



CII 24th NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT 2023

Honeywell Technology Solutions Lab Pvt. Ltd

SEZ, RMZ Ecoworld Infrastructure Pvt. Ltd
Survey # 19/2, Devarabisanahalli Village
Bangalore – 560103
Karnataka, India

Date : 13th, 14th and 15th August 2023

Honeywell

MR. SUBRATA BALIARSINGH
- DIRECTOR IFM - INDIA

MR. C RAVI KUMAR
- OPERATIONS LEADER - BANGALORE

MR. VIJAYAKUMAR SHOLAPUR
- FACILITIES & ENERGY LEAD - INDIA



8

Decade legacy

\$1B

Domestic sales and exports

4

Technology development centers

- Bengaluru
- Madurai
- Hyderabad
- Gurugram

3

Manufacturing centers

- Gurugram
- Dehradun
- Pune

20

Facilities in major cities

- Pune
- Bengaluru
- Gurugram
- Chennai
- Dehradun
- Mumbai
- Kolkata
- Madurai
- Hyderabad
- Vadodara



13500

Employees

3000+

Products, solutions, applications engineered in India

NET ZERO COMMITMENT- HONEYWELL SUSTAINABILITY POLICY



Sustainable Opportunity Policy Honeywell's Commitment to Health, Safety and the Environment

By integrating health, safety and environmental considerations into all aspects of our business, we protect our employees and contractors, our communities and the environment, achieve sustainable growth and accelerated productivity, drive compliance with all applicable regulations and develop technologies that expand the sustainable capacity of our world. Our health, safety and environmental management systems reflect our values and help us meet our business objectives.

- We protect the safety and health of our employees and contractors, and minimize the environmental footprint of our operations through efforts to prevent illness, injury and pollution.
- We actively promote and develop opportunities for expanding sustainable capacity by increasing energy and water efficiency, improving security and safety, and reducing emissions of harmful pollutants.
- We are committed to compliance with all of our health, safety, environmental and legal requirements everywhere we operate.
- Our commitment to health, safety and the environment is an integral aspect of our design of products, processes and services, and of the lifecycle management of our products.
- Our management systems apply a global standard that provides protection of both human health and the environment during normal and emergency situations.
- We identify, control and endeavor to reduce hazards and associated risk (to employees and contractors), emissions, waste and inefficient use of resources, including energy and water.
- We are open with stakeholders and work within our communities to advance laws, regulation and practices that safeguard the public.
- We abide by the company's own strict standards in cases where local laws are less stringent.
- Our senior leadership and individual employees are engaged in aspects of health, safety and the environment and are accountable for their role in meeting our commitments.
- We measure and periodically review our progress and strive for continuous improvement.

These are our commitments to health, safety, and the environment, and to creating Sustainable Opportunity everywhere we operate.

Vimal Kapur
CEO

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CORPORATE ENERGY & SUSTAINABILITY TEAM

Executive Sponsorship
Anne Madden – Senior V.P., General Counsel and Corporate Secretary

Senior Leadership Support
Evan van Hook – Chief Sustainability Officer and Nate Johnson – V.P. Global Real Estate

Program Management
HSEPS - Cathy Gallagher

Corporate Energy & Sustainability Team	Core Members					
	Corporate		SBG Energy Leads		CBRE Facility Partner	
	HSEPS Cathy Gallagher Dinesh Kumar	GRE IFM Eddie Massie Brian Norris Stephen Greenway	Aero Paul Clevenger	HBT Adriana Miranda Cari Field	Americas Dan Lindsey Tony Siddle Susan Fusaro	EMEA Steph Temme Mohammed Ahmed Patrycja Nowacka
HCE / HBT Timm Olson	Procurement Jay Shawver Genna Loeser Angel Ciopec	PMT Barry Martin Mo Hoda	SPS Lauri Mesaeh Sean Quarry	APAC Kevin Guo	India Vijay Sholapur (HON) Elayaperumal G	
Support						
Corp Finance Mary Holt Bobby Barrow	GR Larry Kast	Aero Sebastien Chague (Fin)	HBT Dean Ford Jon Speary Jencil Philip (Fin)	PMT Carine Baerlocher (Fin)	SPS Mahesh Vidyasagar Zachee Gouett Oliveira (Fin)	

Driving Performance & Continuous Improvement



- Reduce Scope 01 and Scope 02 GHG emissions 50 % by 2037 from 2019 base year.
- Reduce Scope 03 emissions 23 % within the same timeframe.
- Investment in Energy savings projects
- Improve Energy Efficiency by 10 %
- Conversion to renewable energy sources

THE ENVIRONMENT



Our commitment to being environmentally responsible is reflected in the extensive work we do to reduce greenhouse gas (GHG) emissions, increase energy efficiency, conserve water, minimize waste, and drive efficiency throughout our operations. Honeywell also champions responsible remediation projects and efforts to make our products safer and more sustainable.

OUR ENVIRONMENTAL GOALS

We are proud of the environmental improvements we have achieved to date and continue in our commitment to make our businesses more sustainable.

- **Pledge to be carbon neutral in our facilities and operations¹ by 2035**
- **Commitment to set a science-based target aligned with the Science Based Targets initiative (SBTi)**
- **Five-year “10-10-10” target to, by 2024:**
 - Reduce global Scope 1 and Scope 2 GHG emissions intensity by an additional 10% from 2018 levels
 - Deploy at least 10 renewable energy opportunities
 - Achieve certification to ISO’s 50001 Energy Management Standard at 10 facilities

GOAL	TIMEFRAME	STATUS
30% GHG reduction ¹	2007 – 2011 (2004 baseline)	Exceeded
20% Energy efficiency improvement	2007 – 2011 (2004 baseline)	Exceeded
15% GHG intensity reduction ¹	2012 – 2016 (2011 baseline)	Achieved 3 years early
10% GHG intensity reduction ¹	2014 – 2018 (2013 baseline)	Exceeded
10% GHG intensity reduction ¹	2019 – 2023 (2018 baseline)	On track
10 Renewable energy opportunities		On track
10 Certified ISO 50001 sites		Exceeding

