



# “SUSTAINABLE BUILDINGS”

## THEME LEADS

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## INTRODUCTION

In 2010 buildings accounted for 32 per cent of total global final energy use and 19 per cent of energy-related greenhouse gas (GHG) emissions. Findings of the AR5 envisage that this energy use and related emissions may double or potentially even triple by mid-century due to several key trends. According to the Global Energy Assessment (2012) projections for 2050, a 46 per cent reduction in global heating and cooling loads (compared to 2005 levels) can be achieved by deployment of today's best practices in construction and retrofit know-how.

As the world's largest democracy facing an increase in frequency and intensity of climatic events, it is imperative that India takes on a key role in deploying an alternate development path to mitigate the impacts of climate change.

The industry captains have been proactive in taking responsibility by integrating sustainability in their operations and within their value chain. While the costs of integrating efficiency in the built environment are significant, savings in energy costs typically more than exceed the investment costs.

As per estimates of the Government of India, less than 5 per cent of the \$11.4 billion market for energy efficiency has been explored. Further, an investment of about \$64 billion<sub>2009</sub> prices until 2031 is required for provision of sustainable services and development of infrastructure. This provides an enormous possibility and opportunity for the corporate sector to chart out a vision for India to combat climate change and rise to meet challenges, create opportunities, and take the lead in the climate discourse.

As per the AR5, the global green building market is valued at approximately \$550 billion<sub>2010</sub> and is expected to grow through to 2015, with Asia anticipated to be the fastest growing region.

In order to create an environment conducive to meaningful growth, the Government of India has launched new initiatives to encourage active participation from the private sector. The foreign direct investment (FDI) policy on the construction development sector, invitation to private sector

## KEY QUESTIONS

- What expertise can corporate India offer to ensure sustainability in the planning and execution of '100 Smart Cities'? What business opportunities and financial structures are required?
- In order to achieve a holistic approach to city development, what resources need to be mobilized?
- What immediate steps are required to build efficiency and smartness in self-occupied buildings and those that can be influenced through the individual value chain?

for design and development of affordable housing in partnership, and collaborations to facilitate performance contracting of existing buildings have all been designed to ensure that development and growth meets the objectives of energy efficiency and environmental sustainability at various levels.

The Energy Conservation Building Code (ECBC) of India launched by the Bureau of Energy Efficiency (BEE) is in place since 2007 and the Government of India is taking necessary steps to mandate the Code. Several states of India including Rajasthan, Odisha, Andhra Pradesh, and Gujarat have already mandated the ECBC, and the corporate sector has greatly benefitted from its adoption. Penetration of energy efficient products for envelope and systems has also gone up several fold. The BEE has been very successful in its appliance labelling programme that has helped raise the bar of energy efficiency in the appliance sector. Green Rating for Integrated Habitat Assessment (GRIHA) has largely been adopted in the governmental sector as a tool to facilitate design, construction, and operation of sustainable habitats. The Leadership in Energy and Environmental Design (LEED) certification system was introduced through collaboration between Confederation of Indian Industry (CII) and the United States Green Building Council (USGBC) way back in 2003. Since then several corporate organizations have adopted the LEED system to demonstrate environmental responsiveness and has gained prominence as a tool to deliver green buildings through a globally acceptable system

The schemes such as 'Make in India' link development and growth to sustainable buildings by incentivizing compliance with green building rating systems such as LEED and GRIHA. The '100 Smart Cities' programme, being spearheaded by the Ministry of Urban Development, clearly delineates the requirement for each city to comply with an environmental sustainability framework. Furthermore, the National Housing Bank has also launched a major programme called Energy Efficient Housing Scheme to refinance energy efficient housing.

Taking the lead, United Technology Corporation in collaboration with TERI has launched a Centre of Excellence (CoE) for energy efficient buildings in India with an objective to mainstream resource efficiency in the existing building stock. The CoE conducts research to assess energy use and consumption patterns of existing buildings that would be used to set energy performance baseline along with a roadmap to make the buildings more energy efficient.

Another example is that of the strategic collaboration between TERI and the USGBC to develop high performance 'green buildings' in India and Southeast Asia. With an initial thrust on existing stock of buildings, the objective is to ensure implementation of key sustainability parameters on the ground through regionalization of LEED.

There are several bilateral programmes in the sector under aegis of the Government of India being supported through bilateral partners such as Swiss Development Corporation (BEEP), AFD (SUNREF), USAID (PACE D), etc. However, there is an urgent need to focus on deployment, identify mechanisms to upscale best practices and initiatives, and encourage technology business incubators that would help address some of the challenges associated with climate change.

Despite several government and private initiatives, the sector has not yet gained the ideal level of traction. Strong barriers hinder the market uptake of largely cost-effective opportunities to achieve energy efficiency improvements. Barriers include imperfect information, transaction costs, limited capital, externalities, subsidies, risk aversion, principal agent problems, fragmented market and institutional structures, poor feedback, poor enforcement of regulations, cultural aspects, cognitive and behavioural patterns, as well as difficulties concerning patent protection and technology transfer. More specific to India, lack of awareness, financing and qualified personnel causes lock-in effects in terms of emissions. The pace of policy uptake is especially important because ongoing development efforts that do not consider co-benefits may lock in sub-optimal technologies and infrastructure and result in high costs in future years.

## **IDENTIFYING BUSINESS OPPORTUNITIES IN SMART CITIES**

Based on discussions with corporate leaders, several opportunities were identified for the corporate sector to implement the vision of the Government of India. Solutions ranged from joint implementation of one model smart city to highlighting solutions already implemented at various levels.

In view of the deliberations, we envisage that the ambitious plan to implement “100 Smart Cities” across India is likely to be planned in a manner that considers redevelopment and retrofitting of existing sites, and greenfield development in identified areas.