23rd National Award for Excellence in Energy Management 2022

CKC - Chennai

August 2022

Agenda

- Cognizant Overview
- Facility Overview
- Design Advantages
- 3 Yrs Energy
- 3 Yrs Specific Energy Consumption
- Benchmark (Internal & National)
- 3 Yrs ENCON Projects
- Innovation Projects
- Renewable Energy Utilization
- GHG Emission & IAQ
- Cognizant Commitment
- Waste Management
- Standard Practice
- Teamwork & Monitoring
- BMS Operation
- External Recognition

Cognizant Overview

Cognizant (Nasdaq-100: CTSH) is one of the world's leading professional services companies that engineers modern businesses. We help our clients modernize technology, reimagine processes and transform experiences so they can stay ahead in our fast-changing world. Together, we're improving everyday life.

318,400
Employees worldwide

$18.5B
Total revenue

194
Fortune 500
May 2022

350
Forbes World's Best Employers for Diversity
April 2021

113
Fortune's World's Most Admired Companies
Feb 2022

567
Forbes Global 2000
May 2022

327
Forbes 2021 World's Best Employer list
Oct 2021

Facility Overview

Electrical

- Incoming Power Supply: 110KV
- Sanctioned Demand: 7000KVA
- Transformer Capacity: 14000 KVA
- Diesel Generator Capacity: 15000 KVA
- UPS Capacity: 2835 KVA
- Chiller capacity:7350 TR
- Elevators: 59No's
- Diesel Yard storage capacity: 90KL

Others

- STP Capacity: 830KLD
- Exclusive Medical Center with Ambulance Service
- Certification
  - 1. ISO 27001:2013
  - 2. ISO 22301:2012

Building

- Nature of Property : SEZ, Owned
- Total area of the facility : 20 Acre
- Build up Area: 258683 Sq.mt
- Seating Capacity: 17900
- Avg Head count:15700 (As on March 2022)
- Buildings, 3 Software development buildings, Combined basement, Multilevel Car parking, Utility block.

Design Advantages

Façade Glass
SHGC -0.22
U Value -1.8 W/Sq.m K

UPS System – Modular
Efficiency –96%

Water- & Air-Cooled Chiller
Performance –0.53 IKW/TR

Transformer
Efficiency –99.6%

Scale & Bio Removal(SBR) **3No's SBR Unit Each**
10M3/Hour

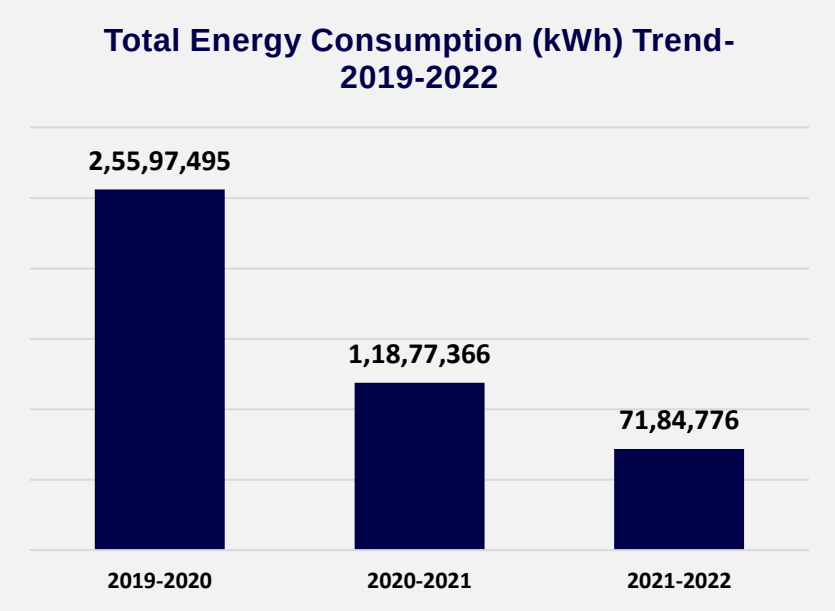
Roof Top Solar
Roof top solar capacity – 820 kWp

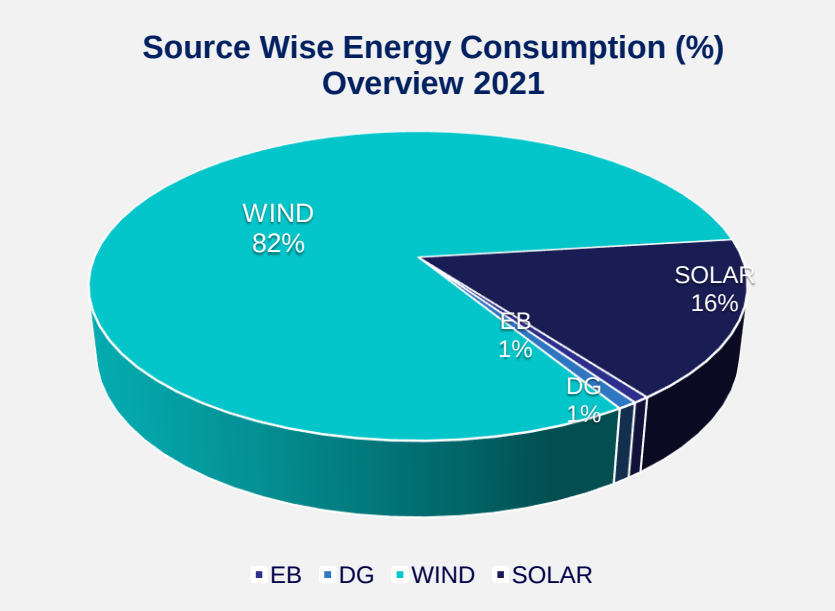
Rainwater Sump
Rainwater Sump capacity – 202 KL

STP Plant
Plant capacity- 830 KLD

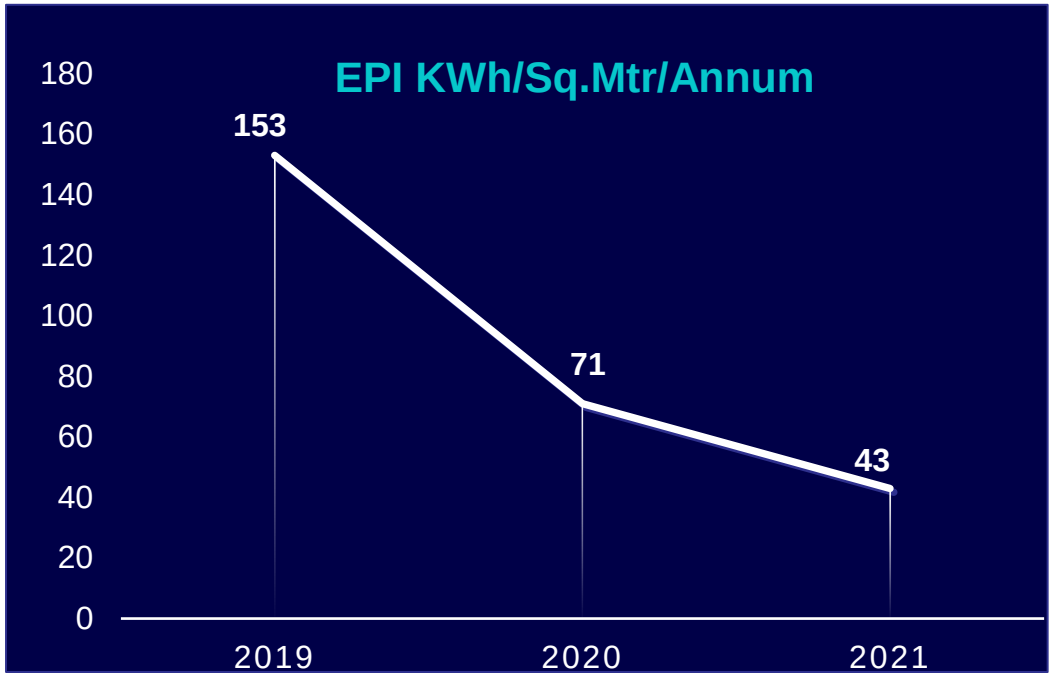
Energy Consumption Overview for Year 2019 - 2022

