KPMG

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Sustainable real estate

An opportunity to leverage

November 2023

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Preface

The real estate sector in India is poised to embrace a future defined by sustainable practices. As the nation undergoes rapid urbanisation and economic growth, the imperative to balance development with environmental stewardship has never been more pressing. This report delves into the critical intersection of sustainability and real estate, examining the current state and promising avenues that lie ahead.

Sustainability has become one of the most critical real estate priorities, calling for focussed efforts from businesses, globally. Contributing to nearly 40 per cent of the global carbon emissions, real estate sector demands immediate action towards decarbonisation across its entire value chain. India ranks 3rd in the global greenhouse gas emissions and as a result, the country has been taking stringent measures to reduce its CO2 emissions, achieving a net zero target by 2070. The real estate sector heavily relies on fossil fuel energy, for both construction of newer buildings and the maintenance of older ones. It is therefore essential for real estate firms to look at operations from a climate lens and introduce alternative practices that commit to the sustainability objectives. The economic benefits of energy-efficient buildings, the resilience conferred by eco-conscious urban planning and the enhanced quality of life for occupiers are few of the dividends reaped from this endeavor. From innovative designs to cutting-edge energy solutions, this requires collaborative efforts from experts, stakeholders and visionaries, to serve as a catalyst for policy formulation and strategic initiatives.

Investors are also playing a pivotal role in driving sustainability in real estate. They demand green certifications, evaluate properties based on ESG factors, participate in impact investing, invest in technologies such as energy-efficient lighting, heating, ventilation, and air-conditioned systems (HVAC), incentivise sustainability targets, promote reporting and transparency, among others.

Today's conscious consumers have information and are ecologically aware. They yearn for buildings that resonate with their values around sustainability. Beyond monetary considerations, they weigh the societal and environmental impacts. Properties designed with energy efficiency, water conservation and eco-friendly materials have lower environmental footprint and operational costs. They are also attuned to the fact that green buildings have improved air quality, ample natural light and promote physical and mental wellbeing.

The emphasis on green building certifications has grown manifold over the last few years and witnessed a five-fold increase since 2010, in line with rising importance of green certifications amongst developers and occupiers. Currently, some of the metro cities in India such as Bengaluru and Delhi NCR dominate the number of green certified buildings in India, further defining the new era of sustainable urbanisation. The occupancy rate in sustainable certified buildings is observed to be higher than non-certified buildings.

Global building footprint is expected to double by 2050, indicating a massive growth opportunity for companies falling under the purview of green real estate. Buildings that cater to the net zero ambitions are most likely to command a green premium, with increased rentals and value among other benefits. It underscores the imperative for sustainability in construction. Mitigating the environmental impact of global building footprint needs to be a collective effort to showcase sustainable urban development, redefining the narrative of the built environment. By embracing sustainable building practices, real estate companies will lay the foundation for a resilient and resource-conscious future.

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Executive summary

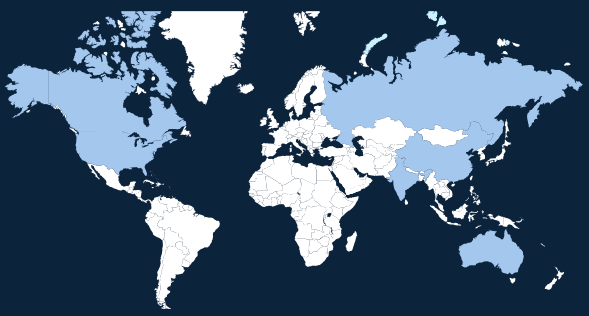
36.8 Gt
World CO_2 emissions in 2022[1]

7.3%
India's share in global CO_2 emissions

45% cut in India's carbon intensity targeted by 2030[2]

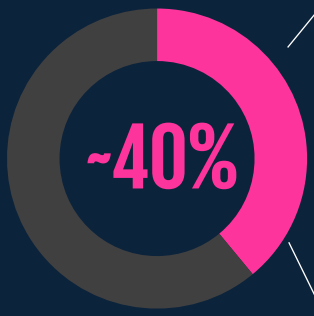
3-10% likely loss of India's GDP due to climate change by 2100[3]

Top emitters of CO_2 emissions



India ranks **3rd** in **global GHG emissions**

Share of building and construction in CO_2 emissions



28% from operational emissions

11% from materials and construction

2.5–3.5% of buildings need to be retrofitted every year[4]

50% of India's total energy needs would be from renewable energy by 2030[5]

USD560 billion
spent on energy efficiency globally in 2022[6]

1.5° C
Global climate target to limit global warming

82% of the grade A new office supply as of September 2023 is green certified[7]

62% of the country's total green office stock is present in the top 10 micro markets across top six cities in India as of September 2023[7]

61% penetration of green stock in India, as of September 2023[7]

companies indicating sustainability as a high consideration in their projects*

companies feel green buildings could see increased valuation*

Green buildings could lead to

35% reduction in emissions

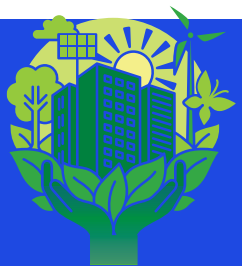
20% reduction in maintenance cost

1. CO2 Emissions in 2022, IEA, March 2023
2. Cabinet approves India's Updated Nationally Determined Contribution, PIB, 03 August 2022
3. The Costs of Climate Change in India, Overseas Development Institute, 8 June 2021
4. State of Climate Action 2021, Climate Action Tracker, 10 March 2022
5. Renewable Energy in India, PIB, 9 September 2022
6. Global energy efficiency progress is accelerating, signalling a potential turning point after years of slow improvement, IEA, 2 December 2022
7. Colliers

Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32

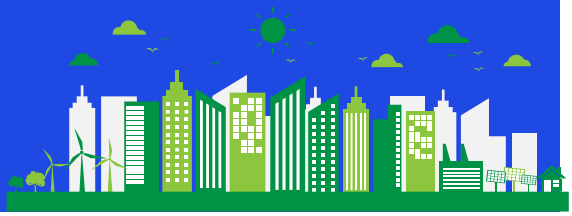
Amid rising concerns around climate change, real estate as a sector warrants immediate action around green practices and sustainable measures. While the government has set its net zero targets, it is imperative for companies across the real estate value chain to lay focus on energy efficiency within their operations.

The demand for **energy efficient buildings** is increasing, as the global building floor area is projected to double from 2020 to 2060. This will add **2.6 trillion ft2** (240 billion m2) of new floor area to the existing building stock.



Rising focus on sustainability is compelling developers to **use recyclable materials** in construction, optimise building operations through energy efficiency in HVAC (heating, ventilation and air conditioning) systems, advanced glass technologies, lightning harvesting, with active monitoring.

Green buildings are gaining prevalence, incorporating bioclimatic architecture, cool roofs, waste hauling and resource efficient structural systems. These command higher rental premium and create more value for owners and investors.



Increased demand for **green certified buildings**, with **LEED, GRIHA, WELL accreditation**, ensuring quality checks on various sustainability KPIs. Though costing higher than traditional ones, these buildings see high traction.

The number of green-certified buildings have seen a **five-fold increase since 2010**, with **61 per cent of India's total Grade A** office stock being green certified. Bengaluru, Chennai and Hyderabad hold the highest share of green-certified buildings.

Modern strategies are getting adopted across residential and commercial assets, including **insulating outer walls and floors, heat efficient glazing, green roofing and AI-driven smart systems for efficiency**.

Developers have shifted focus towards quality assets, deploying **low or zero carbon construction** techniques to maximise efficiency and minimise waste. Retrofitting has also become a prominent trend.

Investors are shifting focus to sustainable assets, setting broader decarbonisation target for existing portfolio, while ensuring due diligence and stress testing real estate portfolios for sustainability elements.

Occupiers have a larger focus on wellbeing, exploring real estate options equipped with **green areas, spa and meditation area**, while also looking for art studios and yoga gardens, where they can rejuvenate.

Indian Green Building Council has collaborated with several **central and state governments** to promote sustainability. Securities and Exchange Board of India released Business Responsibility and Sustainability Report, which aims to create a Business Responsibility-Sustainability Index for companies.

In view of rising importance of sustainability across the sector, developers must ensure **low carbon alternatives** while also deploying **green technologies and upskilling talent**. Occupiers should also be mindful of the environmental impact when buying/leasing a property.

The rising focus on sustainability

Sustainable development has been a prominent challenge in today's age. Taking cognisance of the fact that the increased carbon footprint of nations has led to contemporary weather extremities such as the heat waves, the world is moving towards minimising the impact of climate change by adopting net zero commitments. Consequently, it becomes critical to address the climate change and contribute towards the development of climate resilient buildings. During the 27th Conference of Parties (COP27)[1], 198 countries committed to pursue the goal of keeping global warming below 1.5 degrees compared to pre-industrial levels, as stated in the Paris Agreement. At a juncture where countries have specific net zero goals, India has also set ambitious targets to combat climate change and reduce carbon emissions. In the recent G20 Summit held in India, the significance of taking proactive measures to restrict temperature increase to 1.5 degrees Celsius over pre-industrial levels was addressed. Effective commitment and actions need to be undertaken to have a green development pact for a sustainable future, making efficient use of existing resources to build resilient infrastructure.

Key takeaways

- Decarbonising is critical as the real estate sector contributes to nearly 40 per cent of annual global emissions
- Sustainability is gaining traction in the real estate sector, with about 56 per cent of companies assigning high consideration to sustainability in their projects.

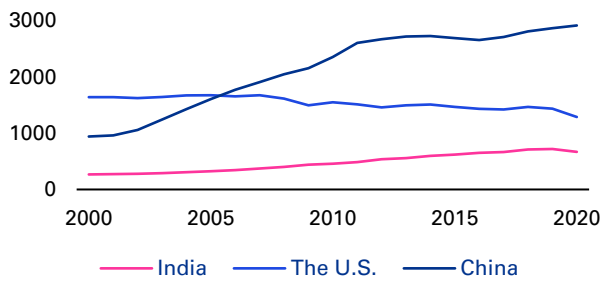
Per capita GHG emissions 2021[2]			
1.93 tonnes CO2e* India	**14.86 tonnes** CO2e US	**12.10 tonnes** CO2e Russia	**8.05 tonnes** CO2e China

Note: *CO2e implies CO2 emissions

India's current stance in sustainable development

India with the largest population[3] and fifth largest economy by nominal GDP, ranks third in the global greenhouse gas emissions. As a result, India is taking steps to reduce its CO2 emissions, with an aim to achieve its net zero target by 2070. India's Long-Term Low Emission Development Strategy, which was submitted at COP27 in Egypt, estimated that India would require around INR85.6 trillion by 2030 for climate change adaptation. Making India a green hydrogen hub through National Hydrogen Mission 2021, increasing electrical energy share by three-fold in industrial energy by 2070, implementing policies to boost domestic manufacturing of electric vehicles and the use of carbon capture and storage to remove GHGs are some of the key strategies that were highlighted during the event.