¹Scope 1 and Scope 2

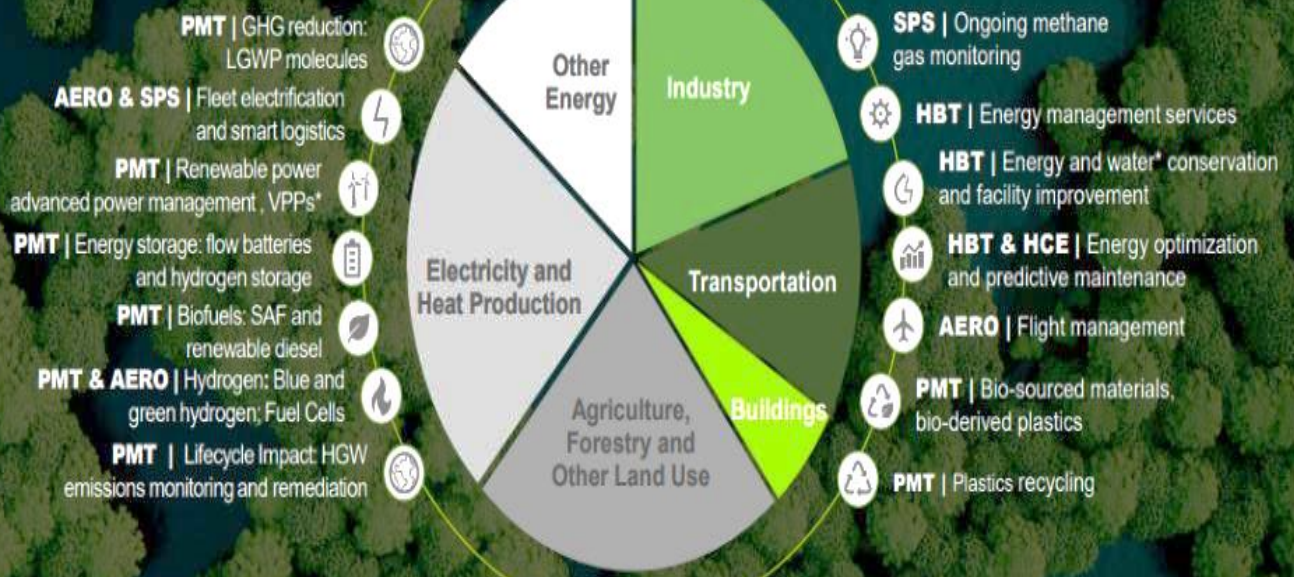
HONEYWELL COMMITTED TO BE CARBON NEUTRAL BY 2035

TARGETED SOLUTIONS FOR SECTORS PRODUCING

About 2/3's

OF THE WORLD'S GREENHOUSE GAS EMISSIONS

GLOBAL GHG EMISSIONS BY SECTOR



~ 30% = Agri, Forest, Land use, Others
 ~70% = Industry, Tpt, Building, Electricity / Heat



01 facility certified
 01 facility in progress



01 facility certified



02 facilities certified

Scope 1 Abatement plan

- Existing DG' conversion to dual-fuel system.
- Leveraging Battery Energy Storage System
- Leveraging Induction based cooking system
- Vehicle fleet engagement model

Scope 2 Abatement

- Offsite and onsite –Green power through PPA
- In-house solar power plant.

SITE INFRA - HTSL CAMPUS 01, BANGALORE



Facility details

- Owner : SEZ, leased
- Year of operation : 2008
- Built up area : 595,520 sq.ft
- Towers : Tower 1 and 2
- Seating Capacity : 3,452
- Tower 1 : GF to 7 floors
- Tower 2 : GF to 4 floors
- Incoming Power Supply : 11 kV
- Sanctioned Demand : 2.75 MVA
- Transformer Capacity : 1.5 MVA x 4 nos.
- Diesel Generator Capacity : 6.75 MVA
- UPS Capacity : 1.73 MVA
- Chiller Capacity : 400 TR x 5 nos.

Engineering
Labs
&
DATA Center

Supports
Asia pacific

67,500 sq. ft.

operates
24 X 7

Annual energy use is about 10.14 million kWh with the spend of INR 8.82 crores, including diesel cost during FY 2022 - 23

BUILDING SALIENT FEATURES

SUSTAINABILITY CONCEPTS CONSIDERED IN BUILDING

Priority to passive design to reduce energy demands

- 1. Compact envelope shape
- 2. Orientation, Solar protection
- 3. Under roof thermal insulation
- 4. Air tightness

Include passive

- 1. UV protected glazing
- 2. Access to day-light exposure, approx. 70%

Occupant comfort and well being

- 1. Achieving indoor comfort requirements (visual / thermal / acoustic)
- 2. Maintaining IAQ (indoor air quality)

More sustainable elements

- 1. Reduced heat island - 1/3rd of the building surrounding area covered with trees and plantation

