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Energy Efficiency in India: The Role of Centers of Excellence

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Challenges Implementing Energy
Efficiency Technologies & Programs;

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History of USAID/India's Energy Program

1965-1975

**Capital
Infrastructure**

1975-1985

**Science and
Technology**

1985-1990

**Energy
Technology
Commer-
cialization**

1990-2000

**Climate
Change**

2001 onwards

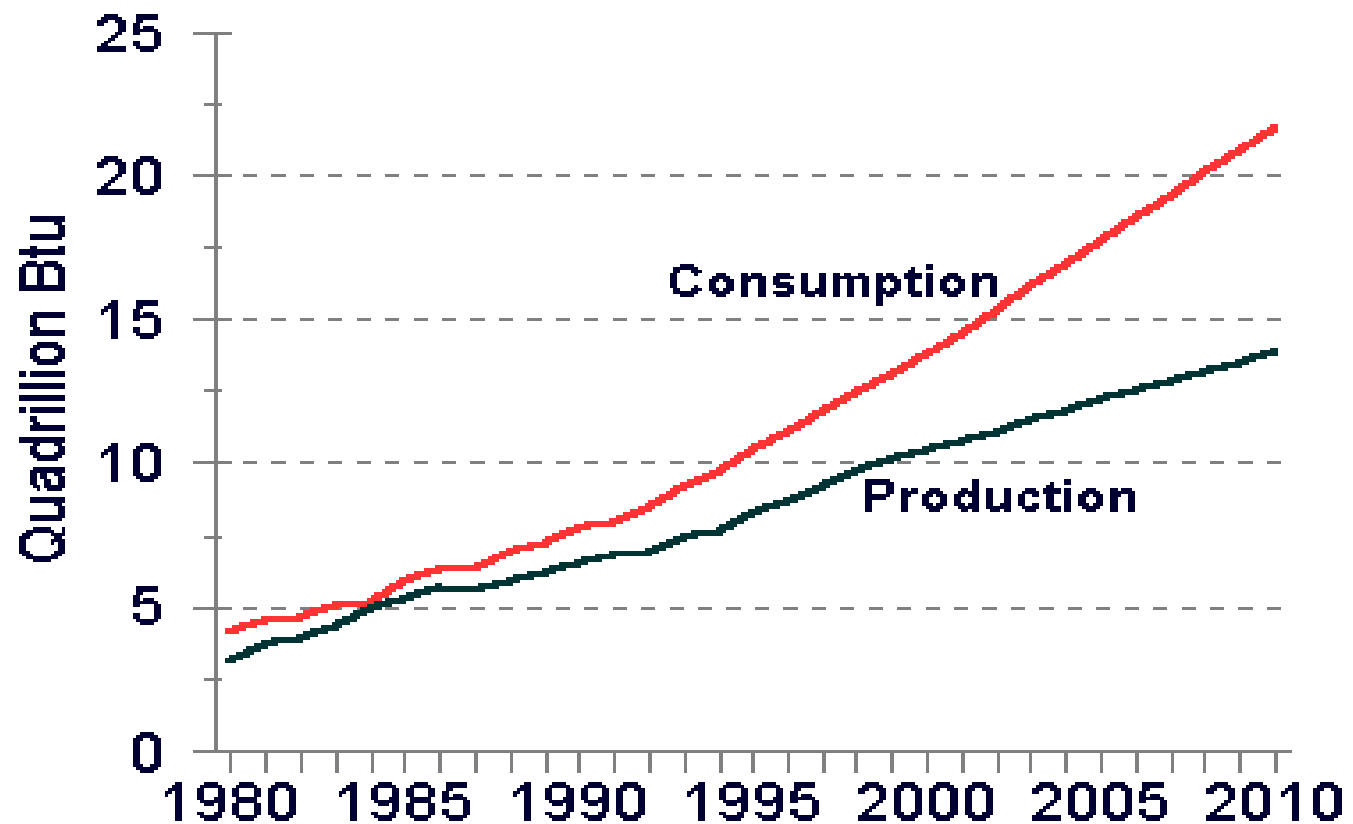
**Clean Coal,
Power Sector
Reform, and
Energy
Efficiency**

Focus Today:

- Clean energy,
- energy efficiency,
- electricity distribution reform,
- water-energy co-management.



