforcement of infrastructure: Compliance capacity of local/domestic building supply chain
• Condition of the local construction market: the effectiveness of Government oversight towards Construction sector
• Lack of awareness and marketing campaign
• Financial constraint and Infrastructure
Benefits: Indian Scenario

- Energy Efficiency and Green building industry could become the largest employer in India in next decade
- Increased opportunities for Foreign Direct Investment
- Reducing the needs for new investments in energy generation
- Decrease dependencies of energy imports
- Improvement of the energy security will result in a favourable social effect and reduces the needs for subsidies
- As a result India will be better prepared to meet the INDC targets
- Green buildings and its associated policies could push the contribution of real estate to Indian GDP to 15% by 2030
Thank You

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