



23rd National Award for Excellence in Energy Management 2022

CCC Coimbatore

August 2022

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Cognizant Overview

Cognizant (Nasdaq-100: CTSI) 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.



Facility overview

CCC (Cognizant Coimbatore campus) is an Owned facility.

Commencement of operations:

- SDB-1 – 2009
- SDB2 - 2014 (Tower-2)
- - 2016 (Tower-1)

Campus - Area Sq.ft:

- SDB1 - 6.56 Lacs Sq.ft with G+7 floors
- SDB2 - 6.50 Lacs Sq.ft with G+7 floors (Tower -1 & 2)
- Green belt spread across 4.0 Lacs Sq.ft

Seat capacity : 14,049

- SDB1 - 5,775 Seats
- SDB2 - 8,274 Seats

1st Facility in Cognizant to attain the
“LEED India Gold Certificate”.

ISO 45001:2018 Certified facility



Utilities overview

Description	Specification	
Substation	<ul style="list-style-type: none"> • EB demand : 7,400 KVA • Transformers capacity : 2,500 KVA x 6 Nos 	
Rooftop solar	<ul style="list-style-type: none"> • Total capacity : 750 kwp (2 x 375 kwp) 	Wind wheeling - Group captive
Diesel generators	<ul style="list-style-type: none"> • Total capacity : 15,000 KVA 	<ul style="list-style-type: none"> • Capacity break up : 10 Nos x 1,500 KVA
Ups	<ul style="list-style-type: none"> • Total capacity : 2,860 KVA (Workstation - 2,300 KVA) 	
Chillers	<ul style="list-style-type: none"> • Total capacity : 6,090 TR 	
	<ul style="list-style-type: none"> • Type - water cooled : 3 No's x 950TR 3 No's. X 900TR 2 No's. x 270TR 	
Sewage treatment plant (STP)	<ul style="list-style-type: none"> • Capacity : 2 No's x 375 KLD 	
High speed diesel (HSD)	<ul style="list-style-type: none"> • Capacity : 60 KL 	
Rainwater sump	<ul style="list-style-type: none"> • Capacity : 70 KL 	

Architectural design of the building



Awards and recognitions



Cognizant Best Energy Saving facility - 2011



Cognizant Best Energy Saving facility - 2012

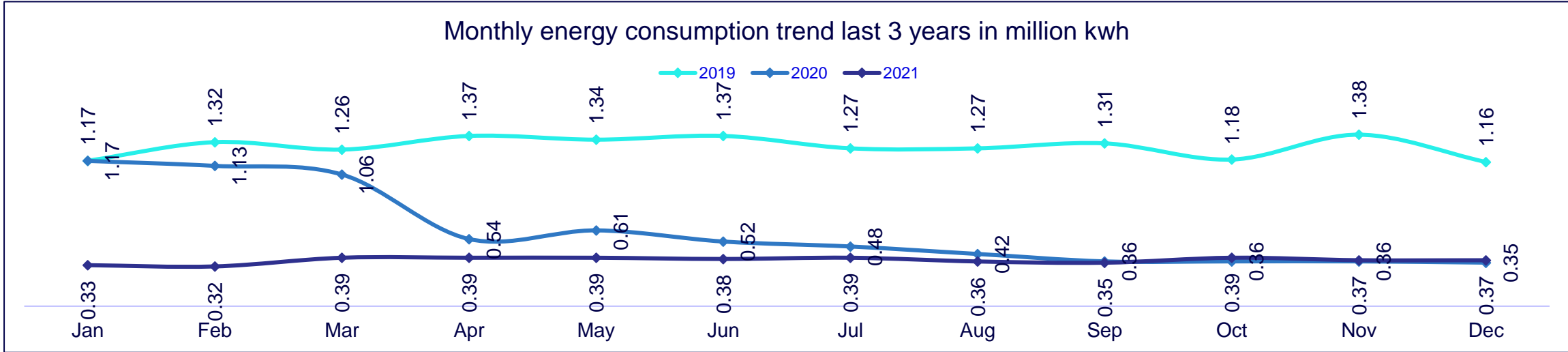
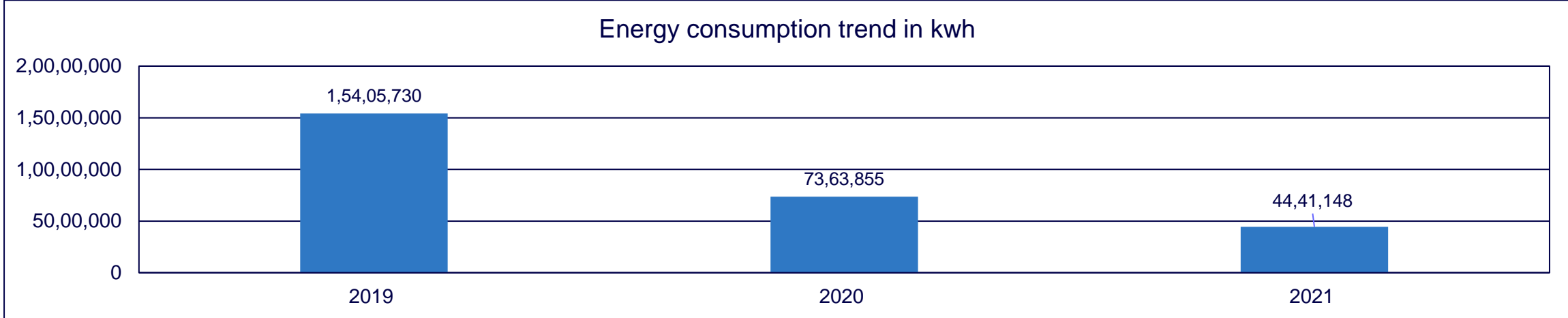


