

# 2<sup>nd</sup> Meeting of the Indo-German Energy Forum

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## Energy Efficiency in Buildings in India An Overview

**Dr. Ajay Mathur**  
**Director General**  
Bureau of Energy Efficiency  
Ministry of Power, Government of India

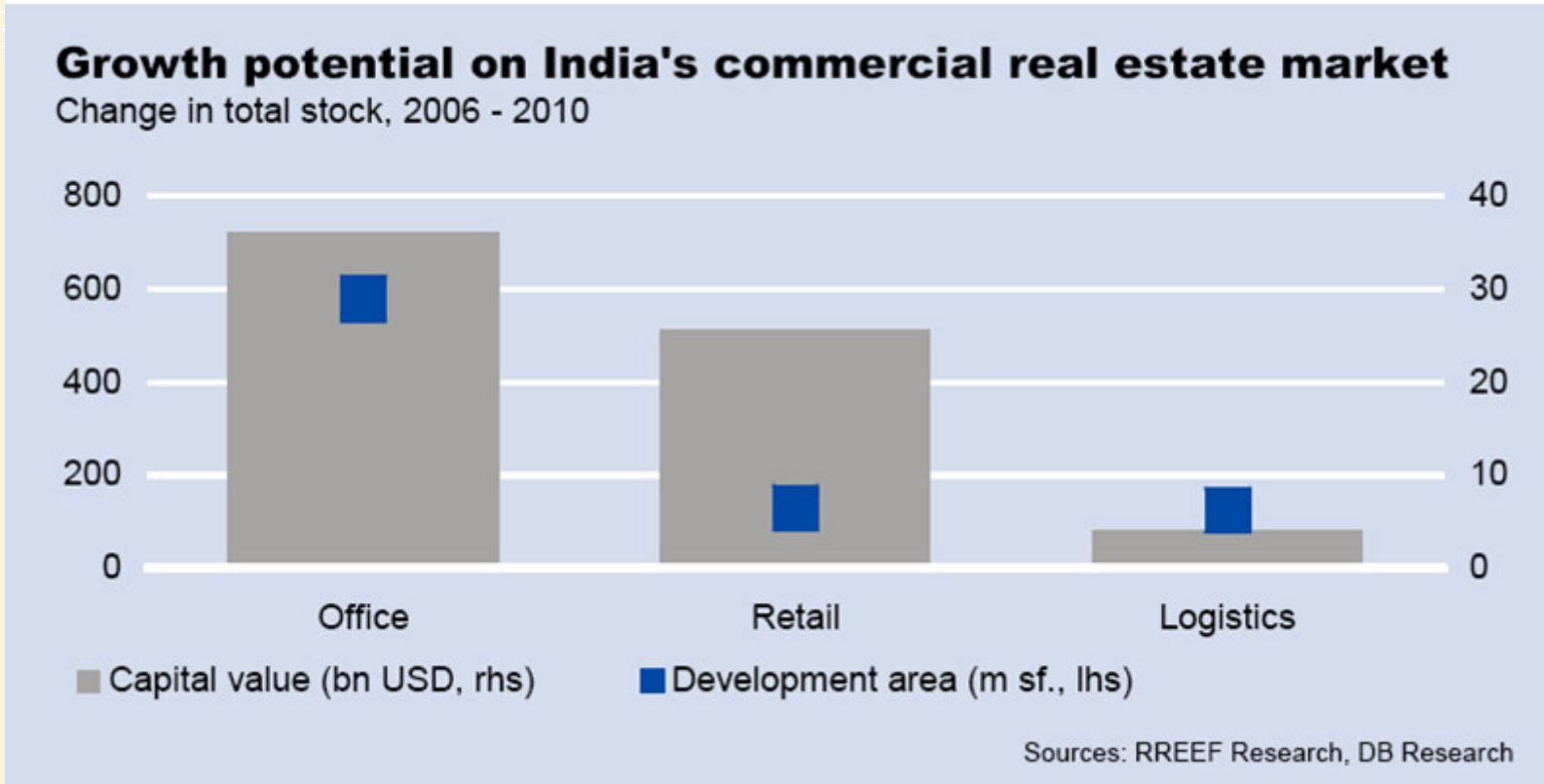
# Growth Profile of Indian Commercial Sector