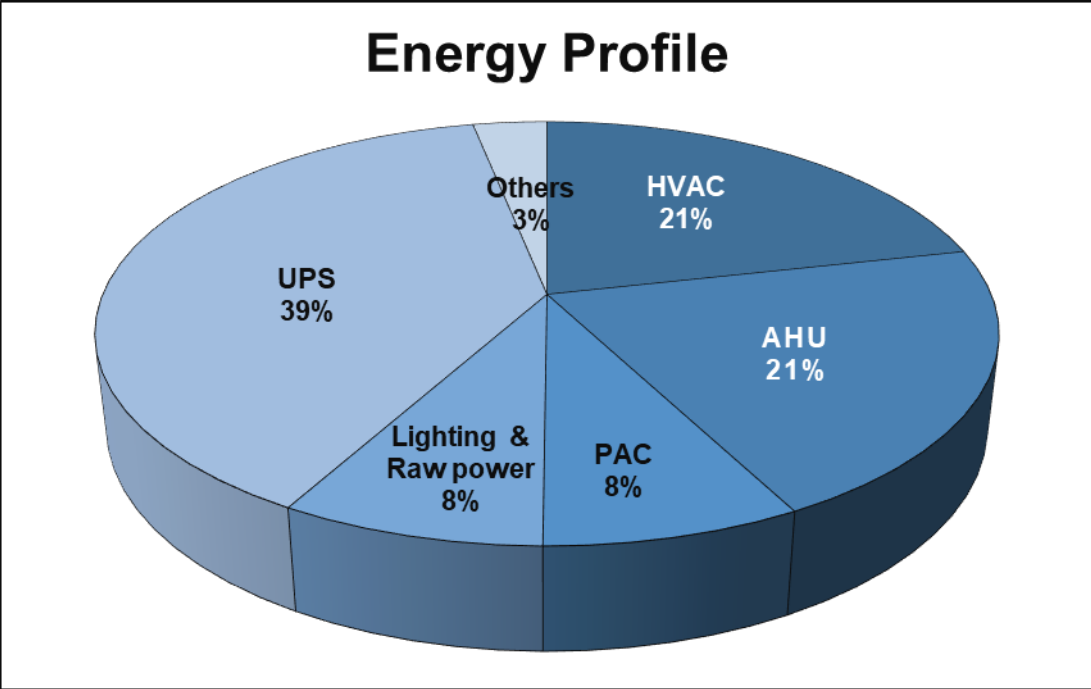
Passive Design features

Micro - climate	Temperate
Building Orientation	East – West
Solar Heat Gain Coefficient (SHGC)	0.72
Visual Light Transmittance (VLT)	71.0
SRI	100.0



ENERGY PROFILE – UTILITY WISE OVERVIEW

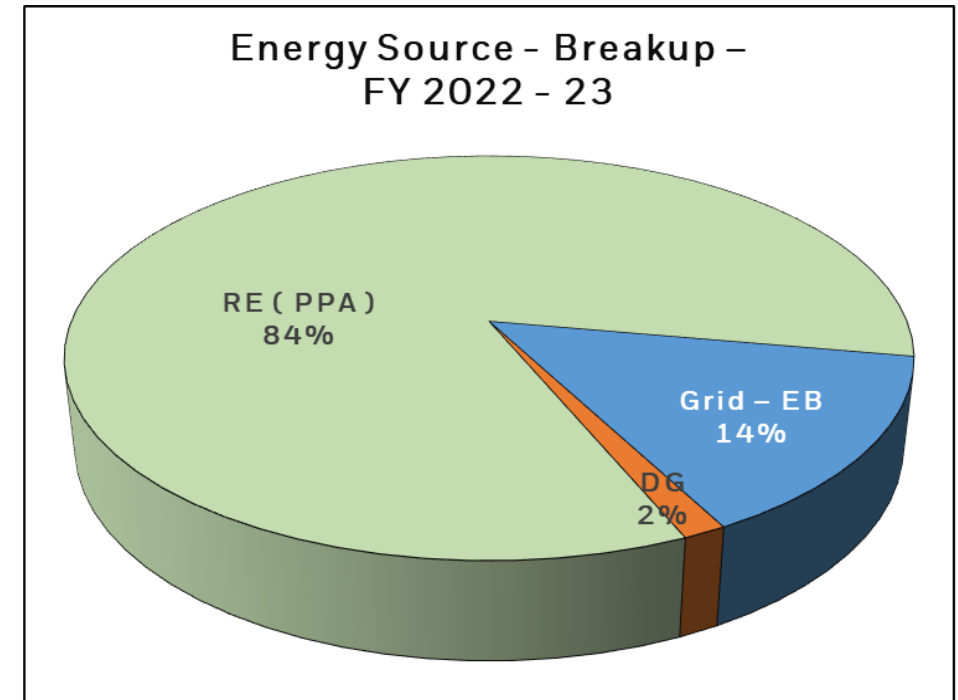
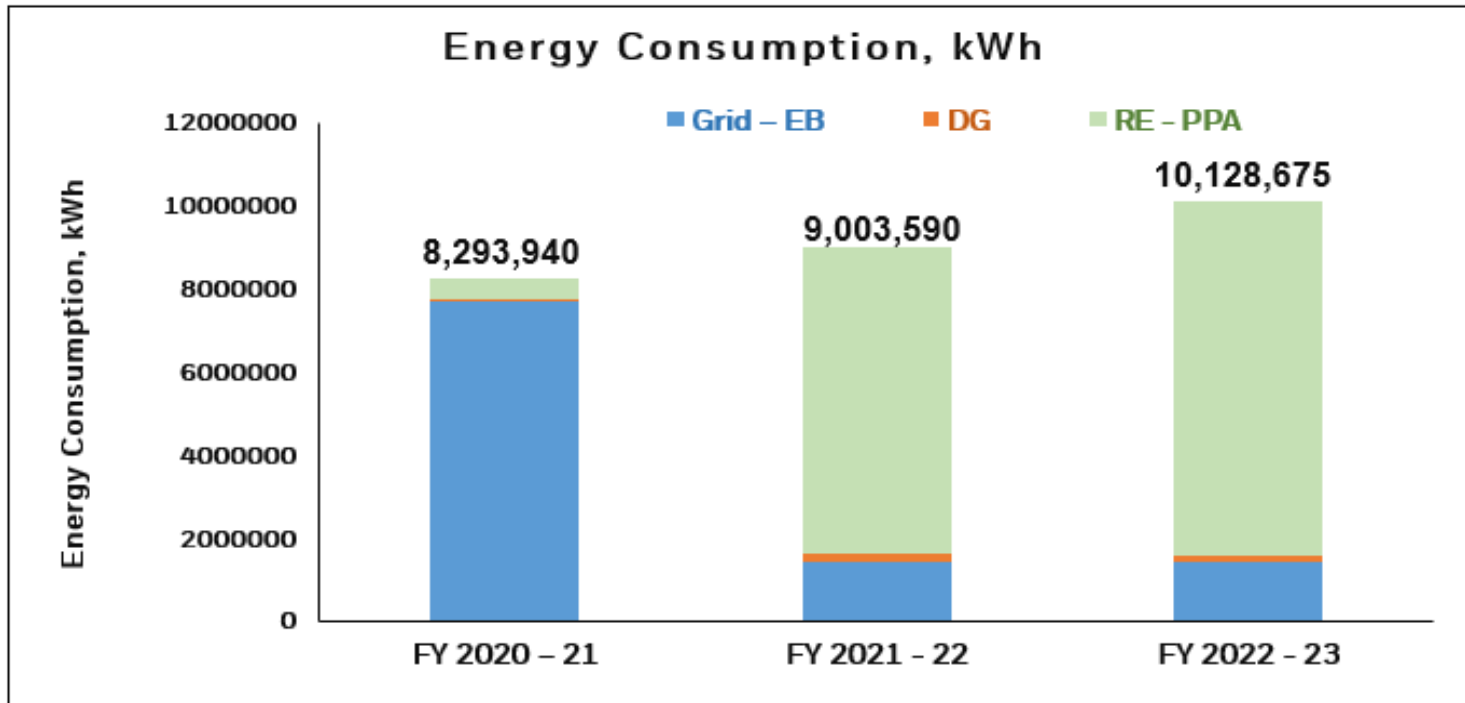
Utilities	Energy Consumption, kWh	Energy share %
Chillers, Pumps & Cooling Towers	2,135,461	21.1
AHU	2,062,245	20.4
PAC	777,395	7.7
UPS (Lab equipment's)	3,843,745	37.9
Lighting	793,645	7.8
Others	313,610	3.1
Total	9,926,101.0	



