

The background of the slide is a high-speed photograph of water splashing, creating a dynamic and energetic feel. The water is clear and blue, with many small bubbles and droplets visible. The splash is moving from left to right across the frame.

**25th NATIONAL AWARD FOR
EXCELLENCE IN ENERGY
MANAGEMENT - 2024**



ITPB, INVENTOR BUILDING

10-12th Sep 2024

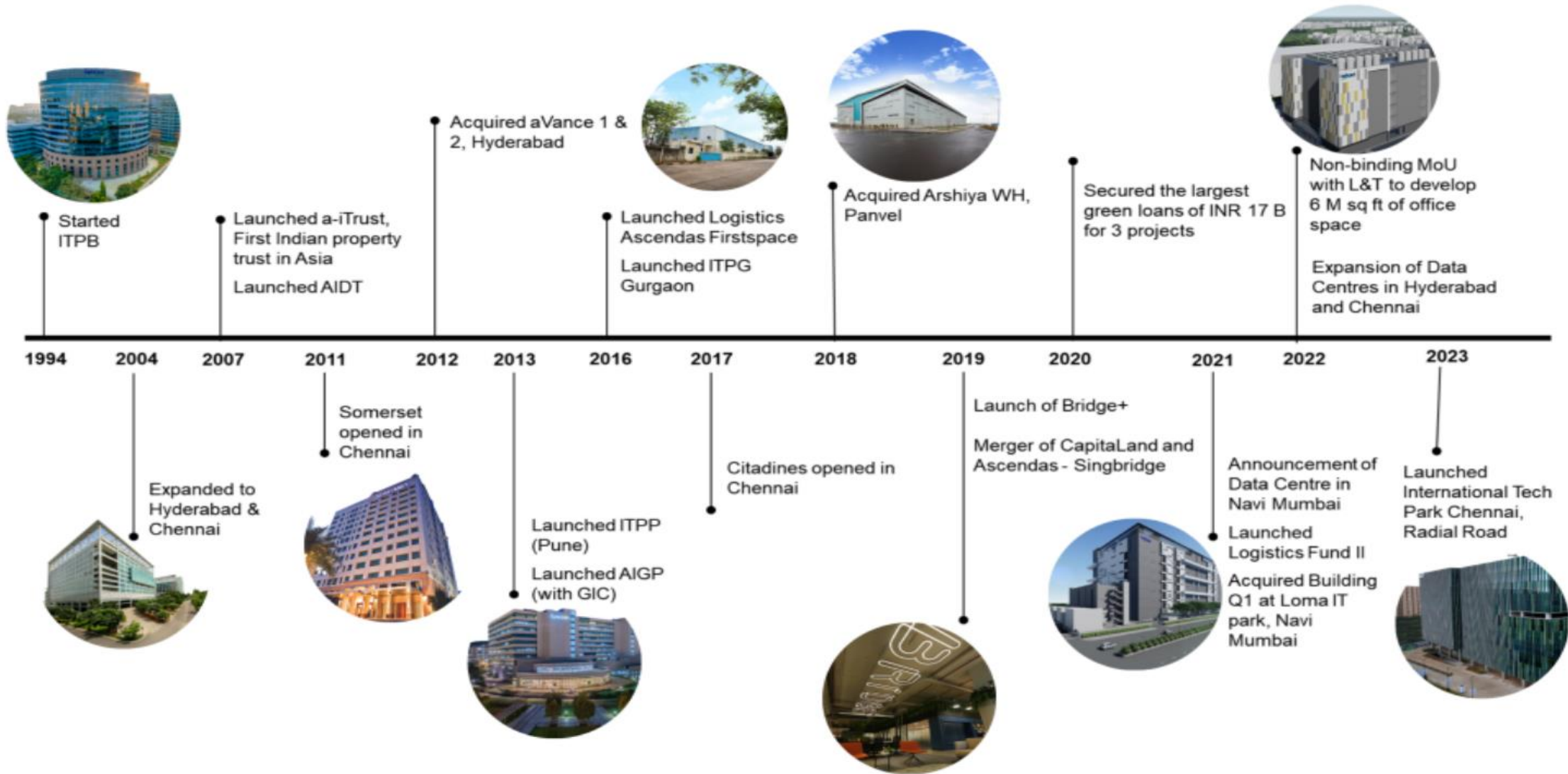
Presented By – Mr. Manoj Kumar, Head
AVP – Bangalore PMD Ops

Company Profile



- CapitaLand Group is one of Asia's largest diversified real estate groups.
- Headquartered and listed in Singapore, CapitaLand's portfolio spans across diversified real estate classes including commercial, retail, business parks, industrial and logistics facilities, integrated developments, urban developments and lodging.
- CapitaLand Group comprises of the listed real estate investment management business CapitaLand Investment, and the privately held property development arm CapitaLand Development.
 - CapitaLand Investment (CLI) owns and manages a global portfolio worth about S\$133 billion as at 31 March 2023. CLI's REITs and business trusts have expanded to include CapitaLand Ascendas REIT, CapitaLand Integrated Commercial Trust, CapitaLand Ascott Trust, CapitaLand China Trust, CapitaLand India Trust and CapitaLand Malaysia Trust.
 - CapitaLand Development (CLD) is the development arm with a portfolio worth about S\$21.8 billion as at 31 December 2022. CLD's strong expertise in master planning, land development and project execution has won numerous accolades including the Building and Construction Authority Quality Excellence Award and FIABCI Prix d'Excellence Award.
- Sustainability is at the core of what we do. As a responsible real estate company, CapitaLand contributes to the environmental and social well-being of the communities where it operates, as it delivers long-term economic value to stakeholders.

CapitaLand India



CapitaLand ESG Pillars

CapitaLand is committed to sustainability and incorporates the key principles of environment, social and governance (ESG) in setting its business strategies and operations



Environment (E)

- Energy/Low Carbon Transition
- Circular Economy/Waste Management
- Water Conservation & Climate Risk Mitigation



Social (S)

- Healthy, Safe Buildings & Occupants/Users
- Human Capital



Governance (G)

- Supply Chain Management
- Customer Relationship Management
- Other Activities
- Risk Management - Ethics %
- Compliance- Audit
- Board Appointments
- Key Leadership Appointments



Market Leadership


- Green Finance (Debt or Equity)
- Sustainability
- Solutions & Technology (Innovative & Scalable)
- Standards in Property Management & Maintenance

CapitaLand Sustainability Master Plan



Build
Portfolio Resilience & Resource Efficiency

- ✓ Low Carbon Transition
- ✓ Water Conservation & Resilience
- ✓ Waste Management & Circular Economy



Enable
Thriving & Future Adaptive Communities

- ✓ Dynamic Human Capital
- ✓ Health & Safe Building
- ✓ Proactive customer relationship management
- ✓ Robust Supply Chain Management



Accelerate
Sustainable Innovation & Collaboration

- ✓ Sustainable operational excellence
- ✓ Sustainable Finance
- ✓ Sustainable Innovation & Technology



Anchored by strong Governance & Sustainable Financial Performance

Key Pathways to 2030



Integrating Sustainability real estate life cycle



Strengthening innovation & collaboration to drive sustainability



Leveraging sustainability trends and data analytics



Monitoring & Reporting to ensure transparency



Increasing stakeholder engagement & communication

Sustainability Standards Adopted



CapitaLand is a signatory to the United Nations Global Compact’s (UNGC4) commitment and adopted UNGC’s universal principles on human rights, labour, the environment and anti-corruption, to create a positive impact aligned with the United Nations Sustainable Development Goals.



