Cognizant

22nd National Award for Excellence in Energy Management 2021

MBP F2 & F3 - Bengaluru

August 2021

Agenda

1. Cognizant Overview
2. Facility Overview
3. Energy consumption overview
4. Specific energy consumption in last 3 years (2018-2020)
5. Information on Internal & National Benchmarks
6. Energy saving projects implemented in last three years
7. Innovative projects implemented
8. Utilization of renewable energy sources
9. Waste management
10. GHG emission and indoor air quality
11. Teamwork, employee involvement and monitoring
12. Standardization of Best Practices
13. Implementation of IGBC certification
14. Kaizen by plant team
15. Awards & Certifications

Cognizant Overview

Cognizant is a multinational corporation that provides IT services, including digital, technology, consulting, and operations services. It is headquartered in Teaneck, New Jersey, United States.

#185

On 2021 **Fortune 500**

Fortune

#533

On **Forbes Global 2000** for 2020

Forbes

#483

On **Forbes The Best Employers for Diversity** 2019

Forbes

12 Years

One of **Fortune's Most Admired Companies**

Fortune

#63

On Forbes Top 100 Digital Companies for 2019

Forbes

#19

On **Forbes America's Best Employers** 2020

Forbes

Cognizant is included in the NASDAQ-100 and the S&P 500 indices. Cognizant had a period of fast growth during the 2000s

159+ delivery and operations centers globally and spread across 39 countries

The company has more than 291700 employees globally, of which, 100000 are women

Total global footprint of 24 million+ built up area, of which 13.6 million SFT is owned Facilities

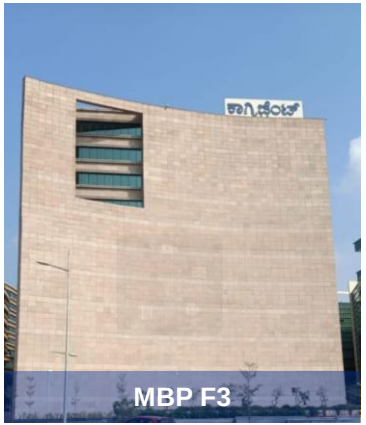
Majority of these operations are in hot and humid climates and operates on 24X7 basis

More than 80% of the space is air-conditioned

Facility Overview

Description	Specification
Facility details	• MBP F2 -2009 • MBP F3 -2013 • Leased facilities • Built up area -1.5 million Sq.ft
Blocks	• Two blocks - MBP F2 & MBP F3 • Exclusive Medical center with Ambulance services
Seating/Headcount	• Seating Capacity: 16600 • Headcount: BAU-14914 | Non R2O -3936
Contracted Demand	• Contracted Demand – 5000 KVA • Incomer Supply – 11KV / 415 V
Transformer capacity	• Transformer capacity – 16000 KVA • Diesel Generator capacity –18000 KVA
Chiller Capacity	• Chiller Capacity – 3760 TR 2X 350 TR Water cooled 3X 390 TR Air cooled
UPS Capacity	• UPS Capacity – 2100 KVA 900 KVA Modular 1,200 KVA Conventional

MBP F2


MBP F3

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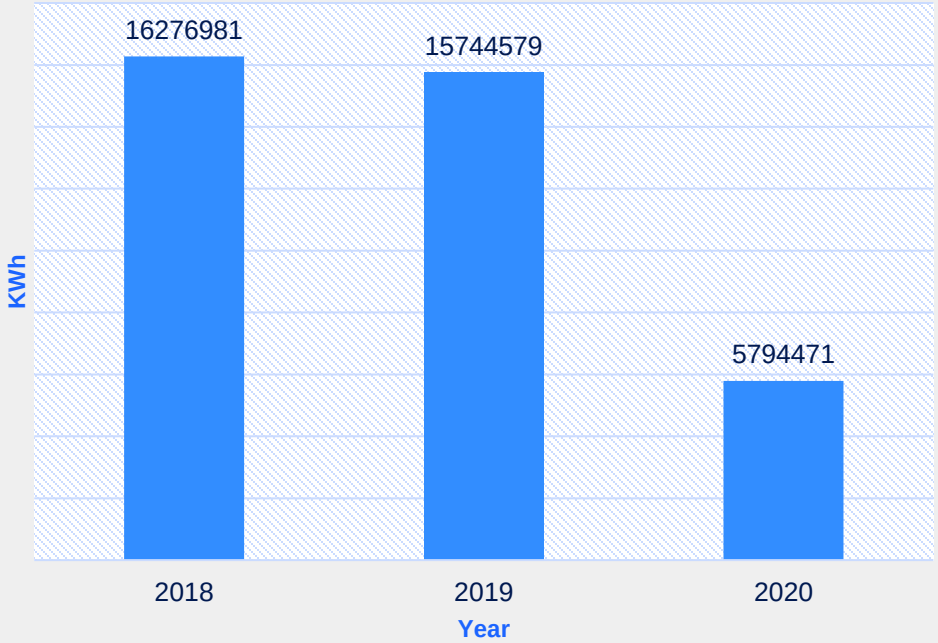
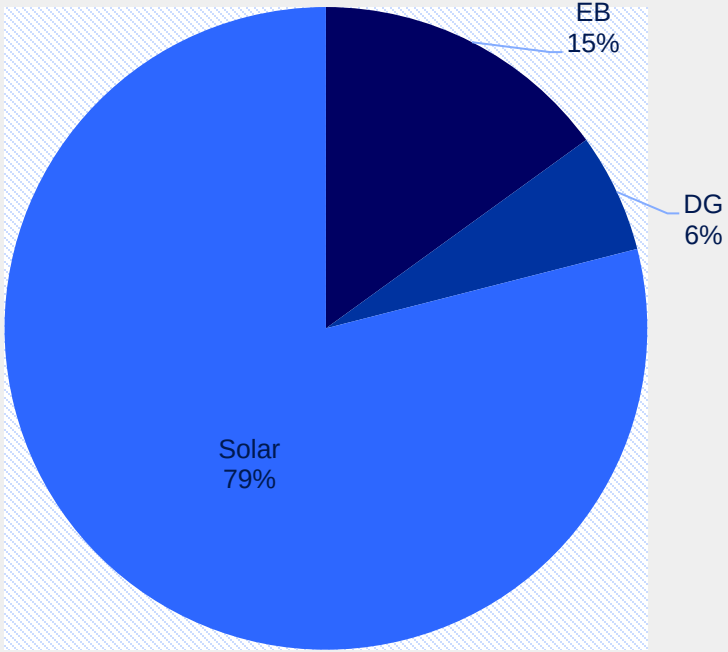
Energy Consumption Overview -2018 to 2020

Power Consumption kWh/Year



Source wise consumption -2020



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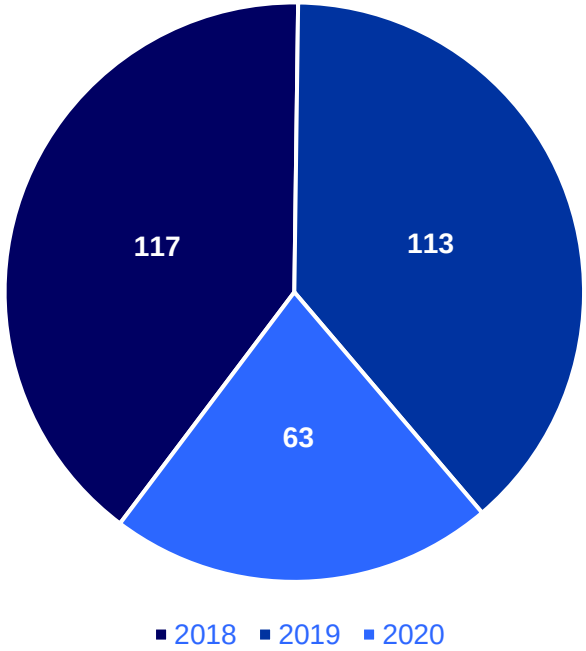
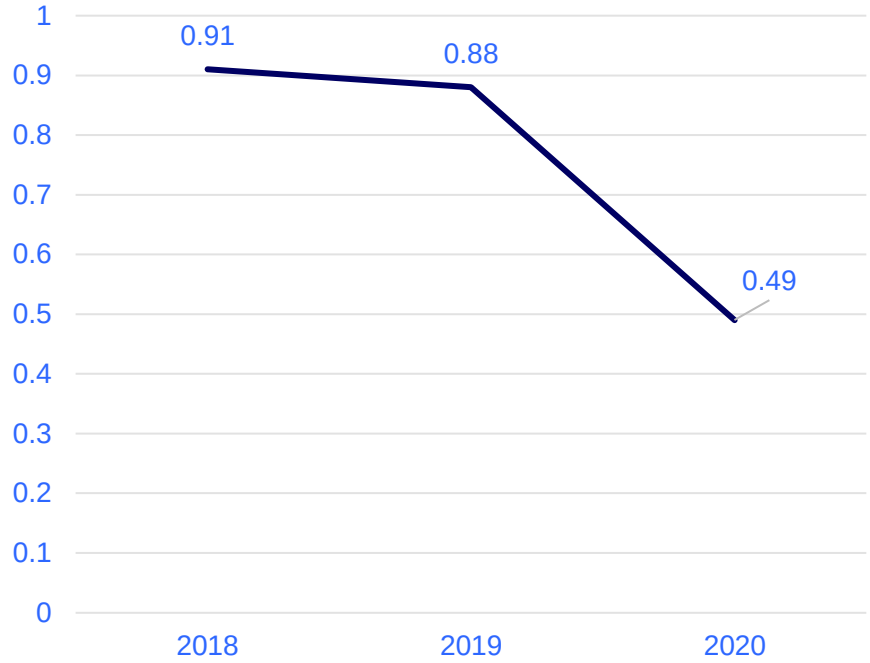
Specific Energy Consumption in Last Three Years

