



NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT - 2021

ITC Limited , Saharanpur



Team :
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Himanshu Yadav -- Utility Engineer
Chandan Kumar --Utility Engineer



**OVERVIEW
OF ITC**

**ENERGY
CONSUMPTION
AND
PERFORMANCE
& Bench
Marking**

**INNOVATIVE
AND ENERGY
CONSERVATI
ON
PROJECTS**

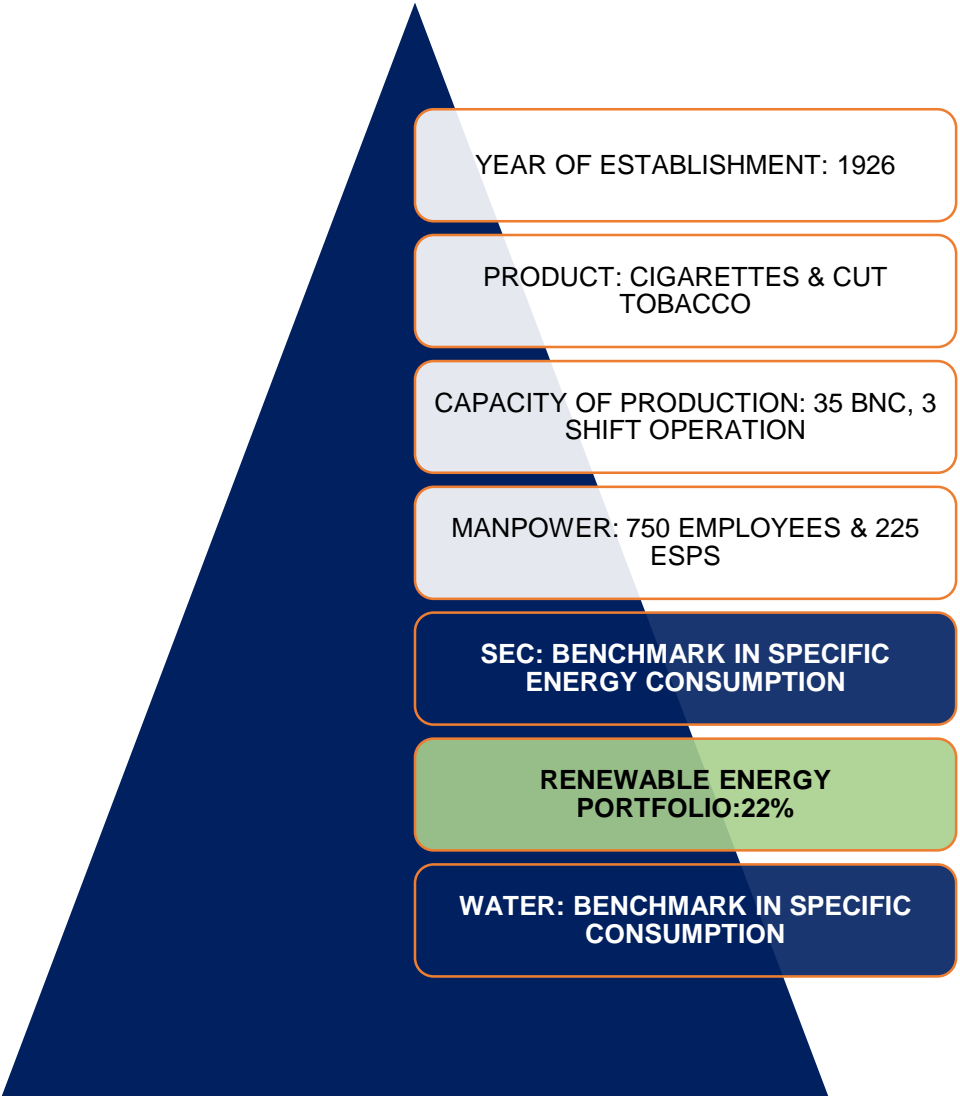
**INDUSTRY
4.0 &
ENCON-
BEYOND
BOUNDARIES**

