

# **PHOENIX MARKETCITY, BANGALORE** 24th National Award for Excellence in Energy

Management 2023-24

PHOENIX MARKETCITY



# **INTRODUCTION**

#### **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**

#### **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**





Electrical and HVAC usage FY 2022-23					
Year	Electrical Use	HVAC Use			
2022-2023	1,41,25,275	59,72,489			

#### 2022-2023

PHOENIX



## 3 Sp. Energy Consumption in last 3 years (FY 20-21 to FY 22-23)

TOTAL ENERGY CONSUMPTION FY 20-21 TO 22-23						
SI NO	MONTH	FY 2020-21	FY 2021-22	FY 2022-23		
1	APR	222864	1067818	1639299		
2	MAY	924828	236148	1721416		
3	JUN	841979	270487	1677337		
4	JUL	779696	1128131	1659422		
5	AUG	1155864	1297172	1705372		
6	SEP	1126786	1298562	1653216		
7	OCT	1222090	1485741	1757483		
8	NOV	1255753	1461226	1645182		
9	DEC	1311873	1532988	1765571		
10	JAN	1351295	1221298	1662334		
11	FEB	1216570	1297798	1496082		
12	MAR	1449737	1523690	1715050		
Total Kwh Consumption		1,28,59,335	1,38,21,058	2,00,97,764		
Built up area in Sqm		98,473	98,473	98,473		
Annual Kwh						
Consumption/m2		131	140	204		
Annual total Foot Fall		39,17,647	57,32,470	1,13,63,737		
Non Operating days		80 days	140 days	0		
Annual Kwh Consumption/Foot Fall		3.28	2.41	1.77		

#### SEC Value FY2020-21 to FY2023-24



Annual Kwh Consumption/Foot Fall



# 4. Information on Competitors, National & Global benchmark



Mall Name	кwн	Area Sqm	Energy Consumption SEC (kWh/Annum/ Sqm)
Phoenix Marketcity - Bangalore - Karnataka	2,00,97,764	98,473	204
As per BEE EPI Benchmark for shopping mall			257
Orion Mall - Bangalore - Karnataka	1,71,66,600	76,180	225
Shanthiniketan - Bangalore - Karnataka	1,18,77,108	55,310	215
Mantri Square Mall - Bangalore - Karnataka	1,47,44,200	67,224	219

#### Energy Data - Total Power Consumption 2022-23 Energy Consumption SEC (kWh/Annum/ Sq M)

# ENERGY DATA - TOTAL POWER CONSUMPTION 2022-23 ENERGY CONSUMPTION SEC (KWH/ANNUM/ SQ M)





*Note:* 2020-21 No capex executed due to covid Impact.



# **5.2.** Energy Saving Project implemented in last three FY.

Year	Description	No of Energy saving projects	Invest	tments(INR)	Electrical Savings (Kwh)		Savings (INR)	CO2e Reduction
FY 2019-20	Installation of New VFD for All AHUs	4	₹	24,40,000	488768	₹	39,10,144	415453
FY 2021-22	Installation of New ATCS for chiller plant	1	₹	23,80,000	489000	₹	39,12,000	415650
FY 2022-23	Energy efficient pumps installation	3	₹	24,67,000	83950	₹	6,71,600	71358



# 6.1.Innovative projects implemented ATCS FY21-22



#### **\*** Highlights

- It is Installed for all the 800TR X 3nos.
  Chiller.
- ✤ 4,89,000kWh energy saving per year.
- Descaling of condenser tubes avoided to increase the chiller life cycle.
- Reduced Energy use by Optimizing Chiller
  Performance .
- Reduced labour associated with HVAC Maintenance.
- Reduced HVAC Operations and Maintenance Costs.



**Phoenix Market City** 

# **6.2. Innovative projects implemented EMOS FY21-22**



**Highlights:** 

- Online Monitoring of IKW/TR.
- Online monitoring of power consumption of chiller.
- Online monitoring of chiller evaporator inlet & Outlet temperature.
- Online monitoring of chiller condenser inlet & Outlet temperature.
- Online monitoring of Condenser approach.



