# 25th National Award

# *for*

# Excellence in Energy Management 2024

# “Shantiniketan Properties Private Limited”, [Noida]

# Energy & Sustainability Team

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INDIA-operations

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ESG

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*Assistant Manager*
ESG

**Ms. Kritika Sharma**
*Executive*
ESG

# Brookfield Properties India

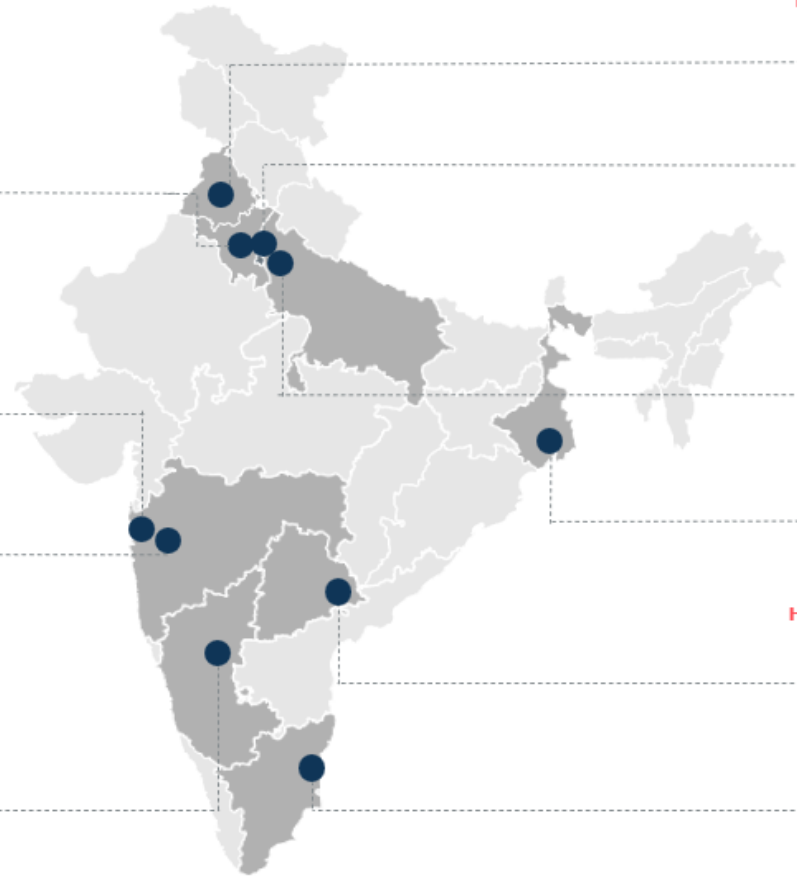
## Brookfield Properties | India

**Gurugram** 9.2M SF
- Candor TechSpace, Sector 48
- Candor TechSpace, Sector 21
- Worldmark, Sector 65
- Airtel Center

**Mumbai** 8.5M SF
- Downtown Powai
- Equinox
- Floors in Godrej BKC
- Waterstones

**Pune** 2.1M SF
- 45Icon
- Bluegrass Business Park

**Bengaluru** 13.9M SF
- Azure
- Centennial
- Ecospace
- Ecoworld
- Ecoworld 4D
- Galleria
- NXT



**Ludhiana** 0.4M SF
- Pavilion Mall

**Delhi** 1.4M SF
- Worldmark, Aerocity

**Noida** 7.3M SF
- Candor TechSpace Sector 135
- Candor TechSpace Sector 62

**Kolkata** 5.7M SF
- Candor TechSpace
- Baytown

**Hyderabad** 3.6M SF
- New development

**Chennai** 2.6M SF
- Millenia Business Park

Brookfield Properties Assets

Under development

#Area stated above includes under construction area and future developments potential
#For Godrej BKC 0.1 M SF is future acquisition (under ROFR)

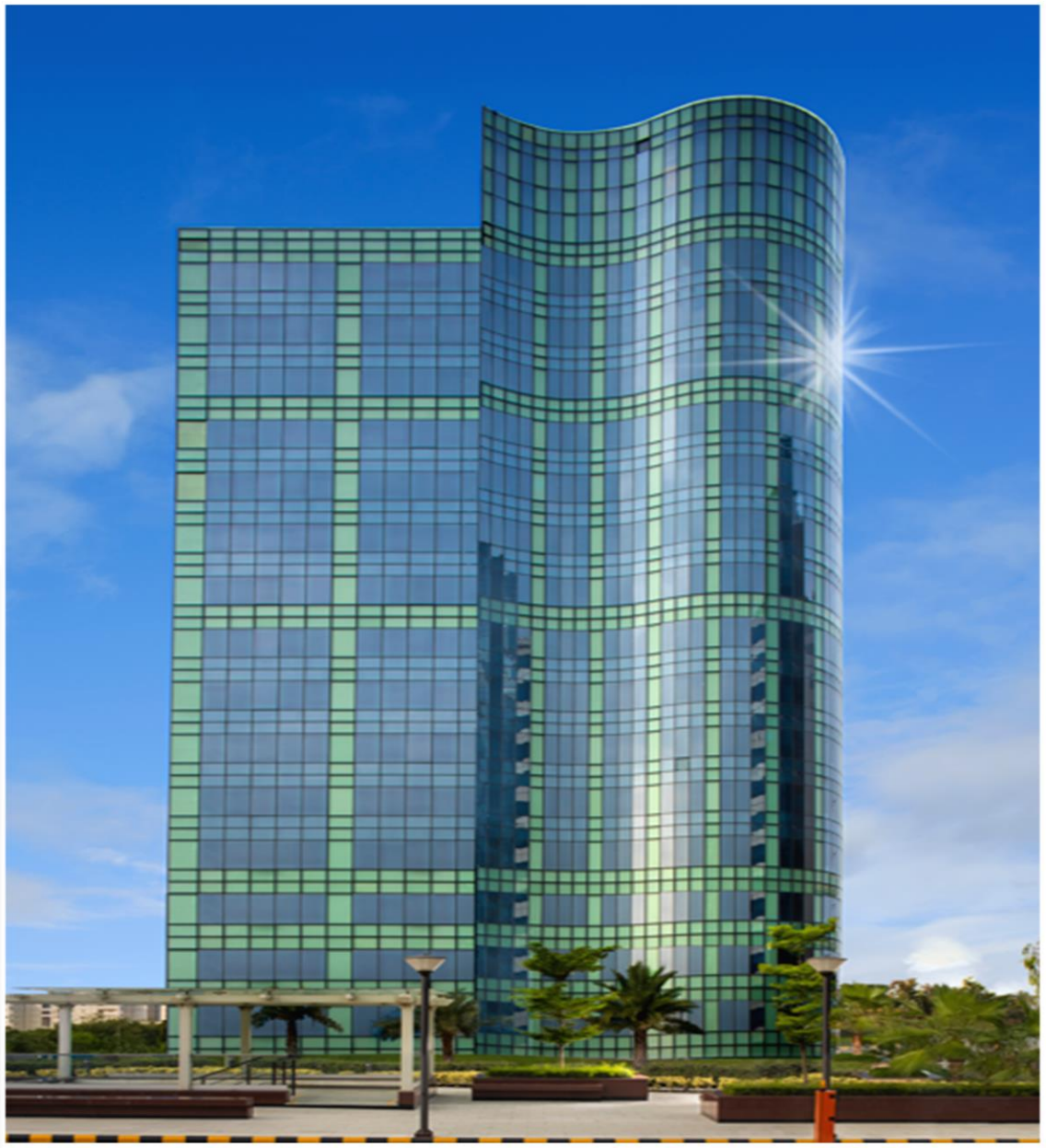
| | |
|---|---|
| 26 | Assets |
| 10 | Cities |
| 55 | M SF total area |
| 41 | M SF operational area |
| ~5 | M SF under development area |
| ~9 | M SF future development |
| $8B | Gross asset value |
| 450+ | Diverse tenants |

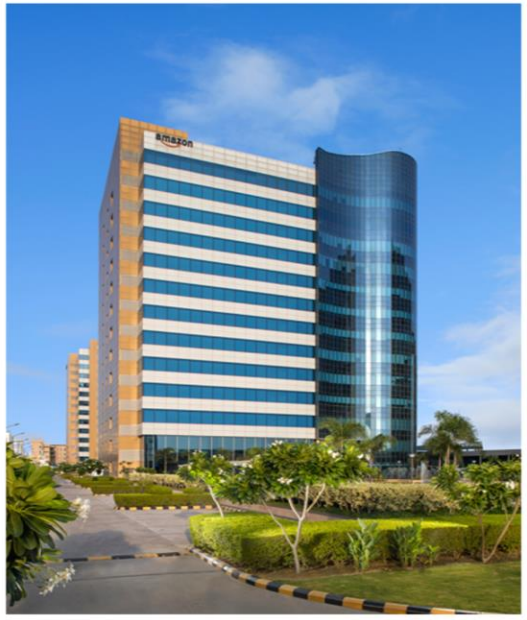
# Campus at a GLANCE..!!