SEC comparision-2018 to 2020 kWh/Annum/Sq.M



SEC Trend 2018-2020 (kWh/Month/Sq.ft)



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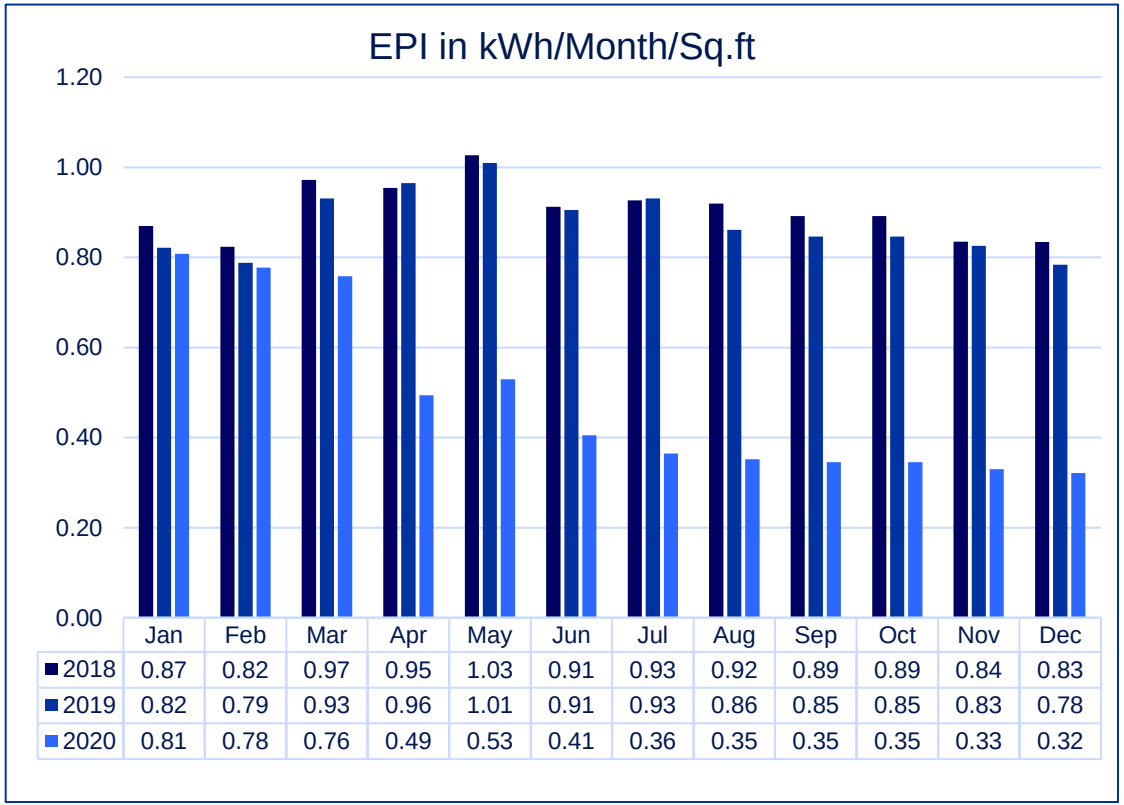
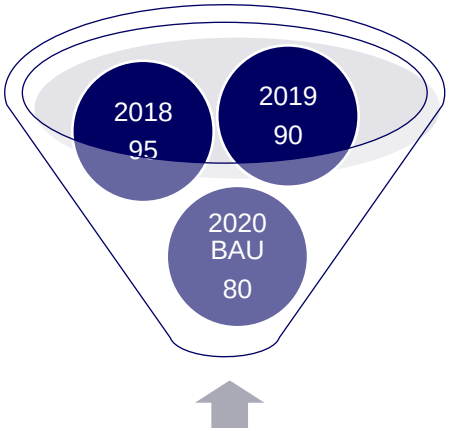
Month-wise Specific Energy (EPI) in kWh/Sq.ft and Per Capita



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0.87	0.82	0.97	0.95	1.03	0.91	0.93	0.92	0.89	0.89	0.84	0.83
2019	0.82	0.79	0.93	0.96	1.01	0.91	0.93	0.86	0.85	0.85	0.83	0.78
2020	0.81	0.78	0.76	0.49	0.53	0.41	0.36	0.35	0.35	0.35	0.33	0.32



Per capita
kWh/Month/Associate

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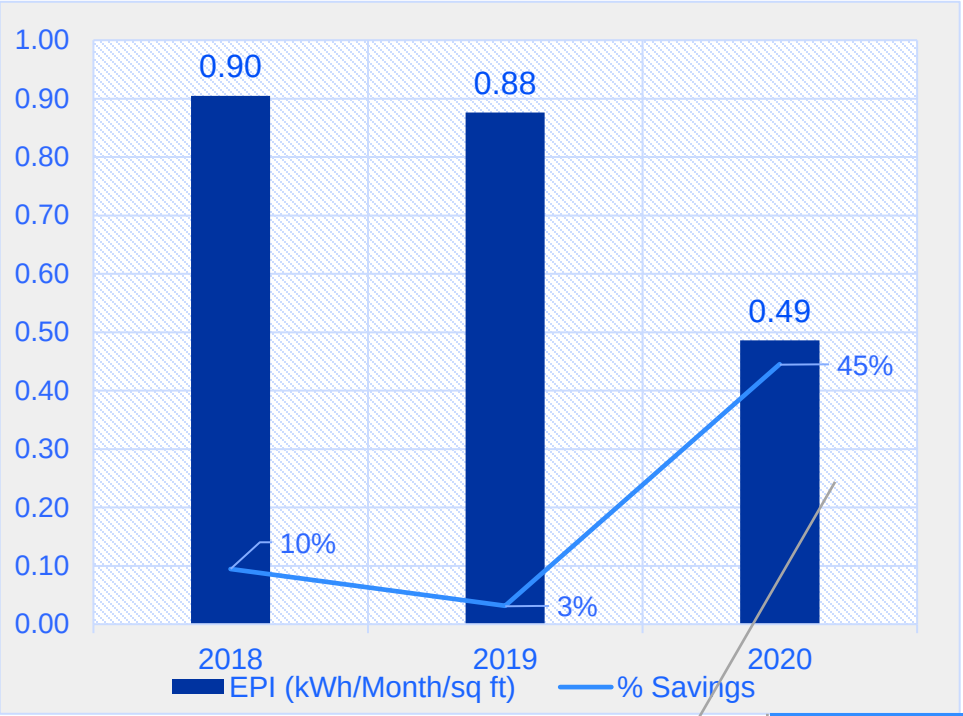
Major Initiatives - Causes for Reduction in Specific Energy



2018	• UPS Retrofit from Conventional to Modular • Integration of passage lights with BMS Application • Rectification of VAV mechanical issue
2019	• UPS room AHU supply air damper operation control • Provision of pull chord switch & lighting sensor • Configured auto open/close of 2-way AHU Valve.
2020	• Desktop power switching OFF activities • Workstation light retrofit activities (T5 to LED at F3) • Dedicated AC unit for dormitory