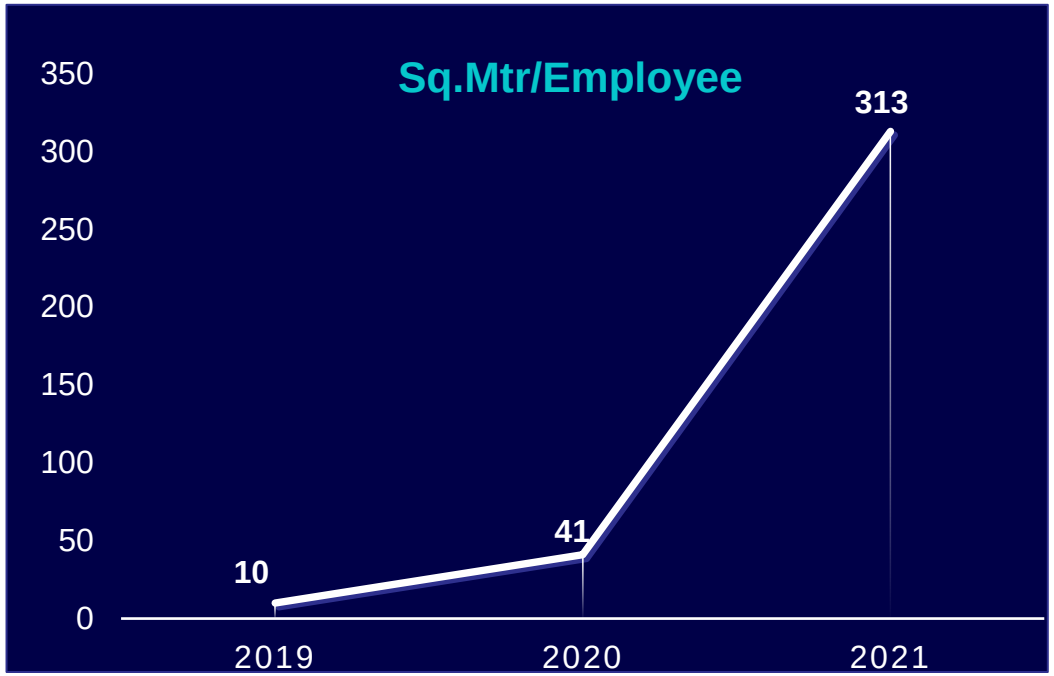
Source of Energy	2019-2020	2020-2021	2021-2022
TNEB (kWh)	1,561,619	564,624	49,434
Diesel Generators (kWh)	356,992	83,940	58,815
Solar Energy (kWh)	1,267,563	1,223,225	1,195,981
Wind Energy (kWh)	22,411,321	10,005,577	5,880,546
Total Energy Consumption (kWh)	**25,597,495**	**11,877,366**	**7,184,776**





Specific Energy Consumption Trend - 2019 to 2021

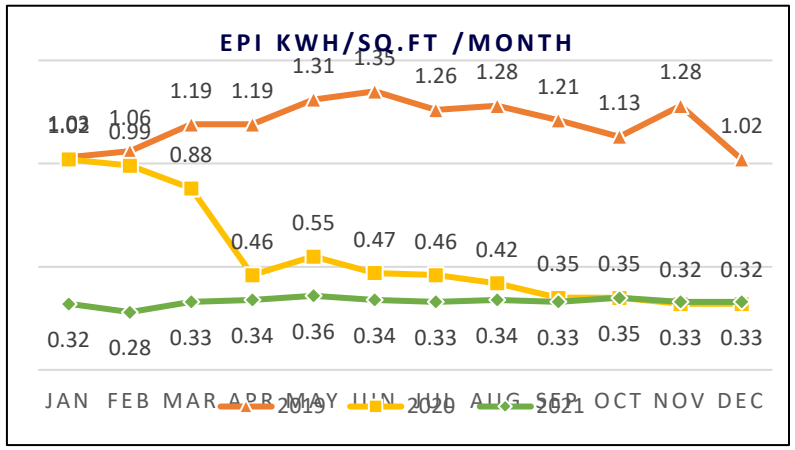




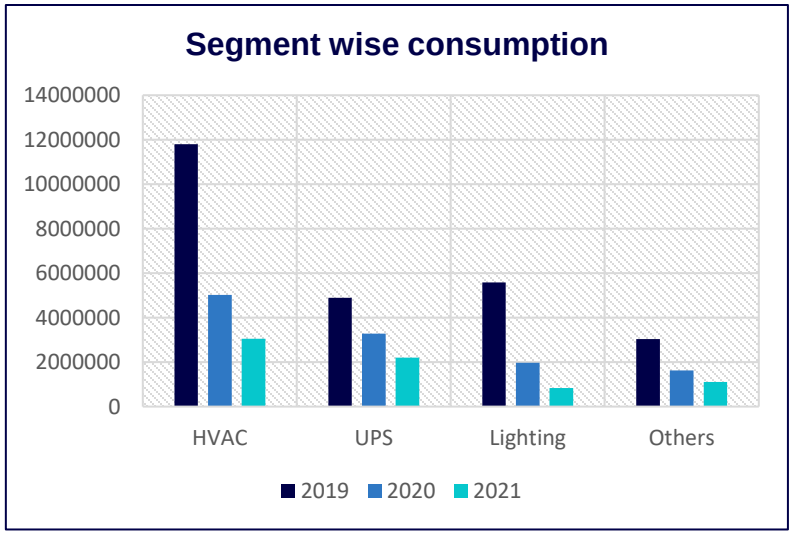
Reasons for Variations

- Energy consumption reduced due to Phase-01 LED Retrofit , UPS Optimization.
- Energy Consumption reduced due to V-Belt, EC Fan & VFD Installation for STP Air Blowers with DO Sensor feedback.
- Due to Covid-19 pandemic, operation in Non-BAU reduced associate headcount which effected the occupant's density.

Specific Energy Consumption Overview - 2019 to 2021



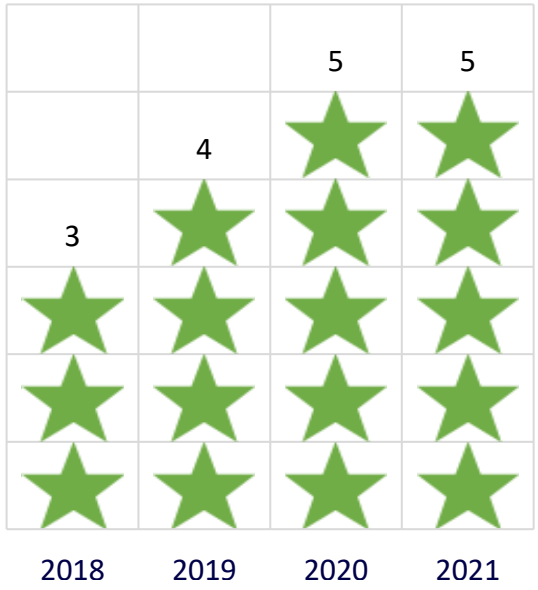
- ECO mode operation enable for UPS to optimized the energy consumption.
- During the covid–19 we have optimized the emergency light.
- During the Covid - 19 pandemic we have optimized VC and PC equipment
- Energy consumption reduced due to VFD Installed in STP Air blower based on feedback from DO Sensor.

