CII 22nd National Award for Excellence in Energy Management 2021

Kodathi, Bengaluru

Eswaramoorthi M – Senior Manager – Facility Management Group

About Wipro

Building a bold tomorrow

Celebrating our 75th year, we leverage the power of technology with a passionate global talent base to help our customers, communities and planet thrive in the digital world.

We are technologists, engineers, designers, strategists and business partners, sharing a purpose-driven culture and an unwavering commitment to customer success.

Employees > 209,000

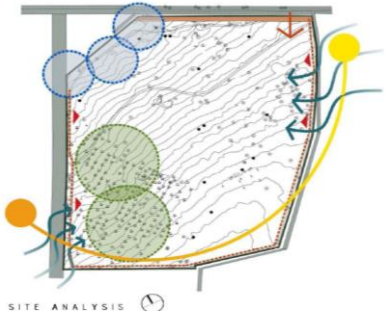
FY21 Revenue - $8.13 Bn

Countries with Employee presence – 66

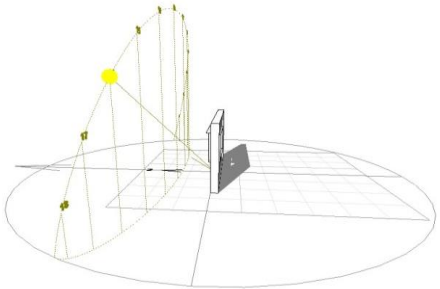
Kodathi Campus overview

- Established in 2018
- Campus Area - 48.25 Acres
- Built up area – 3.48 Million Sq.ft and Seating Capacity > 20,000
- 5 Towers (S4,S1,S3,S5,S2) – S2 is under construction
- 8 Numbers of 2000 kVA DGs for Raw power backup
- 4 Numbers of 1.8 MW DRUPS System with 4 Numbers of 2000 kVA DGs for Critical power back up

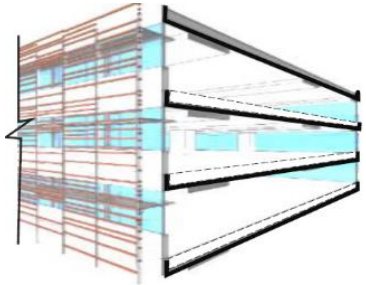
Kodathi Campus key highlights



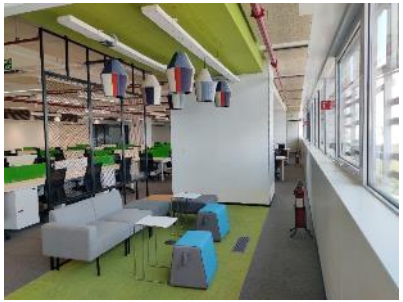
Building design based on Sun path



Double skinned Façade design to reduce heat ingress



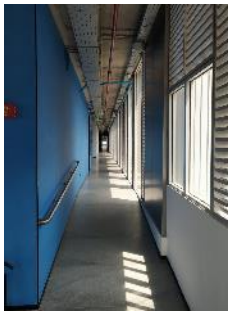
Largest Underfloor Air Distribution System (UFAD) - 2.5 Mn ft^2

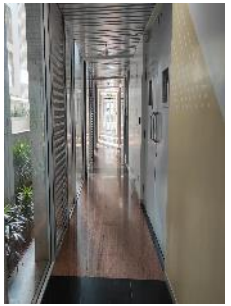


95% Day lit workspaces with day light and movement sensors

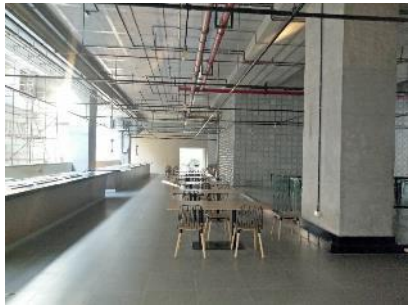
Kodathi Campus key highlights

100% LED for Indoor and Outdoor Lighting

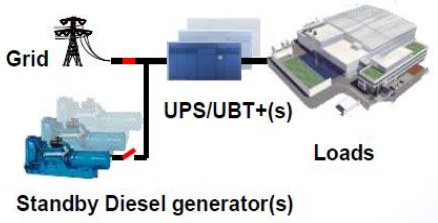




Naturally ventilated corridors in all floors

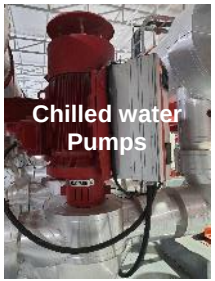


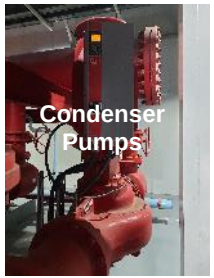
50% Cafeteria space is naturally ventilated