Others – External lighting, cafeteria, Fire hydrant pumps

ENERGY CONSUMPTION OVERVIEW IN 2020 - 2023

Year	Source of Energy			Total Energy Consumption	Energy Cost
	Grid – EB	DG	RE (PPA)	Lakhs kWh	INR
FY 2020 – 21	7,702,990	90,950	500,000	82.94	74,754,650
FY 2021 – 22	1,455,855	197,735	7,350,000	90.04	78,495,951
FY 2022 – 23	1,460,050	143,625	8,525,000	101.29	90,575,331

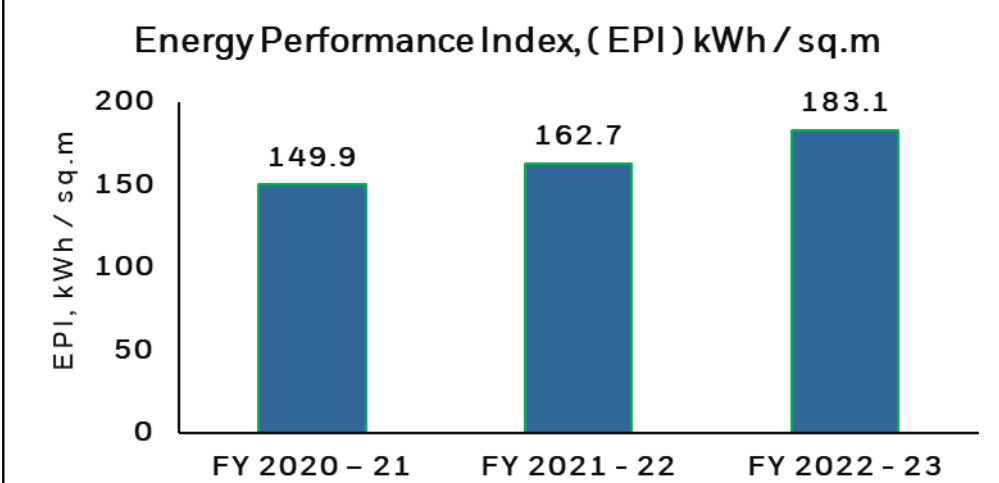


* Reference against 2018 Baseline

Specific Energy Consumption 2020 - 2023

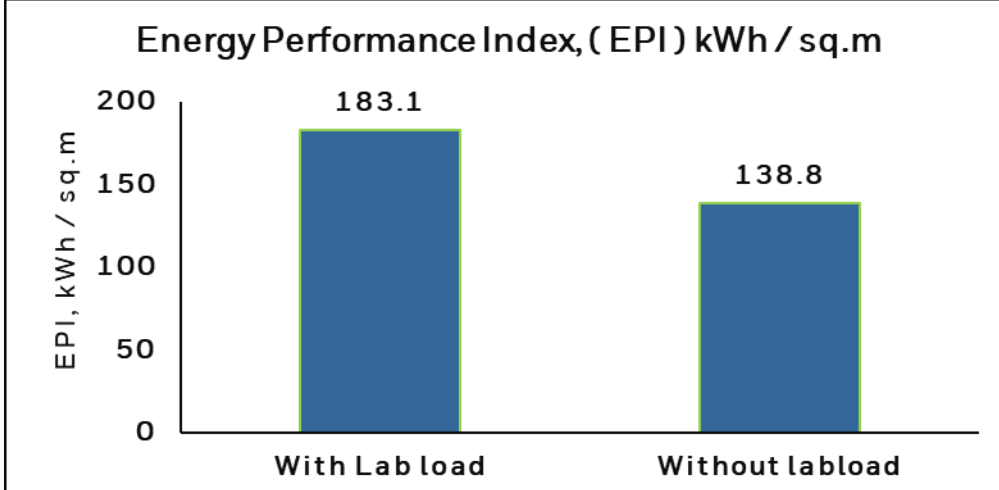
Energy Performance Index - whole building

Year	Energy Consumption, kWh	Area	Energy Performance Index
		Sq.m	kWh / Sq.m
FY 2020 – 21	8,293,940	55,326	149.9
FY 2021 – 22	9,003,590	55,326	162.7
FY 2022 – 23	10,128,675	55,326	183.1



Energy Performance Index - Excluding Lab load & lab space

Year	Energy Consumption, kWh	Area	Energy Performance Index
		Sq.m	kWh / Sq.m
FY 2022 – 23	6,808,400	49,056	138.8



Load addition in 2020

- 60 kW load added in CNS Lab; which operates for 24 x 7
- 150 kW of load added in Engine & Demo Lab
- Both accounts for significant energy consumption increase in following years

Return to work

- Partially employees are requested to return to work from June 2021.
- Starting from April 2022 – 3:2 work model was implemented

- *EPI – provided in 2 different approach.*
- **With Lab loads** and **without lab loads**

