CII 24th NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT 2023

Honeywell Technology Solutions Lab Pvt. Ltd

Survey No. 115, 11, IT Park Road Number 2, Financial District,
Nanakram Guda, RR Hyderabad, Telangana 500 019

13th, 14th & 15th September 2023

MR. SUBRATA BALIARSINGH
- DIRECTOR IFM – INDIA

MR. ARAVIND MAMIDI
- OPERATIONS LEADER – HYD

MR. VIJAYAKUMAR SHOLAPUR
- FACILITIES & ENERGY LEAD- INDIA

Honeywell

HONEYWELL INDIA

8
Decade legacy

$1B
Domestic sales and exports

13000
Employees

3000+
Products, solutions, applications engineered in India

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

NET ZERO COMMITMENT- HONEYWELL SUSTAINABILITY POLICY

Honeywell

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

Revised: 16 June 2023
Version: 8
Document Number: 3-1101-X10

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 Janek Philip (Fin)	PMT Carine Baerlocher (Fin)	SPS Mahesh Vidyasagar Zachee Gouett Oliveira (Fin)

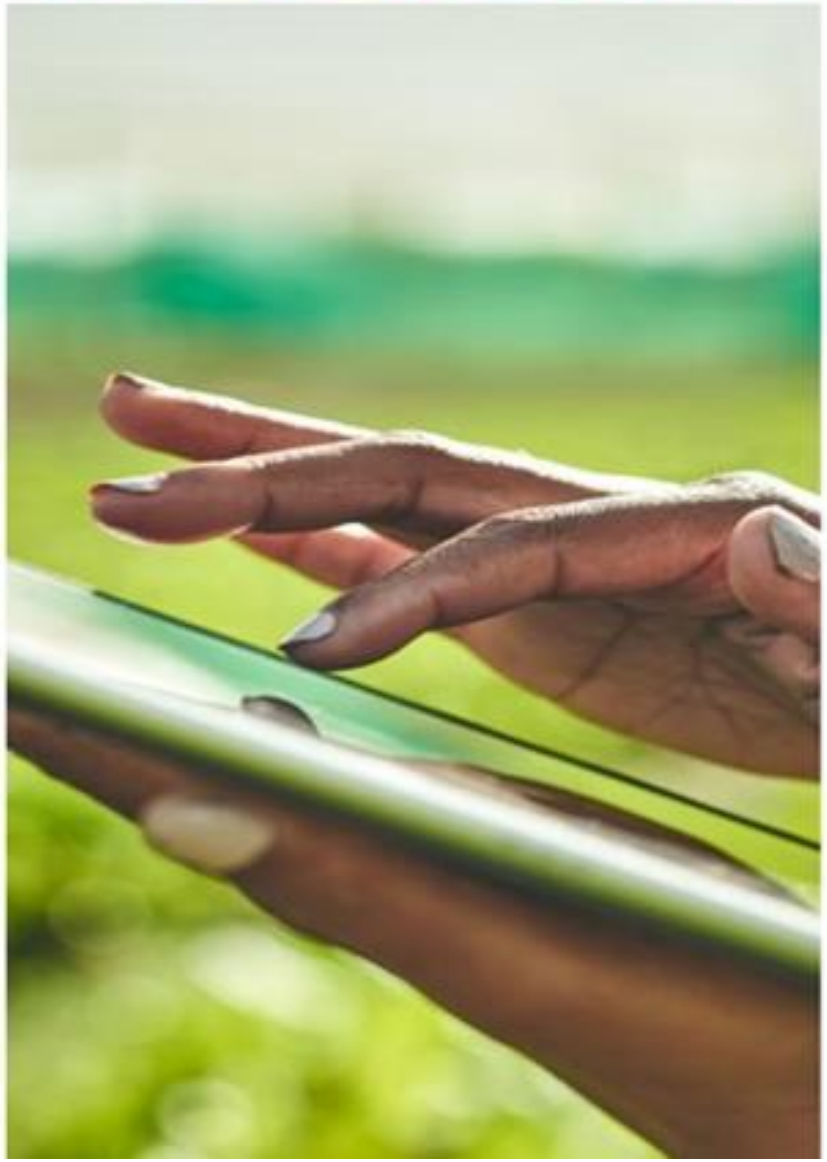
Driving Performance & Continuous Improvement

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

- **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 wo
(GHG) emissions, increase energy efficiency, conserve water, minimize waste, and driv
Honeywell also champions responsible remediation projects and efforts to make our