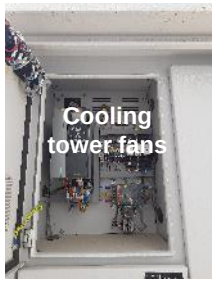


India's first Medium voltage Isolated parallel bus DRUPS system

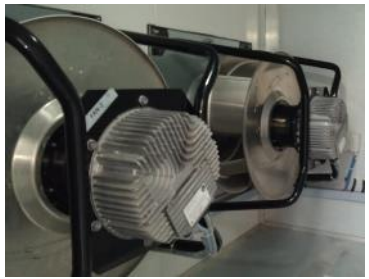
Kodathi Campus key highlights



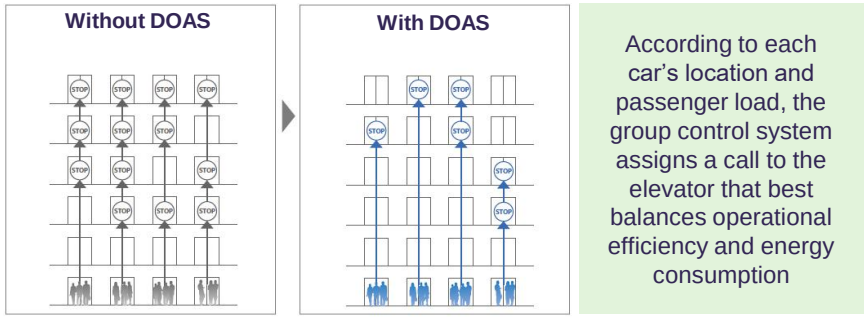




VFD for pumps & fans applications

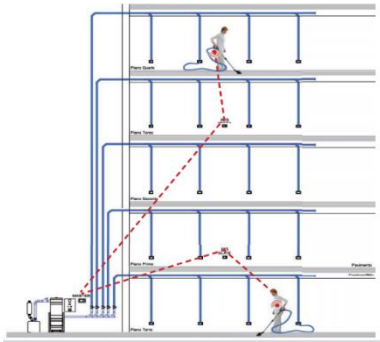


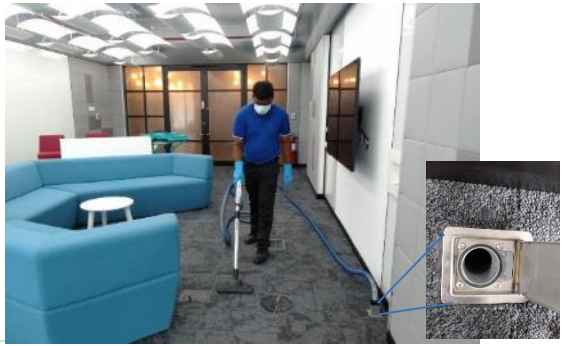
EC fans for AHUs, UFADs, Exhausts, DOAs



According to each car's location and passenger load, the group control system assigns a call to the elevator that best balances operational efficiency and energy consumption

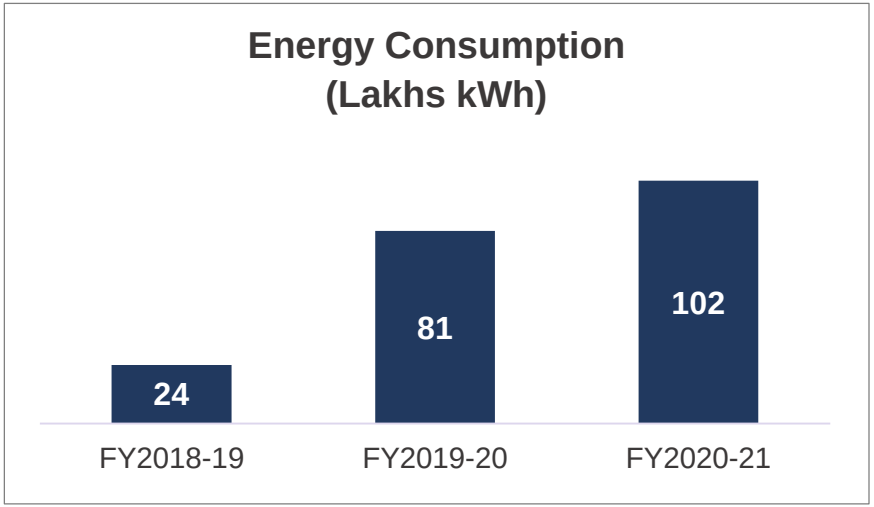
Destination Oriented Allocation System (DOAS) in Lift operation