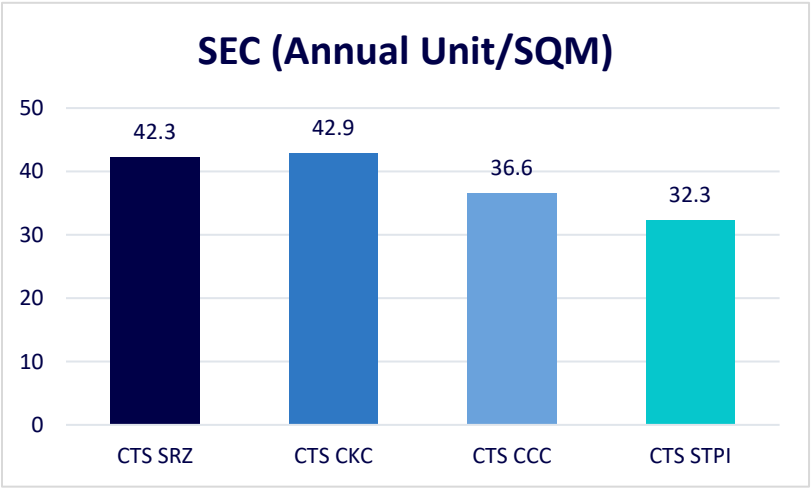


Energy Consumption (KWH)				
Year	HVAC	UPS	Lighting	Others
2019	11793512	4894040	10707433	3035902
2020	5017164	3272545	4576406	1627058
2021	3043673	2199205	4846829	1110385

Comparison of SEC with Internal & National Benchmark

BEE - National Benchmark			
EPI in kWh/Sq. M. / Year			
Star Rating	Warm and Humid	Compossible	Hot and Dry
1 Star	200-175	190-165	180-155
2 Star	175-150	165-140	155-130
3 Star	150-125	140-115	130-105
4 Star	125-100	115-90	105-80
5 Star	Below 100	Below 90	Below 80





To achieve the best SEC, following projects are planned to implement in the coming years

- Contract demand of facility reduced from 10.6MVA to 7MVA due to over all EE implementation achieved earlier.
- Due to covid-19, only critical system were in operation which reduced over all energy consumption.
- EC fan retrofit for all AHUs.
- Plan to implement as 100% LED facility.
- Introduction of New Energy efficient technologies

Action Plan for 2022-2023

Plan to implement conventional V-Belt installation activity for Phase-02

Plan to implement EC Fan for Toilet Exhaust

Plan to implement LED Retrofit activity for upcoming year in SDB-2,3 & MLCP

Plan to implement LED Retrofit activity for peripheral Street light fixtures

2022

2023

2024

Road Map

Split & Cassette Unit replacement

AHU actuator replacement

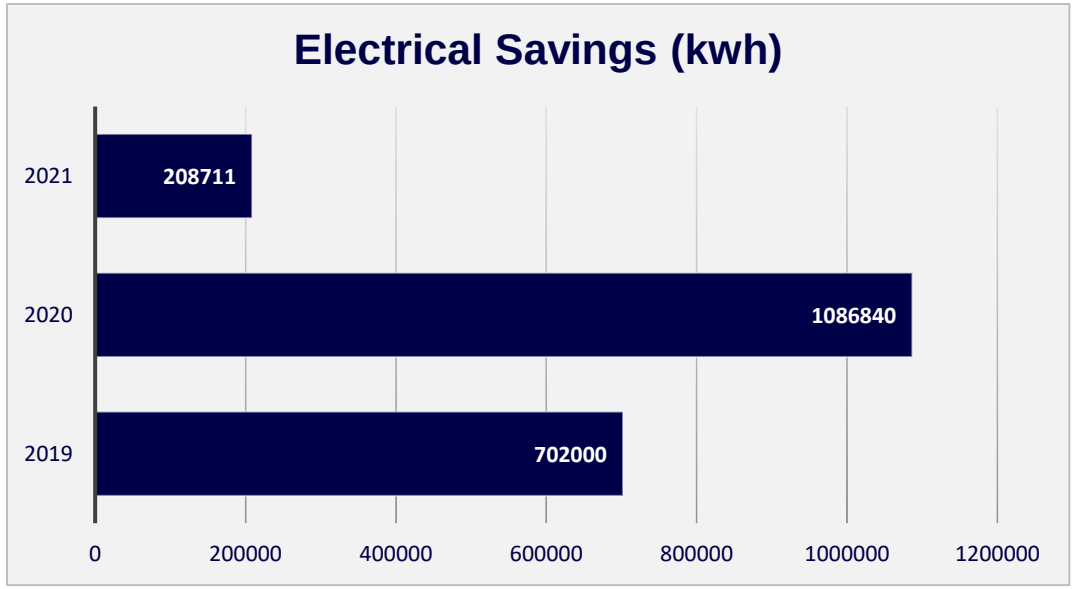
Plan to implement LED Retrofit activity for upcoming year in SDB-3 & MLCP

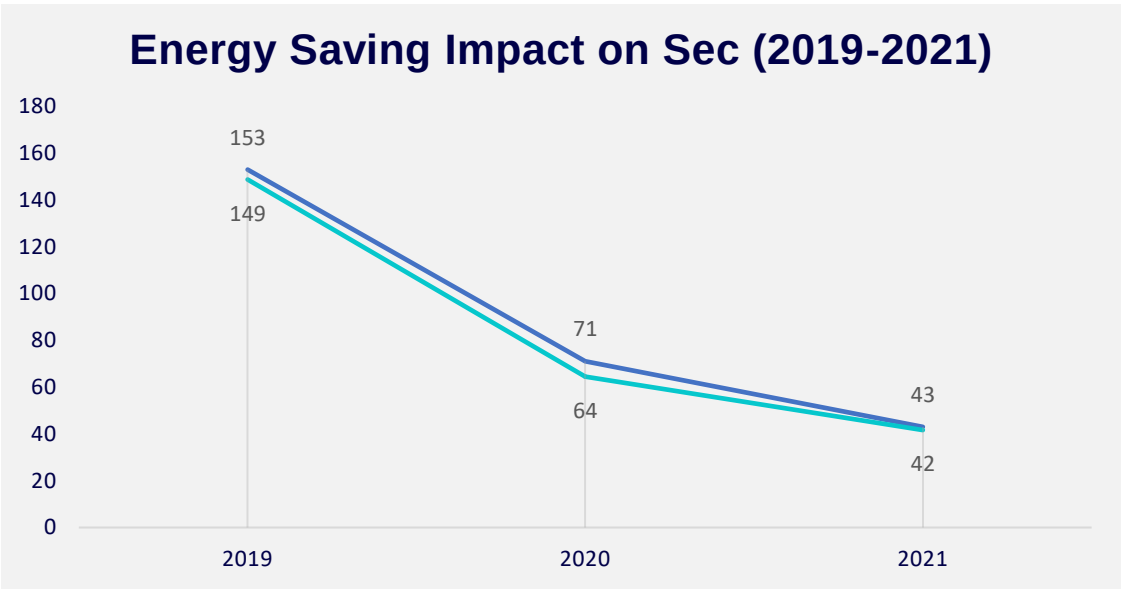
EC fan implementation

Energy Saving Projects Implemented in Last 3 Years

Year	Description	Energy Saving KWH	Annual Cost Saving (Million in INR)	Investment (Million in INR)
2019	HVAC	108000	3.6	6.36
	UPS	108000	1.2	2.3
	UPS	360000	2.7	0.1
	Lighting	126000	1	0.4
2020	HVAC	119779	1.38	1.60
	HVAC	8217	0.09	0.11
	Lighting	929205	9.29	10.11
	HVAC	29640	0.29	0.20
2021	HVAC	35040	0.41	0.87
	Power	53892	0.40	0.3
	HVAC	119779	1.38	1.6

