

Climate Change Mitigation Calls for Sustainable Buildings

Governmental commitment to mitigate climate change is going to have a major impact on the fortunes of the building materials industry. It is likely that soon there would be greater incentive to use products that are green and sustainable while building commercial or even residential structures

AT THE RECENTLY HELD United Nations conference on climate change (COP21) in Paris, more than 190 countries have committed to contribute in keeping global warming in check. All these countries in a collaborative manner will try to mitigate climate changes by avoiding the rise of temperatures by more than 2°C. The US and China are the largest greenhouse gas emitters and also world's largest economies. Thus the onus is on them to act fast to meet global climate goals. Although India is still way behind these countries in terms of absolute emissions, its share in global emissions is estimated to increase to 14% in 2040 from 6% at present, which is more than double. Plus, India being a country which is still building its infrastructure, the scope of reducing emissions is more than those of the developed ones.

Naturally, the focus is on using clean energy to achieve the same. India is betting on its potential of generating solar power and minimising coal-generated power. However, more than anything else what will serve India best in such a scenario is making its infrastructure sustainable or less energy consuming, and making it possible to fulfil its energy needs mostly through clean energy.

Explaining the rationale behind this line of thinking, Johann Hesse, head of Cooperation of the European Union in India, says, "Buildings contribute to about 30-40% of energy consumption in many Indian



Our partnership with IFC and peers will further our shared vision for sustainable housing

ANITA ARJUNDAS
Mahindra Lifespaces

cities and about 22% of the country's annual greenhouse gas emissions." At the policy level making development sustainable, or green, has struck a chord. Even at the corporate level the demand for sustainable or green buildings for office premises or campus is on the rise for its inherent benefits.

DEMAND SURGING

India is by no means lagging behind on the sustainable development front. The fact that the number of certified green buildings in the country has surged over the last four to five years is a direct indication of the growing popularity of the 'Sustainability' concept.

According to Indian Green Building Council (IGBC), green real estate in India

has grown from a mere 20,000 sft in 2003 to a little over 3.0 billion sft of registered, pre-certified and certified projects in 2015! Of this, green office spaces account for 200 million sqft, primarily in the 10 major cities. Now the target is to reach 10 billion sft by 2022. Further as per a recently released report by the US Green Building Council (USGBC), "By 2018, the green building industry in India will grow by 20% driven largely by environmental regulations and demand for healthier neighbourhoods."

The adoption of green development practices is more visible in the commercial sector. The increasing adoption of sustainable real estate in the sector stems from the urge



Most of our projects are going to be certified green

DHAVAL AJMERA
Ajmera Realty



Our projects are marked by the use of environment-friendly materials

AKHIL KUMAR SUREKA
Sarvome Developers

of minimising operational and overhead costs by cutting energy and water consumption in the building. Analysing the savings that corporates can achieve by using green buildings, Rajat Malhotra, COO, Integrated Facilities Management (West Asia), JLL wrote in one of his columns, "A typical 100,000 sft green office building saves the occupier Rs 30 to 40 lakh in a year on energy alone. Savings in water could be close to half this amount. In comparison to conventional office spaces, green offices are 20-30% more efficient in the use of water and energy. Of course, there are added costs to green office spaces, as well. Office rental benchmarking studies in the seven major cities have revealed a typical premium of 2-3%."

The major proponents of green commercial real estate are the MNCs. Today, a large number of IT/ITES companies and BFSI firms have an explicit 'Green' mandate when it comes to leasing commercial spaces. Bank of America Continuum, Citibank, UBS, Inautix and Intuit, to name a few, are some of the firms that are firmly committed to occupying sustainable office spaces. However, this line of thinking has not remained limited to MNCs. The demand for green office space is equally high among Indian corporate, and some of them have included green office spaces in their corporate sustainability objectives.

Corporate offices that already dot the Indian landscape with green certified buildings include the Suzlon OneEarth — the renewable energy giant Suzlon's campus in Pune, Chennai Developmental Centre (Chennai); Wipro Tech Park (Visakhapatnam); Dabur India building (Chandigarh); Thermax Corporate office (Pune); and Infosys campuses, to name a few. Some of the prominent green commercial projects include Godrej Genesis in Kolkata, J W Marriot near international airport in Mumbai, the Indian Oil Corporation building, and learning centre in Panipat, Haryana.

