23rd National Award for Excellence in Energy Management 2022

Siruseri SEZ – Chennai

August 2022

Agenda

1. Brief of the Organization & Facility Overview
2. Energy Consumption Overview for the Year 2019-2021
3. Specific Energy Consumption in Last 3 years (2019-2021)
4. Energy Saving Projects Implemented Details (2019-2021)
5. Innovative Technologies Implemented
6. Utilization of Renewable Energy Sources
7. Awards , Teamwork, Employee involvement & monitoring

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

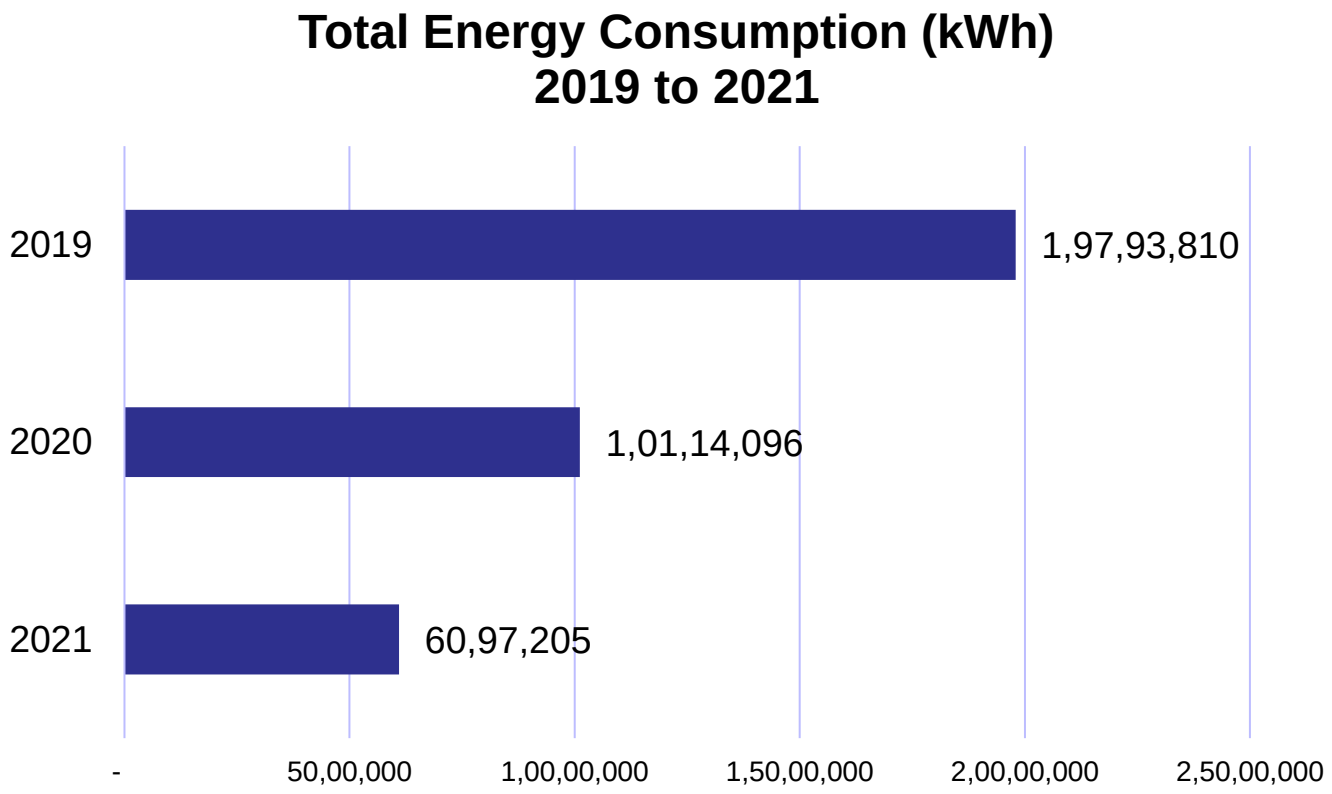
567
Forbes Global 2000
May 2022

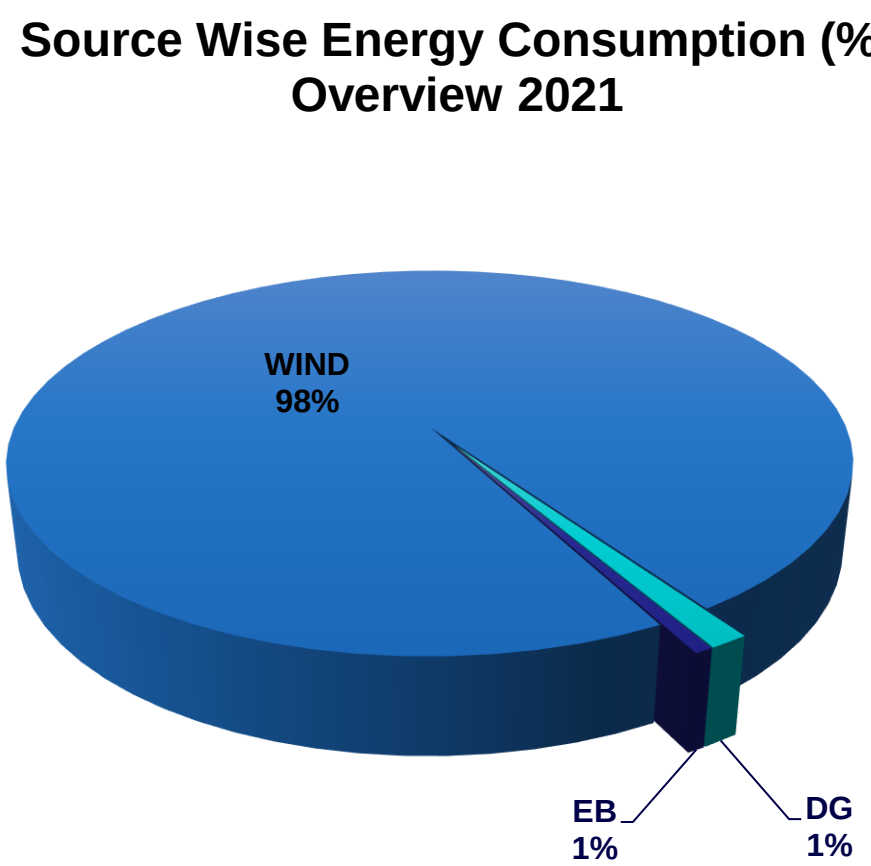
327
Forbes 2021 World's Best Employer list
Oct 2021

Facility Overview

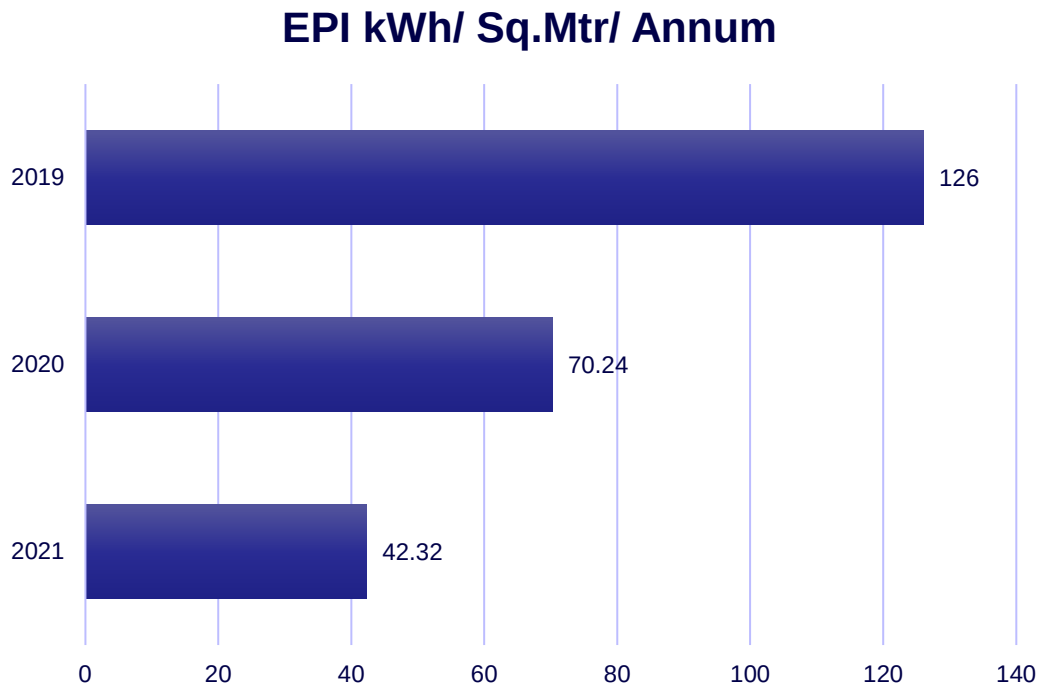
- Operations from 2011, Owned Facility at SIPCOT
- Campus Area – 40 acres.
- Total Built-up Area- 200,986.67 Sq.mtr
- Five Blocks (SDB1,SDB 2,SDB 3, MLCP & Cafeteria)
- Seating Capacity: 12554
- BAU Head Count: 8558 Associates & 1550 CWR
- TNEB Sanctioned Demand – 5500 KVA
- TNEB Supply Voltage Level – 33 KV
- Transformers Aggregate Capacity – 14000 KVA
- Diesel Generator Aggregate Capacity – 12000 KVA
- Chiller Aggregate Capacity – 4886 TR
- UPS Aggregate Capacity – 1905 KVA
- Exclusive Medical Center with Ambulance Service
- Gold Rated LEED Certified Building
- Certified for ISO 45001 and ISO 14001