Million tonnes of carbon per year (MtC/yr)[5]



India's per capita CO2 emissions have been on the rise and have doubled since 2000. Although, carbon emissions in 2020 saw a reduction compared to the previous year[4], this was mainly due to lockdowns and a slowdown in economic activities during the pandemic and not specifically through emission-cutting measures.

1. Emissions gap report, UNEP, 27 October 2022
2. India: CO2 Country Profile, Our World in Data, as accessed on 31 May 2023
3. Total Population by Country 2023, World Population Review (WPR), as accessed on 31 May 2023
4. Significant progress made by India in meeting its NDC, PIB, 23 July 2021
5. National Carbon Emissions 2021, Integrated Carbon Observation System, March 2021

India's sustainability targets

- To achieve net zero greenhouse gas emissions by 2070
- Reduction in carbon dioxide emissions by one billion tonnes by 2030
- To lower its economy's carbon intensity by 45 per cent by 2030, relative to 2005 levels
- To boost non-fossil fuel energy capacity to 500 gigawatts (GW) by 2030, up from approximately 157 GW currently
- To obtain 50 per cent of total energy needs from renewable energy sources by 2030.

Source: Government of India

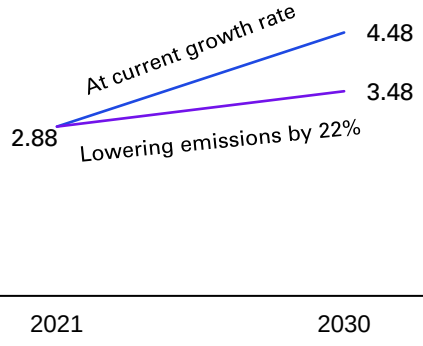
Top three emitters contribute to half of the total GHG emissions in the world

USA and China are one of the top greenhouse gas (GHG) emitters in the world contributing to over 40 per cent of global GHG emissions. As of 2021, India contributes to around 7.3 per cent of the world's GHG emissions owing to its humongous population base.[6] However, per capita emissions of the country still stand significantly lower than other developed economies.

Intergovernmental Panel on Climate Change (IPCC) report states that the global CO2 emissions must be about 18 giga tonnes (Gt) by 2030 for the world to keep the temperature rise below 2°C. If India continues to emit CO2 at current rate, its carbon emissions would reach as high as 4.48 Gt by 2030. However, if India cuts down its CO2 emissions by 22 per cent, its total emissions will tone down to 3.48 giga tonnes by 2030. This could majorly contribute to cutting down overall global CO2 emissions.

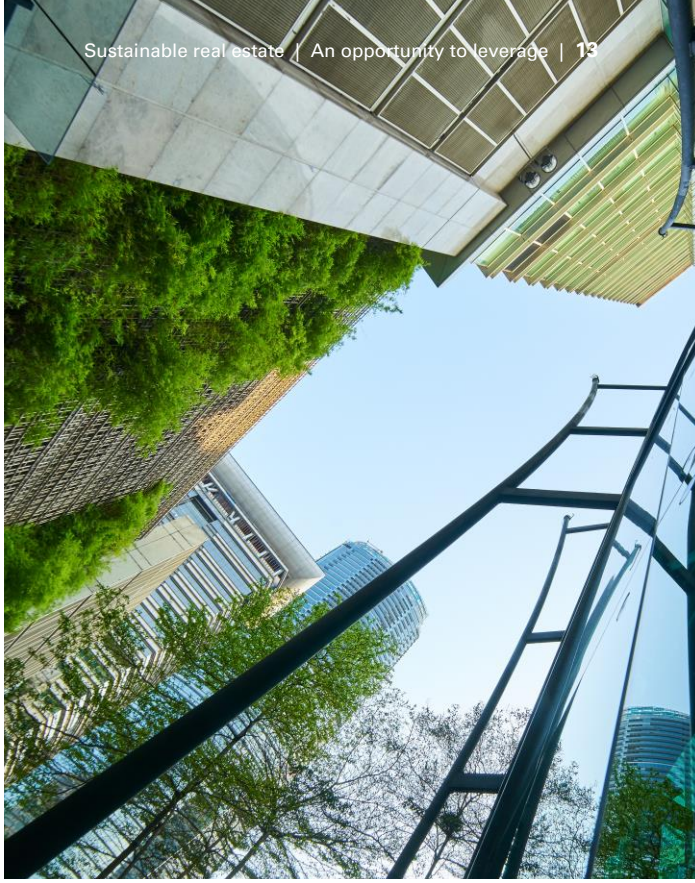
With this objective, it would be critical to drive sustainable measures and minimise carbon emissions from manufacturing, cement and chemical production, transportation, construction and other heavy industries – real estate being one of them.

India's CO2 emissions (giga tonnes)



Source: Colliers, Climate change, Down to Earth.

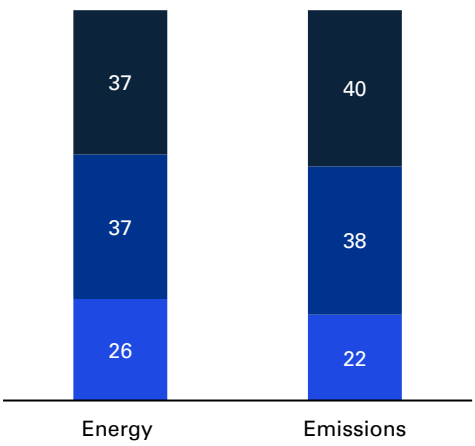
6. Statista, accessed on 20 March 2023



Sustainability in real estate

The built environment contributes a substantial carbon footprint, accounting for around ~40 per cent of annual global CO2 emissions.[7] By 2040, it is expected that roughly two-third of the existing global building stock would continue to contribute to CO2 emissions, signifying challenges in meeting the Paris Agreement's 1.5°C target. Additionally, the global building floor area is estimated to grow twofold by 2060, necessitating an additional 2.6 trillion sq ft (240 billion sq m) of new floor area to support urban expansion.[8] As a result, lowering greenhouse gas emissions from buildings and construction would be crucial to mitigate global warming and its effects.

Share of construction in global final energy and process emissions, per cent, 2021[9]



Real estate building and construction sector contributed to ~37 per cent of global energy and 40 per cent of process emissions in 2021.[9]

The real estate sector currently contributes for about 28 per cent of the operational emissions and the remaining 11 per cent from materials and construction.[7]

Note: The numbers in the chart are rounded values and should not be summed up to calculate total values

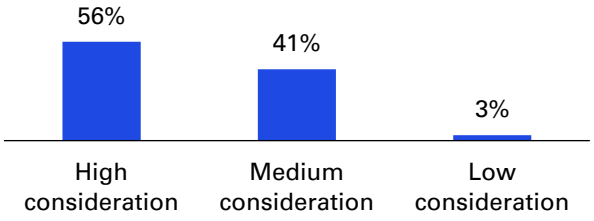
The real estate industry heavily relies on fossil fuel energy, not just for construction of new properties/buildings but also to maintain the performance of existing properties. It is therefore imperative for real estate firms to look at operations from the view of climate lens. Investors, developers and occupiers need to identify aspects and create strategies around sustainability to especially lower carbon emissions.

7. Embodied Carbon, World Green Building Council, as accessed on 1 June 2023
8. Why the built environment?, Architecture 2030, as accessed on 1 June 2023
9. 2022 Global status report for buildings and construction, UNEP, 09 November 2022

Sustainability is becoming a critical factor in real estate projects

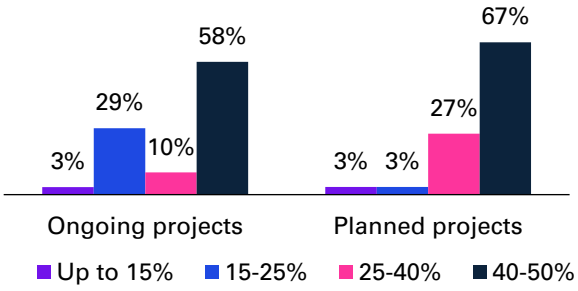
In the residential sector, open spaces and properties with efficient energy systems see more interest from homebuyers. Green office properties too would see an uptick in demand as occupiers, especially large global companies are setting ESG targets that include sustainable offices across the world.

Stakeholders' considerations around sustainability*



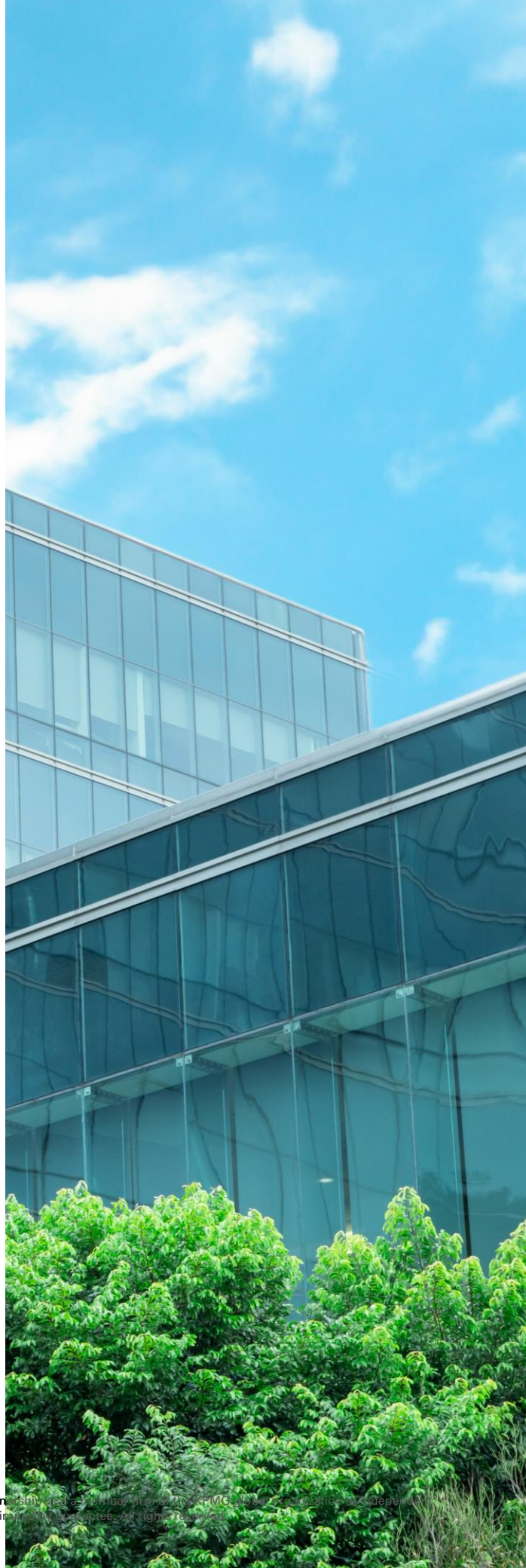
Sustainability is gaining traction in the real estate sector, with about 56 per cent of companies assigning high consideration to sustainability in their projects.