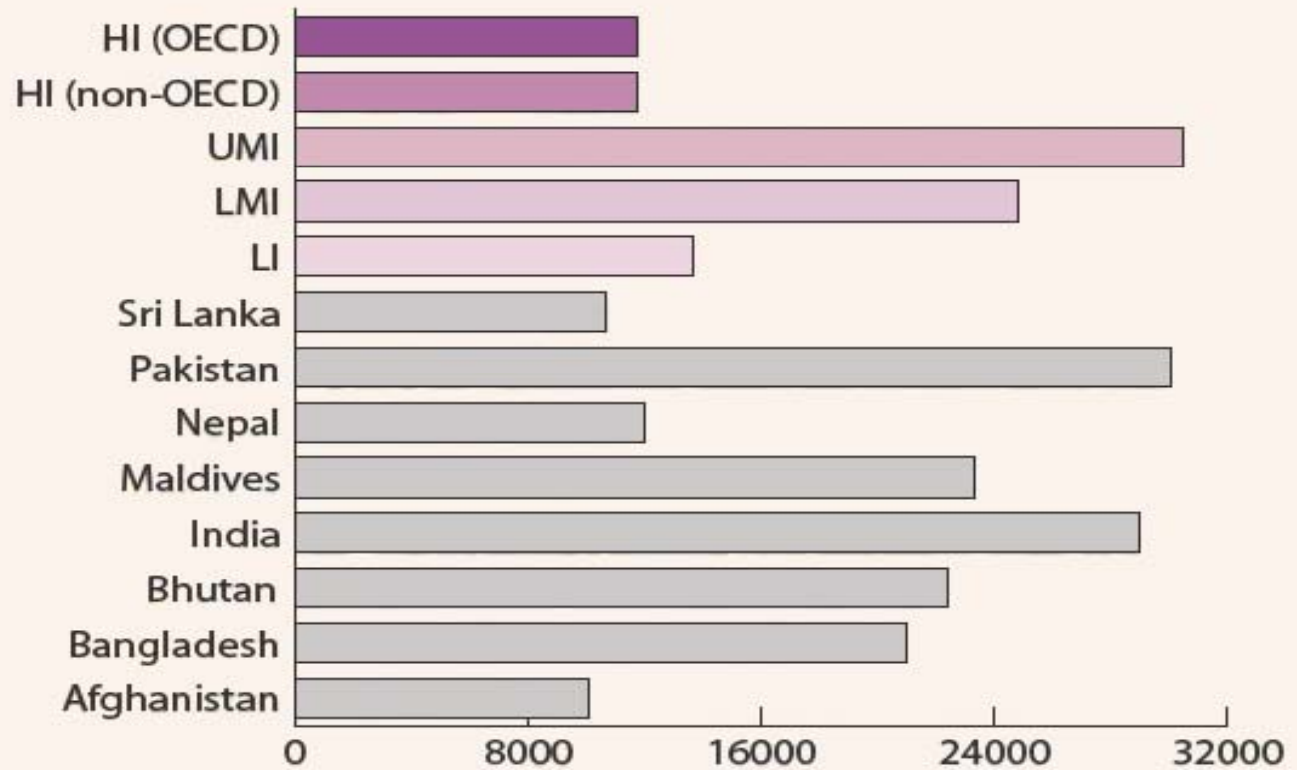
India's Energy Balance



Source: U.S. Energy Information Administration



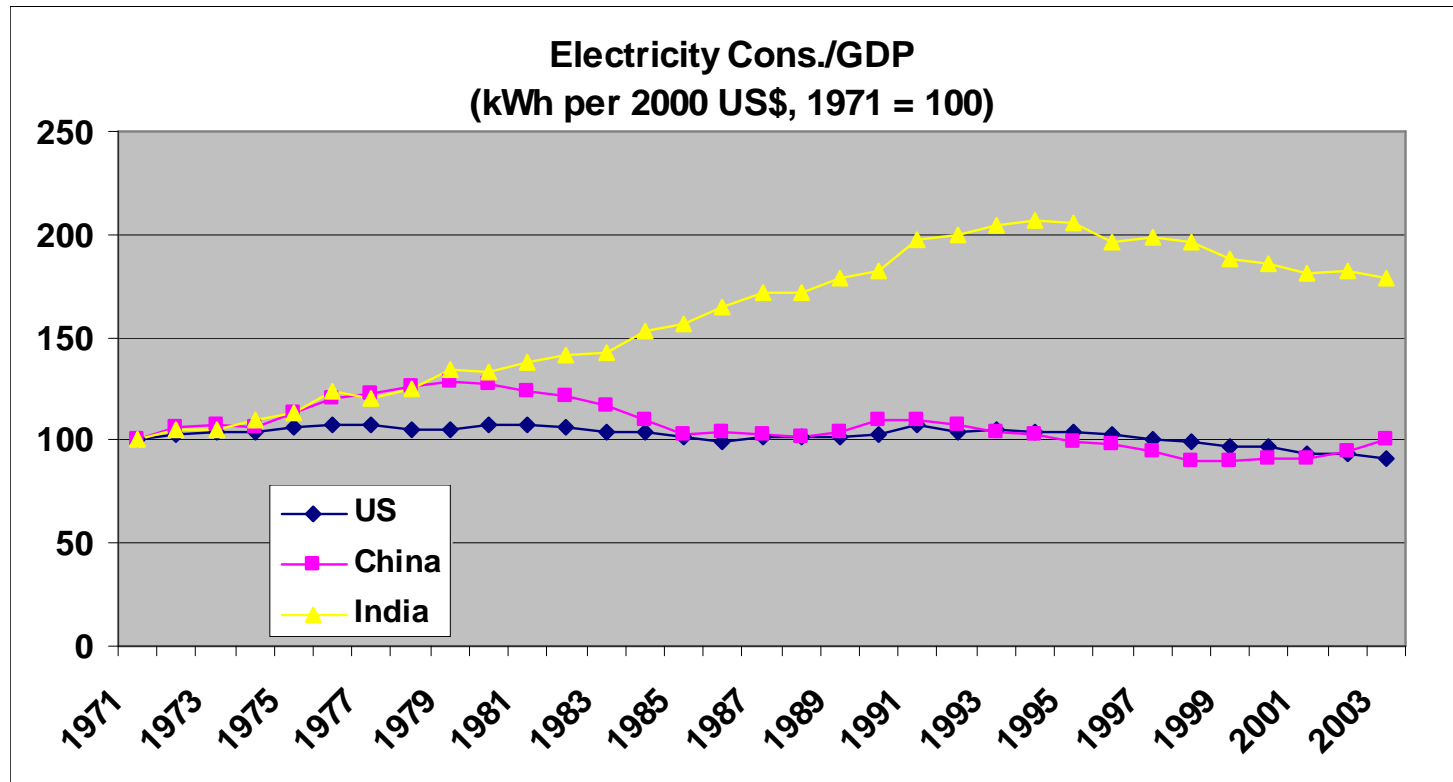
ENERGY INTENSITY (*Btu per \$GDP*)