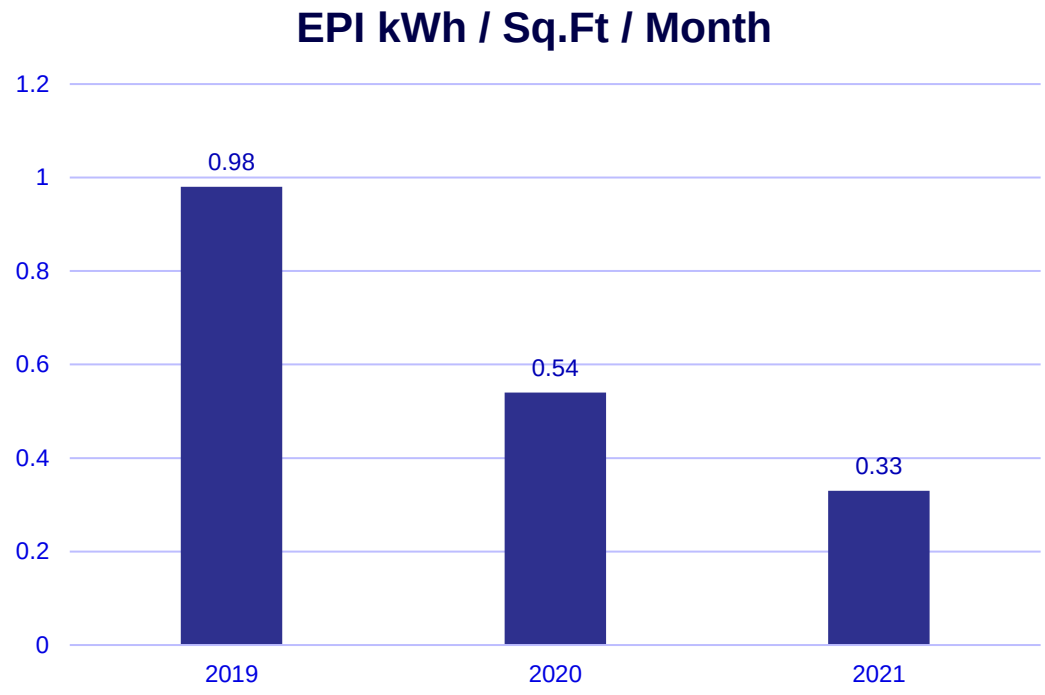
Energy Consumption Overview for year 2019 - 2021





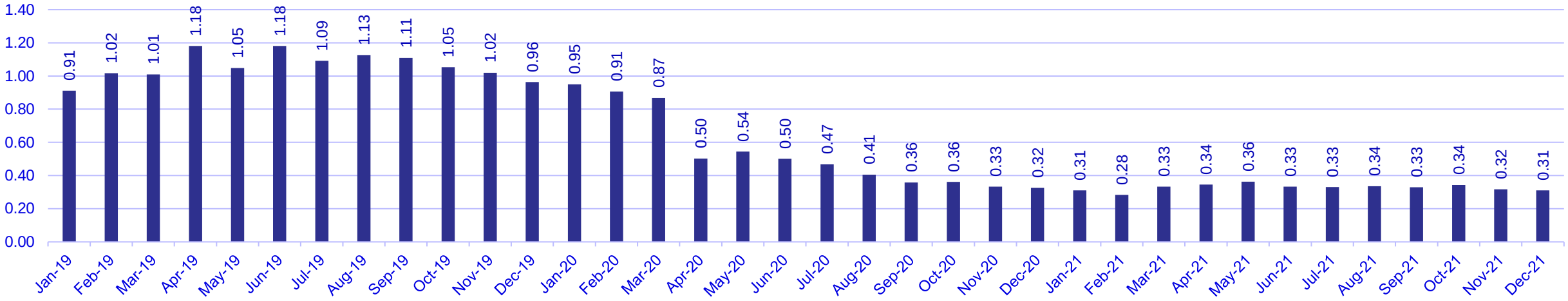
Specific Energy Consumption (EPI) Trend-2019 to 2021