# 6.3. Innovative projects implemented STP-RTM FY21-22



### **\*** Highlights

- Online Monitoring of STP inlet & outlet water flow.
- Online monitoring of COD & BOD.
- Online monitoring of TSS & TDS.
- Online monitoring of pH & Turbidity.





### 6.4. Major Encon Projects planned :2023-24





# 6.5. Major encon Projects planned :2023-24

#### \* Proposed : Next Gen Smart & Intelligent Cooling System- CPM.

- Trigger for Implementation: Chiller are switched manually, and it is not loaded based on the requirements.
- \* Innovative description: Currently our chiller plant is monitored through BMS but not controlled in BMS. Low side like

AHU and lighting systems are monitored and controlled through BMS.

#### **Monitoring Center** ✤ Air Conditioning Finergy Management A/O **RS485 Control Cente** IDC/Tele Center Power monitoring Environmental monitoring Ethernet **RS485** Zigbee Ethernet 쟱 CPM-70 HTO Modbus Zigbee Multifunction Power Meter Temp. & Humidity Sensor BACnet WiFi Power monitoring of each racks Air Conditioning monitoring Air Conditioning AEM-DRA Orifice Tube : BTU thermal processing Multi-circuit equipment Power Meter Ducts Temperature, Humidity, Switch Room Wind velocity sensing transducers **UPS Power Monitoring** Chiller : Temperature, Humidity, Pressure sensing transducers **CPM-80** IDC/Tele-Center Power Analyzer

#### Benefits

- ✓ Energy saving by 10 to 20%
- ✓ Maintenance & Operation cost reduced by 5 to 8%
- ✓ Efficient Manpower Utilization



# 6.6. Major encon Projects planned :2023-24

#### Proposed : Replacement of existing AHU with Smart Ahu with Ec fans

- Existing AHUs are 2011 Vintage it require Upgradation
- Trigger for Implementation: Drastic drop on performance
  & Maintenance cost being high, affecting high side HVAC
  system performance.
- Energy efficiency: Smart AHUs are designed to optimize energy consumption by automatically adjusting the operation of the unit based on real-time conditions. This can result in significant energy savings and reduced operating costs.
- Improved indoor air quality: Smart AHUs can monitor and control various parameters such as temperature, humidity, and air flow, ensuring that the indoor air quality remains at optimal levels. This can help create a healthier and more comfortable environment for occupants.

# SMART AHU EMPOWERED BY INNOVATION!







DEMAND CONTROL VENTILATION

A MONITORING

FULLY FACTORY FITTED AUTOMATION







CONSTANT AIRF LOW AND PRESSURE MAINTENANCE. REAL-TIME FILTER PM 2.5 SENSOR STATUS MONITORING. AIR QUALITY CONTROL

## 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 2020-21	Solar PV	50	11.46	93.91%	10524
FY 2021-22	Solar PV	50	12.99	93.82%	12090
FY 2022-23	Solar PV	50	17.74	88.24%	16512



# 8. GHG emission and indoor air quality

- 88% 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.

<b>Reduction of tCO2e* by Adapting Solar Energy</b>				
FY	<b>Reduction of tCO2e*</b>			
FY 2020-21	10,524			
FY 2021-22	12,090			
FY 2022-23	16,512			





