PHOENIX MARKETCITY, BANGALORE

25th National Award for Excellence in Energy Management 2024

INTRODUCTION

PHOENIX MARKETCITY BANGALORE

OUR UNIQUE FEATURES

- Classified as a “Larger Lifestyle Engagement Destination” offering an array of unforgettable experiences.
- Situated at the prime location of East Bengaluru, surrounded with IT parks, luxury residential complexes.
- Phoenix remains ‘The’ destination for the premium discerning customers of the city as well expats with its international look and tastefully done interiors

INTRODUCTION

PHOENIX MARKETCITY BANGALORE

OUR UNIQUE FEATURES

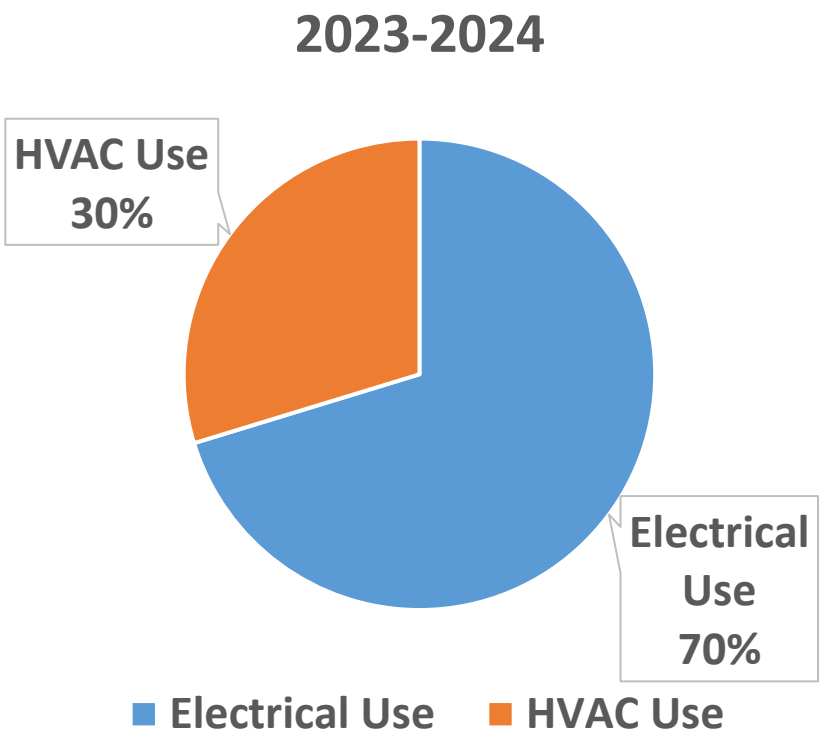
- Over 300 stores, representing an exhaustive mix of International, National and Regional premium brands.
- Phoenix stands out for its enormity with empty spaces, the beautiful courtyard and lung space providing an experience to its patrons.
- The courtyard of 40K Sq ft surrounded by alfresco dining is the epicenter of premium events and concerts.
- This award-winning centre of 1M retail space with the right mix of luxury, premium international and national brands makes it a favoured hang-out and shopping destination.

Architectural Design of the building and Energy efficient features architecturally

- 6Nos Atriums are provided for better Day light.
- Polycarbonate Reflector louver sheet installed in all atrium's roof top for better sun light and heat reflection.
- Entire Roof rainwater treated and utilized in the facility.
- Zero water discharge facility – Complete STP treated water utilized for Cooling tower, Flush and Gardening purpose.
- Automated sliding door installed at all entries and exits to avoid conditioned air loss.
- Electric vehicle charging stations installed to promote clean environment and contributing in Net zero Emission.
- Entire facility façade glass is with Teflon layer for heat reflection.

2. Energy Consumption Overview

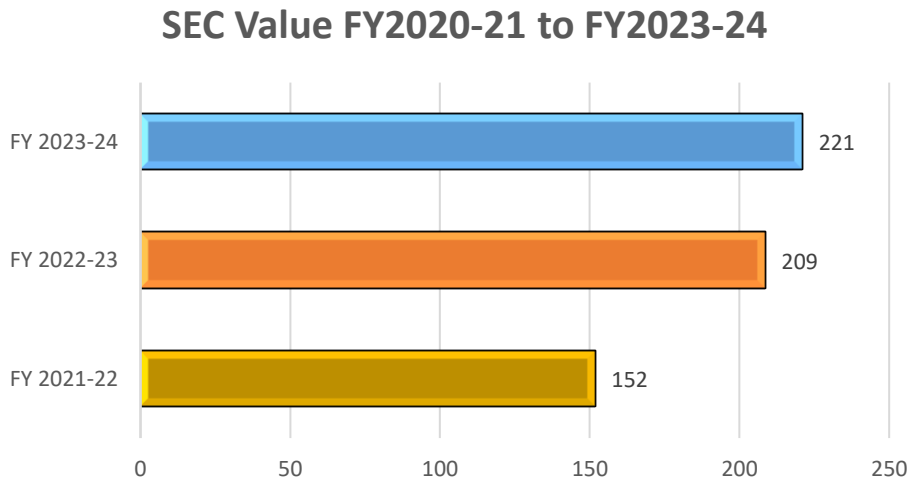
Overall Energy Consumption data				
Year	KWh	Trading Area sqm	Annual total Foot Fall	(KWh/Annu m/sqm)
2021-2022	1,38,21,058	91,009	57,32,470	152
2022-2023	2,00,97,764	96,319	1,13,63,737	209
2023-2024	2,19,43,651	99,277	1,32,52,544	221

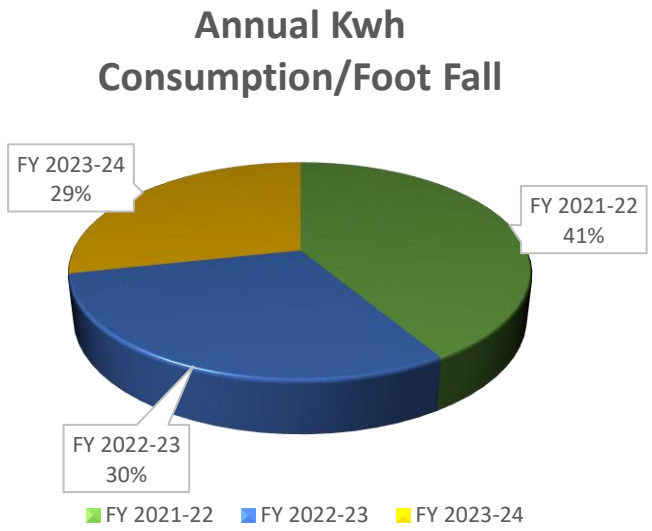


Electrical and HVAC usage FY 2023-24		
Year	Electrical Use	HVAC Use
2023-2024	1,52,60,789	66,82,862