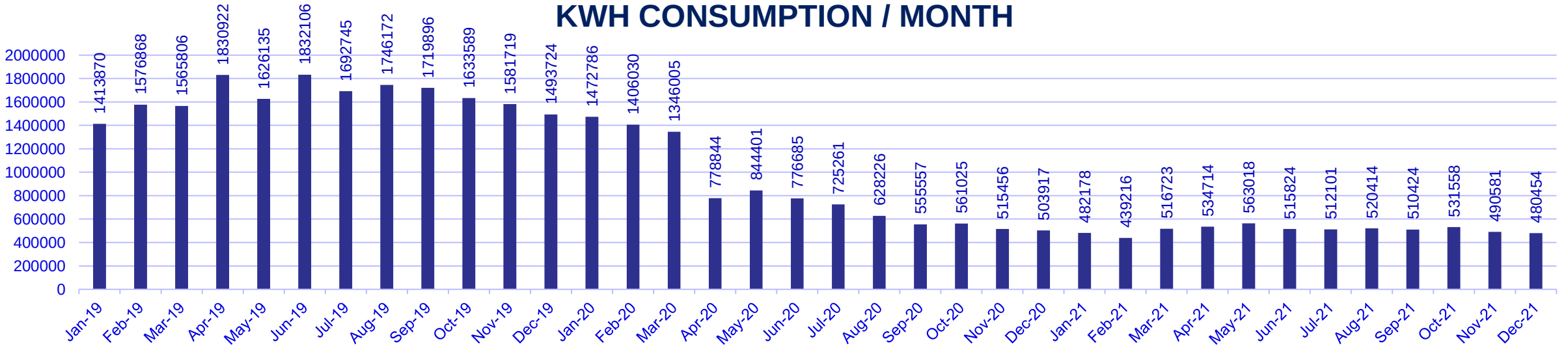


Specific Energy Consumption Overview - 2019 to 2021

SEC- KWH/ SFT / MONTH

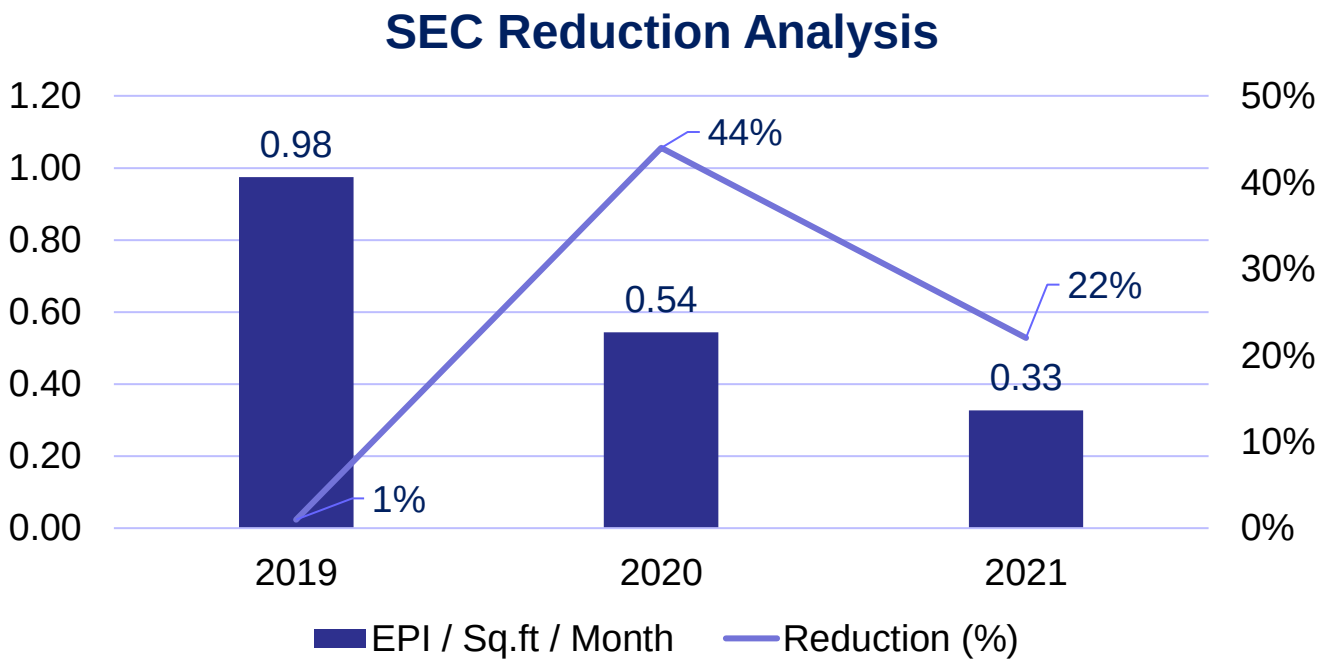


KWH CONSUMPTION / MONTH



Specific Energy Consumption Trend Analysis - 2019 to 2021

Year	EPI / Sq.Ft / Month	Reduction (%)
2019	0.98	1%
2020	0.54	44%
2021	0.33	22%



2019

- Effective lighting operation control via BMS.
- Effective utilization of low ambient temp for heat load optimization.
- Electrolytic scale remover for cooling tower system.

2020

- LED retrofit in SDB 1 building
- UPS retrofit in SDB 3

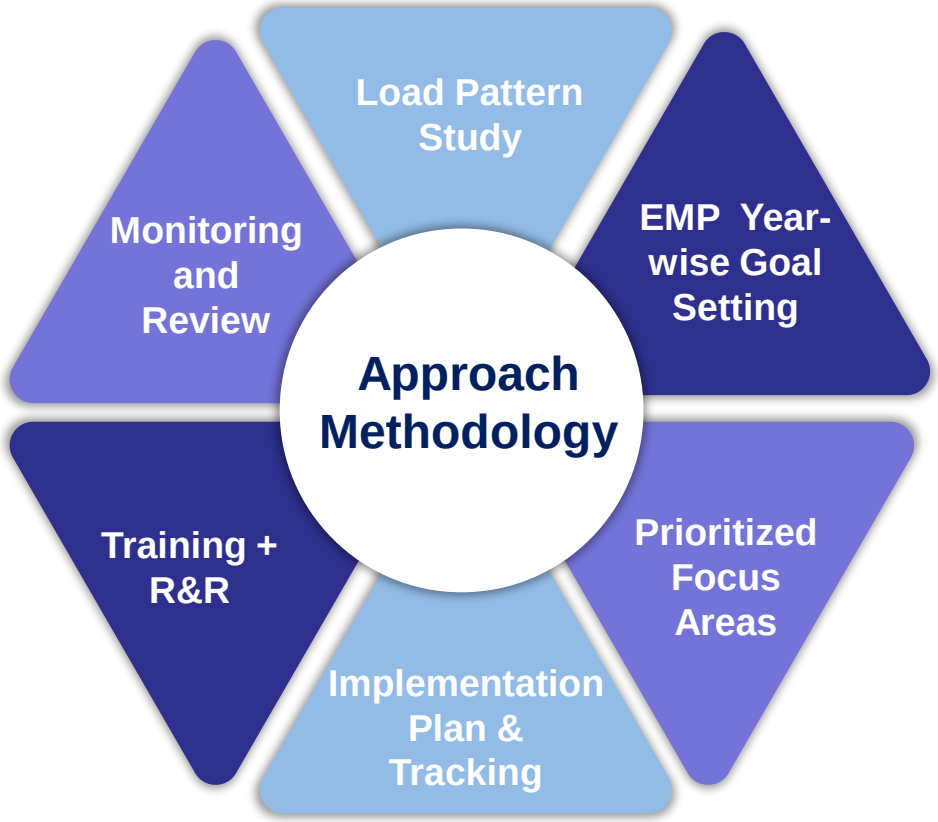
2021

- Modification of main header pipelines interconnection at chiller plant room
- LED Retrofit - Replacement of 2 x 18 Watts CFL fittings with 1 x 12 Watts LED fittings in SDB2 & 3 buildings
- STP Retrofit

Comparison of SEC with Internal & National Benchmark

BEE - National Benchmark			
	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**

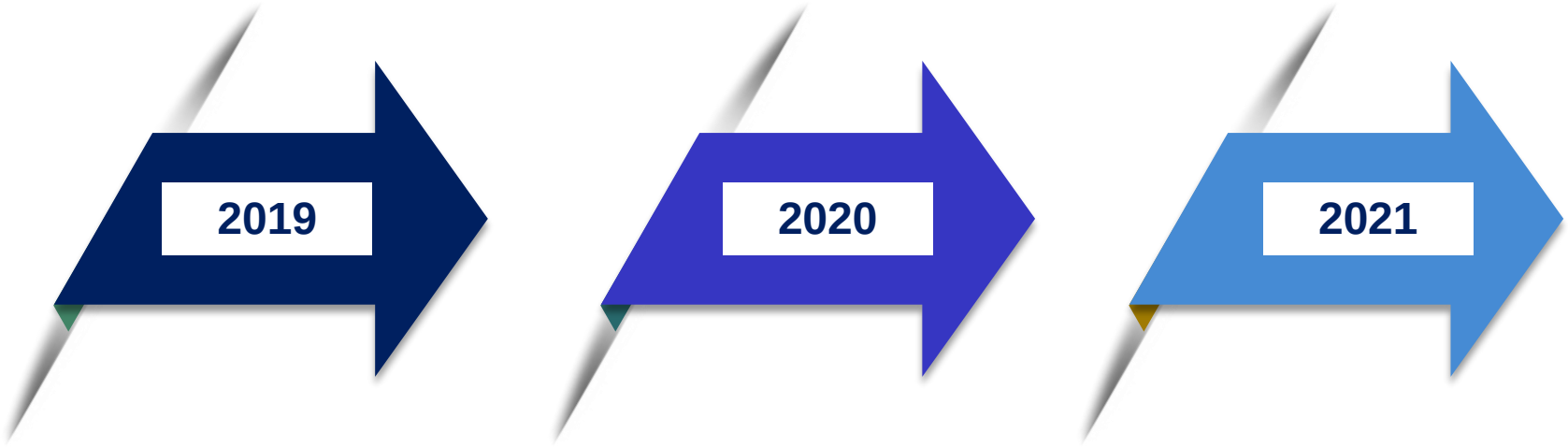
Internal Benchmark - Owned campus	
Facility Name	EPI/sqm/Annum
CHN - Siruseri	32.3
CHN - Siruseri - SEZ	42.3
CHN - CKC	42.9



List of Energy Savings Projects Planned – FY2022-23

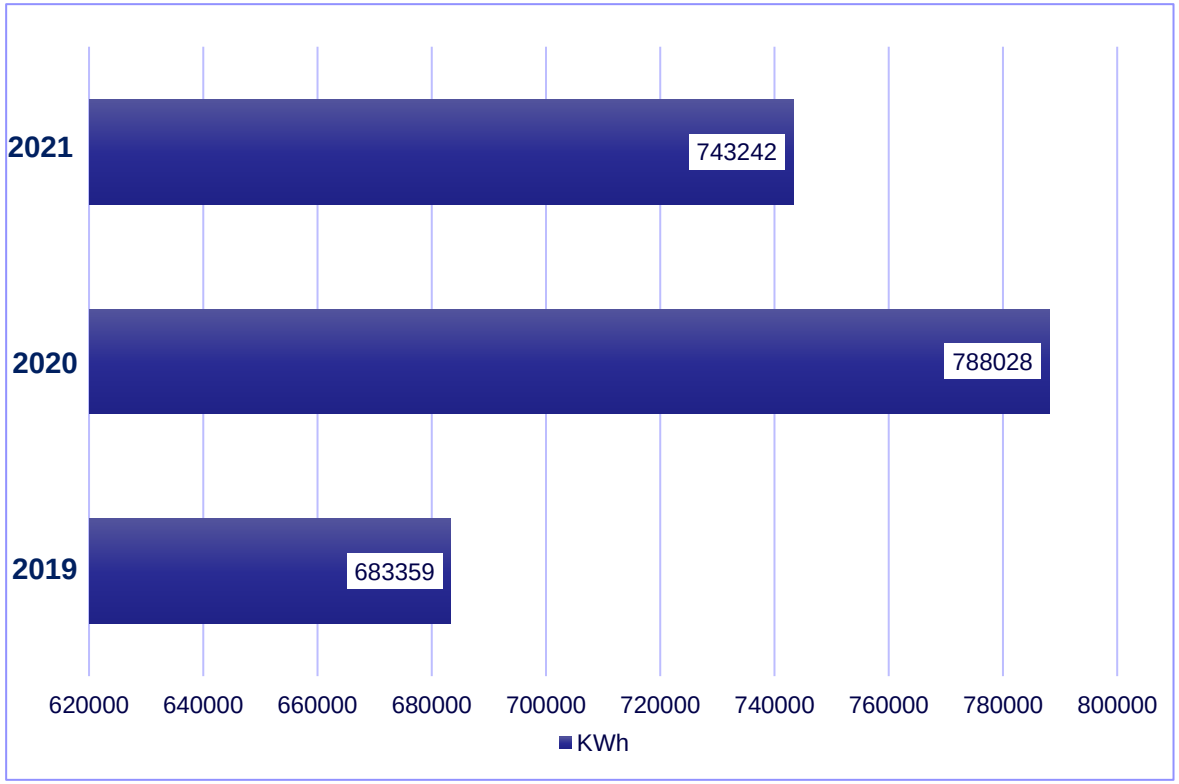
Year	Initiative Category	Intiative Discription	Investment for Initiative (INR)	Energy Savings (kWh)	Energy Cost (INR)	Pay Back Period (Months)
2022	Lighting	Replacement of 4 x 14 Watts FTL fittings with 1 x 24 Watts LED fittings in SDB2 & 3 buildings	88,71,450	1,067,308	85,38,464	12 Months
2022	AHU	Workstations AHUs retrofit across campus 82nos	1,08,90,000	648,300	51,86,400	24 Months
2022	Chiller	Modification of main header pipelines interconnection at chiller plant room	4,63,991	80,186	6,41,488	9 Months