CII Excellent Energy Efficient unit award - 2013

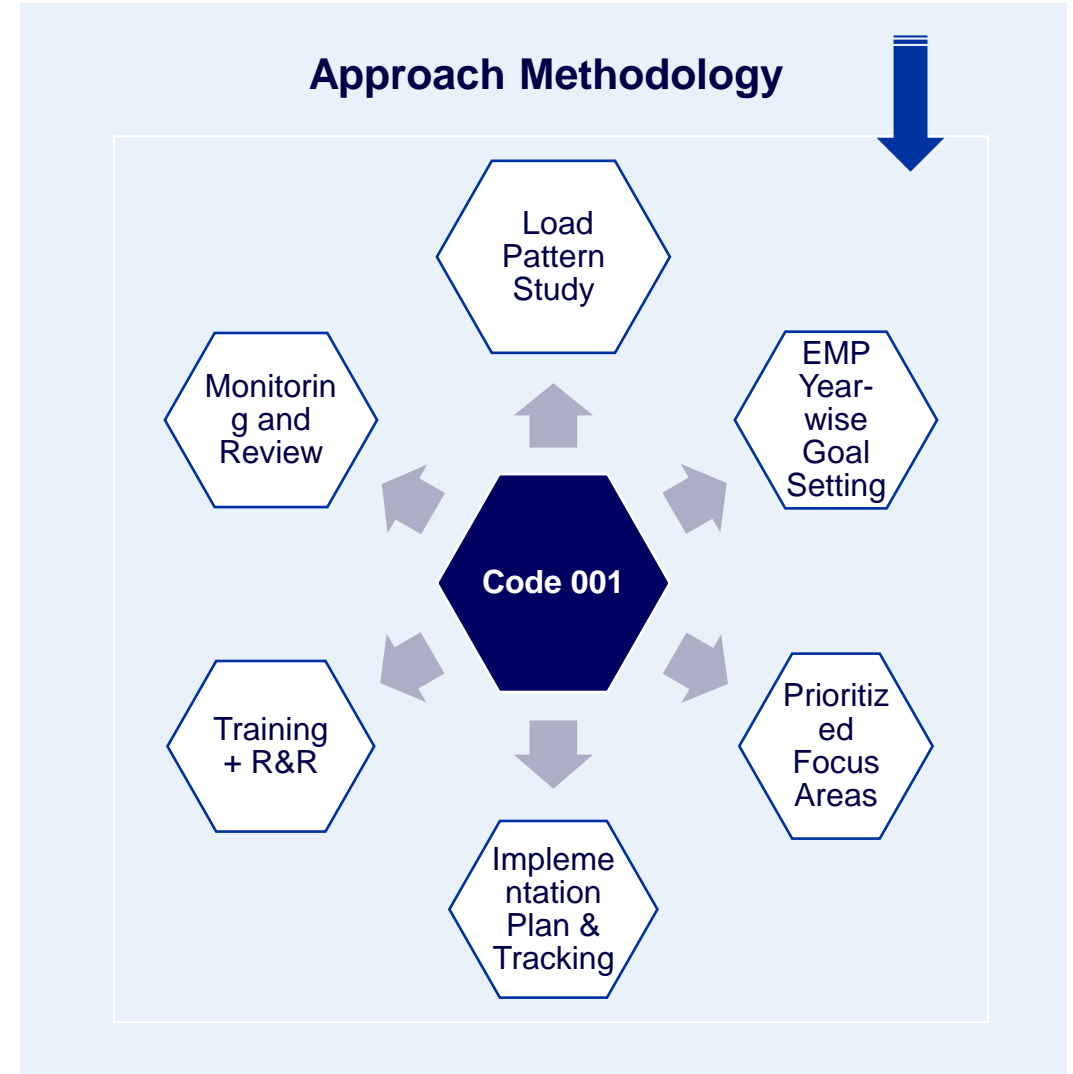
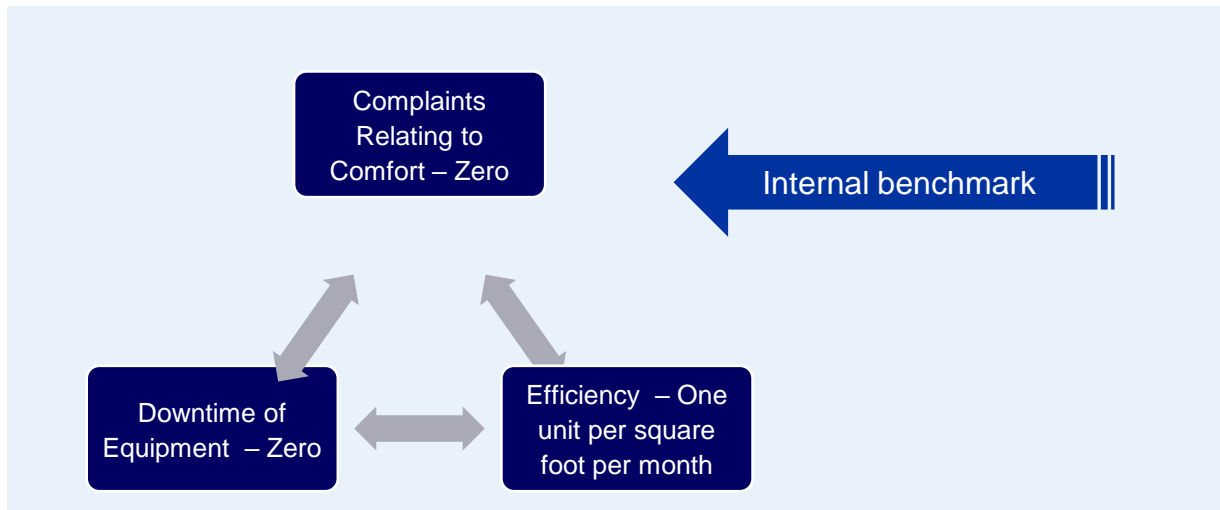
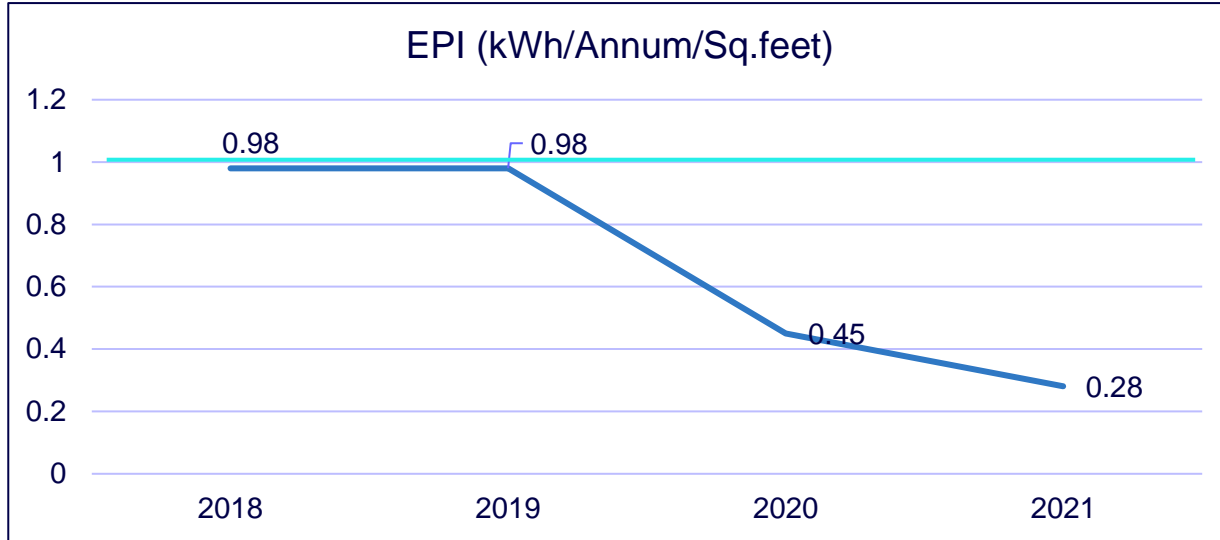


