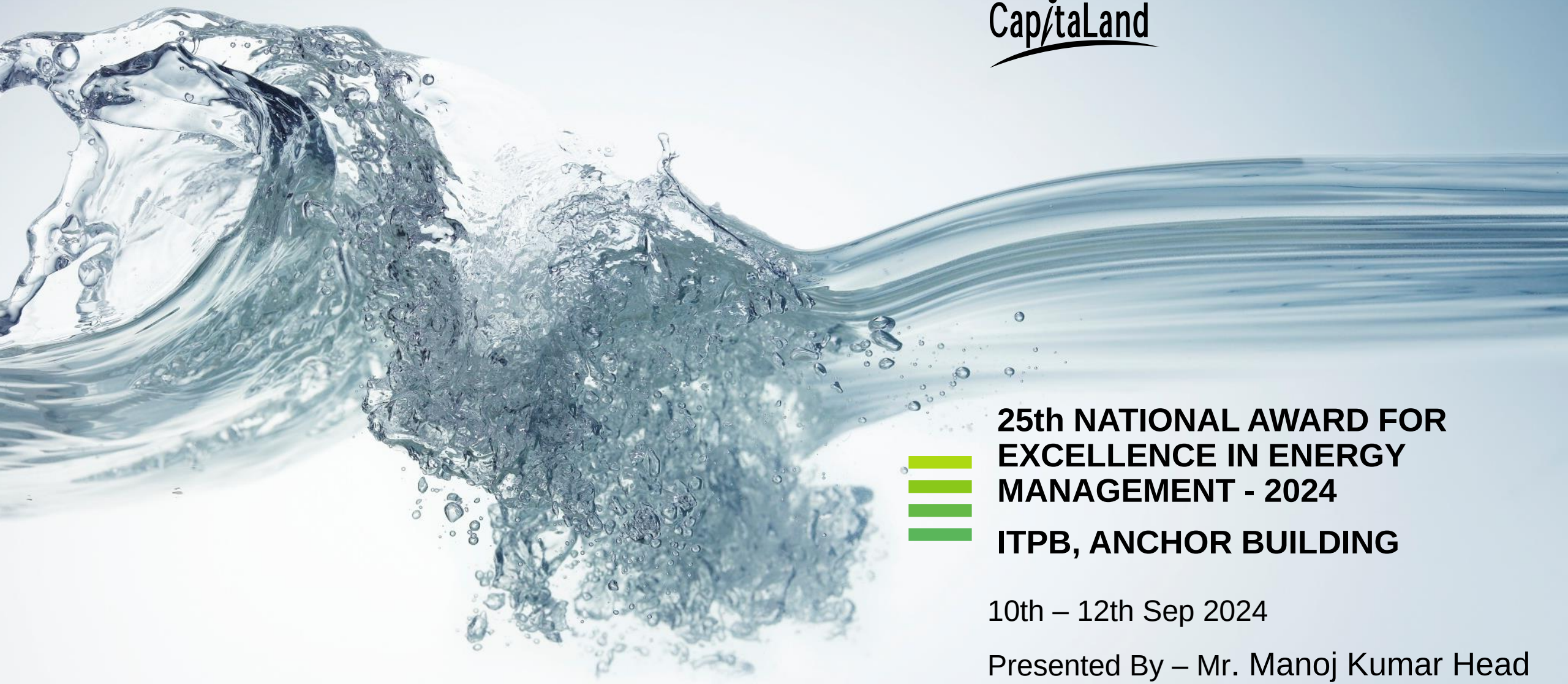


25th NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT - 2024

ITPB, ANCHOR BUILDING

10th – 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

1994 — Started ITPB

2004 — Expanded to Hyderabad & Chennai

2007 — Launched a-iTrust, First Indian property trust in Asia; Launched AIDT

2011 — Somerset opened in Chennai

2012 — Acquired aVance 1 & 2, Hyderabad

2013 — Launched ITPP (Pune); Launched AIGP (with GIC)

2016 — Launched Logistics Ascendas Firstspace; Launched ITPG Gurgaon

2017 — Citadines opened in Chennai

2018 — Acquired Arshiya WH, Panvel

2019 — Launch of Bridge+; Merger of CapitaLand and Ascendas - Singbridge

2020 — Secured the largest green loans of INR 17 B for 3 projects

2021 — Announcement of Data Centre in Navi Mumbai; Launched Logistics Fund II; Acquired Building Q1 at Loma IT park, Navi Mumbai

2022 — Non-binding MoU with L&T to develop 6 M sq ft of office space; Expansion of Data Centres in Hyderabad and Chennai

2023 — Launched International Tech Park Chennai, Radial Road

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 Efficienc

- ✓ 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:

MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM

GRESB

EURONEXT vigeo eiris INDICES WORLD 120

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
Operational Water Intensity (incl. STP where applicable)	m3/sqm	1.02	0.94	0.87
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

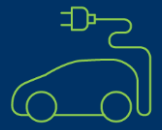
40% of Energy Usage Intensity reduction in 2022 from 2019. Partly through implementation of various energy efficient initiatives and partly due to Covid-19 impact

