



MAITREE
MARKET INTEGRATION AND TRANSFORMATION
FOR ENERGY EFFICIENCY

POWER FOR ALL

24/7 electricity for all. **100% electrification** by 2018.

4 times increase in generation by 2040

RAPID URBAN GROWTH

45% people will live **in the cities** by?

HIGH GDP GROWTH

Over **5% annual growth** from 2015-2040. Amongst the **world's highest**

INCREASING DISPOSABLE INCOME

Over **5% annual increase** from 2015-2040

2nd highest in the world

HOUSING FOR ALL

20 million houses to be built by 2022

GROWTH IN CONSTRUCTION

1 billion m2 commercial space demand by 2030

2/3rd of buildings in 2030 yet to be built



MISSION: ENERGY EFFICIENCY

“Energy Efficiency has the potential to unlock market worth Rs. 74,000 crore, avoid capacity addition of 19 GW, fuel savings of 23 mn tonnes and green house gas emissions reductions of 98.55 mn tonnes per year.”

National Mission for Enhanced Energy Efficiency



‘Energy Efficiency has the potential to unlock market worth Rs. 74,000 crore, avoid capacity addition of 19 GW, fuel savings of 23 mn tonnes and green house gas emissions reductions of 98.55 mn tonnes per year’

source: National Mission for Enhanced Energy Efficiency

Energy use for cooling is dependent on the building design, efficiency of the air conditioner, and the way the in which air conditioning system is operated. If the building is not well designed, then the cooling demand will be very high, resulting in increased energy use, irrespective of the efficiency of air conditioning. Similarly, if the air conditioning system is inefficient, or is operated improperly, the cooling energy use will be high even for a well-designed building. An integrated approach for building design, air condition system design, and operations is required for overall energy efficiency.

PROGRAM COMPONENTS

ENERGY EFFICIENCY IN BUILDINGS	SUSTAINABLE COOLING	SUSTAINABLE COOLING
<ul style="list-style-type: none"> + Supporting Energy Conservation Building Code (ECBC) implementation + Expanding markets for green and energy efficient buildings + Moving towards a super-efficient and NZEB target for new buildings + Large-scale energy efficiency upgrades of existing buildings 	<ul style="list-style-type: none"> + Program design and implementation support for low-energy comfort systems + Supporting large-scale deployment of super-efficient cooling technologies 	<ul style="list-style-type: none"> + Skill development for building sector professionals + Capacity building for energy efficient design, construction and operation + Consumer outreach for energy efficiency behavior modification



1. ENERGY EFFICIENCY IN BUILDINGS

MAITREE Building program supports large-scale building energy efficiency efforts in partnership with public and private agencies. The scope of the activity includes energy efficient design for new buildings, retrofits of existing building, and energy efficient operations and maintenance including occupant engagement in all buildings. The program will also support the uptake of building energy codes (ECBC) through market-based, non-regulatory interventions. The program will also build technical and management capacity of partner organizations and their staff and contractors to continue implementing these projects in the future. Establishing a system of measurement, evaluation, and learning for effective program management will also be a focus of the effort.



2. SUSTAINABLE COOLING

MAITREE will support cooling market transformation through enabling policy framework, integrated design approach, innovative technologies, and end-user engagement. The program will support design and implementation of super efficient air conditioners and aggregating markets for large-scale procurement. Proven technologies and designs for low energy cooling systems will be mainstreamed. Working in partnership with large public and private sector entities, MAITREE will develop strategies for procurement of energy efficient and green air conditioners.



3. TRAINING, CONSUMER ENGAGEMENT, AND OUTREACH

MAITREE training efforts focus on integrated design for energy efficient buildings and cooling systems along with efficiency in operations and management. Intensive courses, including both classroom learning course content and online training programs, will be developed for building sector professionals, facility managers and owners. Technology exposure and real world experience will be facilitated through industry and program partners. MAITREE's consumer engagement and outreach programs will reinforce the linkages between energy savings and user behavior.

Energy efficiency is the most cost effective energy resource that can displace electricity generation from other sources.

MAITREE ACTIVITIES

Harnessing the power of Public-Private Partnerships for large-scale energy efficiency deployment.