However the residential sector, which constitutes the bulk of projects, is lagging behind in this aspect. While the buyers are averse to spending more, developers themselves are sceptic and are not pushing this concept.



AIS has been moving the industry towards an eco-friendly future

VIKRAM KHANNA
Asahi India Glass

Dhaval Ajmera, director of Ajmera Realty, opines, "We have witnessed that comparatively there is more demand for commercial green offices, because the concept of green buildings started with commercial buildings, institutions, schools, offices etc."

Anuj Puri, chairman and country manager JLL India, comments, "Sadly, the reality is that most home buyers in India are still quite averse to paying an extra premium for a green residential project. Obviously, developers will not fall over themselves to cater to a segment



Smart cities will require engineered windows that save energy

RAJESH CHAWLA
VEKA

wherein demand is lacking."

He adds, "There is no denying that this is a very challenging environment for developers with committed funds for development of projects. They need to be able to find occupiers or buyers in order to recover the cost of capital and the investment. This means that the growth story of sustainable real estate in India depends on consumers proffering demand as much as on developers for generating supply of green buildings."

PRO-SUSTAINABLE MOVEMENT

Developers and the green rating agencies have realised the need to address the challenges and work in a collaborative manner to increase penetration of sustainable real estate in India. Several workshops and conferences are being organised in nooks and corners of the country highlighting what is plaguing the real estate sector, especially in green or sustainable development, and trying to find a solution.

The latest of these initiatives is the formation of Sustainable Housing Leadership Consortium led by IFC, a part of World Bank, and some of the leading names in the Indian housing sector. The effort is part of IFC's eco-cities programme, supported by the European Union. The consortium will focus particularly on the affordable housing sector.

The key players in the market have been keen to cater to the sustainable housing segment, not only because it provides brand

mileage, but also is the way for the future. Among other large players Tata Housing claims to follow 'Green Standards' for all its projects, from its value homes to the ultra-premium luxury projects. Its strategy has been to

build green homes using alternative technologies and alternative materials which are sustainable.

Having mapped its carbon footprint, it aims to become carbon neutral by 2017-18.

Brotin Banerjee, CEO and MD of Tata Housing, says, "India will witness a construction boom driven by increased economic activity, growing need for affordable housing, and upgradation of old infrastructure. As we embark on fulfilling this demand, we need to be

conscious of creating housing and infrastructure developments that are built using green construction methods and remain sustainable over time. We believe this is the right time to raise awareness of creating sustainable infrastructure."

Godrej Properties, the winner of 'Golden Peacock Award for Sustainability' in 2015, is another proponent of sustainable buildings. Pirojsha Godrej, managing director & CEO of Godrej Properties, says, "Sustainability is an integral part of our DNA at Godrej Properties and we will continue our endeavour to set new benchmarks in delivering environmentally-friendly projects across the country."

One of the first companies in India to launch the green homes movement - Mahindra Lifespaces - is the first Indian real estate company to have voluntarily released its triple bottom-line focused externally assured Sustainability Report, based on the GRI (Global Reporting Initiative) framework. In 2015 Mahindra Lifespaces was recognised as regional sector leader in Asia by the Global Real Estate Sustainability Benchmark (GRESB), for the second year in a row. On the formation of the sustainability consortium, the company's managing director & CEO Anita Arjundas says, "The choices that India makes in managing its urban development today will have critical implications for the climate benefits and costs of our cities for decades to come. Our partnership with IFC and our peers will implement a shared vision for sustainable housing that is sensitive to the long term environmental needs of our cities, and thereby to human progress."

However, another founding member of the consortium Shapoorji Pallonji Real Estate is not completely convinced if India is ready for the switch. The company's president & CIO Venkatesh Gopalkrishnan opines, "Sustainable housing is a norm in developed countries; however it is yet to catch up within India. To begin with, developers in the country need to

There are key business benefits associated with going green

SANDIP SOMANY
HSIL



Sustainable Housing Leadership Consortium

The Sustainable Housing Leadership Consortium has been formed by the early contributors in India's green building and affordable housing movement – Godrej Properties, Mahindra Lifespace Developers Limited, Shapoorji



Pallonji Real Estate, Tata Housing Development Company, and VBHC Value Homes Private Limited. IFC will leverage private sector investments to facilitate greater uptake of certified green buildings, facilitate policy dialogue between the private sector and the government, evaluate technology levers and share best practices, raise public awareness, and identify strategic actions for implementation.