Savings in 2020 - More reduction due to minimal occupancy

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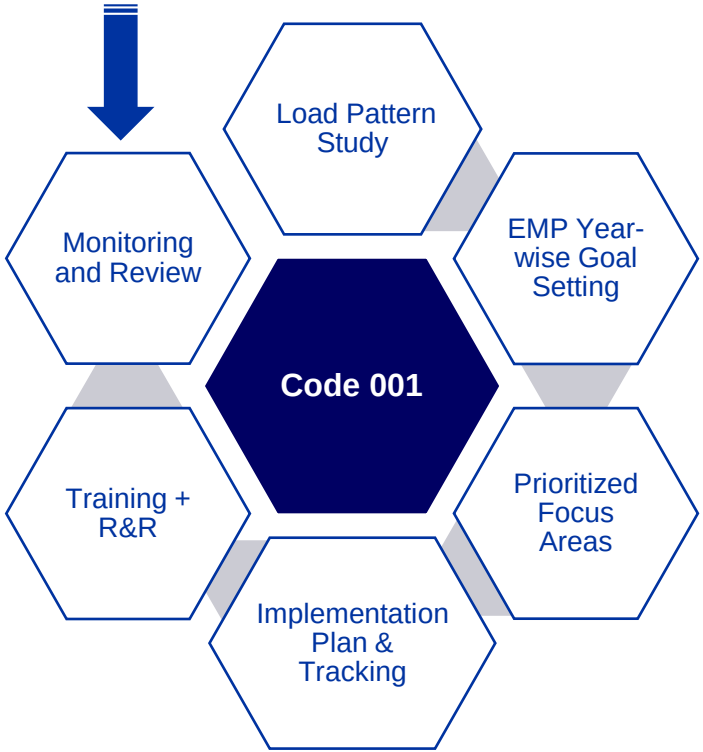
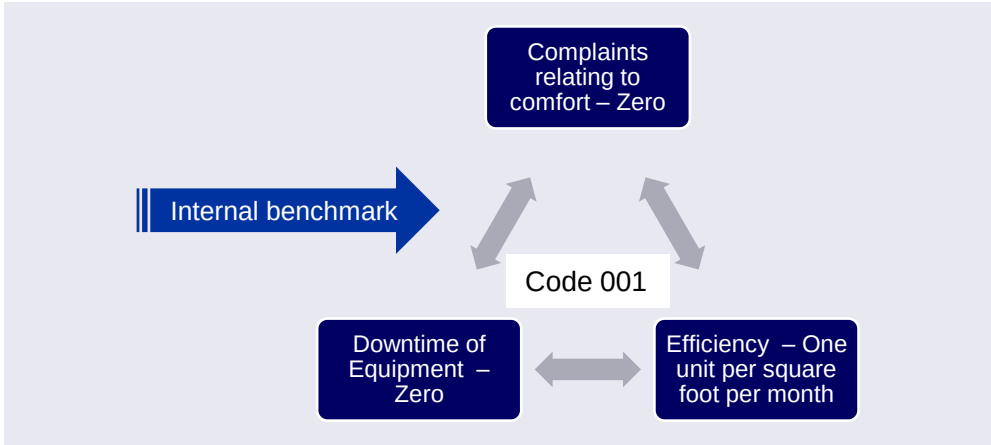
Comparison of SEC with Internal & National Benchmarks

Approach Methodology



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**



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List of Energy Conservation Projects Planned – 2021

1.UPS consolidation works (Conventional to Modular UPS)

2.Workstation light fixture retrofit activities (T5 to LED) @ F2

3.Power savings HVAC projects - Dedicated AC for dormitories, Mom's lounge
4. Lighting sensor for switch rooms and restricted ODC

5. Dedicated AC for UPS room to avoid running chiller nonbusiness hours, weekend and holidays

6. VRV unit integrations & 2nd phase AHU supply provisions for switch room

7. Split unit retrofit activities

Annual Energy Savings (kWh)

1633220

Annual Cost Savings (INR)

19183848

Road Map - 2021			
Total planned Projects 07	Total energy savings 16 Lacs kWh	Total investments 272 Lacs	ROI 1.5 Years

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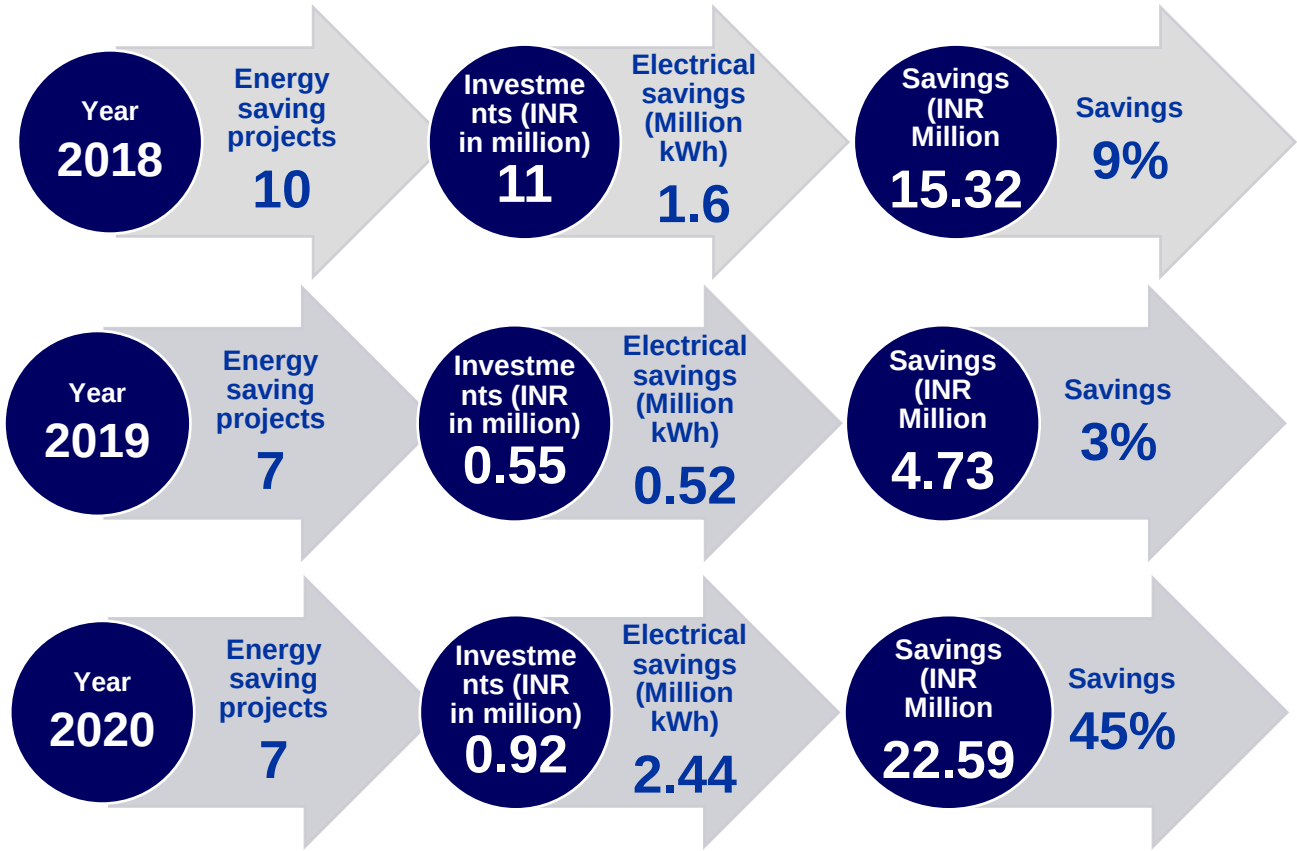
Energy Saving Projects Implemented in Last Three Years