MARKET SCALE-UP



SUSTAINABLE PROCUREMENT



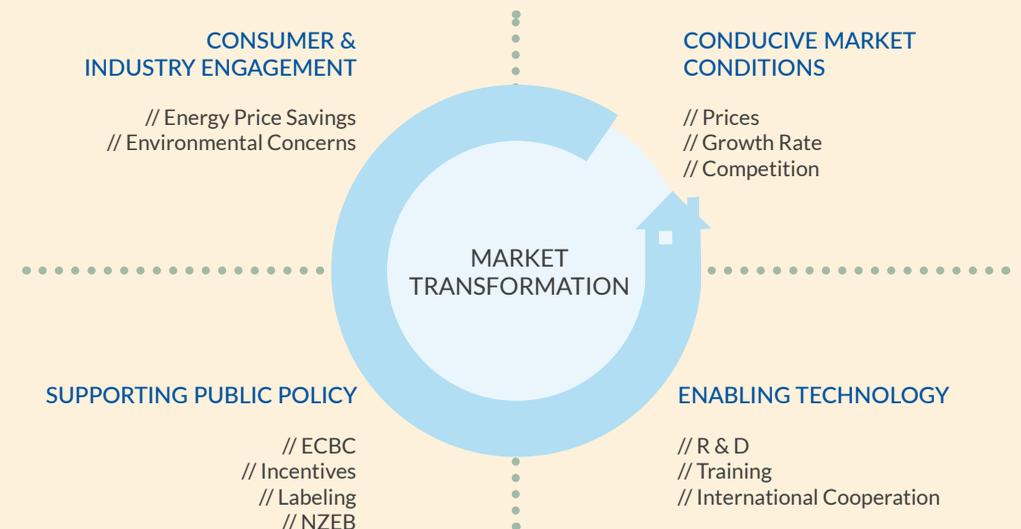
ENERGY PERFORMANCE SPECIFICATIONS



ENVIRONMENTAL AND SAFETY STANDARDS

SUSTAINABLE MARKET DEVELOPMENT

Market transformation¹ is defined as the strategic process of intervening in a market to create lasting change in market behavior by removing identified barriers or exploiting opportunities to accelerate the adoption of all cost-effective energy efficiency as a matter of standard practice. This activity aims at removing market barriers to broader adoption of energy efficiency, as well as accelerating adoption in buildings and air conditioning.



An integrated approach to include buildings, cooling, and consumer engagement to bring about a sustainable change

¹ As defined by the American Council for Energy Efficient Economy (ACEEE)

PROGRAM BENEFITS

Energy efficiency improvement in buildings is the most cost-effective option with multiple benefits.

- Energy Savings and Reduced Emissions
- Scalable Business Models for Energy Efficiency
- Mobilization of Investments
- Market Expansion for EE Products and Services
- Enhanced Human & Institutional Capacity for EE Programs
- Creation of Green Jobs
- Cost-Effective EE Products and Services
- Enhanced Indoor Air Quality and Comfort
- Consumer Engagement for EE Behavior Modification

REGIONAL RELEVANCE - SCALABLE AND REPLICABLE APPROACH

India is leading the energy efficiency market transformation in the south Asian region. The countries in the region are now experiencing the growth in building and air conditioning at the same pace. This is the most strategic time for interventions to set the orientation of policy, technology and skills for energy efficiency. MAITREE implementation approach is scalable and easy to adapt to other products and geographies. The model can easily expand to other economies using a similar approach with a result-oriented sustainable development outcomes.

MAITREE partners are looking at developing energy efficiency business opportunities in other countries, further multiplying the impact of the program. EESL is collaborating with governments in Vietnam, Bangladesh, Nepal and Sri Lanka to start energy efficiency programs on a similar model. The super efficient air conditioners launched in India have a direct relevance in the region, and the industry is looking at a larger regional market for future expansion.

U.S. Green Building Council (USGBC) has identified India as the hub for the entire region including Middle East, South Asia and South East Asia. MAITREE is working closely in partnership with USGBC to develop a strategic approach scalable to other countries to establish a bigger regional green building market. In this context, the Indian Green Building Council (IGBC) is also committed to working closely with their counterpart green building associations in South Asia to promote net zero energy buildings in association with MAITREE.

Knowledge exchange and study tours across regions have more relevance climatically and in terms of construction practices and end-user lifestyle. MAITREE will support regional collaborations for more relevant learnings. The business models, lessons learned, and market experience will be shared with other countries in the region.

MAITREE ACHIEVEMENTS

THE IMPACT SO FAR



Catalyzing new partnerships for creating new demand for energy efficiency

1. Retrofitting existing public buildings in Delhi to be net zero energy. The first set of projects will see an investment of over \$ 700,000 in energy efficient equipment.
2. Super efficient ceiling fan program initiated for replacing over 10 million fans in Delhi, with a potential to reduce peak summer demand by 500MW.
3. Building energy retrofits initiated for airports and Delhi metro projects.
4. Supported techno-economic feasibility for expanding gas market in India through trigeneration. Over 500MW gas trigeneration capacity to be established in the first year
5. Initiated installation of super efficient air conditioners for banks and ATMs. Market potential of over 500,000 locations across the country.
6. The urban development authority in the city of Lucknow building 12,000 energy efficient and green affordable houses
7. First ever process for environment friendly recycling and disposal of airconditioners and other electronics replaced during retrofits. Reclaiming refrigerants and ensuring inefficient products are phased out of the market.
8. USD 300 million investment from World Bank for India Energy Efficiency Scale-Up Program

USAID'S BUILDING SECTOR LEGACY

Policy frameworks

- + MAITREE has developed the NZEB Vision for Lucknow Development Agency. LDA will apply these standards first in 12,000 houses in Sharda Nagar Scheme, a housing project for economically weaker sections. Investments of nearly \$ 70 million in affordable green building systems will result from this project.
- + NZEB vision document prepared for Indian Railways lays out the performance targets and implementation approach for new and redeveloped stations.