The Sustainable Housing Leadership Consortium is an attempt to lock in efficiencies and promote sustainable growth in India's housing stock as the country rapidly urbanises. It complements ongoing activities in IFC's four-year Eco-Cities programme. The programme is working to catalyse the green buildings market and promote climate-smart infrastructure projects in five cities with a focus on scalable and replicable clean energy and resource-efficient solutions.

The founding members of the consortium have committed to make 100% of their housing portfolio sustainable by 2017 through appropriate green building certifications, and achieve 20% reduction in incremental variable costs. The consortium will also provide leadership and advocacy for broader industry and government policy actions to make 20% of India's new housing construction sustainable by 2022.

"Given that two-thirds of India's building infrastructure is still to come up, we have a window of opportunity to shape resource efficient and liveable cities," says Jun Zhang, IFC's country manager for India. "This partnership with leading housing companies will demonstrate how sustainability can be the norm in India's urban housing sector in future. The consortium's goals are aligned to the recently-agreed climate change agenda in Paris and facilitate India's transition to a low-carbon economy."



We believe
that a
quest for
sustainability
leads to
innovation

PAU ABELLO PELLICER
Roca Bathroom Products

make sustainable housing an integral part of their business plan in the medium to long term. This initiative will help achieve this objective. S P Group believes in this common vision and has supported sustainable and green housing over the years and will continue to support it.”

Rahul Sabharwal, COO of VBHC states that sustainable and green building practices will be crucial in realising the dream of smart cities in India. “It is an exciting time in India to rethink on our outlook towards sustainability in housing. It is the need of the hour, without which the national dream of smart cities would be devoid of a long term sustainable success. Increasing rural-urban migration without a commitment to sustainability in our buildings and our energy consumption is only going to make our problems worse. VBHC Value Homes is committed to sustainable design and construction practices, as well as aims to reduce lifecycle maintenance cost for the users of our buildings.”

Other relatively small-scale developers or regional players too are aiming to cater to this segment. SARE Homes, for instance, has proactively addressed critical issues of carbon emissions and other greenhouse gases plaguing the real estate sector. The company has undertaken efforts to reduce its carbon footprint as a developer and lend its might for mitigating the devastating impact

of global warming and climate change. The carbon footprint has been verified by third-party verifier DNV (Det Norske Veritas). David Walker, managing director of SARE Homes feels such practices will act as a market differentiator and will set it apart from the competitors. He opines, “It is imperative for individuals, institutions, industries and nations to make serious efforts in reducing their carbon trail. While many corporate entities may be reluctant to reduce their carbon footprint, since they believe it involves higher costs, such practices act as a market differentiator for SARE. As the construction industry directly and indirectly contributes some of the highest GHG (greenhouse gases) emissions globally, we believe it is necessary to reduce this carbon trail through sustainable practices and by monitoring different activities and ascertaining their carbon footprint.”

Akhil Kumar Sureka, managing director of Faridabad-based Sarvome Developers, feels that the demand is high as green homes are beneficial projects to invest in. “Such projects are very much in demand since the pollution levels are rising across the globe. We are making sure that we use environment-friendly material for construction of the entire project. With the use of latest technology, we are offering smart home solutions, which ultimately leads to conservation of energy (electricity) and helps in reducing global carbon footprint. We are installing solar panels in our entire project within the norms laid by the government so that our project utilises solar energy to the optimum.”

Ajmera adds, “Developers are exploring environmentally and economically sound design and development techniques in order to design buildings and infrastructure that are sustainable, healthy and affordable, and encourage innovation in buildings and infrastructure systems and designs. A green building helps in saving electricity, water, energy, which is a great boon for the masses. This will soon become a norm and as a developer we hope that it continues in the long run.”

“Most of Ajmera’s projects are venturing into green real estate. Ajmera Aeon and Ajmera Zeon, the towers of our i-Land project in Wadala, are green projects. These

towers take care of sustainability in terms of saving water, electricity and power along with having sewage treatment plants. Our Times Square has gained the stature of gold rated LEED certified private IT Park and is defining the new age genre of business parks,” he adds.