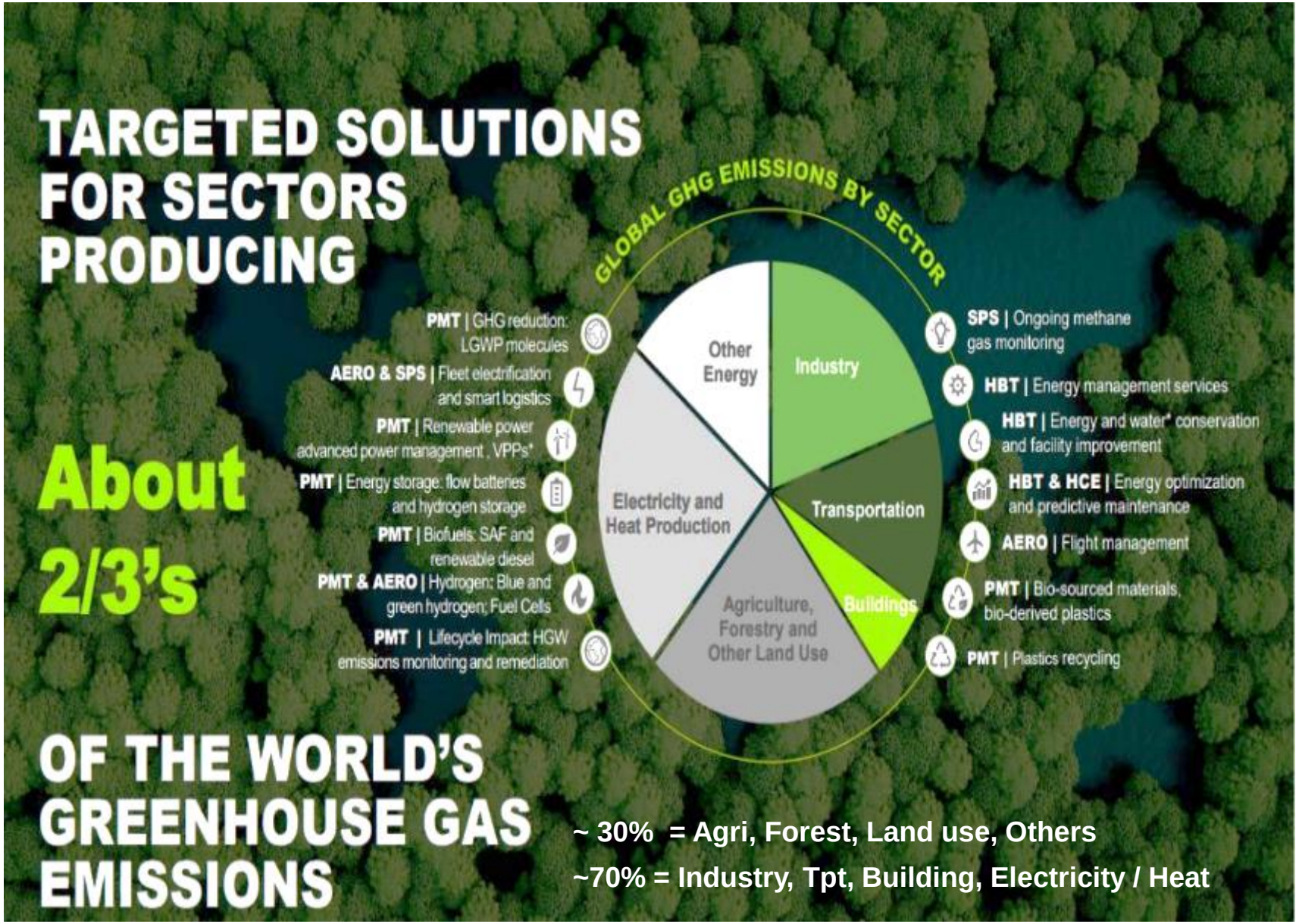
OUR ENVIRONMENTAL GOALS

We are proud of the environmental improvements we have achieved to date and conti
businesses more sustainable.

- **Pledge to be carbon neutral in our facilities and operations[1] by 2**
- **Commitment to set a science-based target aligned with the Scie Targets initiative (SBTi)**
- **Five-year "10-10-10" target to, by 2024:**
  - Reduce global Scope 1 and Scope 2 GHG emissions intensity by an additiona
  - Deploy at least 10 renewable energy opportunities
  - Achieve certification to ISO's 50001 Energy Management Standard at 10 fac

GOAL	TIMEFRAME
30% GHG reduction[1]	2007 – 2011 (2004 baseline)
20% Energy efficiency improvement	2007 – 2011 (2004 baseline)
15% GHG intensity reduction[1]	2012 – 2016 (2011 baseline)

HONEYWELL COMMITTED TO BE CARBON NEUTRAL BY 2035



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
- Vehicle fleet engagement model

Scope 2 Abatement plan

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

SITE INFRA – HTSL HYDERABAD

Facility details

- Year of operation : 2008 (24 / 7 operations)
- Built up area : 153 000 Sq.ft
- Lab area : 32,082 Sqft (20%)
- Buildings : Building 1, Building 2
- Seating Capacity : 1,046 Nos.
- Incoming Power Supply : 11 kV
- Sanctioned Demand : 1.55 MVA
- Transformer Capacity : 1.5 MVA x 2 nos.
- Diesel Generator Capacity : 3.12 MVA
- UPS Capacity : 0.625 MVA
- Chiller Capacity : 120 TR x 2 nos.

Annual energy use is around 3.18 million kWh with the spend of INR 3.11 crores, including diesel cost during FY 2022 - 23

BUILDING SALIENT FEATURES

SUSTAINABILTY CONCEPTS IMPLEMENTED IN BUILDING

Priority to passive design to reduce energy demands

1. Compact envelope shape
2. Orientation, Solar protection
3. Air tightness

Include passive

1. UV protected glazing.
2. Day-light exposure up to 70%.

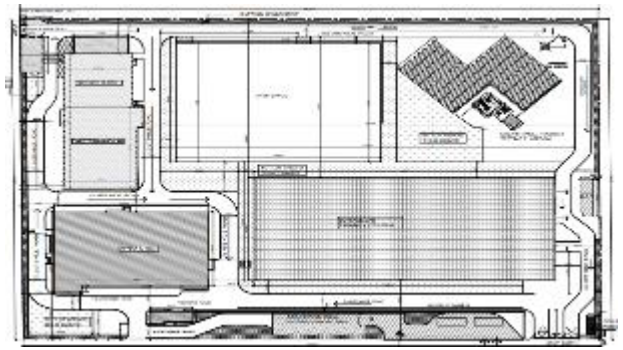
Occupant comfort and well being

1. Achieving indoor comfort requirements (visual / thermal / acoustic)
2. Maintaining IAQ standards (indoor air quality) as per ISHRAE guidelines.