- Demand for OFFICE SPACE in India is driven by the increasing share of the services sector in the Indian economy
  - Office space supply shifting from Central Business Districts to secondary centers (office and IT parks)
  - Modern office buildings in newly developed areas enable the higher quality standards that are essential for IT services
  - All India office market
    - 70% by IT Services companies (more than 7000 No.) in India
    - 15% by financial service providers & pharmaceutical sector
    - 15% by other sectors
    - Office stock must increase nearly 20 million sf/year in New Delhi, Mumbai, Bangalore to keep pace with growing demand
    - Conservative estimate (for India): Approx. 55 million sf/year
- SHOPPING CENTRES/ MALLS
  - By the end of 2008, space of 79 million sf in 257 centers are estimated in 15 largest cities of India



# Outlook for India's Commercial Real Estate Market<sup>1</sup>



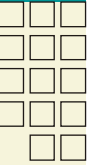
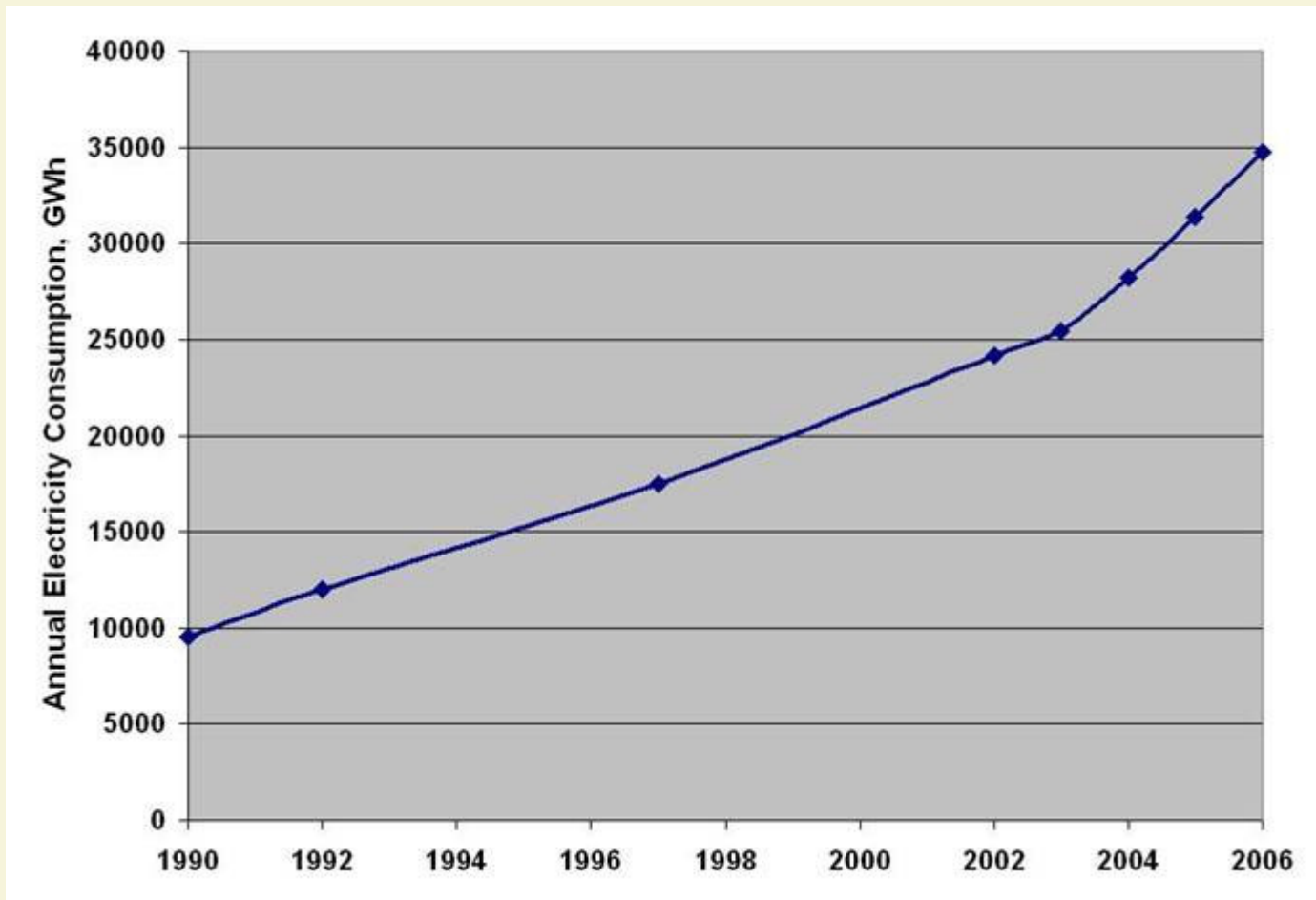
# Energy IN-efficiency is rampant