Share of sustainable elements in ongoing and planned projects*



While majority of the companies have been using sustainable materials in about half of their ongoing projects, greater number of companies aim to have more focus on using sustainable materials and processes in their upcoming or planned projects.

Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32. The survey was conducted during Sep-Nov 2022 for developers, occupiers and investors to understand their intent towards development of sustainable real estate in India. 69 per cent of the total respondents were developers.



Sustainability is being incorporated across different phases of project lifecycle

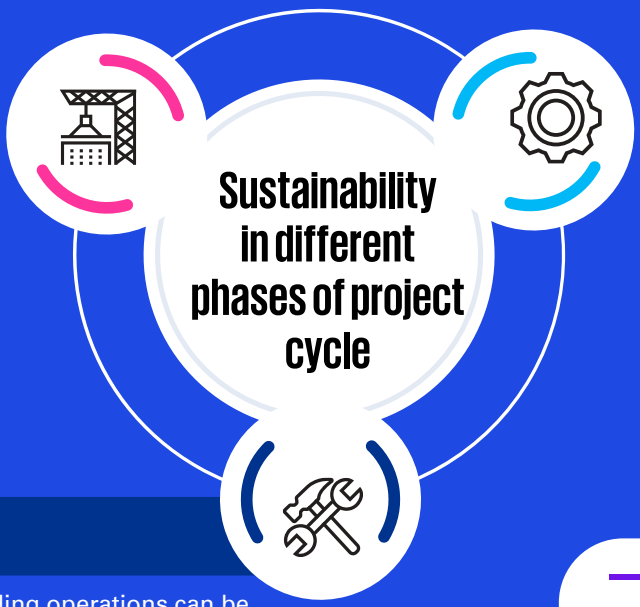
Construction

Developers can use sustainable materials for construction which includes use of recyclable and renewable materials. Such materials can minimise energy consumption and reduce waste production.

Some sustainable construction materials which can be used by developers include- alternates of bricks made of earthen materials like clay and mud, bamboos, structurally insulated panels, bio-composites, block and sustainable concrete. These materials can reduce CO2 emissions by up to 50 per cent.[10]

Transactions

Occupancy decisions are now being influenced by building sustainability too, which can bring about benefits such as reduced carbon footprint, comparatively lower operational costs, elevated indoor environment and employee productivity. Tenants are looking for more sustainable options while leasing properties and even willing to pay higher rentals for environment-friendly buildings, compared to conventional buildings. Tenants are applying for green certifications too to reach their sustainability goals.



Operations

Sustainability in building operations can be elevated through aspects such as optimising energy efficiency in HVAC systems, using air filter of Minimum Efficiency Reporting Values (MERV) 14. Advanced glass technologies are being used in buildings to save energy by adjusting the amount of sunlight that passes through a window. Also, lighting harvesting is being widely used in office spaces that increase building's performance by minimising energy consumption. This can be achieved through active monitoring, end to end management and adoption of new technologies.

Achieving net zero goals requires businesses to adopt sustainability through green buildings. Therefore, new developments should aim for carbon neutrality by using sustainable materials for construction, renewable resources for energy and green spaces for the environment.

Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32

10. Here's how alternative construction materials can help India curb carbon emissions, Business today, 28 March 2023

Enhancing sustainability through green buildings

Sustainable transitions in land, building, energy, transport and cities together are taking shape of far-reaching strategies that will aid the global carbon reduction goals. Green buildings can also reduce carbon emissions if they have built in green spaces. Built in green spaces that are integrated into the design of green buildings provide a multitude of benefits, from improved indoor environment quality to temperature regulation. Green developments reduce the adverse impact on the environment by limiting energy, water, waste and at the same time can save long-term energy costs. According to the US Green Building Council (USGBC), maintenance cost for LEED certified buildings is about 20 per cent lower than for regular buildings. Even old buildings retrofitted with green amenities can cut down operation cost by 10 per cent in just one year.[1]

Key takeaways

- Green buildings offer benefits such as enhanced productivity, better health and increased asset value
- Green buildings command higher rentals and valuation and lower the overall operating costs
- Developers can look at optimised designs, energy and water conservation measures and green insulation to implement green buildings.

Benefits of green buildings

Occupier's perspective

Green buildings can **improve productivity and performance of employees** through improved indoor environment

Green buildings are known to have around **20 per cent reduced maintenance cost** than ordinary buildings[1]

Living green walls, including **vertical gardens or eco-walls improve air quality** and serve as a natural acoustic filter **improving overall wellbeing of the occupants**

Developer's perspective

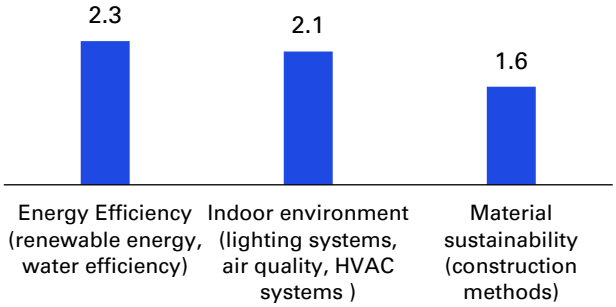
Green buildings command **higher rental premium** and such developments are likely to **receive more traction from tenants**

Green buildings **create more value for owners and investors** and can fetch **higher returns on investments**

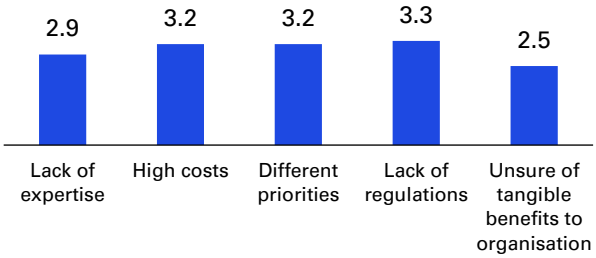
Green buildings can **reduce carbon emissions by 35 per cent** and **waste by 70 per cent**[2]

1. Benefits of LEED, USGBC, as accessed on 1 June 2023
2. Making urban India sustainable through green buildings, MCHI, January 2022

Stakeholders' rating for incorporating sustainable features in their projects* (rating scale 1-3)



Implementing sustainable real estate decisions* (rating scale 1-5)



Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32. These are average ratings from the survey respondent group. A higher rating suggest more weightage to that particular aspect.

Prevalence of green practices across various asset classes

Commercial (Offices)

From a construction point of view, adding insulation to outer walls and floors, applying coatings and foams, using heat efficient glazing, insulating top floors, green roofing and ponding can be some of the key aspects that developers can look at to make buildings more sustainable. Employing energy-efficient motors and appliances can be some other features. Moreover, HVAC use over 50 per cent of energy consumed in commercial buildings, thus, **retrofitting measures** such as chiller sequencing, usage of low-approach cooling towers, installation of variable frequency drives and auto tube cooling systems can be used to reduce energy consumption.[3] Smart lighting & LED light fixtures can also be used to ensure energy efficiency in buildings.

Data centres

Data centres are estimated to consume 400 terawatt-hours (TWh) of electricity, accounting for about 2 per cent of total global demand.[4] Switching to **renewable energy power plants** can offset much of the electricity that data centres use.

Additionally, using **building materials with lower embodied carbon and upgrading energy systems** with AI-driven smart systems can significantly reduce carbon emissions and lead to energy optimisation.

Residential

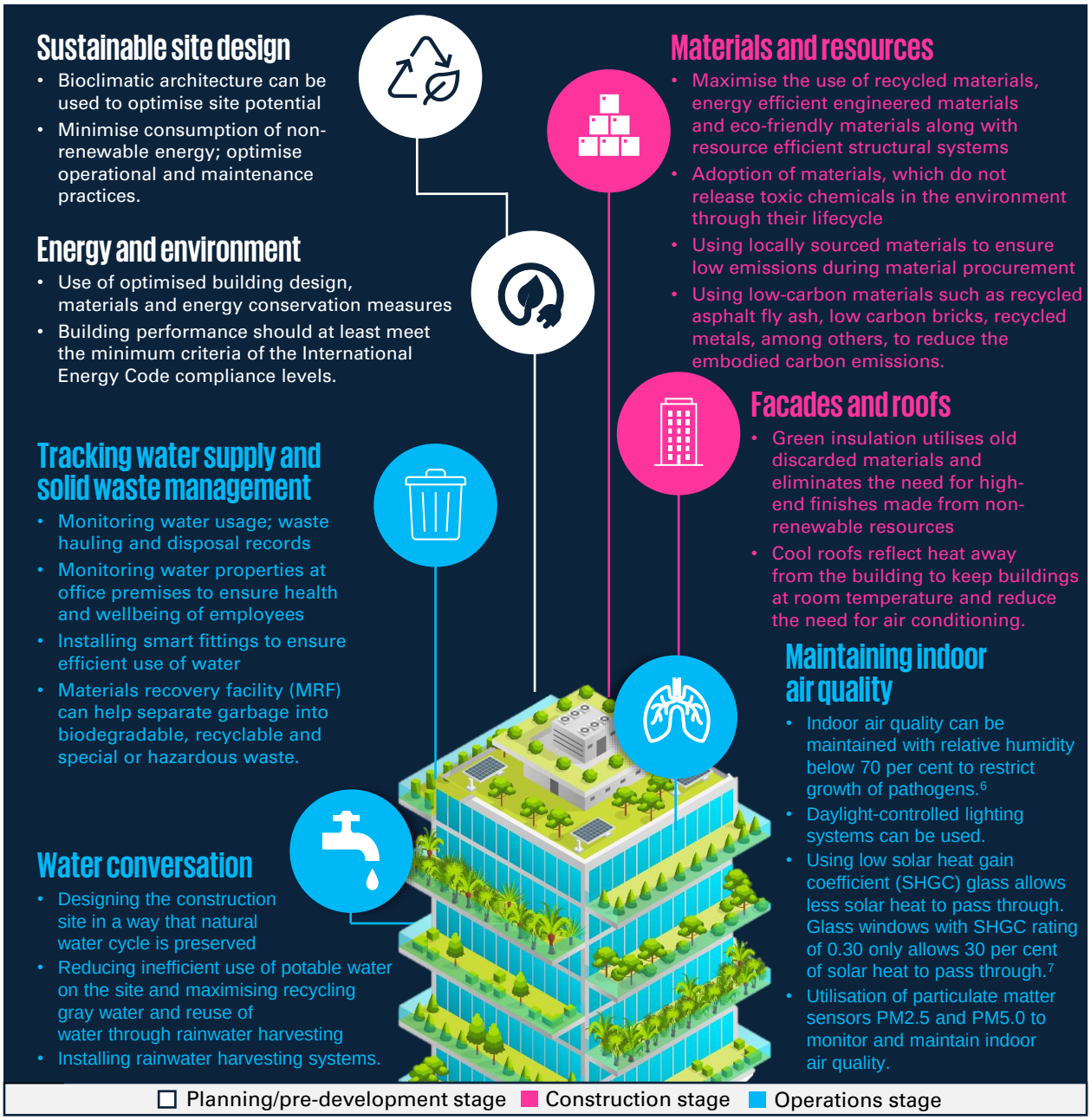
To establish a green residential building, it is important to follow the standards set by green building codes such as the **National Building Code, the Energy Conservation Building Code (ECBC)** and the **Leadership in Energy and Environmental Design-India (LEED-India).**