More sustainable elements

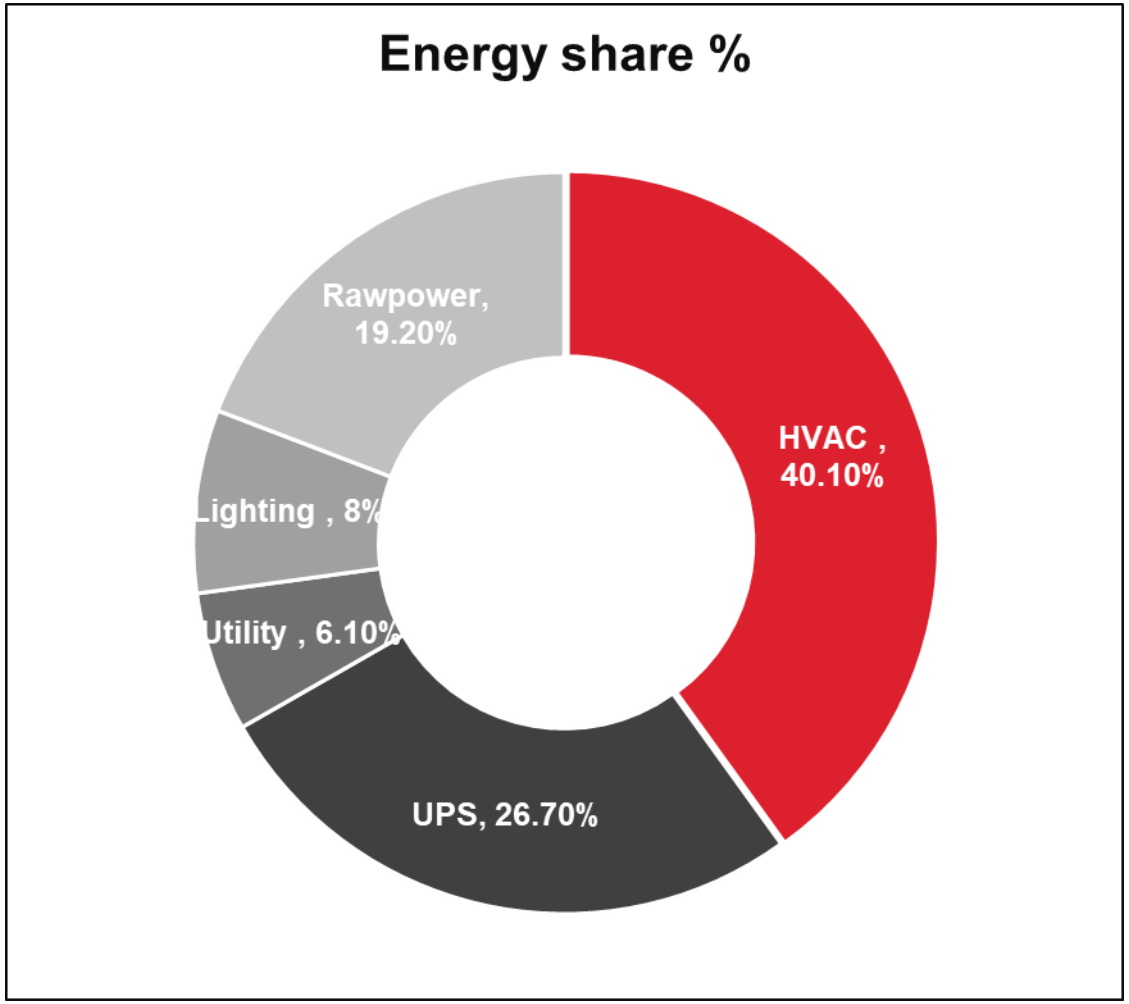
1. Roof top Solar plant of 100Kw .
2. Ground mounted Solar power plant of capacity 250 kw in progress.
3. Zero discharge .
4. Rainwater harvesting .
5. Green plantations

Building Orientation	North – South
Solar Heat Gain Coefficient (SHGC)	0.72
Visual Light Transmittance (VLT)	71.0
SRI	102