COMPARISON SEC - INTERNAL & NATIONAL BENCHMARKING

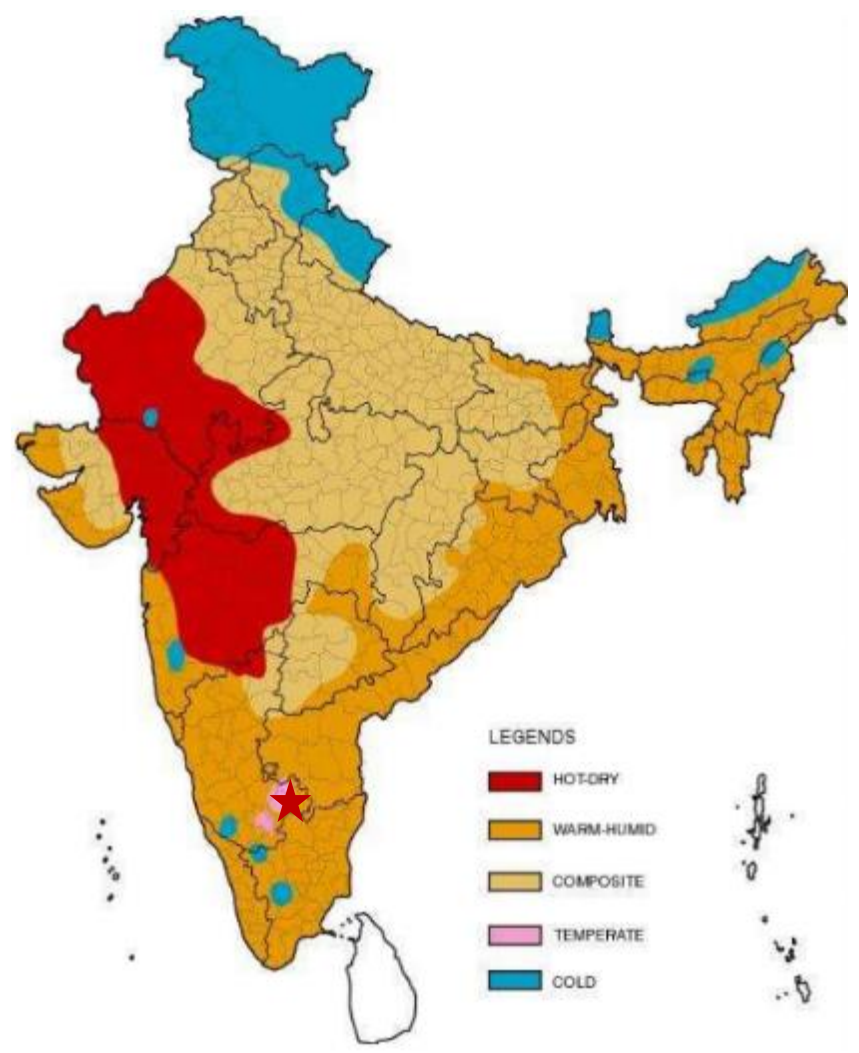
Internal Benchmarking	Location	Zone	SEC (kWh / m ² / y)
Honeywell	Campus 01, Bangalore	Composite	183.1
Honeywell	Campus 02, Bangalore	Composite	251.1

Benchmarking	Reference	SEC (kWh / m ² / y)		Star Label
		Standard	Actual	
National level	Bureau of Energy Efficiency (BEE)	179	183.1	1 Star
			138.8 *	3 Star

* EPI – provided in 2 different approach. *With Lab loads* and *without lab loads*

Climate Zone	AC	
	< 50.0 %	> 50.0 %
EPI (kWh / m ² / year)		
Composite	86	179
Moderate	94	179
Warm & Humid	101	182
Hot & Dry	90	173

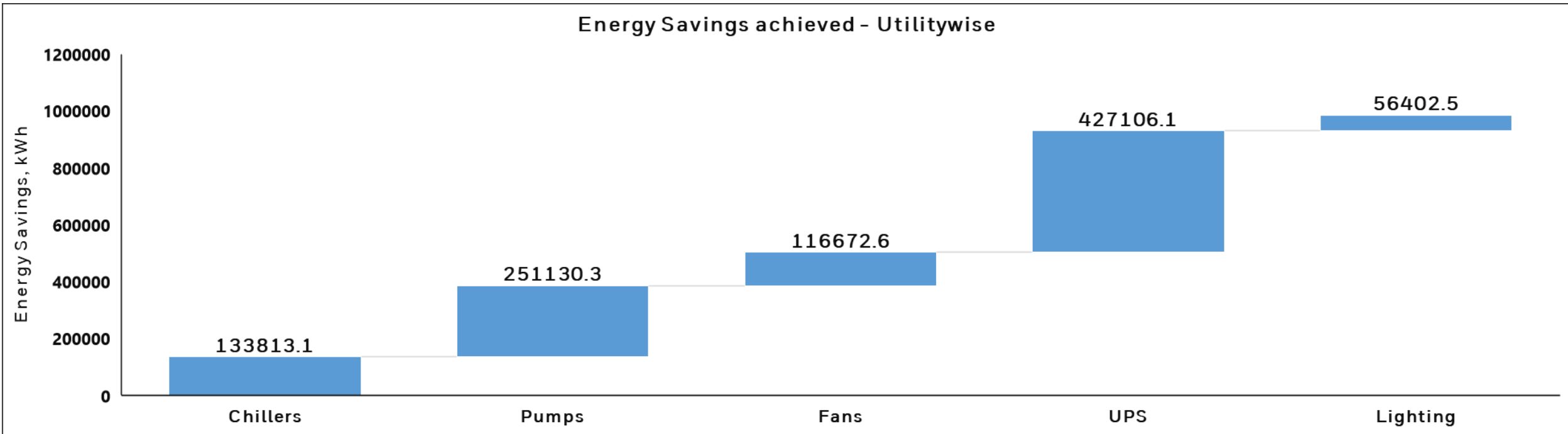
EPI (kWh / m ² / y)	Star Label
190 – 165	1 star
165 – 140	2 star
140 – 115	3 star
115 – 90	4 star
Below 90	5 star



★ **Bangalore**

Energy Saving projects implemented in 2020 - 2023

Year	No. of Energy Saving projects	Investment	Electrical Savings	Cost Savings	Impact of SEC
		million INR	Lakhs kWh	million INR	%
FY 2020 – 21	03	4.31	2.57	2.37	1.17
FY 2021 – 22	04	8.94	3.97	3.47	1.35
FY 2022 – 23	03	11.06	3.59	4.24	1.18



