TATA CONSULTANCY SERVICES

CII National Award for Excellence in Energy Management 2021

Confederation of Indian Industry

Building on belief

TCS- Mihan Nagpur (IGBC Gold Rated Green Building)

Sector : Building

Team Members : Dr. Laxmikant Naik

Vishwanath Sule ,Sachin Gujar & Nilesh Vaidya

Environmental Sustainability, Health & Safety

Brief Introduction of Company : About TCS

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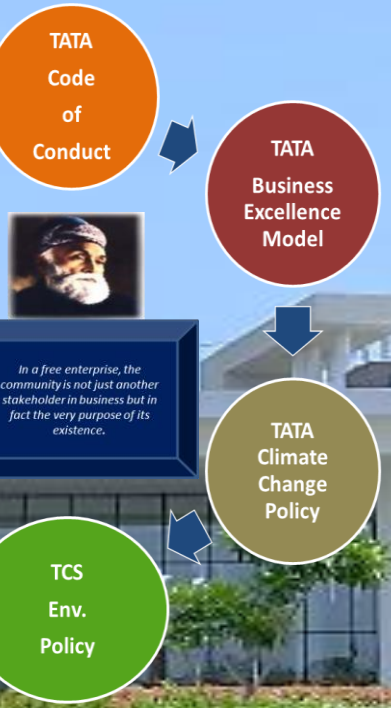
Board Level Committee
(including CEO & MD – Director Responsible for Corporate Sustainability)

Executive Vice-President & Global Head-HR
Head – Corporate Sustainability

Sustainability Council
Representatives from .....

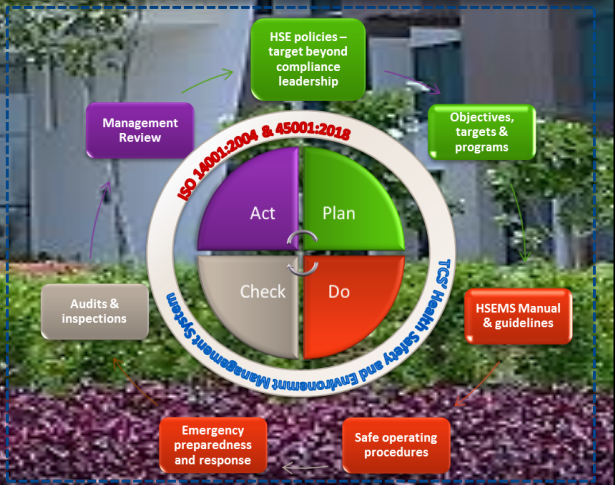
- Internal IT
- Infrastructure, Planning & Development
- Administration
- Environmental Sustainability , Health & Safety
- Human Resources
- Corporate Social Responsibility
- TCS Maitree
- Safety First /Fit4 Life /Purpose F4 Life
- Corporate Communications
- Investor Relations

40-HSE Coordinators overseeing Management Systems deployment across all TCS Locations



Sustainability Road Map

Energy	Water	Waste	Carbon	IT for Green	Biodiversity
Energy efficient building design	Water efficient design	Reduction at source	Avoid, Reduce, Replace and offset hierarchy	Products and services to help reduce the ecological impact of our customers	Conserve and enhance biodiversity within TCS campuses
Operational efficiency	Operational efficiency	Segregation	Energy efficiency		
Green IT	Rainwater harvesting	Recycling and reuse	Shift to renewable energy		
	Sewage recycling	Minimum waste to landfill			



Brief Introduction of Building : TCS –Mihan , Nagpur

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- **Location** : TCS MIHAN, Spécial Economic Zone, Village Dahegaon, Nagpur
- Gold Rated (IGBC) Green Building
- ISO 9001/ 20000/27001/14001/45001 certified
- **Total /Facility area** - 50. Acres/ 1.18 Lakh Sq. ft with 6400 Employees
- Total number of buildings, 11, including Library, Data Center, Gymnasium, Cafeteria, Consulting /Video Conferencing /Training rmunoom , Indoor /out door games etc
- Innovative Technologies: Energy efficient building envelop, Solar PV System, Solar water Heater, Energy efficient HVAC & Lighting System, Heat Recovery Unit ,Green IT technology, Zero discharge , Zero waste to landfilled site etc are some of the innovative technologies

A View of TCS- Mihan, Nagpur

Birds Eye –View of Facility

Energy Consumption Overview :Building Envelope

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Architectural Energy Efficient Features of the Building

- AAC block wall, R-15 roof insulation, double glazing Unit.
- Heat Transfer DGU Façade Glass
- Energy efficient Interior and exterior lighting system. Use of maximum daylight
- Energy efficient fan system and Energy Recovery System.
- Vertical Garden 500 Sq ft
- Well developed landscape with well grown **2636 Trees** & Lawn Area providing natural cooling & ventilation also reduces Heat island Effect