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

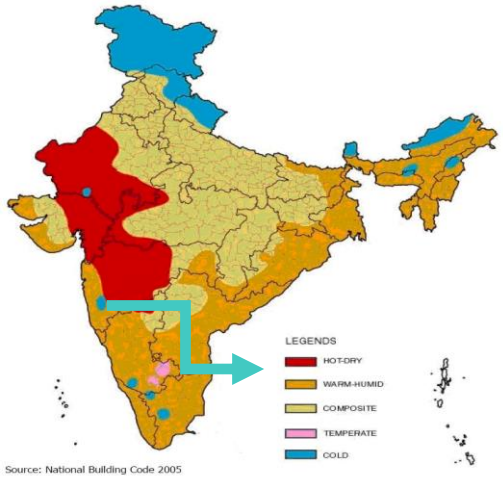
International Tech Park Bangalore (ITPB)

- 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

APPLIED MATERIALS · AT&T · GM · Mu Sigma · SOCIETE GENERALE · SCIENTIFIC GAMES · TATA CONSULTANCY SERVICES · technicolor

Building Overview – Passive design Feature



Building Orientation	East - West
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

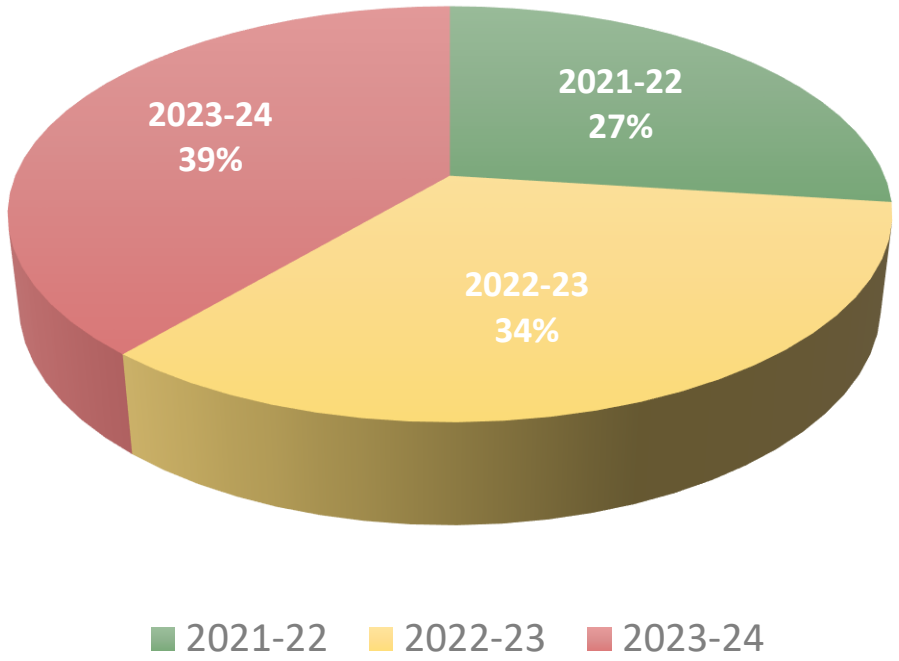
Building Overview – Energy Design Features

AHUs Fitted with Energy efficient **EC fans** resulting in **20%** energy reduction compared to traditional belt driven Fans

Centrifugal Chillers with design capacity of 0.458 KW/TR (ARI Condition)
Variable secondary pumping system integration with DPT resulting in **25% reduction in pump load**

Energy Consumption Data Company Profile

Year	Energy Consumption in Kwh
2021-22	2,111,628
2022-23	2,666,825
2023-24	3,032,294