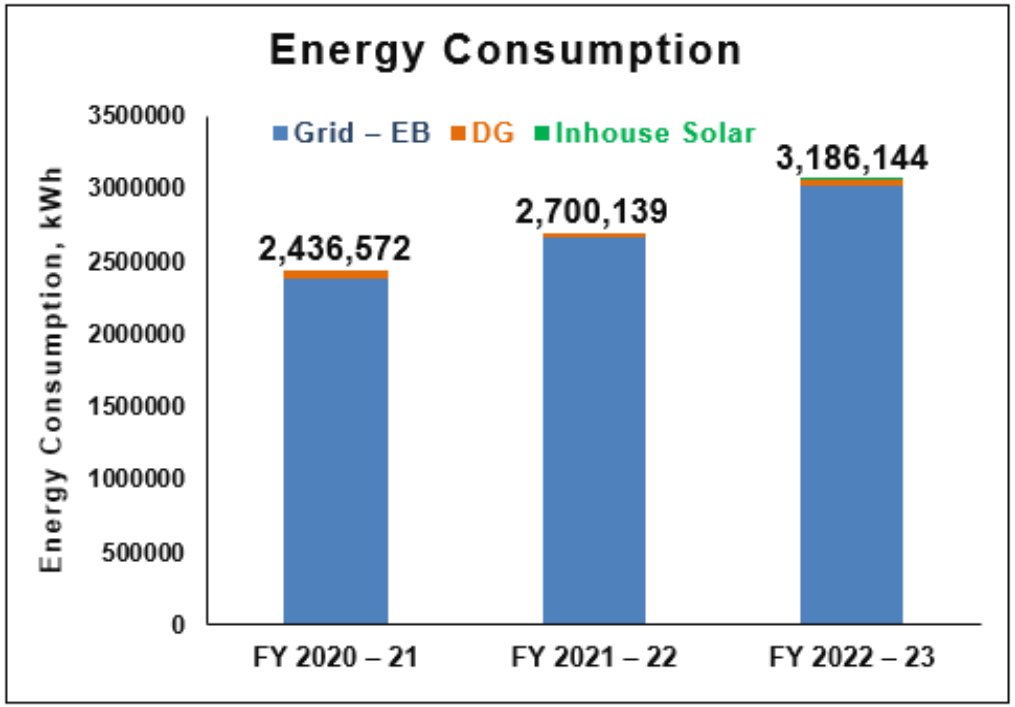
ENERGY PROFILE – UTILITY WISE

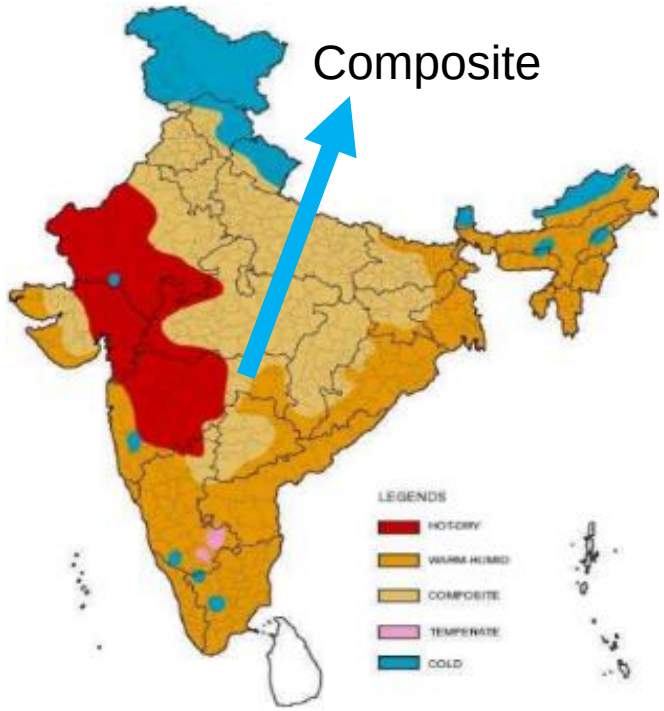
Utility	Energy Consumption, kWh	Energy Share %
HVAC	127,650	40.1
UPS	849,115	26.7
Utility	193,106	6.1
Lighting	254,251	8.0
Raw Power	611,567	19.2
Total	**3,184,590.0**	



ENERGY CONSUMPTION OVERVIEW IN 2020 - 2023

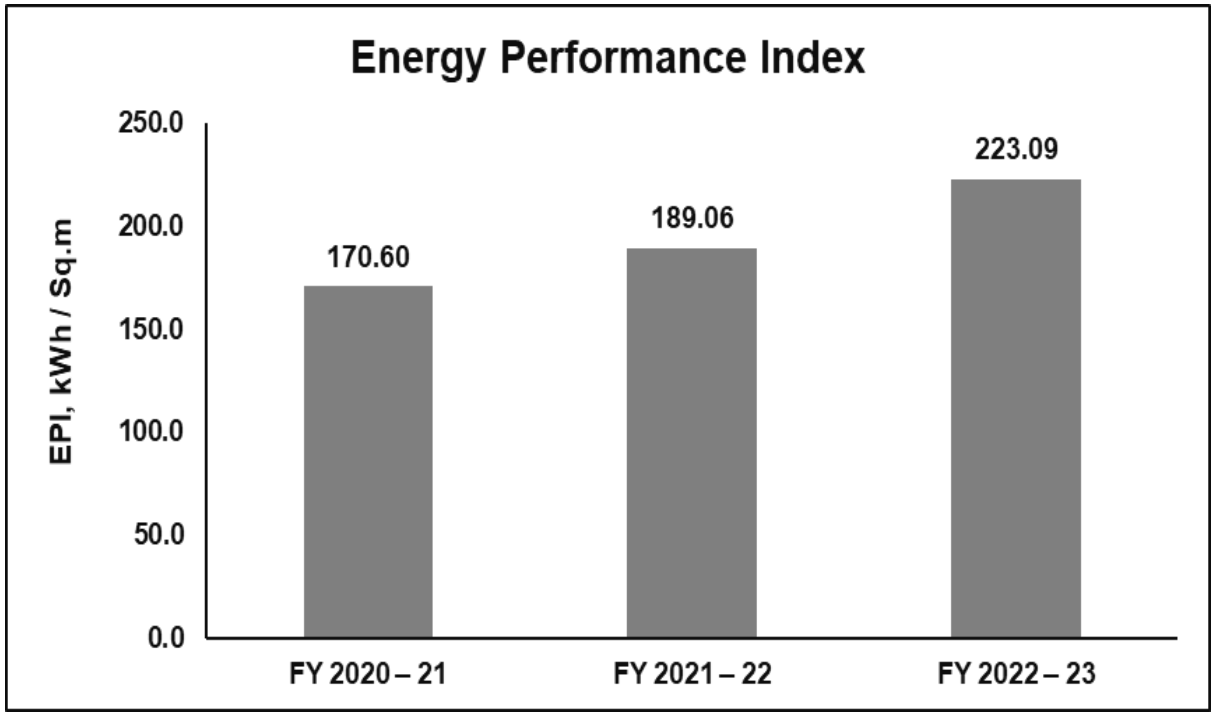
Year	Source of Energy – Energy Consumption, kWh			Total Energy Consumption	Energy Cost
	Grid – EB	DG	RE (In house Solar)	Lakhs kWh	INR
FY 2020 – 21	2,390,140	46,432	0	24.37	21,573,672
FY 2021 – 22	2,663,083	37,056	0	27.00	23,512,053
FY 2022 – 23	3,124,900	42,914	18,330	31.86	31,108,684





Specific Energy Consumption 2020 - 2023

Year	Total Energy Consumption	Area	Energy Performance Index
	kWh	Sq.m	kWh / Sq.m
FY 2020 – 21	2,436,572	14,282	170
FY 2021 – 22	2,700,139	14,282	189
FY 2022 – 23	3,186,144	14,282	223



NOTE : The consumption for the year 2019-20 was 36,55,128 kWh; EPI 256

- **The year 2020-21 –Around 85 % of employees are working from home , only essential services are operational which includes labs.**
- **Starting from April 2022 – 3:2 work model was implemented.**
- **Lab area expanded from 12000 sqft to 30,000 Sq.ft.**