Energy Saving Projects Implemented in Last 3 Years





Year	No of Energy saving projects	Investments (INR Million)	Electrical Savings (KWH)	Savings (INR Million)	Pay back period (Months)
2019	4	9.16	702000	8.5	12.93
2020	4	12.02	1086840	11.05	13.05
2021	3	2.77	208711	2.19	15.21
Total	**11**	**23.95**	**1997551**	**21.74**	**41.19**

Innovative Projects Implemented

Innovative Project 1 : VFD Installation for STP Air Blowers with DO Sensor feedback for efficient operations

- Air Blower Running continuously with maximum load
- During Covid-19, plant operation hours are reduced & oxygen demand meet easily. So, air blower not required to run continuously
- DO(Dissolved Oxygen) level not maintained
- MLSS & BOD levels not maintained
- Having more vibration with full load

Benefits

- Air Blower Running with variable RPM
- DO (Dissolved Oxygen) level maintain properly (3.0 PPM max)
- The power consumption reading before and after shows good amount of savings
- Air Blower Lifetime will increase, and maintenance cost reduced
- Air Blower Noise will reduced

53892 KWH

Description	Value	UOM
Blower Installed Capacity	74	KW
Blower Operation	37	KW
Present Power Consumption	24.95	KW
Operation Hour/Day	24	Hours
Antisipated % Saving	25%	%
2 No's VFD & Commissioning Investment	300000	IND
Present Energy Consumption	215568	KWh/Annum
Antisipated Energy Saving	53892	KWh/Annum
Investment	396106	INR
RIO	9.09	Months

Innovative Projects Implemented

Innovative Project -2 : Energy Saving Through Replacement of Conventional V- belt with Polyurethane Belt Phase- 01

- Frequent replacement V-belt
- Slippage results to multiple damage like bearing & alignment
- High frictional & heat loss
- Increases the carbon footprint
- Having more vibration

Benefits

119779 KWH

- Carried out the complete assessment of the polyurethane v-belt and installed the same at CDC for CAHU & VAHU
- Observed that the belt condition is same as installed a year back
- There is no friction, heat loss, misalignment in the CAHU & VAHU
- The power consumption reading before and after shows good amount of savings.

Before Retrofit

After Retrofit

Description	Value	UOM
Power Draw by VAHU & CAHU motor before retrofit	497	KW
Power Draw by VAHU & CAHU motor after retrofit	37	KW
Difference	24.95	KW
% Saving Realized	24	Hours
Annual Energy Savings	25%	%
Cost Saving (Energy)	300000	INR
Investment	1600800	INR
RIO	13.94	Months

Innovative Projects Implemented

Innovative Project -3 : SDB 03 Rest Room Exhaust Fan Retrofit with Direct Drive Blower in Place of Belt Driven Blower Phase-01

- Exhaust fan in the toilets frequently fall under maintenance (winding)
- Currently Blower operated through belt driven motor causing more noise due to bearing wear and tear and vibration from unit
- Changing belt was a difficult task due inaccessibility
- Dismantling exhaust blower was also a difficult task due to fan installed inside the plenum – Inaccessibility

Benefits

35040 KWH

- Maintenance after conversion found very low
- High CFM level achieved - contributing Energy saving
- Noise and vibration reduced to minimal
- Energy savings achieved -20%

Before Retrofit

After Retrofit

Description	Value	UOM
Rest room Exhaust Fan Belt driven blower before retrofit SDB-03	16	KW
Rest room Exhaust Fan Direct driven blower After retrofit SDB-03	14	KW
Difference	5	KW
% Saving Realized	27%	Hours
Annual Energy Savings	35040	%
Total Cost Saving	431000	INR
Investment	870000	INR
RIO	25.28	Months

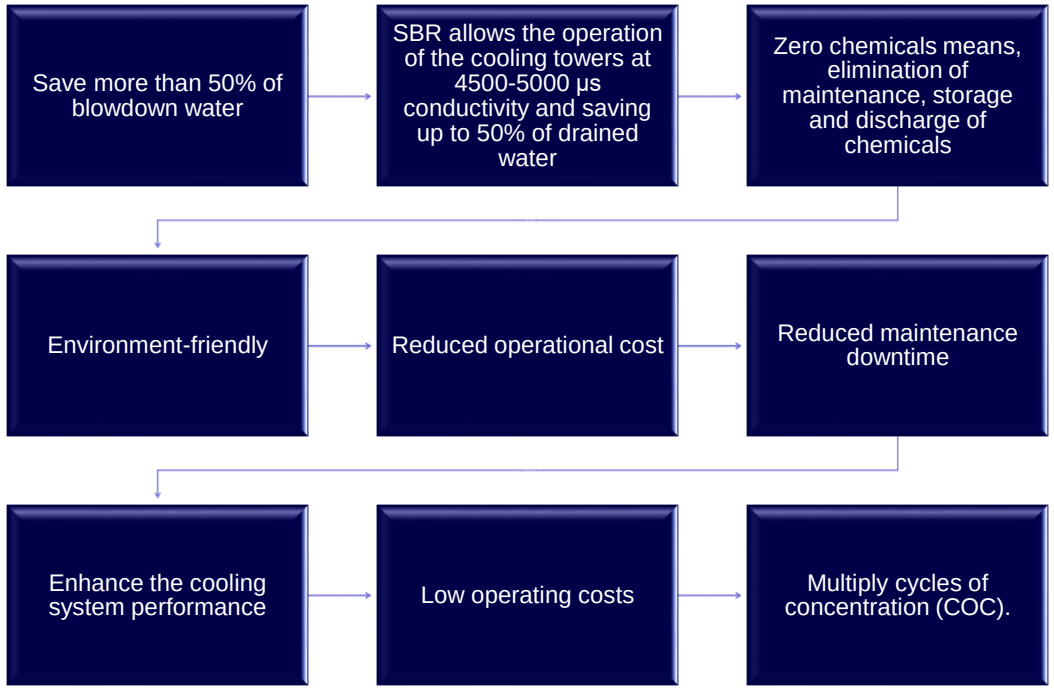
Innovative Projects Implemented

Innovative Project -4 : Installation of Scale & Bio Removal(SBR) System in Cooling Tower Water Line

Problem Faced

- Currently the Water-Cooled Chillers is the primary source for the cooling demand considering high efficiency as compared to Air cooled chillers
- Water cooled chillers efficiency depends on the performance of chiller’s condenser and cooling tower
- The quality of make up water maintenance is a challenging task in cooling towers
- To control the biological growth in cooling tower is a challenge, when the TDS value cross the limit of 300ppm
- Fouling on the condenser tubes and the cooing towers is a key factor of chiller efficiency
- The silica content was high in the make up water which would eventually result into low COC (cycles of concentration)