3 Sp. Energy Consumption in last 3 years (FY 21-22 to FY 23-24)

TOTAL ENERGY CONSUMPTION FY 20-21 TO 23-24				
SI NO	MONTH	FY 2021-22	FY 2022-23	FY 2023-24
1	APR	1067818	1639299	1835889.2
2	MAY	236148	1721416	1943461.6
3	JUN	270487	1677337	1905629.8
4	JUL	1128131	1659422	1865036
5	AUG	1297172	1705372	1874920.8
6	SEP	1298562	1653216	1789310
7	OCT	1485741	1757483	1881056.16
8	NOV	1461226	1645182	1767124
9	DEC	1532988	1765571	1816780
10	JAN	1221298	1662334	1733992
11	FEB	1297798	1496082	1689160.08
12	MAR	1523690	1715050	1841291.52
Total Kwh Consumption		**1,38,21,058**	**2,00,97,764**	**2,19,43,651**
Built up area/Trading area in Sqm		**91,009**	**96,319**	**99,277**
Annual Kwh Consumption/m2		**152**	**209**	**221**
Annual total Foot Fall		**57,32,470**	**1,13,63,737**	**1,32,52,544**
Non Operating days		**140 days**	**0**	**0**
Annual Kwh Consumption/Foot Fall		**2.41**	**1.77**	**1.66**

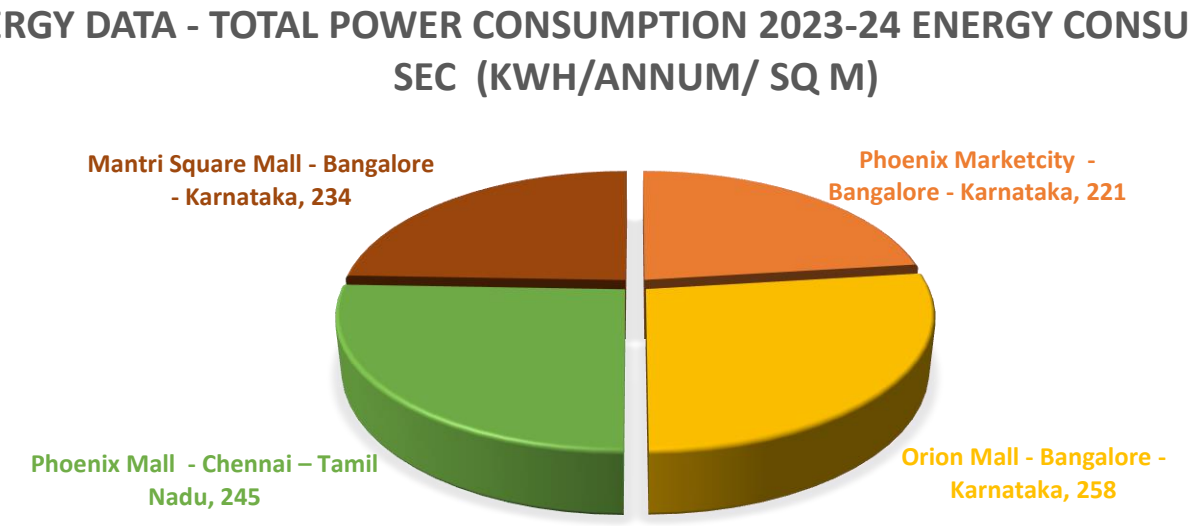




4. Information on Competitors, National & Global benchmark

Mall Name	KWH	Area Sqm	Energy Consumption SEC (kWh/Annum/ Sqm)
Phoenix Marketcity - Bangalore - Karnataka	2,19,43,651	98,473	**221**
Orion Mall - Bangalore - Karnataka	1,96,61,000	76,180	**258**
Phoenix Mall - Chennai – Tamil Nadu	3,21,98,735	1,31,175	**245**
Mantri Square Mall - Bangalore - Karnataka	1,57,44,200	67,224	**234**

Energy Data - Total Power Consumption 2023-24 Energy Consumption SEC (kWh/Annum/ Sq M)



5.1. Energy Saving Project implemented in last three FY.

FY2021-22

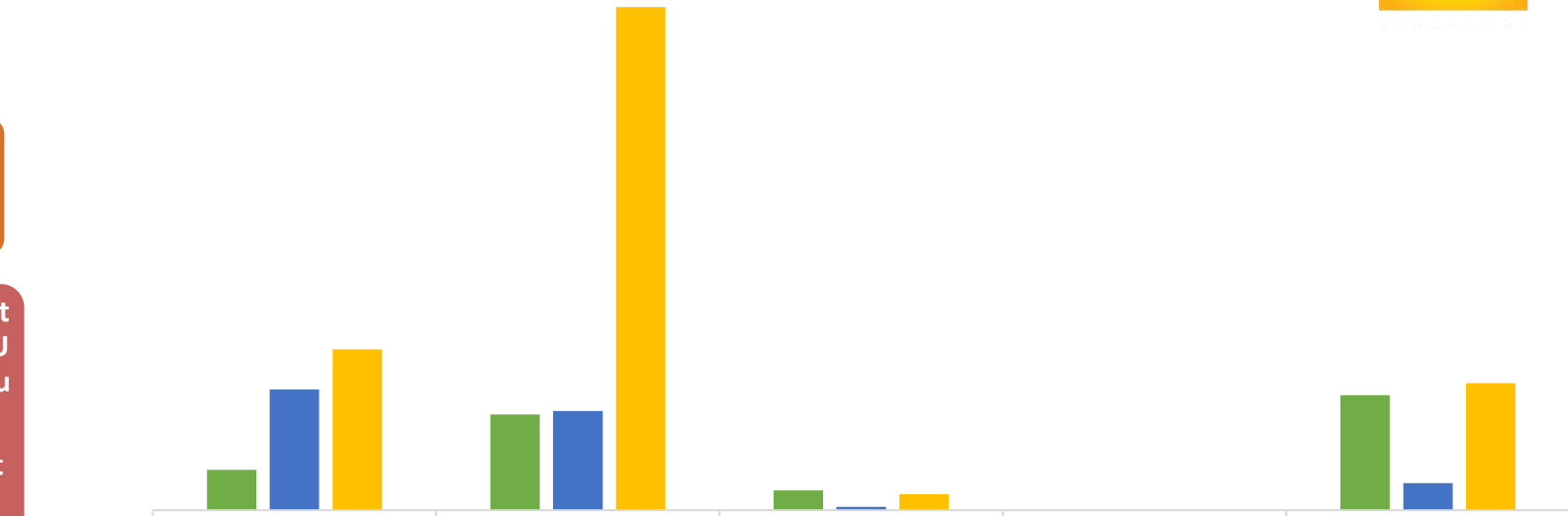
- Installation of Automatic condenser tube cleaning system for Chiller's

FY2022-23

- Energy efficient pumps installation

FY2023-24

- 1. Replacement of existing AHU with Smart Ahu with Ec fans.
- 2. Chiller plant management. (CPM)