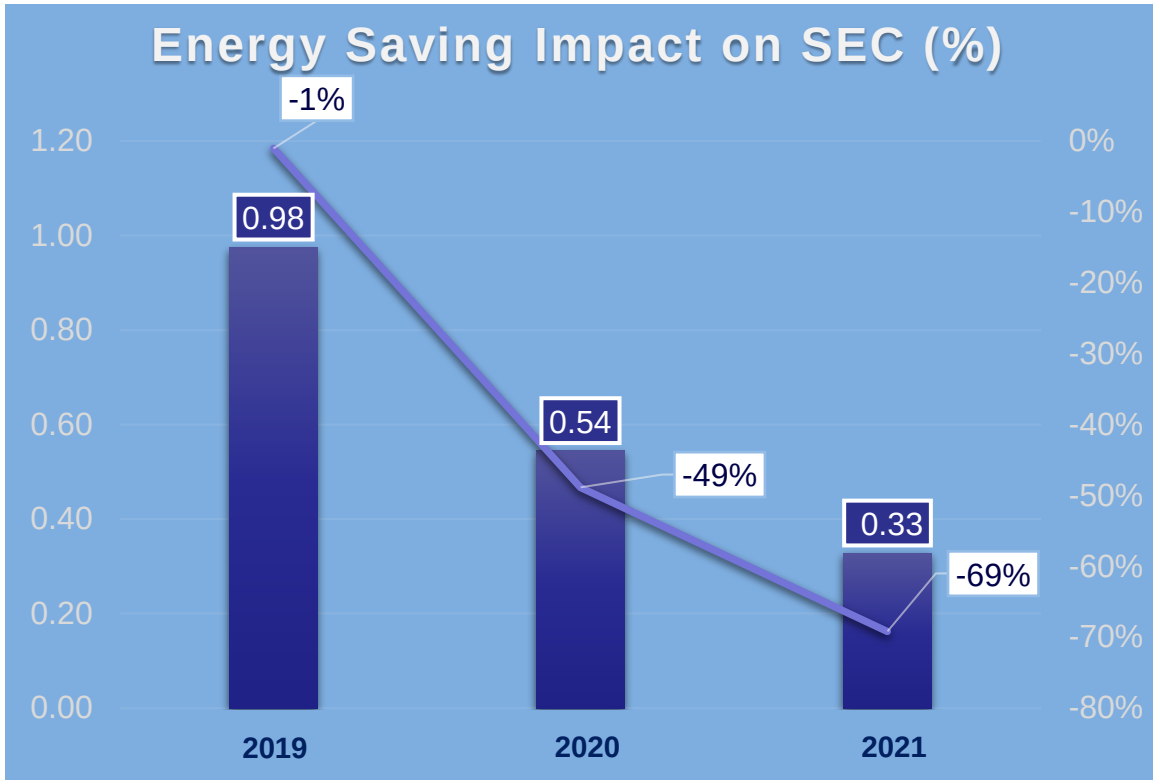
Energy Saving Projects Implemented Summary in 2019 to 2021



2019	2020	2021
No of initiatives – 8 Achieved Energy Savings - **6,83,359 kWh** Annual Cost Savings - **54.7 L** Investment - **47.1 L**	No of initiatives -2 Achieved Energy Savings - **9,55,920 kWh** Annual Cost Savings - **91.36 L** Investment Cost - **123 L**	No of initiatives -2 Achieved Energy Savings – **7,43,242 kWh** Annual Cost Savings - **66.14 L** Investment Cost – **285.66 L**

Energy Savings Comparison & Its Impact - 2019 To 2021





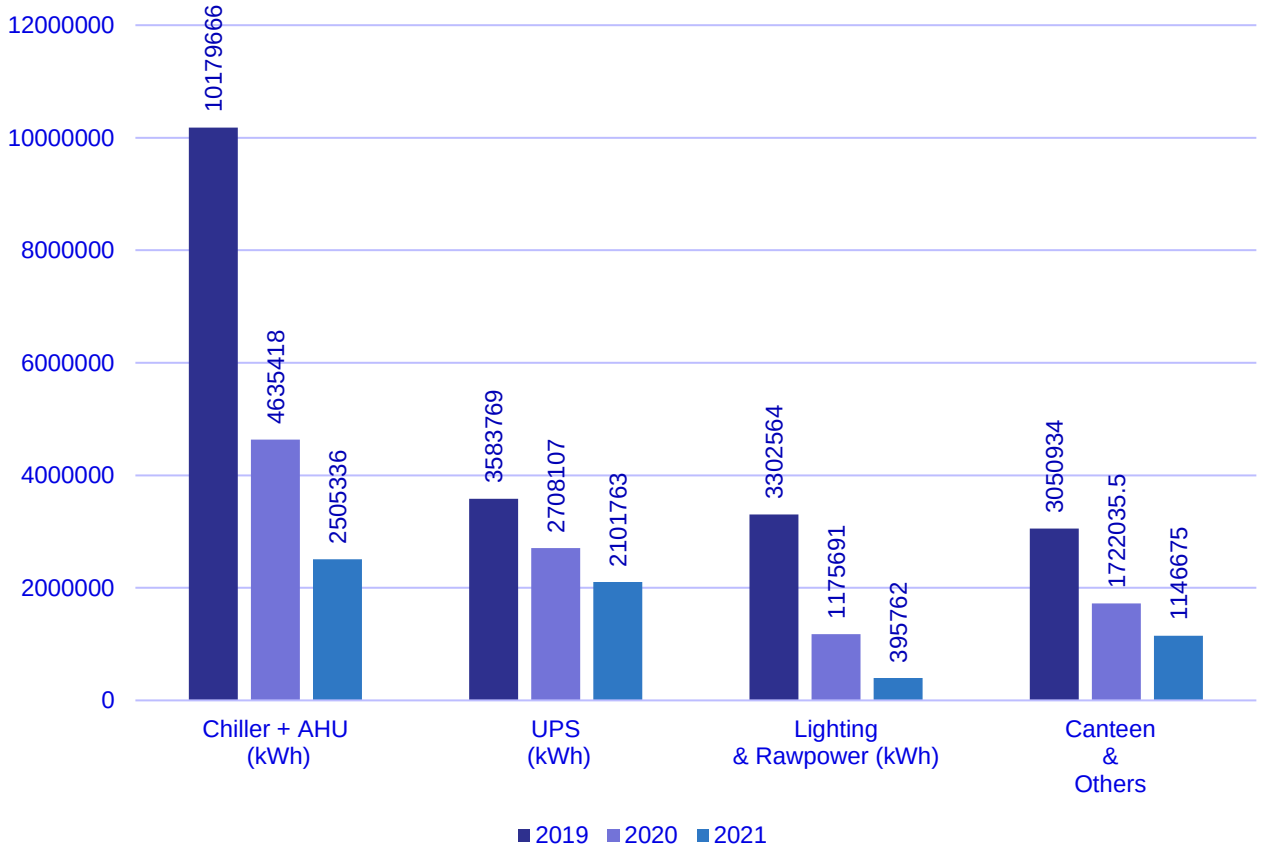
Total Energy Savings
22.14 L kWh

Total Cost Savings
INR 197 Lakhs

Overall SEC Reduction
0.33 kWh / Month / Sq.Ft.