CapitaLand was one of the first companies in Singapore to voluntarily publish its annual Sustainability Report and adopt the internationally recognized Global Reporting Initiative (GRI) reporting framework



CapitaLand also participates in the annual Carbon Disclosure Project (CDP) Climate Change Programme and its footprint is calculated in accordance with the Greenhouse Gas (GHG) Protocol

For its efforts on sustainability CapitaLand is listed on:



CL India Sustainability Goals

Environmental Indicator	Unit	2019	2025	2030
Green Certification (For Own & Managed Bldgs Only)	%	80%	-	100%
Renewable Electricity Consumption	%	35%	17.5%	35%
Operational Energy Intensity	kwh/Sqm	66.7	61.7	56.7
<u>Operational Water Intensity (incl. STP where applicable)</u>	<u>m3/sqm</u>	<u>1.02</u>	<u>0.94</u>	<u>0.87</u>
Operational Waste Intensity	kg/sqm	10	9	8
Absolute Carbon Emission	(Tonnes CO2e)	47,195	43,629	31,831
Carbon Intensity	kgCO2e	31.3	21.6	11.9

NA – Not Available

Sustainability and Digitalisation



Switch to renewable power

Solar power to the tune of **77 million kWh**
Approx. **38%** of parks' power consumption for 2022
54,000 metric tons CO2 reductions p.a. (*Energy consumed across 6,500 homes p.a.*)



Energy Efficiency

40% of Energy Usage Intensity reduction in 2022 from 2019. Partly through implementation of various energy efficient initiatives and partly due to Covid-19 impact



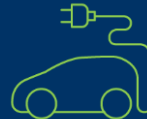
Water Efficiency

61% reduction in water consumption in 2022 from 2019. Partly through effective water management and partly due to Covid-19 impact
100% usage of treated water



Automation

Central Operations Command Centre-Could based IoT platform to monitor equipment health & performance and optimize operations for 70% of the business parks portfolio



Mobility

Electric Vehicle (EV) charging points
E-Bicycles electric buggies for commuting within the park
App based carpooling



Contactless Features

Contactless journey for employees & visitors Health & Safety



Certification

Green building certification for **95%** plus buildings through LEED / IGBC
All future building will be green certified




Zero Waste

*ITPC Taramani certified by CII-IGBC to be **Net Zero Waste-Operation Phase***
Introduced a Trashbot at ITPB to effectively segregate waste for recycling
*Under construction ITPC Radial Road certified by IGBC to be **Net Zero at design stage***



Health & Wellbeing

IAQ based monitoring & control with **UVGI** in AHUs pan India



ITPB Inventor Building

International Tech Park Bangalore (ITPB)

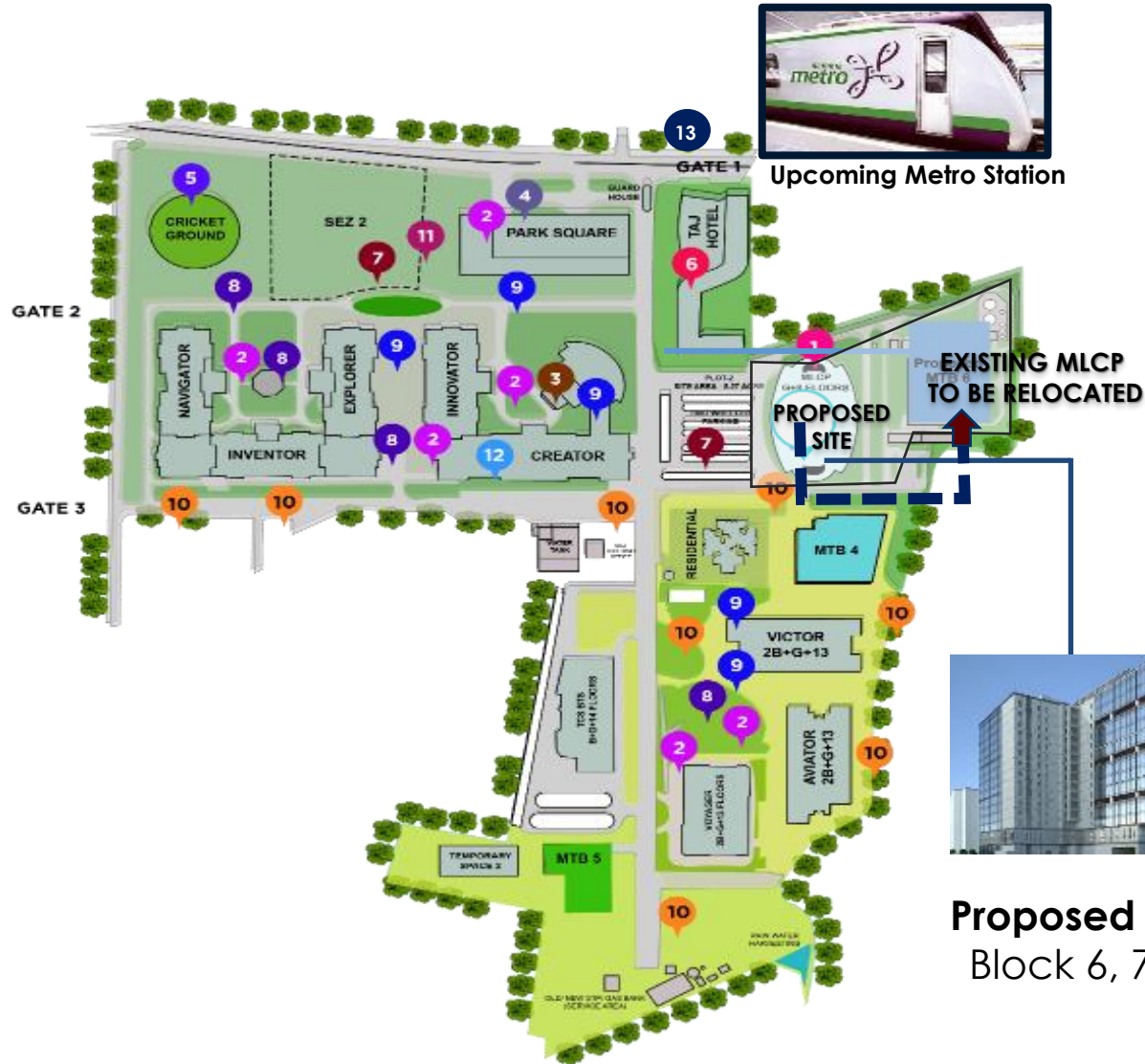


- One of the first integrated **IT parks** in India
- **69 acres** – IT SEZ & Non- SEZ Options
- **5 million sq ft** of used space, **8.2 million sq ft** when fully developed
- Park population: **55,000**
- **450,000 sq ft** retail mall
- **200 room** 5 Star business hotel