CII
- Excellent Energy Efficient unit
- Most useful presentation in 2019

Energy consumption trend - 2019 to 2021



Cognizant Approach



National benchmark comparison

Benchmark Data - BEE for buildings where air-conditioned area is 50% more than carpet area bandwidth at buildings for 3 climate zones

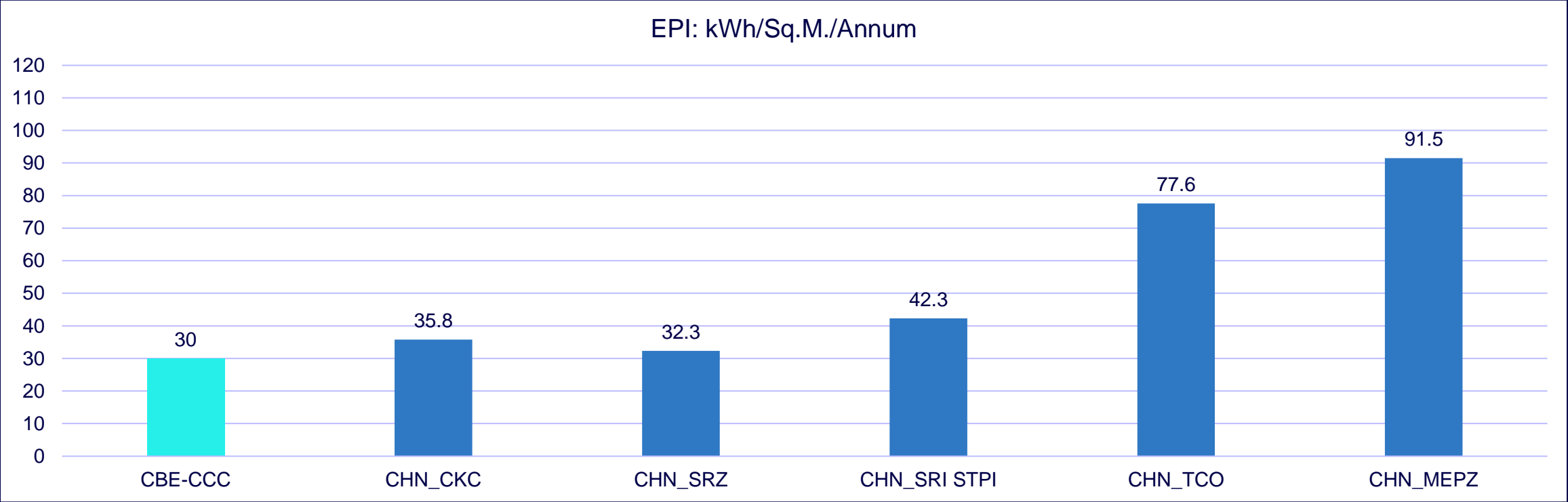
EPI in kWh/Sq. M/Year

Star Rating	Warm and Humid	Composite	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