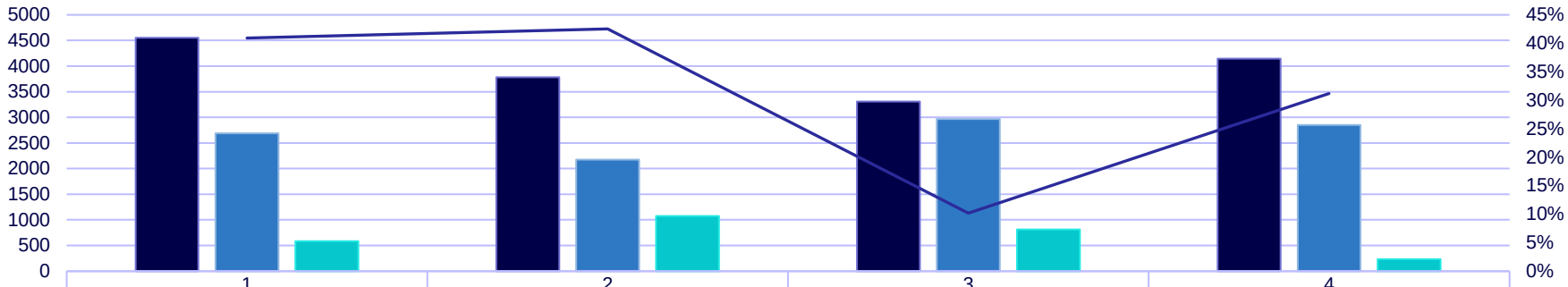
Benefits of SBR



Innovative Projects Implemented

Innovative Project 4 : Installation of Scale & Bio Removal(SBR) System in Cooling Tower Water Line

Cooling tower Make Up Water Trend



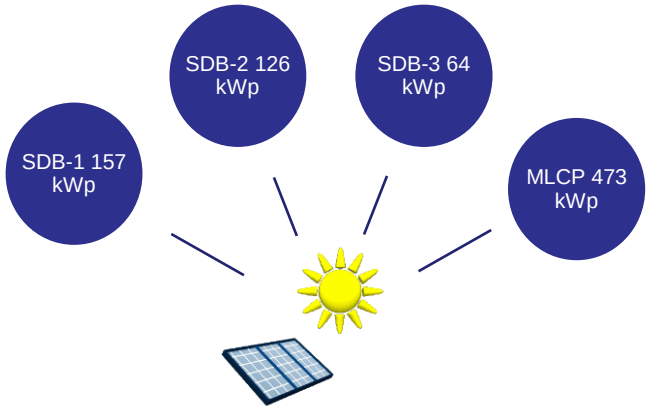
	1	2	3	4
Before SBR Raw Water Makeup	4554	3783	3307	4145
Post SBR Raw Water Makeup	2690	2174	2970	2852
Post SBR STP Water Makeup	581	1075	810	234
% Raw Water saved	41%	43%	10%	31%

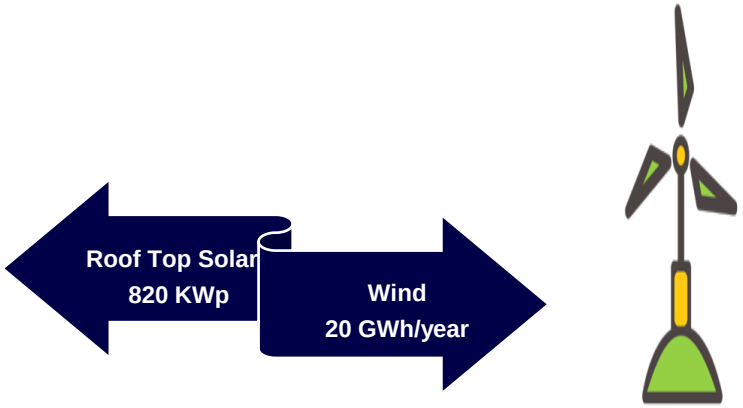
Cost saving of water purchase 2.59 lakhs for 2700 KL

Cost saving of chemical purchase per quarter 12 lakhs

Cooling tower performance improvement due to less scaling & save of 1.5 lakh unit energy & 15 lakh INR cost