ROLE OF BUILDING MATERIAL INDUSTRY

Now that it's clear that sustainable building practice is the way forward, it's logical to check what makes a building green. A spokesperson from The Energy Research Institute (TERI) has said, “A building that strives to optimise demand for electricity, water and other natural resources (in construction, operation and demolition); generates all its electricity on site through renewable energy; caters to its water demands through sustainable processes such as rainwater harvesting; and recycles all



Smart cities
call for a
sustainable
approach to
construction

SAHIL JINDAL
Jindal Pe-x Tubes

its waste on site; would qualify as a building meeting highest standards of greenness.”

So, it is clear that energy efficient lighting, electrical fixtures and electronics, besides the mechanism to harvest rainwater and dispose waste would be the priority. However, including a green design norm at the initial stage itself and thereby selecting appropriate materials for the construction would go a long way in maximising the potential of reducing energy and water consumption. For example, using a material that would prevent

heat loss will reduce the pressure on ACs and save energy. In fact, approximately 75-80% of energy consumption in these buildings can be attributed to building envelopes, which include walls, roofs and fenestration (windows, doors, skylights). There are several studies to prove that significant amounts of energy can be saved simply by improving the performance of the building envelope.

Here's how certain materials impact the sustainability quotient of the building...

Glass

One thing common across most sustainable buildings is heavy use of façades. This construction technique not only minimises energy requirement by enabling use of daylight but also helps in preventing heat loss. Many of the leading glass manufacturers are providing eco-friendly glasses suited for green buildings.

The market leader in the segment in India, Saint Gobain, claims that sustainable habitat is at the core of its strategy - designing, manufacturing and distributing building materials which provide innovative solutions to the challenges of energy efficiency, environmental protection and enhanced comfort for daily living and working. Saint-Gobain has also shown its commitment to advocacy of sustainability by promoting the Care 4 programme as well as the Green Building movement across the globe. Saint-Gobain played an important role in the Paris climate change talks of 2015 (COP21) and made a firm commitment to combat climate change by signing the climate pledge.

The other major player in the segment, Asahi Glass, also offers an eco-friendly range of products under Ecosense. Ecosense is a high performance glass portfolio, available in a unique range of 33 nature-inspired shades under the four categories – Enhance (Solar Control), Exceed (Solar Control Low-E range), Essence (Low-E range) and Edge (Solar Control & Thermal Insulation). “As India’s leading integrated glass company, AIS has been at the forefront of moving towards an eco-friendly future. It has pioneered innovations in glass processing technology to develop both single-glazed and double-glazed products with the best ‘Green’ parameters. This is giving

Developer's View

“The market for green homes and sustainable homes is steadily on the rise”

Sandeep Ahuja, CEO of Mumbai-based developer Richa Realtors, discusses the rising demand of sustainable buildings and the company's approach in making them

What is the level of demand for sustainable/green homes in residential or commercial real estate?

Demand for green homes is on rise in a specific strata of society. Some are aware of its benefits and understand its necessity while some consider it a prestige symbol. Either ways there has been progressive increase in demand, especially in metro cities. Tier-II and tier-III are lagging in this trend. Lack of awareness regarding green homes, about their utility, and return on investment is something that people need to be educated about. The biggest challenge faced by green homes is the misconception that they are too expensive. The market for green homes and sustainable homes is steadily on the rise. Sustainable design features, when embedded, not only could make homes energy efficient but also result in cutting construction costs. We are also trying to inculcate eco-friendly means in our projects.



How are you making your projects sustainable?

We are using pre-fabricated materials in construction. Due to use of pre-fabricated material, air pollution caused due to on-site construction methods has decreased radically. Richa Projects is trying to adopt an integrated process of design by involving all consultants concerned, including the green building consultant, from the very beginning. Several studies are done to integrate high performance building envelopes, optimisation in design, choosing materials that are low on embodied energy, etc. Water management on site is done through rain water harvesting and water recycling. We are promoting in situ solid waste treatment and waste water treatment. We are also making sure that maximum construction waste is diverted from landfills, thus avoiding any kind of soil or ground water pollution by adopting appropriate strategies.