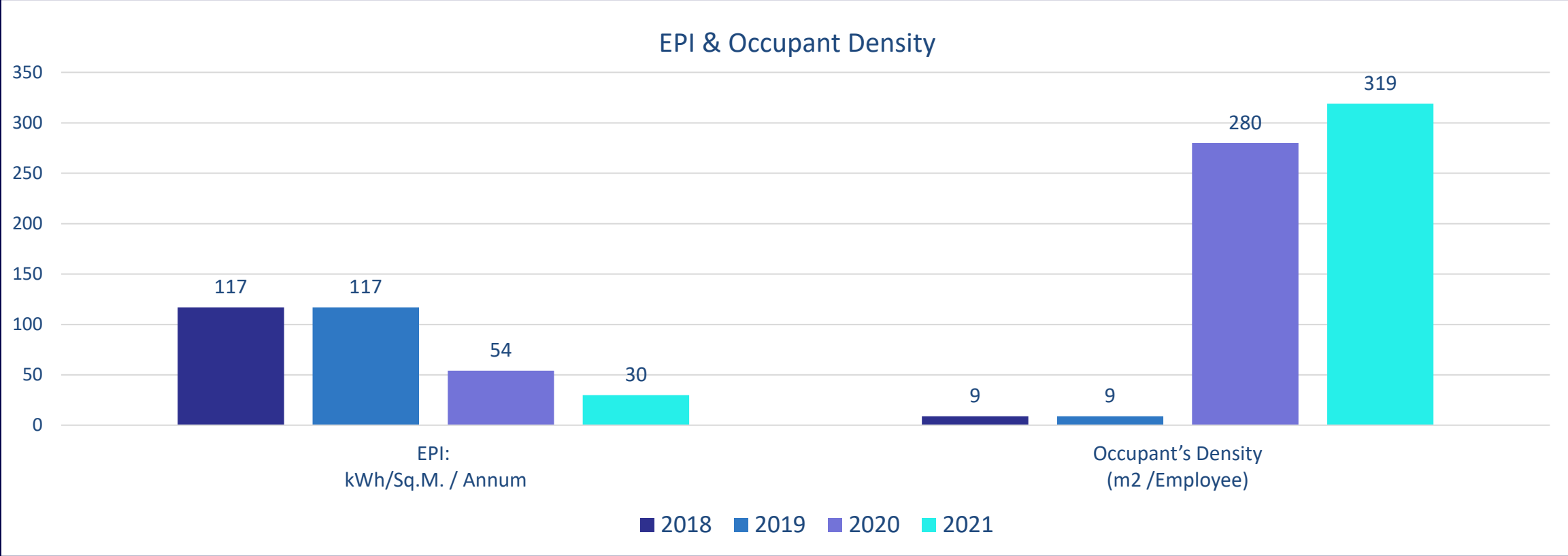
Coimbatore facility EPI

Description	2018	2019	2020	2021
EPI: kWh/Sq. M./Annum	117	117	54	30

Cognizant internal benchmark comparison



Specific energy consumption - 2018 to 2021



Our journey

2020

1. Workstation 24W LED retrofit- 2,610 Nos
2. Downlighter - 12W LED retrofit - 400 Nos
3. ECO mode enabled in workstation UPS.
4. Cooling tower fills replacement.
5. New condenser coil replacement for chiller

0.28

EPI < 1

2021

1. Workstation 24W LED Retrofit- 705 No's
2. Downlighter- 12W LED Retrofit- 800 No's.
3. 20W LED Retrofit for SDB 2 Tower- 1 & 2 staircase lights 40 No's.
4. Cooling tower fills replacement @ 1000 & 300 TR
5. STP plant - one stream of 375KLD aerator system optimization

2019

1. New solar water heater at food court -1,000 Liters
2. 150nos 15W LED downlight retrofit
3. 70nos 20W LED retrofit at staircase

0.45

0.98

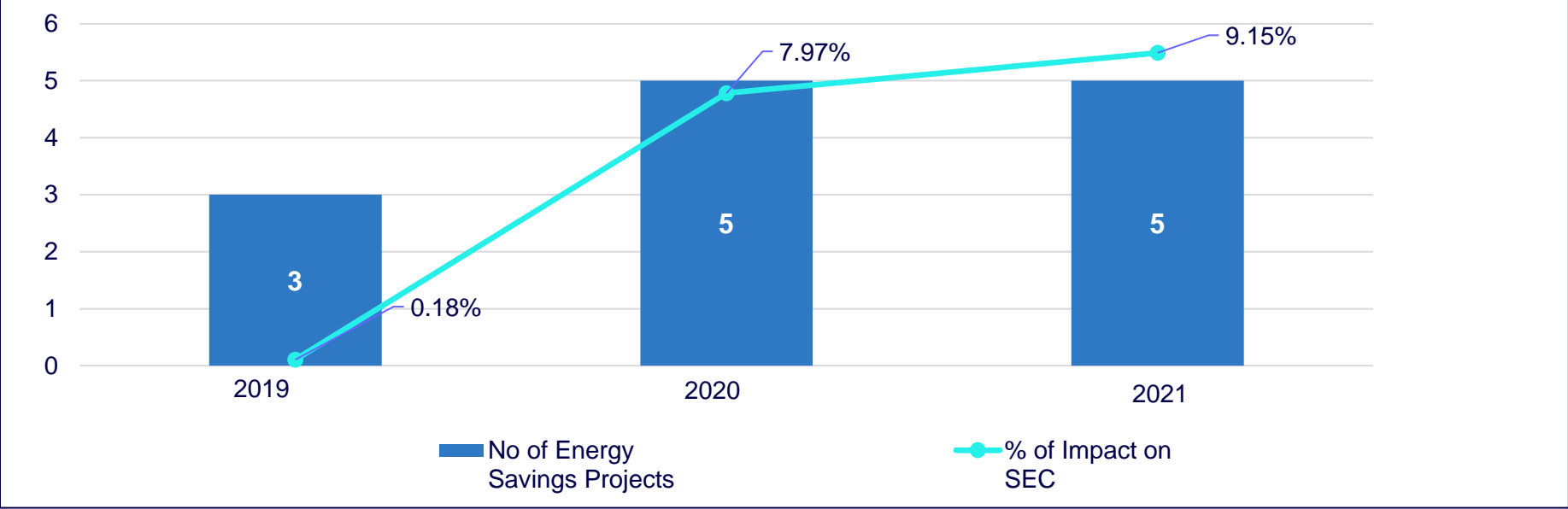
2018

0.98

Summary on ENCON projects - investments

Sl. No	Title of project	Year	Total annual energy saving (kWh)	Total annual savings (INR million)	Investment made (INR million)	Payback (months)
1	New solar water heater for food court operation - 1000 liters x 2 no's	2019	8,460	0.09	0.40	55.0
2	LED retrofit 31w LED to 15 W LED lights installation SDB-2 Tower-2 - 150 no's	2019	9,676	0.07	0.08	14.0
3	LED retrofit for SDB-1 & food court rear side staircase lights (EL) from 2x18w CFL to 20W LED (surface mounted) fitting - 70 no's	2019	3,38,340	0.08	0.55	78.0
4	LED retrofit workstation space - 2x36W CFL to 24W LED lights around -2,610 no's	2020	7,608	3.48	4.35	15.0
5	LED Retrofit - Downlighter 18W CFL to 12W LED - 400 No's (raw and EL)	2020	10,800	0.08	0.34	53.0
6	300KVA UPS 1&2 workstation UPS energy saver eco-mode enable	2020	2,30,256	0.11	0.00	0.0
7	Cooling tower fills replacement retrofit at SDB-1 1000 TR CT 1&3 and 300 TR CT 1	2020	150	2.37	2.09	11.0
8	New condenser coil replacement at SDB-1 chiller -1 900TR	2020	87,060	0.00	4.49	0.0
9	LED retrofit- workstation space - 2x36W CFL to 24W LED lights around -705 no's	2021	15,216	1.21	1.17	12.0
10	LED retrofit - downlighter 18W CFL to 12W LED - 800 No's (Raw and EL)	2021	5,530	0.21	0.69	39.0
11	LED retrofit for SDB-2 Tower- 1 & 2 staircase lights (EL) from 2x18w CFL to 20W LED (surface mounted) fitting - 40 No's	2021	1,53,504	0.08	0.09	14.0
12	Cooling tower fills replacement retrofit at SDB-1 1000 TR CT 3 and 300 TR CT 2	2021	1,45,152	2.14	1.05	6.0
13	STP Plant - one stream of 375KLD aerator system optimization	2021	8,460	2.02	0.00	0.0