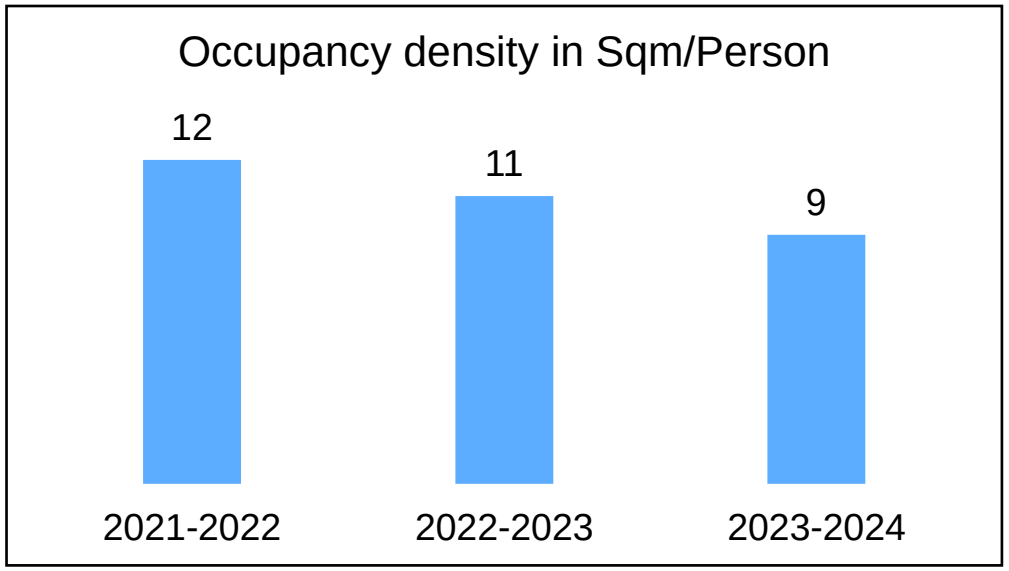


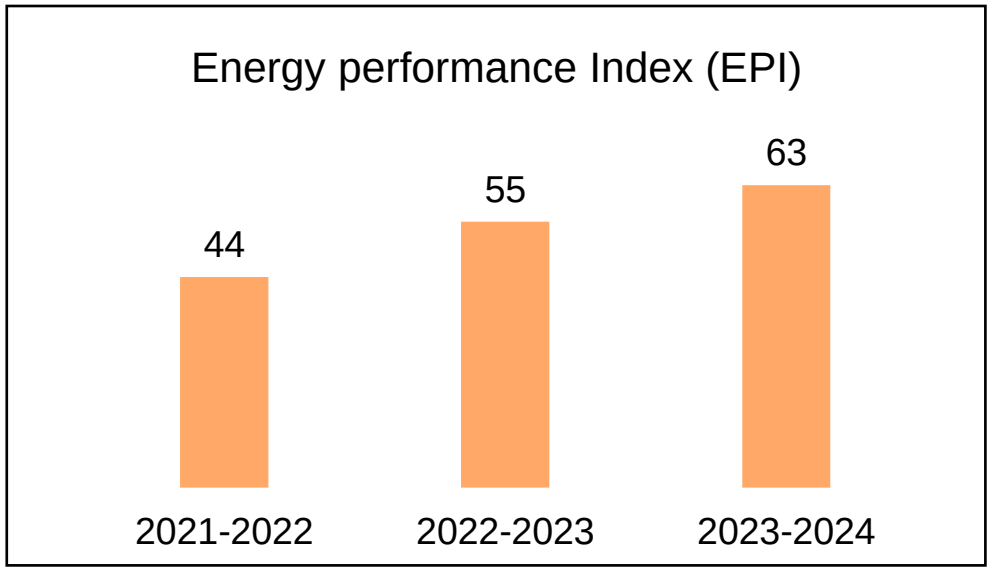
The Energy consumption of the building from 2021 to 2024 in increasing trend mainly from Lock-down to back to office and increase of the occupancy, but the over all energy well with in the AAhEPI Benchmark as per BEE 19.5 wh/hr./sqm

Specific Energy Consumption

S.NO	Description	2021-2022	2022-2023	2023-2024
1	Built up area in Sqm	48300	48300	48300
2	No of floors in the building	13	13	13
3	Working hours per day	12	12	12
4	Working days / week	6	6	6
6	Total No.of Employees	5200	5200	5200
7	No. of Employees coming to office	4000	4500	5200
8	Occupancy density in Sqm/Person	12.08	10.73	9.29
9	Energy consumed in KWH	2,111,628	2,666,825	3,032,294
10	Energy performance Index (EPI)	43.72	55.21	62.78

Specific Energy Consumption - Trend





Reason for Variations:

1. The Specific Energy consumption trend variation is because of Occupancy increased due to back to office

Information on Competitors, National & Global Benchmark

Competitor AAhEPI Benchmark under BPO	
Competitor Name	**AAhEPI for BPO (Wh/hr.sqmts.year)**
RMZ Ecoworld 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 Anchor building comes under BPO category with IT offices Combination of Office, Hub rooms, Food court with 90% Air-conditioned space
- 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 - 16.7 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,