Overall SEC Reduction
69%

Energy Saving Projects Impact on Utilities Consumption - 2019 to 2021



Chiller & AHU
- 7674330 kWh
- 75%

UPS
- **1482006 kWh**
- **41%**

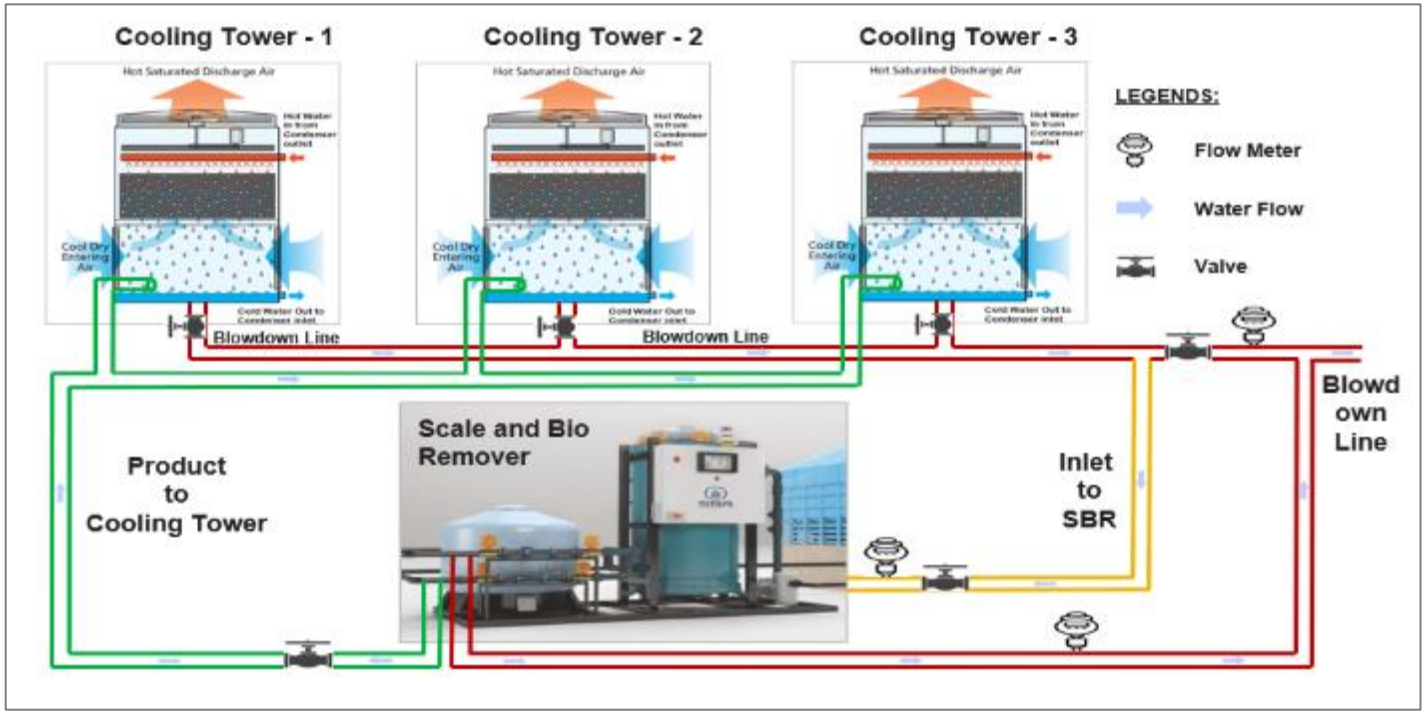
Lighting & Power
- **2906802 kWh**
- **88%**

Canteen & Others
- **1904259 kWh**
- **62%**

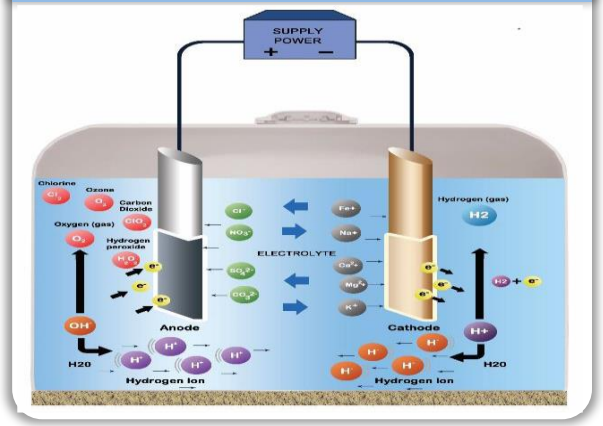
Innovative Project 1 - Electrolytic Scale & Bio Removal (SBR) System

Water Cooled Chiller Operational Challenges

- Makeup water TDS < 300 ppm
- Silica in make up water – 65 ppm
- Cycles of Concentration limit < 3.5
- Circulation water TDS < 1000 ppm
- Blowdown water quantity – 25 KLD
- Condenser Tubes fouling | Biological growth control in CT
- Chemical dosing - Silica not controlled
- Condenser – Hard scale formation
- Heat Transfer Efficiency | Chiller – iKW/TR



SBR – WORKING PRINCIPLE



SBR - ADVANTAGES

Savings Summary

- Water – 140 KL (₹.30.9 L)
- Chemical Cost – ₹ 15.6 L
- Energy – 1.18 L kWh (₹.9.4 L)
- Total Cost Savings – ₹.55.9 L
- SBR unit cost – ₹.22.23 L
- Payback Period < 5 Months

Innovative Project 2 - UPS Retrofit (Conventional to Modular UPS)

Previous Setup

- Conventional UPS Capacity 3x400 KVA
- Modular UPS Capacity 2x450 KVA
- Overall Capacity Optimization 300 KVA (25%)
- Average Energy reduction 299880 kWh / Annum
- Annual Cost savings of INR. 26.68 Lakhs
- Investment Cost INR. 65 Lakhs
- ROI is 2.4 Years

Current Setup

Benefits

- Elimination of AC & DC Capacitator
- Dual Source provisions
- Harmonics level mitigation
- On demand Module can added
- AMC Cost Reduction
- Floor Space also optimized

Innovative Project 3 - Modification of Chilled Water Main Header Pipeline Interconnection

Operational Challenges

In Early setup the chilled water header pipelines interconnection pipe size was as same as main pipelines and water leaving from water cooled chiller will enter into system again through water cooled chiller primary pumps (short cycling) and no effective suction flow for secondary pumps.