Key occupiers



ITPB Master Plan



Upcoming Metro Station

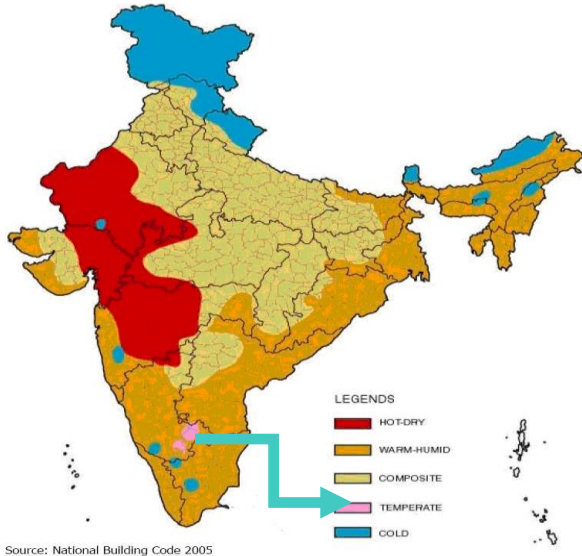


Proposed Site
Block 6, 7, 8



- 1 MLCP
- 7 Open two-wheeler parking
- 2 F&B zone
- 8 Smoking zones
- 3 Concourse
- 9 Pedal Dock
- 4 Park Square Mall
- 10 Yulu Bicycles
- 5 Cricket Ground
- 11 Uber
- 6 Vivanta by Taj
- 12 Bus Bay
- 13 Upcoming Metro Station

Building Overview – Passive design Feature



Building Orientation North - South

SHGC of Façade glass 0.24

SRI of paint >100

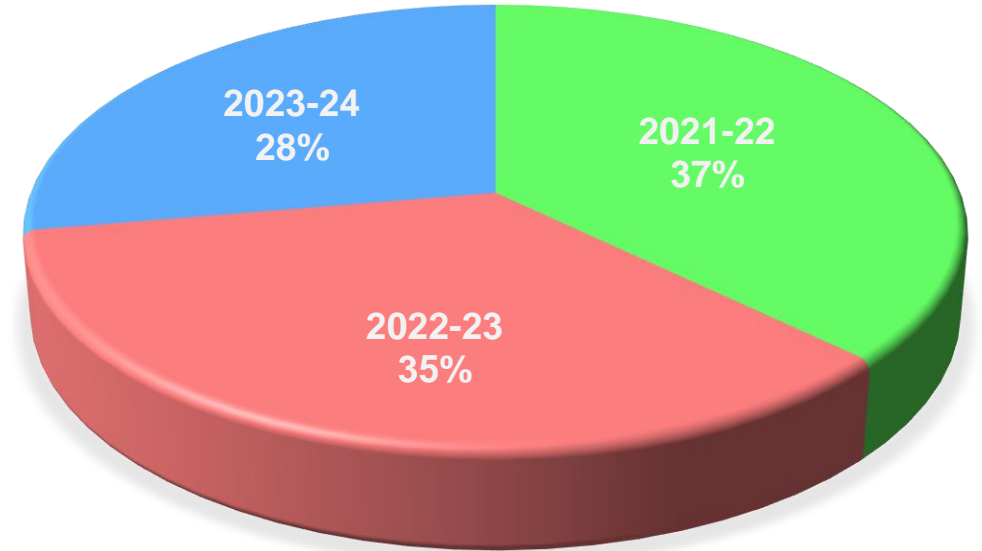
Climate Zone Temperate

Wall Section 8" AA block U factor 0.148 btu/hr.ft² F



Energy consumption data

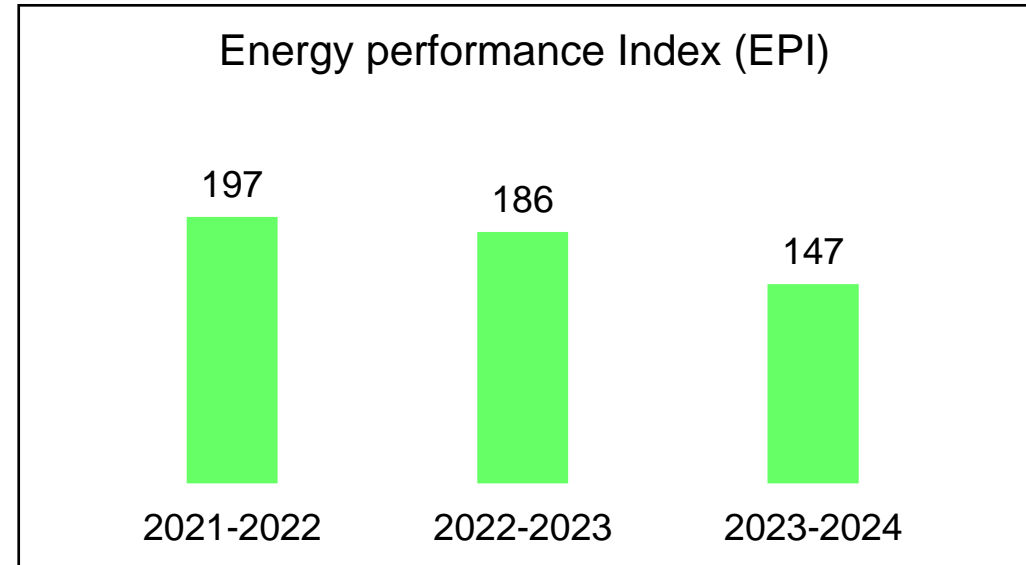
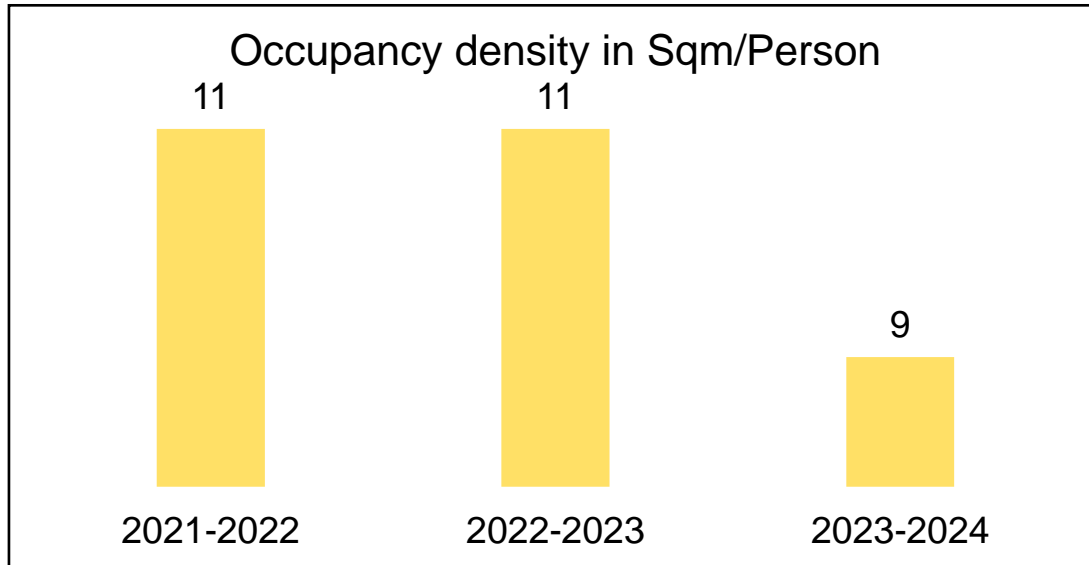
Year	Energy Consumption in Kwh
2021-22	5,263,782
2022-23	4,964,000
2023-24	3,917,285