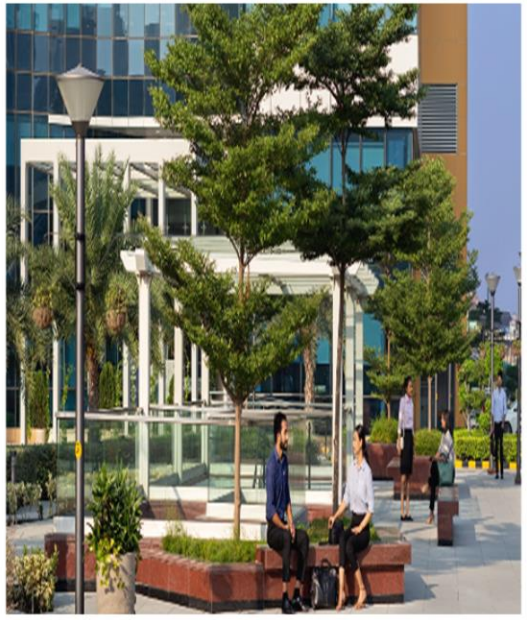
| Entity Name | Shantiniketan Properties Pvt. Ltd. |
|---|---|
| Land Area | 19.3 Acres |
| Project Highlights | Sustainable features that include<br>• Energy efficient chillers with ATCS<br>• Rooftop Solar system<br>• CTI certified cooling towers<br>• AHUs with EC Fans & ES Filter<br>• 100% LED lights<br>• Water-efficient landscaping<br>• Zero water discharge campus achieved through Sewage treatment plant (STP) with ultra-filtration<br>• High-performance glazing system to allow minimal heat gain while maximizing pleasant daylight ingress<br>• Electric vehicle charging stations<br>• Zero Wet Waste Discharge campus achieved through Organic waste composter |
| Amenities | • Breakout Area<br>• Restaurant & Food Courts<br>• Daycare<br>• Indoor and outdoors well being facilities |


Future Development

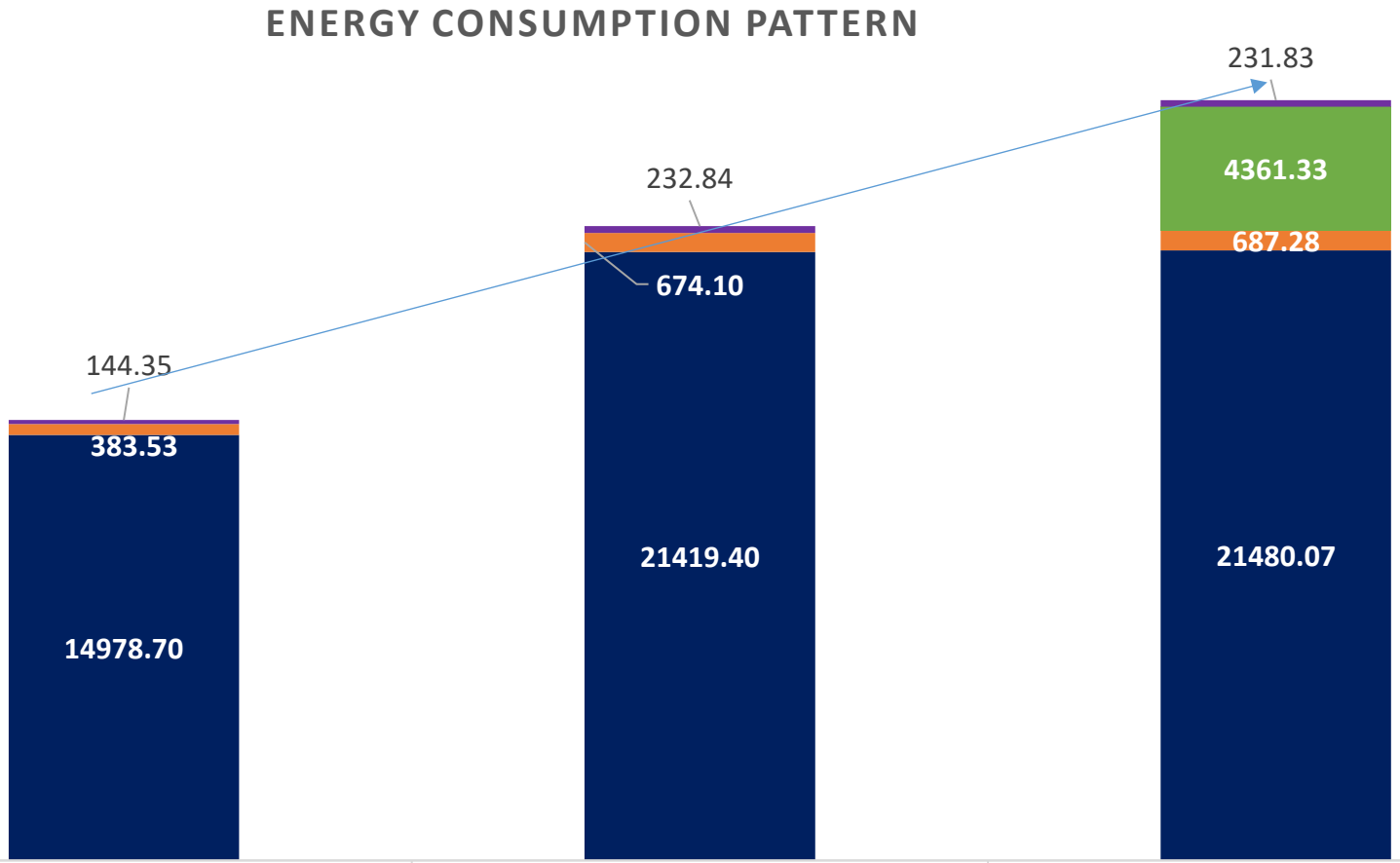
# Campus at a GLANCE..!!



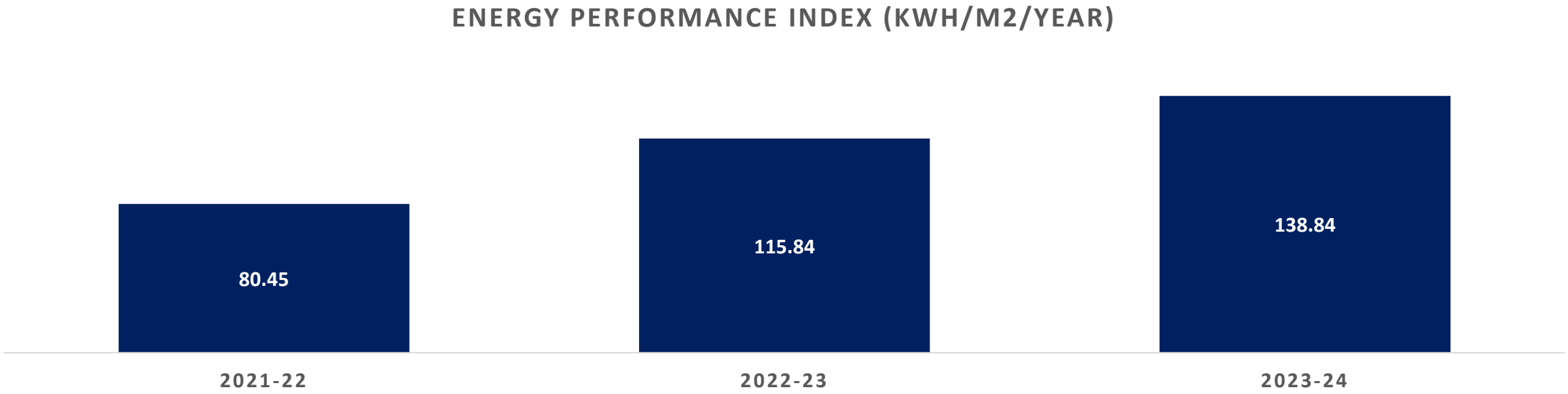
# Energy Performance



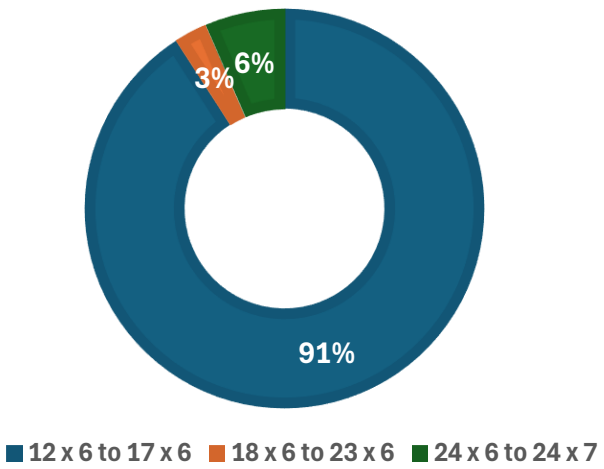

| | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|
| Renewable Energy - Onsite (MWH) | 144.35 | 232.84 | 231.83 |
| Renewable Energy - Offsite(MWH) | | | 4361.33 |
| DG sets Energy(MWH) | 383.53 | 674.10 | 687.28 |
| Grid Energy(MWH) | 14978.70 | 21419.40 | 21480.07 |

- Energy consumption increased from FY2022 to FY2024 due to higher physical occupancy, which rose from 36% in FY22 to 66% in FY23 and 95% in FY24.
- Renewable energy sourced through IEX/open access is included in FY24.