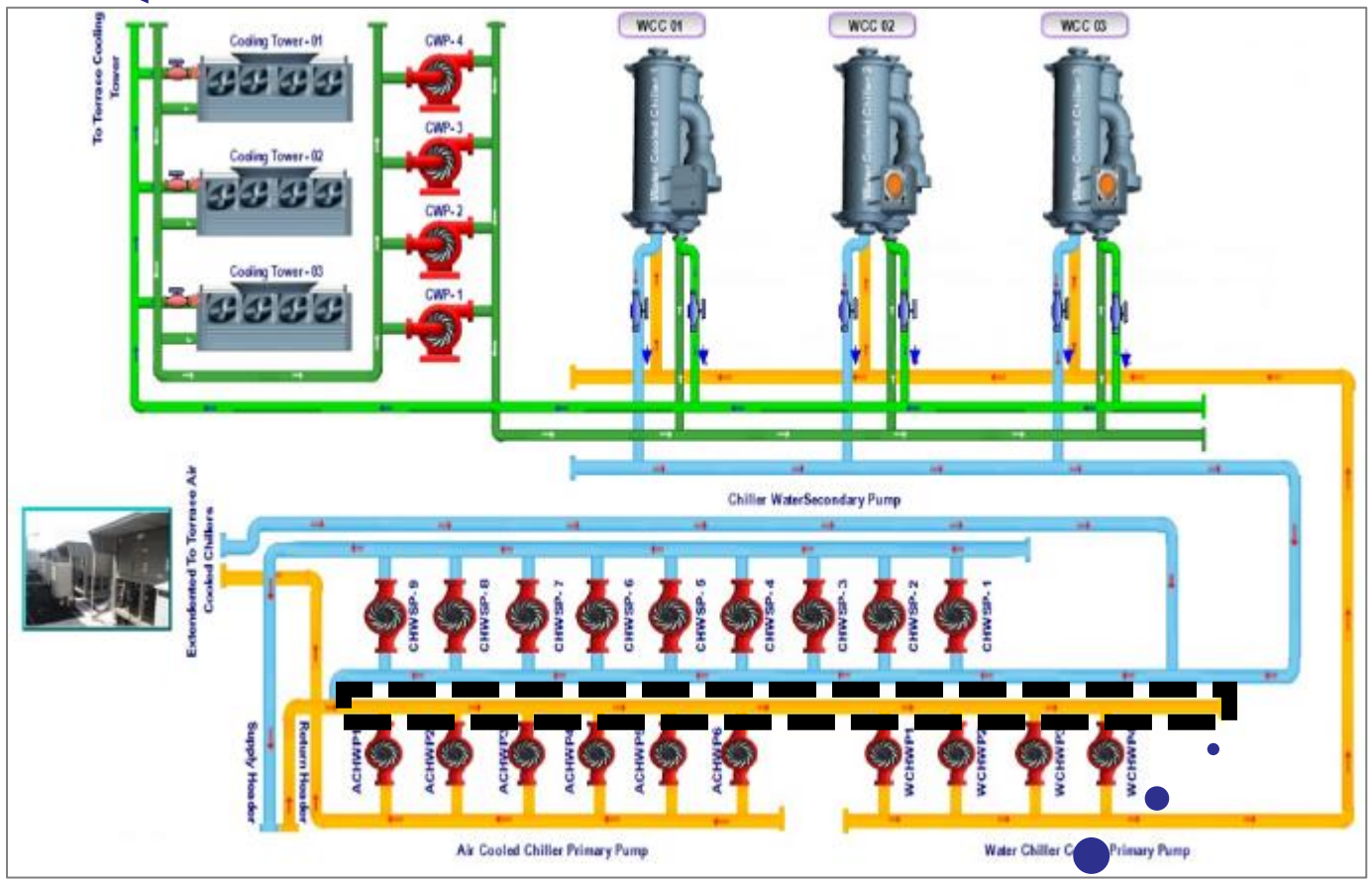
Modified System

- Inter connection pipeline size was reduced to 300mm dia from 600mm dia,.
- Pipeline tapping point also changed to avoid short cycling of chilled water within the system.

Savings Calculation

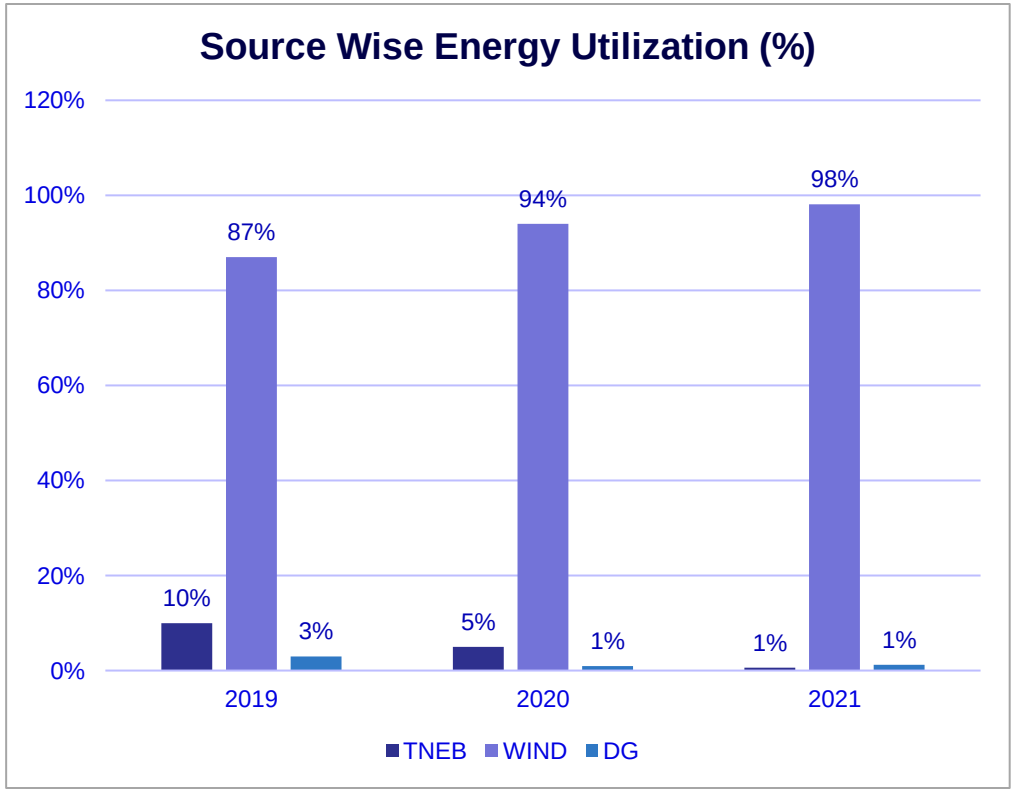
Energy Savings – 80186 kWh
Cost Savings – INR 7.13 Lacs
Investment – INR 4.64 Lacs
ROI – 8 Months

Chilled Water Pipeline - Schematic Layout



Earlier Inter connection pipeline size was 600mm Dia, Modified pipeline size 300 mm Dia,

Utilization of Renewable Energy Sources – 2019 to 2021



Technology (Electrical)	Type of Energy	Onsite/Offsite	Installed Capacity (MW)	Wind Energy Utilization (million kWh)	% of overall renewable energy
Electrical	Wind	Offsite	256.85	45.6	90.5%

Utilization of Renewable Energy Sources – FY 2019-21

Year	Installed Capacity (MW)	Total Wind Energy Contracted Quantum (Lacs kWh)	Actual Supplied Wind Energy Quantum (Lacs kWh)	SRZ Consumption (Lacs kWh)	Allocation contribution (%)
2019-20	256.85	525	509	170.1	33.0%
2020-21	256.85	525	379	72.6	19.2%
2021-22	256.85	525	339	59.2	17.5%

- In FY 2018-19 additional quantum of 200 Lacs kWh purchased with an investment of INR.200 Lacs
- Actual Supplied wind Energy Quantum reduction for FY 2020-21 & 2021-22
  - Non-BAU Actual Energy consumption got reduced
  - Renewable energy utilization (Wind) **2019 - 87% , 2020 - 94% & 2021 – 98%**

RPO & REC Summary

Year	Solar REC Requirement (%)	Non-Solar REC Requirement (%)	Solar REC requirement Qty (No's)	Non-Solar REC Requirement Qty (No's)	Remarks
2019-20	5%	9%	851	1531	REC Purchase under progress
2020-21	8%	10%	581	744	
2021-22	11%	11%	622	622	

Waste Utilization and Management

Paper Waste – Recycle, Reduce & Reuse

- Limitation of printer access
- E-Fit tool implemented and manual check list optimized
- Paper cups usages eliminated 100%

Food waste – Recycle & Reuse

- Recycled through organic waste composter
- Organic waste convertor capacity: 500 kg/day
- Average food waste of 9000 kilograms is converted in to 11000 kilograms of manure

Hazardous / E waste/Battery Waste – Recycle & Reuse

- Battery waste – Extension of battery warranty (3 to 3.5 years)
- E –Waste – CFL to LED retrofit to enhance the lifetime and reduce the waste generation.

Plastic Waste – Recycle & Reuse

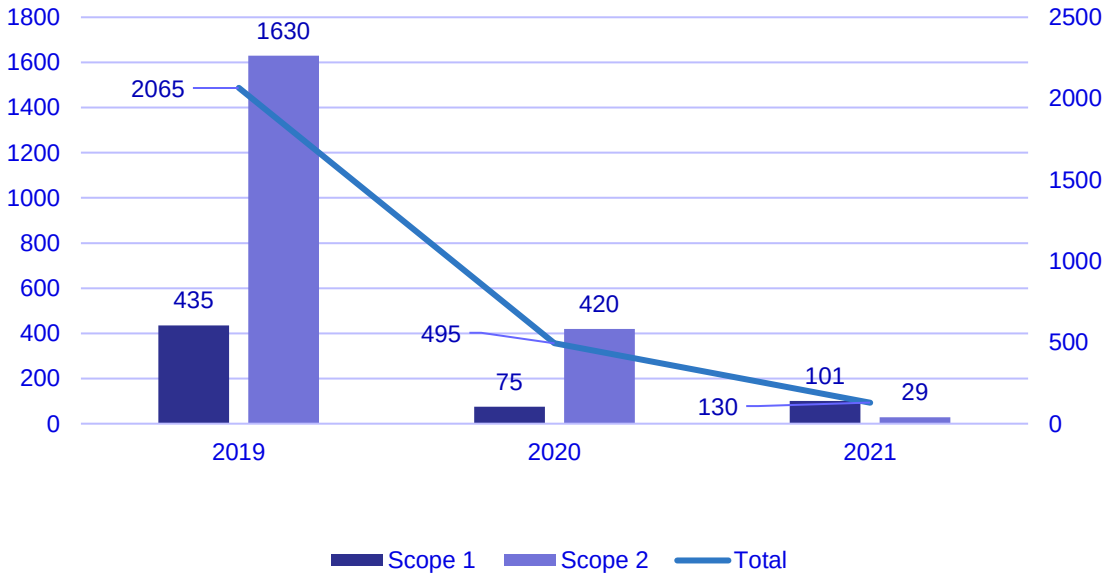
- Plastic waste is segregated and stored separately
- Plastic wastes are disposed only through authorized recyclers
- Single use and throw away plastics are banned inside the campus

Solid (Garbage) waste – Recycle & Reuse

- All Solid wastes generated are disposed within SLA through authorized vendors.