DGU Façade Glass

EE Lighting System

Use of Day Light

Natural Cooling & Ventilation

Energy Consumption Trend in Last Three years

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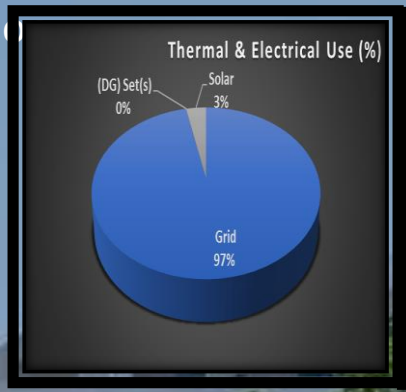
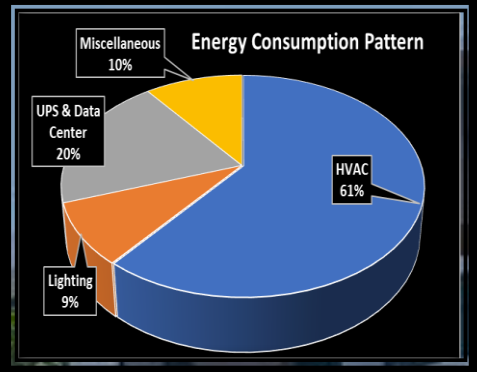
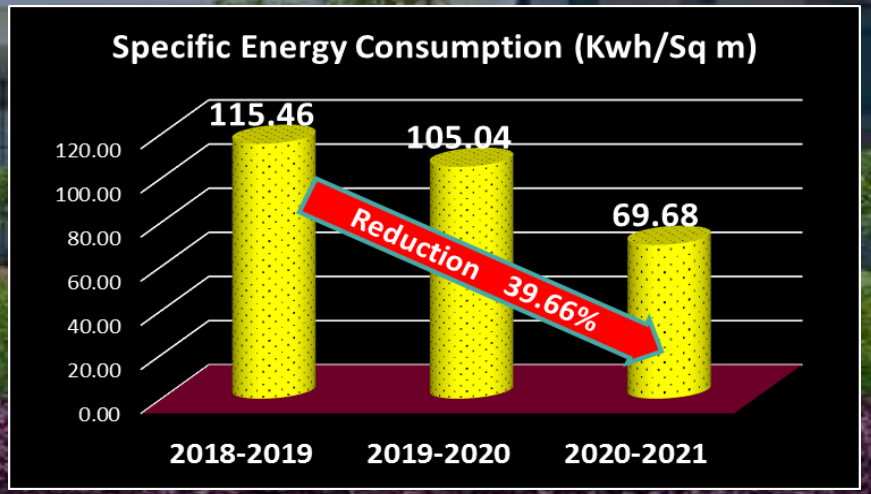
Effective implementation of various Energy Conservati program in the areas of

- Building Envelop: Explained previous slide
- Improve Energy Efficiency in operations
- Energy Efficient HVAC System
- Energy Efficient Lighting System
- Green IT
- Other Energy Conservation Programs
- During **2020-21** **33.36%** due to pandemic norms (SBWS)







Improve Energy efficiency in Operations

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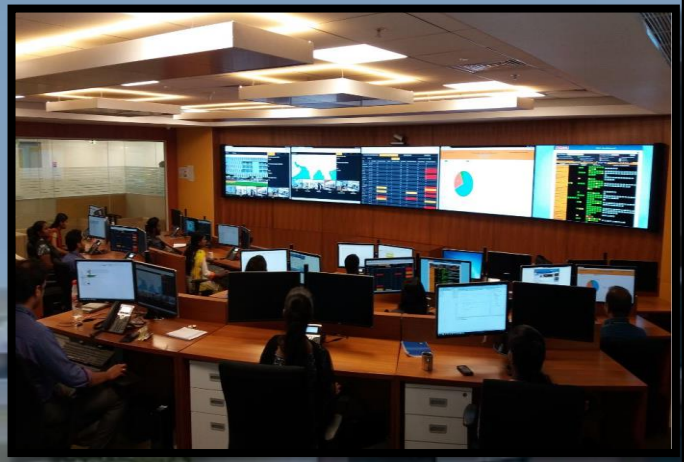
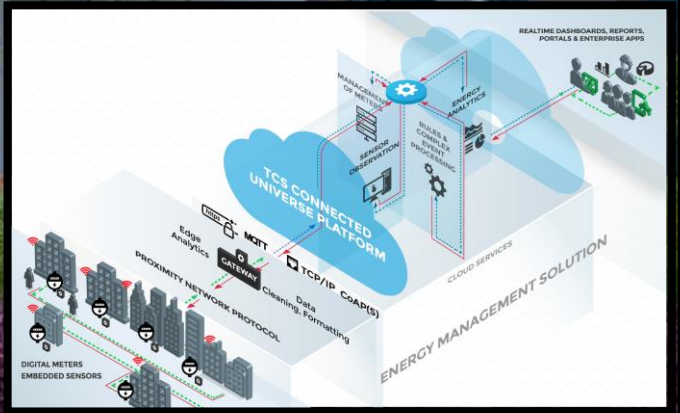
- TCS -Recourse Optimization Center (RoC)
  It is a command center operation , established to monitor and optimize the resources like energy, water, transport etc. for TCS facilities

- ROC uses leading edge & patent-rich cloud based IoT Platform, scalable to additional energy management aspects, and other business operational areas

- ROC is using TCS EMS solution hosted on Azure cloud. 18000+ sensors are installed at the ground level giving 2.5 million observations per day at a 15 minute interval covering 35 Mn. Sq. ft. for 135+ buildings.