ENCON PROJECT PLANNED IN FY 2023 - 24

Title of the Project	Electrical Savings, kWh pa	Cost Savings, INR pa	Investment, INR	Status
Replacement of conventional UPS with EE modular UPS (150 kVA x 2 Nos. with 75 kVA x 2 Nos.)	58,235.0	521,195.0	2,680,000.0	Completed
Replacement of age old PAC units with Energy Efficient PAC units (20 TR x 6 Nos.)	14,455	732,820	9,531,600	W I P

Replacement of Conventional UPS with Energy Efficient Modular UPS

Old UPS



New UPS



Innovative projects – Battery Energy Storage System

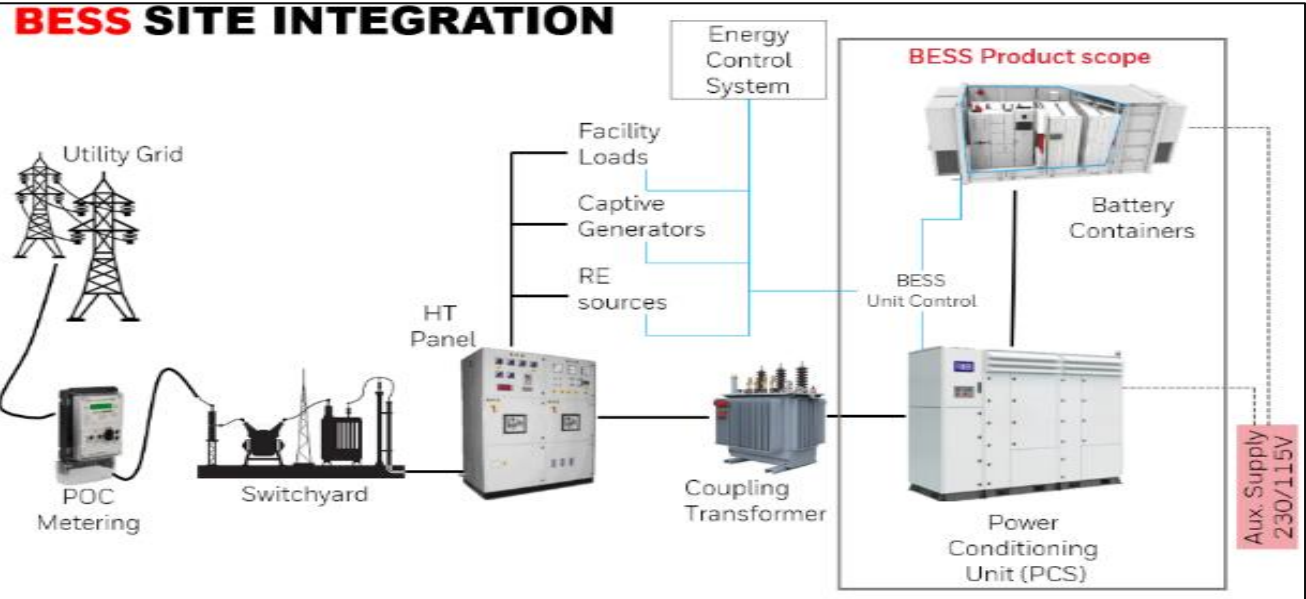


Capacity Installation 600 kW

Technology developed by Honeywell

Energy storage system that uses batteries to store and distribute energy in the form of electricity.

BESS captures energy from different sources, accumulates this energy, and stores it in rechargeable batteries for required demand



Innovative projects – Battery Energy Storage System



BESS solution

- Energy management - demand management
- Regulates frequency
- Reduce fluctuations & equipment damages due to outages
- Reduce peak hour energy demand costs
- Charging through renewable energy
- Reduce carbon footprint
- Seamless transfer between grid and BESS

Key Notes :

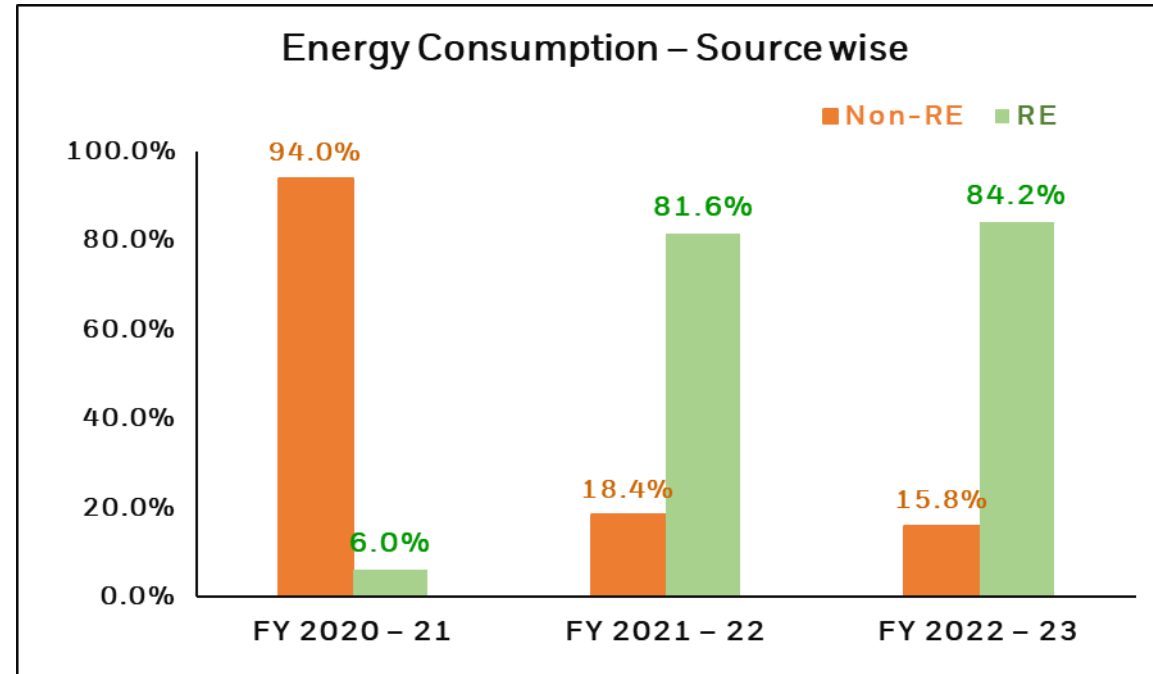
Feasibility study under progress

- as a substitute to DG during Grid power failure.
- alternate to UPS

Reduce the need for non-renewable power sources - diesel generators and associated fuel consumption rates, contributing to a smaller reduction on carbon footprint.