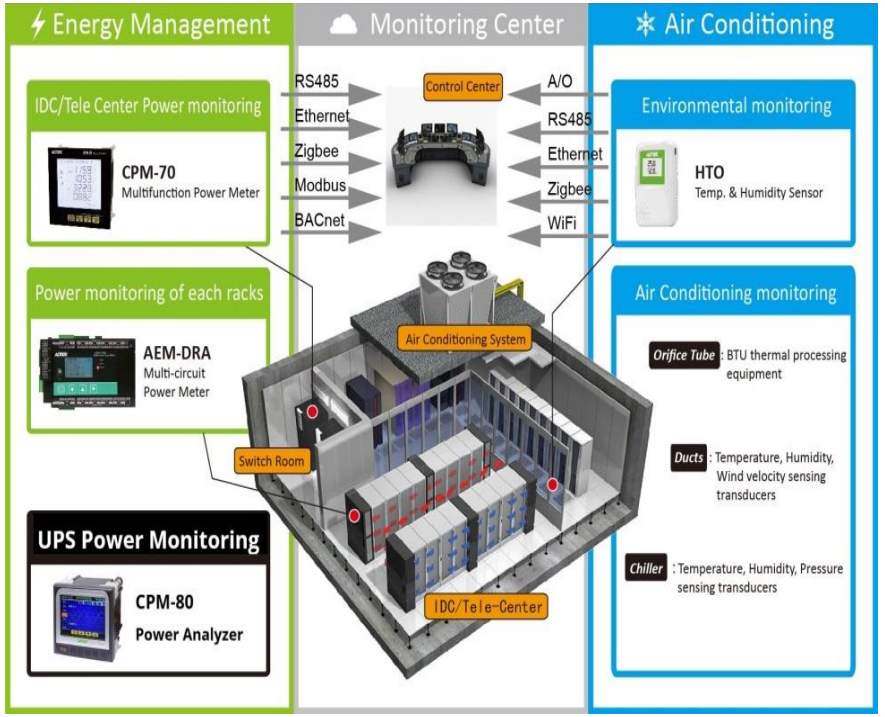
	No of Energy saving projects	Investments(INR Million)	Electrical Savings (Million Kwh)	Thermal savings(Million Kcal/MTOE)	Savings (INR Million)
FY 2021-22	1	2.38	0.49	0.00	2.86
FY 2022-23	3	2.47	0.08	0.00	0.67
FY 2023-24	4	12.52	0.40	0.00	3.16

Year	Description	No of Energy saving projects	Investments(INR)	Electrical Savings (Kwh)	Savings (INR)	TCO2e Reduction
FY 2021-22	Installation of New ATCS for chiller plant	1	₹ 2.38	0.49	2.86	416.50
FY 2022-23	Energy efficient pumps installation	3	₹ 2.47	0.08	0.67	71.36
FY 2023-24	Replacement of existing AHU with Smart Ahu with EC fans & CPM	1	₹ 12.52	0.40	3.16	336.03

6.1.Innovative projects implemented CPM FY23-24

❖ Highlights

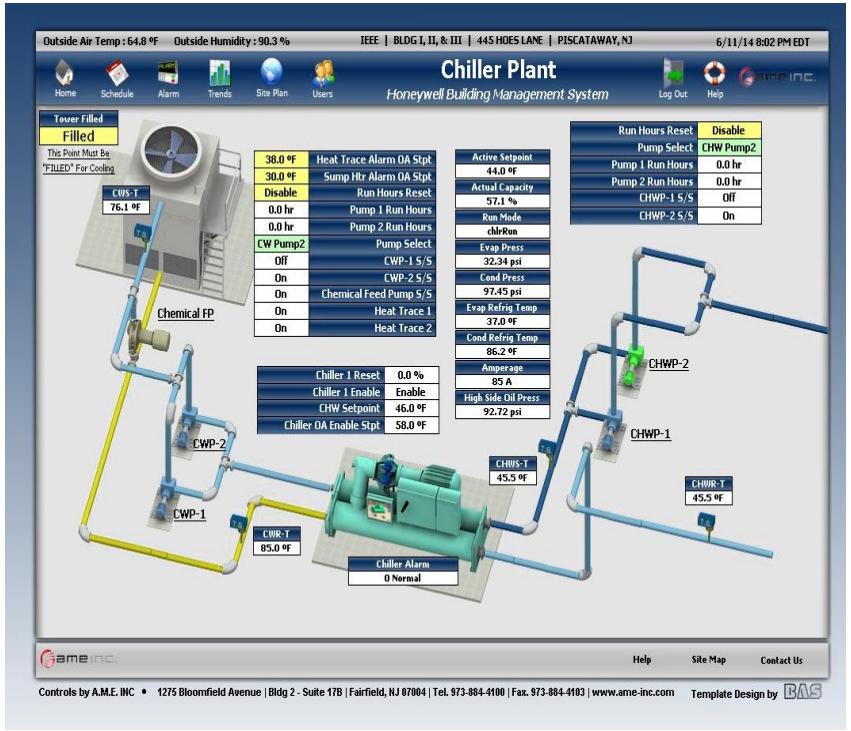
- ✓ **Monitoring and Control:** The CPM continuously monitors various parameters, such as temperature, pressure, flow rates, and power consumption of each chiller and associated components like pumps, cooling towers, and heat exchangers.
- ✓ **Load Management:** The CPM optimally distributes the cooling load among the available chillers to ensure efficient operation. It decides which chillers to run based on current demand, chiller efficiency, and operational constraints.
- ✓ **Sequencing and Staging:** The CPM sequences the start-up and shut-down of chillers to minimize energy consumption and wear and tear on the equipment. It stages the operation of multiple chillers to match the cooling load dynamically.
- ✓ **Energy Optimization:** By analyzing real-time data and using advanced algorithms, the CPM adjusts settings and configurations to achieve the highest possible energy efficiency. This includes optimizing the operation of pumps and cooling towers to reduce energy consumption.



6.1.Innovative projects implemented CPM FY23-24

❖ Highlights

- ✓ **Fault Detection and Diagnostics:** The CPM can detect anomalies and faults in the chiller plant operation, providing alerts and diagnostic information to maintenance personnel. This helps in early identification and resolution of potential issues.
- ✓ **Energy Efficiency:** Chillers are among the most energy-intensive components of HVAC systems. A CPM can significantly reduce energy consumption by optimizing chiller operation, leading to lower utility bills and reduced environmental impact.
- ✓ **Improved Reliability:** By ensuring that chillers operate within their optimal ranges and by providing early fault detection, a CPM enhances the reliability and longevity of the chiller plant, reducing downtime and maintenance costs.
- ✓ **Enhanced Comfort:** A well-managed chiller plant ensures consistent and reliable cooling, maintaining optimal indoor conditions for occupants and processes.
- ✓ **Cost Savings:** Beyond energy savings, a CPM can lower operational and maintenance costs by preventing equipment overuse and by streamlining maintenance activities through predictive diagnostics.