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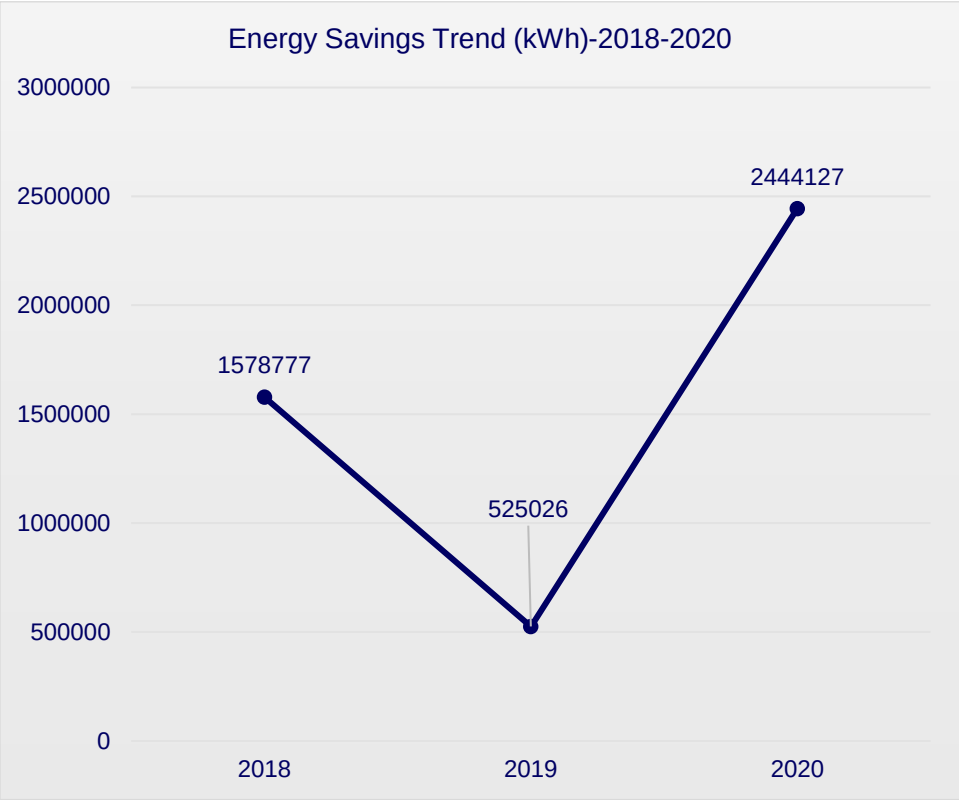
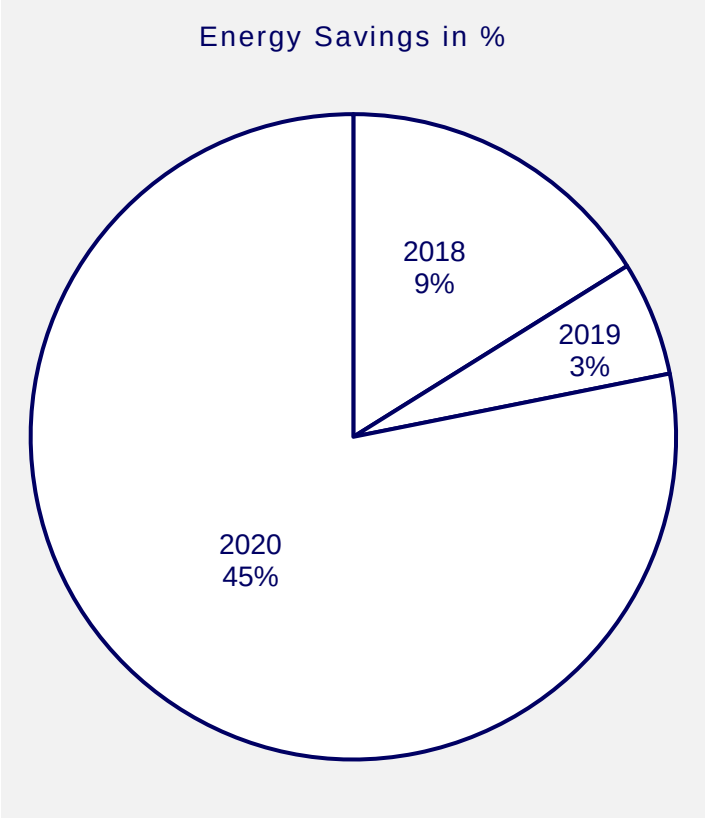
Energy Savings Trend (2018 to 2020)





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Energy Consumption (Category-wise) 2018 – 2020

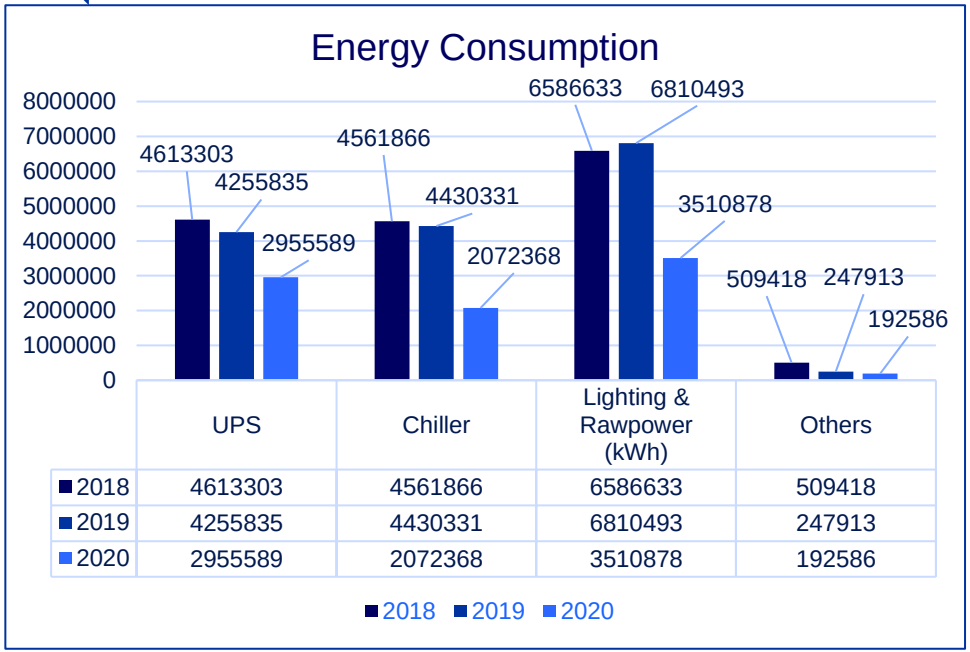
UPS → 2018 - 10%, 2019 - 8%

Chiller → 2018 - 12%, 2019 - 3%

Lighting & Raw Power → 2018 - 9%, 2019 - (-3%)

Additional cafe counter and Ducted AC unit running hours increased as project time increased

Consumption Reduction (Category-wise) YOY



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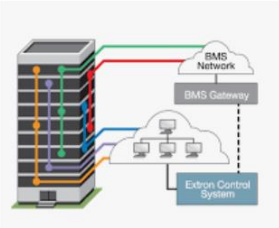
Innovative Project

Auto Operation of Split Air Conditioner via BMS



Challenges/ Identification

The Air Conditioning units feeding to the workstations are manually operated.

Unable to schedule the AC as per the requirements.

Brainstorming

Planned to integrate all 37 units to BMS along with blue star and Honeywell supports.