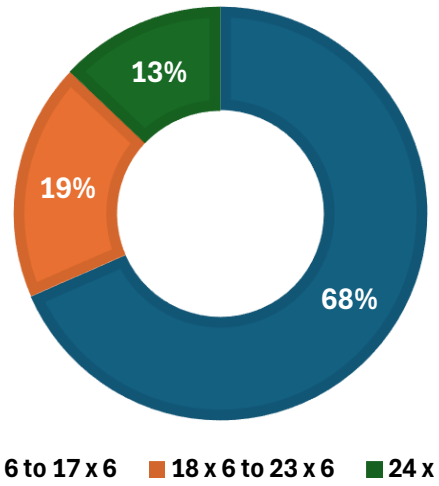
# Energy Performance…..Contd.



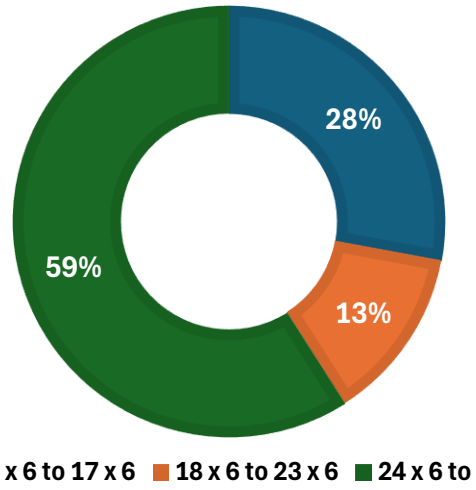

FLOOR OPERATIONAL AREA FY(2021-22)



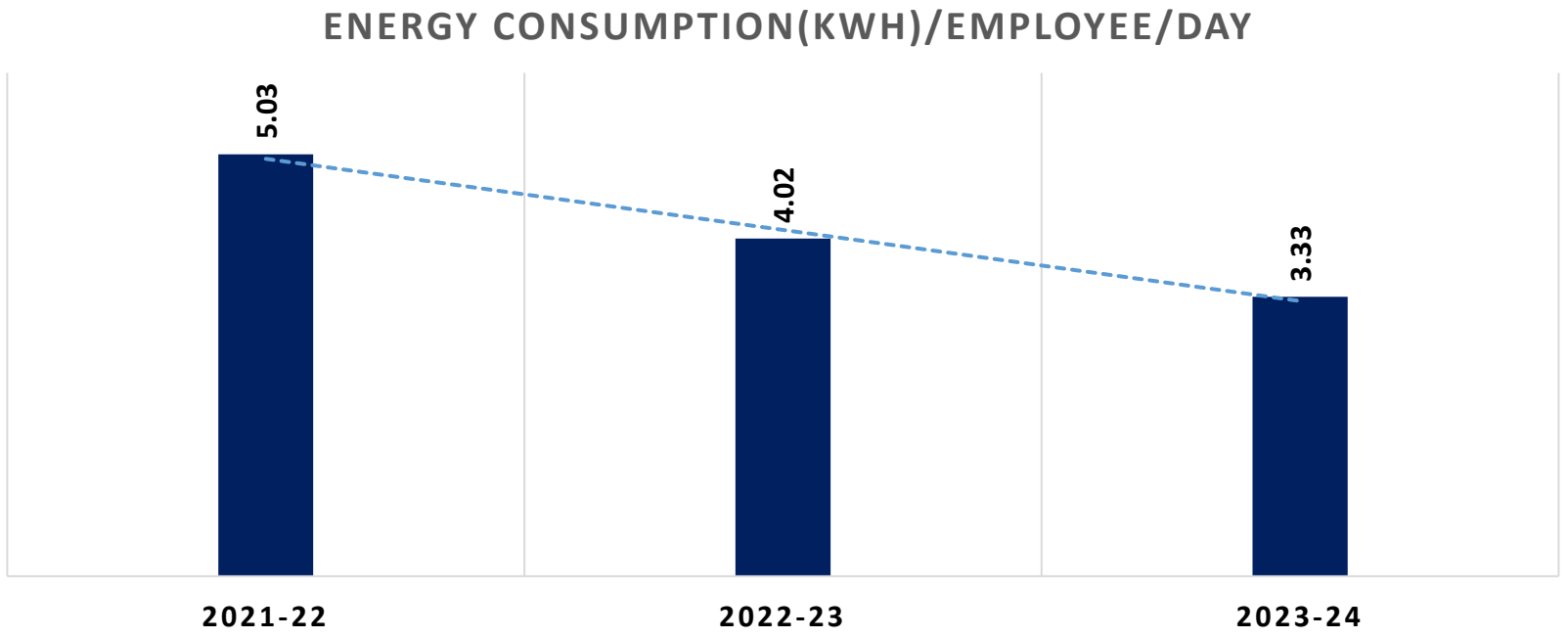

FLOOR OPERATIONAL AREA FY(2022-23)




FLOOR OPERATIONAL AREA FY(2023-24)



# Energy Performance…..Contd.

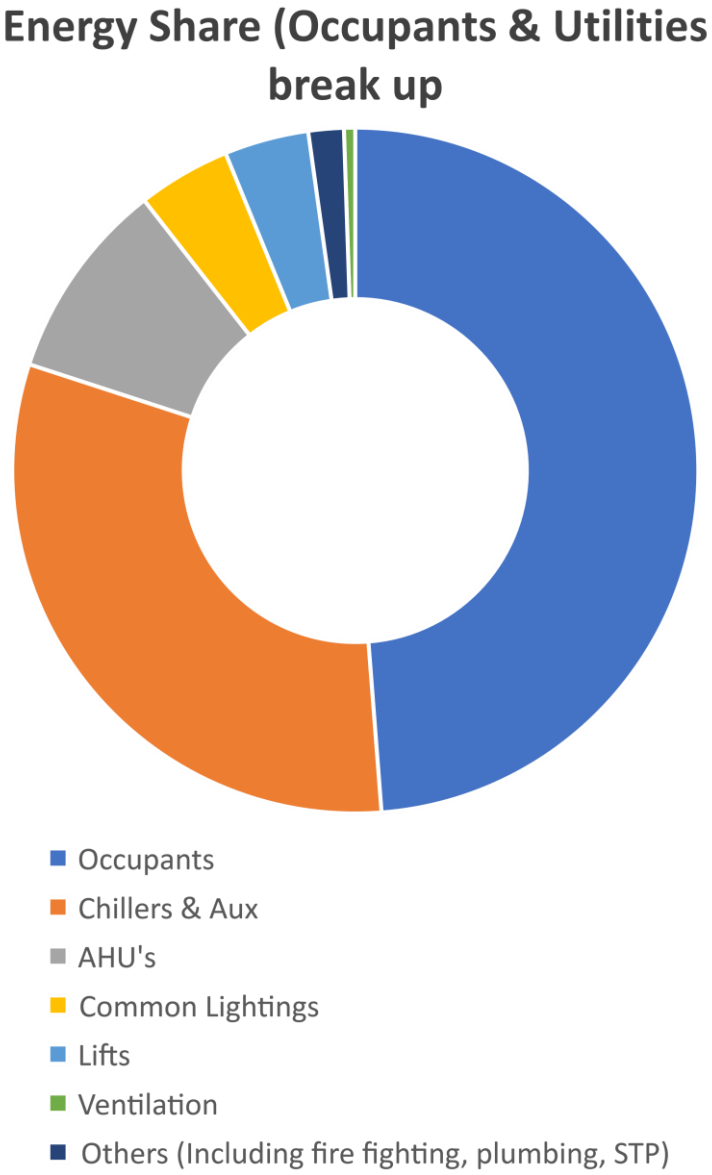



- EPI Increase: EPI rose by 73% from FY22 to FY24 due to a 160% increase in occupancy rate during the same period.
- HVAC Intensity (kWh/Employee): Reduced by 34.7% from FY22 to FY24.
- Energy Consumption (kWh/Employee/Day): Decreased by 33.8% from FY22 to FY24.