Furthermore, buildings can be made more sustainable by focusing on reduction of energy consumption through retrofitting, optimising efficiency of drinking and wastewater and reducing waste.

3. Retrofitting office buildings: Moving towards sustainability, Vestian, July 2022
4. How data centers can reduce their carbon footprint, Energy, June 2022

Strategies around successful deployment of green buildings

According to the World Green Building Council (WorldGBC), decarbonisation can be achieved through a lifecycle approach to carbon reduction that considers all emissions generated by a building over its lifecycle. Hence, collaboration is needed to build deeper penetration of sustainable construction. Buildings with sustainable elements can reduce the energy used in heating the interiors by 5 per cent in winters and cooling them down by 33 per cent in summers. Due to dark surfaces, cities have higher temperatures than rural areas. A study suggests that green rooftops on 7 per cent of buildings can cool down the city by up to 2°C.[5]



5. How green buildings help combat climate change, GlobalSpec, 30 October 2023
6. Making urban India sustainable through green buildings, MCHI, January 2022
7. Solar Heat-Gain Coefficient Ratings for Windows, the International Association of Certified Home Inspectors, as accessed on 1 June 2023

While there are multiple sustainability elements and practices that can be incorporated in buildings at various stages of building lifecycle, understanding the overall performance of the building becomes critical. Green certifications help occupiers assess a building's performance with respect to different sustainability parameters through their rating systems. Hence, occupiers nowadays are increasingly preferring green certified buildings as they look to build green portfolios.

Green building standards and policies providing impetus

Green certifications– An evolving platform to endorse green buildings

Green certifications are a medium to validate a building as 'green'. There are many green certification platforms that enable different levels of programmes for entities to highlight their sustainable measures, products, services and practices. The world's first green building standard, Building Research Establishment's Environmental Assessment Method (BREEAM), was introduced by the UK in 1990, to create a more systematic and informed standard. Over the years, several standards have been introduced globally to set benchmarks and to assess whether a building is sustainable or not.

Early 2000s saw the formation of Green Rating for Integrated Habitat Assessment (GRIHA) and Indian Green Building Council (IGBC). These councils verify whether the buildings satisfy the set standards in energy, water, health and wellness and waste at every step of its lifecycle. This section talks about different types of green certifications that are popular in India and analyses the green penetration of such buildings in Grade A office stock across top six cities in India.

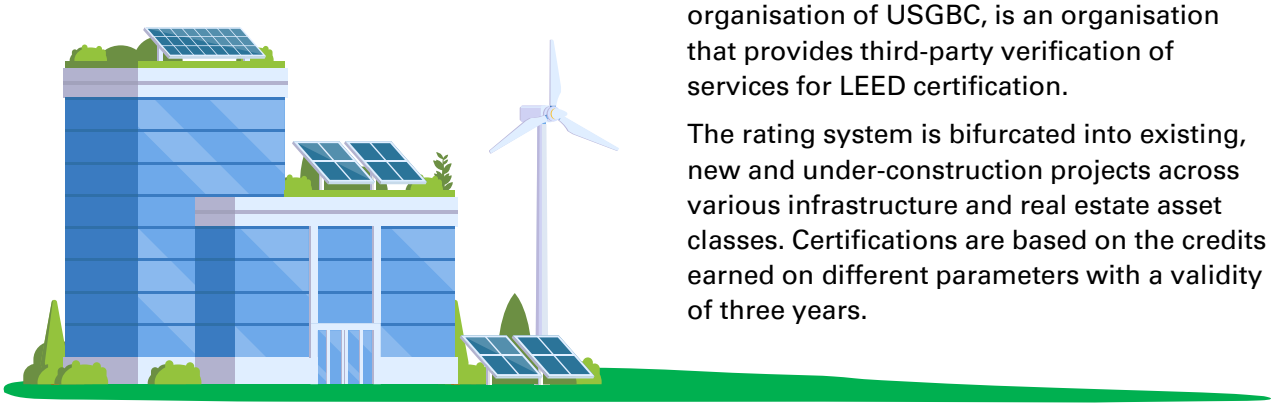
Key takeaways

- LEED is the most widely used certification in India, it evaluates building performance to develop healthy and high-performance green buildings
- GRIHA rating systems assess building performance to optimise energy efficiency
- WELL certification focuses on occupant's health and wellness using people-first approach.

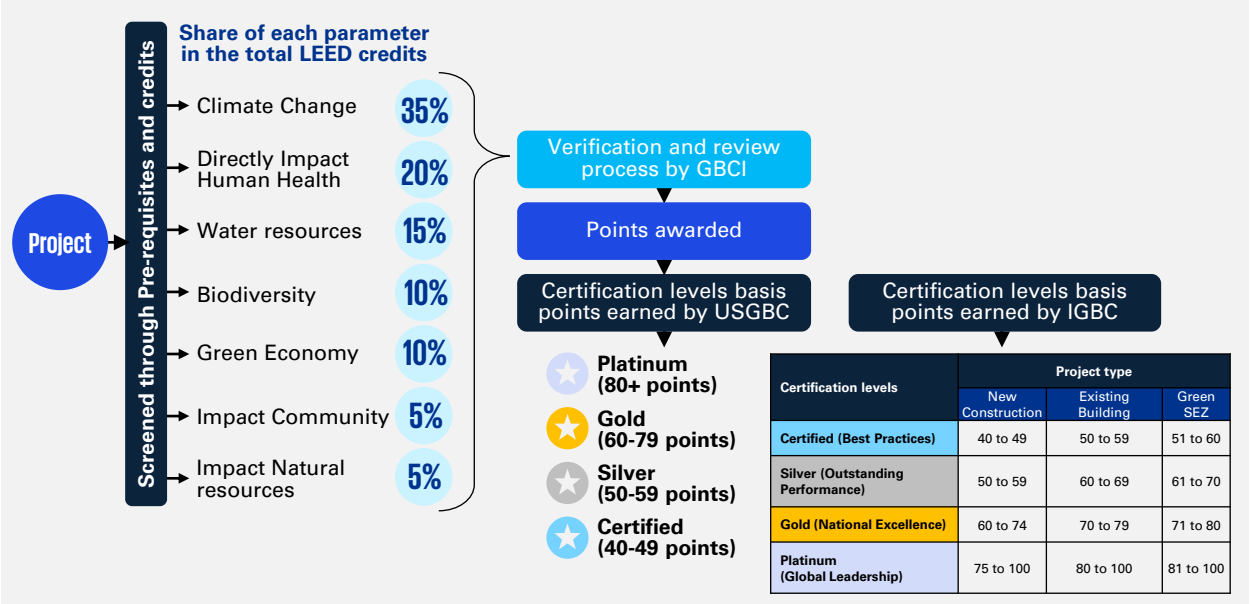
LEED: Evaluates building performance standards

U.S. Green Building Council (USGBC) started issuing LEED certificates in 1998, with an aim to transform the conventional way of designing, constructing and operating buildings and communities by inducing environment, social responsibility and health factors. From 100 certified projects in 2004 to more than 100,000 projects participating today, LEED has reached v4.1 (the next generation standards for green buildings) with more inclusive and data-driven building performance monitoring system. The Indian Green Building Council (IGBC) which was established in 2001, designs the IGBC LEED certification to entail energy, water and fresh air, based mandatory requirements that enable quality life for the occupants. Green building certification Inc. (GBCI), a sister organisation of USGBC, is an organisation that provides third-party verification of services for LEED certification.

The rating system is bifurcated into existing, new and under-construction projects across various infrastructure and real estate asset classes. Certifications are based on the credits earned on different parameters with a validity of three years.