GHG Inventorisation – 2019 To 2021

GHG Emission (MT of CO2) Trend– 2019 to 2021



GHG Reduction Target & Action Plan

GHG Reduction

1.TNEB Power fluctuation in 2019

2.RE utilization decreases (92% to 87%) in 2019

3. NR2O in 2020

1. SBT-24% ↓ in 2024
2. IOT Project implementation
3. Energy efficiency project implementation

GHG Target

Indoor Air Quality (BAU)

Test Parameters	Units	Result	Permissible limit	Remarks
Carbon Dioxide (CO2)	Mg/m3	570	1000	1. Testing through NABL Laboratory 2. Random sampling will be done Monthly once for workstations
Total Fungal Count	Cfu/m3	48	500	
Total Bacterial Count	Cfu/m3	103	500	

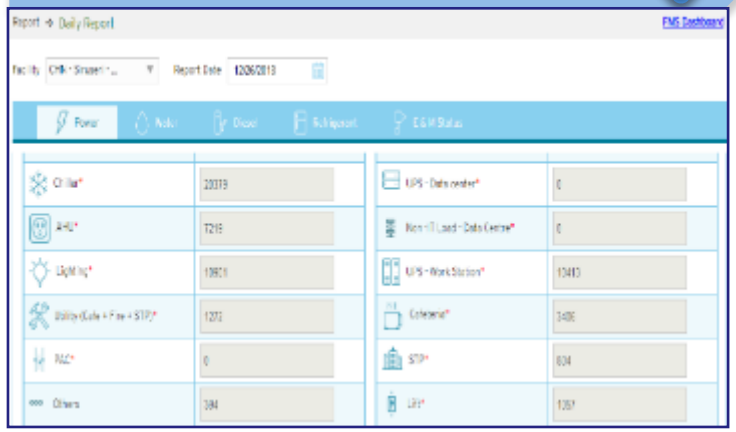
Standardization of Best Practices

Personnel Computer	Air-Conditioning	Kitchen / Pantry
 Sleep mode enabled for all personnel computer	Workplace temperature policy standardized 24°C to 26°C	Elimination of electrical hot plate
		Mandatory use of BEE star rated equipment's
 Conventional CPU replacement with compact CPU	Maintaining UPS/ Battery room temperature b/n 25°C to 26°C	Scheduled operation of ventilation system
		Periodical cleaning of heater in bain-marie
 Awareness created to Associates to switch off the monitor while leaving the workplace	Hub room temperature- maintained b/n 24°C to 26°C	Standard operation temperature for all freezer equipment
		Weekly deep cleaning for all type of freezer

Measuring & Monitoring Device & Tool

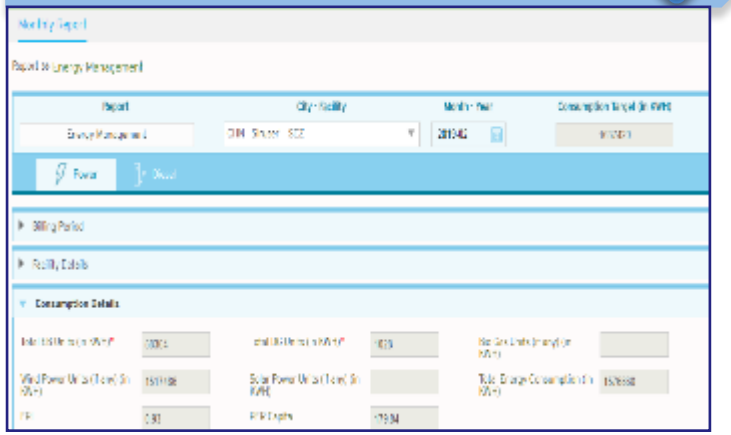
Building Segment Wise Consumption

FMS Tool-Daily Consumption Monitoring



Chiller Operating Parameters Monitoring

FMS Tool-Daily Consumption Monitoring



Chiller Operating Parameters Monitoring

Initiative by Plant Team

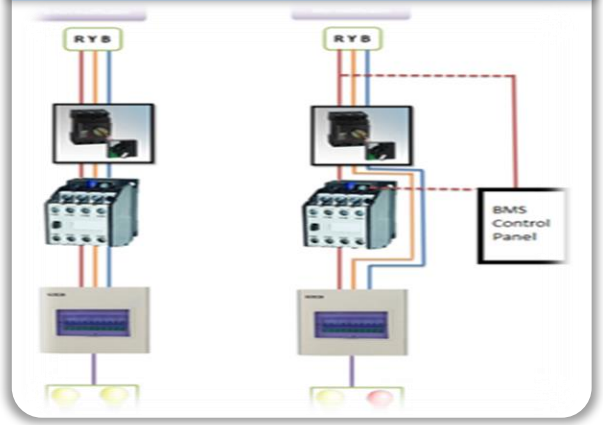
Enabling Energy Saver Mode in Modular

Timer Controller for Peripheral Lighting

Limit Switch for AHU Room & Fire Shaft Door

Desktop Power off Activities Across Campus

Lighting Operation control Via BMS



Motion Sensor for Restroom Lighting Control

Pull Cord Switch Installation for Lighting

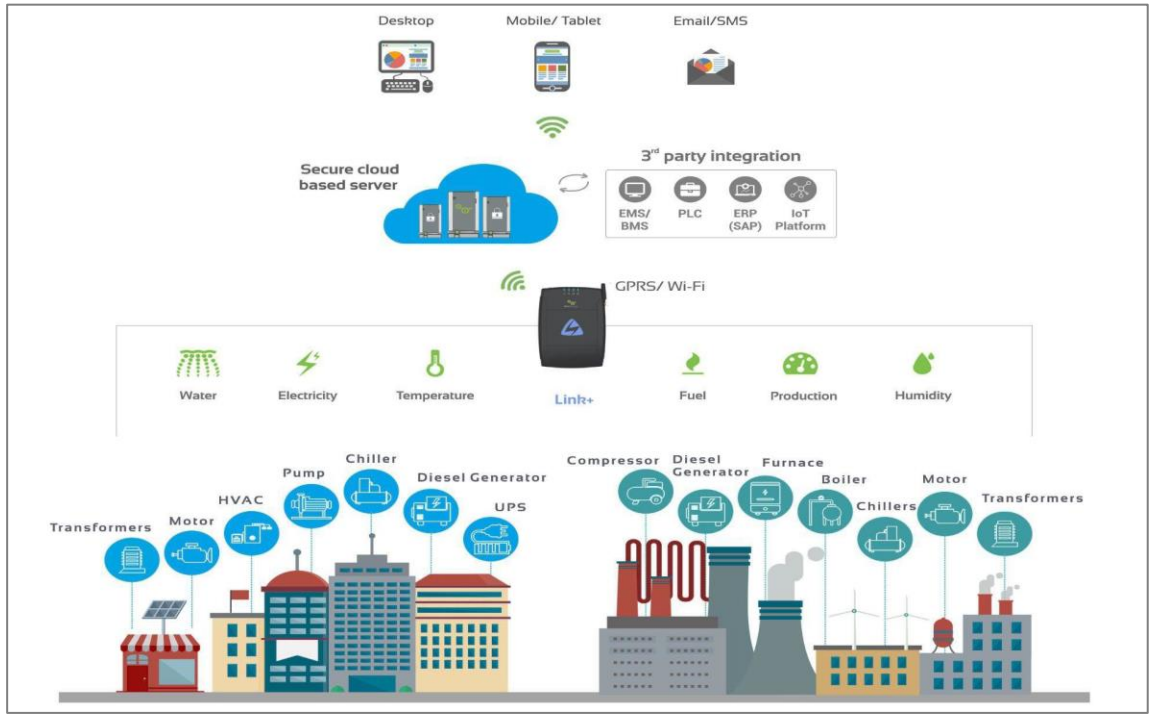
World Earth Hour Celebration

Major Achievement - IOT Based Energy Meter Monitoring

SmartSense

An Internet of Things (IOT) analytics platform that helps businesses with predictive Intelligence to Optimize Energy & Maintenance costs and reduce asset downtime