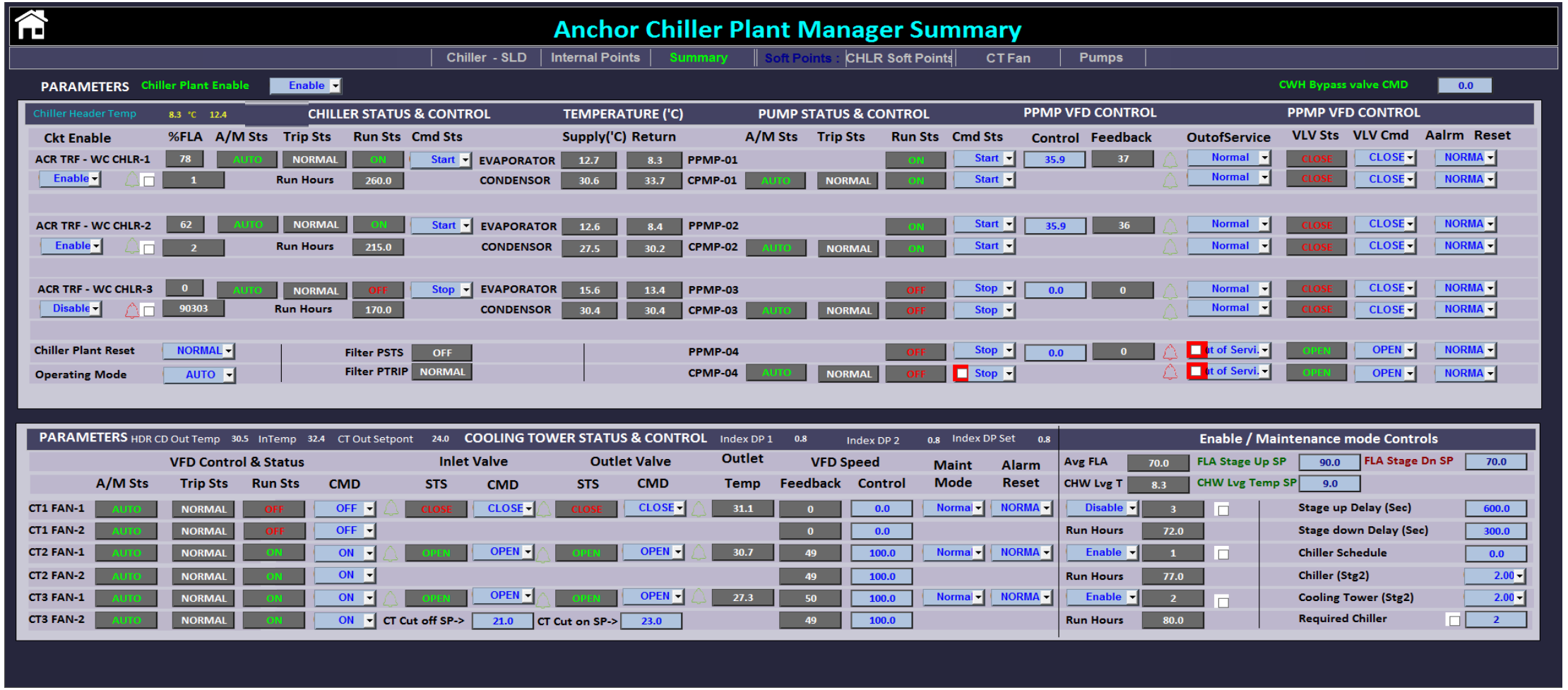
- **Intelligent Asset Management** – Data modelling and machine learning based energy tracking to make informed decisions.

Energy Saving Projects Implemented

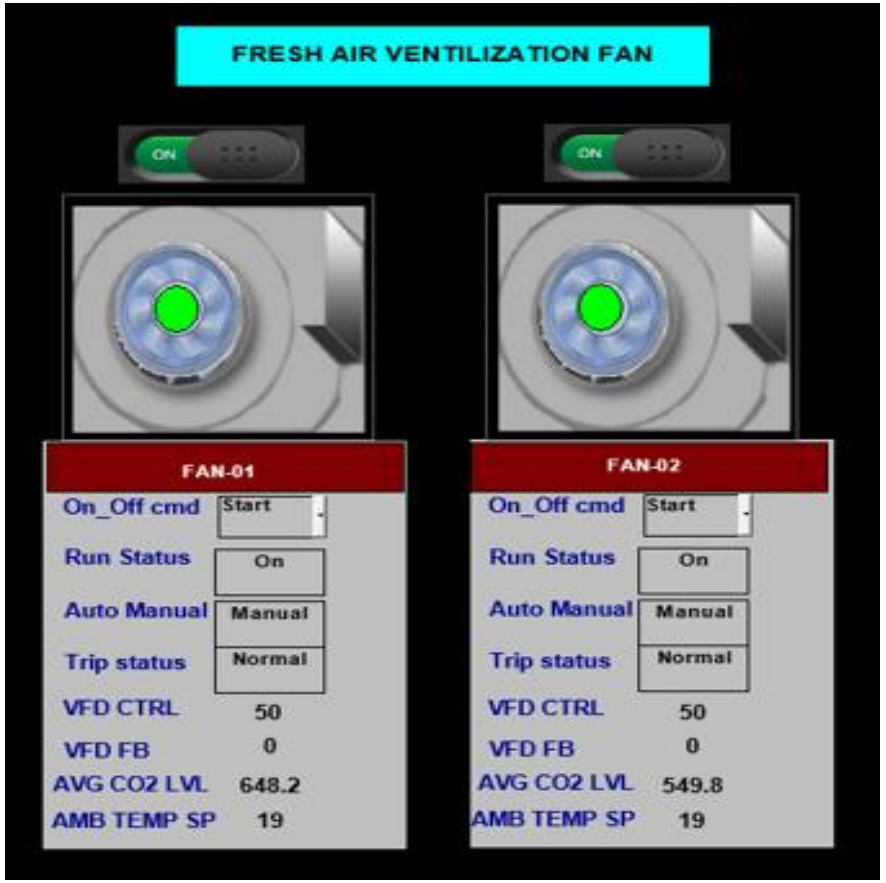
Year	No of Energy Saving Projects	Investments (INR Million)	Electrical Savings (Million kWh)	Savings (INR Million)	Impact on SEC
FY 2022-23	1	1.2	0.11	0.89	4%
FY 2023-24	1	1.8	0.15	1.20	5%