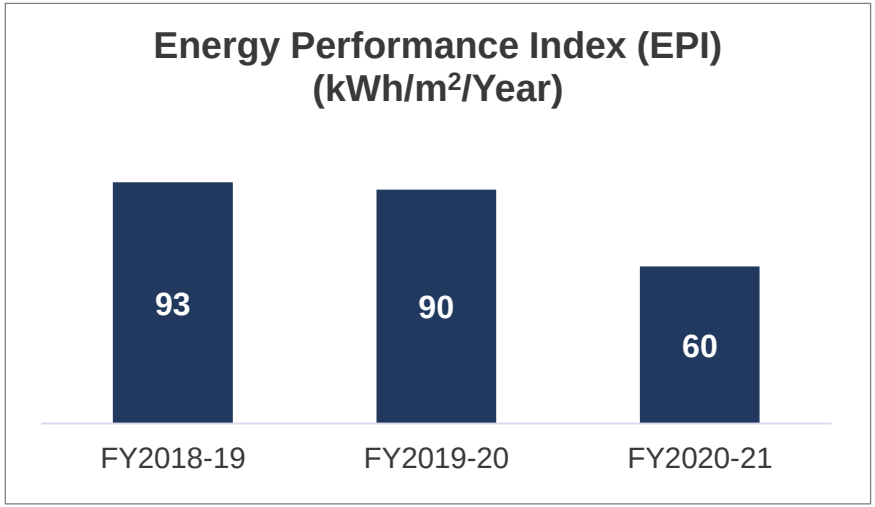




Centralized Vacuum System

Energy Consumption Overview





Year	EB (kWh)	DG (kWh)	Solar (kWh)	Total (kWh)	Area (m^2)	EPI (kWh/m^2/Year)	% Reduction	
FY2018-19	1,052,400	1,390,820	-	**2,443,220**	26,324	92.81	Base data	
FY2019-20	3,374,400	438,766	4,250,000	**8,063,166**	89,664	89.93	3%	
FY2020-21	747,600	528,330	8,890,000	**10,165,930**	168,365	60.38	35%	Owing to reduced occupancy

National and Global Benchmarking

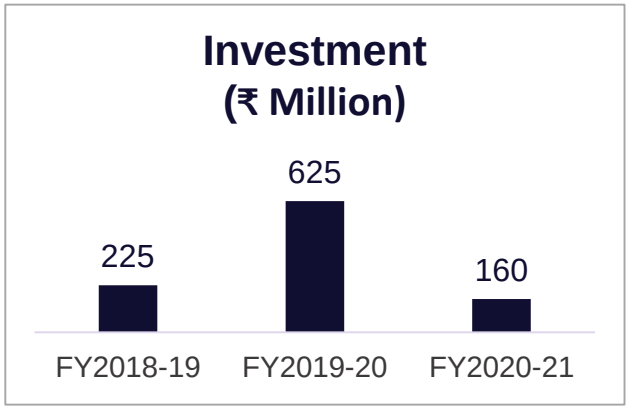
Benchmarking Details	Reference	SEC (kWh/m²/Year)	Wipro Kodathi Campus
Other Wipro Campuses	Wipro Annual Report FY2020-21	144	**90 (FY2019-20)** **65 (FY2020-21)** **Expected to achieve 75-80 once employees are back to work from office**
Other IT/ITES companies/Group	CII Energy award Programme, Bangalore (2019-20)	90	
National Level	BEE (Bureau of Energy Efficiency)	179	
International Level	Lawrence Berkeley National Laboratory	65 to 90	

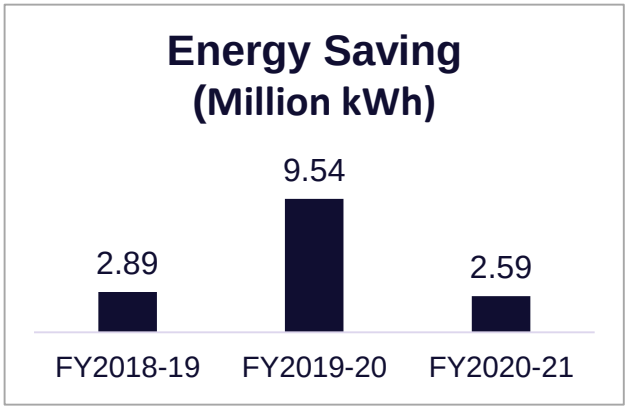
Encon Projects planned in FY2021-22

- Solar PV installation in roof area of Utility, S1 and S3 tower (462 kW_p)
- Online chemical dosing and water treatment system for S5 tower chiller condenser section
- Electrical charging infra for EV vehicles

Energy Saving projects implemented in last three years

Year	No of energy saving projects	Investment (₹ Million)	Electrical energy Savings (Million kWh)	Cost Savings (₹ Million)
FY2018-19	3	224.70	2.89	21.21
FY2019-20	4	624.84	9.54	70.00
FY2020-21	3	159.54	2.59	19.00