**GREENOVATI
ON JOURNEY
TOWARDS
RENEWABLE**

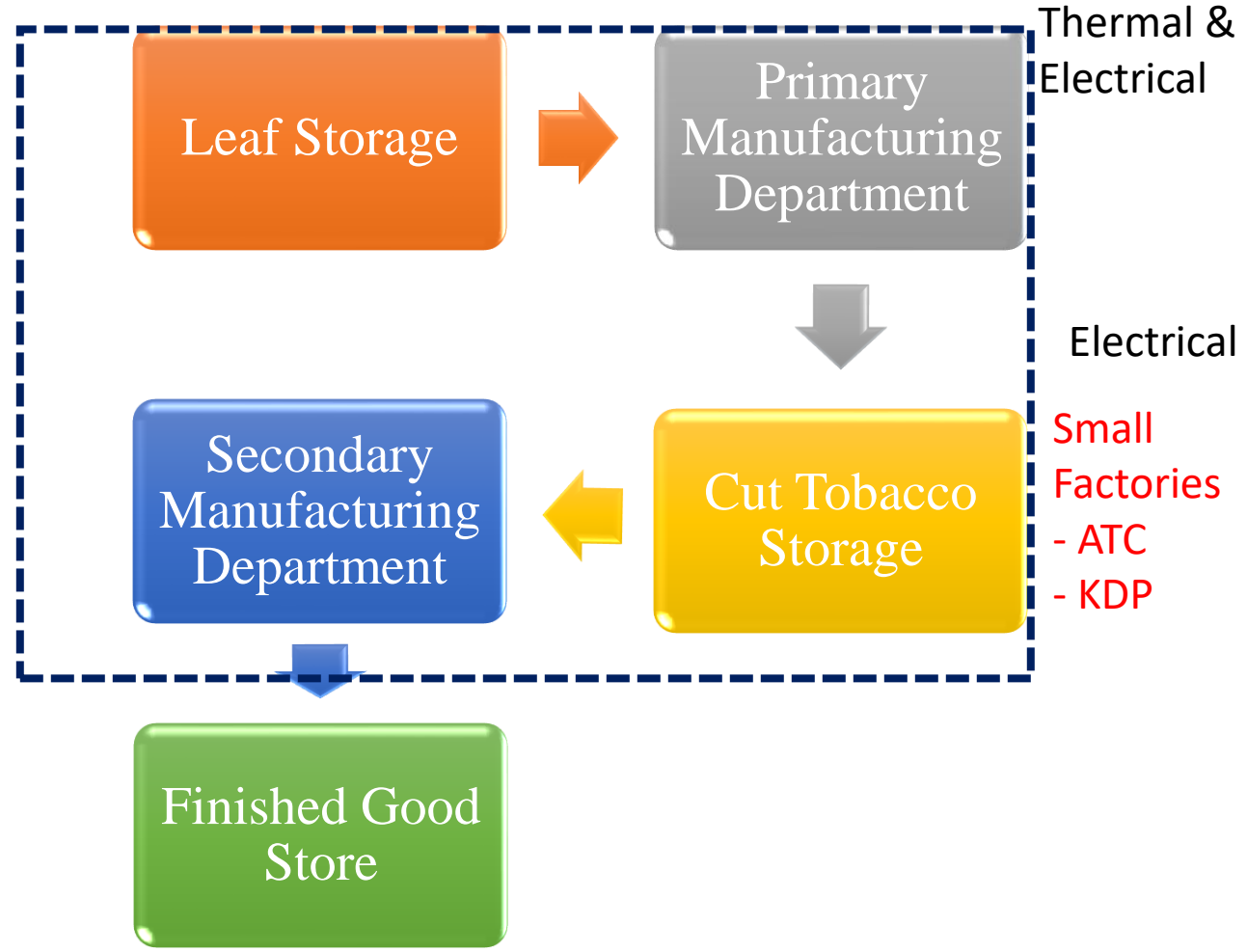
**GREEN
SUPPLY
CHAIN and
FUEL
SUBSTITUTION**