- Provision of 520 Energy meters for Energy Monitoring by ROC





Reasons For Variation : Energy Efficient HVAC System

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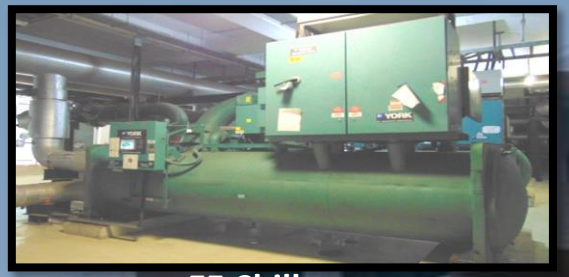
- **High Efficiency LT Chiller** to eliminate transmission and transformer losses & High COP Cooling Tower
- Demand Control Ventilation with fresh air intake regulated by **CO2 Sensors**
- **Heat Recovery Units** for is a secondary air conditioning units used to pre cool the intake fresh air
- **Variable Air Volume Units** installed in air distribution for conditioned areas for optimum part load operation
- Heat Recovery Wheel to pre cool fresh air
- Green Gas Used in HVAC Systems (R32, R410)



EE Chillers

Cooling Towers

Heat Recovery Unit

Reasons For Variation : Green IT Techniques

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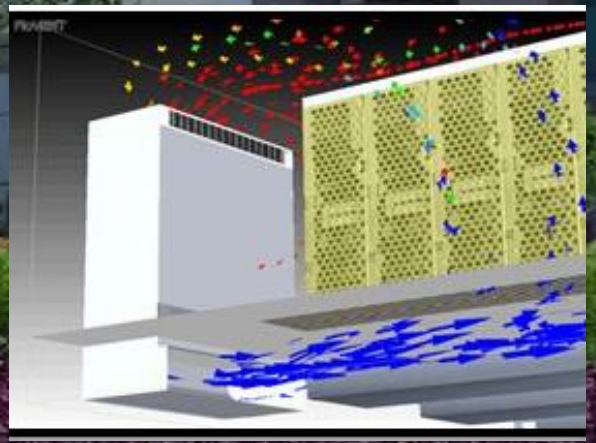
- Provision of Green Data Center as ;**Server Virtualization**
- Aligning the Server Racks with help of TCS Developed Power Assess Tool
- Energy efficient **Localized Cooling Architectural System** Cold & Hot Aisle Containment, In Row Cooling. Rear Door Heat Exchanger.
- Replacement of Desktops with Thin Clients
- Installing Energy Star Rated PCs
- Desktop hibernation to reduce wastage of energy consumed during non-office hours and idle period
- Procurement of Green Printers to reduce energy Consumption (PIN Deployment)

Energy Efficient Data Center



Localise Cooling Architectural System

Reasons For Variation :Energy Efficient Lighting System

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Provision of Internal & External LED Lighting System

Illumination level at to 300 lux for visual comfort as well as using less energy

Installation of **Capacitor Bank (APFC)** to reduce transmission losses and distortion due to heavy in surge current.

Provision of **Intelligent light sensors** in conference rooms

Sensible use of peripheral lightning along with Timer based Controller

Provision of electronic energy meter for Lighting DB panels, UPS, Air Conditioning, Solar PV & DG sets separately

EE Internal & External lighting System

Automatic Power Factor Control

Reasons For Variation : Other Energy Efficient Initiatives

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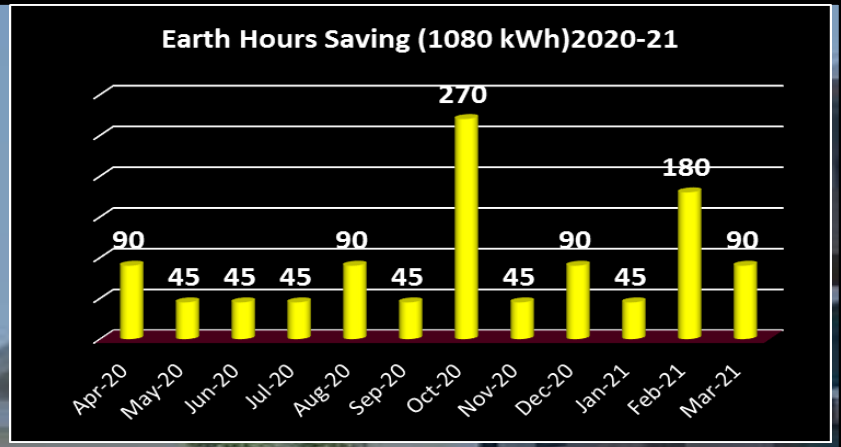
- Energy savings due to Set up the Earth Hour(4050Kwh) for 3 years
- Provision of Energy Efficient Pumping System : Water Free Wheeling System
- Provision of Energy Efficient Irrigation System
- Provision of Vertical Garden
- Provision of Indoor Plants
- Well grown natives trees with biologically diversified landscape
- Awareness Program for energy conservation : Mailers, Posters, Lectures, Competitions

Improvement : SEC Reduce **9.03 %** **2019-20** While during **2020-21** **33.36%** due to pandemic norms (SBWS)



Earth Hour Set –up for 2020-21

Indoor Plants

Green Wall

Information on Competitors, National & Global Benchmark

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Competitor	Internal Competitor	External Competitor
Parameters	Electrical SEC kWh/kg	
Comparison of Specific Energy Consumption (SEC)	2019-2020	
SEC : Yours	105.04	
SEC Values for Competitor - 1	153 Bhubaneshwar Branch	Wipro 144 *
SEC Values for Competitor - 2	141 Kochi TCS Centre	
SEC Values for Competitor - 3	122 Thiruvananthapuram	
National Benchmark for SEC	173**	
International Benchmark for SEC	242.188 ***	