Innovative Project
Energy efficient air conditioning system

Water Cooled Magnetic Bearing Centrifugal Chillers

- Integrated unit mounted VSD with standard Harmonic filter and meets IEEE519
- Hybrid Falling-film evaporator technology
- Magnetic bearing - No Maintenance on lubrication part (Oil Free Design)
- Run lowest condensing entering water temperature – Due to Oil free design

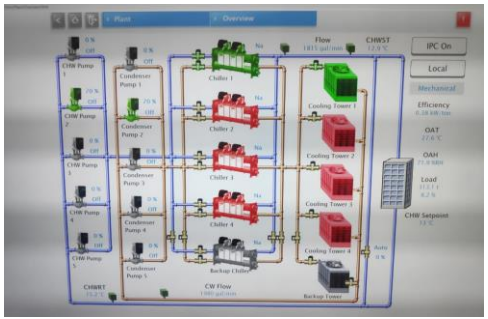
Two separate chilled water circuits based on applications

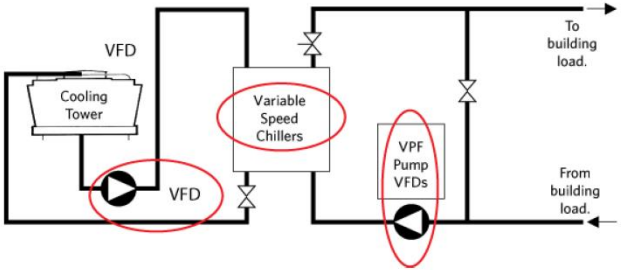
- **HT Circuit (Outlet 14ºC)**
  - Office Space
  - Hub Rooms
  - Server Room
- **LT Circuit (Outlet 7ºC)**
  - Cafeteria
  - Dormitory
  - DOA

Automatic Tube cleaning System (ATCS)

- A hydro-mechanical system, circulates Sponge balls through condenser's tubes and keep them permanently clean.
- The ATCS system injects and collects the soft balls in seconds and it cleans the tubes at programmable intervals.
- The sponge balls collect all sediment from the tubes inner surfaces without disturbing the condense water flow

Patented Hartman Loop™ technology for Air conditioning control





- The Hartman LOOP™ optimizes the plant efficiency by considering the performance curve of the equipment at different loading scenarios and attempts to sequence/stage parallel devices to minimize energy consumption.
- The Hartman LOOP™ methodology is a control method for chilled water plants that employs three patented techniques:
  - **“Natural Curve" sequencing**
  - **“Equal Marginal Performance Principle" for speed optimization**
  - **Demand Based control for stable operations**
- Armstrong IPC 11550 incorporates the Hartman LOOP™ control methodology for ultra-efficient all variable chilled water plant control. (Plant Configuration :All variable (i.e. Variable Chillers, Primary pumps, Condenser pumps & Cooling Towers).
- **Plant Performance : 0.432 kW/TR.**

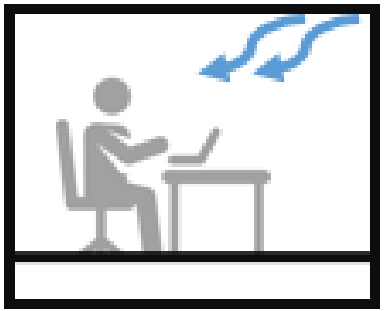
Under Floor Air Distribution System (UFAD)

In traditional office buildings, cold air is introduced into an enclosed environment via ductwork placed above a suspended ceiling, then returned through the ceiling to a different duct.

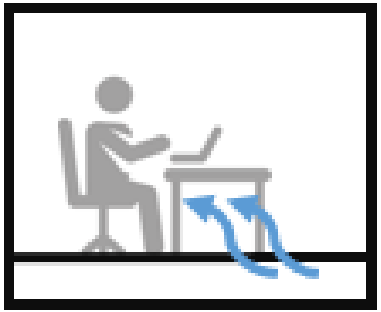
With UFAD system, conditioned air is routed through the empty plenum space underneath a raised access floor. Cool air remains close to the floor while air with human-friendly temperatures is in the middle where occupants are and higher temperature air rises towards the return plenum through natural air displacement.

Traditional System

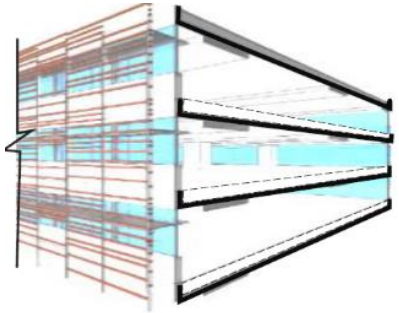
Supply air temp – 13-15^{o}C



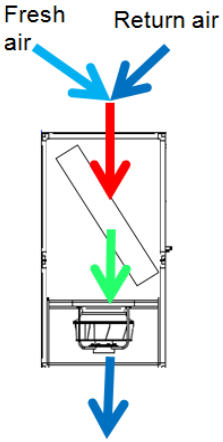
UFAD



Supply air temp – 18-20^{o}C



Under Floor Air Distribution System (UFAD)