Success

- Executed the plan
- Automated the Air-conditioning operations/Monitoring

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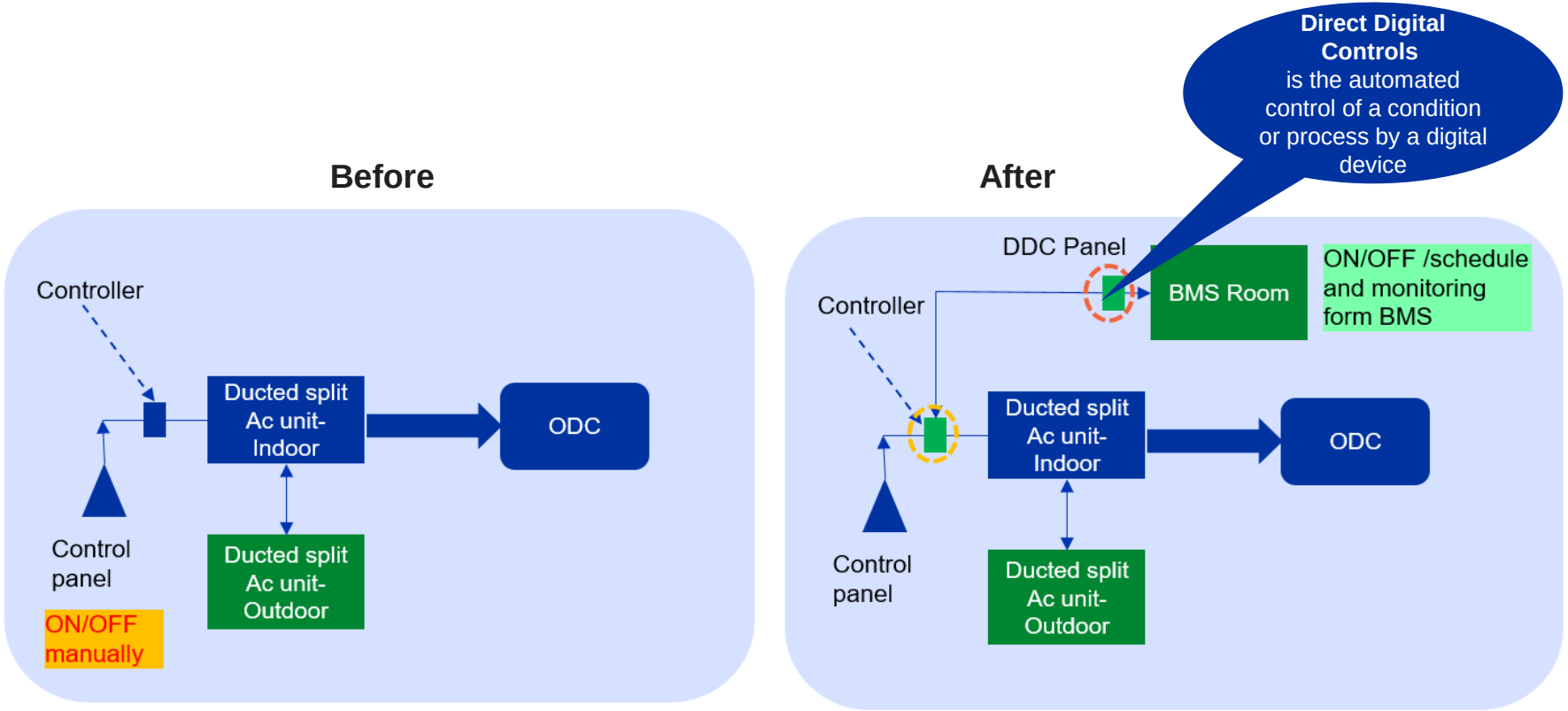
Auto Operation of Split Air Conditioner via BMS



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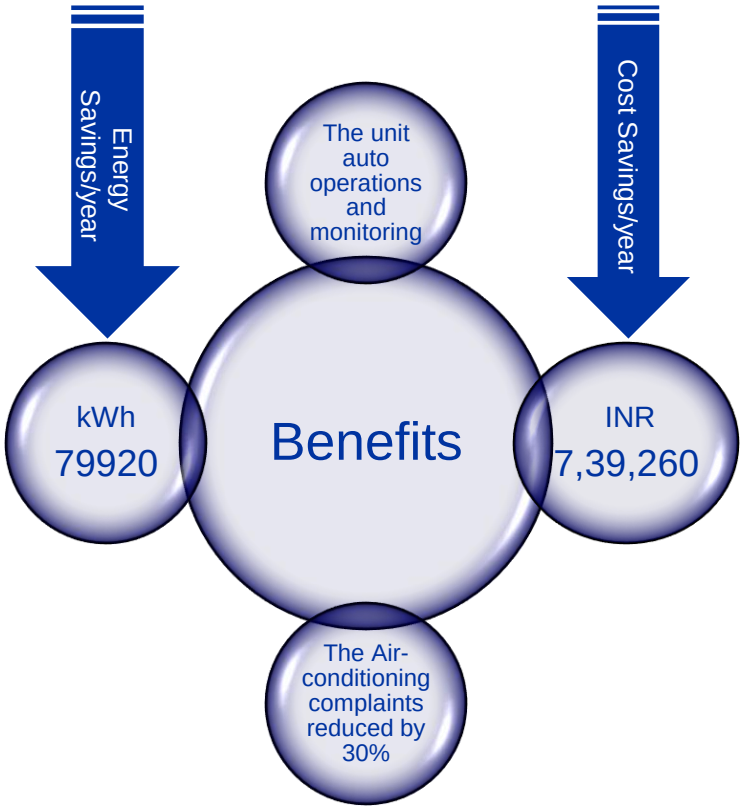
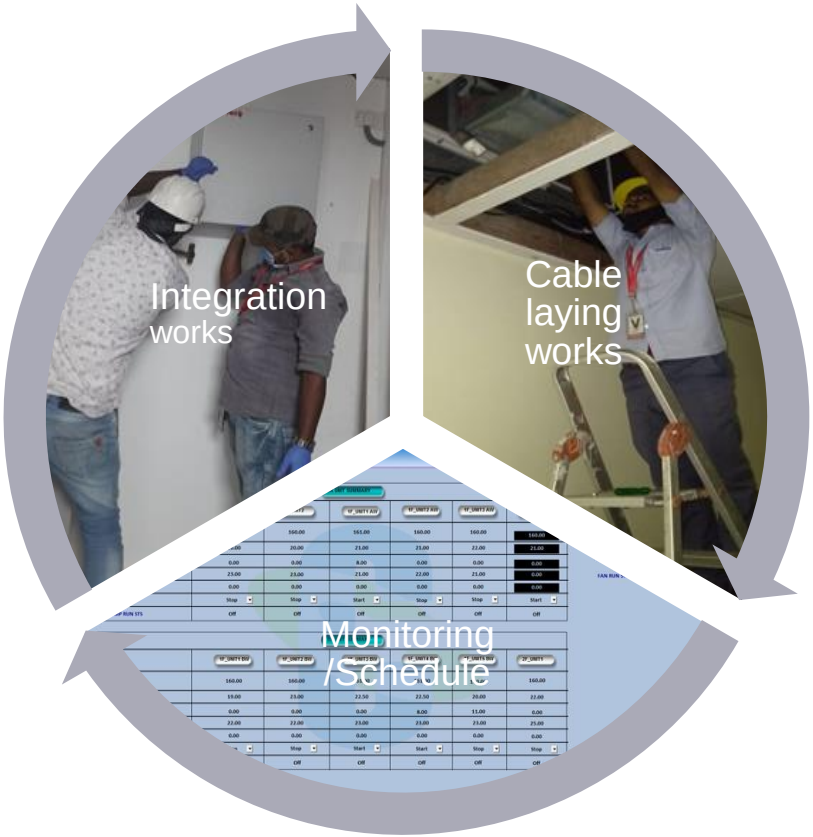
Auto Operation of Split Air Conditioner via BMS - Savings





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Utilization of Renewable Energy Sources

Technology **Electrical** → Type of energy **Solar** → Onsite/Offsite **Offsite** → Installed capacity **100 MW**

Utilization of Renewable Energy Sources				
	EB	**DG**	**Solar**	**Solar Energy**
2018	10993264	5283717	0	Utilization vs EB - 0%
2019	3203214	1833932	10707433	Utilization vs EB - 86%
2020	870807	347258	4576406	Utilization vs EB - 85%

Waste Management

E- waste	Hazardous Waste	Non-Hazardous Waste
• CFL • Tube • Lamps • NSS Waste	• Used Oil • Waste Oil • Battery waste • Filters • Oil socked cotton	• Paper • Food • Plastic • Metal

Key initiatives taken for enhancing waste utilization:

1.Initiatives for minimizing e-waste

- Conversion to LED
- NSS - Recycling & reuse

2. Food waste is collected for creating compost in our facility by base builder using OWC

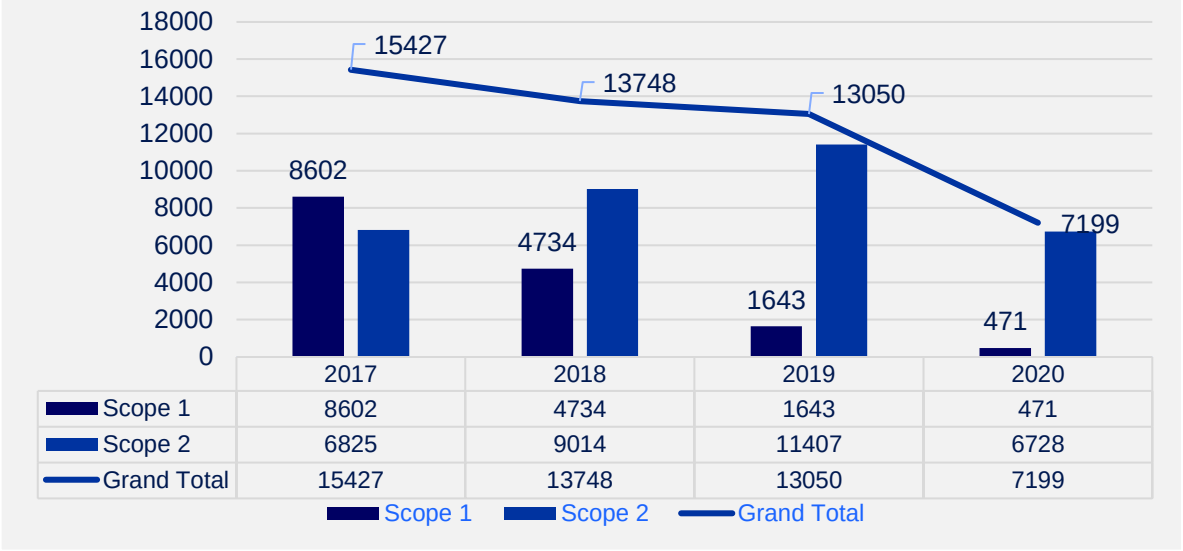
3. All wastes were supplied through authorized vendors for recycling