Source: Energy Information Administration, World Bank income groups.



India's Electricity Intensity Declined From in 1993



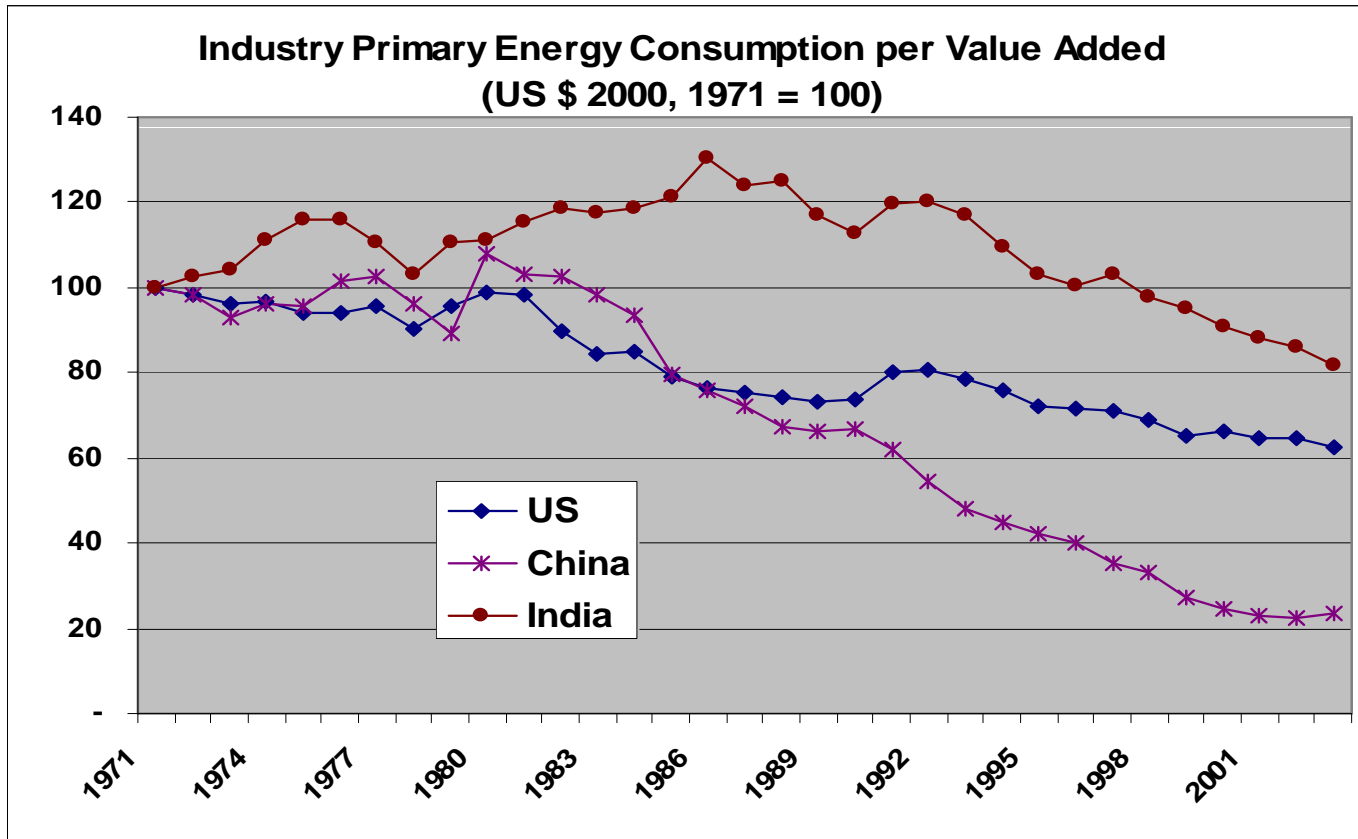
Source:

Energy data – IEA

Economic data – World Bank



Improvement in India's industrial energy intensity





Why Energy Efficiency?

- Bottom - line ; Industrial Competitiveness
 - *However “top-line” investment priorities prevails*
- Minimization of Shortages
 - *Loss in GDP of 0.8-1.2%; Improves tax`revenues*
- Impact on Fiscal Deficit
- Mitigate Environmental Impact
- Employment generation



ENERGY EFFICIENCY (EE) TRENDS IN INDIA

- EE as a strategic solution to address national security and fiscal deficit
- Indian corporates have begun to institutionalize EE
- Public Use of Energy Represents a Major Opportunity
- Greatest Advances came from vendors
- ESCOs mostly are small and generally under-capitalised
- Best result is obtained when public policy mechanisms are teamed with business policy



Key Barriers to Energy Efficiency

- Excessive Supply Bias Continues
- Inefficient Pricing Regimes Prevail
- Lack of EE Service Providers
- Still a Boiler Room issue – not a Board Room concern
- Absence of M&V Protocols



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Summation Point

Need to move energy efficiency programs and strategies from version 1.0 to version 2.0

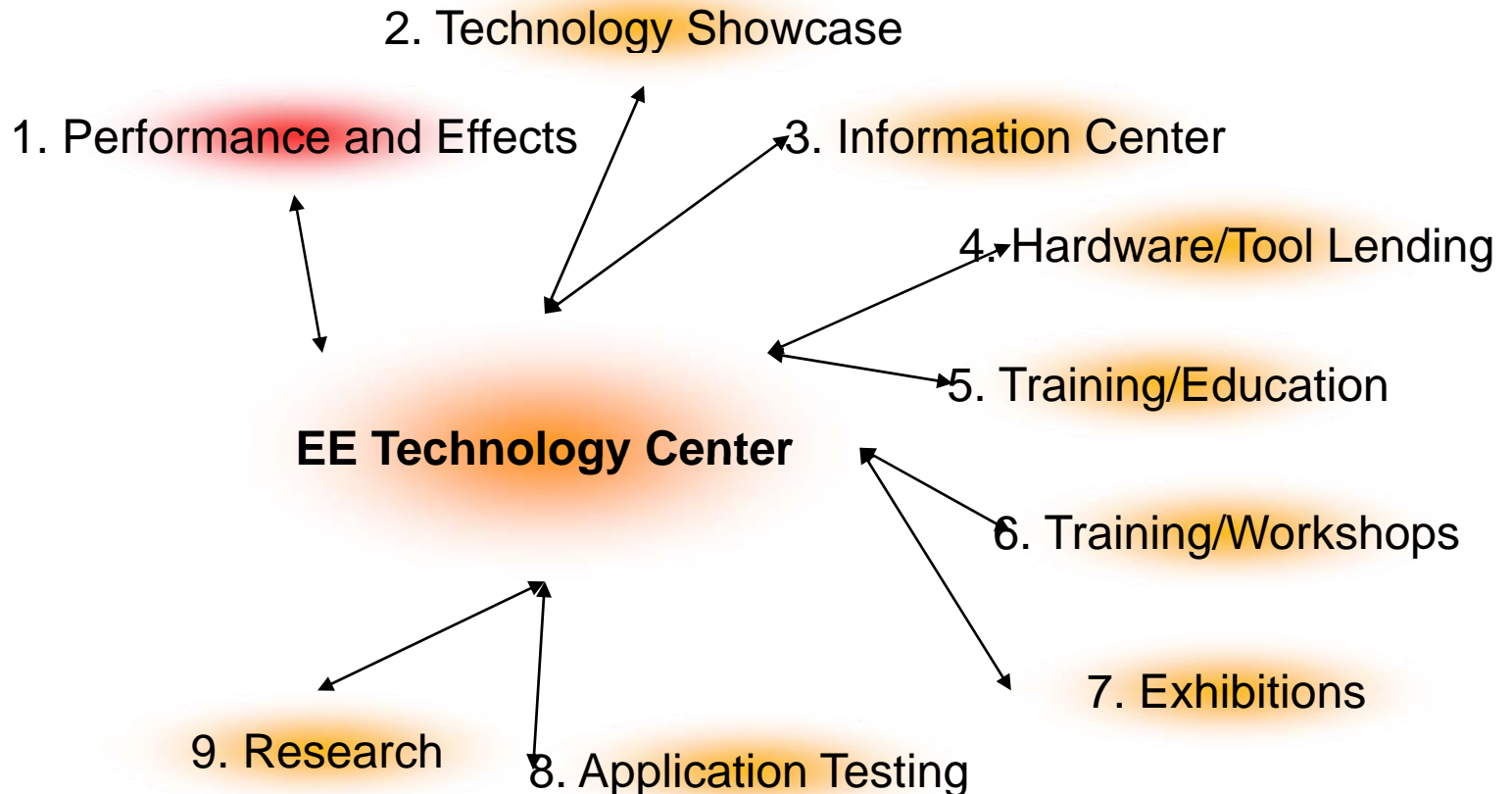


EE Centers of Excellence

- Public Education
- Facilitate demonstration; showcase products
- Facilitate technology development, incubation
- Catalyze EE market transformation and business growth



EE Center of Excellence





Energy Center Activities

- Research
 - Technology R&D, Policy, Program, Investment
- Education
 - Outreach, public awareness
 - Training – workshops, classes, demonstrations
- On-site Services
 - Technology showcase / exhibition
 - Conferencing / training facilities
 - Application / product testing