Note

* Wipro Annual Report 2019-2020

** BEE Bench Marking for Commercial Building

*** iotacommunications-Benchmarking Commercial Building

Environmental Sustainability targets for this decade | FY21 to FY30

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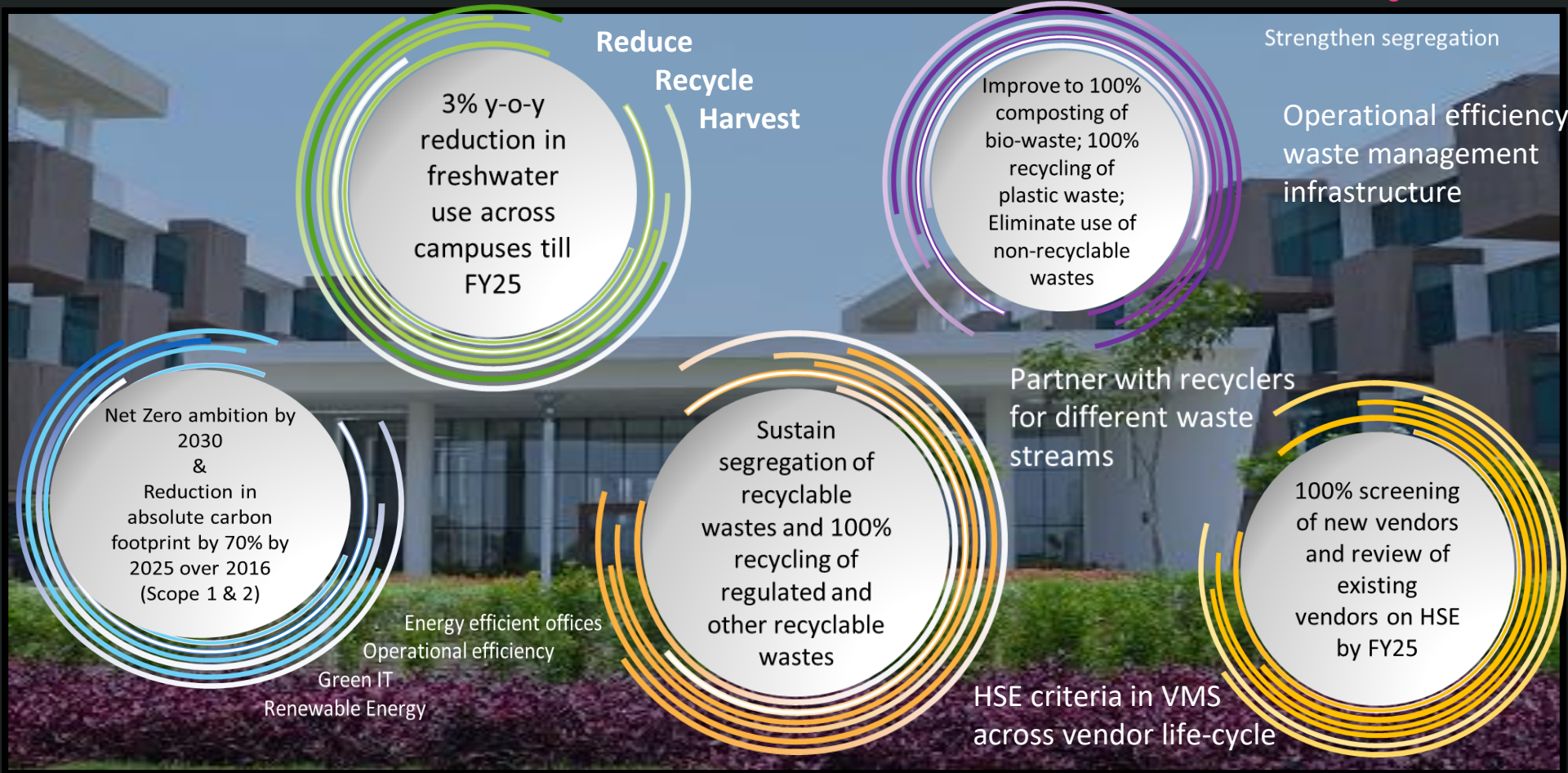

List of Major Encon Project Planned in FY 2021-22

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- Certification of TCS –Mihan for ISO 50001-2018
- Expansion of Solar PV System
- Provision for Solar Street Lighting System
- Provision for Solar Parking System
- UPS Consolidation
- Biogas Generation

Solar PV Expansion

Solar Lighting System

Solar Parking System

Energy Savings Project implemented last 3 Years

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S N	Year	No of Energy savings Projects	Investment (INR Millions)	Electrical savings (Million kWh)	Thermal savings (Milliom Kcal MTOE)	Savings (INR Millions)	Impacts on SEC
1	FY 2018-19	7	0	1.23	NA	5.03	Reduced by 13. 06 % (2017-18)
2	FY 2019-20	8	23.11	2.02	NA	8.84	9.03 % (2018-19)
3	FY 2020-21	8	Nil	0.99	NA	4.36	33.67 % (2019-20)

Innovative Project Implemented : REMC Project

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Infrastructure & Information – Enterprise Level