Specific Energy Consumption

S.NO	Description	2021-2022	2022-2023	2023-2024
1	Built up area in Sqm	27080	27080	27080
2	No of floors in the building	8	8	8
3	Working hours per day	24	24	24
4	Working days / week	7	7	7
6	Total No.of Employees	3000	3000	3000
7	No. of Employees coming to office	2500	2500	3000
8	Occupancy density	10.83	10.83	9.03
9	Energy consumed in KWH	5,329,912	5,029,589	3,989,997
10	Energy performance Index (EPI)	196.82	185.73	147.34

Specific Energy Consumption - Trend



Reason for Variations:

- Replacement of conventional belt driven centrifugal fans with Energy efficient EC fans
- Replacement of End-of-Life constant screw chillers with highly efficient variable speed centrifugal chillers
- Automatic descaling system

Information on Competitors, National & Global Benchmark

Competitor AAhEPI Benchmark under BPO	
Competitor Name	AAhEPI for BPO (Wh/hr.sqmts.year)
RMZ Eco world Infrastructure Pvt. Ltd. (Building 5AB), Bangalore)	11.57

National SEC Benchmark (BEE)	
Benchmark for Office Buildings - AAhEPI	
Climate Zone	For 90% AC area
Temperate	19.5

- ITPB Inventor building comes under BPO category with IT offices Combination of Office, Hub rooms, with 95% Air-conditioned space and 24x7 operation
- Bangalore comes under Temperate Climate Zone and our campus comes under the category of more than 90 % Airconditioned area. Hence AAhEPI Benchmark as per BEE 19.5 wh/hr./sqm
- Our AAhEPI FY 2023-24 - 16.8 wh/hr./sqm.

List of Major Encon project planned in FY 2024-2025

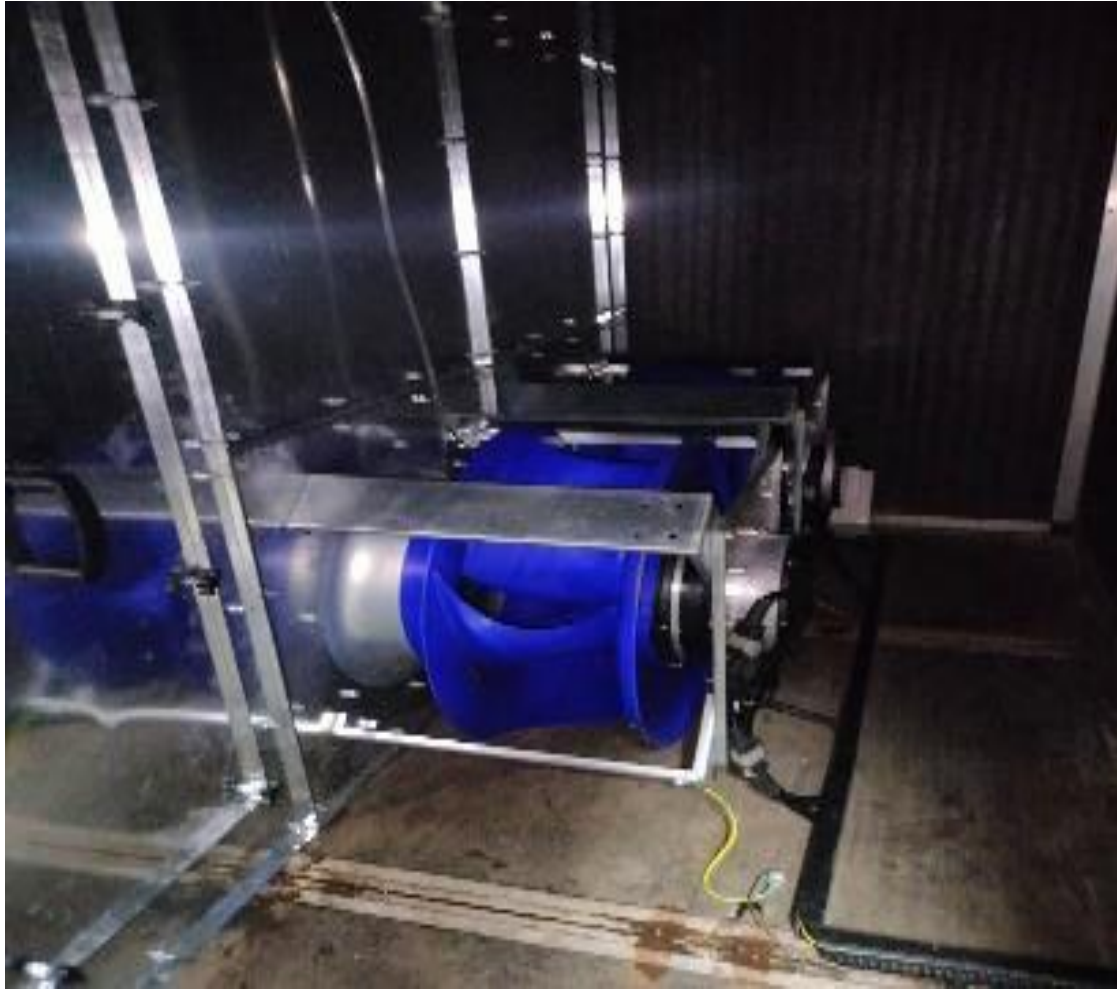
- **CPM upgrade and optimization-** To obtain the maximum efficiency through optimization , sensing devices will be added to pumps, AHUs and Cooling towers In addition to the current system
- **Cooling tower optimization-** with the aid of the chiller plant optimizer , the most efficient mode of operation will be identified by modelling the cooling towers characteristics,
- **Intelligent Asset Management** – Data modelling and machine learning based energy tracking to make informed decisions.