6.3. Innovative projects implemented Smart AHU EC FY23-24

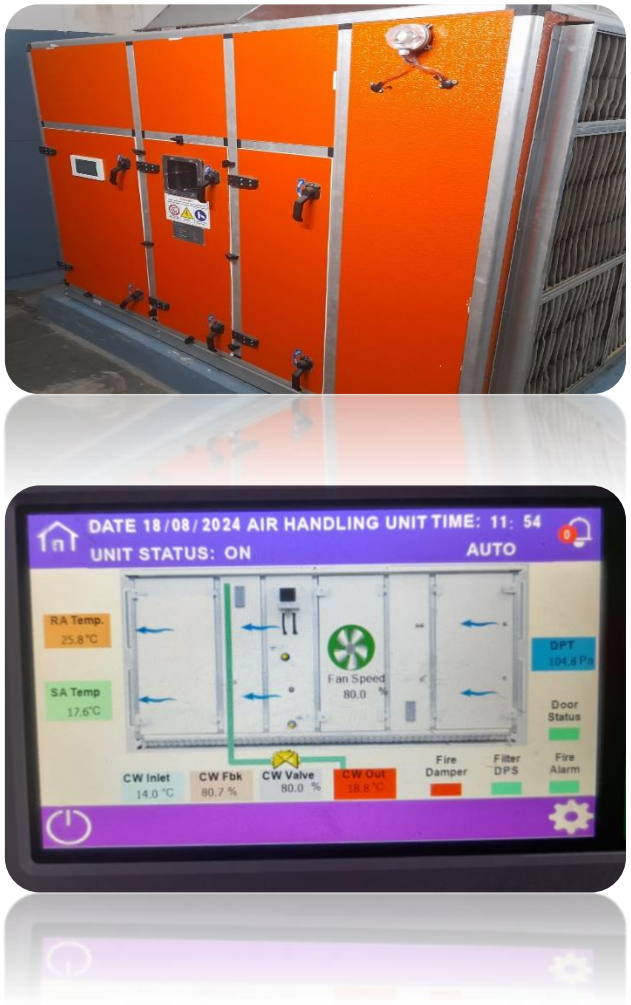
❖ Highlights

- ✓ EC technology uses electronic controls to reach the desired system performance. This means no carbon brushes or belts running the motors which have to be frequently changed from wear and tear. Secondly, EC fans' higher efficiency leads to lower motor temperature, dramatically reducing the amount of waste heat produced. Low motor temperature also improves the life of highly loaded motor parts like windings and bearings. Lastly, varied start-up speeds on EC fans reduce stress on mounting hardware which in turn reduces wear and tear.
- ✓ Reduced energy consumption.
- ✓ Integrated variable speed control capabilities to allow fan performance to accurately match varying air flow requirements without energy wasteful damping.
- ✓ EC motors maintain a high efficiency level at part speeds.
- ✓ Lower motor noise, particularly under speed control.

6.3. Innovative projects implemented Smart AHU EC FY23-24

❖ Highlights

- ✓ On-board motor-electrical protection, no need for external line devices.
- ✓ Remote monitoring enabled via digital and analogue communication ports.
- ✓ Compact motors making them readily interchangeable for retrofits.
- ✓ Run cooler than AC induction motors, reducing heat put into air flow and leads to longer component life.
- ✓ EC fans are a motor, speed controller and impeller built into a single module and do not need belts and pulleys that are associated with more traditional AC induction motor driven fans. This means there is less requirement for maintenance generally.
- ✓ EC fans use up to 70% less energy than AC-fans, this is because they can produce the same output for less input. With less power consumption necessary to run your HVAC system, the installation of EC fans means reduced energy costs in buildings.



6.4. Major Encon Projects planned :2024-25

1

- Replacement of existing CSU & DX Units with Smart EC fans.
- Energy efficient Grundfus pumps for WTP, STP & Chiller pumps.

2

- Installation of Enthalpy sensors for optimum power saving from cooling towers.
- Replacement of 150watt CDMT light with 70watt LED fittings.

3

- New automatic glass sliding door installation of manual doors.

6.5. Major Encon Projects planned :2024-25

❖ Proposed : Installation of CSU & DX Units with Smart EC fans.

- ❖ Innovative description: 1. Requires less space compared to belt drive unit .
- ❖ 2. lower friction loss compared to belt drive therefore higher airflow and more efficiency
- ❖ 3. Requires periodic inspection and maintenance, but maintenance cost is relatively cheaper and convenient
- ❖ 4. Much greater life expectancy that belt drives
- ❖ 5. Very quite in operation.

Compact, low height and low noise
pro-plus ceiling suspended Air Handling Units to fit any ceiling.

Systems that create pleasing environment by diffusing uniformly the required temperature.

Benefits

- ✓ Energy saving by 20 to 25%
- ✓ Annual saving (KWH) 58,400 units
- ✓ Annual saving cost 4,67,200/-

Compact Low Height / Noise Ceiling Suspended AHU

Compact Low height units with low noise levels • Fitted with direct drive

6.6. Major Encon Projects planned :2024-25

❖ Proposed : Replacement of Energy Efficient vertical pumps

1. Existing Mono block motors are 2011 Vintage it require Upgradation.
2. Improving pump efficiency is one way to reduce energy consumption and preserve natural resources, as only enhancing the efficiency of just one pump can save substantial energy.
3. Reduce Energy Costs, Higher Productivity Gains, Lower Maintenance Costs, Improved Operation, Reliable Pumping, Fewer System Failures, Higher Efficiency.
4. Reduce Operation Time
5. Optimize Efficiency Of Pump & Motor
6. Reduce System's Pressure Loss
7. Adjust Pump Speed As Per Requirement
8. Divide The Pump System Into Several Pump Units
9. Periodically Reduce The Flow & Pressure

Benefits

- ✓ Energy saving by 10 to 30%
- ✓ Annual saving (KWH) 87,250 units
- ✓ Annual saving cost 7,00,000/-

6.6. Major Encon Projects planned :2024-25

❖ Proposed : Installation of Enthalpy sensor for Cooling tower

Enthalpy and Energy Efficiency

Optimizing enthalpy is critical to enhancing HVAC energy efficiency. HVAC units can drastically cut the energy needed for heating, cooling, and moisture control by precisely controlling enthalpy. This approach not only decreases utility costs but also aids in protecting the environment. Strategies include selecting equipment that effectively utilizes enthalpy changes and designing systems that minimize unnecessary heat exchange.

