

A report from the Economist Intelligence Unit

Achieving scale in energy-efficient buildings in India

A view from the construction and real estate sectors



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Contents

	Executive summary	2
	About our research	4
1	Opportunities and challenges	5
2	Policy stumbling blocks	7
3	Looking ahead—scaling up through residential building and retrofits	9
4	Conclusion	11



Executive summary

India is home to 1.2bn people, approximately 31% of whom now live in urban areas, according to the World Bank. Indeed, this South Asian giant boasts three of the world's top 20 mega cities—Mumbai, 18.4m strong, followed by Delhi (16.3m) and Kolkata (14m). These and other urban areas are only expected to grow. India's government projects the urban percentage of its population to reach 38.8% by 2026. As a result, a staggering 465m urban dwellers will need housing of one form or another.

Years of economic growth—an average of 7.6% annually since 2000—have spurred demand for more modern commercial and residential buildings and have increased energy consumption. According to a 2010 McKinsey report, between 700m and 900m square metres of commercial and residential space will be built each year until 2030. Residential buildings, which until now have not been targeted for energy efficiency, make up 75% of India's market. The upside potential to expanding and adapting existing energy-efficiency policies to the residential segment is tremendous.

To date, efforts of India's policymakers have focused on reducing energy consumption in new commercial buildings. Achieving significant scale will depend on efficiency measures becoming standard practice in the commercial middle market, retrofit, and, particularly, the residential buildings segments.

India needs to build a better business case for energy-efficient construction. Roughly 75% of executives in India's building industry believe energy-efficient buildings cost at least 15% more than traditional buildings, according to the Economist Intelligence Unit (EIU) June 2012 survey. This limits their willingness to make additional upfront investments. Yet, 80% of them agree that energy-efficiency legislation benefits their sector. Indian businesses, therefore, would likely welcome more stringent government legislation and efforts to improve the awareness of cost savings—helping them to achieve scale and reduce carbon emissions.

Key findings from the report include:

- **The key energy-efficiency regulation for large commercial buildings in India, the Energy Conservation Building Code (ECBC) adopted in June 2007, is having a positive effect.**

Commercial buildings certified for energy efficiency now account for 1.2bn square feet (about 111m square metres) of space. Although experts say the true impact of the ECBC's implementation may be greater because some building owners are willing to simply secure energy savings rather than going through multiple procedures to become certified.

- **To date, policymakers have prioritised the large commercial sector over India's commercial mid-market and residential buildings segments.** Few formal energy-efficiency guidelines or laws exist today for new housing developments. However, the Bureau of Energy Efficiency is now helping to draft some, while the residential sector is starting to employ many best practices related to window design and building orientation.
- **Consensus is growing among private and public sector leaders that now is the time to make India's voluntary energy-efficiency code for commercial buildings mandatory.** In fact, the government has announced its intention to make the ECBC mandatory during India's current economic Five-Year Plan (2012-2017).
- **Market forces such as the falling cost of materials are helping home builders overcome the perception that energy-efficient buildings are costly.** Solar photovoltaic panel costs, for example, have fallen dramatically over the last four years. Promotion of energy-efficient technologies by government regulators would further drive near-term demand until these technologies are in widespread use and, consequently, become less costly.
- **Home builders are less attracted by potential energy savings—since these will mostly benefit homeowners, so they would like to see more incentives for construction.** Legislative proposals are on the table to give builders tax cuts and other concessions for constructing energy-efficient buildings. Such incentives should be accompanied by closer government monitoring to ensure implementation of energy-efficiency measures. ■



About our research

Achieving scale in energy-efficient buildings in India: A view from the construction and real estate sectors is an Economist Intelligence Unit report sponsored by the Global Buildings Performance Network. It is a follow-up briefing to our June 2012 report *Energy efficiency and energy savings; A view from the building sector*, which drew on a survey of 423 senior executives in the buildings sector. This paper focuses on how companies in India approach energy-efficiency investments, the challenges and opportunities they face and the role policy plays in encouraging scale in energy efficiency across commercial and residential buildings. The EIU bears sole responsibility for the content of this report. The findings do not necessarily reflect the views of the sponsor. The paper was written by Vir Singh and edited by Janie Hulse.