**EMPLOYEE
ENGAGEMENT**

ITC Saharanpur (Insight)

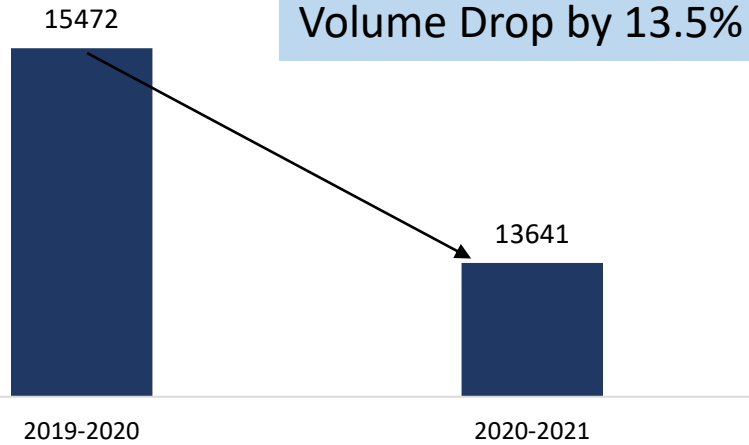


Manufacturing Process-Flow diagram

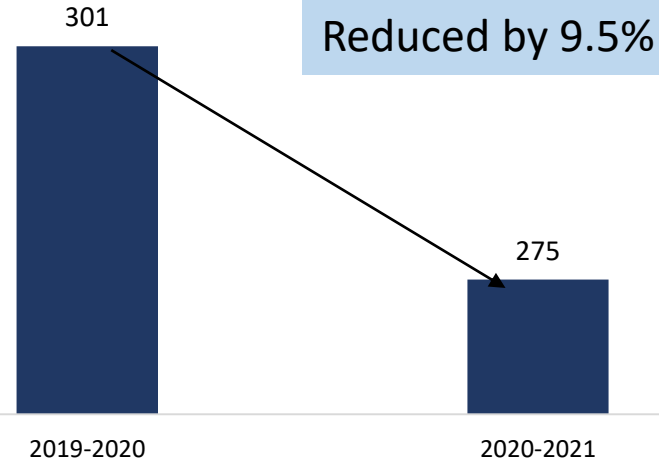


Impact On Production

Volumes Million Cigarette



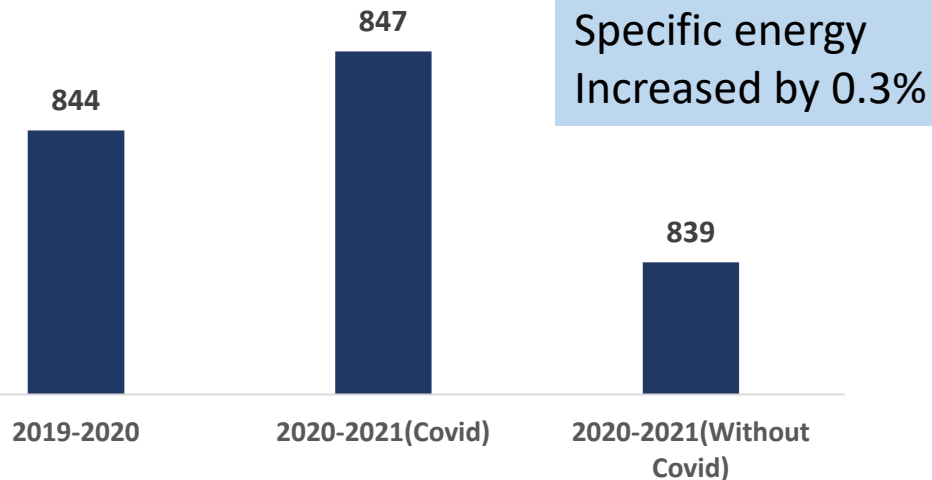
Production Days



- Disruption in supply chain.
- Lower Production Volume and Production Days.
- Lower Demand across market segments