Energy Saving Projects Implemented

Year	No of Energy Saving Projects	Investments (INR Million)	Electrical Savings (Million kWh)	Savings (INR Million)	Impact on SEC
FY 2023-24	1	4	0.13	1.34	3.25%
FY 2023-24	1	30	0.90	9.00	22.68%

- FY 2023-2024, Project 1: Replacement of End-of-life conventional belt driven centrifugal fans with EC fans to reduce transmission losses and reduced maintenance thereby increased energy efficiency.
- FY 2023-2024, Project 2: Replaced End of life constant speed water cooled screw chiller with variable speed centrifugal chiller and realized efficiency improvement up to 22% of SEC

Energy Saving Projects Implemented 2023-2024



Innovative Projects Implemented

- Cooling towers has dual mode of operation N or N+1 where N =Number of Chiller running, In N mode, cooling tower fan speed will increase up to 100% but in N+1 mode of operation the cooling tower speed will increase only till user defined lesser speed.
- With the above logic the cooling surface area gets increased, and the power consumption reduces at the cubic root of speed.
- We implemented the above logic in Anchor chiller Plant Manager upgrade and realized savings in both cooling tower fan energy consumption and centrifugal chiller energy consumption.
- This can be implemented in all water-cooled chiller plants



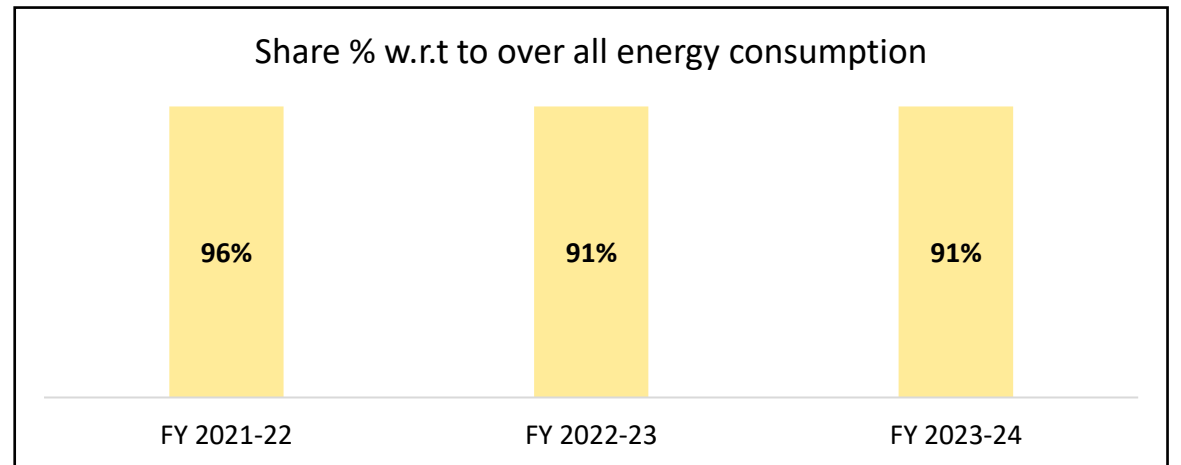
Utilization of Renewable Energy sources (Onsite)

Year	Source (Solar, Wind, etc)	Installed Capacity MW	Capacity Addition (MW) after FY 2021	Total Generation million kWh	Share % w.r.t to over all energy
FY 2021-22	Solar	0.435	0	0.066	1
FY 2022-23	Solar	0.435	0	0.066	1
FY 2023-24	Solar	0.435	0	0.073	2



Utilization of Renewable Energy sources (Offsite)

Year	Source (Solar, Wind etc)	Total offsite Installed Capacity MW	Capacity Addition (MW)	Total Generation (million kWh)	Share % w.r.t to over all energy consumption
FY 2021-22	Solar	160	0	5053231	96
FY 2022-23	Solar	160	0	4517240	91
FY 2023-24	Solar	160	0	3564729	91



GHG Emissions

CapitaLand will transit to a low-carbon business that is aligned with climate science. In November 2020, we had our emissions reduction targets approved by the Science Based Targets initiative (SBTi) for a 'well-below 2°C' scenario. In May 2022, we elevated our scope 1 and 2 carbon emissions reduction targets which were validated by SBTi to be in line with a 1.5°C trajectory, currently the most ambitious designation available through the SBTi process.

CapitaLand's science-based targets are:

Reduce absolute scope 1 and 2 GHG emissions by 46% by 2030 from a 2019 base year

Reduce scope 3 GHG emissions from capital goods by 22% per square metre by 2030 from a 2019 base year

2022 Performance Against Targets

Target:
46%

6.8% reduction achieved for scope 1 & 2 absolute GHG emissions

Target:
22%

48% reduction achieved for scope 3 (capital goods) GHG emissions intensity

GHG Emission – Scope 1 & Scope 2

Year	CO2 Emission Grid in Kg	CO2 Emission DG in Kg	Total CO2 in Kg
2021-22	166,336	8,152	174,487
2022-23	352,940	4,836	357,776
2023-24	278,519	12,237	290,756

Reference for emission factors

Grid emission factor (without RES) for electricity purchased from the grid		
Source: CEA CO2 Baseline		
2020-21	0.79	Kg CO2/kWh
2021-22	0.79	Kg CO2/kWh
2022-23	0.81	Kg CO2/kWh
2023-24	0.82	Kg CO2/kWh

Grid emission factor for the fuels used		
Source: IPCC Database		
Diesel	2.68	Kg CO2/litre of diesel
Petrol	2.28	Kg CO2/litre of petrol
LPG	2.97	Kg CO2/Kg of LPG
Natural Gas	1.8	Kg CO2/Kg of natural gas
Furnace Oil	0.074	tCO2/GJ

Indoor Air Quality (Monitoring & Control)

Reduction in Particulate Matter (PM) in tenant spaces is a necessity for improved indoor air quality. However, for achieving the required levels of filtration, MERV 13 filters could be required in every AHU which is very costly on an ongoing basis.