This report's findings are based on three principal sources:

- Extensive desk research derived from the latest data, documents and reports.
- Analysis of our June 2012 survey of 423 global executives and 102 executives in India's building sector. More than one-third of the India respondents (34%) were C-level; 41% worked for companies that list revenue greater than \$500m; 70% came from the real estate sector (commercial, residential and industrial); and 30% were in the building construction industry.

- In-depth interviews with experts from leading companies involved in energy efficiency in India's building sector.

We would like to thank the following individuals for sharing their time and insights:

Pavan Bakeri, managing director, Bakeri Properties

Niranjan Khatri, sustainability director, ITC Limited

Sanjay Seth, energy economist, Bureau of Energy Efficiency

Karan Grover, architect, Karan Grover & Associates

Manish Kumar Gupta, assistant vice president, design & development, ATS Infrastructure Limited

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1

Opportunities and challenges

A small but growing number of commercial buildings are going green outside the formal rating process, which is overseen by the Indian Green Building Council. Their energy and cost savings contributions to India's massively expanding buildings sector are not being measured, according to Karan Grover, an architect who has designed energy-efficient buildings.

"Many people are telling me, 'We don't need a green stamp. I don't want to get into the documentation. The auditors for the green ratings take so long to revert,'" explains Mr Grover.

These nascent moves, if formalized and expanded, present tremendous opportunities for significant energy and cost savings in new builds. India's construction boom has enormous upside potential. India's power supply will have to grow by 6.5-7% each year from 2012 to 2017 for the country to achieve the targeted economic growth rate of 9%, according to the government's Planning Commission. Massive power blackouts in July 2012, which affected more than 600m people, are a stark reminder of the demand-supply gap that casts a shadow over India's economic growth. Securing energy-efficiency gains by designing and investing in new buildings is substantially cheaper than retrofitting.

The potential savings are particularly significant for India's residential building sector. No energy-efficiency policy yet exists for residential projects, which account for 75% of the country's buildings. However, builders in this

segment are already employing some best practices recommended for new commercial buildings. In addition, various newly drafted measures from the Bureau of Energy Efficiency are under discussion in state and town planning organisations for inclusion in local by-laws.

India's green buildings market is still being developed, with stakeholder opinions diverging in regard to the cost of inputs, to the payback period and to investment prospects in general. These assessments can vary widely depending on one's role in the green building ecosystem, on borrowing rates, on local incentives and on market demand for properties. Some claim that the costs of energy-efficient materials and technologies are falling, which is helping to increase market demand. The incremental costs of designing and building energy-efficient structures in 2000 was 16-17% and the payback period was seven years, according to Mr Grover, the architect who designed the Indian Green Buildings Council (IGBC) office in Hyderabad in 2004. "Now we are down to 4%, and payback is two years," he continues, adding that "soon" the cost of a green building will be equal to that of constructing a conventional building in India.

Not everyone is so optimistic. Pavan Bakeri, managing director of Bakeri Properties, thinks that assessment might be true for a few well-known buildings officially certified as energy efficient. But, for him, the cost of installing new technologies remains a major obstacle. "Ahmedabad's energy prices are among the highest in the country. Yet

[investments in energy efficiency] are not breaking even,” observes Mr Bakeri. He explains that even for top builders, a bank’s annualized prime lending rate may be up to 15%. At this rate, versus 4-5% in developed countries, he insists that the payback period on investments is longer than Mr Grover’s estimate of two years. He explains that recovering the additional investments takes between 3.5 and 4 years because of high interest rates, of additional costs of extended interest payments and of relatively lower energy savings because consumption habits in India are generally less wasteful.

Mr Bakeri reveals another obstacle to investment: “In the vast majority of cases, especially in residential development, developers exit a project through an outright sale to the client. And, hence, the savings resulting from energy efficiency do not accrue to the developer. And, as of now, there is not enough willingness amongst clients to pay a higher rate to developers for an energy-efficient building.” This, coupled with high borrowing costs and lack of demand, make energy-efficiency investments less appealing.

The cost of capital is also a concern among senior executives in India. Some 12% of those who responded to our June 2012 survey identified subsidized lending as the second most influential factor (after tax rebates, 22.5%) in their company’s decision to invest in energy efficiency. An October 2012 report by the National Resources Defense Council explains, “The financial industry is

concerned about the lack of demand for these [energy-efficient] products from building owners and developers...and the lack of standards for such energy-efficient equipment, technology, and applications.”