Energy saving projects implemented - 2019 to 2021



Year	No of energy savings projects	Investments (INR million)	Electrical savings (million kwh)	Savings (INR million)	Impact on SEC
2019	3	1.04	0.03	0.24	0.18%
2020	5	11.27	0.59	6.04	7.97%
2021	5	3.01	0.41	5.66	9.15%

Innovative project : PLC based solar automation

Manual operation

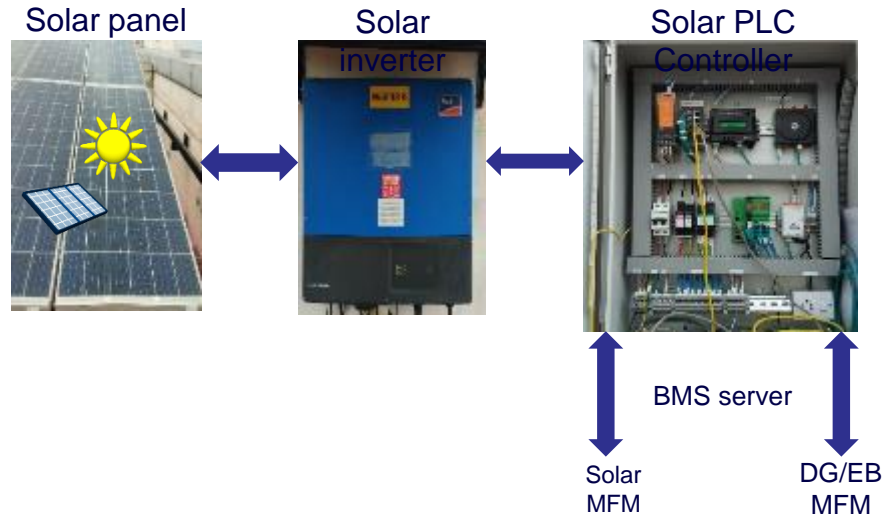
- During pandemic, the roof top solar inverters were controlled manually due to minimum building load
- This manual control led to under utilization of roof top solar system.



Automation

- PLC controller was installed to modulate the solar generation with reference to building load.
- This automation helped us to eliminated the manual control of inverters.

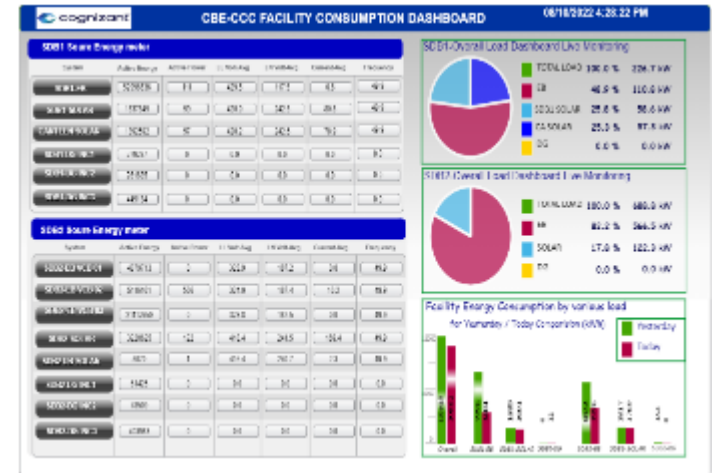
Automation Flow Chart



Achievement

- Increased Solar utilization by 34%

Solar Automation



Solar operation	Energy consumption in kWh
Manual operation (May' 2020)	57,088
Automation operation (May' 2021)	76,387
Difference	19,299
% of increase	34%

Innovative project : STP plant aerator optimization

2/3

STP operations

- During pandemic the input to STP is very low, but we were operating all the aerators to maintain the plant (2 x 375 KLD plant).
- Which led to increase in the STP operation cost.

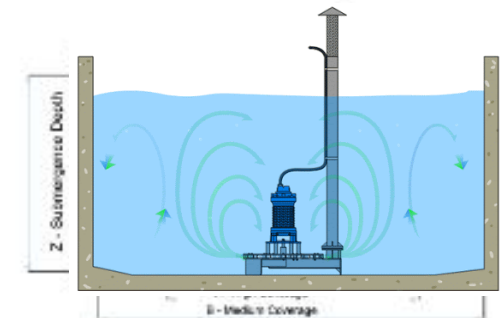
Aerator optimization

- Two stream of operation were optimized into a single stream operation.
- Eliminated operations of 4 aerators (each 4.2 KW)

Achievement

78,480 kWh
Annual energy saved

6,27,840 INR
Annual cost



Air blower lifetime is increased

Innovative project : Cooling tower fill replacement

3/3

Objective

To improve the cooling tower performance by replacing new fills and its accessories.

Benefits

Cooling tower efficiency was increased from 43.67% to 55.07% .

Status	Design	Before fills replacement	After fills replacement
Location	Sdb-1	Sdb-1	Sdb-1
CT no	1000tr, ct-1	1000tr, ct-1	1000tr, ct-1
CT inlet temp (deg F)	98.6	93.8	89.6
CT outlet temp (deg F)	89.6	86.9	82
CT range (deg F)	9.0	6.9	7.6
CT approach (deg F)	16.6	15.8	13.8
Ambient wet bulb (deg F)	82	78	75.8
Ambient dry bulb (deg F)	Na	88.4	83.8
CT effectiveness %	54.21	43.67	55.07
Chiller FLA %	Na	90	90