AHU

- Floor Mounting type AHU with low noise. Chilled water connections from top
- Latest generation **Backward curve EC fans** with sliding arrangement RadiPac 560 mm dia
- **Inbuilt PIBC Valve**. PIBC Valve control through supply air temperature & Fan speed control through AFPS
- **Inbuilt water leak detector**
- **AHRI certified evaporator coil**

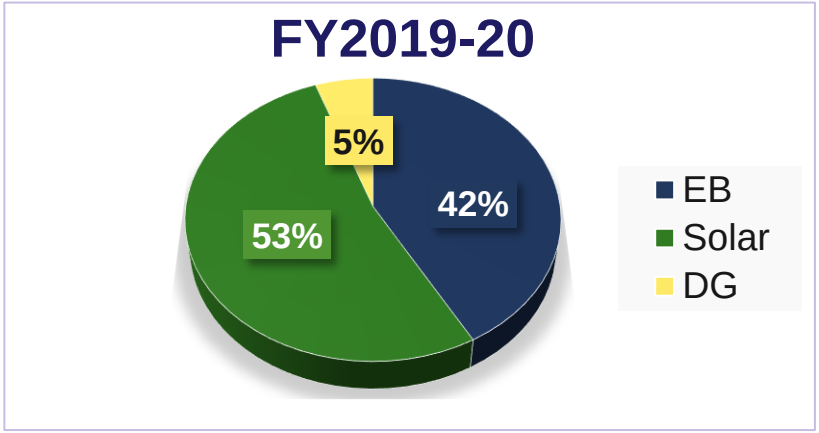
- The indoor air circulation system ensures supply of conditioned air at elevated temperature close to occupant thru the Under floor air distribution system.
- Every air terminal provided is a variable terminal and the same ensures subzone temperature control through user defined temperature set point.

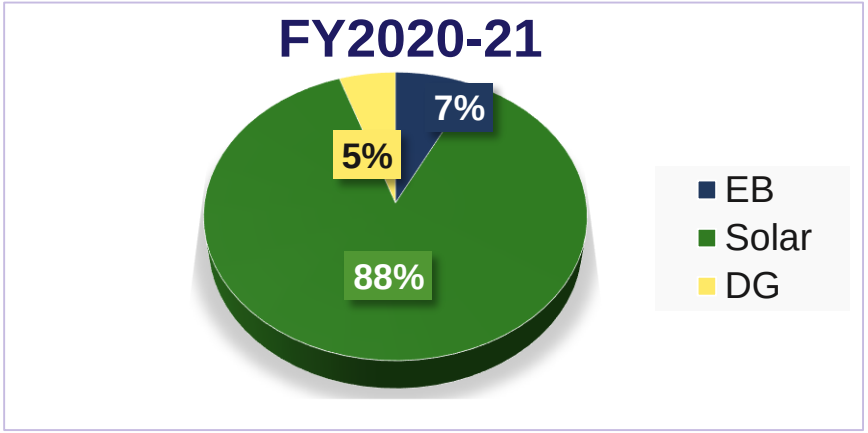
UFAD Capacity	S4 Tower	S1 Tower	S3 Tower	S5 Tower
7 TR (6000 CFM)	54	52	35	-
9 TR (7500 CFM)	6	26	5	12
12 TR (9000 CFM)	10	61	40	-

Innovative Project Summary
Energy efficient Air conditioning system with UFAD

Description	Investment (₹ Million)	Electrical Energy Savings (Million kWh)	Cost Savings (₹ Million)	Impact on SEC (kWh/m^2/Year)
Energy efficient air conditioning system (Chillers, Pumps, Cooling Tower, Hartman Loop, UFAD, Variable air volume terminal)	466.54	10.23	75.08	45

Utilization of Renewable Energy sources





- We entered into power purchasing agreement with two Solar PV Developers (20MW & 30MW) and started procuring Solar Power from Sep' 2019 onwards for Kodathi campus.
- We have installed 228 kW_p onsite Solar PV Plants at Utility block and S3 tower roof area recently.

Roof Location	Plant Capacity	Investment (₹ Million)	Date of commissioning
Utility Block	65.52 kW_p	2.675	April 2021
S3 Tower	162.24 kW_p	6.156	July 2021
S1 Tower	234 kW_p	7.996	Under installation
Total	**462 kW_p**	16.8	

GHG Emissions

Absolute Emission Profile (tons of CO2 eq)

Scope 1

	FY 2018-19	FY 2019-20	FY 2020-21
Fuel & Refrigerant – India Offices	13,424	13,366	10,885

Scope 2

	FY 2018-19	FY 2019-20	FY 2020-21
Purchased Electricity – India Offices and DCs	1,03,866	1,24,564	86463

Scope 3

	FY 2018-19	FY 2019-20	FY 2020-21
Employee Commute	79,160	84,536	18,055
Business Travel	1,17,819	1,23,789	13,538
Waste	760	274	140
Upstream Fuel+Energy emissions	76,659	72,888	53,937
Purchased goods / services	82,246	1,00,460	2,15,830*
Upstream Leased Assets	24,302	39,580	12,606
Work From Home Emissions			36,230

*Purchased goods and services based on material group and category spend for Tier 1 suppliers.