4. Digitalized technology for all operations is implemented to reduce papers, files, etc.

- Food coupons/billing replaced by Hunger box applications
- Aborted using paper cups and plastic bottles in the facility by initiating BYOM Concept
- All disposable cutleries (plastic) are replaced with wooden cutleries (Bio-degradable)
- Compliance tools review mechanism by Delite, EY, DSR/Resilio, e-fit, Avanthi portal is implemented

GHG Inventorization & Indoor Air Quality

GHG Inventorization – 2018 to 2020



GHG reduction target & action plan

1. Implementation of Retrofit projects
2. Increased RE Utilization
3. Reduced EB power interruption
4. SBT-24% of GHG emission reduction in 2024 from the base year of 2019

Test parameters	Units	Result	Permissible limit	Remarks
Carbon Dioxide (Co2)	ppm	700	< 1000	1. Testing through NABL Laboratory 2. Frequency of sampling is quarterly for workstations
Total Fungal count	Cfu/m3	0	500	
Total Bacterial count	Cfu/m3	1	500	

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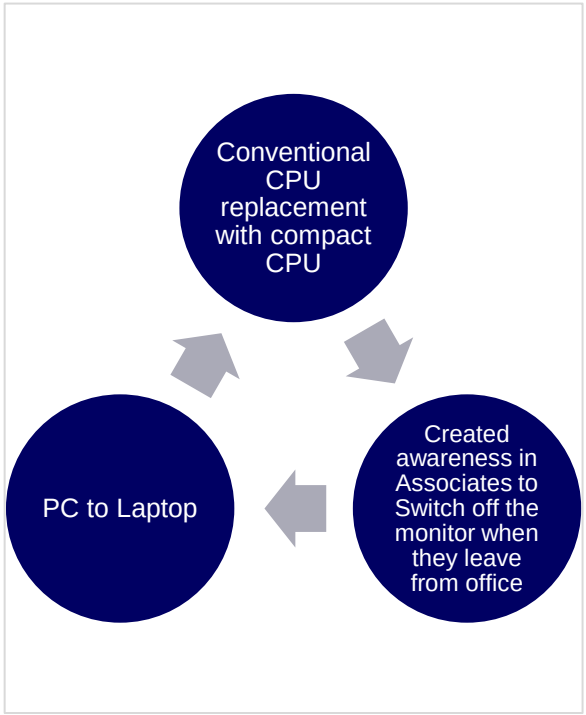
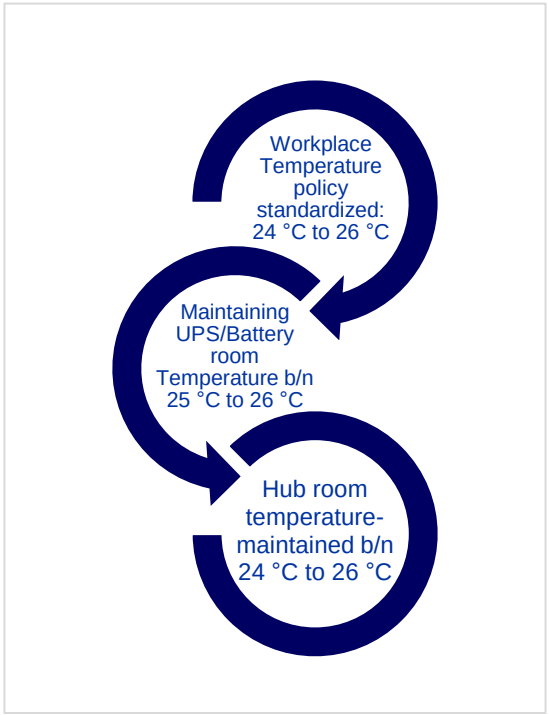
Standardization of Best Practices

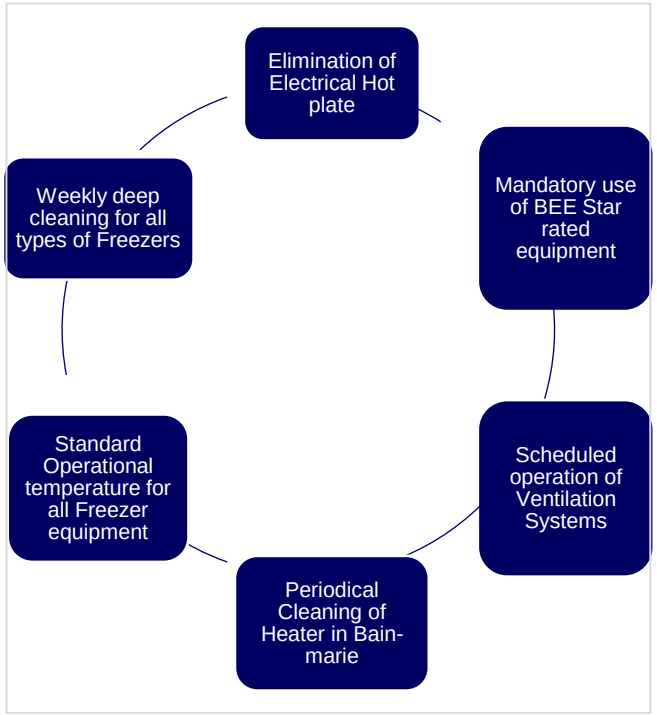
Personnel Computer



Air-conditioning



Kitchen/Pantry



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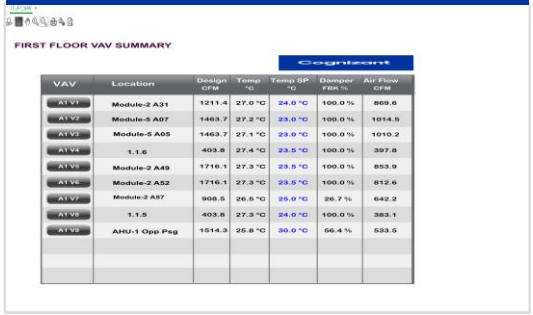
Teamwork, Employee Involvement & Monitoring 1(3)

AHU Monitoring in BMS

VAV Monitoring in BMS



FIRST FLOOR VAV SUMMARY

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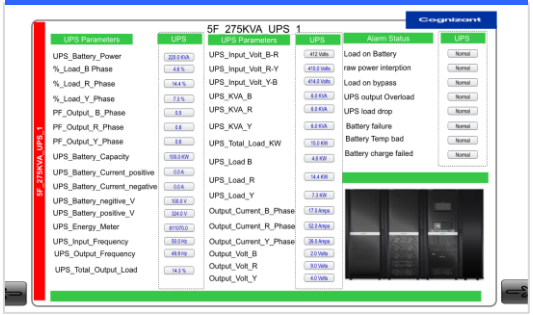
VAV	Location	Design CFM	Temp °C	Temp SP °C	Damper FBK %	Air Flow CFM
AT V1	Module-2 A31	1211.4	27.0 °C	24.0 °C	100.0 %	869.6
AT V2	Module-5 A07	1463.7	27.2 °C	23.0 °C	100.0 %	1014.5
AT V3	Module-5 A05	1463.7	27.1 °C	23.0 °C	100.0 %	1010.2
AT V4	1.1.6	403.8	27.4 °C	23.5 °C	100.0 %	397.8
AT V5	Module-2 A49	1716.1	27.3 °C	23.5 °C	100.0 %	853.9
AT V6	Module-2 A52	1716.1	27.3 °C	23.5 °C	100.0 %	812.6
AT V7	Module-2 A57	908.5	26.5 °C	25.0 °C	26.7 %	642.2
AT V8	1.1.5	403.8	27.3 °C	24.0 °C	100.0 %	383.1
AT V9	AHU-1 Opp Psg	1514.3	25.8 °C	30.0 °C	56.4 %	533.5