Today, two rating systems assess energy-efficient buildings in India—the US-inspired LEED (Leadership in Energy and Environmental Design) ratings, which are administered by the Indian Green Buildings Council, and the GRIHA ratings, or the Green Rating for Integrated Habitat Assessment, which was developed by The Energy Resources Institute, a policy think tank. India has about 220 LEED-certified buildings and 308 projects registered by GRIHA .

Both rely on ECBC guidelines to assess a building’s energy efficiency in the commercial sector. However, given the cumbersome processes involved, some companies choose to ignore these agencies in their pursuit of energy efficiency.

A lot of states are at various stages of adopting and implementing the national Energy Conservation Building Code (ECBC) and other energy-efficiency measures such as new provisions in local building by-laws. Sanjay Seth, energy economist at the Bureau of Energy Efficiency (BEE), notes that the states that have been most proactive are those where significant “infrastructure development is happening.” He explains that India’s north-eastern states have seen fewer registrations because not many buildings in the region qualify under the provisions of the ECBC. ■

2

Policy stumbling blocks

“The private sector will accept binding regulations for energy efficiency provided it does not increase costs for the common man,” notes Mr Bakeri, explaining that spiralling labour and other costs have already pushed home prices up by about 50% in the last five years. “Housing prices have become unsustainable for the common person.” Buyers in the largest segment of the housing market—lower middle-class homes—are the most price-sensitive, he says.

Buyers in this category, which represents 90% of the housing market, simply cannot stomach a 10% price hike and home prices will increase despite a drop in some costs, materials, for instance, according to Mr Bakeri. For these reasons, well-thought-out policies can have the greatest impact in this area, he says. But, for policies to work, a focus on results is critical.

Mr Bakeri believes that the national government should offer incentives to banks, which are already required to allot a certain amount of their lending portfolio to housing, to support investments in energy efficiency in the building sector and elsewhere. Many mid-level construction firms, however, operate outside the formal market and may not benefit from such a mandate, limiting the scope of its effectiveness.

Some, including Mr Bakeri, believe that “India can and must leverage the ‘cap and trade’ system.” The collapse in carbon credit prices, however, brings into question the financial viability of the

system. Even the UN-backed Clean Development Mechanism (CDM) to promote carbon credit capital is rarely used for building energy-efficiency projects since it’s difficult to substantiate energy and carbon savings. Most CDM projects are geared toward renewable energy.

Awareness of energy-efficiency technologies and their benefits is lacking, according to Manish Kumar Gupta of ATS Infrastructure Ltd. “We should encourage awareness programmes in certain organisations for developers and end users to make people more comfortable and handy with these systems,” he maintains.

Among key awareness-building targets are resident welfare associations (RWAs). These are civic bodies representing the interests of the citizens of specific urban areas. Ignoring these groups could lead to neglect and, ultimately, the breakdown of energy-efficiency systems.

“[Without] proper technical awareness, if something goes wrong and the RWAs don’t want to invest, the whole [energy-efficient] system spoils,” Mr Gupta adds. “The RWA is going to have to maintain so many solar panels, lights, sensor-based systems and timers, solar lights. People are not bothered if one common area component is not working,” he continued.

Another issue for developers, according to Mr Gupta, is red tape. “Developers need too many approvals,” he says. “The government should go for a single-window approval of all these things

together on one platform—be it EIA [Environmental Impact Assessment], ECBC, GRIHA or any other certification.”

To help meet these challenges, the government has articulated its commitment to strengthening implementation of energy efficiency in buildings, starting with the ECBC. The government clearly stated that energy-efficiency norms for large commercial buildings six years ago will become law in India’s 12th Five-Year Plan (2012-2017).

“We are going to go for a completely mandatory plan. Fifteen to twenty states in the country have already moved ahead with its implementation,” says Mr Seth.

Many, including Mr Grover, welcome this development. “This is a good time to turn guidelines into mandatory laws for all new construction in India. I would happily support such a move along with many architect colleagues across the country,” he says. ■

3

Looking ahead—scaling up through residential building and retrofits

Of all players in India's green building sectors, residential building developers are perhaps the most difficult to win over because they have not been offered enough incentives. "If you were to give a power tariff rebate, developers would not see it as an incentive," Mr Seth says. "Incentives should be such that the developers should be able to see the benefits."