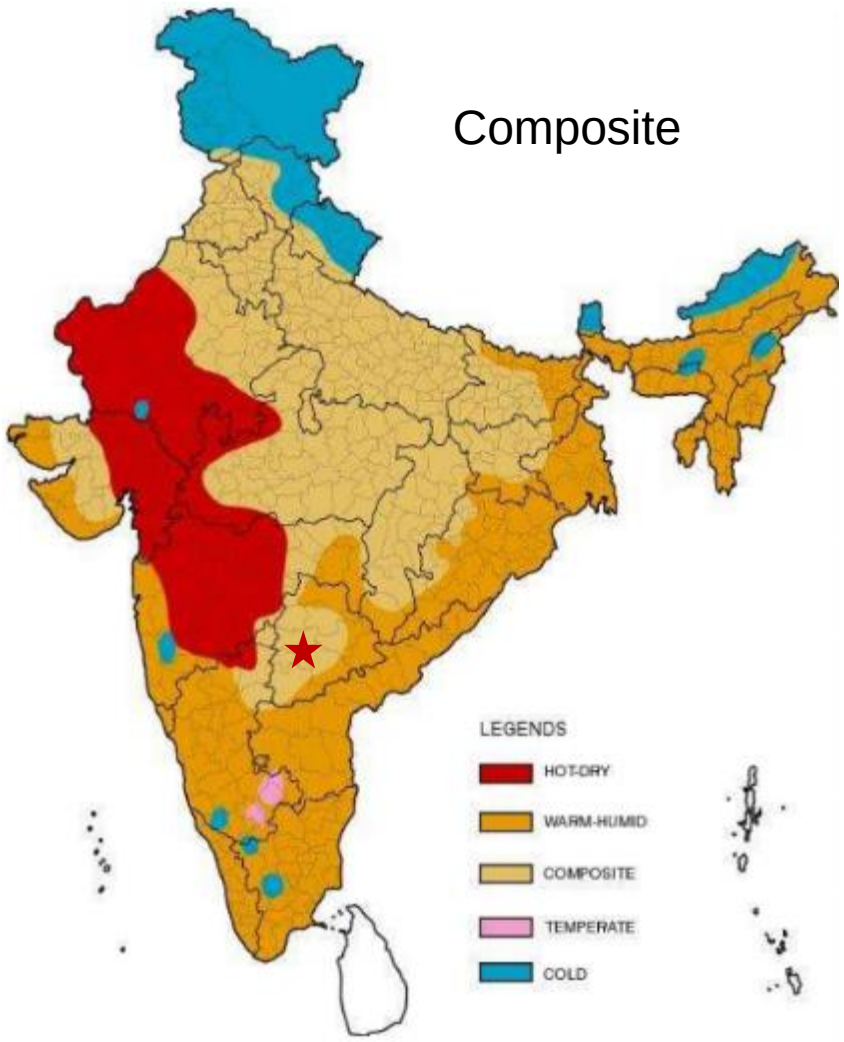
COMPARISON SEC WITH INTERNAL & NATIONAL BENCHMARKING

Internal Benchmarking	Location	Zone	SEC (kWh / m^2 / y)
Honeywell	Hyderabad	Composite	223.9
Honeywell	Bangalore Campus 02	Composite	251.1

Benchmarking	Reference	SEC (kWh / m^2 / y)	
		Standard	Actual
National level	Bureau of Energy Efficiency (BEE)	179	**223.9**

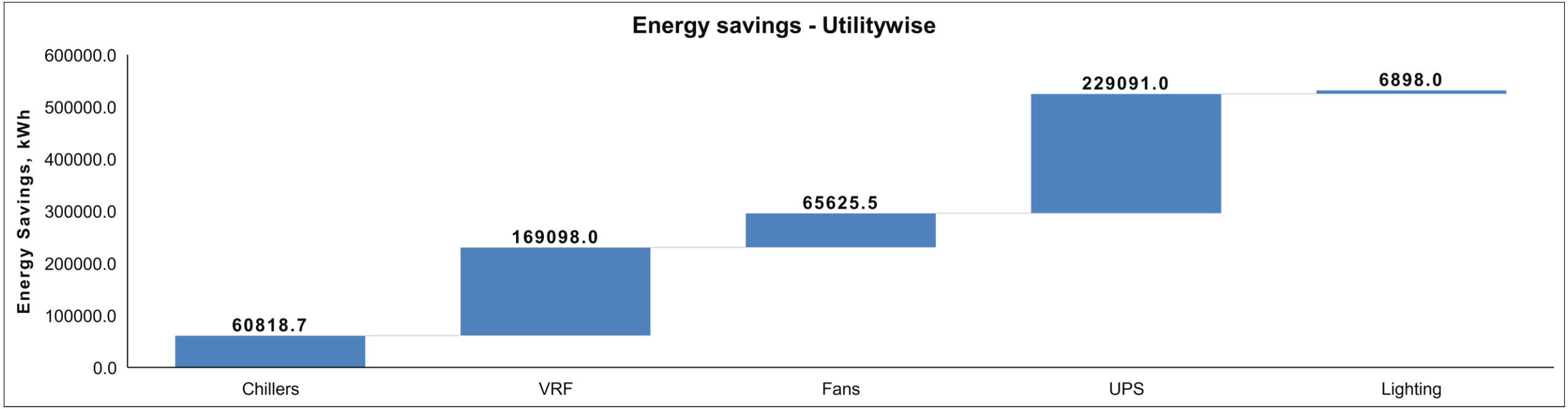
Climate Zone	AC	
	< 50.0 %	> 50.0 %
EPI (kWh / m^2 / year)		
Composite	86	**179**
Moderate	94	179
Warm & Humid	101	182
Hot & Dry	90	173

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



Energy Saving projects implemented in 2020 – 2023

Year	No. of Energy Saving projects	Investment	Electrical Savings	Cost Savings	Impact of SEC
		Lakhs INR	Lakhs kWh	Lakhs INR	%
FY 2020 – 21	04	72.6	3.14	26.91	11.4
FY 2021 – 22	02	16.96	0.48	4.31	1.7
FY 2022 – 23	02	87.5	1.69	16.57	5.0



ENCON PROJECT PLANNED IN FY 2023 - 24

Title of the Project	Electrical Savings, kWh pa	Cost Savings, INR pa	Investment, INR	Status
Replacement of old VRF units with star rated Energy Efficient VRF units	286,925.0	2,725,770.0	9,500,000.0	W I P
Installation of 250 kW of Solar PV plant	353,500.0	3,382,995.0	13,169,915.00	W I P