LEED certification process



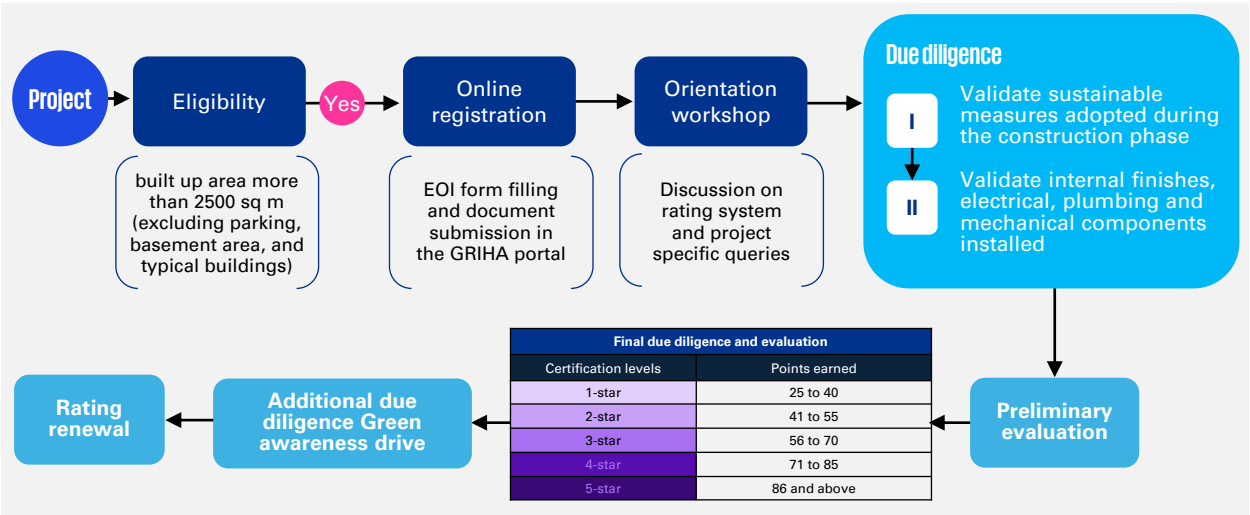
Certification levels	Project type		
	New Construction	Existing Building	Green SEZ
Certified (Best Practices)	40 to 49	50 to 59	51 to 60
Silver (Outstanding Performance)	50 to 59	60 to 69	61 to 70
Gold (National Excellence)	60 to 74	70 to 79	71 to 80
Platinum (Global Leadership)	75 to 100	80 to 100	81 to 100

Source: Colliers, LEED rating system, USGBC, 2023
Note: The percentage figure shows the share of each parameter in the total LEED credits

GRIHA: Optimises energy efficiency

Green Rating for Integrated Habitat Assessment (GRIHA) was formed by The Energy and Resource Institute (TERI) in 2007. GRIHA rating system quantifies different parameters such as energy consumption, waste generation and renewable energy adoption, to decipher the condition of a building's sustainability elements.

GRIHA v2019 has incorporated lifecycle analysis, cost analysis and water performance index along with high weightage towards user experience and market feedback. The rating system is divided into 10 categories totaling 100 points and five points extra are provided to projects showcasing innovative sustainable strategies. Rating ranges from 1 star to 5 star, with 5 being the highest. Once the certification is given to a project, it is valid for five years.



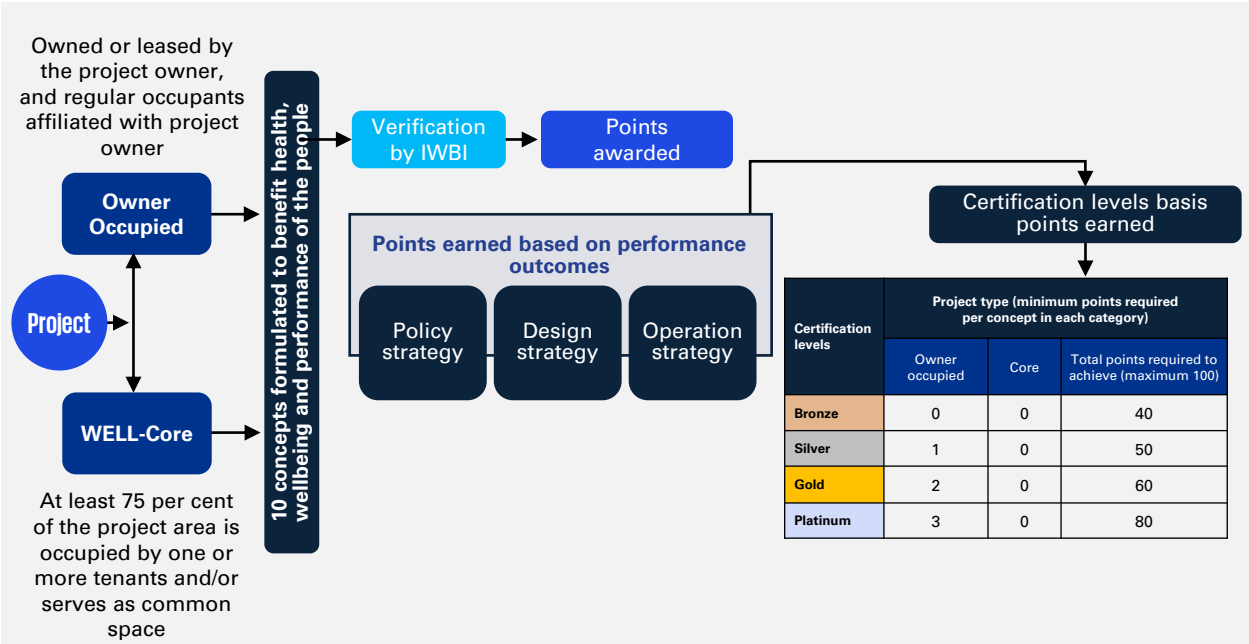
Final due diligence and evaluation	
Certification levels	Points earned
1-star	25 to 40
2-star	41 to 55
3-star	56 to 70
4-star	71 to 85
5-star	86 and above

Source: Colliers, Green Rating for Integrated Habitat Assessment as accessed on 1 June 2023

WELL: Drives health and wellness

In 2014, International WELL Building Institute (IWBI) launched WELL certification to transform health and wellbeing using a people-first approach. Spanning across start-ups and Fortune 500 companies, WELL has enabled developers to prioritise health, wellness and safety of their occupiers. The rating system is aligned with design, policy and built environment and aligning the same with health and well-being.

WELL certified projects earn points basis features, some of which revolve around how natural elements like air and water can create psychological comfort for occupants. While the focus of LEED-certified buildings is on becoming energy efficient, WELL-certified buildings focus on healthy lifestyle and environment. WELL-certified office buildings have about 8-10 per cent improved employee productivity amidst enhanced indoor environment.



Certification levels	Project type (minimum points required per concept in each category)		
	Owner occupied	Core	Total points required to achieve (maximum 100)
Bronze	0	0	40
Silver	1	0	50
Gold	2	0	60
Platinum	3	0	80

Source: Colliers, WELL v2, IWBI, 2020-2023

Government regulations towards sustainability[1]

- The Bureau of Energy Efficiency (BEE) and the Ministry of Power, Government of India have been working on various initiatives to plan and execute energy efficiency programmes.
- Additionally, Indian Green Building Council (IGBC) collaborated with several central and state government agencies to promote the green building movement in the country.

Eco Niwas Samhita 2021[2]

The Bureau of Energy Efficiency (BEE) has developed Eco Niwas Samhita 2021.

The code is developed to set the minimum benchmark to achieve energy efficiency in residential buildings.

The part I of the code is focused to set minimum building envelope performance standards, which plays a significant role in limiting heat gains and loss while ensuring adequate daylighting and ventilation.

Whereas the Part 2 provides energy efficiency standards for electro-mechanical systems of residential buildings in addition to the parameters prescribed in 2018.

Energy Conservation Building Code (ECBC) Commercial[3]

The ECBC applies to commercial building complexes that have a connected load of atleast 100 kW or greater or 120 kVA or greater. In 2009, BEE launched ECBC for existing buildings as a voluntary policy measure to reduce the adverse impact of buildings on the environment. The programme rates buildings on a 1-5 scale, with 5 star labelled buildings being most efficient.

1. Bureau of Energy Efficiency, Government of India, Ministry of Power
2. Eco-Niwas Samhita 2021, Government of India, Ministry of Power
3. Energy Conservation Building Code, 2017

How policy makers in India are encouraging top companies to move towards sustainability?

In May 2021, Securities and Exchange Board of India (SEBI) released Business Responsibility and Sustainability Report (BRSR), which is applicable to the top 1,000 listed entities based on market capitalisation. The entities are supposed to prepare a Business Responsibility Report (BRR) which should include the ESG initiatives taken by the company. The step was taken to bring India's sustainability reporting to global reporting standards. The reporting is on a mandatory basis from FY 2022-23, prior to which in FY 2021-22 companies could report on a voluntary basis. Companies other than the top 1,000 companies can also submit their BRR report on a voluntary basis.

The information from BRSR filings will help to create a Business Responsibility-Sustainability Index for companies. For successful implementation of reporting, the guidelines of BRSR reporting can have a well-defined plan of action by SEBI which would streamline the process for entities.

Green certifications and supportive government policies are helping developers and occupiers in building green portfolios by encouraging and incentivising them. Certifications are also helping occupiers in making informed occupancy decisions as they advance their commitments towards net-zero transition.

Occupiers taking a step towards sustainability

Changing priorities of occupiers post COVID-19; focus on health and wellbeing

Growing awareness towards climate change has resulted in office occupiers being concerned about the changing climate landscape and in turn has highlighted the importance of sustainable office workspaces. Occupiers have been increasingly prioritising health and wellness aspect in their workplace decisions, especially post pandemic. A rising preference is seen towards green, tech-enabled modern office spaces equipped with wellness related amenities and collaborative spaces.

Key takeaways

- Post-COVID-19 occupiers are prioritising health and wellness at the workspace
- There is an increased preference for quality office spaces with cutting edge amenities
- Occupiers are also embracing technology which can enhance operational efficiency at workspace
- Green leases are expected to gain momentum led by benefits such as reduction in overall energy consumption.

Increased preference towards wellness

- Occupiers are preferring good quality office spaces with cutting edge amenities and collaborative spaces providing an optimal work experience to their employees
- Occupiers are exploring real estate options equipped with green area, spa, meditation area, fitness centre to name a few, as they encourage employees to practice personal wellness through workshops and wellness sessions
- Occupiers are also going for options with art studios, hobby rooms and yoga gardens, where they can relax and rejuvenate.

Embracing technology for greater efficiency

- Occupiers are increasingly embracing technology to enhance operational efficiency at workplaces
- Occupiers are incorporating modern technologies such as smart bulbs, smart windows, touchless faucets and intelligent curtain control systems, among others.

Using renewable energy and low-carbon materials

- Occupiers are powering building services such as lighting and HVAC by renewable energy resources to reduce carbon emissions
- Occupiers are increasingly chasing green certified buildings to ensure that the workplace has met environmental, energy and health standards in its design, construction and performance.