Since fresh air entering the AHUs from the Terrace fresh air duct is the major source of PM, instead of using MERV 13 filters in all AHUs, MERV 13 filters can be used on the fresh air duct entry at the terrace.

Alternatively, special filters made of nano fibers claimed to have a low back pressure of 60 Pascal vs 200 Pascal for MERV 13 filters in view of higher density of fine pores per square feet, can be used.

IAQ Guidelines for existing buildings

	PM 2.5 ($\mu\text{m}/\text{m}^3$)	PM 10 ($\mu\text{m}/\text{m}^3$)
Excellent	< 25	< 50
Good	25 - 35	50 - 150
Poor	> 35	> 150



Ground Floor Lobby : Tuesday, August 20, 2024

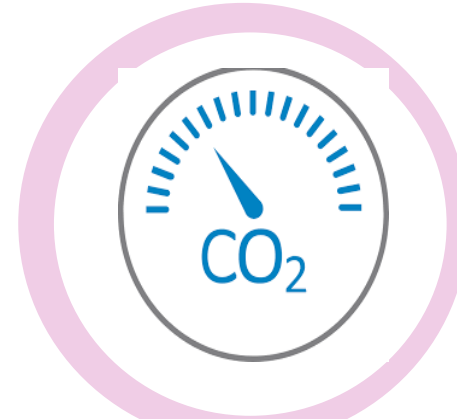


Indoor Environmental Quality



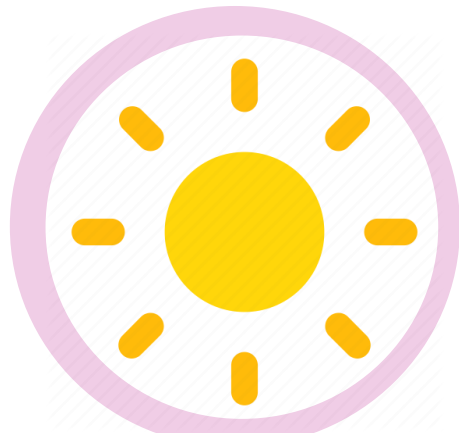
Tobacco smoke control

- Minimising exposure of non-smokers to the adverse health impacts arising due to passive smoking in the building.
- We having Outdoor Smoking Area
- located at a less than 7.6 meters from all outdoor air intakes with the regulations of Ministry of Health & Family Welfare, Government of India.



Co2 Monitoring

- Continuously monitoring and control carbon dioxide level in the building to ensure occupant comfort
- Installed CO2 sensors in return air ducts to maintain a differential CO2 level of maximum 530 ppm in all regularly occupied areas



Daylighting

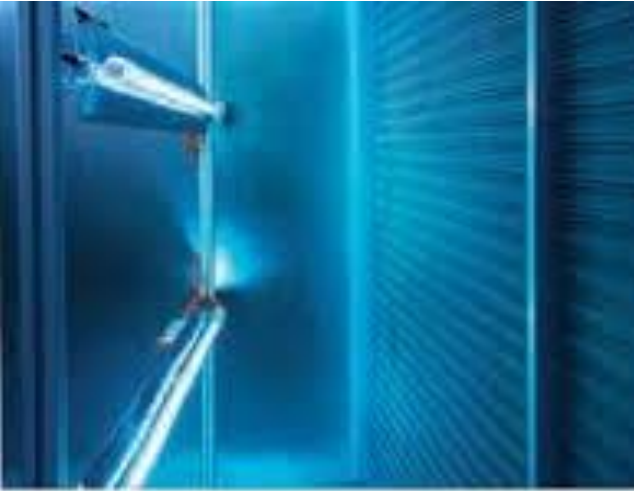
- There is connectivity between the interior and the exterior environment, by providing adequate daylighting



Wellbeing facility

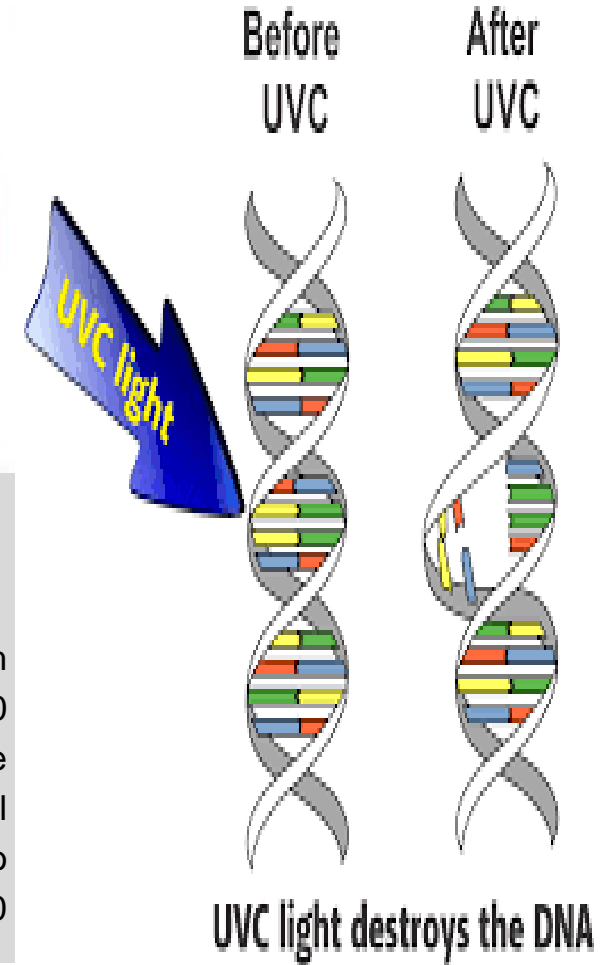
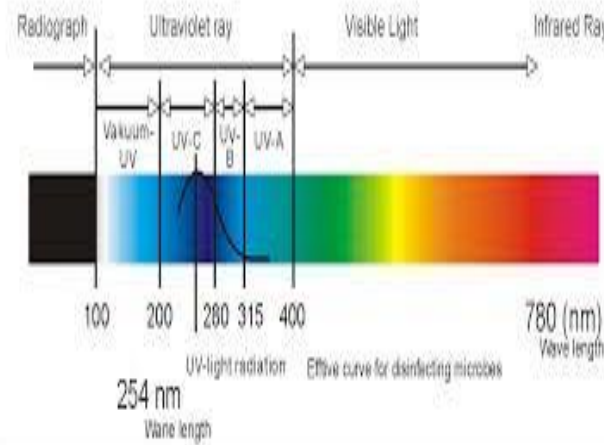
- Providing occupant well-being facilities, so as to enhance physical, emotional and spiritual well-being of building occupants.