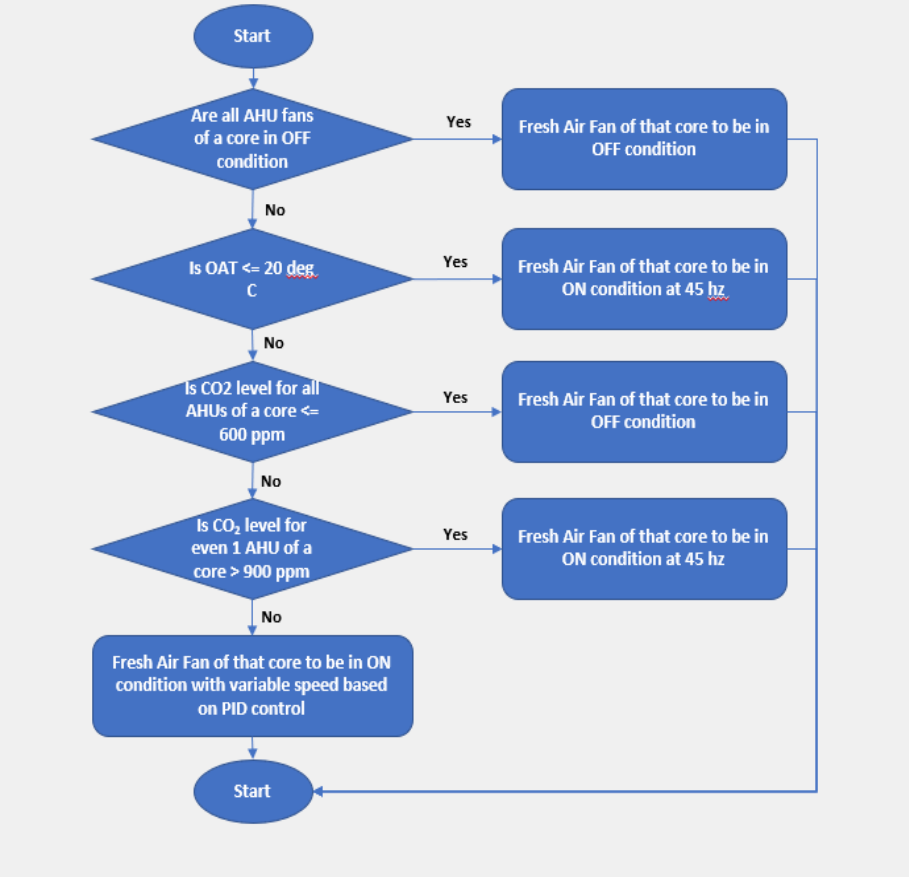
- FY 2022-2023, Project: Demand Based Ventilation system, All conditioned spaces were provided fresh air, based on CO2 demand and minimum ventilation rate required, at lower ambient temperature fresh air is utilized to the maximum through customized logic
- FY 2023-2024, Project: Chiller plant Manager (CPM) upgrade, CPM logics were not functioning as intended, implemented staging of chillers, modulation of primary variable pumps and cooling towers for the chiller plant efficient operation.

Energy Saving Projects Implemented 2023-2024



Energy Saving Projects Implemented 2022-2023





Innovative Projects Implemented

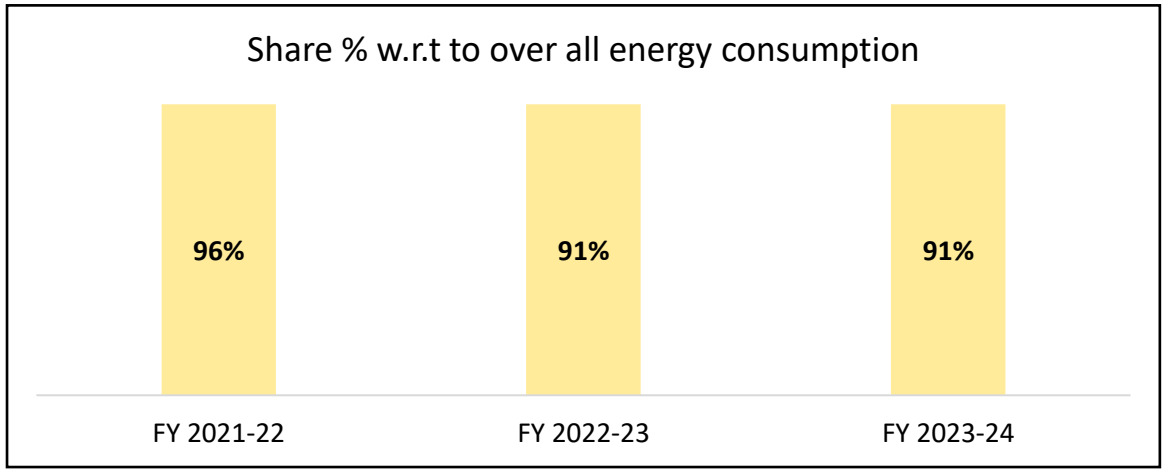
- Cooling towers has dual mode of operation N or N+1 where N=Number of Chiller running, In N mode, cooling tower fan speed will increase up to 100% but in N+1 mode of operation the cooling tower speed will increase only till user defined lesser speed.
- With the above logic the cooling surface area gets 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	0.024	0	0.020	1
FY 2022-23	Solar	0.024	0	0.020	1
FY 2023-24	Solar	0.024	0	0.020	1