UPS Monitoring in BMS

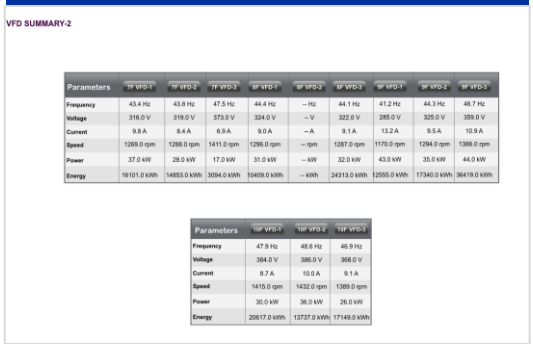


Energy Meter Monitoring in BMS

SECOND FLOOR ENERGY METER SUMMARY

PARAMETERS	LTG PNL S1	LTG PNL S2	LTG PNL 1 S1	LTG PNL 1 S2	HVAC
Frequency	50.1 Hz	50.1 Hz	50.1 Hz	50.1 Hz	50.1 Hz
Current R	0.0 A	0.0 A	5.2 A	10.6 A	6.9 A
Current Y	0.0 A	0.0 A	10.5 A	12.5 A	4.0 A
Current B	0.0 A	0.0 A	6.8 A	12.7 A	6.6 A
Iavg	0.0 A	0.0 A	7.5 A	11.9 A	5.8 A
Voltage RY	410.8 V	411.0 V	410.9 V	410.1 V	401.5 V
Voltage YB	414.9 V	414.9 V	415.0 V	414.0 V	401.6 V
Voltage BR	414.5 V	414.7 V	414.5 V	413.6 V	403.3 V
Voltage R	235.0 V	235.1 V	235.0 V	234.5 V	232.3 V
Voltage Y	239.1 V	239.5 V	239.2 V	238.9 V	232.2 V
Voltage B	242.0 V	241.7 V	242.0 V	241.1 V	232.0 V
Avg Voltage	413.4 V	413.6 V	413.4 V	412.5 V	402.1 V
Total PF	0.0 pf	0.0 pf	0.9 pf	-1.0 pf	-0.7 pf
R-Phase Power	0.0 KW	0.0 KW	1.0 KW	2.0 KW	1.2 KW
Y-Phase Power	0.0 KW	0.0 KW	2.4 KW	2.6 KW	0.7 KW
B-Phase Power	0.0 KW	0.0 KW	1.4 KW	2.7 KW	1.1 KW
Total KW	0.0 KW	0.0 KW	4.8 KW	7.3 KW	3.0 KW
Energy	71.0 KWh	96.4 KWh	150.2 KWh	160.5 KWh	197.8 KWh

VFD Monitoring in BMS

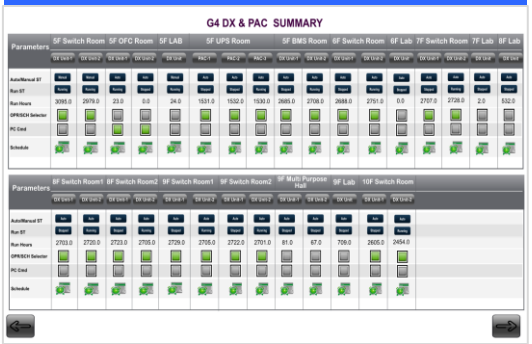


VFD SUMMARY-2

Parameters	7F VFD-1	7F VFD-2	7F VFD-3	8F VFD-1	8F VFD-2	8F VFD-3	9F VFD-1	9F VFD-2	9F VFD-3
Frequency	43.4 Hz	43.8 Hz	47.5 Hz	44.4 Hz	-- Hz	44.1 Hz	41.2 Hz	44.3 Hz	46.7 Hz
Voltage	316.0 V	319.0 V	373.0 V	324.0 V	-- V	322.0 V	285.0 V	325.0 V	359.0 V
Current	9.8 A	8.4 A	6.9 A	9.0 A	-- A	9.1 A	13.2 A	9.5 A	10.9 A
Speed	1269.0 rpm	1286.0 rpm	1411.0 rpm	1296.0 rpm	-- rpm	1287.0 rpm	1170.0 rpm	1294.0 rpm	1366.0 rpm
Power	37.0 kW	28.0 kW	17.0 kW	31.0 kW	-- kW	32.0 kW	43.0 kW	35.0 kW	44.0 kW
Energy	16101.0 kWh	14853.0 kWh	3094.0 kWh	10409.0 kWh	-- kWh	24313.0 kWh	12555.0 kWh	17340.0 kWh	36419.0 kWh

Parameters	10F VFD-1	10F VFD-2	10F VFD-3
Frequency	47.9 Hz	48.6 Hz	46.9 Hz
Voltage	384.0 V	386.0 V	368.0 V
Current	8.7 A	10.0 A	9.1 A
Speed	1415.0 rpm	1432.0 rpm	1389.0 rpm
Power	30.0 kW	36.0 kW	26.0 kW
Energy	20617.0 kWh	13737.0 kWh	17149.0 kWh

DX Unit's Monitoring in BMS



G4 DX & PAC SUMMARY

Parameters	5F Switch Room	5F OFC Room	5F LAB	5F UPS Room			5F BMS Room	6F Switch Room	6F Lab	7F Switch Room	7F Lab	8F Lab
	DX Unit-1	DX Unit-2	DX Unit-3	PAC-1	PAC-2	PAC-3	DX Unit-1	DX Unit-1	DX Unit-1	DX Unit-1	DX Unit-1	DX Unit-1
Auto/Manual ST	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto	Auto
Run ST	Running	Running	Running	Stopped	Stopped	Stopped	Running	Running	Running	Running	Running	Running
Run Hours	3095.0	2979.0	23.0	0.0	24.0	1531.0	1532.0	1530.0	2685.0	2708.0	2688.0	2701.0
OPERSCH Selector												
PC Cmd												
Schedule												

Parameters	8F Switch Room1	8F Switch Room2	9F Switch Room1	9F Switch Room2	9F Multi Purpose Hall	9F Lab	10F Switch Room
	DX Unit-1	DX Unit-2	DX Unit-1	DX Unit-1	DX Unit-1	DX Unit-1	DX Unit-1
Auto/Manual ST	Auto	Auto	Auto	Auto	Auto	Auto	Auto
Run ST	Stopped	Stopped	Running	Stopped	Running	Running	Running
Run Hours	2703.0	2720.0	2723.0	2705.0	2729.0	2705.0	2722.0
OPERSCH Selector							
PC Cmd							
Schedule							

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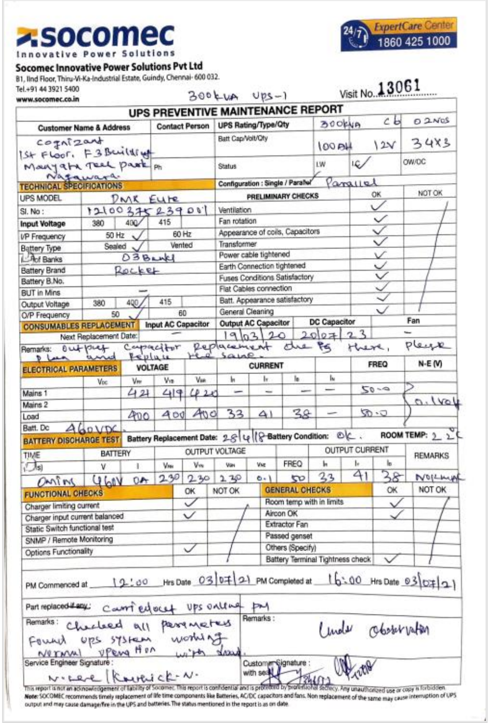
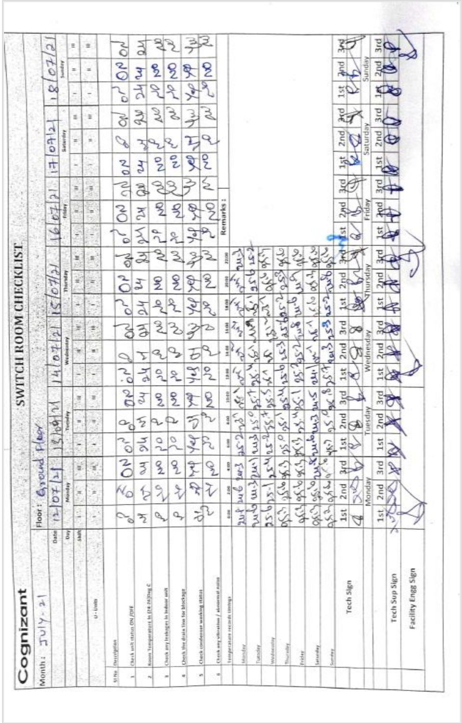
Teamwork, Employee Involvement & Monitoring 2(3)