Institutional strengthening

- + 1st Green Building Market Transformation Roundtable, organized with United States Green Building Council, held in May 2018. Building designers, manufacturers and representatives from US Trade agencies and other international development agencies gathered for the 1st Roundtable.
- + Recommendations developed for an integrated management information system for EESL's Building Energy Efficiency Program that improves business efficacy by enabling both building retrofit design and implementation.
- + MAITREE conducted a training workshop on BEEP Inventory Development Tool during the EESL's Workshop on Building Energy Efficiency Program with Regional Teams.

Scaling new heights

- + MAITREE, Ministry of Rural Development, Global Green Growth Institute and Department for International Development for climate resilient housing.
- + MAITREE will develop green city guidelines for upcoming urban settlements along the Maharashtra Prosperity Corridor in partnership with Global Green Growth Institute.
- + Airport Authority and Delhi Metro Rail Corporation projects to its portfolio.
- + USD 300 million investment from World Bank for India Energy Efficiency Scale-Up Program.
- + USAID and EESL will hold the 1st Market Transformation Awards on 12th November 2018 in Hyderabad.

Building energy efficiency continues to be a focus of successive USAID programs in India since the year 2000. USAID efforts brought together the Confederation of Indian Industries (CII) and the US Green Building Council (USGBC) to form the **Indian Green Building Council (IGBC)**. It ushered in an era of energy efficient and green buildings in India, now with vibrant eco-system of green buildings with over **5,000 green buildings registered with an area of over 6 billion square feet**.

India's first Energy Conservation Building Code (ECBC) as well as the next generation of the code, ECBC-2017, were prepared as a part of USAID's programs. USAID technical support also extended to support code implementation through development of ECBC **implementation strategy for states, user manuals, tip-sheets, training programs, and professional accreditation exams**. Energy conservation funds and energy efficiency finance mechanisms were developed to mobilize the investments required for energy efficiency.

While ECBC is a regulatory approach for minimum energy efficiency, USAID supported the development of a market driven approach for super efficient buildings powered by integrated renewable energy. As apart of this effort a **Net Zero Energy Buildings (NZEB)** vision and roadmap for India was drawn through extensive consultation with the building industry. Subsequently an **NZEB Alliance and Knowledge Portal** were launched to promote and support the approach. USAID support enabled the Indian Railways for developing a "Green and Net Zero" vision and action plan for all future station developments. As a shining example of this effort, the **new campus for Nalanda University is being developed as a net zero energy campus** with USAID technical assistance.

Recognizing the importance of energy use in air conditioning in buildings, USAID programs have focused on **reducing energy use in both commercial and residential air conditioning**. The ECBC and green building ratings result in better building designs for reducing the demand for air conditioning and also specify the minimum efficiencies for these systems. USAID supported the first ever air conditioning market research followed by a comprehensive market transformation strategy for India. In parallel, USAID worked for the **design of a super-efficient air conditioner program in partnership with EESL**. The emerging product was one of the most efficient room air conditioner, which has already resulted in other manufactures following suit with new super-efficient ACs.

THE USAID JOURNEY

TRANSLATING THE VISION TO REALITY

2000-2002

ECO

Establishment of Indian Green Building Council

2004-2006

ECO II

Energy Conservation Building Code (ECBC)
2007
ECBC implementation strategy
Scheme for Building Energy Efficiency Finance
Design of State Energy Conservation Funds

2006-2012

ECO III

ECBC training programs and capacity building
Energy Benchmarking and Building Labeling
Net Zero Energy Building (NZEB) Strategy
Roadmap for India

2012-2018

PACE-D

Energy Conservation Building Code 2017
ECBC Implementation support to states
ECBC professional accreditation program
NZEB Knowledge Portal
NZEB Alliance
NZEB action plan for Indian Railways
NZEB design and development support for
Nalanda University Campus
Indian HVAC Market Research and Market
Transformation Strategy

“Advancing U.S. - India cooperation on energy efficiency, clean energy, and energy security.”

MAITREE builds on the strength of international experience and resources that USAID has brought to the building sector over the last decade. The program leverages the technical and financial resources of the private sector in line with USAID's Clean Energy initiatives.

PROGRAM PARTNERS

Bilateral Partners

Ministry of Power
USAID

Government

Bureau of Energy Efficiency (BEE)
Energy Efficiency Services Ltd. (EESL)
Indian Railways
Lucknow Development Authority (LDA)
Energy Efficiency & Renewable Energy Management Center, Government of Delhi

Private Sector

CBalance
US Green Building Council (USGBC)
Indian Green Building Council (IGBC)
Indian Society of Heating Refrigeration and Airconditioning Engineers (ISHRAE)

International Agencies

UNEP
World Bank
Global Green Growth Institute (GGGI)

Implementing Partner

Environmental Design Solutions [EDS]

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Climate change is no longer some far-off problem; it is happening here, it is happening now.

Barack Obama

Book Design: One Small Design Studio, New Delhi

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