#### 23<sup>rd</sup> National Award for Excellence in Energy management 2022





# **09. BMS & Certification**



#### **Electrical Asset Monitoring Mechanical Asset Monitoring** Water Tank Level Monitoring $\bigcirc$ DASHBOARD ELECTRICAL DASHBOARD PLUMBING DASHBOARD HVAC 11 11 PHOENIX HT to LT Power Distribution LIGHTING DB-BASEMENT FLOOR PHOENIN RAW WATER LEVEL Last Day Readings Chiller Header Temp. Ambient 1 RMU YARD Current: PHASE R PHASE Y PHASE B LEVEL 01: wait LEVEL 01: wait Temperature: IIIIIIII 29,7 °C Supply: HILLIN 8.80 °C ELECTRICAL ROOM 1 7 Previous Day: PHOENIX ۲ F11 F13 LEVEL 02: wat LEVEL 02: Wait Return: 11111111 13.60 °C ELECTRICAL ROOM 2 ٠ ٠ ۲ HOODY SUB STATE OF Cummulative Humidity : IIIIIIII 0.0 % W sector as crete ELECTRICAL ROOMS INCOMER INCOMER 7 FVR OVER HEAD. DRAINAGE & SEWAGE PUMP's CHILLER's PRI. PUMP's AHU's CSU's CT-1 Temp. LIGHTING DB-LOWER GROUND and the owner from the vard SUNP-1 SUNP-2 SUNP-3 SUNP-4 SUNP-5 SUNP-6 SUMP-1 CSU-1 CSU-2 CSU-3 AHULI AHUL2 AHUL3 AHUL4 AHUL5 AHUL6 AHUL7 Chiller-1 Pri. Pump-1 💧 - 60 (TIMEOUT)(TI DG STATUS PHACE R PHACE Y PHACE B Pri. Pump-2 🥚 econd Floor . . . Chiller-2 ۲ ..... ELECTRICAL ROOM 2 ۲ ŵ. ŵ. ۲ OUTGOING TY OUTGOINGTO OUTGOINS TO OUTGOINGTO . DG-1 STS 🥥 . ۲ . Chiller-3 🧉 Pri. Pump-3 🧉 First Floor . . . . ٠ ٠ ELECTRICAL ROOMS ٠ TE1 TR2 TRE TR4 STANDEN PUN DG-2 STS 🧉 100.0 % JG Floor 5.0 % 77.0% ELECTRICAL ROOM4 Pri. Pump-4 🔘 . . timeonal timeonal ..... ..... • • ..... SUMP LEVEL DG-3 STS 🧉 G Floor STP DOMESTIC FIRE TANK 14 10 10 -10 ü . Supply ٠ ٠ ۲ LT KIO SKO-1 🙆 LT KIO SHR-2 🙆 LT 10 50-3 👩 LT 10 50-4 🔕 FLOW STATUS LIGHTING DB-UPPER GROUND DG-4 STS 🧉 SEC. PUMP's ATS-2 ATS-1 ATS-3 ATS-4 DG-5 STS 🗉 Chiller-1 FS 🥥 MALL OVER HEAD. CT-2 Temp. PHANE R PHANE Y PHANE R Sec. Pump-1 👅 FIRE FIGHTING PUMP's Chiller-2 FS 🛛 💿 MALL STAIR CASE FVR STAIRCASE FRESH AIR FAN's PVR OHT PUMP. TE INCOMER DO INCOMER ES INCOMER DO INCOMER ES INCOMER DO INCOMER ES INCOMER DO INCOM TFA's ELECTRICAL ROOM 1 ۲ \$200A 3200 A \$200 A \$390 A \$200 A \$2904 3200 A 3200 A Chiller-3 FS 💊 Sec. Pump-2 🕚 TIMEOUTTIM Status ŵ W FAN-1 🥥 ELECTRICAL ROOM 2 ۲ TFA-1 -PUNP-1 PUNP-2 UPS STATUS Sec. Pump-3 👩 FAN-1 PUNP1 PUNP1 Cond.-1 FS Unit-01 🔵 ELECTRICAL ROOMS 0 0 FAN-2 TFA-2 🕚 FAN-2 ۲ ۲ ٠ ۲ ٠ ٠ ۲ Sec. Pump-4 🕚 Cond.-2 FS PVR OHT 0 0 BOOSTER PUMP ü UPS-1 STS Unit-02 🔘 - 63 UTGOING TO BILLEP PANEL OUTGOINGTO 2R OUTGOING TO FAN-3 TRA-3 🧉 OUTGOING TO OUTGOING TO OUTGOING TO FAN-3 FIFE PANEL 1250 A Sec. Pump-5 🥥 FINEOUT (FINEOUT 661 % 87.1 % 101.2 % UPS -2 STS 🧶 Cond.