# Energy Mapping

## Energy Share of Major Utilities

| Section | Share of Energy (%age) |
|---|---|
| **Occupants** | **49%** |
| **Common Area Consumption** | |
| **Chillers & Aux** | **31.2%** |
| **AHUs** | **9.4%** |
| Common Lightings | 4.4% |
| Lifts | 4.0% |
| Ventilation | 0.5% |
| Others (Including Fire fighting, Plumbing, STP) | 1.7% |
| **Common Area Consumption** | **51%** |
| **Total** | **100%** |



# Major Encon Project Planned in FY25

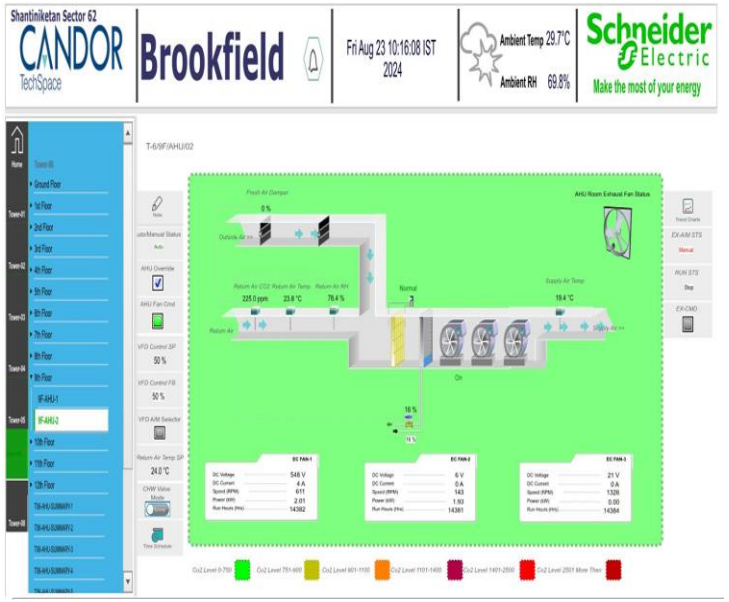
| Major Encon Projects | Description | Status | EDC |
|---|---|---|---|
| HVAC Ring Main Line System | All the individual plant rooms to be inter-connected so that single plant room can supply chilled water to two or more buildings. Higher energy savings due to optimal loading of chillers during low load period. | Installation in progress | Dec-24 |
| Automation of chemical dosing in HVAC cooling tower | Installation of automatic chemical dosing and bleeding systems to manage water quality and impurity levels in HVAC cooling towers, and an automatic tube cleaning system to remove fouling and scaling from condenser tubes for efficient heat exchange. | Completed | |
| Water Automation | Automating water tank levels to conserve energy and water involves implementing systems that monitor, control, and optimize water usage in real-time. | Yet to start | Nov-24 |

# Energy savings projects implemented in last three years

| Year | Major EM Project Implemented | Investment (INR Million) | Energy Saving ( Million kWh) | Cost Savings ( INR Million) |
|---|---|---|---|---|
| FY 2021-22 | 4 | 1.64 | 0.34 | 3.8 |
| FY 2022-23 | 6 | 54.95 | 2.1 | 23 |
| FY 2023-24 | 3 | 6.58 | 0.72 | 6.6 |

## Photographs:

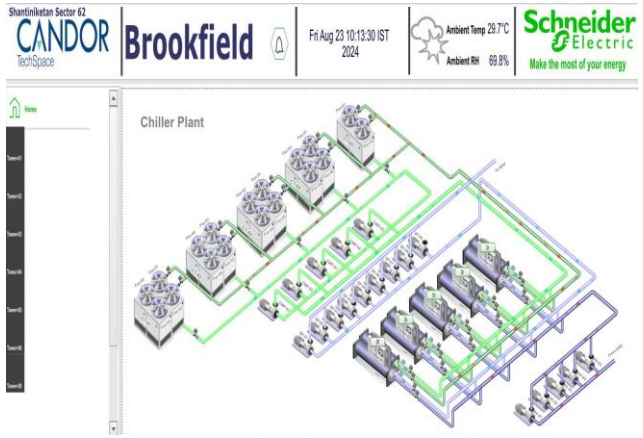
Actuator valve replacement



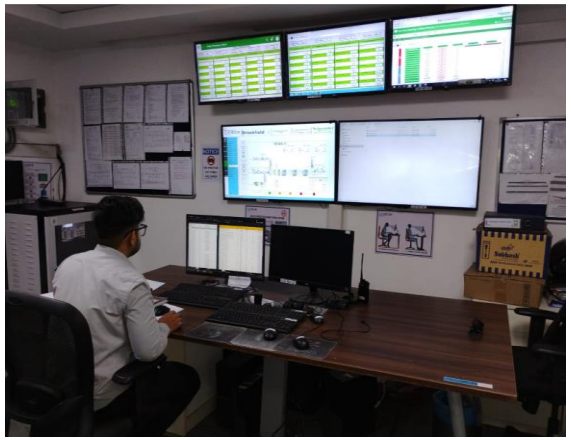

Demand control ventilation

EC Fan Retrofitting

# Energy savings projects implemented in last three years…..Contd.




**Chiller Plant Optimizer**



**Centralized Building Management System**

**ESP Filter Retrofitting**

**PLC SCADA for DG Set**

**Cooling Tower Upgradation**

**Exhaust fan integration with CO sensor in Basement**

# Innovation Project-1: Integration of STP Exhaust Fan with $H_2S$ and $CH_4$ Sensor

**Background:** STP plants generate various gases, including methane ($CH_4$), hydrogen sulfide ($H_2S$), ammonia ($NH_3$), and carbon dioxide ($CO_2$), during the treatment process. Exhaust fans help to remove these potentially harmful gases from the plant to ensure a safer working environment.

**Challenges:** Exhaust fans operate continuously at full capacity, regardless of actual demand, leading to unnecessary energy consumption and higher operational costs.

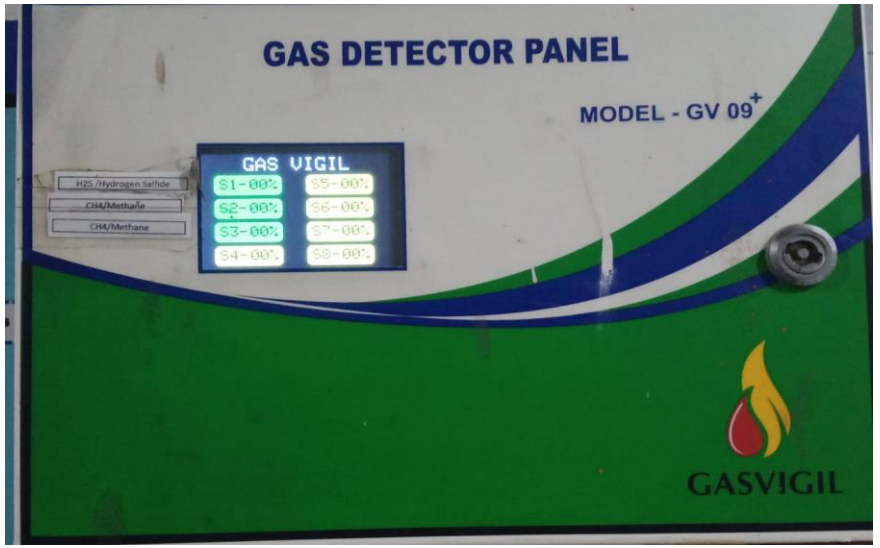
**Proposed System:** Integrated methane and hydrogen sulfide ($H_2S$) sensors with an STP plant exhaust fan to enhancing energy efficiency while maintaining safety and operational effectiveness.

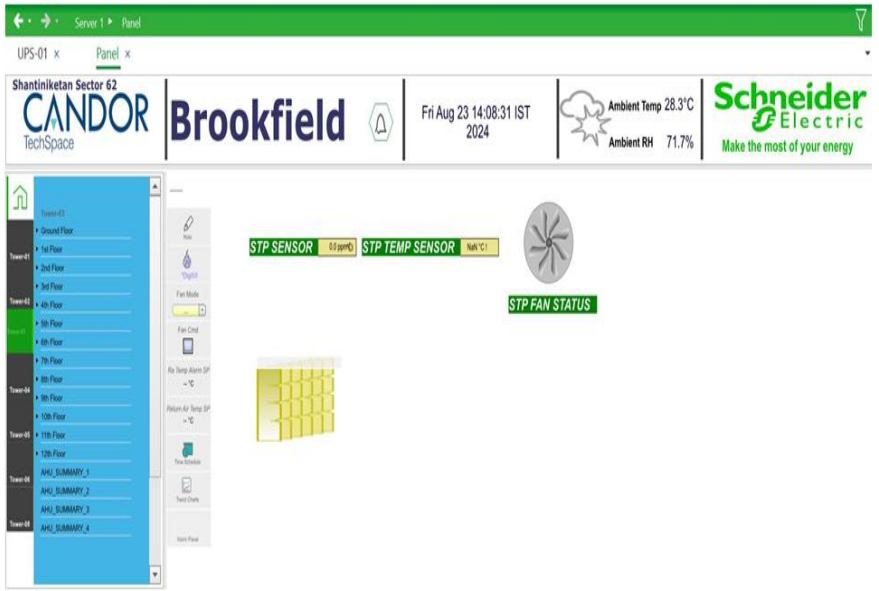
**Advantages:**

- Reduces energy consumption by operating the exhaust fan only when needed, based on real-time gas detection.
- Optimizes exhaust fan use, preventing unnecessary wear and tear, and extending equipment lifespan.
- Provides early warning for dangerous gas levels, improving workplace safety

**Cost benefit analysis:**

| | | |
|---|---|---|
| Total Investment | : | 4.5 Lacs |
| Annual Electrical energy saving | : | 39420 kWh |
| Annual Cost Saving | : | 3.85 Lacs Rs. |
| Payback | : | 14 months |



# Innovation Project-2: IOT Based data analytics tools

**Purpose:**
The tool is designed to monitor energy consumption, forecast future energy needs, schedule the use of green energy through IEX/Open access, and integrate with occupant and equipment meters.