Indeed, the vast majority of incentives either in place or under discussion focus on building inhabitants, who are granted subsidies or, occasionally, benefit architects who receive cash rewards for designing energy-saving structures. This provides little financial motivation for builders, most of whom will sell off housing or commercial space within four years and move on to the next project.

The government is responding to these concerns by creating tax breaks and other incentives. But the effectiveness of the first few incentive schemes has fallen short of many expectations; the government's ability to monitor and enforce energy-efficiency implementation is generally weak. Moreover, incentives for developers without awareness to drive demand have limited utility. Nevertheless, some incentive schemes that were focused on building space have been successful. These include rights to a greater built-up area than those currently sanctioned, known as Floor Area Ratio (FAR) or Floor Space Index (FSI). Although these programmes may entice developers who

normally wouldn't build green to pursue certification for economic reasons, poor government monitoring of efficiency gains can easily result in many developers renegeing on their commitments.

The expanded floor space incentive resonates strongly with builders. "FSI or FAR is a very powerful tool that is very attractive to developers," observes Mr Bakeri.

"If green buildings are to be more popular, one of the most cost-effective government methods is increasing FSI as an incentive. This does not require any financial outflow from government coffers," agrees Niranjan Khatri, general manager of environmental initiatives at the hotels division of ITC Limited, a large business conglomerate. He notes that local authorities in Noida, a township on the outskirts of New Delhi in Uttar Pradesh state, have declared a 5% additional FAR for certified green buildings.

National regulations are also under discussion. The Bureau of Energy Efficiency has drafted provisions on energy efficiency that can be used to regulate construction at the local level. The Ministry of Urban Development is also involved and is now advising all municipal administration departments of the state governments to include these provisions in building by-laws, explains Mr Seth.

Other Bureau-backed actions should catalyse growth in the sector, including training and certification programmes, to ensure enough

implementation capacity. The Bureau has also monitored the supply of energy-efficient materials to avoid supply constraints that might slow growth, a common problem in India's fragmented and cost-constrained construction industry.

Finally, the energy-efficiency discussion is slowly shifting from an overwhelming focus on new construction to include the retrofit segment. A full 94% of those polled in India's residential sector said energy-efficiency measures were most relevant to new building construction. As a result, little information is available about the retrofits market or about how much of India's existing building stock is now equipped to consume less energy. According to developers who responded to the survey, buildings with a single owner are more likely to opt for a retrofit. Bringing multiple tenants or owners into agreement about energy-efficiency investments is extremely difficult.

ITC was an early mover in this space. It

retrofitted all its hotels in a very short time. Mr Khatri, sustainability director at the group, says the company taught itself how to "integrate two seemingly incongruent concepts" by pioneering "responsible luxury" at the ITC Gardenia Bengaluru hotel in 2009. "We leveraged our experience at ITC Gardenia by retrofitting all our older luxury hotels and securing LEED ratings for all of them within a year," he recalls.

While India has a long way to go, he adds, much has been achieved. "New ideas take time to take root and scale up," Mr Khatri says. Moreover, the area covered by green buildings has jumped from 170,000 square feet (about 15,800 square metres) in 2005 to 1.2bn square feet (about 366m square metres) today, he says. "This is a big jump, without a regulatory push. Some 25,000 architects have been trained in green building design, and many other stakeholders are aligned to the green building movement." ■

4

Conclusion

The commercial sector has blazed the energy-efficiency trail in India's building sector. It has created a viable niche market and inspired some companies in India's immense residential sector to follow suit, despite inadequate legislation and incentives. In tandem, the Indian government—at the national, state and local levels—is taking steps to rectify policy deficiencies. Indian executives in

the commercial and residential sectors are receptive to better, more stringent regulations. The time is ripe for the government to make energy-efficient building an attractive business with profit potential. By capitalising on India's massive construction boom, the government can help achieve scale in energy-efficient buildings and slow the growth of CO₂ emissions. ■

Whilst every effort has been taken to verify the accuracy of this information, neither The Economist Intelligence Unit Ltd. nor the sponsor of this report can accept any responsibility or liability for reliance by any person on this white paper or any of the information, opinions or conclusions set out in the white paper.

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