Benefits

- ✓ Energy saving by 10 to 30%
- ✓ Annual saving (KWH) 2,10,240 units
- ✓ Annual saving cost 16,81,920/-

6.6. Major Encon Projects planned :2024-25

❖ Proposed : Replacement of 150watt CDMT to LED light fittings

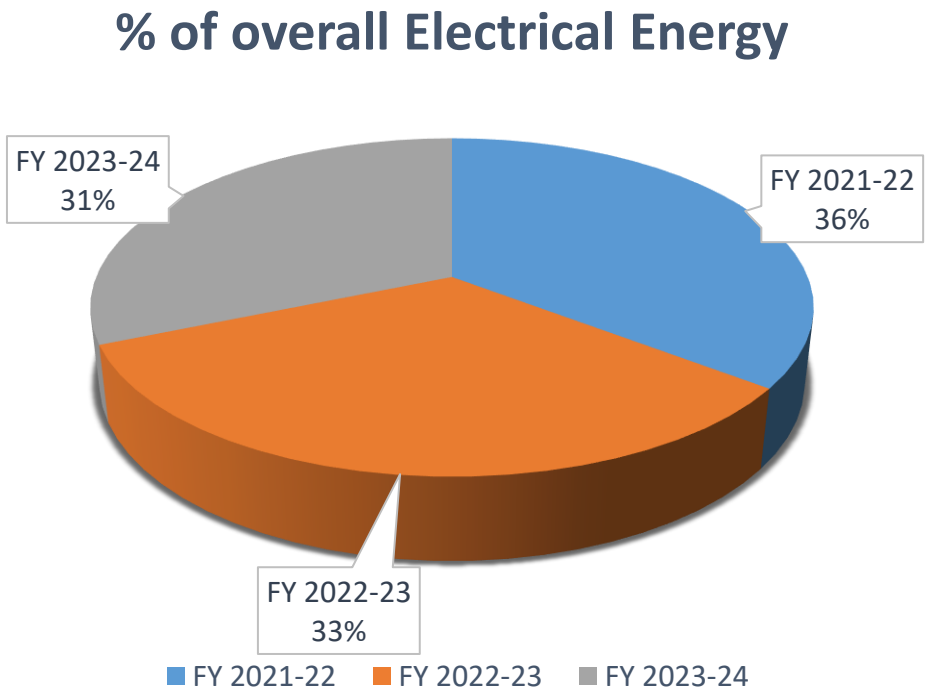
1. Currently there are 150watt wall washer CDMT ceramic coated metal halide lamp fittings.
2. Planned to replace with 70watt LED light fittings.
3. Better illumination compared with CDMT.
4. Easy maintenance with easy installation.

Benefits

- ✓ Energy saving by 50%
- ✓ Annual saving (KWH) 5,256 units
- ✓ Annual saving cost 42,048/-

7. Utilization of Renewable Energy Sources

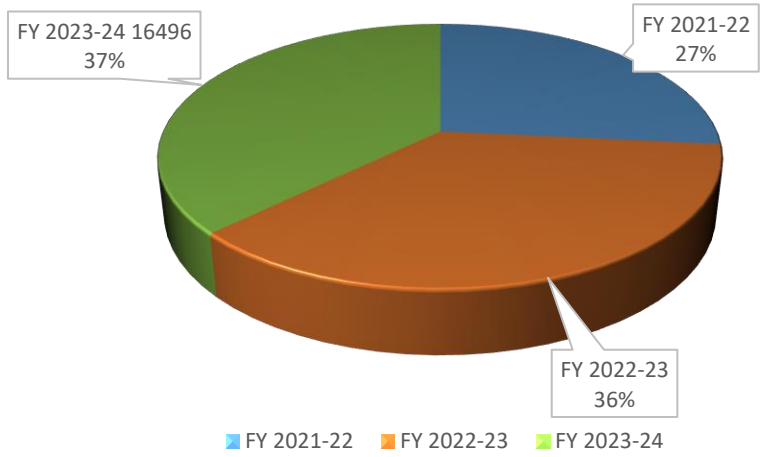
Year	Technology (Solar/Wind/Biomas etc)	Installed Capacity (MW)	Consumption (Million KWh)	% of overall Electrical Energy	TCO2e Reduction
FY 2021-22	Solar PV	50	12.99	93.82%	12090
FY 2022-23	Solar PV	50	17.74	88.24%	16512
FY 2023-24	Solar PV	50	18.12	83.00%	16946



8. GHG emission and indoor air quality

- 83% of Overall power consumption of mall in warded from solar energy for sustainable future.
- Merv -13 Prefilter installed on all the Common area AHU's
- Mall established EV Charging station at free of cost for the customer, to promote EV.
- Automated CO Sensors installed at parking area for monitoring & Maintain of CO level.
- PNG Is used for all the F&B cooking purpose.
- Installation of sensor-based LED tube lights at plant rooms.

Reduction of tCO2e* by Adapting Solar Energy	
FY	**Reduction of tCO2e***
FY 2021-22	**12,090**
FY 2022-23	**16,512**
FY 2023-24	**16,946**



24th National Award for Excellence in Energy management 2023

CII

Confederation of Indian Industry

24th National Award for Excellence in Energy Management 2023

This is to certify that

Phoenix Market City, Bengaluru

has been recognized as

"Excellent Energy Efficient Unit"

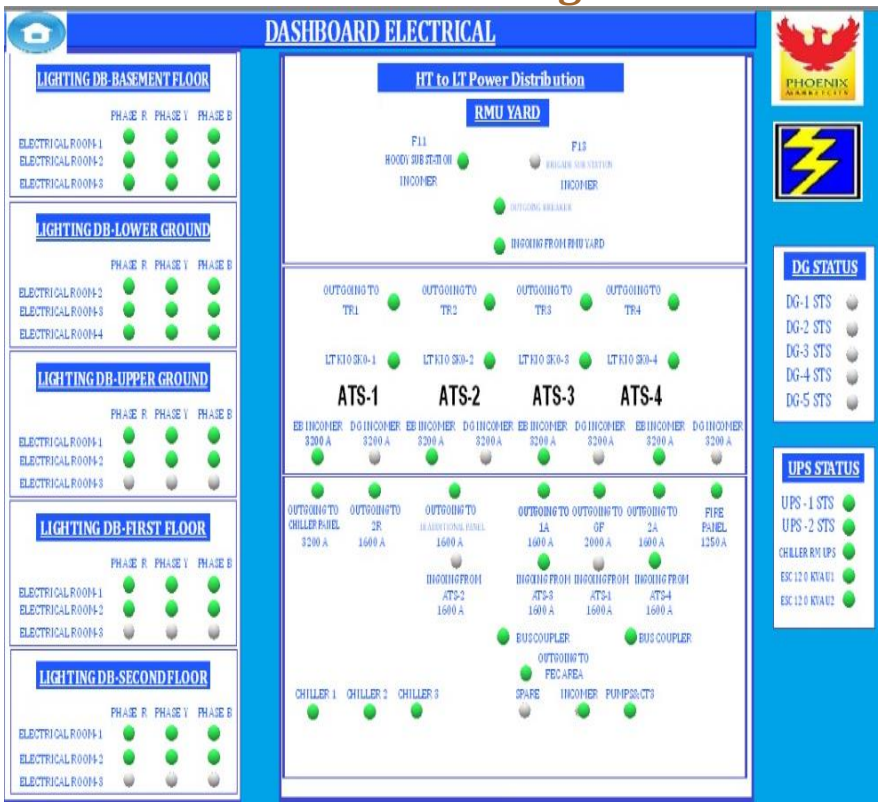
This acknowledgement is based on the evaluation by the panel of judges at the "National Award for Excellence in Energy Management" held during 13 - 15 Sep 2023, Hyderabad