**Functions and Features:**
- Real-Time Monitoring: Detects anomalies
- Forecasting: Analyzes historical data to predict future energy needs.
- Green Energy Scheduling
- Compares energy consumption to identify improvement areas.
- Auto-Invoicing

**Advantage:**
- Energy Efficiency: Optimizes use and reduces waste through real-time monitoring.
- Cost Savings: Lowers costs by using green energy.
- Offers accurate billing
- Provides actionable insights for better energy management.
- Sustainability: Enhances sustainability by integrating green energy and reducing reliance on non-renewables.

**Cost Benefit Analysis:**

| | | |
|---|---|---|
| Total Investment, Lacs Rs. | : | 22.4 Lacs |
| Annual Electrical energy saving | : | 66901 kWh (Estimated) |
| Annual Cost Saving | : | 36.38 Lacs Rs. (Including Renewable cost) |
| Payback | : | 07 months |

# Innovation Project-3: Automatic chemical dosing, bleeding for HVAC cooling towers, and chiller condenser tube cleaning system

**Background:** Chemical dosing and bleeding was done manually, which resulted in overuse or underuse of chemicals, leading to poor water quality and higher condenser approach and operational costs.

**Challenges:**

- Increased scaling and fouling
- Reduce heat exchange efficiency
- Higher energy and water consumption
- Increased maintenance cost
- Shortened equipment lifespan
- Poor water quality

**Proposed System:** Installed automatic chemical dosing and bleeding systems to manage water quality and impurity levels in HVAC cooling towers, and an automatic tube cleaning system to remove fouling and scaling from condenser tubes for efficient heat exchange.

**Advantages:**

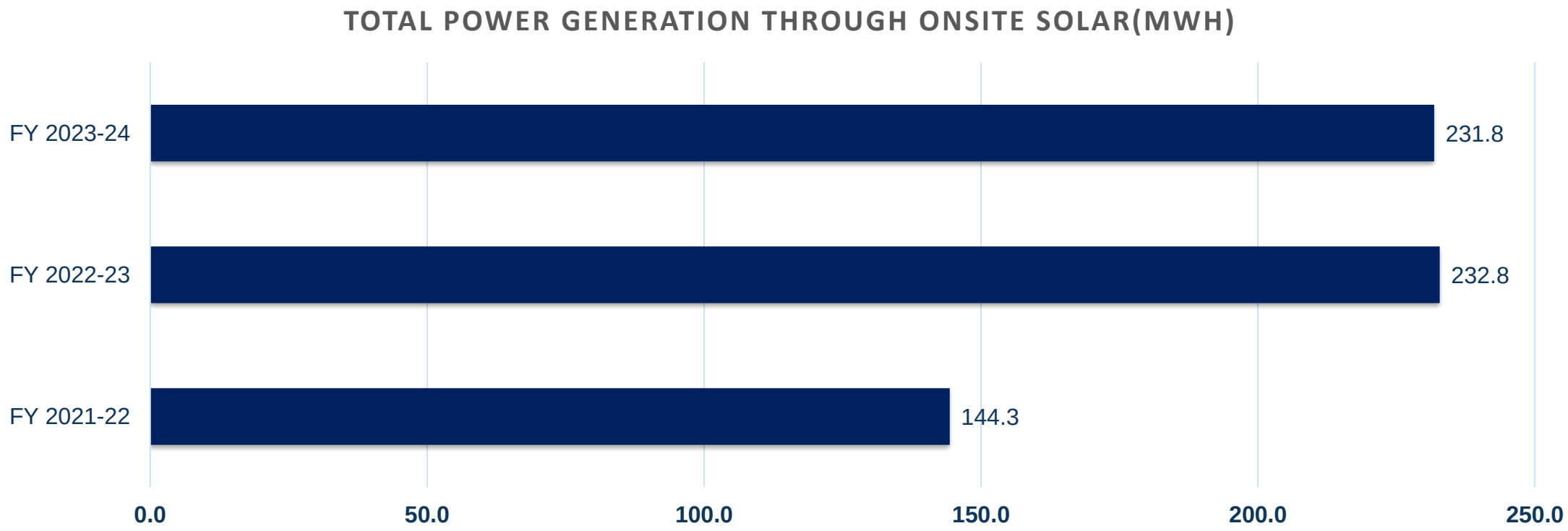
- **Energy Savings:** Maintains heat transfer efficiency and prevents scaling and fouling.
- **Water Conservation:** Manages the cycle of concentration (COC) to reduce water use.
- **Extended Equipment Life:** Prevents damage and wear caused by fouling, prolonging equipment lifespan.

**Cost benefit analysis:**

| | | |
|---|---|---|
| Total Investment, Lacs Rs. | : | 13.80 Lacs Rs. |
| Annual Electrical energy saving | : | 157584 kWh |
| Annual Cost Saving | : | 14.78 Lacs Rs. |
| Payback | : | 11 months |

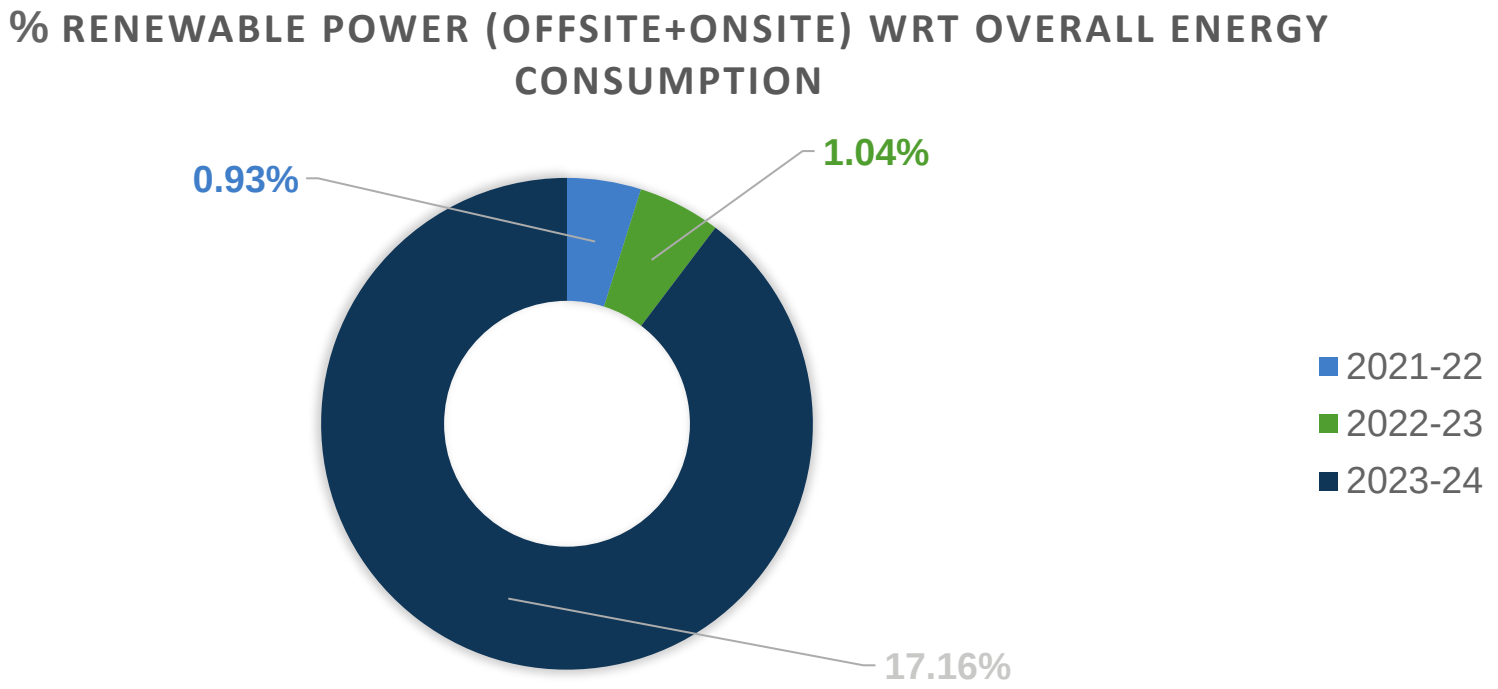
# Utilization of Renewable Energy Sources (Onsite)

| Year | Source | Installed Capacity in MW | Total Generation through Solar(MWH) | Overall consumption (MWH) | % Share with overall energy Consumption |
|---|---|---|---|---|---|
| FY 2021-22 | Solar | 0.107 | 144.3 | 15,507 | 0.93% |
| FY 2022-23 | Solar | 0.177 | 232.8 | 22,326 | 1.04% |
| FY 2023-24 | Solar | 0.177 | 231.8 | 26,761 | 0.87% |