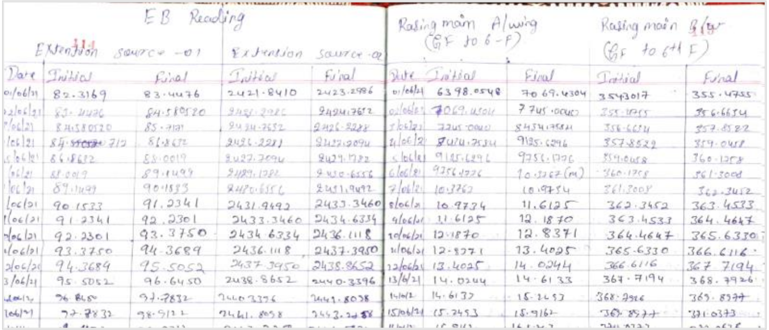
Periodic Equipment Service



Daily monitoring



Power Consumption Daily Track



RE: MBP F3 power consumption details for the month of Aug-2021

MBP-F3 EM Dash board Aug-2021...0.xlsx 103 KB

MBP-F3 Feeder reading Aug- 2021.xlsx 166 KB

MBP-F3 STP & Raw water details Aug-2021.xlsx 15 KB

MBP-F3 Water cons Aug-2021.xlsx 27 KB

Power consumption

Feeder	Last Week Same day Consumption	Today Consumption	Savings	Reason
Extension Source-01&02 (UPS)	2655	2702	46	
Chiller panel source-01 &02 (Chiller)	642	351	-291	Units decreased due to decreased in chiller operation by 1hr
Raising Main panel A&B -wing (GF to 6F)	1819	1849	30	

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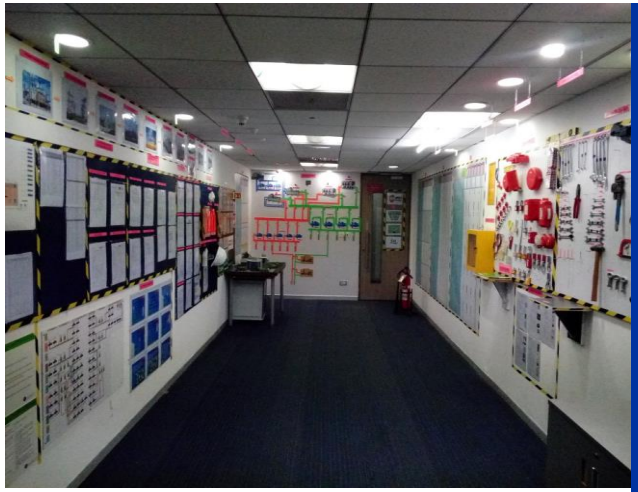
Teamwork, Employee Involvement & Monitoring 3(3)



Demo room for Training

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IGBC Certification

CII
Confederation of Indian Industry

Indian Green Building Council

Indian Green Building Council (IGBC)

hereby certifies that

Block F3 (Palm) - Manyata Embassy Business Park

Bangalore

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

IGBC's LEED India for Core & Shell Gold

September 2015

C N Raghavendran	Dr Prem C Jain	S Raghupathy
Chairman, LEED India	Chairman, IGBC	Executive Director, CII-Godrej GBC

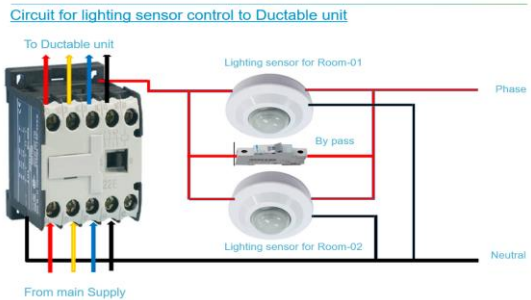
Kaizen by Plant Team

Remote Controlled equipment for HVAC ducts

Motion Sensors for ODC and switch room lighting control

VAV Services by In-house team

Auto operation of AC unit via motion sensors



World Earth Hour Celebration

AHU duct leakage rectification by In-house team

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Awards

EHS Excellence Awards 2019 (Digitalization)

EHS Excellence Awards 2019 (4 Star)

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Major Achievements – MD surrendered 6000 KVA to 5000 KVA

IDEA DISCRIPTION	• Reduction of Maximum Demand -6000 KVA to 5000 KVA
PROBLEM STATEMENT	• Average Billing for Maximum Demand is higher than the actual usages • Actual Billing cost for Maximum Demand is INR.15.3 Million per Annum
SOULTION IDENTIFIED	• Peak demand usages analyzed and recommendation given to the builder for MD reduction from 6000 KVA to 5000 KVA
PROCESS ADAPTED	• As per our recommendation, Builder Team took up the case with Bangalore Electricity Supply Company (BESCOM) and surrendered the excess demand of 1000 KVA
TRAILS & IMPROVISTAIONS	• Initially we have recommended to surrender the excess MD of 1500 KVA. However considering the connected load capacity and future requirements, Builder has accepted for 1000 KVA Demand.

LOGICS/ANALYSIS

1. Monthly billing demand and actual reached demand analyzed for 3 Years
2. Based on the analysis and brainstorming session with stakeholder, decision has been taken to surrender the Demand

COST BENIFTS / PROCESS IMPROVMENT

Overall MD surrendered – 1000 KVA

Actual Billing of MD (Min of 85%)	- 850 KVA
Monthly cost savings	- INR.212500
Annual cost savings	- INR.2.5 Million

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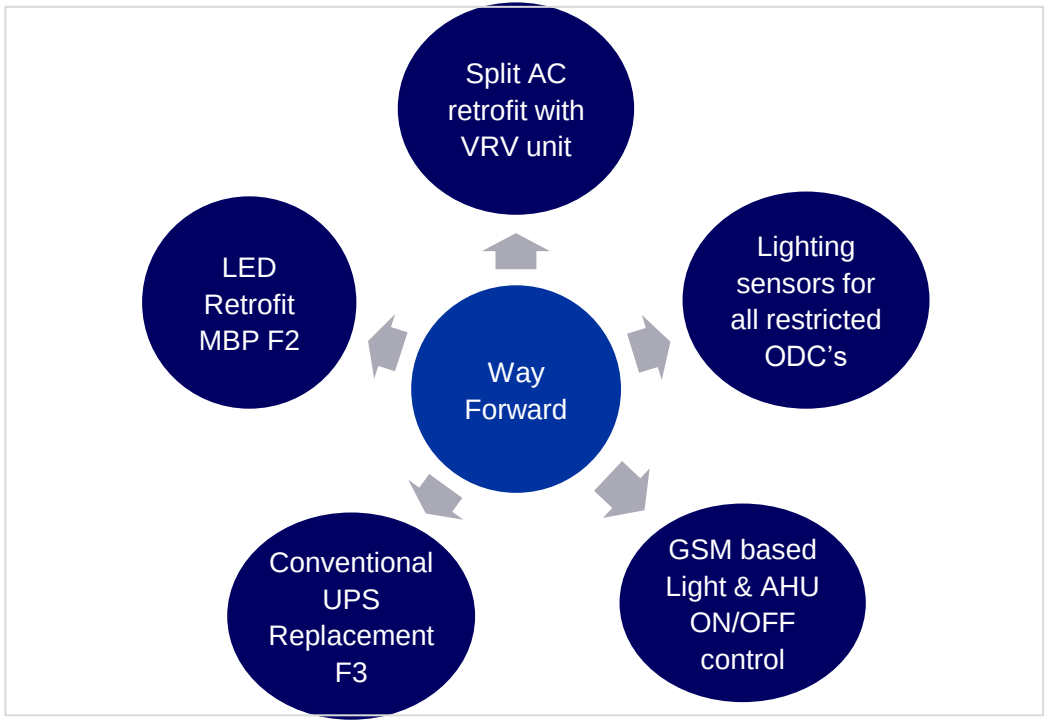
Way Forward for Next Three Years

3 Way Approach

- Energy Efficiency
- IOT & Digital
- IOT & Digital



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22nd National Award for Excellence in Energy Management 2021

MBP F2 & F3 - Bengaluru

August 2021