K S Venkatagiri
Executive Director
CII - Godrej GBC

Ravichandran Purushothaman
Chairman, Energy Efficiency Council
CII - Godrej GBC

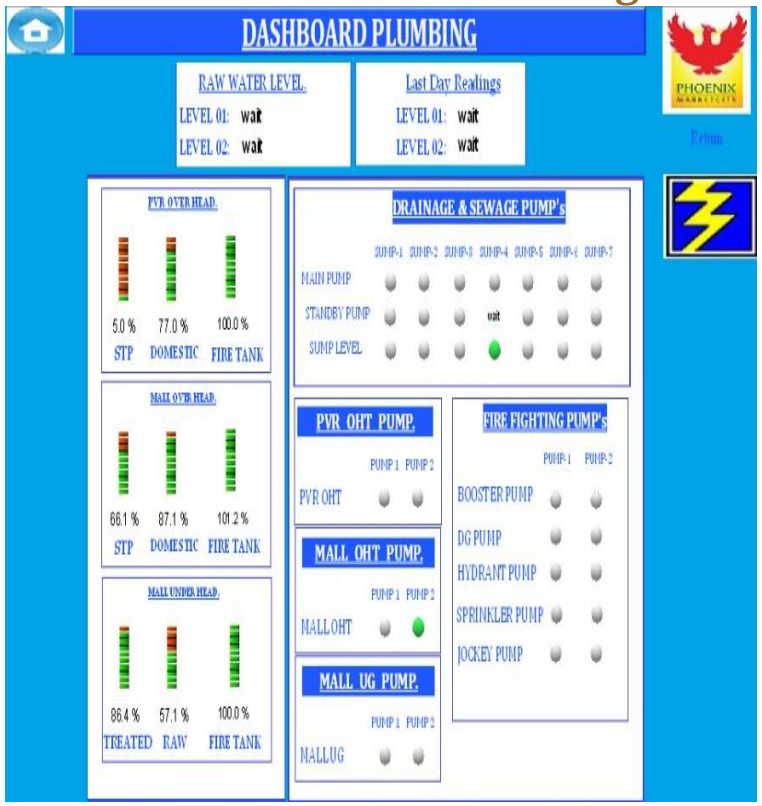
09. BMS & Certification

Electrical Asset Monitoring



Mechanical Asset Monitoring

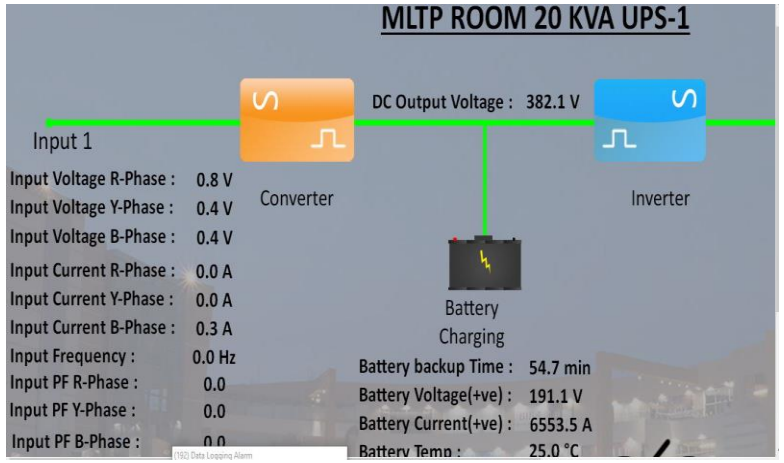
Water Tank Level Monitoring



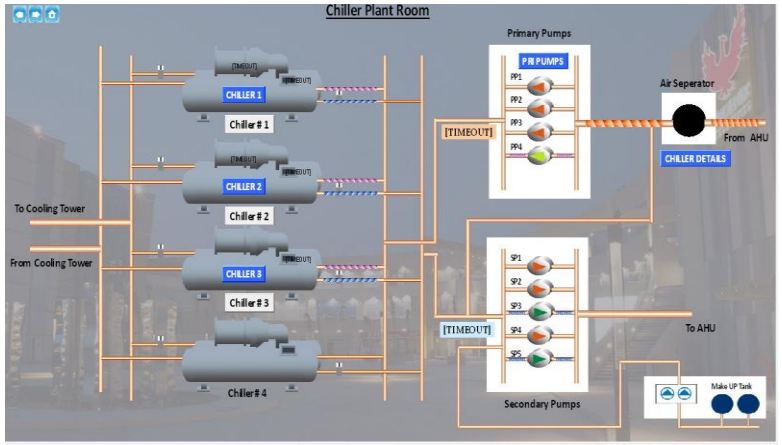
BMS Dashboard and monitoring at Engineering Office apart from BMS Operator