Indoor Air Disinfection in AHU / Space through UVGI Solution (UV-C)



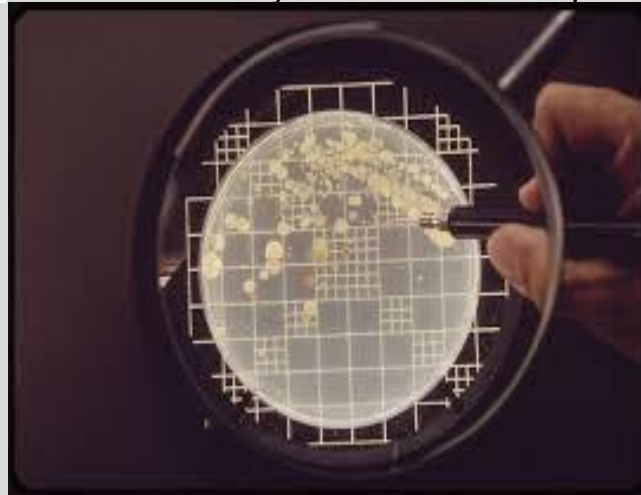
Disinfection Rate

- 90% of disinfection achieved over a period of around 30 days, and ~98% over 45 days. 1 in every 150 AHUs to be petri-dish tested in laboratory to validate both pre



Design

- Fan CFM, cooling coil size, and internal height and width of the AHU is required to arrive at the size and count of lamps



Specification

- UV-C light with 254 nm wavelength & intensity of ~1,800 $\mu\text{W}/\text{cm}^2$ at a mounting distance of 300 mm from the coil between coil & fan. Lamp life to be around 10,000 - 12,000 hours of operation

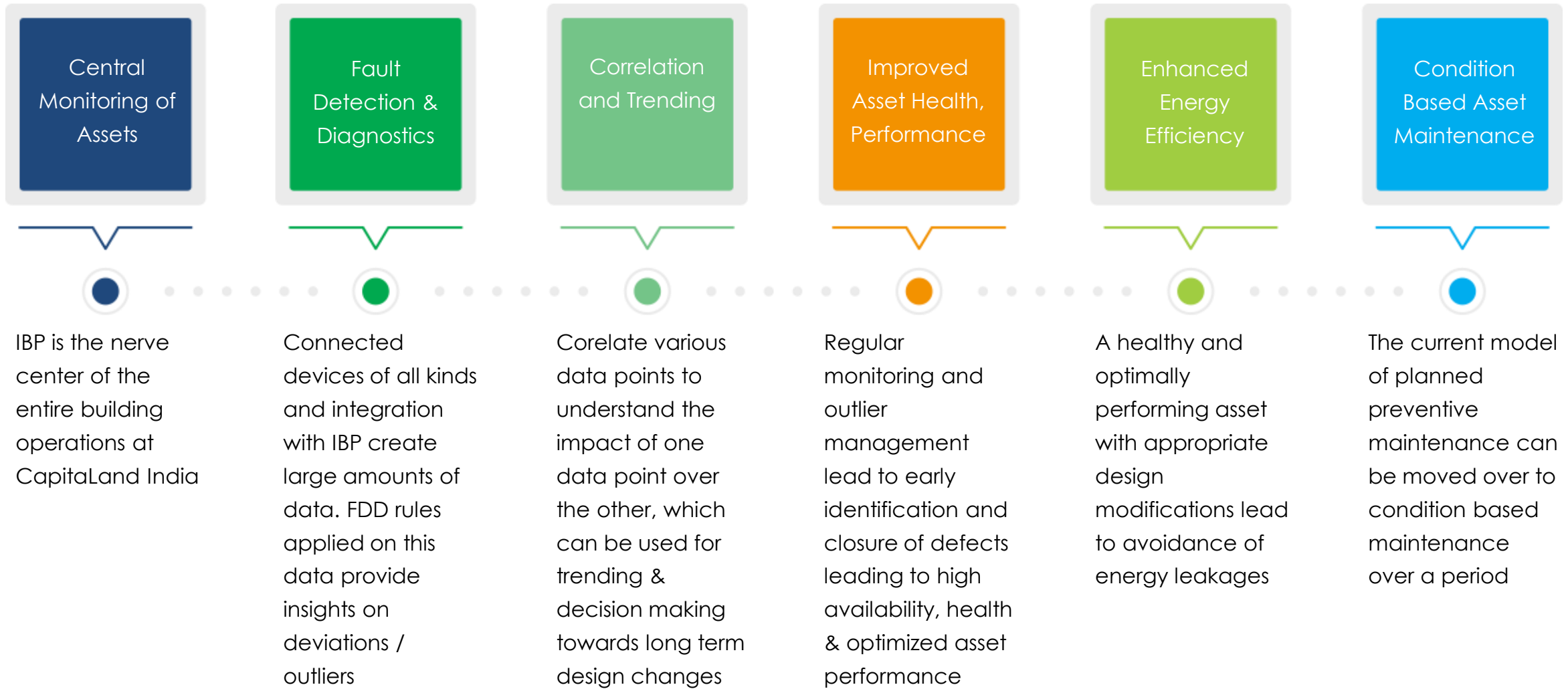
CapitaLand India is implemented this solution in our Pune parks

BMS and Certification

Equipment	BMS
Chillers	Yes
AHUs	Yes
Water network	Yes
Common area Lighting	Yes
Ventilation Fans	Yes
Lifts	Yes
Fire Fighting	Yes