Utilization of Renewable Energy Sources-2019-2021

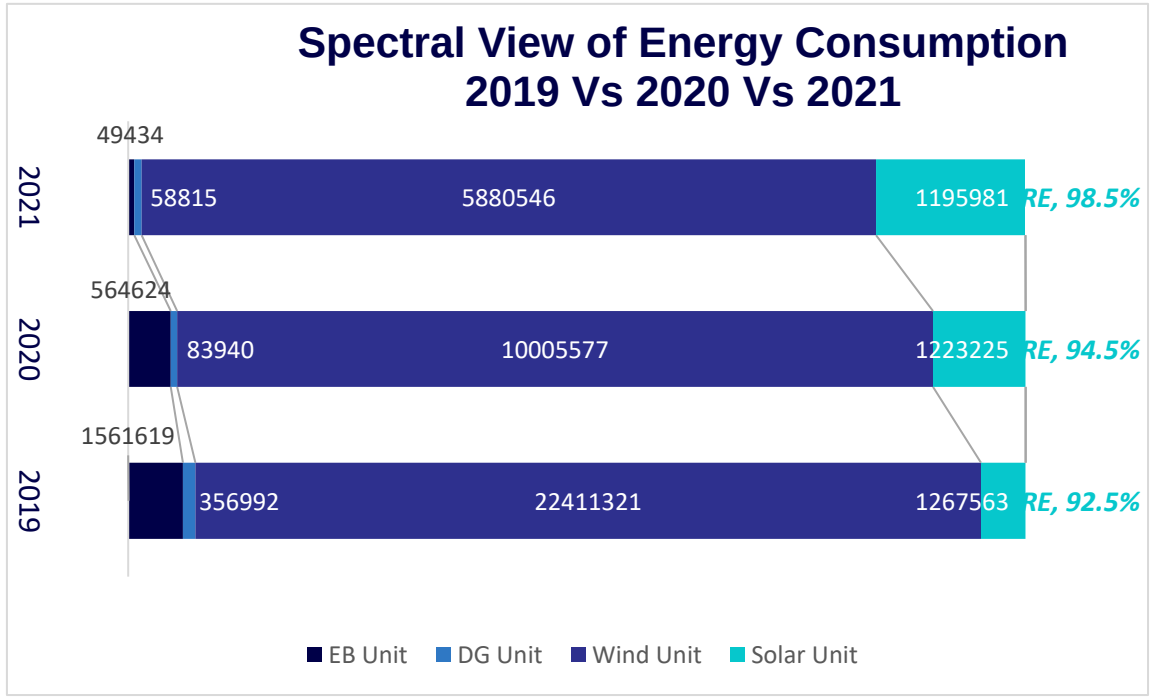


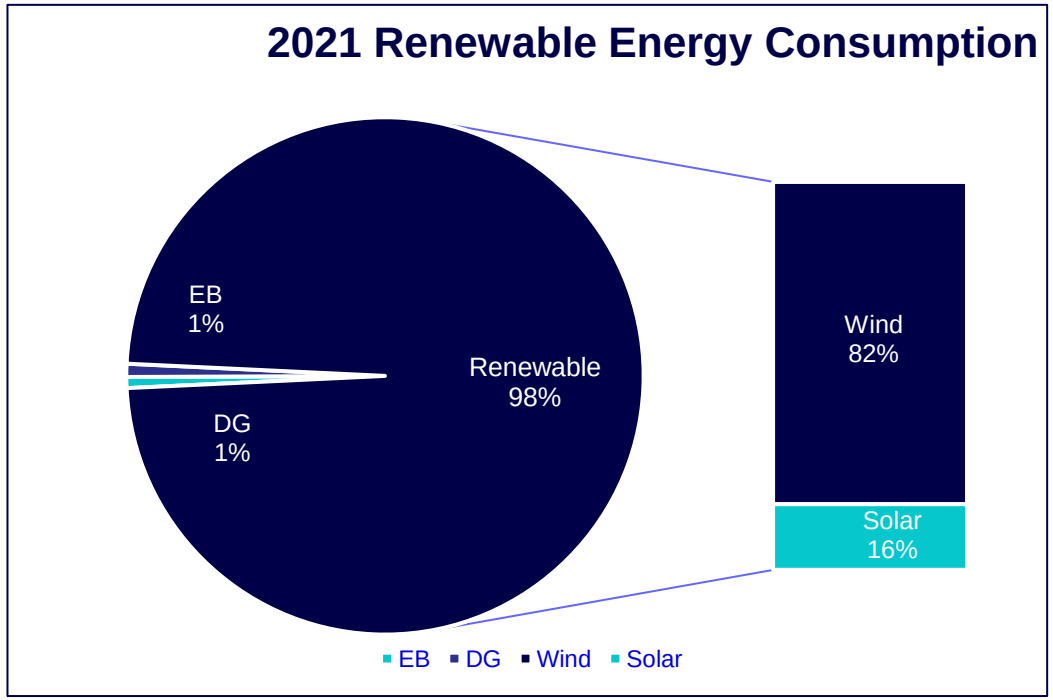


Type RE	ON Site / Off site	Installed capacity	Gnereration Units (Mwh)	Overall Energy Consumption %
Rest room Exhaust Fan Belt driven blower before retrofit SDB-03	16	KW		
Rest room Exhaust Fan Direct driven blower After retrofit SDB-03	14	KW		
Difference	5	KW		

- Total installed Roof Top solar capacity – 820 kWp, 16% of campus requirement is met through Solar power
- CKC facility considered for Wind source allocation from 2019 onwards.
- Total Wind Energy Quantum per year – 20 GWh/year
- After pandemic RE% increase further

Utilization of Renewable Energy Sources-2019-2021





Cognizant Commitment

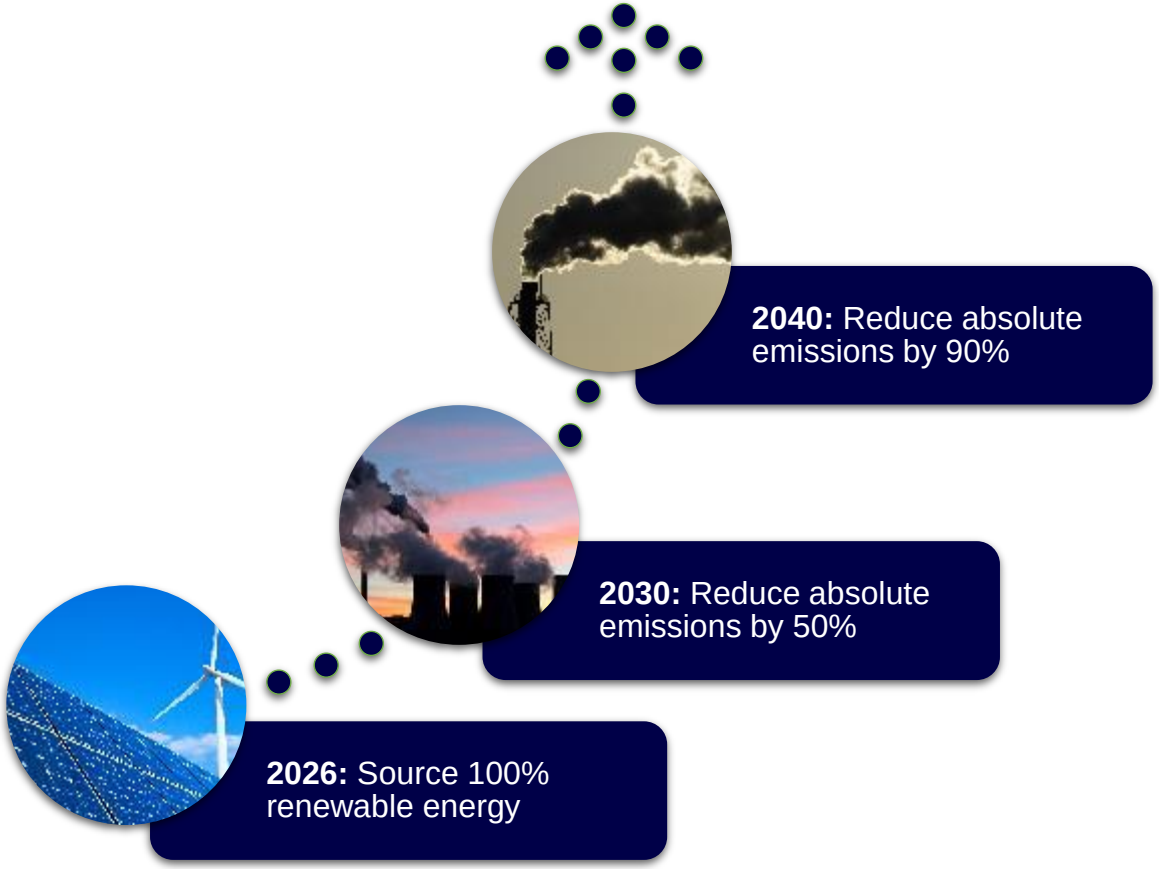
NetZero to reduce our contribution to climate change we set a global, public goal of reaching net zero emissions compared to our 2019 emissions baseline. In order to achieve our Net Zero Goal, we will address emissions in our operations, including our offices and facilities, as well as from our supply chain and business travel. The commitment will shape our real estate management, energy sourcing, supply chain and travel philosophy in addition to the equipment and technologies we use in our offices and data centers.

Key Elements of our Net Zero Goal

- Focuses on absolute emissions reductions through operational efficiencies and renewable energy use, before the use of carbon offsets
- Measures reductions from a recent, pre-COVID-19 emissions baseline (2019) ●
- Includes a near-term renewable energy target
- Includes often-hidden emissions, from travel to supply chain to associate commuting, in Scope 3
- Aligns with the need to keep global average temperature increases to 1.5 degrees Celsius

Key Elements of our Net Zero Goal Governance

- Submitted for third party validation with the Science Based Targets Initiative (SBTi)*
- Periodically reviewed by the Board's Governance and Sustainability Committee
- Commissioned an external third party to perform attestation procedures over our GHG emission
- According to the United States Environmental Protection Agency, Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain.