UTILIZATION OF RENEWABLE ENERGY SOURCE

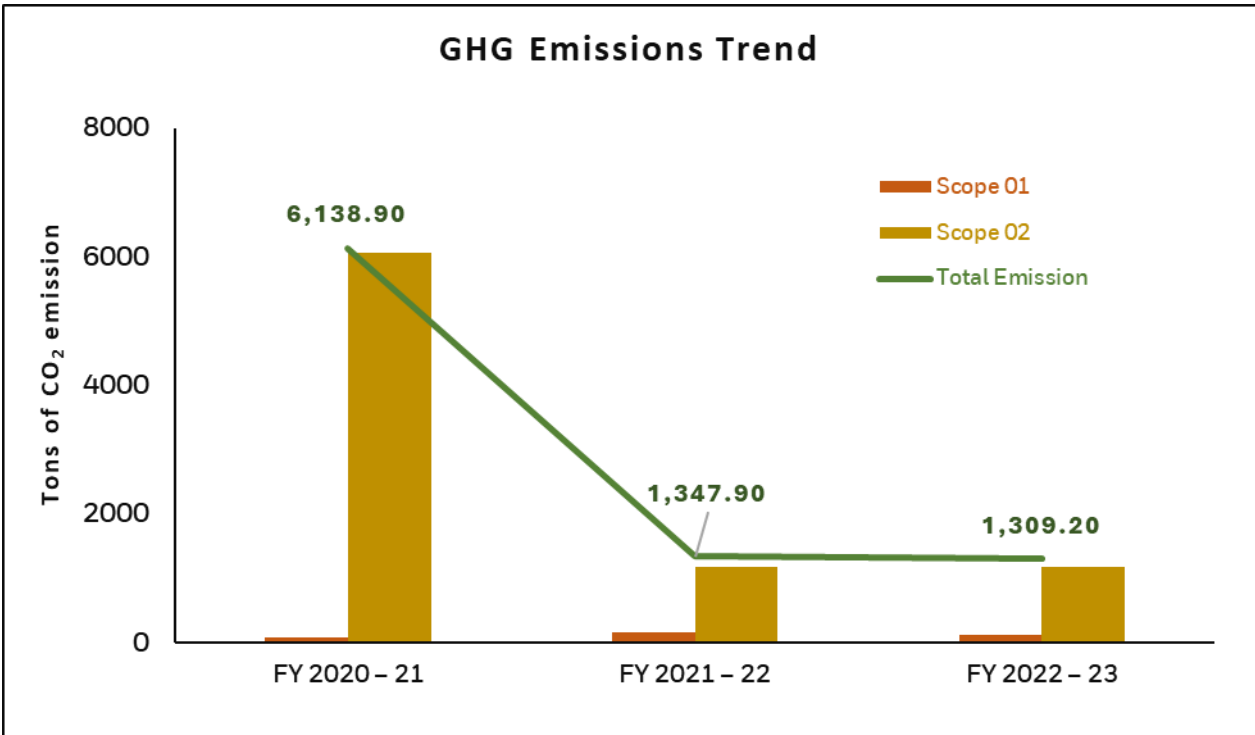
Year	Renewable Energy Source	Renewable Energy Consumption, kWh	Total Energy Consumption, kWh	% Renewable Energy	CO ₂ emission offset, tons of CO ₂
FY 2020 – 21	PPA	500,000.0	8,293,940.0	6.0	393.5
FY 2021 – 22	PPA	7,350,000.0	9,003,590.0	81.6	5,784.5
FY 2022 – 23	PPA	8,525,000.0	10,128,675.0	84.2	6,905.3



**6,905.3
Tons of CO₂**

GHG EMISSION TREND

CO ₂ e year	Scope 01	Emission factor CO ₂ e / unit = 2.69	Scope 02			Total Emission, CO ₂ in tons
	Fuel consumed in liters	Total GHG emission in TCO ₂ e	Energy consumption in kWh	Emission factor CO ₂ e / unit	Total GHG emission in TCO ₂ e	
FY 2020 – 21	31,362	84.4	77,02,990	0.786	6,054.6	6,138.9
FY 2021 – 22	62,705	168.7	14,55,855	0.810	1,179.2	1,347.9
FY 2022 – 23	47,060	126.6	14,600,50	0.810	1,182.6	1,309.2



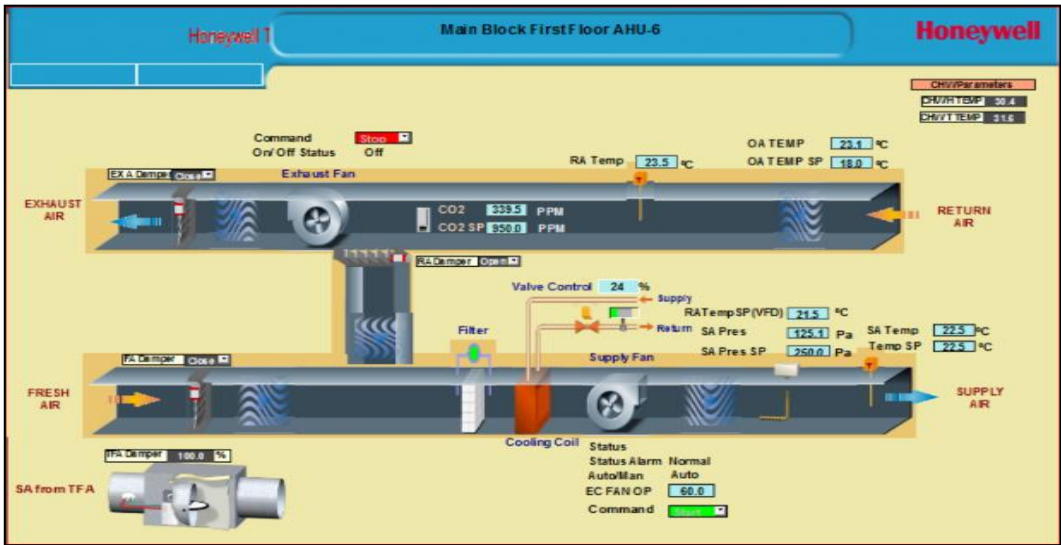
DG set operation

- **Optimization in DG set daily test**
 - Implemented in 2020
 - “A check” test frequency revised from daily to weekly once.
 - Annually 12.5 kL of Diesel consumption reduced.
 - Approx. 33.3 Tons of CO₂ emission reduction