IoT Based Intelligent Building Platform



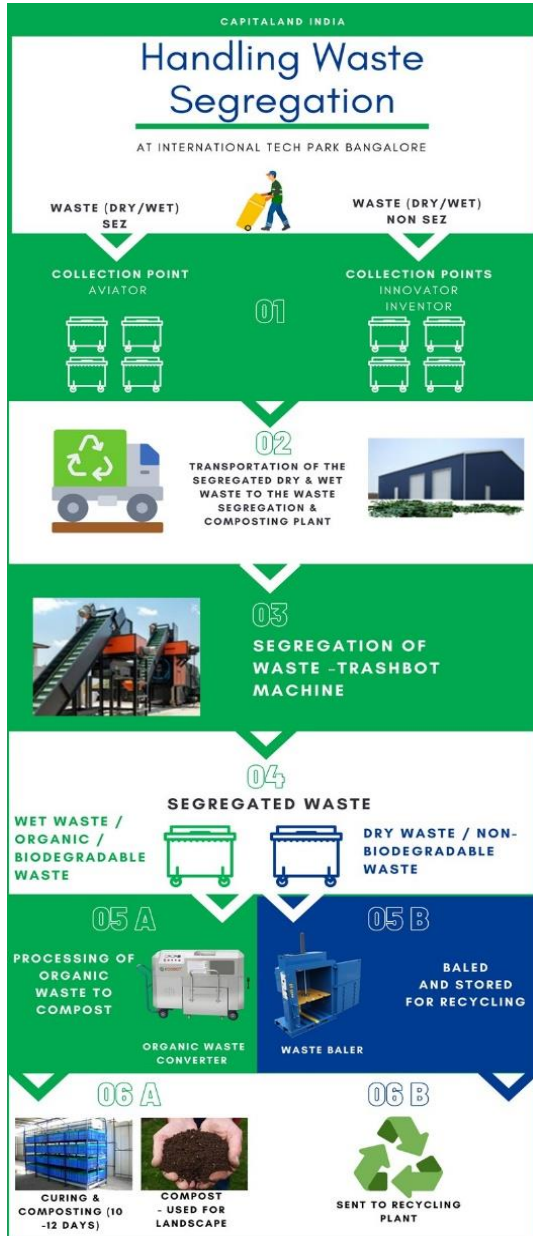
Net Zero Commitment

CapitaLand Investment Limited (CLI) has elevated its commitment to sustainability by aiming to achieve Net Zero emissions by 2050. To realise this commitment, CLI aims to reduce its absolute scope 1 and 2 greenhouse gas emissions by 46%, up from 28%, by 2030 from a 2019 base year. These new targets to reduce greenhouse gas emissions are validated by the Science Based Targets initiative^[1] (SBTi) to limit global warming to 1.5°C, in accordance with the goals of the Paris Agreement^[2]. CapitaLand is one of the few Singapore-based companies to have SBTi-approved carbon targets aligned to the 1.5°C scenario for its extensive global operations.

The new Net Zero commitment builds on existing sustainability targets outlined in CapitaLand's 2030 Sustainability Master Plan^[3] unveiled in October 2020. This includes accelerating the transition to a low-carbon business, improving water conservation and resilience, and enabling a circular economy. CLI announced its Net Zero commitment today in tandem with the publication of its 13th Global Sustainability Report which covers its 2021 sustainability performance. CLI is on track to attain its Net Zero commitment as well as its 2030 Sustainability Master Plan targets.

Solid Waste Management – Ensuring Zero Landfill

Process Chart



Step -1
Source Segregation



Step -2
Collection @ NON SEZ & SEZ Bin Center



Step -3
Transport through E-Buggy to "The Green Bin" - Waste Management Center



Step -4
Final Segregation through Automated Machine (Dry / Wet & Metal)



Step -5
Bailing of Segregated Dry Waste



Step -6
Garden waste in Shredder Machine to use in OWC



Step -7
Wet Waste + Garden Waste In Organic Waste Converter



Dry Waste – 100 % Recycled
 -Paper / Cardboard – to paper products
 -Tissue – Incinerated to ash
 -Metal – to metal logs
 -Plastic- to dustbin 's
 -Glass – to Marbles



Wet Waste – 100% converted to Compost
 -Used for Park Landscaping
 -Distribute to customers on Earth & Environment day for home gardening
 -Used at CSR school Landscaping

Carbon sequestration - ITPB

Carbon Sequestration Project @ ITPB

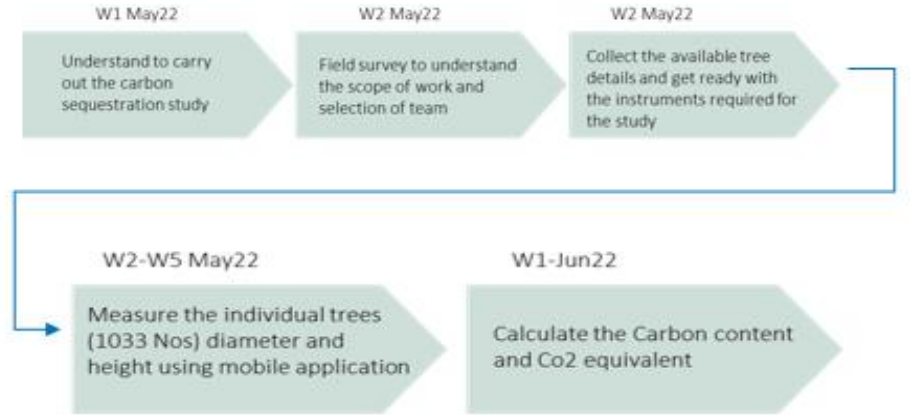
We have measured all 1033 trees in ITPB Bangalore, and these trees reveals few unbelievable facts

As of today, total **863,751 kg** Of Co2 equivalent removed by the trees.

Save Tree save life

Project partners:
Krichakumar - P.M, Harish - P.M, Jayanta - Head, DIS, Pradeep - Head, P.JM
Supported by:
Prerna Suresh - P.M & George, Head P.M & B

The infographic features a background of lush green trees. It includes a title at the top, a central text box with the total carbon sequestration amount, and a bottom section with project partners and a slogan. Two small inset photos show people working in a park.



Future Activity:

- We took ITPB as a model plant and same activity will be carried out to other parks as well
- The data collected in this study will be share to city PJM & PMD team for effective utilization

Welcome to The Healing Garden

ts,

Remove your shoes and step into the Zen space. This healing garden has been specifically designed to combat work stress! Each element has been especially curated for relaxation.

Pebbles: This walk will revitalize your body. Walk barefoot to improve your blood circulations and lower your blood pressure. Such a grounding will also aid in reducing inflammation and help improve your sleep.

Herbal Plants: Curious about which herbs we have? Walk around! Each herb has medicinal quality which will help improve concentration and memory, elevate your mood and boost your energy levels.

Bamboo: Provides 35% more oxygen than any equivalent stand of trees. It also effectively absorbs carbon footprint.

Buddha statue with waterscape: Water is known to provide calming effect and Buddha is the ultimate representation of Zen. Together – they will help you stay calm and attain a peaceful mind.

IMPORTANT: Enjoy the beauty of the place and maintain its sanctity for every one to enjoy.

medicinal benefits - breathe into it

SHOES

Remove your shoes for the Zen effect



HERBS



BUDDHA STATUE WITH FOUNTAIN

*will provide cool atmosphere
and calmness*



PEBBLES

*for reflexology and acupunture will help
reduce stress*



BAMBOO

provides more oxygen than other trees

The Healing Garden @ ITPB



Awards & Accolades





Thank You



Cap/taLand