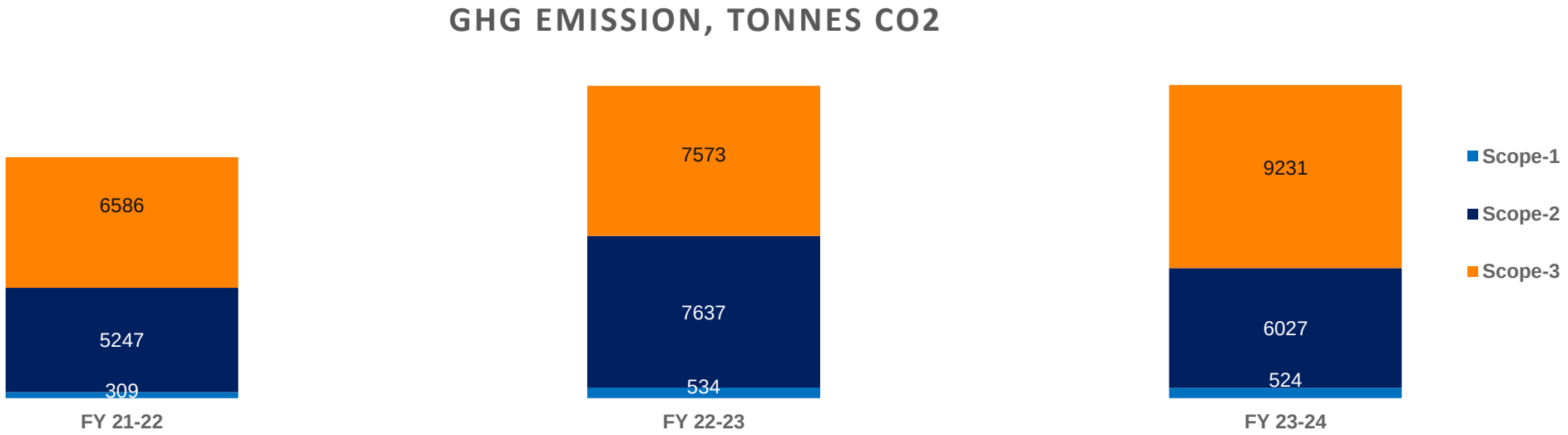


# Utilization of Renewable Energy Sources (Offsite)

| Offsite Renewable Energy (Through IEX) | | | |
|---|---|---|---|
| Year | Total Renewable Energy (MWH) Purchase | overall consumption (MWH) | % Share with overall energy Consumption) |
| FY 2021-22 | 0 | 15,507 | 0% |
| FY 2022-23 | 0 | 22,326 | 0% |
| FY 2023-24 | 4,361 | 26,761 | 16.3% |



# GHG emission and Net Zero target




Nifty 19,310.15 ↓ -55.10 FEATURED FUNDS Canara Robeco Equity T... 5Y RETURN ↑ 14.2 % INVEST NOW Search Stock Quotes, News, Mutual Funds and more

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Business News › Industry › Services › Property / C'struction › Brookfield Properties India advances net-zero target by 10 years to 2040

## Brookfield Properties India advances net-zero target by 10 years to 2040

By Kailash Babar, ET Bureau • Last Updated: Dec 01, 2022, 05:22 PM IST

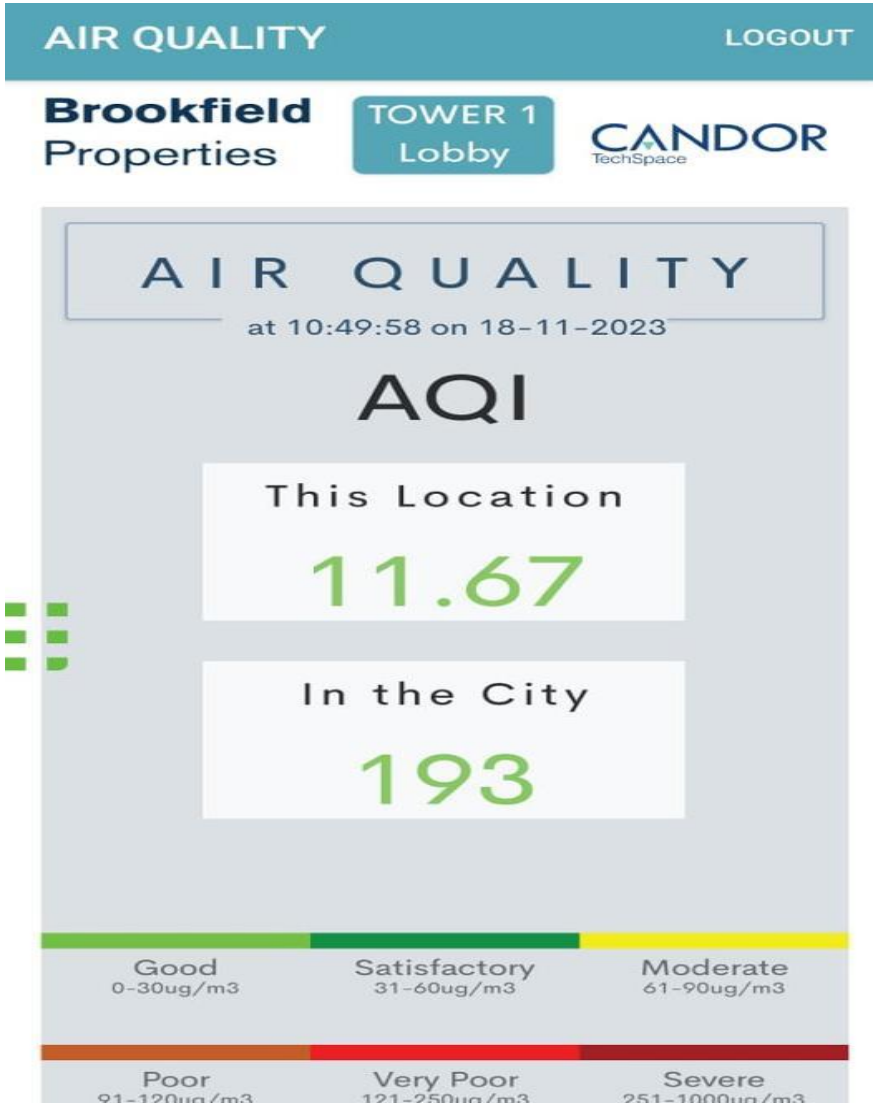
SHARE FONT SIZE SAVE PRINT COMMENT

# Indoor air quality

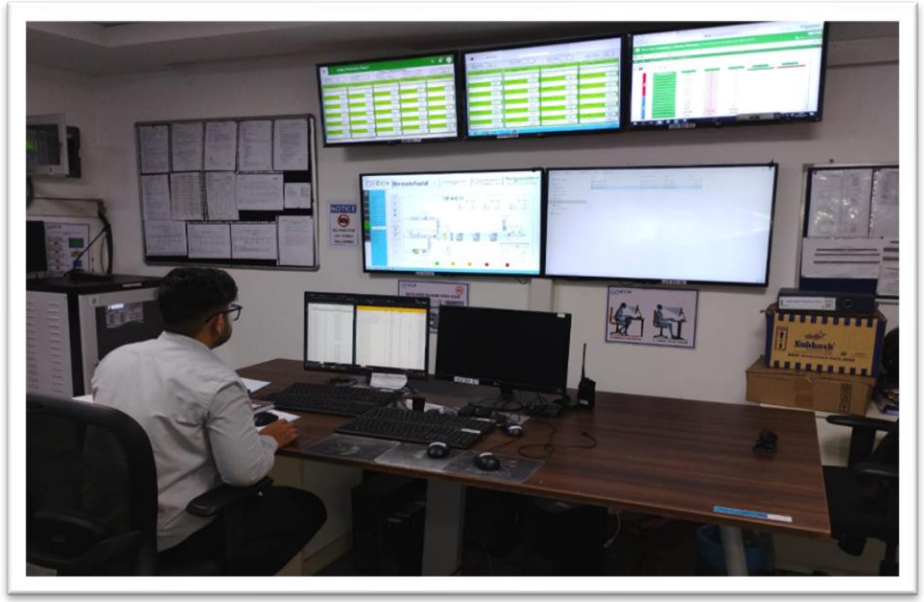
- **Monitoring IAQ parameters (CO, CO2, PM2.5, PM10, TVOC etc.) at building levels**
- **Implementing solutions to control the IAQ parameters**