What are the sustainable elements that you are incorporating in projects?

In our projects, we are installing water efficient plumbing fixtures like faucets and showers, energy-efficient glass, and appropriate shading on glass to reduce heat gain. Buildings have been designed in a way to avoid glare and promote good daylight. Energy-efficient light fixtures in common areas etc are used as well.

developers and their architects greater choice and the ability to explore possibilities. These solutions enhance the aesthetics, efficiency and economics of commercial and residential spaces, compared to traditional building materials," says Vikram Khanna, COO—architectural institutional business & consumer glass, CMO, CIO, Asahi India Glass Limited.

Windows & Doors

Windows and doors account for a large portion of heat loss through a wall, lowering its overall R-Value. Use of engineered doors and windows can minimise heat loss to a large extent and the use of the same is on the rise. Use of smart glass complements the sustainability effort. A report titled 'Global smart windows market 2016–2020' notes, "Smart windows are growing in popularity because of their ability to regulate daylight. The amount of light passing through the windows can be automatically controlled using photo sensors. Smart windows block UV rays." The report forecasts global smart windows market to grow at a CAGR of 21.13% during 2016–2020.

On how these windows can help in attaining sustainability, the report notes, "Smart windows help in controlling the amount of sunlight and heat entering the building. They protect the users from UV rays and also shield the furniture from fading. Smart windows also help in saving the amount of electricity required for HVAC and during the peak load time."

Rajesh Chawla, director of uPVC profile maker VEKA, opines, "Besides keeping with the global trend, the traditional systems are becoming obsolete and are being replaced by uPVC for more obvious reasons. And in smart cities, products like uPVC windows which help in saving energy and offer other smart facilities like sound insulation would be greater in demand."

Plumbing

While kitchens use the most energy in a typical home, bathrooms use the most water. According to the US EPA, a family of four could save more than 16,000 gallons of water per year simply by replacing a traditional toilet with a high-efficiency toilet. "A lot of what

Improving Green Quotient

SARE Homes, an FDI developer promoted by Duet Group and focused on developing residential real estate, is being proactive about reducing the carbon footprint and increasing the green quotient of its projects

Using a methodology based on the Greenhouse Gas (GHG) Protocol, DNV had verified a total of 1263.58 metric tonnes of CO₂ equivalent emissions, basis data collected and compiled by SARE Homes across eight operational sites and offices. Here's the agreed scope of work:

- Scope 1: Direct Emissions: Emissions due to combustion of fossil fuels as part of DG set operations (in stationary equipment), combustion of fossil fuels in mobile equipment (company-owned vehicles), venting of GHG gases and emissions due to maintenance/turnaround activities (AC/refrigerant gas refills/servicing), have been covered.
- Scope 2: Indirect Emissions: Emissions due to purchase of electricity have been covered under indirect emissions.
- Scope 3: Other Indirect Emissions: Other indirect GHG emissions have not been considered and have been excluded.

GHGs were quantified for diesel and LPG combustion. For refrigerant refills, PFCs and HFCs were quantified. Each of the sources of emission within the organisational boundary was identified and the type of GHG emitted from this process evaluated. Each of these sources was categorised as per direct and energy indirect emission sources.

SARE Group is committed to reducing its carbon footprint and has offset its Scope 1 and Scope 2 organisational emissions by procuring Verified Carbon Standard (VCS) certified carbon offsets for unavoidable emissions. The company is committed to reducing emissions year on year and is investing in solar and wind power renewable projects across India.

Vineet Relia, managing director of SARE Homes, informs, "By identifying annual emissions we are better positioned to initiate measures that reduce carbon footprint, boost the green-building quotient, and differentiate us from traditional developers with a heavier carbon trail. What we currently need is access to finance and the right technology to combat climate change."

The other benefits from emission analysis and control include:

- **Fiscal Benefits:** Climate and energy strategies can help slash energy costs
- **Wastage Detection:** GHG emissions inventory reveals where energy is being wasted and identifies opportunities for higher efficiency
- **Climate Leadership:** By acting now to address climate change, the organisation is recognised for leadership on climate and energy issues
- **Community Benefits:** Measures to reduce GHG emissions and energy consumption can improve air quality and public health, stimulate local economy, create green jobs, and make communities more habitable



makes a bathroom green has to do with water savings," says Sean Ruck, spokesperson for the National Kitchen & Bath Association. "And consumers can easily incorporate a lot of items that don't look or perform any differently than traditional materials, for about the same price."