Occupiers' inclination towards green leases

A green lease is a lease agreement that incorporates smart, energy aligned clauses, shared objectives and operational procedures between tenant and occupier to collaboratively advance buildings into high performance, carbon neutral and sustainable ones. The green clauses in leasing can range from 'Light Green' to 'Dark Green'. 'Light Green' clauses imply that the parties seek to, but do not ensure specific actions, while 'Dark Green' clauses involve stringent targets, monitoring and penalties.[1]

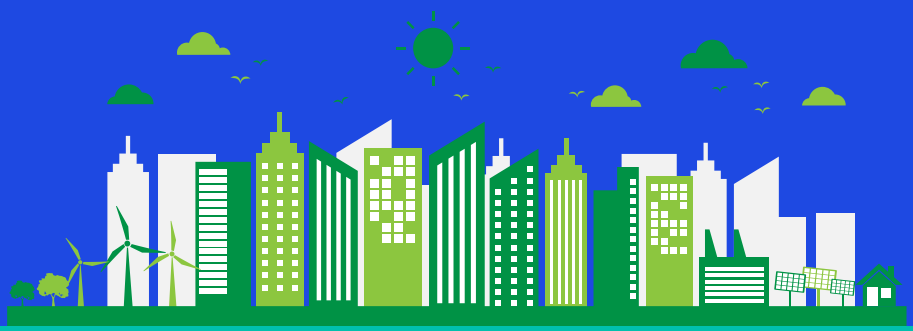
Key priorities to be considered in a green lease

Securing environmental performance commitments

Sharing verifiable technical data

Allocating financial investments and incentives

Green leases to gain momentum in the coming future



A green lease helps reduce the overall consumption of energy in a building, leading to savings. Green leases are expected to gradually gain momentum as more corporates have been prioritising social and governance clauses in their agreements.

Companies applying for green recognition have increased significantly after the pandemic.
The growth reflects the climate change awareness recognised by the government and corporate tenants.

Green leases are gradually becoming a necessary tool to meet the developments and changes in demand of real estate. It has been reported that most gold -certified Green Lease Leaders have integrated green leases into **80 to 100 per cent**[2] of their portfolio.

1. Green Leasing – a Win Win for Tenant and Landlord, Sustainabilitynext, November 2017
2. Top 3 trends from the 2022 Green Lease Leaders, Institute for Market Transformation, May 2022

What is the effective cost for an occupier if one opts for a green/high performance building?

Most green buildings have an **added cost of 5 to 15 per cent**[3] as compared to a conventional building with the **payback period of 3-5 years.**

However, the **cost of green buildings** in India might vary between **INR150 – 250 thousand per KW capacity for renewable energy.**[3] Factors such as **design time, building materials, building envelope, operation and maintenance, among others,** can result in **slightly higher cost.**

With rising occupier preference for green buildings and green leases, India's green footprint is on the rise. Over the last few years, especially post-Covid-19, there has been a rise in green certified stock for Grade A office buildings. Majority of the new supply across the top six cities of the country in the last 3-4 years is green. At the same time, developers are also focussing on retrofitting to benchmark existing buildings with the sustainability criteria.

3. Cost of green building in India, InHabit, August 2021

India's current green footprint

India has a total Grade A office stock of about 691 mn sq feet as of Q3 2023, as per Colliers, of which 61 per cent have obtained at least one green certification. The number of green-certified buildings has witnessed over five-fold increase since 2010, in line with rising importance of green certifications amongst developers and occupiers. As of Q3 2023, Bengaluru, Hyderabad and Chennai hold higher proportion of green-certified buildings with almost three in every five assets green certified.

Key takeaways

- About 421 mn sq ft of Grade A office stock has at least one green certification
- 61 per cent of Grade A office stock in the top cities is green as of Q3 2023
- Bengaluru accounts for the highest share of green buildings followed by Delhi NCR
- Cities like Mumbai and Delhi NCR hold the highest opportunity to upgrade existing Grade A office assets.

421 mn sq feet

Pan India green certified office stock* as of Q3 2023

61%

Penetration of green stock Pan India as of Q3 2023

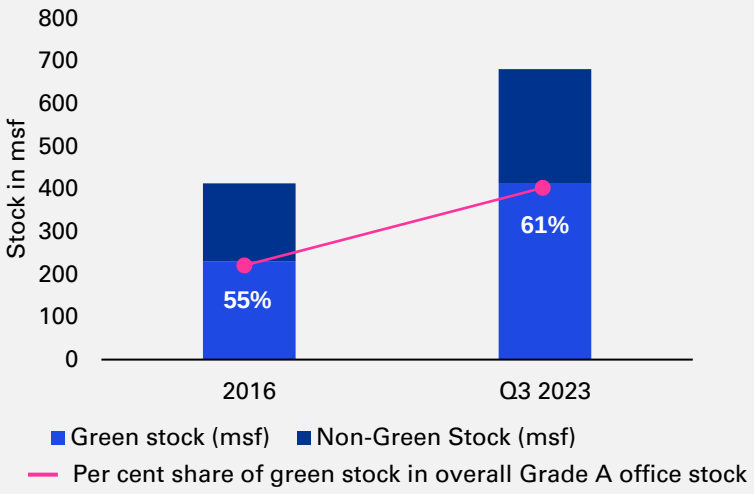
82%

of the Grade A new office supply in Q3 2023 is green certified

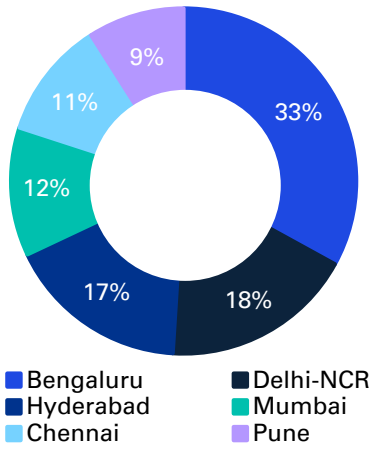
Source: Colliers

Note: *Top 6 cities includes – Bengaluru, Chennai, Delhi-NCR, Hyderabad, Mumbai, Pune

Quantum of green stock rose by 83 per cent in Q3 2023 from 2016



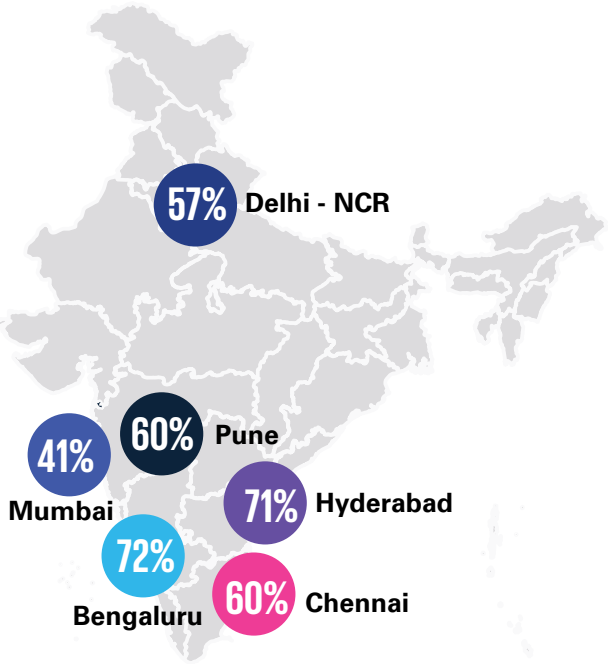
Share of certified Green Grade A office stock in Pan-India (per cent)



32%

of Delhi's total green stock has come in since 2020, led by increased focus on health and wellness

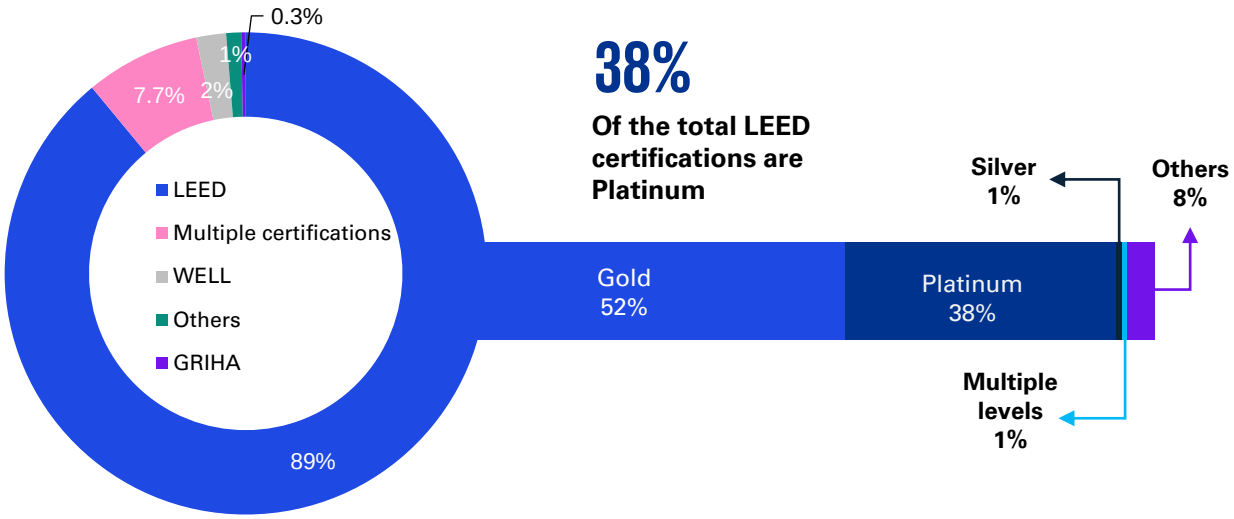
Green penetration in Grade A office stock of 6 top cities in India



Source: Office data as of Q3 2023, Colliers

LEED certification most prevalent in green building rating system

LEED certification is the most popular certification in India, with more than 89 per cent of the existing green-certified buildings holding the same. About 38 per cent of these green buildings have received platinum certifications – the highest level of certification with 80+ points. This testifies developers' conscious efforts toward creating sustainable commercial real estate.