-3 FS 🛛 🧉 LIGHTING DB-FIRST FLOOR GF 2000 A 2A 1600 A EXHAUST AIR FAN's 1A 1600 A FAN-4 🔍 TEA-4 Supply Return GPUMP ü 0 FAN-4 🔍 1600 A 1600 A STP DOMESTIC FIRE TANK \$200 A CHILLER RM UPS MALL OHT PUMP. PHASE R PHASE Y PHASE B BIGUNGFROM DIGONIGFROM FAN-5 🔍 TFA-5 -.0 FAN-5 🔍 HYDRANT PUMP ų. ESC 12 O KIYA DI 🔘 COND. PUMP's Unit-01 🔴 10 CT FAN's INCOMPT ON . . ٠ MALL LIFTWELI TFA-6 🔵 FAN-6 ELECTRICAL ROOM 1 AT\$-2 1600 A ATS-3 1600 A AT\$1 1600.5 ATS4 1600 A CT-3 Temp. MALL UNDER HEAD. PUMP1 PUMP3 ESC 12 0 KVAU2 🔘 Unit-02 ELECTRICAL ROOMS ۲ Con. Pump-1 📦 CELCES CES TEA-7 PRINKLER PUMP 🔍 FAN-7 FAN-6 0 MALLOHT 📦 🥚 ELECTRICAL ROOM-3 ..... Con. Pump-2 🍙 DX UNITS TIMEOUTTIME BUS COUPLER an-1 🔴 🔴 🔘 BUSCOUPLER FAN-8 - 60 FAN-7 🥥 IOCKEY PUMP ψ. 10 Con. Pump-3 🕚 OUTCOMING TO Fan-2 🕘 🕘 🔵 Status FAN-9 FAN-8 🥥 LIGHTING DB-SECOND FLOOR FECAREA MALL UG PUMP. Con. Pump-4 🧶 Unit-01 🤍 Fan-3 🛛 🕘 🔘 SPARE INCOMER PUMPSACTS FAN-10 ---CHILLER 1 CHILLER 1 CHILLER 1 FAN-9 tweend threem PHASE R PHASE Y PHASE B Unit-02 . • . ٠ Fan-4 🕘 🕘 🔘 86.4 % 57.1 % 100.0 % PUMP 1 PUMP 2 Supply Return ELECTRICAL ROOM 1 ٠ TREATED RAW FIRE TANK MALLUG 0 0 ELECTRICAL ROOM:2 ٠ 3 PLUMBING ELECTRICAL HVAC ELECTRICAL ROOMS ŵ. .....

**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.

## **09. BMS & Certification**





#### **Online Energy Monitoring System**

### **10. NET ZERO commitment**





- **\*** The Current EPI for the facility is 204 kWh/m<sup>2</sup>/annum at present.
- ✤ We are targeting to reduced 20+ Kwh/m2/annuam in next 12 months.
- As of Now, more than 85% (approx. 88%) is by Green Power.

#### Road Map for Net Zero Plan;

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

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



- 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.



## **Any Other relevant information**

#### **\*** Rainwater Harvesting and Recharge pit

#### Year of Installation-2011-2012

#### Benefits :-

- Total Water conserved thru Rainwater Harvest System in FY 2022-23
  - is 894 KL, i.e., 1.6% of the Potable water Purchase
- It decreases the demand for water.
- It reduces the need for imported water.
- It promotes both water and energy conservation.
- improves the quality and quantity of groundwater.
- Sensor based taps installed to minimize the water usage.
- ✤ Aerator installed in all the tap to reduce the Gravitational pressure.





# **THANK YOU**

PHOENIX MARKETCITY

# Mr. Ravi Marakala

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