A lot can be achieved in bathrooms by choosing appropriate plumbing fixtures and fittings. Water saving flush technology like dual flush, or Tornado Flush (introduced by TOTO), reduces water consumption significantly. Composting toilets and waterless urinals are other technologies that are widely being used, especially in the commercial and hotel sector.

Sandip Somany, JMD of HSIL, opines, "Embracing sustainability in product design and manufacturing not only yields anticipated environmental improvements, but also drives greater innovation, quality improvement, energy savings, and revenue growth as well." He adds, "The good news about sustainable design is that manufacturers are increasingly finding that there are key business benefits associated with 'Going Green' and offering eco-friendly products. This is a combination of market dynamics wherein the percentage of conscious consumers is on the rise and technology is rapidly evolving as well."

Somany states that in the bathroom products category flushing technology, faucet aerators, and Rabbit cleaning technology for showers wherein less water does not impact functionality, are the areas of focus. "The Hindware product portfolio constitutes over 20 designs which are WEP and UPC certified. In addition, there are intelligent toilets which are fully automated, sensor-operated faucets, pressmatic faucets, showers with Rabbit technology, and sensor urinals. The product basket on offer is huge."

This drive towards sustainability also leads to innovation. "Most of the bath fittings companies promote sustainability as this also leads to innovation. This in turn helps the manufacturers to gain financially," asserts Pau Abello Pellicer, managing director of Roca Bathroom Products Pvt Ltd. He further adds, "Parryware's commitment to environment conservation and constant endeavour towards the development of technology solutions for saving water and energy has led to innovate,

Resource Efficient Bricks

Clay-fired bricks offer substantial energy savings and design flexibility, says TERI

The Indian brick industry is the second largest producer in the world, says a report by Punjab State Council for Science & Technology. However, its traditional kiln practices are adversely impacting the environment by depleting

ground water and destroying flora and fauna. Therefore, creating a market for better quality and resource efficient bricks (REBs) such as perforated or hollow clay-fired products is essential for transforming the industry, saving fuel and reducing pollution.

A recent workshop by The Energy Research Institute (TERI), designed to awaken industry professionals of shortcomings of the present brick making practices and encourage them to embrace modern brick concepts, loudly advocated the use of clay-fired resource efficient bricks. Held at the Bengaluru campus of Austrian brick maker Wienerberger, the workshop was part of the UNDP-GEF brick project 'Energy Efficiency Improvements in Indian Brick Industry'. It effectively showcased features of clay bricks as well as the flexibility that they provide to designers and architects.

According to Wienerberger India managing director Monnanda Appaiah, "Fired-clay REBs bring in exceptional value from an environmental and sustainable perspective, and also bring considerable design flexibility to architects and structural consultants, savings for builders, and lifelong healthy living spaces for the end user."

Appaiah narrated how REBs had changed the scenario of construction in developed countries by replacing conventional solid bricks, thereby resulting in substantial savings of top soil and fuel. "REBs have led to energy saving by way of better insulation of buildings with reduced electricity consumption for heating and cooling needs."

A number of developers who attended the workshop confirmed that it was possible to save 7-10% of structural load due to lightweight Porotherm smart bricks, as well as valuable natural resources including water.

Nayanika Singh, GEF Consultant, representative of Ministry of Environment, Forest & Climate Change opines, "REBs possess irrefutable benefits and resource efficiency in building materials should be seen as a very important requirement in the extremely challenging environment."

Another architect Ar Jaism, head of Jaism Fountain adds, "The country cannot continue to take the environment for granted; we need to and soon the REB bricks would be the future of construction in India".

"REB as a concept is not really new, it has been in existence for many years. The best part of the brick is that it is adaptable and flexible for any aesthetic design requirement for buildings," opines Ar Sathya Prakash Varanasi of Sathya Consultants.



the eco-range of sustainable products. Our offerings include high efficiency flushing systems, sensor operated faucets, shower panels, waterless urinals, which help conserve water, a rapidly diminishing natural resource. These products are endorsed by GRIHA and can be used by the retail consumers." He further asserts that the company is working on its footprint reduction projects – energy conservation, greenhouse gas reduction, water conservation and waste reduction.