38%

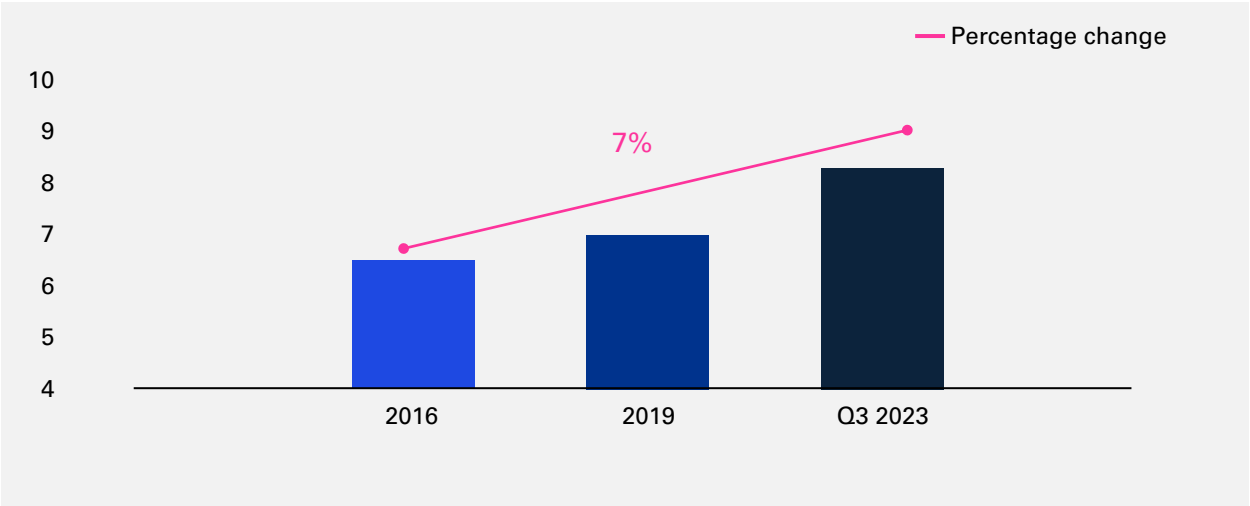
Of the total LEED certifications are Platinum

Source: Colliers
Note: Data as of September 2023

WELL certification picking up post pandemic:

With occupiers getting more cautious about employee health and wellbeing post pandemic, WELL certifications witnessed a rise in registrations since 2014. According to Colliers, WELL-certified office stock witnessed a two-fold rise since 2014. As of Q3 2023, WELL-certified stock stands at 8.3 million sq ft across top six cities. Investing in employees' physical and mental wellbeing is leading to happy employees, thereby, leading to improved productivity for businesses. Currently, Mumbai city holds maximum WELL-certified office stock.

WELL Certified stock in msf



Source: Colliers

Top 10 micro markets accounting for a majority of the green stock

62 per cent of the country's total green stock is present in the top 10 micro markets across top six cities in India. These top micro markets are largely a part of suburban and peripheral areas that consist of newer developments. Lowest penetration of green stock is observed in Central Business Districts (CBDs) of top six cities, as they are characterised by old office stock. According to Colliers, CBDs of the top six cities in total consist of only 3 per cent of the total green footprint of India.

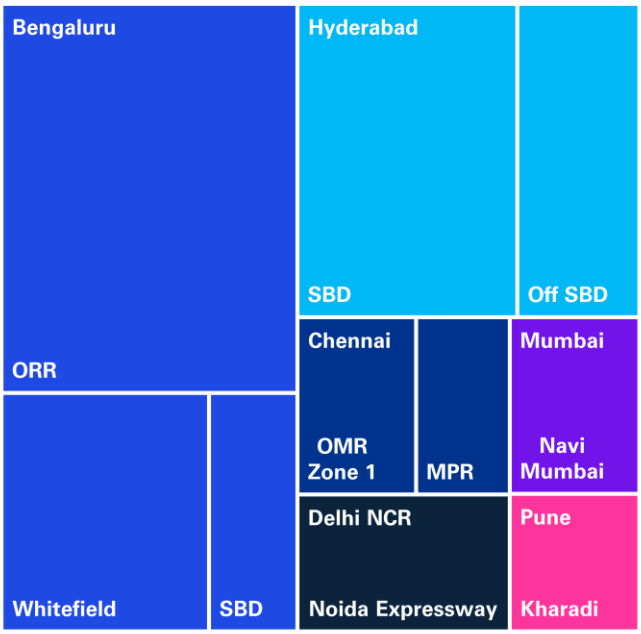
86%
of Bengaluru's total green stock is in Outer Ring Road (ORR), Whitefield and SBD

60%
of Delhi NCR's total green stock is located in Gurugram

30%
of Mumbai's total green stock is located in Navi Mumbai

Source: Colliers
Note: Data as of September 2023

Top 10 micro markets with high green penetration



Source: Colliers
Note: Data as of September 2023

Market definitions -

Bengaluru –

Outer Ring Road (ORR) - from Silk Board to Hebbal

Secondary Business District (SBD): Indiranagar, Koramangala, CV Raman Nagar, Jayanagar, JP Nagar, Rajaji Nagar

Chennai –

Old Mahabalipuram Road Zone 1: Thoraipakkam to Sholinganallur; Semmencherry to Siruseri

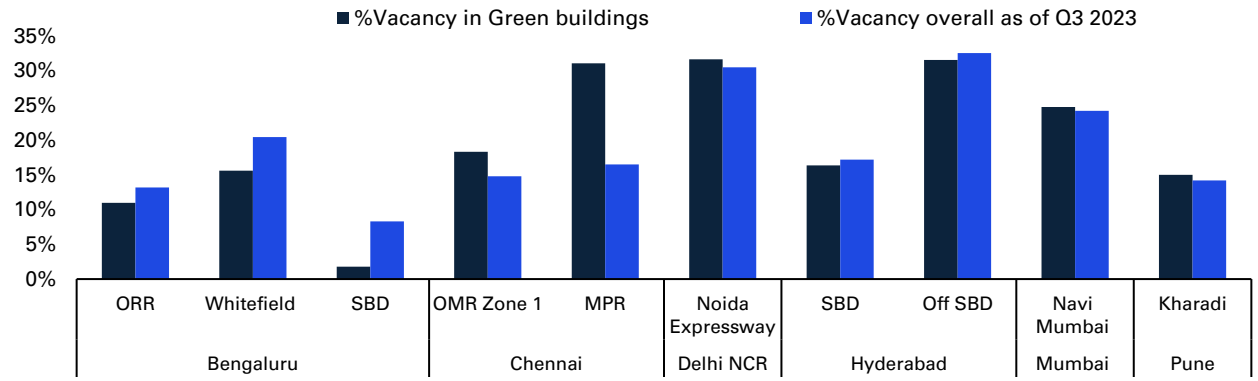
MPR: Mount-Poonamallee High Road

Hyderabad –

Suburban Business District (SBD): Madhapur, HITEC City, Kondapur and Rai Durg

Off SBD: Gachibowli, Nanakramguda, Kokapet and Manikonda

Green certified offices witness higher occupancy levels in most locations*



Source: Colliers
Note: *High vacancy in Chennai's green buildings in MPR micro-market is largely due to surge in new green supply in the last few years

Green certifications are being prioritised in occupiers' real estate decisions for credibility, enhanced value and brand reputation. In most of the top micro markets, vacancy in green buildings is lower than that of non-certified buildings. Corporates are increasingly linking their carbon targets to global climate and are prioritising their commitments toward ESG goals. Sustainability is being factored into occupiers' occupancy decisions as they look to green-proof their real estate portfolios. Occupiers are also increasingly expressing their willingness to spend on environmental improvements, digital solutions and data capabilities, including smart buildings and energy monitoring, for their ESG commitments.

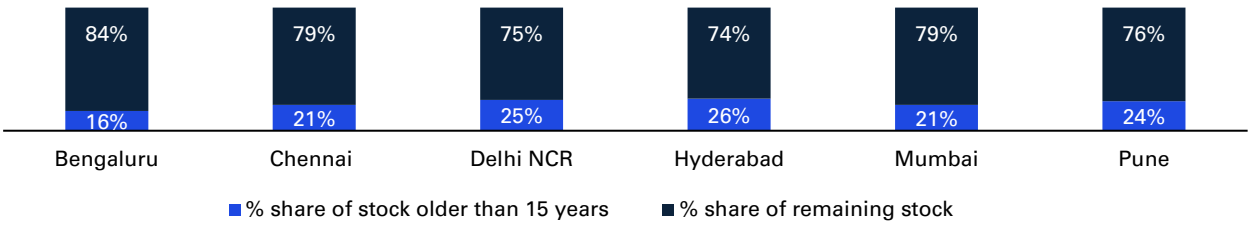
Retrofitting ageing office stock - a step towards sustainability

Post COVID-19, driven by a global economic and health crisis, developers and occupiers have intensified their efforts toward sustainability aspects. Retrofitting and upgradation of existing buildings presents a massive opportunity for landlords and developers to benchmark the current building performance against sustainability criteria by improving building performance. As office buildings get outdated, developers are looking to upgrade and retrofit them.

While newer buildings are designed to be sustainably efficient, they usually come at a heavy environmental cost during the construction phase. Retrofitting not only promotes economic prosperity but also ecological restoration.

Therefore, implementation of retrofitting is equally necessary for increasing the number of green buildings available and facilitate the decarbonisation of real estate.

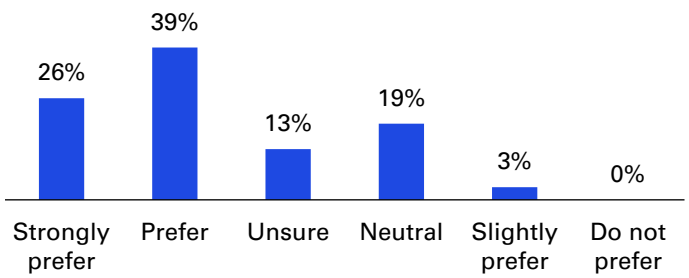
City-wise share of old stock with respect to total office stock



Source: Colliers

Key benefits of retrofitting

Stakeholders' preference for implementing green retrofitting in their existing projects*



65 per cent of the stakeholders prefer (or strongly prefer) implementing green retrofitting led by the number of benefits green buildings can offer such as rental appreciation and increase in longevity of buildings

While the penetration of green office stock has been on the rise in the country, developers and investors have also set short term and long term goals to further decarbonise their portfolios. They feel a green portfolio would not only benefit them with better valuations for their properties but would holistically benefit occupiers, employees and the environment. REITs too have taken steps to align their goals with best global practices which would lead to sustainable growth.

Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32

How can developers and investors make a difference?

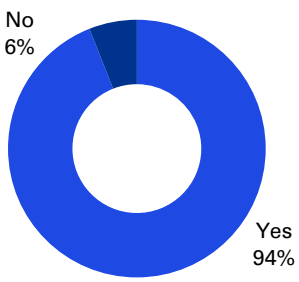
Developers' focused shift towards sustainability

Developers have shifted their focus towards developing high performing assets, as more occupiers scout for sustainable workspaces. With added benefits such as higher rental premium and increased valuation of green buildings, prioritising sustainable practices and developing high performing efficient buildings has further gained momentum.