 - Information library, Hardware tool lending library
- Other
 - Conduct energy audits
 - Market conditioning – analyze and promote policy reform
 - Provide grants



EE Centers – Illustrative Examples of Differentiated Goals

- Center for Efficient Lighting
- Center for Electrical Motors & Motor Drives
- Center for Efficient Home Appliances
- Center for Industrial Applications of EE
- Center for Agricultural Pumping
- Center for Green Buildings



The Concept of RCEEL

Regional Center for Energy Efficient Lighting

A unique culmination of cutting edge innovation in technology, art, architecture and design.

The Art of
Light (ing)



Lighting Technology Center



The Science of
Light (ing)



Lighting Efficiency -The Need

- Strategic Need to advance Lighting DSM in South Asia
- Lessons from CEB past experience & USAID's BELP project
 - Lack of information on energy efficient lighting
 - Absence of facilities that showcase
- There is a need to cultivate integrated design practices for high performance lighting applications and improved aesthetics
- Unique public-private partnership in Colombo – *The Regional Center for EE Lighting: Partnership brokered by USAID's SARI/Energy project between Govt. of Sri Lanka's Sustainable Energy Authority and the Lighting Research Center, Rensselaer Polytechnic, New York*



Conclusion

- ❖ Energy Efficiency (EE) is a key driver for Energy Security, but:
 - It must complement supply and RE strategies
 - We must work on both sides of the energy equation

- ❖ Key developments that advance EE in India:
 - Combining public policy with business policy
 - Catalyze market transformation and business growth

- ❖ Need to establish EE Centers of Excellence



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THANK YOU