Infrastructure Set-Up & Management

- Setting up the TEAMS Infrastructure
- EC View configuration
- Ensuring infrastructure performance

Data Management

- Data stability
- Data availability (target >95%)
- Data quality ((target >95%)
- Data cleansing

Benchmarking & Target Setting

- Setting site wise benchmarks and targets

Monitoring & Analysis – Site Level

Real Time Incident Management

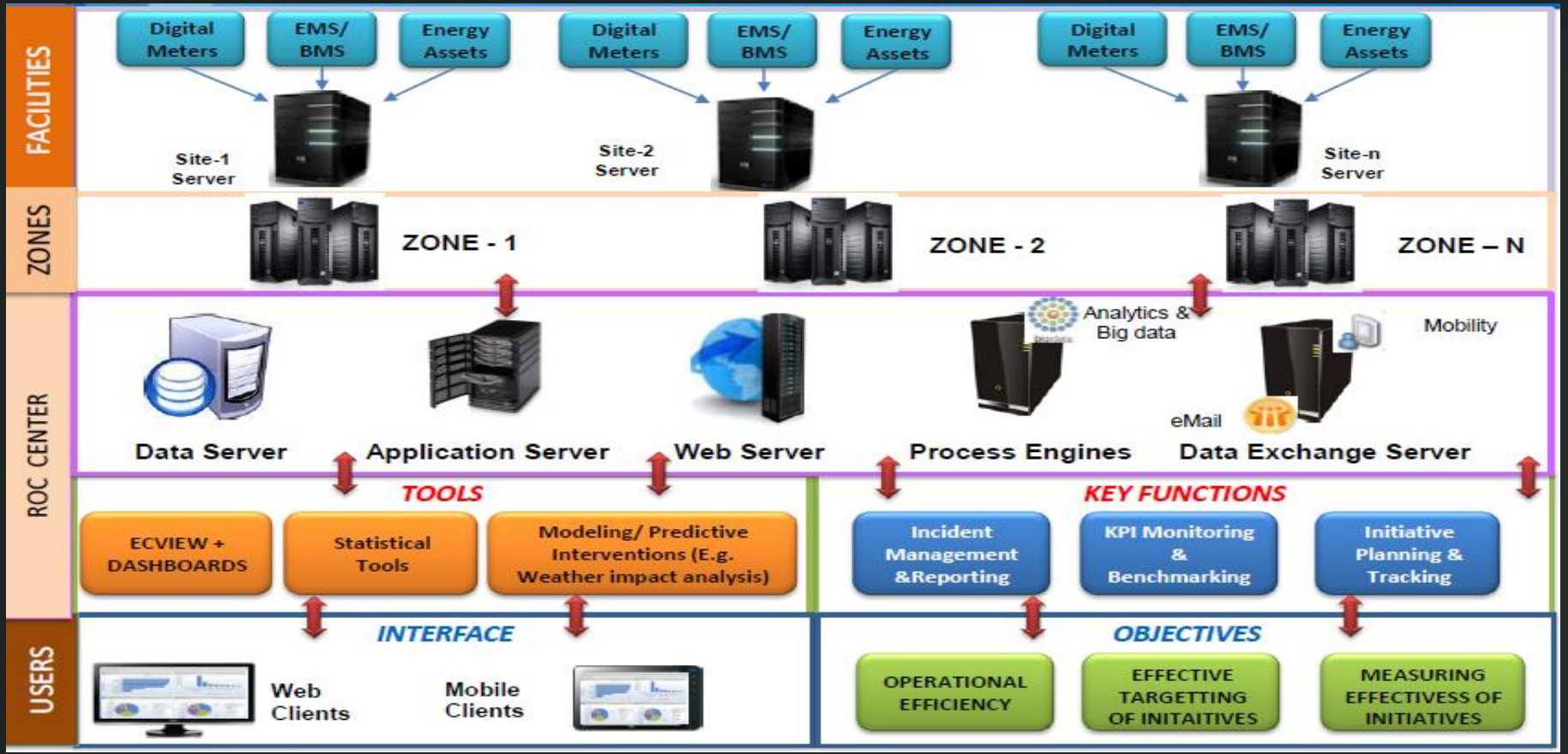
- Daily monitoring to identify and inform site of incidents

Periodic Analysis

- Monthly site level performance - trends, KPIs

Initiatives Management – Site Level

Analyse → Identify Opportunities → Stakeholder Workshops → Energy Reduction Proposal → Implement → Measure & Verify


FACILITIES
Digital Meters
EMS/ BMS
Energy Assets
Site-1 Server
Site-2 Server
Site-n Server
ZONES
ZONE - 1
ZONE - 2
ZONE – N
ROC CENTER
Analytics & Big data
Mobility
eMail
Data Server
Application Server
Web Server
Process Engines
Data Exchange Server
TOOLS
ECVIEW + DASHBOARDS
Statistical Tools
Modeling/ Predictive Interventions (E.g. Weather impact analysis)
KEY FUNCTIONS
Incident Management &Reporting
KPI Monitoring & Benchmarking
Initiative Planning & Tracking
USERS
INTERFACE
Web Clients
Mobile Clients
OBJECTIVES
OPERATIONAL EFFICIENCY
EFFECTIVE TARGETTING OF INITAITIVES
MEASURING EFFECTIVESS OF INITIATIVES