Roca has been working on a new design for a squatting pan that uses very little water for flushing. A prototype was developed by its R&D team in Spain, which would use just 1.5 litres of water for catering to *Swachh Bharat Abhiyan*. However this model was proving to be unviable in terms of production cost, so the design has been modified such that the pan now uses 2.0 litres. "We have also got our products IAMPO certified," informs Pellicer.

The next potential saving of water comes from faucets and showerheads. "Combined with low-flow showerheads and faucets, you'll notice dramatic water savings," says Sean. Sensor based or 'Tap and Flow' types of faucets prevent accidental water waste and also save water. Now manufacturers are using technology that will prevent unnecessary heating of water when not in use. Delta Faucets, for one, has recently launched such a product in India.

Serhan Ates Yagiz, country manager of Eczacibasi Group's building products division in India informs, "All the products we are selling are manufactured as per green building design norms. We have got EU certification for our eco-friendly products. There are certain projects in India where the clients have asked for declaration certifying the product as green for environmental declaration or LEED points."

Even the choice of plumbing pipes can impact the sustainability quotient. Jindal Pipes, for example, offers a type of composite pipes that helps in reducing chances of leakage and improving the water flow, thus reducing water consumption. "They are very flexible and can be bent into any shape which will be retained lifelong. This quality minimises the consumption of fittings and thus reduces chances of leakage, and also improves the

flow rate. These pipes are environment-friendly and are 100% recyclable," informs Sabil Jindal, director of Jindal Pe-x Tubes Pvt Ltd and Jindal Composite Tubes Pvt Ltd, adding that a sustainable approach in building smart cities is crucial.

Paints

Paint ingredients impact the environment. Many modern paints use ingredients that contain toxic chemicals that are harmful to both the environment and human health. "Cadmium, lead and chromium are frequently used in pigments; and petrochemicals, solvents, benzene, formaldehyde and other volatile organic compounds (VOCs) are used in binders and carriers. Toxic, environmentally harmful, chemicals are also used in modern paints as preservatives, stabilisers, thickeners and driers," notes John Rowlinson in his article on Sustainable Build (www.sustainablebuild.co.uk). VOCs are organic (carbon based) chemical compounds that evaporate easily in the atmosphere, and are known to be a major contributor to global climate change.

Now many companies are offering non-toxic paints. Asian Paints has recently introduced Green Painting Service and is offering an eco-friendly water based paints range. The company's group brand manager Anupam Kumar states, "Asian Paints has been a pioneer in the paint industry in developing better and safer products for consumers. Eco-friendly and water-based paints have long been considered the future of paint technology. This future has definitely arrived with the launch of Green Painting Service by Asian Paints Ezycolour Home Solutions."

Others

Additionally, choice of flooring, alternatives to bricks like fly ash, usage of construction chemicals, all add to the green quotient of buildings. Using fly ash bricks, developing an organic waste converter and installing a sewage treatment plant are some of the most common techniques being adopted by Indian developers.

Ajmera adds, "We use alternative bricks and tiles which are certified as eco-friendly and safe for the nature. In almost all our

projects, we provide sewage treatment plants along with solar electricity for few common areas. The air-conditioner and lights are also as per green building norms. As developers, we strive to incorporate all the aspects of a green building in every possible way in our projects. Other than these elements, we also consider the sun path and wind velocity while designing the projects. The natural light and air ventilation is maintained to ensure that the customer uses less electricity and lights during the day, which in turn helps to save electricity."

GoodEarth Housing Group, which focuses on building environment-friendly and sustainable neighbourhoods, has been using compressed stabilised soil cement blocks, a special type of mud block, for construction. The mud is that which has been excavated from the site, and they have worked with Indian Institute of Science to design the block.

WAY FORWARD

The share of sustainable buildings is rising. And even the government has been providing incentives to push the concept. For example, the states of Punjab and Assam, Government of NCT of Delhi, Noida, Delhi Development Authority and Pimpri Chinchwad Municipal Corporation (PCMC) in Maharashtra have adopted GRIHA and passed resolutions incentivising all future buildings to be GRIHA compliant. Also, there is an existing order by the MNRE mandating that all future government and PSU buildings should be at least 3-star GRIHA compliant.