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	2,027,163	96
FY 2022-23	Solar	160	0	2,426,811	91
FY 2023-24	Solar	160	0	2,759,388	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	66,727	2,173	68,901
2022-23	189,611	-	189,611
2023-24	215,596	3,101	218,697

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)

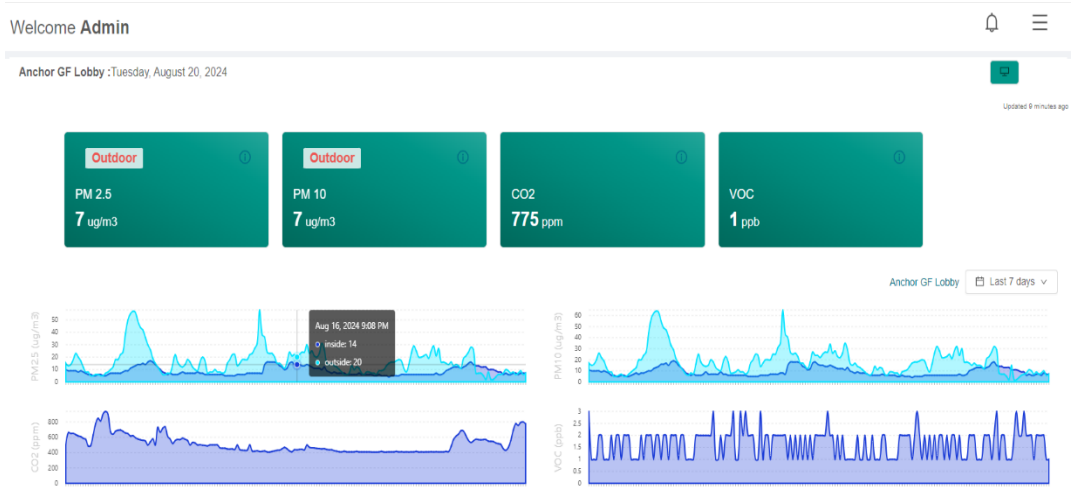
Reduction in Particulate Matter (PM) in tenant spaces is a necessity for improved indoor air quality. However, for achieving the required levels of filtration, MERV 13 filters could be required in every AHU which is very costly on an ongoing basis.

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

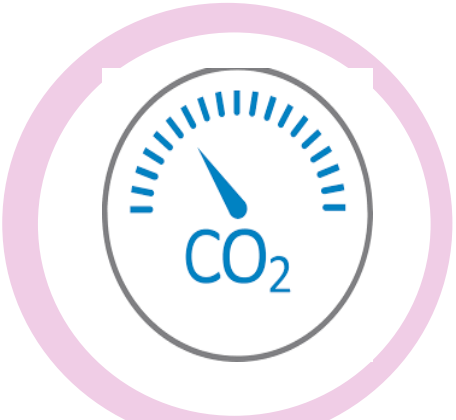
	PM 2.5 (µm/m³)	PM 10 (µm/m³)
Excellent	< 25	< 50
Good	25 - 35	50 - 150
Poor	> 35	> 150