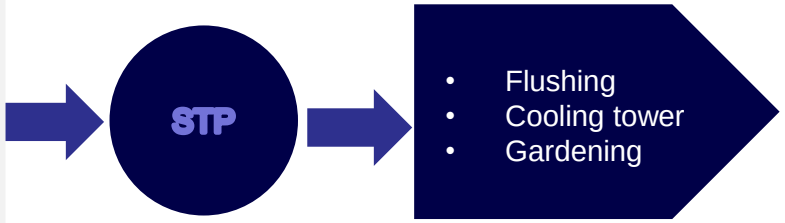
Waste Utilization and Management

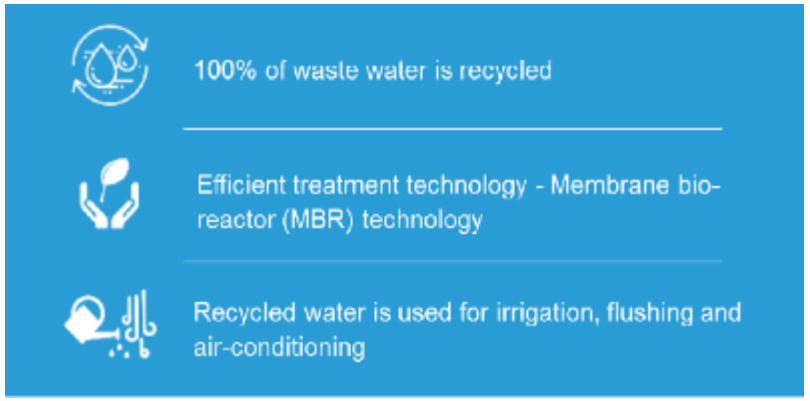
SL No	Type of Waste Generated	Disposal Method	Action taken for Reduction of waste
1	Hazardous Waste	Used and waste oil disposed to TNPCB authorized recycler	Battery waste – 150AH 288No's & 200AH 576No's replaced on Aug 2019 Impedance test found battery in good condition
2	Water Waste	Recycled	STP waste-water is treated and reused for flushing, cooling tower & gardening/landscaping
3	Food Waste	Recycled	Manure is used for the gardening as alternate to the inorganic fertilizers Manure distributed to the employees to use their home garden 1. Food waste generated – 9000 kg/ month – 2019 2. Manure generated – 8000 kg/ month - 2019
4	Non-Hazardous Waste	Carton, plastic & paper waste disposed to authorized recycler	**Paper Waste:-** 1) Limitation of printer access 2) Punctuality tool implemented; manual check list optimized 3) Paper cups usages eliminated 100% Plastic Waste:- Spoons, retail water bottles, straw, stirrers, garbage liners usage are stopped approximately 1200kg/month
5	E Waste	Disposed to TNPCB authorized recycler	**E–Waste:-** Phase-01 LED replacement completed (Lifetime enhancement 2*2 Fitting-4200No's & Down Light- 3009No's) Phase-02 LED Retrofit activity planned

Waste Utilization and Management

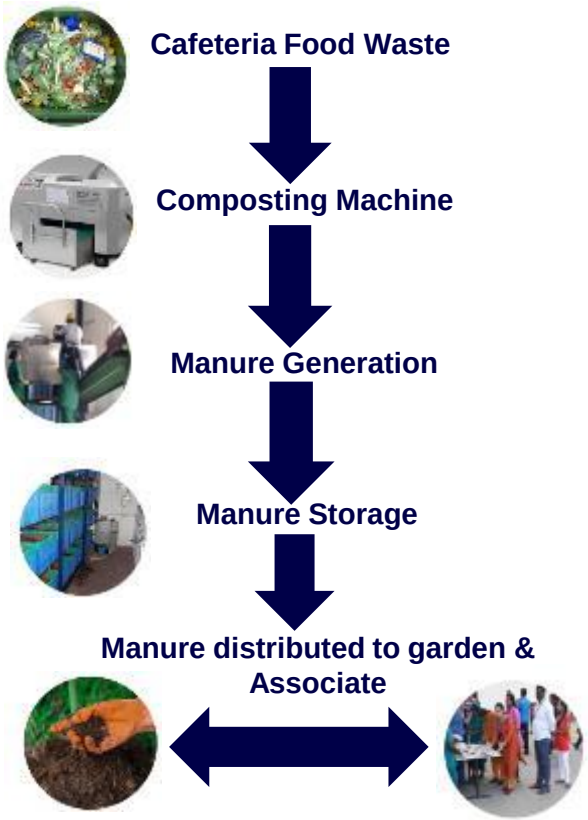
STP Operation

Domestic wastewater
1) Rest Room Washbasin
2) Kitchen Usage Water
3) Shower Room
4) WTP Backwash
STP Water
1) WC Water
2) Urinal Water
3) STP Backwash
Low TDS water
1)Scrubber Blowdown
2) Cooling Tower Blowdown



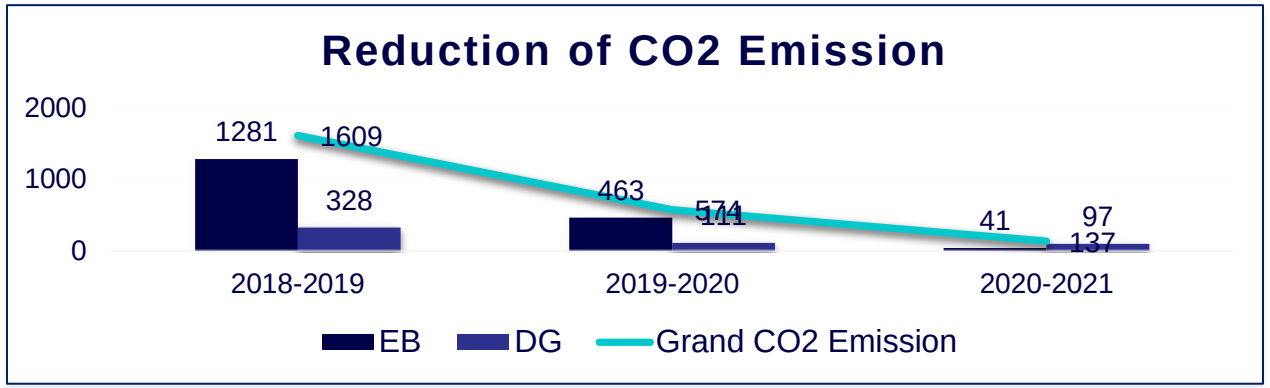


OWC Operation



GHG Emission and Indoor Air Quality

Year	Consumption Details		Ton of CO 2 Emission		
	TNEB	Diesel	Scope-2	Scope-1	Total
2018-2019	1561619	356992	1281	328	1609
2019-2020	564624	83940	463	111	574
2020-2021	49434	58815	41	97	137



GHG Reduction

- Scope 2 Emission reduced by utilization of Wind source
- Increase the usage of renewal energy
- Due to covid-19 only critical system are in operation which reduces over all energy consumption

Indoor Air Quality (BAU)

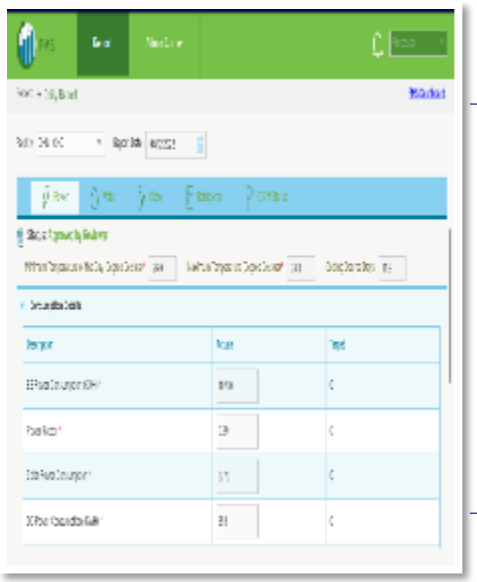
Testing parameters

- Oxygen (O2)
- Carbon Monoxide as (CO)
- Carbon Dioxide (CO2)
- Respirable Suspended Particulate Matter (RSPM)
- Temperature
- Relative Humidity (RH)
- Ventilation Rate
- Total Volatile Organic Compounds
- Illumination
- Total bacterial Count
- Total Fungal Count
- Legionella