However, pushing the concept at the residential level requires more impetus at the policy level. Funding for green projects has been often termed as high risk by banks and other financial institutions, and they have been shying away from this form of lending. The general view seems to be that green residences cost more and their demand is not significant. In reality, the extra investment can be recovered from savings in operating costs and developers need to market these projects aggressively. However, progress is being seen in this segment.

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Mrinmoy Dey



Snehal Mantri

Future of Real Estate is Green

Green buildings not only help in reducing carbon footprint, they also help in saving money through reduction in energy and water consumption costs. And gradually, developers who comply with essential policies such as the Energy Conservation Building Code (ECBC) are taking a leadership position in the market

REAL ESTATE ACROSS the globe is growing at a rapid pace. This is true especially of developing, emerging nations where increasing population and affordability is resulting in high demand for both office and residential spaces. This unprecedented demand has taken a toll on environment and natural resources. To cope with such development, it is critical to understand the impact of this growth on resources and infrastructure.

One of the primary impact area is the over consumption of energy. Energy prices in India have also been on a rise. Both, consumers and governments alike are looking to save energy and money. The officials across states are seeking ways to cover the existing energy deficit and gear up for excessive demand to beat the mounting heat in the cities.

In India, corporates have countered the power outage situation by embracing 'Green' in new campuses and buildings across the country. This move is a bid to reduce power and water consumption, and hence bring down operational overheads. The improved indoor air quality, better ambience, natural lighting and comfort cooling control in sustainable office spaces have been proven to improve employee productivity and wellness.

With consumers demanding more efficient buildings, developers who comply with essential policies such as the Energy Conservation Building Code (ECBC) are taking a leadership position in the market. Consumers are in fact investing in efficiency and are also ready to pay a premium for energy-saving homes and offices as well. The increasing demand for spaces that result in

long term saving and better environmental impact has prompted developers to innovate and support new technologies like green buildings, eco-friendly homes, etc.

New technologies are constantly being developed to complement current practices in creating greener structures. The common objective is to design green buildings that reduce the overall impact of the environment on human health and nature by adopting conservative methods for energy and water resources. The aim is to protect occupant health and improve employee productivity, reduce waste, pollution and environmental degradation.

Green buildings are not only environmental-friendly and help in reducing carbon footprint, they also help in saving money through reduction in energy and water consumption costs. If a building is planned, constructed and maintained following green norms, it can help the occupants save up to 50% just in terms of energy costs.

While many think that the cost of green construction is more than that of conventional construction, the fact is, the cost has come down significantly due to increased supply of green products. These buildings might cost slightly more than a conventional building but in the long run the money saved on energy and water consumption makes up for it.

Using the technology effectively, developers are going forward and introducing the customers with concepts and products which improve their living in a green building. At Mantri Energia – energy saving homes by Mantri Developers Pvt Ltd - developers are making special efforts to

introduce solar tree structures that convert sun light to solar power which can also be used for charging electric vehicles within the property. This innovation is transcending age boundaries, to attract even young children, by creating recreational places which are solar facilitated and are sure to keep all occupied. For instance, the designs such as human sensor activated chess floor lights for little ones that light up when stepped on, attract adults and kids alike.

With enhanced designing and technology, project creators these days are making the life of their prospective customers lively and enjoyable. Live Work Pods - the new 'work from home' workstation is not only attractive for residents, but is also beneficial. These open-office work stations with inbuilt Wi-Fi and charging points are aimed at making working outdoors a joy. By scientifically employing the principles of energy efficiency, the designs make sure there is minimum heat gain, while the smart usage of open space ensures maximum cross ventilation.

Developers and designers are exploring ways to provide their residents green spaces in every possible way. Busy schedule and long hours spent in traffic do not allow one to take care of their plants and their gardens. Sensing this, they are creating live wall plants where self-irrigating plants water themselves. Project innovations like these attract buyers to opt for gated apartments.

Sustainable innovative methods and careful urban planning can go a long way in creating power-efficient cities without restraining the natural resources.

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