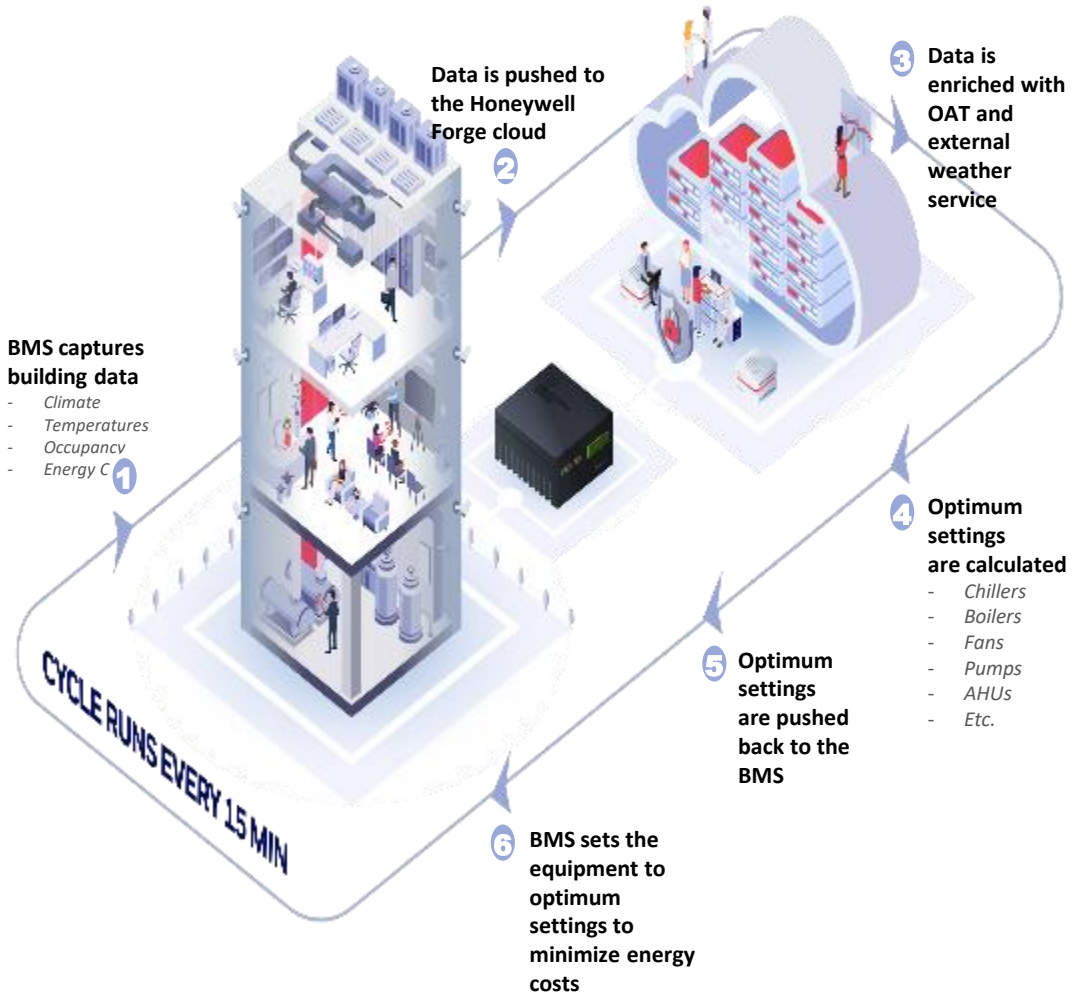
Innovative projects
Intelligent Building Optimization -IBO

- IS A CLOUD-BASED SOLUTION THAT LEVERAGES MACHINE LEARNING TO OPTIMIZE THE HVAC SYSTEM IN A BUILDING.

  LEARNING FROM DATA HOW SET-POINT CHANGES AFFECT COMFORT AND COST.

  IT MINIMIZES ENERGY COSTS WHILE MAINTAINING COMFORT IN A BUILDING.

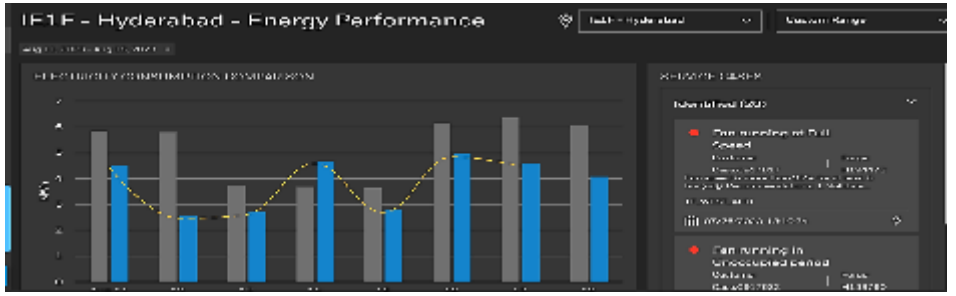
- Models & predicts heating & cooling demand
- Learns and adapts based on real-time data
- Identifies inefficiencies in the HVAC System
- Minimizes costs and protects comfort levels



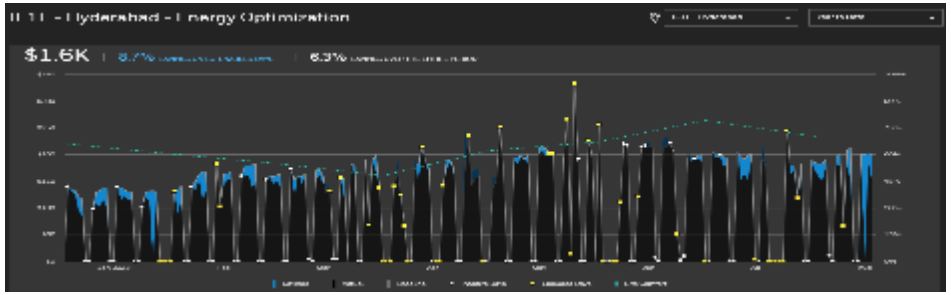
IBO -WHAT IS DONE DIFFERENTLY?