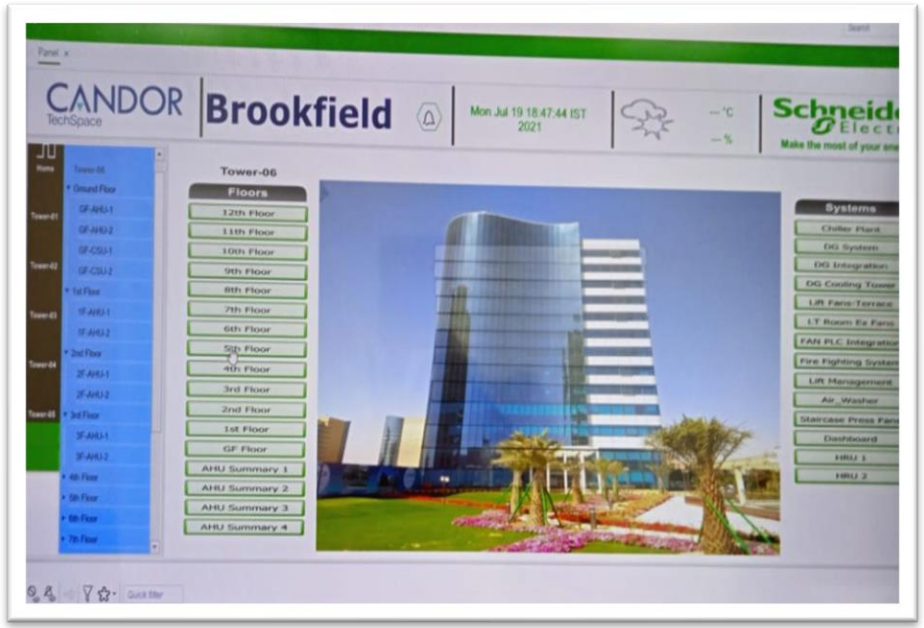
**>95%**

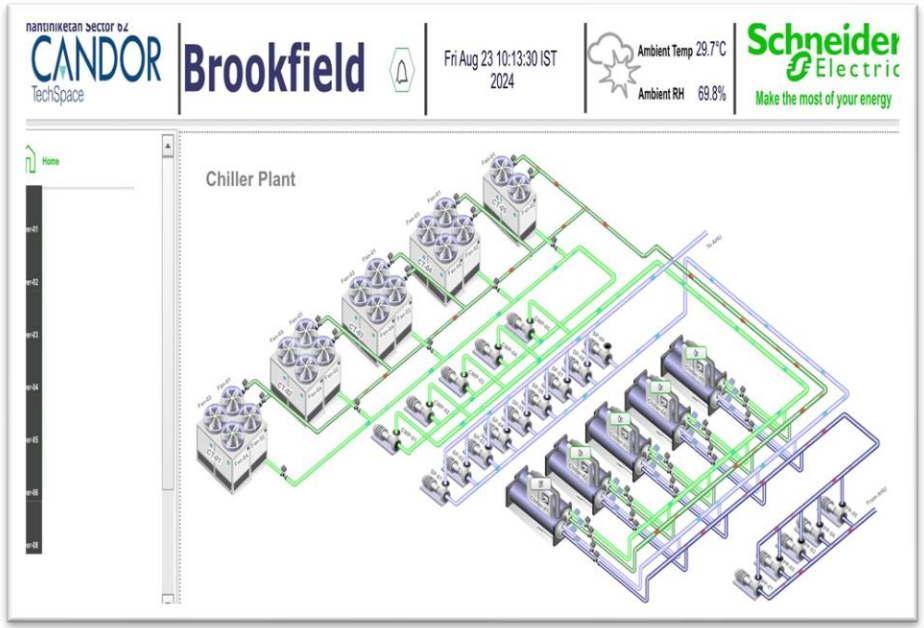
Efficiency of filtering of PM10 and PM2.5 entrapment



# Building Management System



# Awards and Certifications

## Committed to deliver on our Net Zero target by 2040 or sooner.




## KEY ESG CERTIFICATIONS


GREEN BUILDING RATING


5 STAR RATING


BEE 5 STAR RATING


ISO 50001 CERTIFICATION


ISO 9001, ISO 14001 & ISO 45001 CERTIFICATION

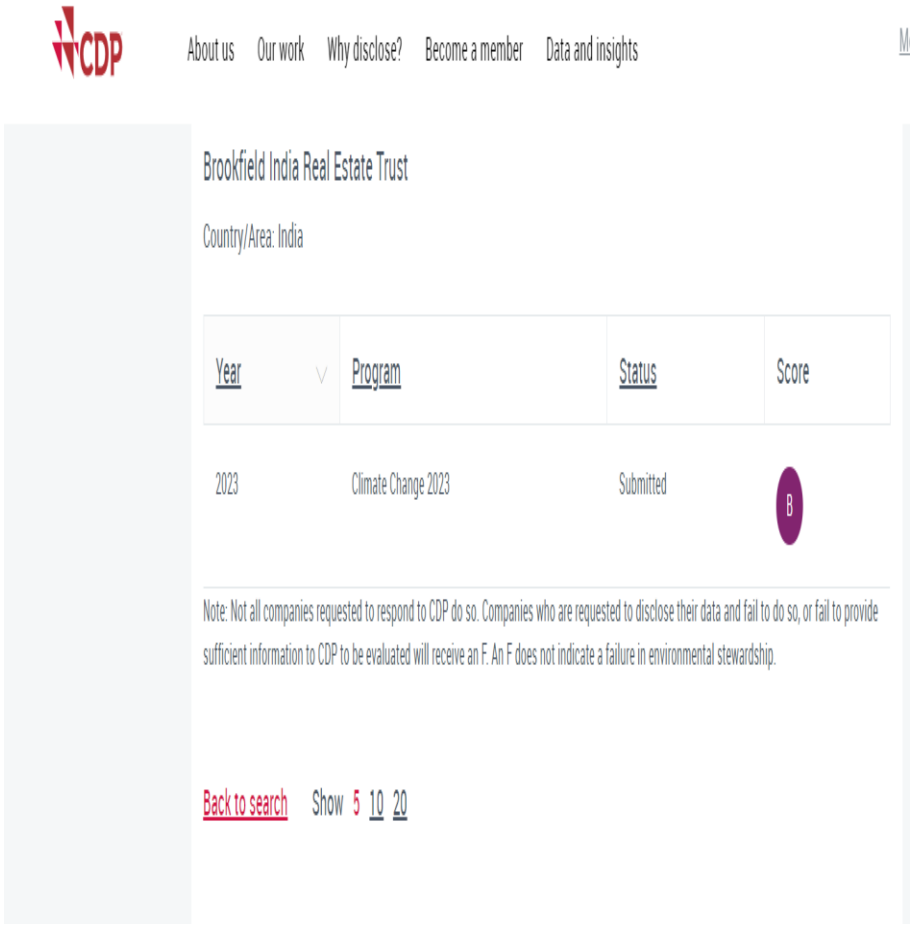

5 STAR RATING


Health, Safety & Hygiene


5S – Gold Rating

# Net Zero Action Plan

## Public Disclosure & Voluntary Initiatives

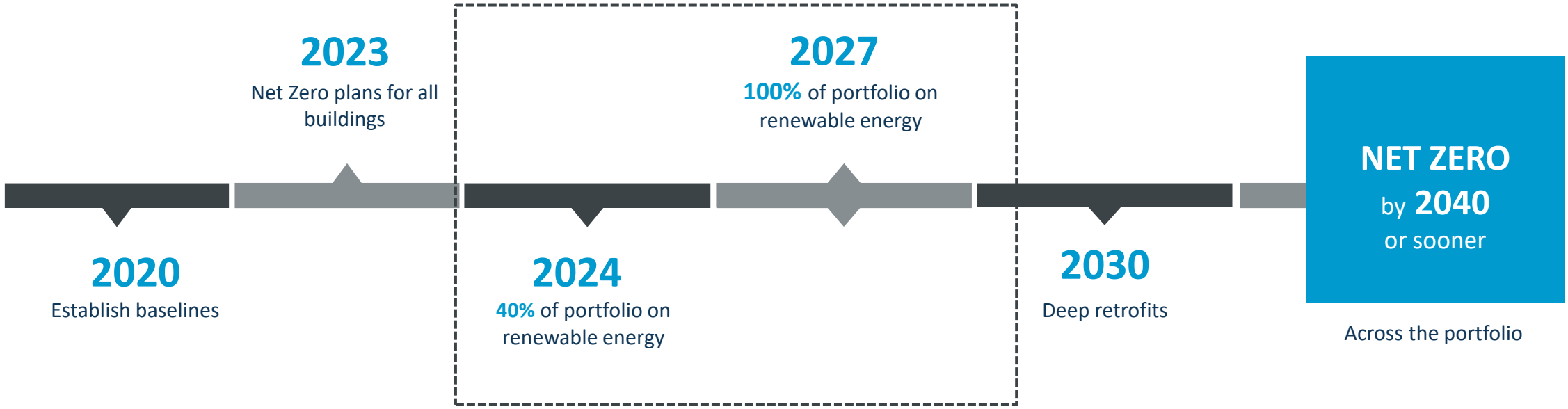



CDP


SBTi

# Our Commitment to Net Zero

**Committed to industry-leading sustainable development to deliver long-term value to our business, partners and communities**




| OUR DECARBONIZATION STRATEGY | Reductions in energy demand and consumption at every asset | Renewable energy sourcing across assets | Judicious use of offsets for remaining emissions |
|---|---|---|---|

Following **science-based targets** methodology in business operations.