RE purchase

- **RE purchase – PPA - Wind**
 - Implemented in 2020
 - 80.0 % energy consumption drawn from RE
- **In the last 2 FYs – 13,000 Tons of CO₂ off-set done**

INDOOR AIR QUALITY



Floor	AHU-1	AHU-2	AHU-3	AHU-4	AHU-5_1	AHU-5_2	AHU-6
GROUND FLOOR							
CO2 LEVEL	301.7 PPM	312.0 PPM	245.6 PPM	246.5 PPM	NA	NA	302.6 PPM
FILTER STATUS	Normal	Normal	Normal	Normal	Normal	Normal	Normal
FIRST FLOOR							
CO2 LEVEL	529.5 PPM	298.7 PPM	302.1 PPM	226.9 PPM	336.6 PPM		
FILTER STATUS	Normal	Normal	Normal	Normal	Normal		
SECOND FLOOR							
CO2 LEVEL	535.9 PPM	472.4 PPM	472.4 PPM	471.9 PPM	471.9 PPM	300.7 PPM	301.7 PPM
FILTER STATUS	Normal	Normal	Normal	Normal	Normal	Normal	Normal
THIRD FLOOR							
CO2 LEVEL	385.3 PPM	558.0 PPM	558.0 PPM	506.9 PPM	506.9 PPM	474.9 PPM	301.7 PPM
FILTER STATUS	Normal	Normal	Normal	Normal	Normal	Normal	Normal
FOURTH FLOOR							
CO2 LEVEL	305.1 PPM	540.3 PPM	540.3 PPM	550.2 PPM	550.2 PPM	299.2 PPM	283.0 PPM
FILTER STATUS	Normal	Normal	Normal	Normal	Normal	Normal	Normal

	AHU 01	AHU 02 A	AHU 02 B	AHU 03 A	AHU 03 B	AHU 04	AHU 05	AHU 06
Ground Floor								
CO ₂	301.7	312.0	NA	245.6	NA	246.5	NA	302.6
Filter	Normal	Normal		Normal		Normal		Normal
First Floor								
CO ₂	529.5	NA	NA	298.7	NA	302.1	226.9	336.6
Filter	Normal			Normal		Normal	Normal	Normal
Second Floor								
CO ₂	535.9	472.4	472.4	471.9	471.9	300.7	301.7	298.7
Filter	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal

TEAMWORK, EMPLOYEE INVOLVEMENT & MONITORING

BMS Team :

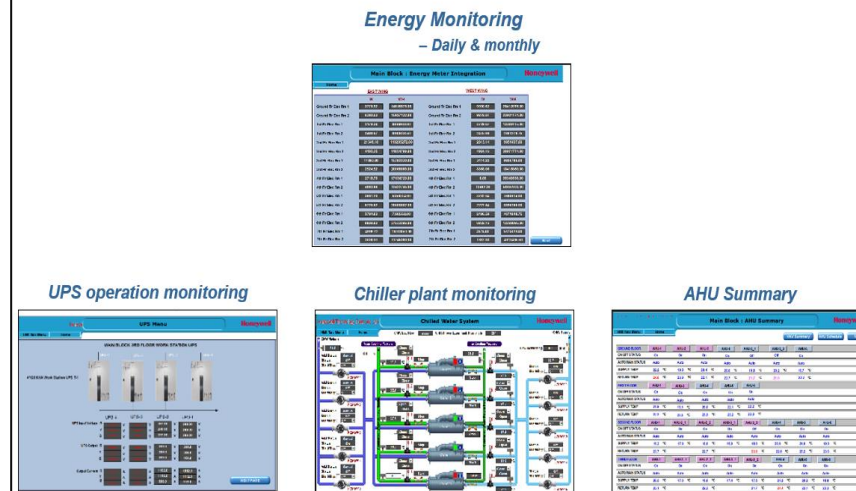
- monitor & control
- scheduling of utilities (Chillers, AHUs)
- monitoring of equipment's
Viz., Transformer, DG, HVAC, UPS, Energy meters etc.,
- Energy consumption data analysis for critical equipment's
- Indoor air quality monitoring

Energy Team

- Certified Energy Managers – 2 Nos.
- Weekly and monthly Energy review
- Energy Dashboard
- Dedicated Energy CAPEX budget
- Periodical Energy Training



ENERGY & UTILITY – ONLINE MONITORING



Kaizens

- MD reduction
- DG A Check optimization from daily to weekly
- Operating multiple chillers at part load
- Chiller scheduling based on seasons
- Fresh air purging on daily basis
- Timer optimization in Lighting sensor
- Fixing of Timer controller for Exhaust fans

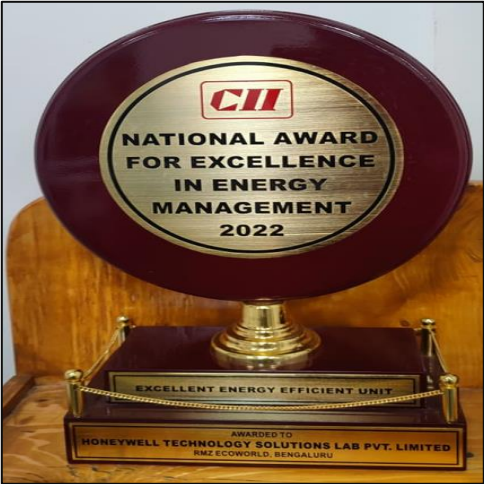
MAJOR ACHIEVEMENTS AWARD



**Energy Efficient unit
2017**



**Energy Efficient unit
2018**



**Excellent
Energy Efficient unit
2022**



**Most Innovative Project
2022**



**EHS Practices award
2015 – 2016
4 Star**

**THANK
YOU**

Honeywell