State-of-the-art	DM – DIGITISED MAINTENANCE	EO – ENERGY OPTIMIZER
• HVAC control system configured conservatively to ensure comfort for all operating conditions • Set-points either constant or changing based on rules if outside too hot then decrease chilled water temperature • HVAC system runs sub-optimally • Part of cooling energy is wasted	• Predicts asset healthy status. • Generates auto remediation request • Guides trouble shoot steps. • Stores historical data • Forecast life cycles replacements.	• Models and predicts demand for cooling • Uses on-line weather forecast. • Set-point adjusted every 15 minutes • Delivers the right amount of cooling energy to maintain comfort

Energy Consumption comparison



Energy Optimization

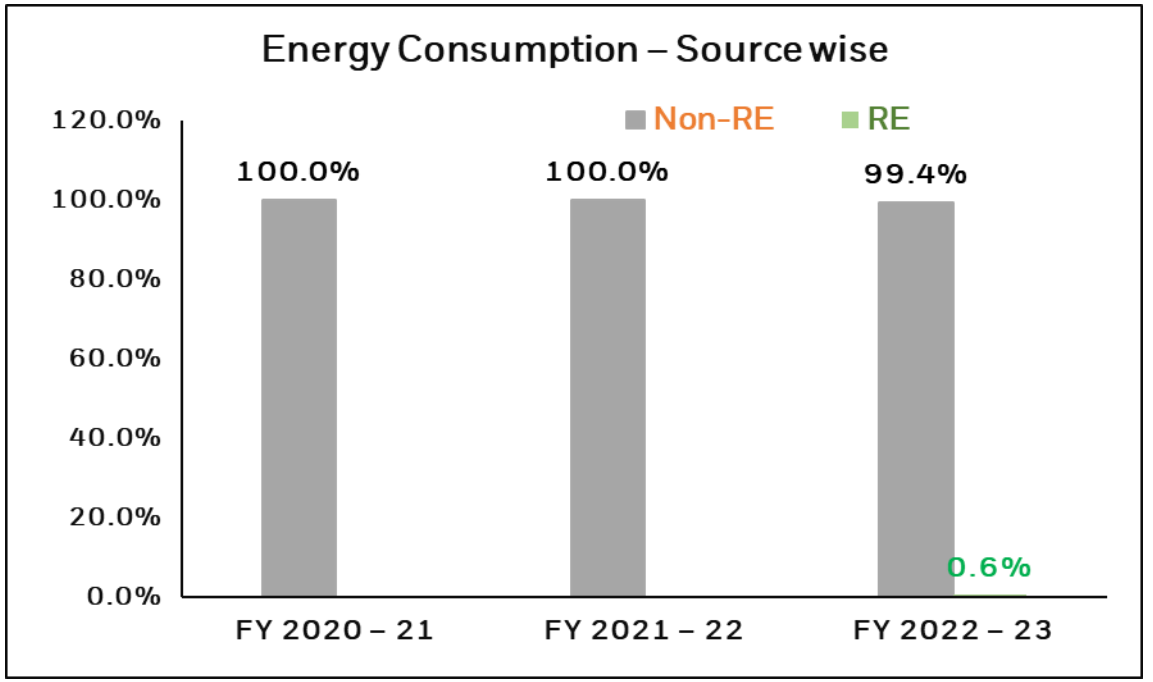


Comfort Performance

Overall savings achieved 8.7 % on HVAC systems

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	-	0.0	2436572	0.0	0.0
FY 2021 – 22	-	0.0	2700139	0.0	0.0
FY 2022 – 23	Inhouse Solar	18,330	3186144	0.58	14.85



CO_2

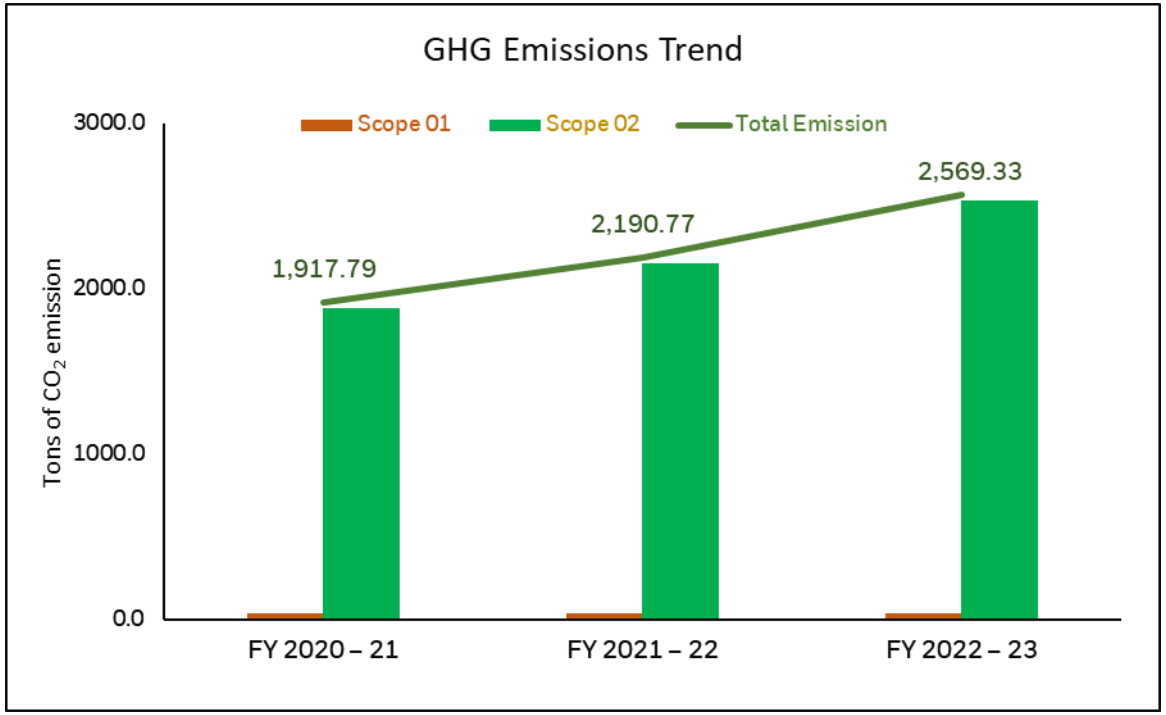
14.85
Tons of CO_2

Remark:

- *100 kWp Roof top plant installed in Dec 2022.*
- *New plant 250 kW ground mounted project is in progress expected complete by N0v 23*

GHG EMISSION TREND

	Scope 01	Emission factor CO_2e / unit = 2.69	Scope 02			Total Emission, CO_2 in tons
CO_2e year	Fuel consumed in liters	Total GHG emission in TCO_2e	Energy consumption in kWh	Emission factor CO_2e / unit	Total GHG emission in TCO_2e	
FY 2020 – 21	14,549	39.1	2,390,140	0.786	1,878.65	1,917.79
FY 2021 – 22	12,517	33.7	2,663,083	0.810	2,157.10	2,190.77
FY 2022 – 23	14,185	38.2	3,124,900	0.810	2,531.17	2,569.33



DG set operation

- **Optimization in DG set daily test**
  - *Implemented in 2020*
  - *"A check" test frequency revised from daily to weekly once.*
  - *Approx. 2.88 Tons of CO_2 emission reduction*

Renewable Energy

- **RE utilization – inhouse Solar**
  - *Roof top Solar plant of 100 kWp installed in Dec 2022.*
  - *Ground mounted Solar plant of 250 kWp is in-progress*

INDOOR AIR QUALITY

AHU PARAMETERS	1F EAST AHU	1F WEST AHU	2F EAST AHU	2F WEST AHU	3F EAST AHU	3F WEST AH
ON/OFF COMMAND	Start	Start	Start	Start	Start	Start
ON/OFF STATUS	On	On	On	On	On	On
AUTO/MANUAL STATUS	Auto	Auto	Auto	Auto	Auto	Auto
RA TEMP	23.6 ℃	23.7 ℃	23.5 ℃	24.9 ℃	24.0 ℃	24.0 ℃
RA TEMP SP	23.3 ℃	24.2 ℃	25.5 ℃	25.0 ℃	24.0 ℃	21.0 ℃
SA TEMP	17.1 ℃	18.0 ℃	24.4 ℃	22.2 ℃	16.8 ℃	16.6 ℃
CHW CONTROL	100.0 %	49.5 %	0.0 %	14.1 %	97.3 %	100.0 %
VFD SPEED CONTROL	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	0.0 %
FA DAMPER CONTROL	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
DUCT STATIC PRESSURE	296.7 Pa	251.5 Pa	250.0 Pa	258.9 Pa	281.5 Pa	290.7 Pa
DPS SP	300.0 Pa	300.0 Pa	280.0 Pa	280.0 Pa	300.0 Pa	300.0 Pa
CO2 SENSOR	158.7 PPM	172.0 PPM	281.4 PPM	170.7 PPM	159.9 PPM	22.1 PP
CO2 SENSOR SP	300.0 PPM	300.0 PPM	300.0 PPM	300.0 PPM	300.0 PPM	300.0 PP
FILTER STATUS	Normal	Normal	Normal	Normal	Normal	Normal

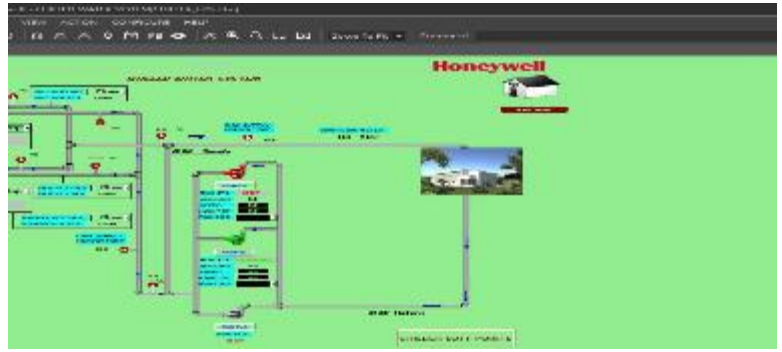
TEAMWORK, EMPLOYEE INVOLVEMENT & MONITORING

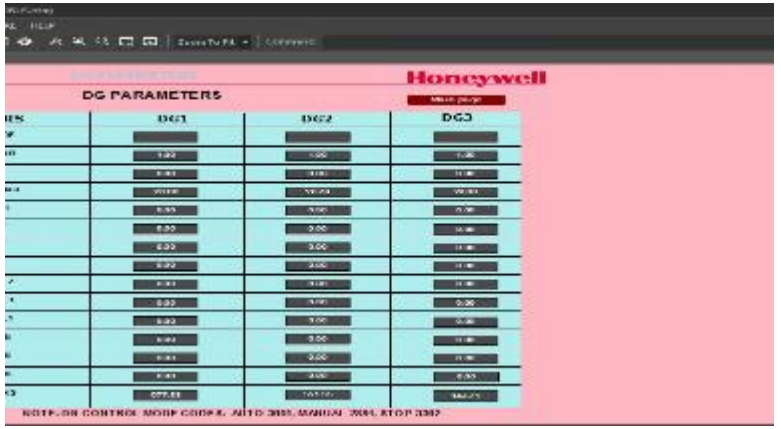
Energy Team

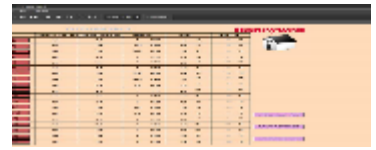
- Certified Energy Managers – 2 Nos.
- Weekly and monthly Energy review
- Energy Dashboard
- Dedicated Energy CAPEX budget
- Periodical Energy Training

Kaizens

- Timer optimization in Lighting sensor
- Fixing of Timer controller for Exhaust fans
- Reducing AC operations hours in Lift room
- DG A Check optimization from daily to weekly







OUTDOOR GREENERY, HARVESTING PITS

Total around 310 trees grown site and planted 100 + Fruit plants

MAJOR ACHIEVEMENTS AWARD

Honeywell wins Big at 25th HYSEA Awards; Bags CSR, and Best Product Awards

HTS Recognized as Best development Centre by Hyderabad Software Enterprises Association

HTS Hyderabad recognized by Institute of Directors with OHS Golden peacock Award 2017 & 2016

Energy Efficient Unit Award from CII – 2016, 2017 & 2018

THANK YOU

Honeywell