Utilization of Renewable Energy sources

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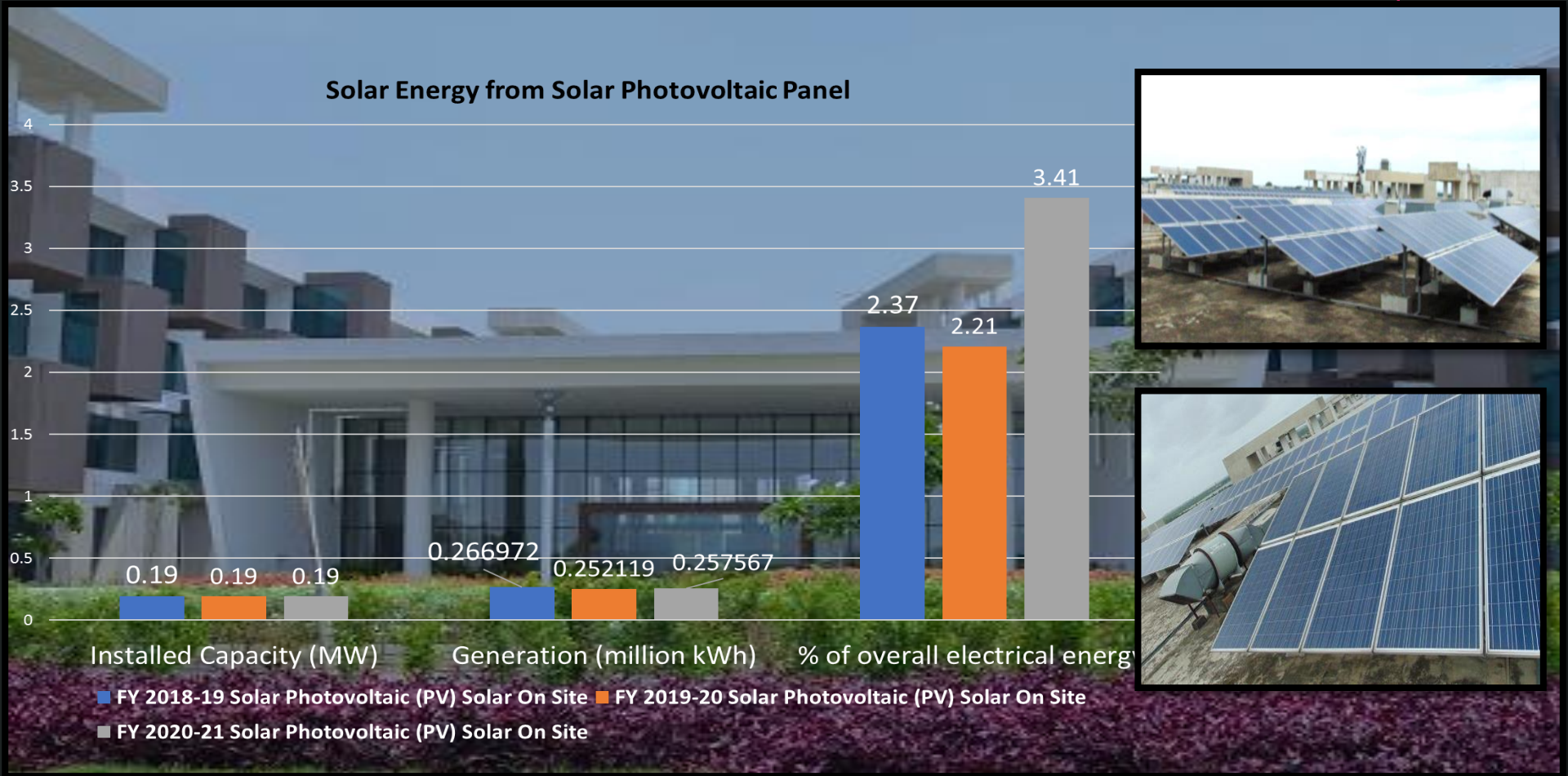
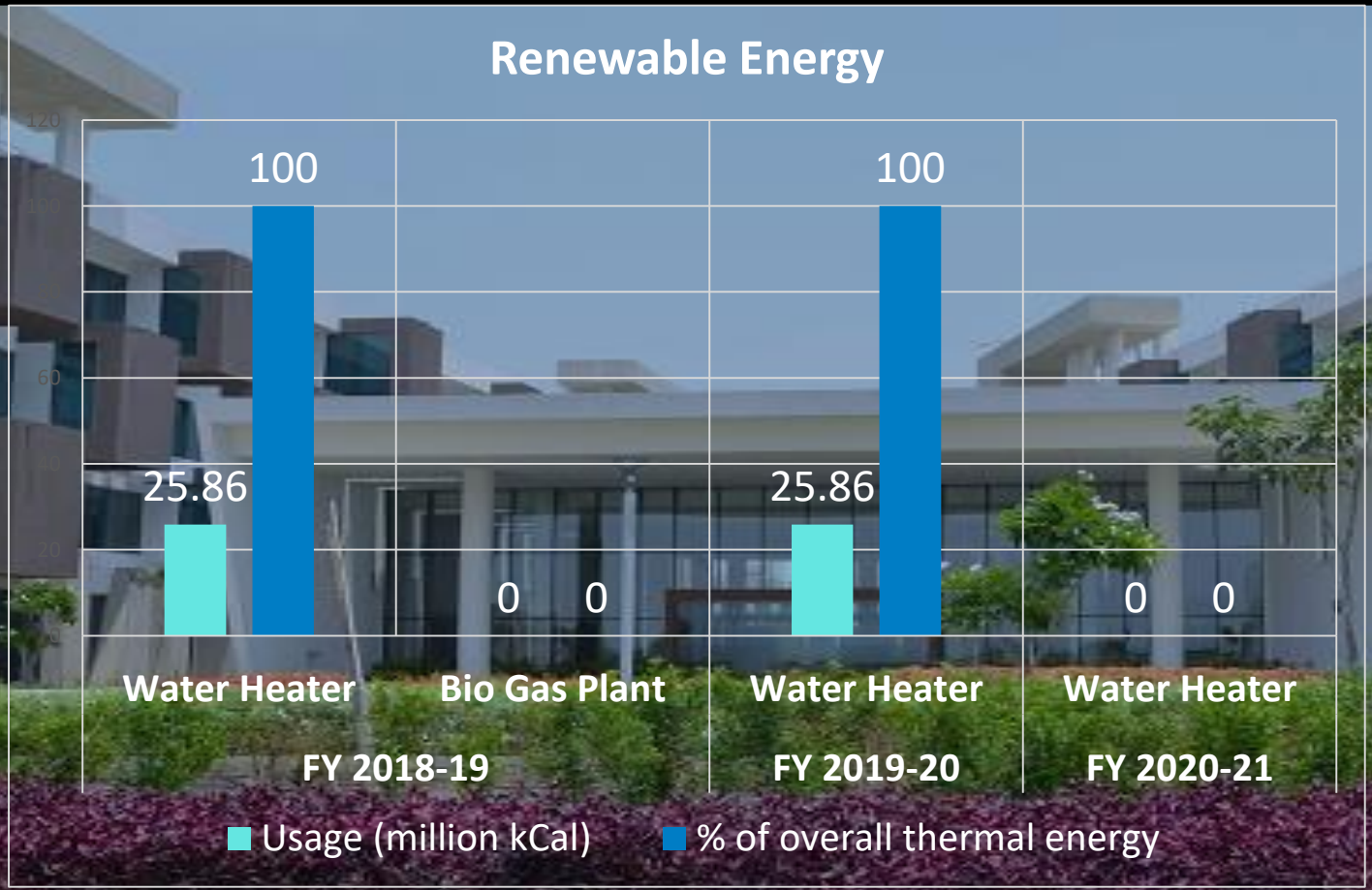