Indoor Environmental Quality

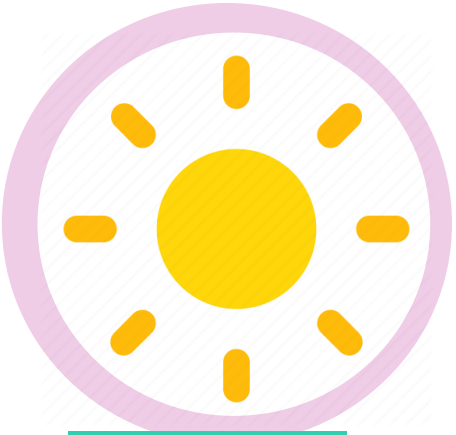
Tobacco smoke control

- 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



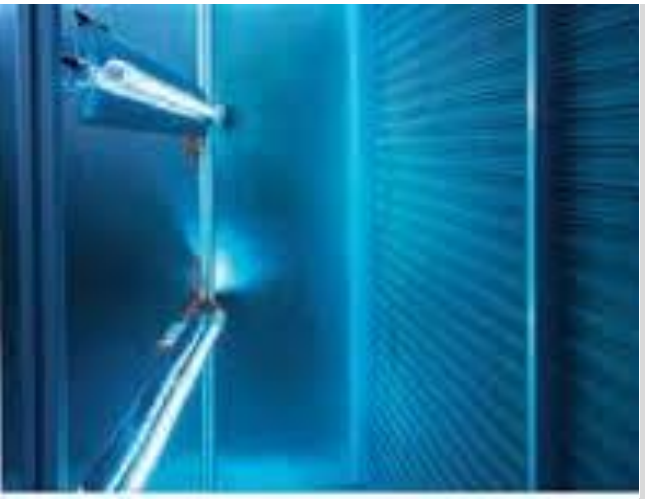
Daylighting

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

Wellbeing facility

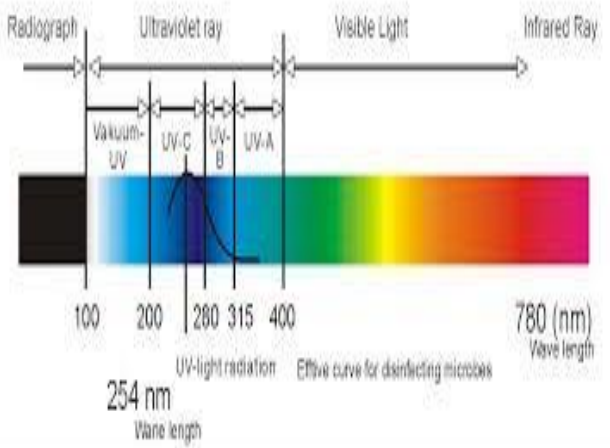
- Providing occupant well-being facilities, so as to enhance physical, emotional and spiritual well-being of building occupants.

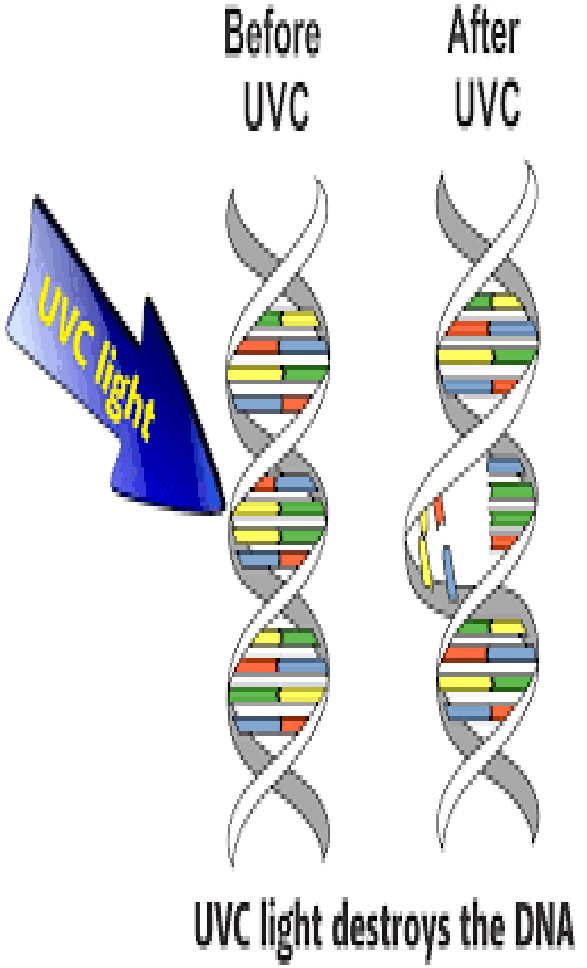
Indoor Air Disinfection in AHU / Space through UVGI Solution (UV-C)



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 µW/cm² 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 & 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

Central Monitoring of Assets	Fault Detection & Diagnostics	Correlation and Trending	Improved Asset Health, Performance	Enhanced Energy Efficiency	Condition Based Asset Maintenance
IBP is the nerve center of the entire building operations at CapitaLand India	Connected devices of all kinds and integration with IBP create large amounts of data. FDD rules applied on this data provide insights on deviations / outliers	Corelate various data points to understand the impact of one data point over the other, which can be used for trending & decision making towards long term design changes	Regular monitoring and outlier management lead to early identification and closure of defects leading to high availability, health & optimized asset performance	A healthy and optimally performing asset with appropriate design modifications lead to avoidance of energy leakages	The current model of planned preventive maintenance can be moved over to condition based maintenance over a period