Data Center Efficiency

	FY 2018-19	FY 2019-20	FY 2020-21
Absolute Energy Consumption of DC's (MwH)	51,31,539	57,32,383*	2,29,00,207
Number of DC's	3	3	5**
PUE	2.23	2.11	1.61

*Contributes to 2.5% of our operational energy consumption. 48.3% of this is from Renewable Energy Sources.

Total Energy Consumption (MwH)

Source Type	Fuel	FY 2018-19	FY 2019-20	FY 2020-21
Renewable	Biogas	88.632	72	0
Non-Renewable	Charcoal	488.93	437	3.4
Non-Renewable	LPG	6807.46	6059	920.5
Non-Renewable - Generated	Diesel for Electricity	5388	5776	2290
Composite - Grid	Purchased Electricity	133049	150076	107080
Renewable - Purchased	Purchased Electricity	91810	73659	64855
Renewable - Generated	Solar Heater	1332	1332	892.5
Renewable - Generated	Solar PV	194	247	278

For further details, Please refer Wipro Annual Report

https://www.wipro.com/content/dam/nexus/en/investor/annual-reports/2020-2021/integrated-annual-report-2020-21.pdf

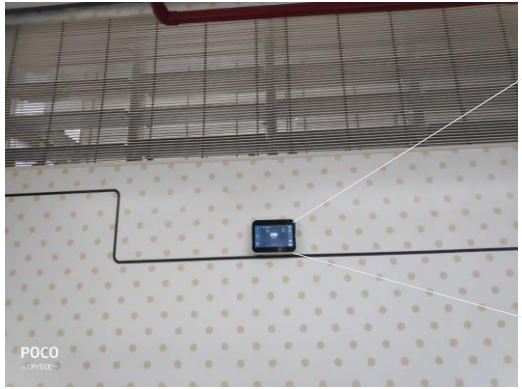
https://www.wipro.com/content/dam/nexus/en/investor/annual-reports/2020-2021/wipro-esg-dashboard-fy-2020-21.pdf

Wipro is a founding member of 'Transform to Net Zero': A global alliance to accelerate the transition to a net-zero global economy.

Our Net Zero Commitment: ***We're committed to contribute to planetary Net-Zero Greenhouse Gas emissions targets by reducing our emissions to zero by 2040 and a 55% reduction by 2030***

Read more at **wipro.com/sustainability**

Online Indoor Air Quality(IAQ) monitoring at workplace



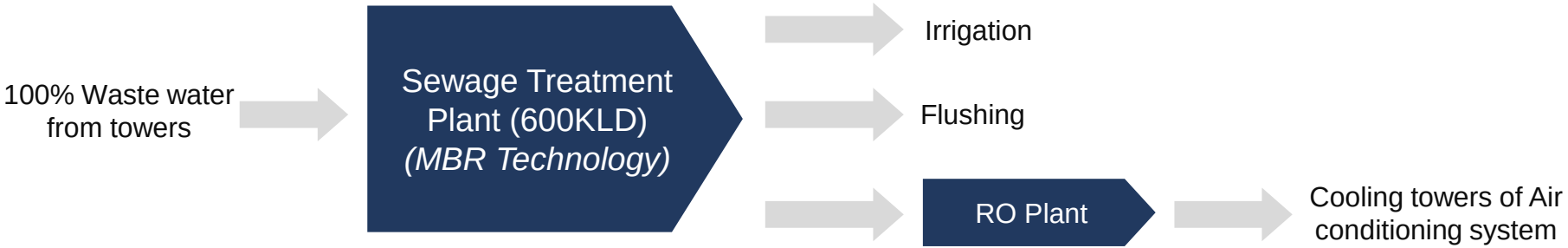
Air handling units provided for DOAs are Eurovent certified units with 2 stage filtration system with UV lamps and refrigerant heat pipes. Fresh air VAV's provided in the DOA unit distribution ensures supply of fresh air based on space CO_2 demand. All the fans in DOA units are of EC fans for better energy efficiency.

We have installed IAQ sensors at work places which monitors Temperature, RH, CO_2, $PM_{2.5}$ and TVOC parameters on continuous basis. IAQ sensor is tested and certified by the RESET standard for accuracy, and fully compliant with the WELL v2 building standard for performance.

We have used best practices of ISHRAE and IGBC and incorporated continuous monitoring of RH,CO_2, $PM_{2.5}$ and TVOC through IAQ sensor and other parameters through external agency in all ODCs at regular interval.