Committed to setting **science-based targets** by
- 2024 for the REIT portfolio
- 2025 for rest of the portfolio

# Zero Emission Program

**We are considering a three-pronged approach that prioritizes energy reduction and renewable energy procurement**

## Net zero emissions

### 18%*

**Energy efficiency and end of life upgrades**

- Direct investment in ROI projects
- Equipment at end of life that will be replaced by efficient solutions
- Assisting Occupants in adopting energy efficiency

### 75%*

**Renewable energy procurement**

- To provide energy replacement for both common area as well as Occupant occupied area

### 7%*

**Carbon offsets**

- Providing solutions for Occupants with targets sooner than 2040

** Estimated average asset energy profile, varies with type of asset, location and hours of operations*

# Renewable Energy Strategy- Short Term

**We have considered a multi-pronged approach for renewable energy procurement in order to progress towards our goal of net zero emissions by 2040**

**Short Term (2024-25)**

**ENERGY EXCHANGE (IEX)**

**% Load on Renewable Energy ~35-40%**

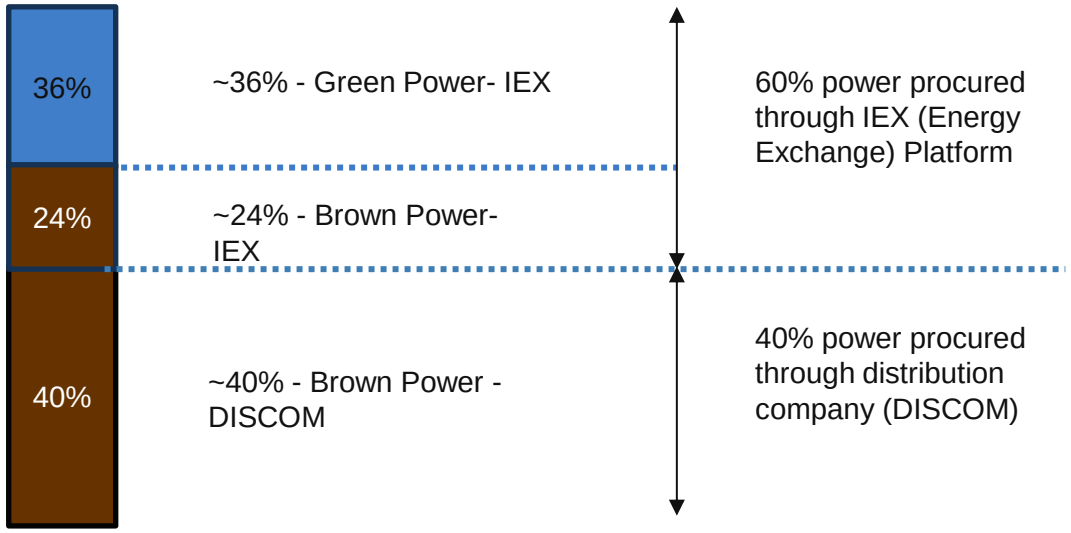
**INCLUDES:**

- PROCUREMENT FROM IEX THROUGH 3RD PARTY TRADERS

**COMMERCIALS:**

MARKET BASED (DEMAND/SUPPLY)

**TIMELINES: IMPLEMENTED-APRIL2024**



# Renewable Energy Strategy- Medium/Long Term

**In the long term we intend to transition to our owned Renewable energy plant in a phased manner by 2027.**

**Medium/ Long Term**

**3RD PARTY OPEN ACCESS**

**% Load on Renewable Energy**
**~95%**

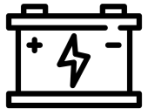
**INCLUDES:**

- SOLAR
- WIND FARM
- STORAGE

**COMMERCIALS:**

IN PROGRESS

Candor Techspace ← STATE ← CENTRAL GRID ← **3rd Party Open Access Source**



Estimated Timelines for Renewable Energy

Phase 1 – Q2CY24 – Solar (40%)

Phase 2 - Q2CY25 – Solar + Wind (~70%)

Phase 3 - Q2CY27 – Solar + Wind + Storage (95%)

- Will allow us to meet our long term decarbonization targets
- Occupant areas will be supplied through 3rd Party Open Access
- Common areas will be supplied initially through 3rd Party open access and post regulatory approvals through group captive from owned plant in Bikaner
- Rates will be cheaper than current DISCOM supplies

# Water Snapshot

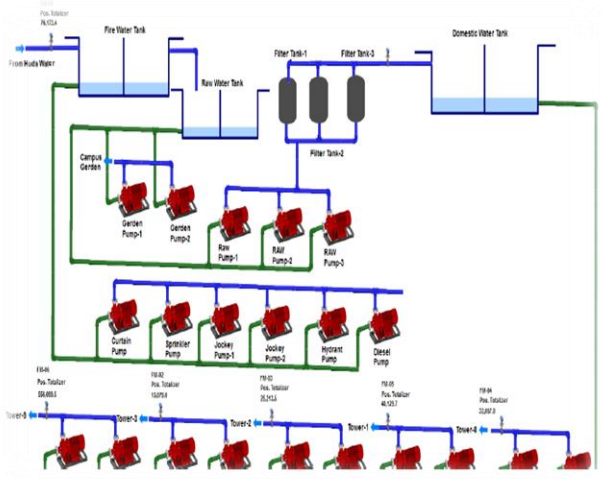
## DRIP IRRIGATION

## INSTALLATION OF WATER EFFICIENT FIXTURES


## RAIN WATER HARVESTING PITS


## SEWAGE TREATMENT PLANT

## FLOW METERING INTEGRATION



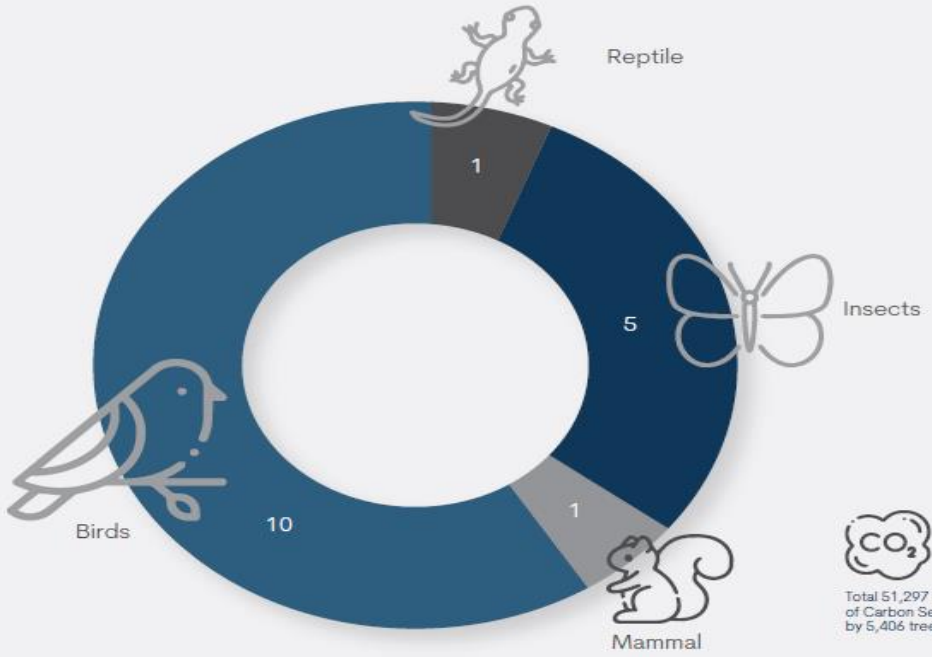

## DROUGHT TOLERANT SPECIES

# Biodiversity Profile

## Candor TechSpace, Sector 62, Noida

**Existing biodiversity profile**

- Total 19% green cover with 100% ecological connectivity.
- Habitat comprising of 83 floral species.
- 49% floral species are native to India.
- Habitat supporting 17 faunal species.
- Simpson's Biodiversity Index (SBI) value for trees, shrubs, herbs, and climbers was found to be 0.77, 0.50, 0.17 and 0.72 respectively.
- Less than 1% of invasive species were noted.




Total 51,297 Kg of Carbon Sequestered by 5,406 trees

- Green cover value > 40% of the land area (ground and built structures) is considered as good and 95% ecological connectivity is considered suitable for the faunal species.
- The faunal species value is based on a single visit survey and the diversity and abundance may vary.
- Simpson's Biodiversity Index value ranges between 0 to 1, a value close to 1 indicates higher diversity and evenness.
- The given Carbon Sequestration values are calculated for trees only and do not include other green patches comprising of shrubs, herbs and grass. Also, the Carbon Sequestration value is influenced by factors like the type of species, its girth and height.
- Currently Urban Heat Island (UHI) value has been represented on the right-side, increasing the green cover percentage can help in reducing the UHI effect.
- The images have been processed from USGS Earth Explorer, Landsat.

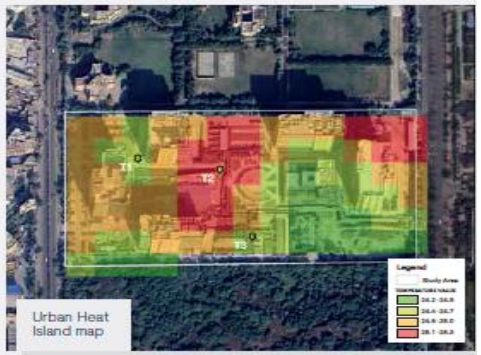
41 Tree species

11 Shrub species

25 Herb species

6 Climber species





# ‘ Thank You’

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