Before



After



CT efficiency increased to **55.07%**

Overall savings

Approximate average energy saving per year

1.53 Lacs kWh/INR 12.24 Lacs

Best practices

ECO mode enabled in UPS



Saving -900kWh/Month

Power quality improvement

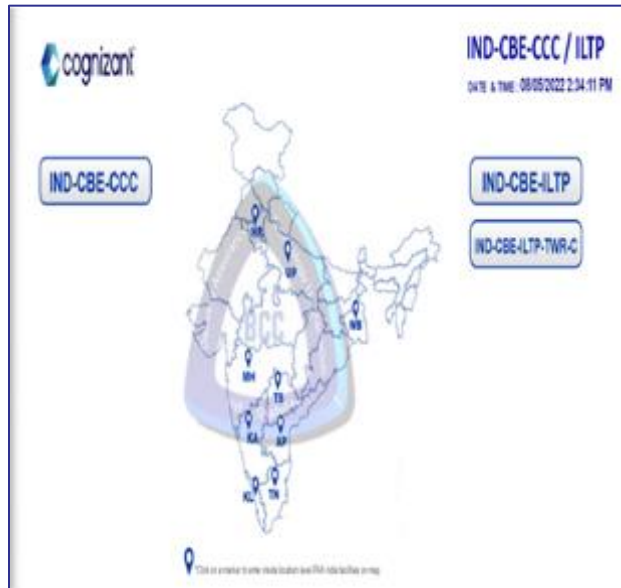


Active harmonics filters were installed to improve power quality

TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED			
Field Harmonic Measurement Report		No: 132/2019	
Name of the Industry: M/s Cognizant Technology Solution India (P) Ltd, Phase-B			
Circle:	CEEC/NORTH	Date of test:	15.01.2019
Division:	Vadamarai	Voltage level at PCG:	33KV/110KV
Sub-division:	Sarasampatty	Sanction Demand:	5100 KVA
Section:	Keeranatham	Last 12m average demand/Current:	1539 kVA 36.95 A
HT SC No:	509	Average Current during measurement:	36.76 A
Nature of Industry: Others (IT)			99%
Measured Values of Power Quality Parameters			
Sl No	Description	Values	
		Allowable Limit	Measured
1	Individual Voltage Harmonic Distortion (Max)	3%	0.75% 1/5
2	Total Voltage Harmonic Distortion	5%	0.96%
3	Total Current Harmonic Distortion (TDD)	8%	1.48%
Witnessed by			
Sl No	Office	Designation	Signature
1	GBM / TANGEDCO	AS / O A / O K. Gopalan	
2	MRT / TANGEDCO	Asst. HTH/MRT/M/CEE	
3	CONSUMER	J. M. RAMESH Chief Engineer	

Best practices

Digitalization



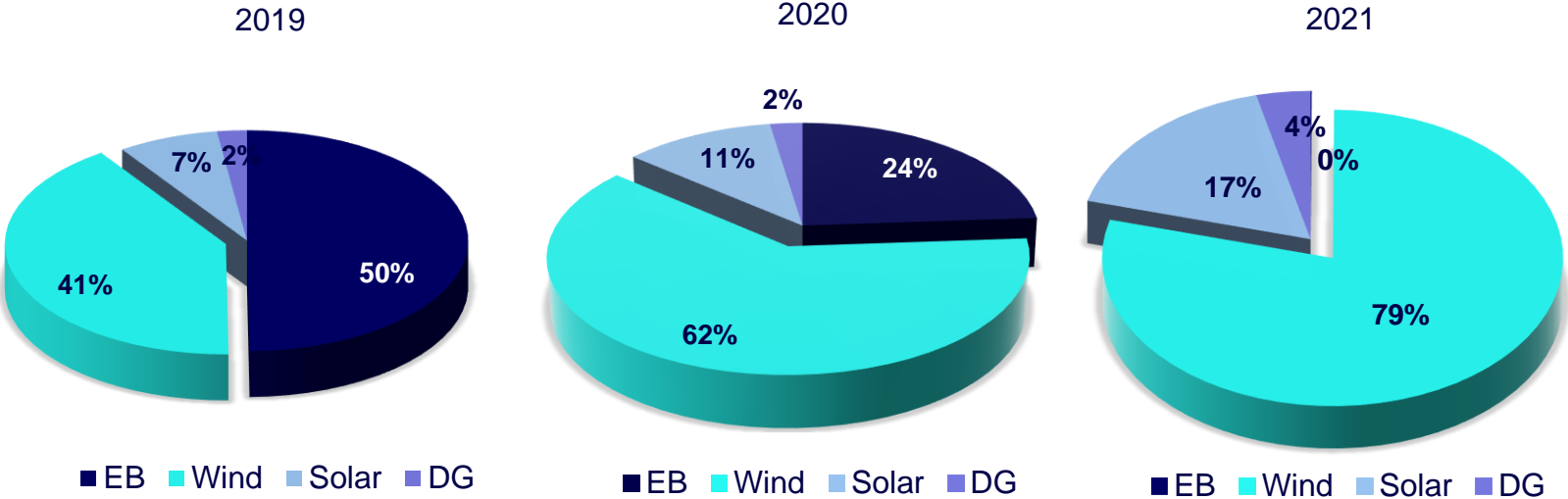
BUILDING MANAGEMENT SYSTEM
(SDB1 - HUB ROOM TEMPERATURE MONITORING)

11/14/2019 2:1

Temp. Value	Alarm Status	Description	Temp. Value	Alarm Sta
25.75 C	NORMAL	6F EW HUB ROOM	24.58 C	NORMAL
24.55 C	NORMAL	6F MW HUB ROOM	23.88 C	NORMAL
25.28 C	NORMAL	6F WW HUB ROOM	23.42 C	NORMAL
23.44 C	NORMAL	7F EW HUB ROOM	23.02 C	NORMAL
23.58 C	NORMAL	7F MW HUB ROOM	21.88 C	NORMAL
23.81 C	NORMAL	7F WW HUB ROOM	24.22 C	NORMAL
23.55 C	NORMAL	4F DC MAIN ROOM	22.55 C	NORMAL
23.64 C	NORMAL	4F DC BACKUP ROOM	22.38 C	NORMAL
23.73 C	NORMAL	4F DC NETWORK ROOM	22.58 C	NORMAL
21.34 C	NORMAL	4F DC VOICE ROOM	21.42 C	NORMAL
22.18 C	NORMAL	4F OFC ROOM	22.78 C	NORMAL
23.85 C	NORMAL	4F UPS ROOM	23.21 C	NORMAL
23.31 C	NORMAL	6F UPS ROOM	24.78 C	NORMAL
23.32 C	NORMAL	CANTEEN HUB ROOM	24.28 C	NORMAL
23.85 C	NORMAL	CANTEEN UPS ROOM	23.22 C	NORMAL