09. BMS Controlling/Monitoring Engg Assets

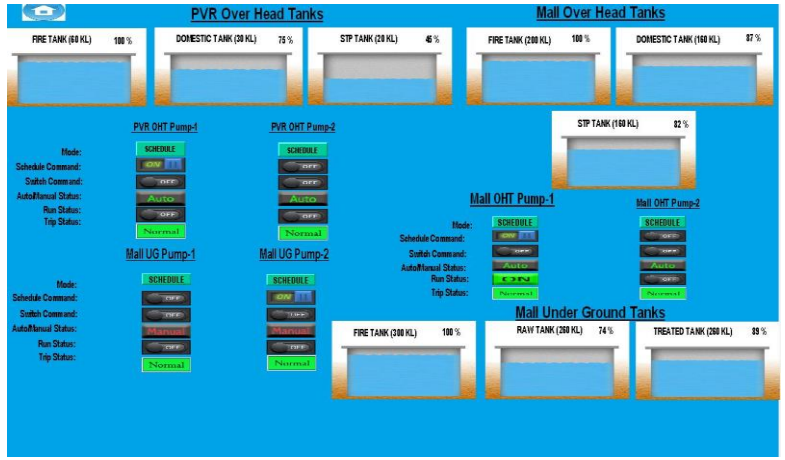
Electrical Asset Monitoring

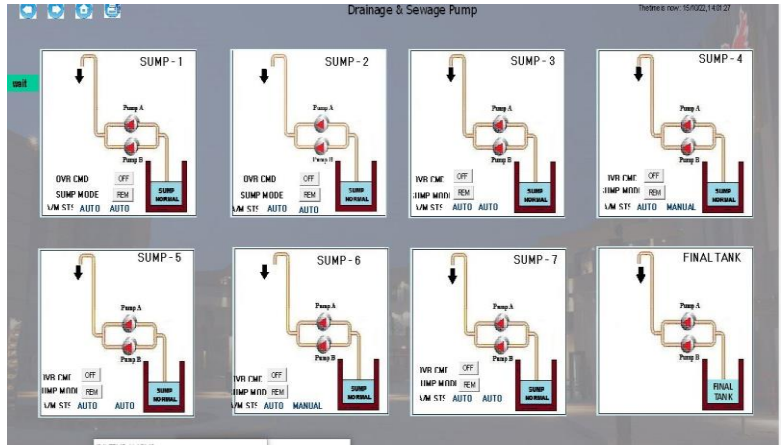


Mechanical Asset Monitoring



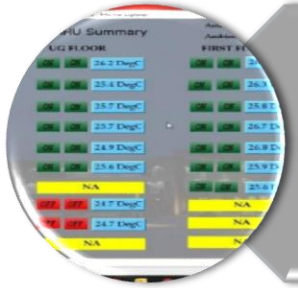
Water Tank Level Monitoring





BMS Monitoring System

09. BMS & Certification

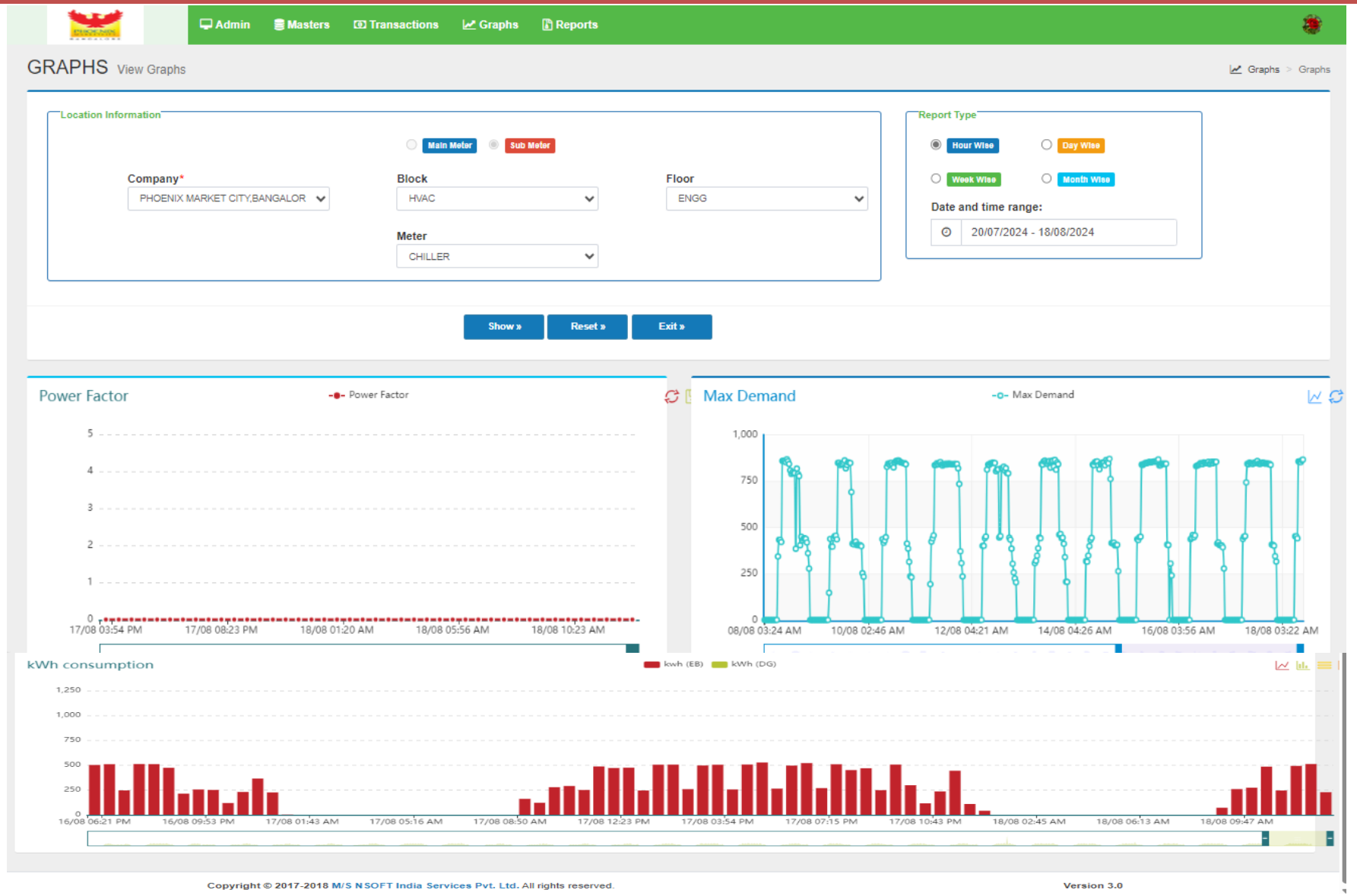


Equipment Operation & Monitoring through BMS, updating on the developments frequently.

Daily, weekly & Monthly report, Equipment status reviewed by HOD.

Capex project planning & execution, Energy efficiency/awareness training to the Team.

12. BMS & Certification



Online Energy Monitoring System

10. NET ZERO commitment

1. *The Current EPI for the facility is 221 kWh/m²/annum at present.*
2. *Conducted NetZero carbon study from certified Third prty consultant and implementation in progress by facility.*
3. *We are targeting to reduced 20+ Kwh/m2/annum in next 12 months.*
4. *As of Now, more than 83% (approx. 88%) is by Green Power.*