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

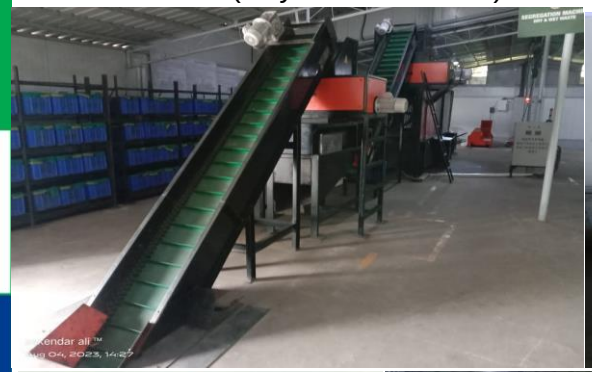
Process Chart

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

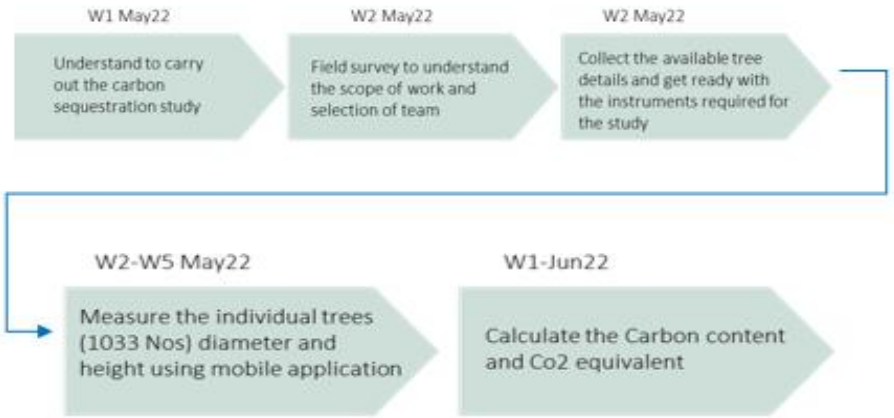
Step - 6
Garden waste in Shredder Machine to use in OWC

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

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



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.

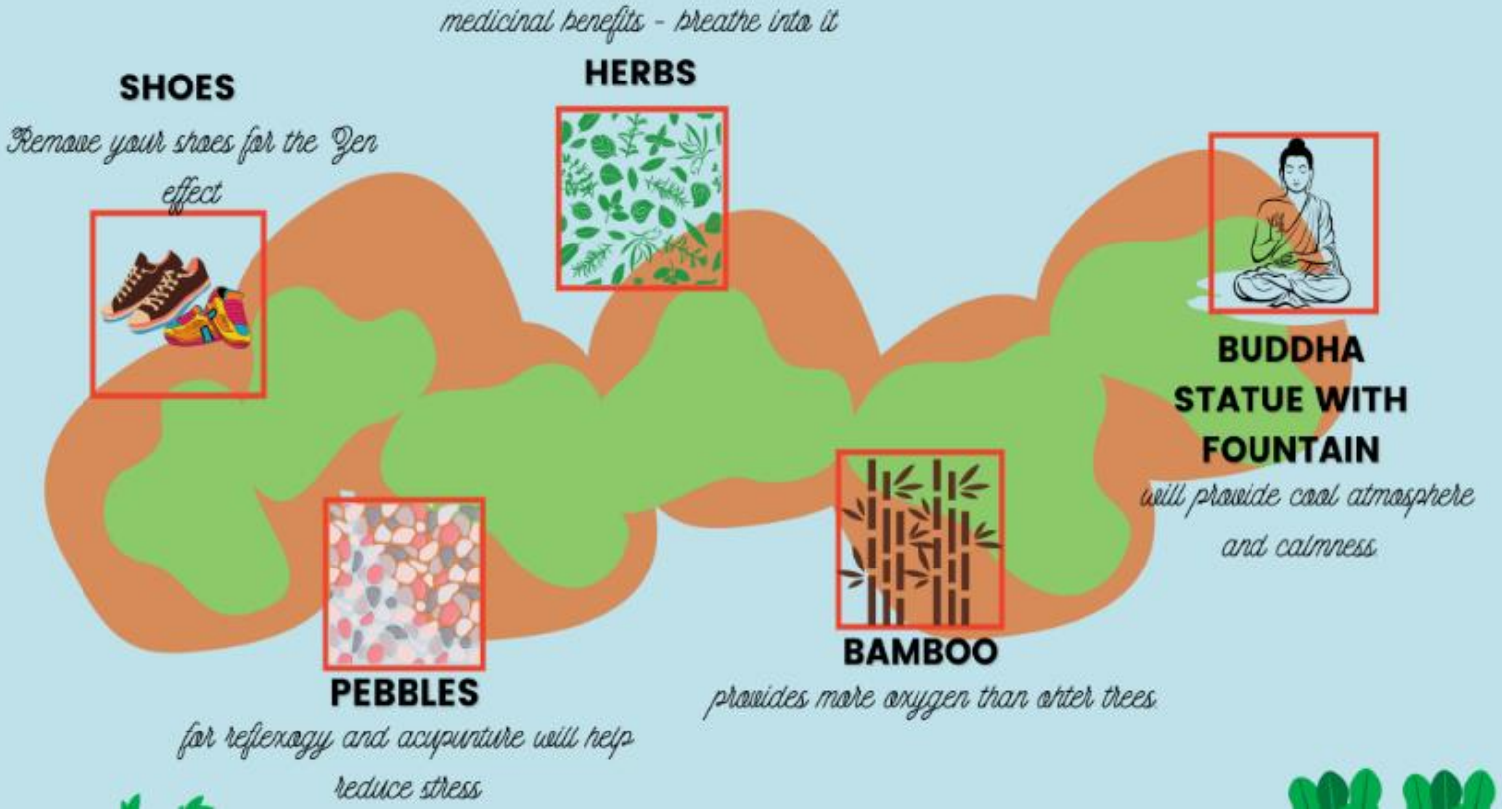
Pebbles: This walk will revitalize your body. Walk barefoot to improve your blood circulations and lower your blood pressure. Such a grounding will also aid in reducing inflammation and help improve your sleep.

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



The Healing Garden @ ITPB

Awards & Accolades

Thank You