- Live monitoring for critical systems
- Energy savings through automation

Utilization of renewable energy sources




96.8% is through renewable energy

Year	EB	Wind (offsite)	Solar (onsite)	DG	Total	%of Renewable
2019	7,67,41,79	62,60,037	11,36,134	3,35,380	1,54,05,730	48%
2020	17,60,293	45,88,945	8,35,544	1,77,685	73,62,467	74%
2021	3,521	35,12,227	7,57,263	1,68,137	44,41,148	96%



Offsite wind wheeling



Onsite rooftop solar (750 kWp)

Waste Management



E-waste
Disposed through an authorized recycler



Food waste
Processed through OWC and utilized as manure



Paper waste
Processed through ITC



Utilized STP plant recycle water for WC flushing, gardening & CT makeup



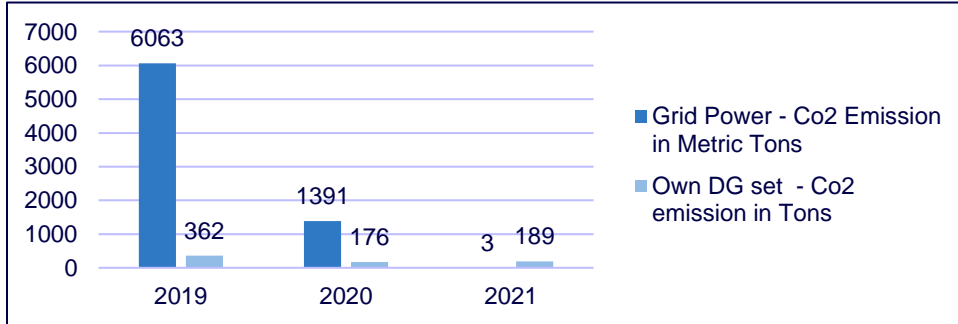
Ban on single-use plastic as per TNPCB



Batteries disposed through authorized recycler

GHG emission and indoor air quality

Scope - 1 & 2



Year	Grid Power CO2 emission in Metric Tons	Own DG set CO2 emission in Metric Tons	Energy CO2 emission in Metric Tons
2019	6063	362	6425
2020	1391	176	1567
2021	3	189	192

Carbon reduction achieved

- Energy consumption reduced between 2019 to 2020.
- Major energy contribution from renewable sources - 2020 & 2021.
- Operational energy savings and various retrofit projects.

CO2 emission reduction action plan for 2022

- R22 - Split into eco-friendly gas operated unit retrofit
- VRV unit to VRF upgraded ODU unit retrofit
- BVRF unit to IVRF upgraded ODU unit retrofit projects

Indoor air quality

Year	Grid Power CO2 emission in Metric Tons	Own DG set CO2 emission in Metric Tons
Oxygen (O2 in %)	19.5 - 23.5	20.8
Carbon monoxide (CO in PPM)	< 9 PPM for max 8 Hours	BDL(DL:1.0)
Carbon dioxide (CO2 in PPM)	< 1000	553
Respirable suspended particulate matter (RSPM in µg/m³)	50	6.5
Temperature in °C	23 - 26°C in summer 20 - 24°C in winters	24.9
Relative humidity (RH in %)	30 - 60	52
Ventilation rate (CFM/person)	Minimum 17	61.3
Total volatile organic compounds (TVOC in PPM)	3	0.007
Total bacterial count cfu/m³	500	106
Yeast & mold cfu/m³	500	41
Legionella - cfu/plate/10min	Absent	Absent

Cognizant Commitment



2040: Reduce absolute emissions by 90%



2030: Reduce absolute emissions by 50%



2026: Source 100% renewable energy

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

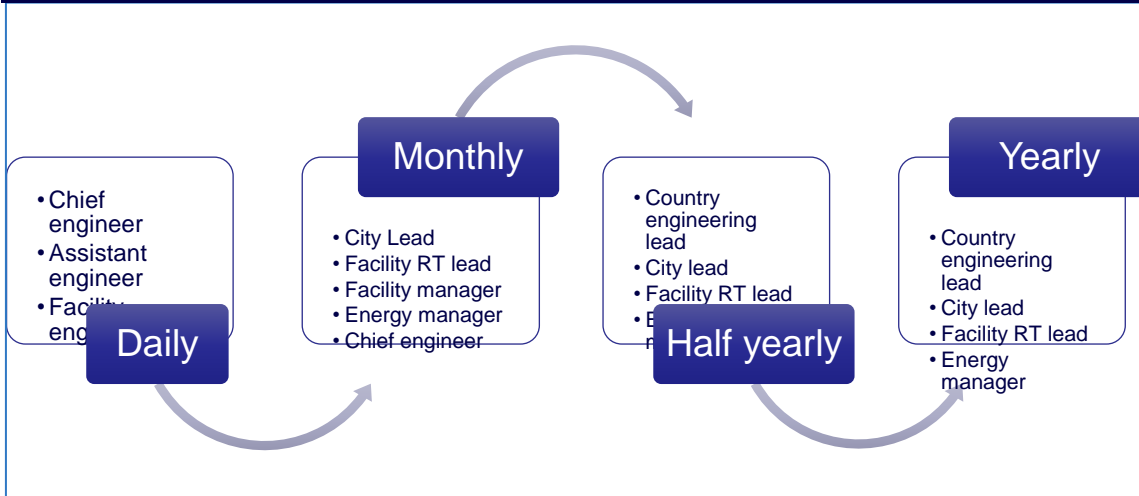
- Focuses on absolute emissions reductions through operational efficiencies and renewable energy use, before the use of carbon offsets
- Measures reductions from a recent, pre-COVID-19 emissions baseline (2019)
- Includes a near-term renewable energy target
- Includes often-hidden emissions, from travel 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