Waste Management

Waste Water Management

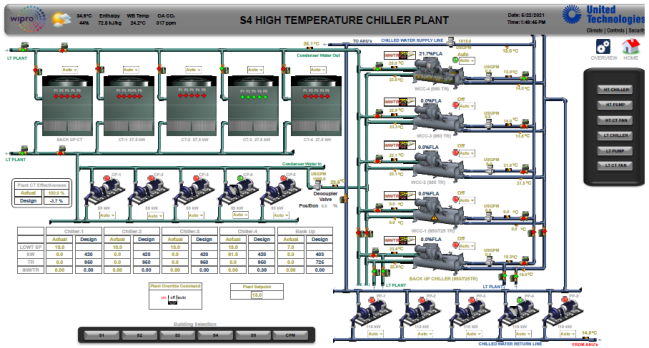


Waste reduction initiatives

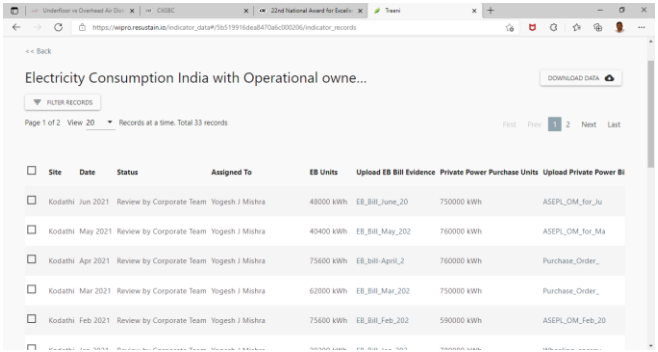
- Battery free DRUPS System (No disposal requirement of Batteries)
- Magnetic bearing centrifugal chiller (No oil management system & no disposal requirements)
- Entire campus exteriors with form concrete finish (No Plastering and No painting requirements)
- 1000 kg/day organic waste composter (OWC) for composting food waste and garden waste
- Fire hydrant and chilled water lines are provided with grooved couplings and hence there is no welding in FHS and Chilled water lines. It will also reduces the wastages of pipes during any modifications.
- No single use plastic is used in the campus (No PET bottles, No Plastic dust bins, No dust bin liners, Empty chemical cans are sent back to OEM for reuse/recycling

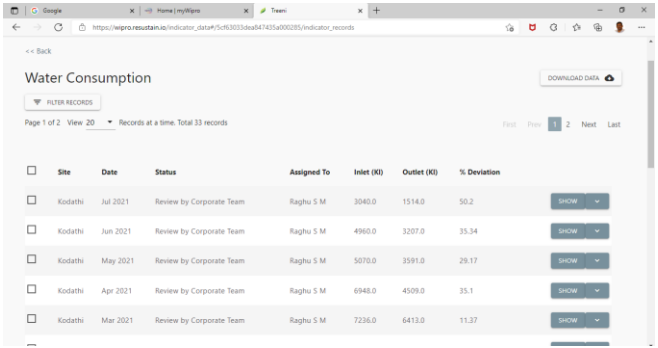
Teamwork, Employee involvement and Monitoring

BMS System to monitor energy consumption

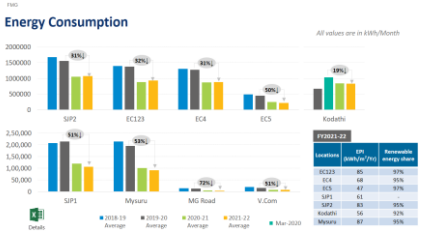


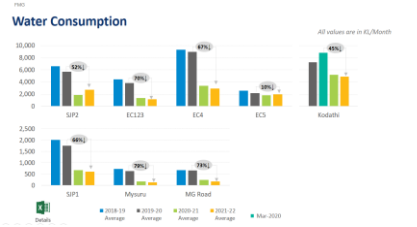
Internal Portal to update energy, water and waste data