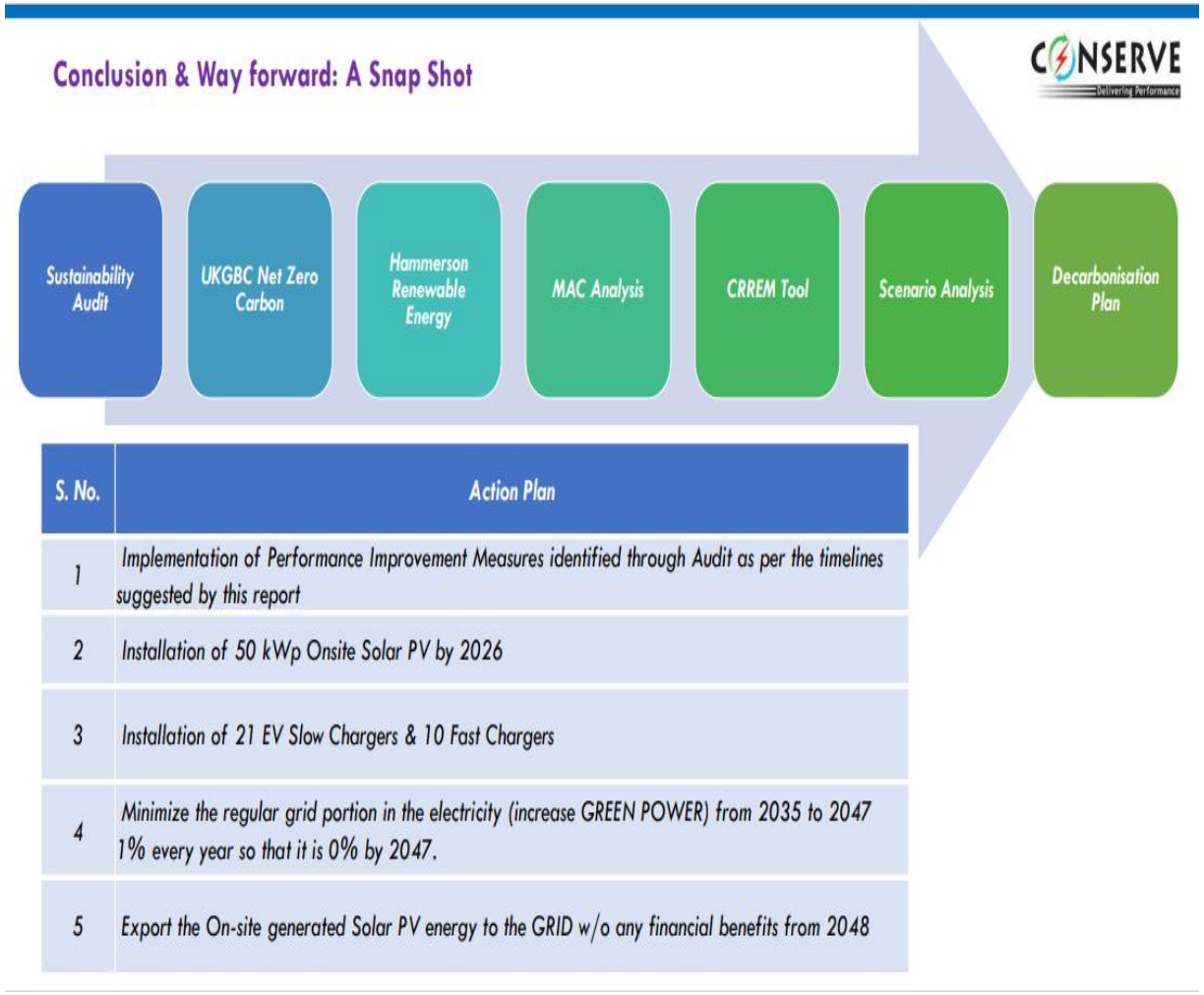
<u>Road Map for Net Zero Plan;</u>

1. *By Implementing the identified PIMs (20% Energy Reduction) & Work on YoY improvements (5-10%)*
2. *Tenant Guidelines & Training*
3. *Creating an encouraging environment for tenants to contribute in Net zero plan and Rewarding the Tenants FOR BEST PERFROMANCE*

10. NET ZERO commitment

The order of priority for Implementation strategies based on the MAC Curve Analysis shall be.

1. Installation of electrolytic convertor for cooling water,
2. Installation of Motorized butterfly valve to cooling tower lines,
3. Installation of Plant manager for chillers,
4. M&V and its benefits,
5. Replacement of the cooling tower with higher capacity,
6. Provide Heat Reflective Tiles on roof,
7. Installation of over-deck insulation,
8. Replacement of AHUs with EC Fans,
9. Installation of enthalpy sensor in cooling tower &
10. Replace existing HVAC pumps with energy efficient pumps.



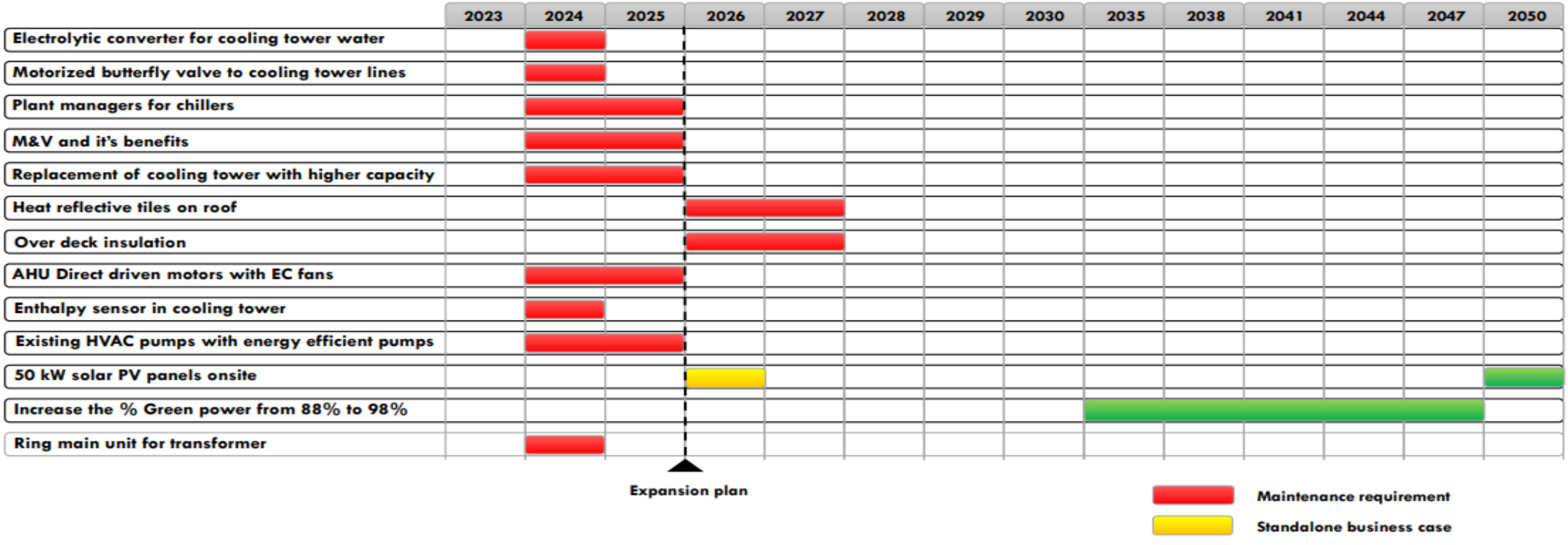
S. No.	Action Plan
1	Implementation of Performance Improvement Measures identified through Audit as per the timelines suggested by this report
2	Installation of 50 kWp Onsite Solar PV by 2026
3	Installation of 21 EV Slow Chargers & 10 Fast Chargers
4	Minimize the regular grid portion in the electricity (increase GREEN POWER) from 2035 to 2047 1% every year so that it is 0% by 2047.
5	Export the On-site generated Solar PV energy to the GRID w/o any financial benefits from 2048

10. NET ZERO commitment

Objective: Outline implementation timeline of decarbonisation initiatives.

Implementation Timeline:

Objective: Outline implementation timeline of decarbonisation initiatives.



12. Learning from CII Energy Award or any other award program

- The build up towards the nomination process has helped us to recognise and identify projects which has helped our company's excellence in the reduction of energy consumption and innovation. Our mission towards use of clean energy and reduction of carbon footprints is helping us scout for new avenues and techniques of resource conservation.

- We appreciate the organizer for providing this platform to share our experience, implementations and concepts, we believe that our efforts at mitigating climate change and prioritising a circular economy will ensure our sustained growth in the future.

- This exercise has been enriching in more ways than one.

THANK YOU

Mr. Ravi Marakala

Designation – DGM Services

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