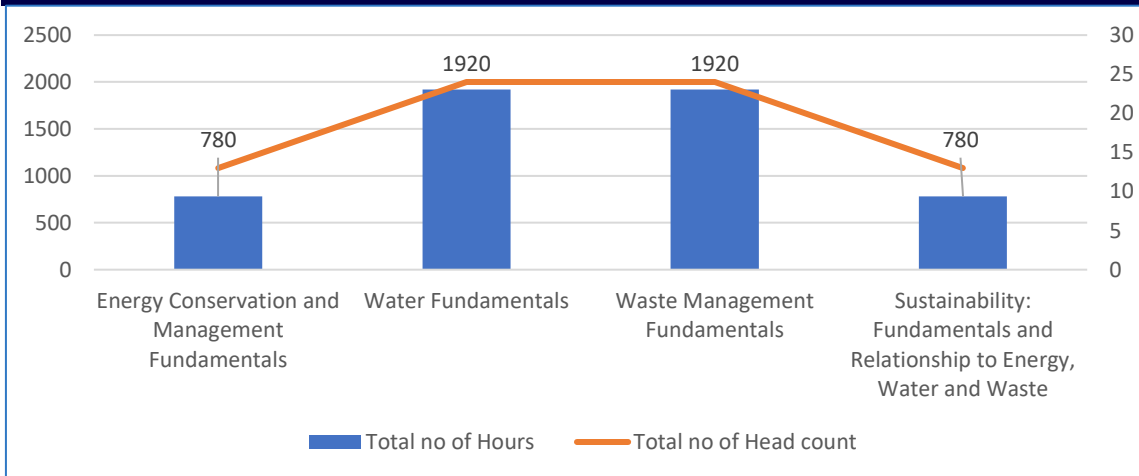
- Submitted for third party validation with the Science Based Targets Initiative (SBTi)*
- Periodically reviewed by the Board's Governance and Sustainability Committee
- Commissioned an external third party to perform attestation procedures over our GHG emission
- According to the United States Environmental 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.

Measuring, monitoring & training

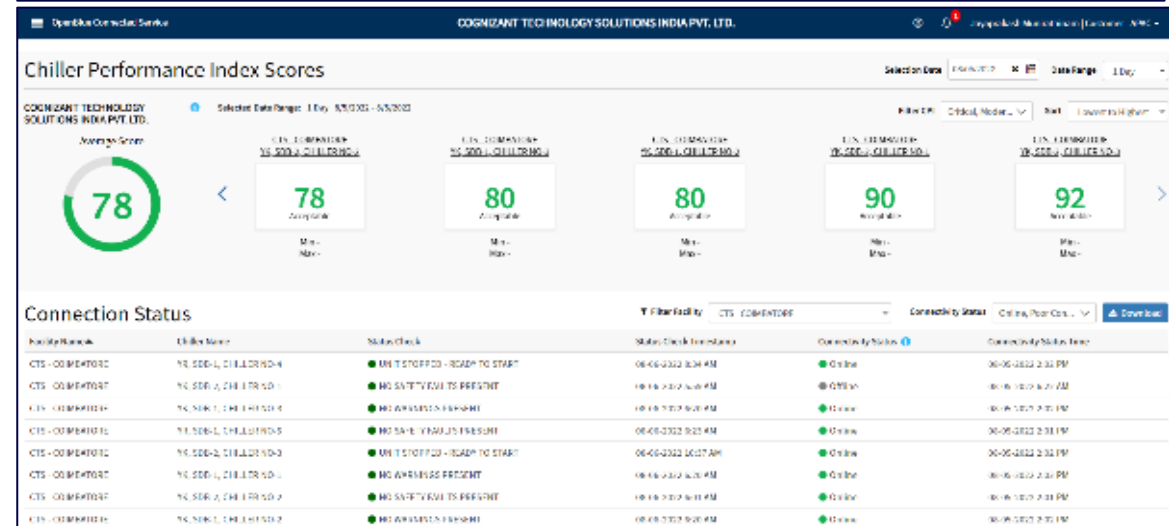
Energy report monitoring & review flow chart



Sustainability training



Monitoring of UPS' & chillers- IOT



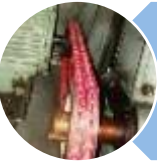
Way forward 2022 to 2024



Retrofit AHU - EC fan



Retrofit energy efficient power transformer



Replace AHU conventional V belt with polyurethane belt

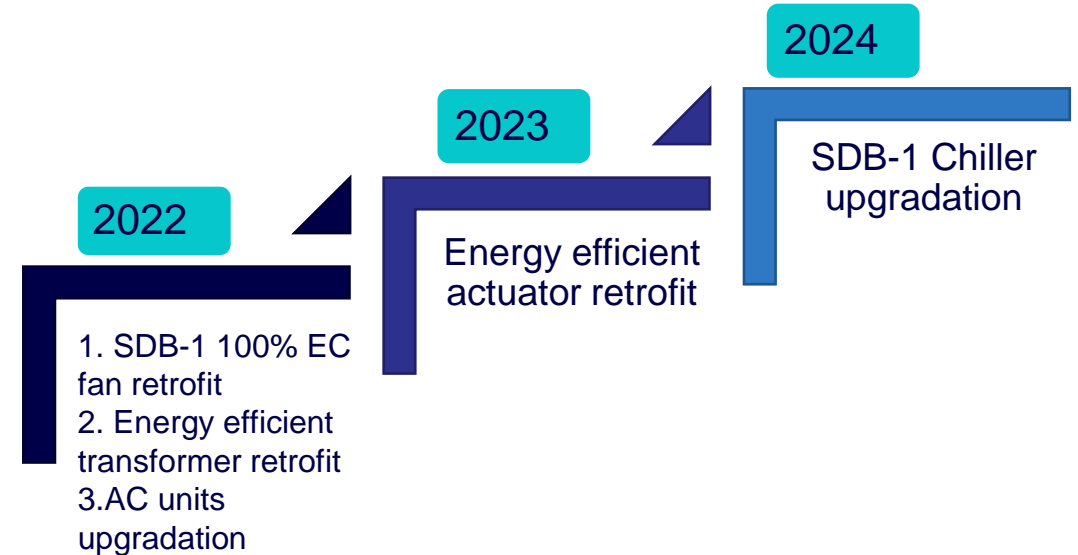


Introduce solar based battery inbuilt LED streetlight



Replace T5 light fixtures with LED light fitting

Energy savings project road map



Investment towards energy saving projects in 2022

No of energy savings project in 2022	Investment (Rs in Million)
6	15.84



23rd National Award for Excellence in Energy Management 2022

CCC Coimbatore

August 2022