Monthly review of energy performance

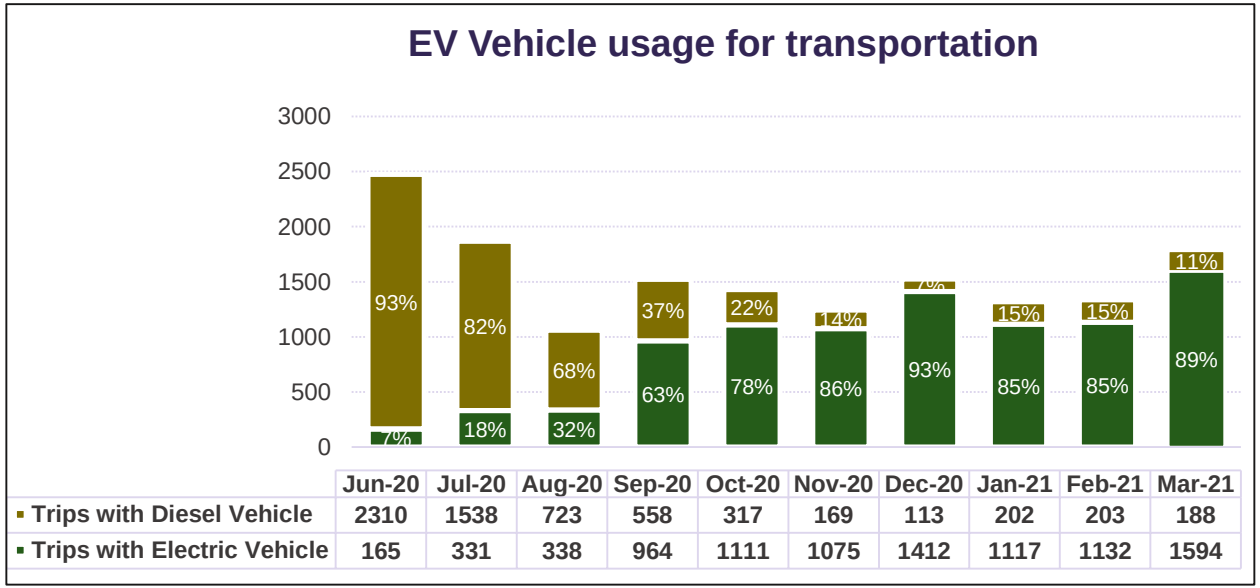




Energy Performance is reviewed on monthly basis by FMG Head – PAN INDIA

EV Vehicle usage for employee commute

We introduced Electric Vehicles for employee commute in Kodathi campus from June 2020 onwards. More than 80% of the trips are happening through EV vehicles now



	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
Trips with Diesel Vehicle	2310	1538	723	558	317	169	113	202	203	188
Trips with Electric Vehicle	165	331	338	964	1111	1075	1412	1117	1132	1594

We are investing ₹ 61 Lakhs in FY2021-22 to create the electrical infra for EV charging in Kodathi campus

Wipro won the 2020 EPEAT Purchaser award for positively impacting the environment by procuring sustainable IT products

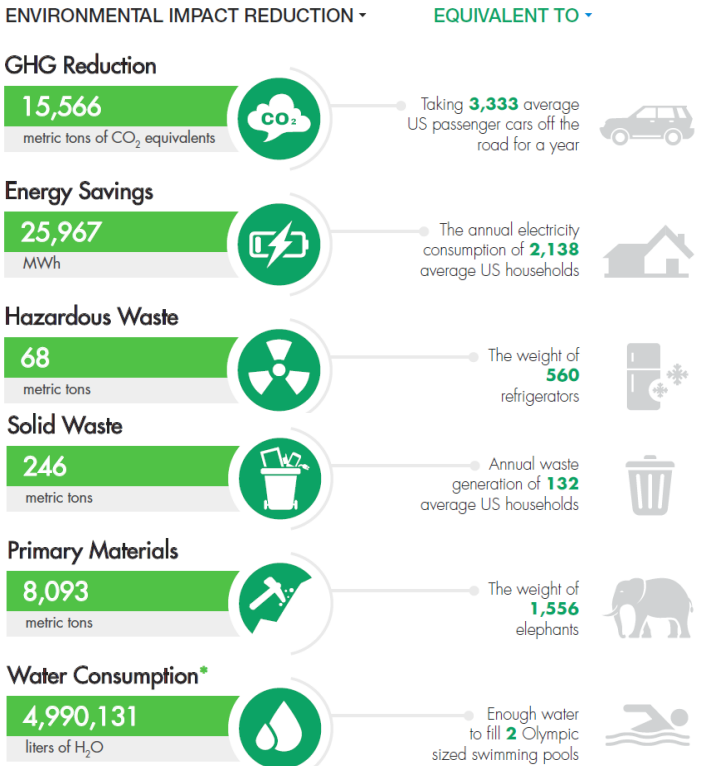
epeat **2020 EPEAT Purchaser Award Winner**
www.greenelectronicscouncil.org

Wipro Limited

Total lifetime impact reductions and cost savings over the lifetime of **109,010** EPEAT-registered products purchased in 2019

COST SAVINGS IN THE AMOUNT OF **$2,477,130**

- Wipro adopted EPEAT standard from Green Electronic Council for its hardware procurement



Certifications

ISO CERTIFICATION

Kodathi campus is certified for ISO 14001 & ISO45001 in Feb'21. We have planned to implement ISO50001 in FY2020-21 which got deferred due to pandemic. The same will be implemented in FY2021-22 once employees are back to office.

IGBC CERTIFICATION

We have applied for IGBC platinum certification for Kodathi facility. Site Assessment also completed by IGBC.

Thank you

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Thank You