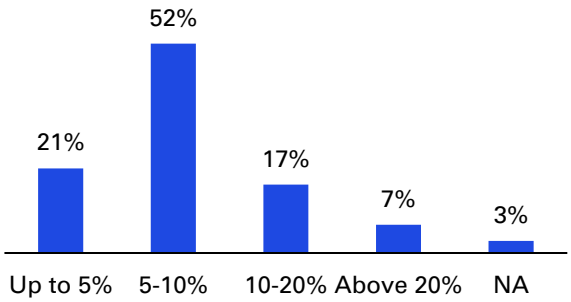
Key takeaways

- Developers are choosing low carbon construction techniques and aim for green certifications in early stages of construction
- Investors' targets are aligned with net zero targets to reduce carbon emissions across their portfolios
- REITs have also taken steps to align their goals with best global practices for sustainable growth.

Are green buildings expected to see an increase in rents/valuation?*



Incremental value green buildings command*



Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32

Typically, green buildings are expected to command higher capital and rental values, led by their efficient features and environmental and social long-term benefits. 94 per cent of stakeholders feel that green buildings are expected to see increased rents/valuation. A majority of them also believe that green buildings lead to 5-10 per cent higher valuation as compared to non-green buildings.

How can developers build green portfolios?

Developers can use **local, recyclable and low carbon materials** for construction and use **clean transportation** for procurement of materials. This shall help reduce carbon footprint of the buildings during construction

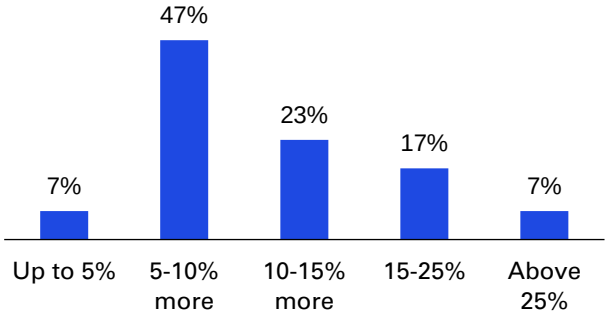
Choosing **low or zero carbon construction techniques** can ensure maximum efficiency and **minimise waste** on site

Deploying renewable energy resources such as **solar panels shall significantly minimise the carbon emissions** and offset residual emissions of the buildings

Designing for efficiency is the key to reduce building's carbon emissions. **Effective building design** can **ensure optimum space usage, adequate natural light and ventilation**

Aiming for **green certifications in early stages of construction** will create a systematic approach towards building high performing assets

How much incremental investments do you foresee for developing green buildings*



Enabling sustainable construction strategy is expensive as these upgradations demand more capital. About half of the companies foresee 5-10 per cent incremental investments for developing green buildings

Note: *Based on a survey done by Colliers-KPMG in India with a sample size of 32

Investors leveraging sustainability at scale

ESG targets for global private equity funds and asset managers

Globally, investors are increasingly investing into high-performing green assets. Investing in such assets is not just 'nice to have' anymore but has now become the norm in developed markets. Top global investors are playing vital role in decarbonising the industry, as they are prioritising decarbonisation of their huge real estate portfolios, committing towards achieving their net zero targets by 2050. Decarbonisation offers significant benefits to investors, in terms of enhanced returns, value creation, brand recognition, reduced operational costs and increased market share. Investors are increasingly engaging with developers and occupiers to communicate and align with their sustainability commitments.

Over the years, leading global investors have become more cautious about climate risks and are proactively monitoring their environmental impact and targeting a reduction of emissions across their portfolio companies. Most funds have set interim targets to reduce their carbon emissions, which are aligned to their long-term ESG targets. These include short term strategies such as reducing carbon emissions across all owned and managed assets, installing and utilising renewable capacities across their assets, investing in green assets, issuing green bonds and sustainability linked debts. Some of the leading global investors have also announced their global emissions reduction programmes with a goal of reducing carbon emissions at scale across their real estate portfolios. Investors are also assessing physical climate risks within due diligence and asset management activities aiming long term resilience and growth of their businesses. They are also actively partnering with their subsidiaries to help put them on a lower-carbon trajectory.

How are fund managers approaching sustainability?

What is being done at the portfolio level?	How can adoption of ESG be made mandatory?	Setting benchmarks
• Setting broader decarbonisation target for existing portfolio • Innovations at the portfolio level-interventions in energy, water and waste decarbonising • Due diligence and stress testing real estate portfolios for sustainability elements	• Enforcing sustainable clauses in green leases by encouraging clients to use environment friendly features • A legal contract with an external property manager that specifies actions to improve ESG performance, such as setting targets for reducing energy consumption	• Setting goals for sustainable investments and giving higher weightage to green financing • Benchmarking against peers and industry standards

How are Indian REITs targeting to achieve sustainability?

Similar to global investors, the Real Estate Investment Trusts (REITs) in India have also defined their ESG goals and targets, including their short-term goals and a net zero target for 2050.

Global Real Estate Sustainability Benchmark (GRESB)

The organisation provides peer benchmarks for investors which can help investors to evaluate and achieve their ESG targets and improve business intelligence. The entity provides a score, based on ESG performance and strategies of the company. The score helps companies analyse where their company stands at the global level.

During Q4 2022, all the three REITs in India got a 5-star rating from GRESB for their ESG performance and scoring which was above the global average[1]

1. 2022 Real Estate Assessment Results, GRESB, December 2022

Green financing in India

- Green financing refers to financial arrangements made specifically for initiatives that are environmental friendly. The real estate business benefits from it since it offers financial support and accelerates the shift to a greener economy.
- In 2020, green finance investment decreased to INR309 thousand crore (~USD44 billion) from INR316 thousand crore (~USD54 billion) in 2019, amounting to a fourth of the country's requirements.[2]
- While fund flows to the energy efficiency sector increased by 26 per cent between FY2019 and FY2020, funding for green buildings decreased by 81 per cent.[2]
- Green building sector witnessed a fall in its investment numbers, and this may be attributed not only to the completion of buildings but also to the delay in the issuance of certificates.

2. Indian Green Building Council, CII

Way forward and recommend-ations

According to WorldGBC, global building footprint is expected to double by 2050. This indicates a massive growth in construction and infrastructure development, which will also increase emissions. The built environment sector has a key role in addressing the climate emergency and reducing upfront carbon emissions.[1] The upcoming buildings are anticipated to be future-ready as they will have a long-lasting impact on the environment and climate for the next 50 years. Future buildings will have to address the challenges of embodied[2] as well as operational carbon upfront. All the stakeholders, including developers, investors and end-users need to collaborate and contribute towards making the construction industry net zero.

Current sustainable practices in India are mostly voluntary, largely focusing upon improving energy efficiency as well as indoor environment. However, a circular approach is required that aims at efficient and sustainable usage, reuse and recycling of natural resources. Subsequently, sustainability reporting should not be limited to just top listed companies, but, should also penetrate the entire value chain. All stakeholders should contribute toward net zero transition. Towards faster adoption of sustainability in real estate innovative collaborations, green financing and dynamic policy making become an imperative from public as well as private sector.

Challenges faced by stakeholders in enabling sustainable strategy

Developers / investors	• Sourcing of low carbon construction materials • Supply chain constraints such as low prevalence of clean transport • Lack of technical expertise to execute the projects • High cost of low-carbon materials • No system for waste disposal and recycling • Lack of incentives from government for green retrofitting
Occupiers	• Lack of awareness and acceptability • Lack of incentives from government for embracing sustainability
Government	• Lack of research and development • Current building codes are in silos • No strict policies for sustainability • No systems for benchmarking sustainability

Recommendations and way forward

Developers / investors	• Replacing high carbon construction materials with available low carbon construction materials • Encouraging purchase of materials nearer to site to reduce travel time and fuel consumption • Upskilling the workforce involved in construction processes • Practising efficient sustainability management and reporting • Design optimisation through value engineering and value designing • Ensuring waste minimisation and disposal • Focusing on reducing upfront carbon as well as embodied carbon
Occupiers	• Proliferation of technical knowledge through training and awareness • Entering into green leases with developers • Setting strong ESG targets • Mandating occupiers to establish ESG disclosures
Government	• Provisioning better funding for sustainability research and development • Setting up of standard building codes and specifications for developing green buildings • Enforcing stricter policies for implementation of sustainable practices • Mandating climate impact disclosures • Imposition of green taxes by government • Considering dynamic incentives such as green cash grants as well and subsidies • Incentivising green retrofitting

Note
1. Upfront carbon- Carbon emissions released before the built asset is used
2. Embodied carbon - Embodied carbon is carbon emissions of a building created by its materials

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KPMG Research team

- **Reshma Pai**
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- **Aanchal Behl**
  Assistant Manager
- **Jyotsna Joshi**
  Assistant Manager
- **Rohit Jain**
  Assistant Manager
- **Anukriti Sah**
  Consultant
- **Rohan Barua**
  Consultant
- **Damini Sharda**
  Associate Consultant
- **Shubham Patil**
  Associate Consultant

Colliers Research team

- **Vimal Nadar**
  Senior Director & Head Research – India
- **Shreeda Goel**
  Deputy Manager, Research – India
- **Pallavi Kukdolkar**
  Deputy Manager, Research – India
- **Shreya Bhusnur**
  Associate, Research – India

Colliers Marketing

- **Sukanya Dasgupta**
  Senior Director & Head
  Marketing & Communications – India

Compliance and Design

- **Shveta Pednekar**
  Manager
- **Pooja Patel**
  Assistant Manager
- **Hrishu Sandhu**
  Senior Executive

KPMG in India contacts:

Neeraj Bansal
Partner – Risk Advisory
Co-Head and COO – India Global
E: nbansal@kpmg.com

Namrata Rana
National Head – ESG
E: namratarana@kpmg.com

Chintan Patel
Head – Building, Construction and Real Estate Sector
E: chintanpatel@kpmg.com

Colliers contacts:

Badal Yagnik
Chief Executive Officer – India
E: badal.yagnik@colliers.com

Argenio Antao
Chief Operating Officer – India
E: argenio.antao@colliers.com

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KPMG Assurance and Consulting Services LLP, Lodha Excelus, Apollo Mills Compound, NM Joshi Marg, Mahalaxmi, Mumbai - 400 011 Phone: +91 22 3989 6000, Fax: +91 22 3983 6000.