- Most commercial buildings have energy performance index (EPI) of 200 to 400 kWh/sq m/year
- Similar buildings in North America and Europe have EPI of less than 150 kWh/sq m/year
- Energy-conscious building design has been shown to reduce EPI to 100 to 150 kWh/sq m/year in India – development of such buildings is restricted to environmentally-sensitive corporates
- Large scale energy-efficient building design is limited due to split incentives - builders fear that they would bear the costs, while tenants would enjoy benefits



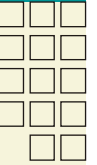
# Electricity Use in the Commercial Sector is exploding !



# What are Energy Conservation Building Codes?



- ECBC set minimum energy efficiency standards for design and construction
- ECBC encourage energy efficient design or retrofit of buildings so that
  - It does not constrain the building function, comfort, health, or the productivity of the occupants
  - Lifecycle costs (construction + energy costs) are minimized



# Energy Conservation Building Code



- ECBC covering the following components prepared:
  - Building Envelope (Walls, Roofs, Windows)
  - Lighting (Indoor and Outdoor)
  - Heating Ventilation and Air Conditioning (HVAC) System
  - Solar Hot Water Heating
  - Electrical Systems
- ECBC finalized after extensive consultation
- Voluntary introduction of ECBC in May 2007; mandatory after capacity building and implementation experience
- Impact of ECBC - Reduced Energy Use for buildings
  - National Benchmark ~ 180 kWh/m<sup>2</sup>/year
  - ECBC Compliant building ~ 110 kWh/m<sup>2</sup>/year



# Energy Efficiency Programme in Buildings



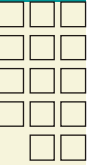
- Energy saving potential in the range of 23% - 46% has been identified through energy audits conducted in public buildings.
- Under the 1<sup>st</sup> phase of Energy Efficient Govt. Buildings Programme 9 public buildings were taken up for energy audits.
- 17 additional Government buildings undertaken for 2<sup>nd</sup> phase through performance contracting under the ESCO route.
- A national programme for existing buildings is under preparation
- Innovative financial instruments for promoting performance contracting are being developed to overcome lack of effective delivery mechanism.



# Existing Buildings- Road Map



- ESCO promotion- branding and rating of ESCOs
- Creating a pool of trained manpower- certification programme for energy auditors
- Partial Risk Guarantee fund being created
- Innovative financial instruments being evolved
- Standardised performance contract documents released
- Securitisation of performance contracts
- **Strong focus on Government buildings- almost 500 large buildings being targeted**





• T H A N K Y O U •