The Smart sense IOT Platform



SRZ-Smart Sense Dashboard

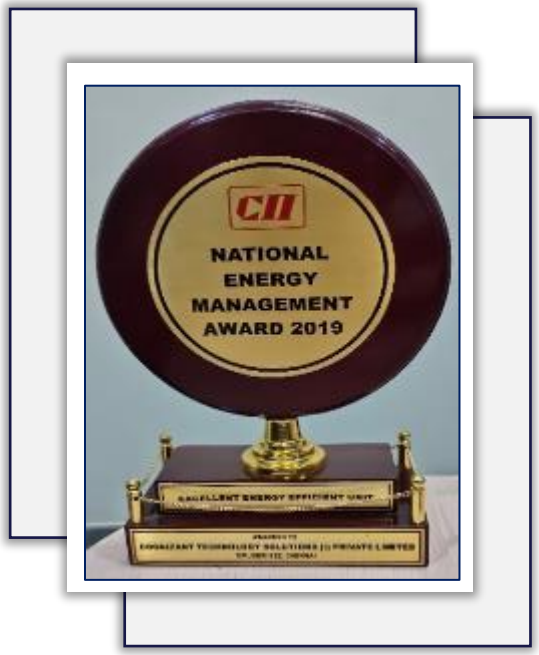
Saving Calculations (Projection):

- Energy Savings 1.98L kWh / Annum
- Cost Savings – INR 17.62 Lacs
- Investment Cost – INR 65 Lacs
- ROI – 3.7 Years

cognizant

Energy & Innovation Awards

CII Award –
Energy Efficient Unit 2019



CII Award –
Energy Efficient Unit 2020

CII Award –
Energy Efficient Unit 2021

CII Award –
Water Management Company of the Year-2021

Certifications – ISO 45001:2018 & IGBC - Gold

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Cognizant Technology Solutions India Private Limited

Techno Complex, 5/535 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

Place and date:
Barendrecht, 12 October 2020

MGMT. SYS.
RvA C 014

For the issuing office:
DNV GL - Business Assurance
Zwolseweg 1, 2994 LB Barendrecht,
Netherlands

Eric Kuck
Management Representative

CII
Confederation of Indian Industry

Indian Green Building Council

Indian Green Building Council (IGBC)

hereby certifies that

Cognizant SRI campus – Phase I,

Chennai

has successfully achieved the Green Building Standards required for the following level of certification under the Leadership in Energy and Environment Design (LEED) for India Green Building Rating System

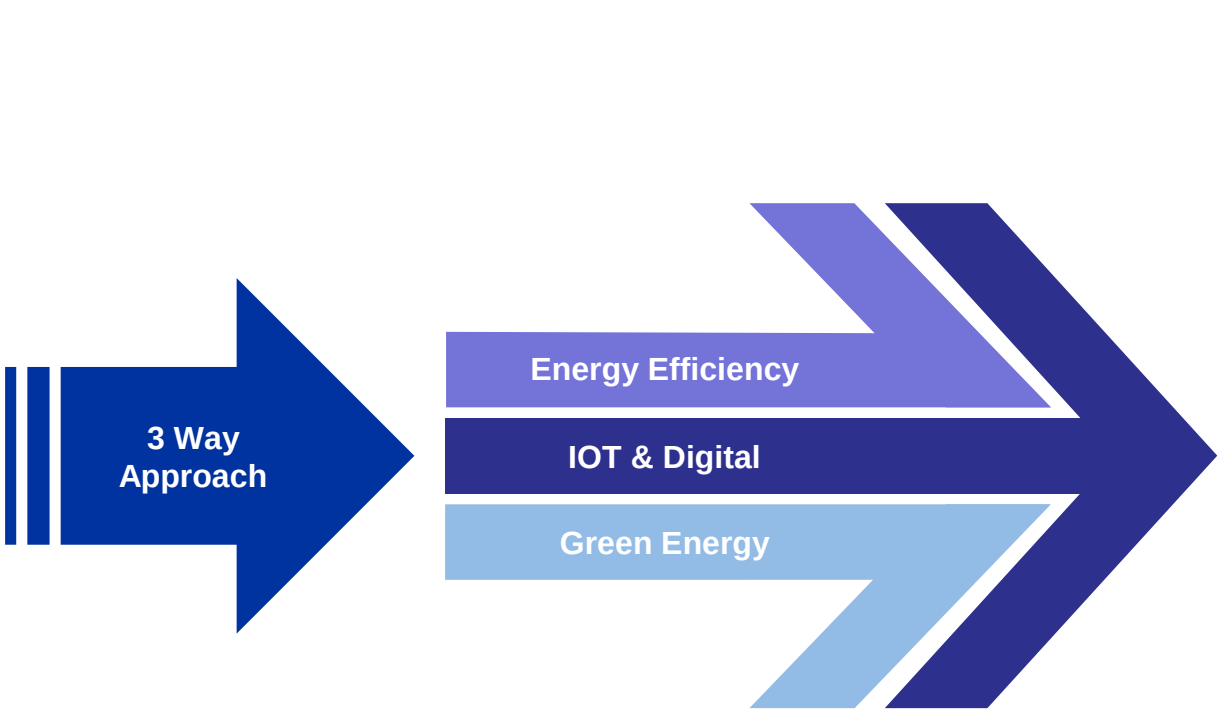
LEED India for New Construction Gold
January 2013

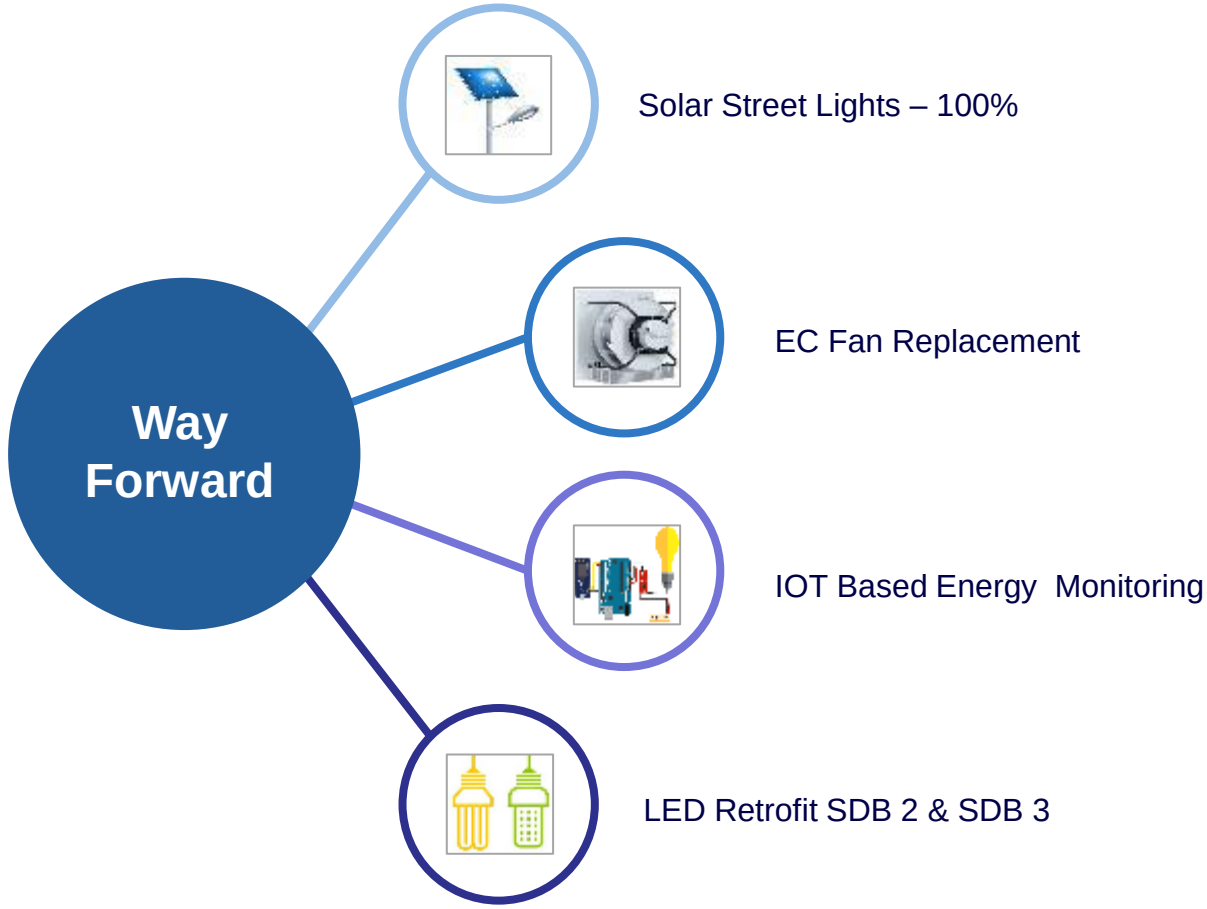
C N Raghavendran
Chairman, LEED India

Dr Prem C Jain
Chairman, IGBC

S Raghupathy
Executive Director, CII-Godrej GBC

Way Forward for Next 3 Years & Vision on EE





Thank you