Utilization of Renewable Energy sources

Building on belief



GHG Emissions and Indoor Air Quality

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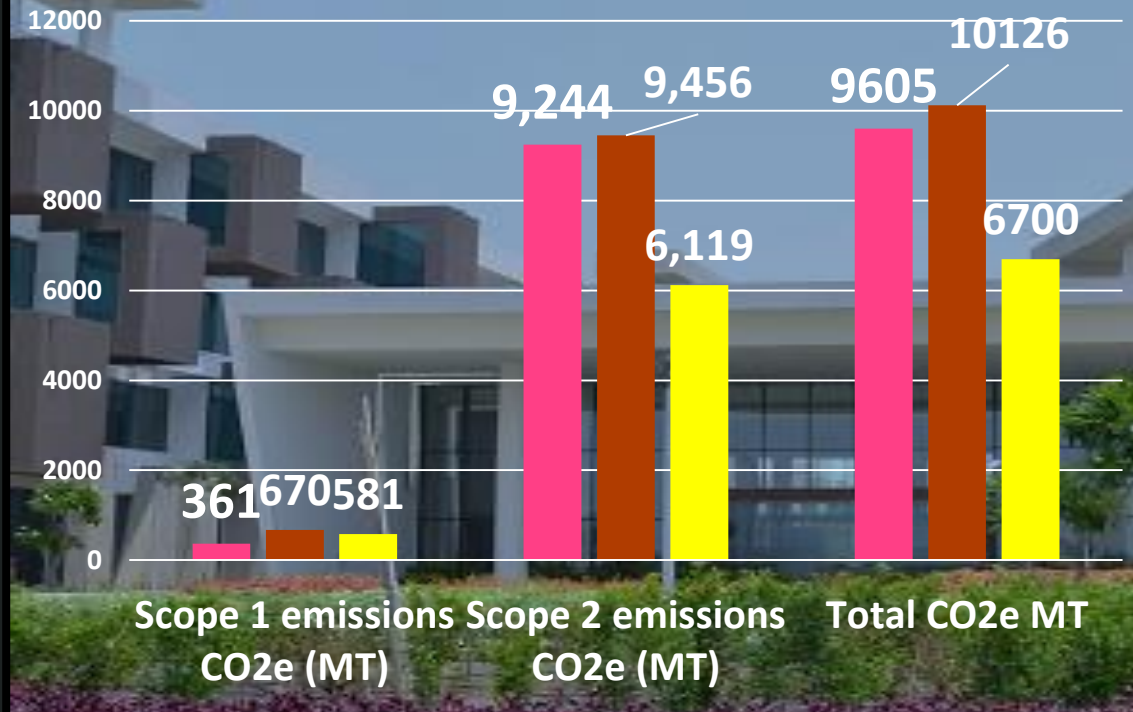
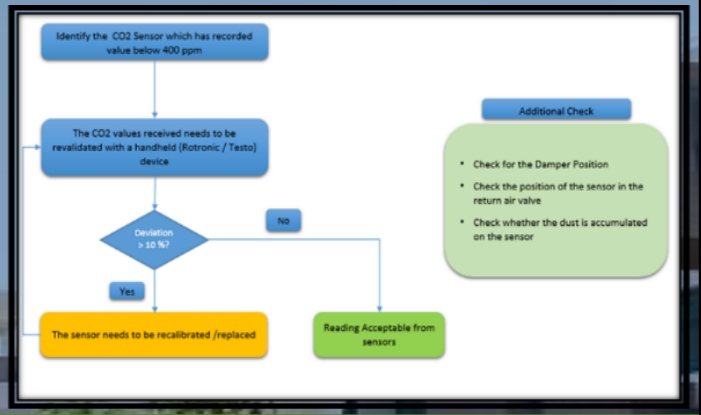
Carbon Foot Print