Remarks:

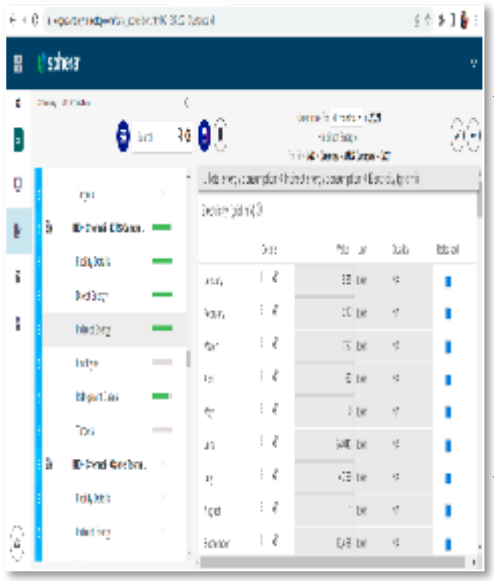
1.Testing through NABL laboratory.
2.Random sampling will be done monthly once for workstations.
3.All the parameters are found within pollution control board specified limit.

Teamwork & Monitoring



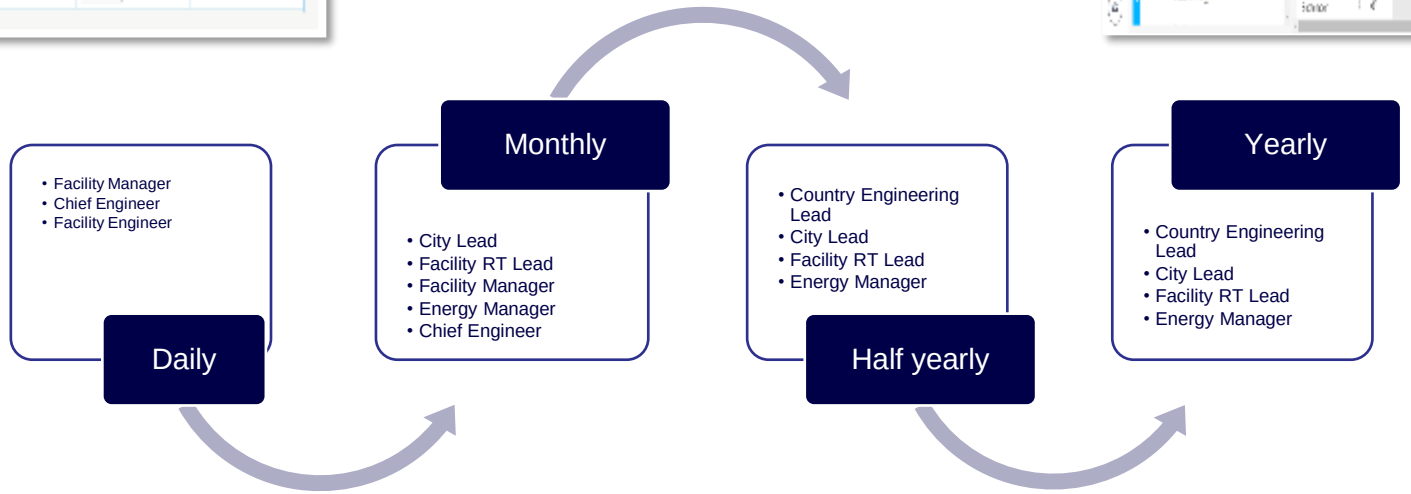
Daily FMS Report

- Consumption Details
- Consumption Breakup
- Hourly Breakup-Transformer /DG/Chiller
- Diesel Consumption
- Water Report
- Refrigerant Status
- Equipment Status

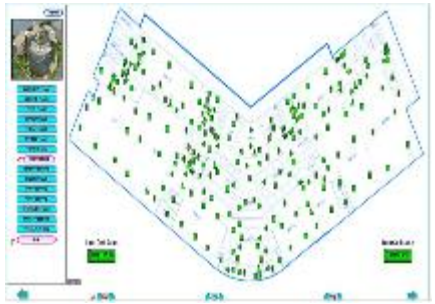


Monthly Sphera Report for CO2 Emission

- Facility Details
- Direct Energy
- Indirect Energy
- Refrigerant Status
- EPI Targets

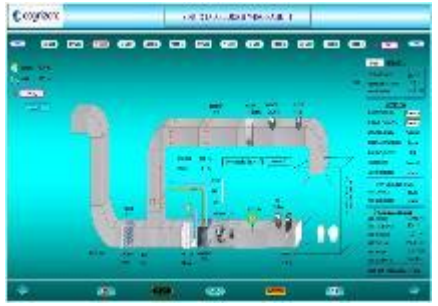


BMS Operation & Monitoring



BMS Operation & Monitoring

- AHU,CAHU,VAHU Operation & Monitoring
- UPS ON/OFF Status & Parameter Monitoring
- All Switch Room & Lab Temp, Alarm Status Monitoring
- All Fire System Monitoring
- All building OHT, Sump level Monitoring
- Weather Monitoring
- All Panel Energy Meter Monitoring With Trend Report
- Transformer ON/OFF/Trip Status & Parameter Monitoring
- DG ON/OFF/Trip Status & Parameter Monitoring
- Diesel Sump Level Monitoring
- Chiller ON/OFF/Trip Status & Parameter Monitoring
- All ODC CO2 Level Monitoring



Recognition by External

CII Award for Excellent Energy Saving Facility in 2019

Three-star Rating in CII SR EHS Excellence Awards 2020

Three-star Rating in CII SR EHS Excellence Awards 2019

Recognition by External

CII SR EHS Excellence Awards 2021
Bronze Award

CII Water Reuse Project Awards 2021

CII Innovative Water Awards 2021

Vision & Mission

ISO 14001:2015 in 2017

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Cognizant Technology Solutions India Private Limited

Techno Complex, S/535, Old Mahabalipuram Road, Okkiyam, Thoraipakkam, Chennai - 600 097, Tamil Nadu, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:
Providing business solutions leveraging information technology and IT enabled services

OHSAS 18001:2007 in 2017

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Cognizant Technology Solutions India Private Limited

Techno Complex, S/535, Old Mahabalipuram Road, Okkiyam, Thoraipakkam, Chennai - 600 097, Tamil Nadu, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Occupational Health and Safety Management System standard:
OHSAS 18001:2007

This certificate is valid for the following scope:
Providing business solutions leveraging information technology and IT enabled services

ISO/IEC 27001: 2013 in 2018

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Cognizant Technology Solutions Corporation

and the sites as mentioned in the appendix accompanying this certificate as owned and operated by its respective subsidiaries

has been found to conform to the Information Security Management System standard:
ISO/IEC 27001:2013

This certificate is valid for the following scope:
Security of information and information processing facilities owned and operated by Cognizant for their business and technology services pertaining to digital business, digital operations, and digital systems & technology, including Cognizant Consulting Services & Cognizant Security services and provided through various locations from India and overseas locations
The SOA version is 6.5 dated 15th March 2018

ISO 45001:2018 in 2019

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Cognizant Technology Solutions India Private Limited

Techno Complex, S/535 Old Mahabalipuram Road Okkiyam, Thoraipakkam,Chennai - 600 097, Tamil Nadu, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Occupational Health and Safety Management System standard:
ISO 45001:2018

This certificate is valid for the following scope:
Providing business solutions leveraging information technology and IT enabled services

23rd National Award for Excellence in Energy Management 2022

CKC - Chennai

August 2022