TCS- Sustainable Intelligent Solution for AIQM

Teamwork, Employee Involvement & Monitoring

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Daily monitoring system and use of iOT

IOT: IoT has enabled a collection of vast amounts of data from the devices and machines across industrial domains. Traditionally, the device data is transported to cloud infrastructure for analysis and useful insights.

TCUP EDGE:

TCUP EDGE is a lightweight IoT platform which is designed to run on resource-constrained devices with low CPU and memory footprint

- **Separate budget for Energy Conservation – Yes,** Based on the technology upgradation plan & energy targets every year budget allocation is done, this year budget is allocated for UPS replacement project
- **Energy efficiency / awareness training program** – Yes,

Tata Sustainability Month. Webinar on Energy. Dec Energy conservation Month. Earth hour on monthly basis and Energy Day-Every year

Monitoring Methodology	Frequency	Responsibility
REMC integrated with Building Management System	Daily (24/7)	Admin
Power IT Tool	Daily	Data Center IS
On –Line SoFi Tool	Monthly	Admin/HSE
Energy Performance review	Quarterly	Admin/HSE/ DCH
Internal Audit	½ Yearly	HSE/Admin
External Audit	Yearly	HSE
Data Assurance by 3rd party (KPMG)	Yearly	HSE

Energy Management : Team Work

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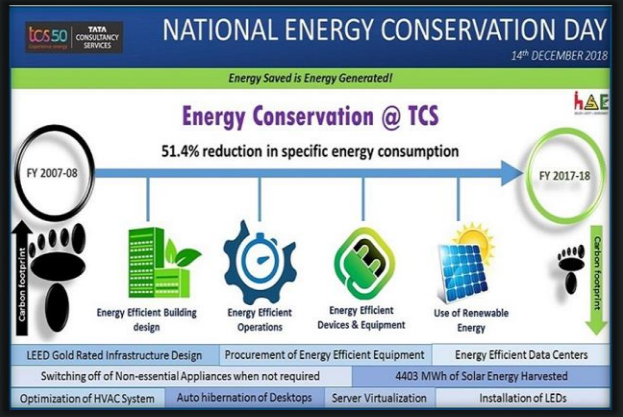
SN	Source of ENCON Idea's	Extent of Team work
1	LEED certification	TCS top management involvement IPD
2	Implementation of ISO 14001, as a part of integrated HSEMS system	HSEMS committee of Kalinga Park comprising of cross functional team Admin, HR, L&D, IS, HSE, various project units
3	Fulfillment of energy conservation targets as per the HSEMS system	HSEMS committee and entire staff
4	Awareness among associates & contract employees regarding Energy conservation	HSEMS committee , HR, HSE, Admin team
5	Implementation of Energy conservation projects	Top management including Center Head, MR & Head Administration of Kalinga Park

Employee Involvement



Water Tank / Fountain

Implementation of ISO 50001/Green Co/IGBC rating

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Implementation of ISO 50001

TCS is being first IT company in India to be certified for this . We have started implementing the standard certification phase wise, So far 6 facilities are certified & Nagpur Mihan will be taken up during 21-22 cycle

IGBC certification Gold Rated :

CII
Confederation of Indian Industry

Indian Green Building Council (IGBC)

hereby certifies that

Tata Consultancy Services Ltd., MIHAN, Phase - A Nagpur

(IGBC Registration No: NC 11 1429)

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

IGBC's LEED India New Construction Gold

November 2016

C N Raghavendran
Chairman, LEED India

Dr Prem C Jain
Chairman, IGBC

K S Venkatagiri
Executive Director, CII-Godrej GBC

38.46 Million Invested on Energy Efficient Project

200 Million is Planned to Invest to Reduce Scope 2 Carbon Footprint

Learning from CII Energy Award 2020 or any other award program

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This is first time TCS Mihan is participating in CII energy award.

However, based on the experience of the other TCS branches we have adopted;

- -Good practices to reduce energy consumptions
- -Benchmarking for setting up an target for SEC
- -Monitoring of absolute electricity consumption

Road map on Sustainable Waste Management

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Waste Collection → Handling → Segregation → Storage → Transportation → Treatment

Biodegradable Waste (Food/Garden) Management Startegy

- **Waste to Energy** → **Bio-Digester (Food waste)**
- **Waste to Manure** → **Vermi-Composting (Garden waste)**

Organic Waste Converter

Proposed Vermi-compost Plant

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Thank You !