Impact On Specific energy consumption

Specific Electrical Energy Consumption

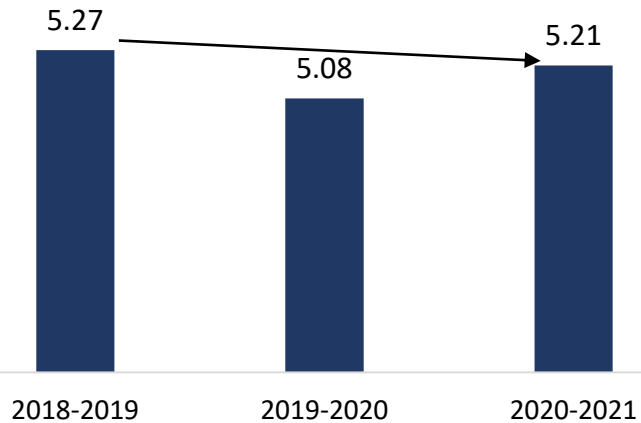


- Thermal GJ/MNC Increased by 4.5% on account of covid protocols, open loop air-conditioning.
- Staggered production schedule.

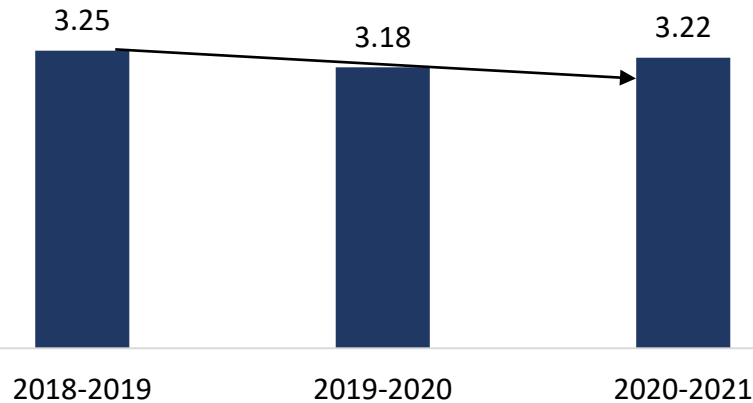
ENERGY CONSUMPTION OVERVIEW



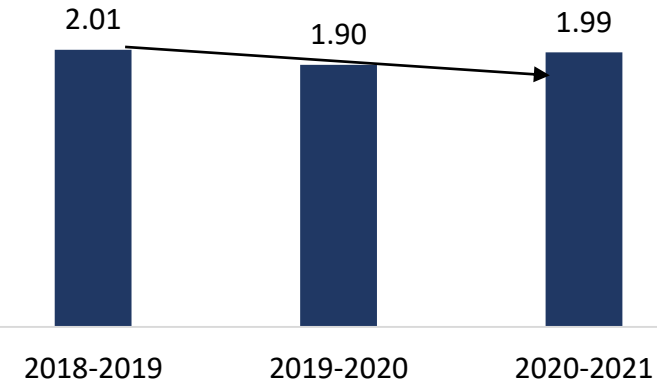
GJ/MNC



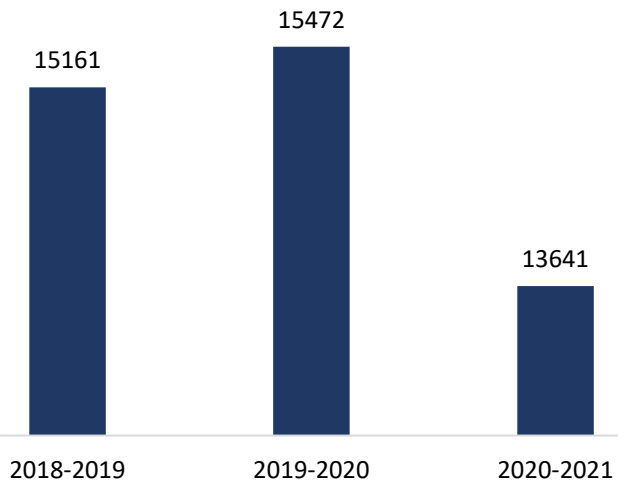
Electrical GJ/MNC



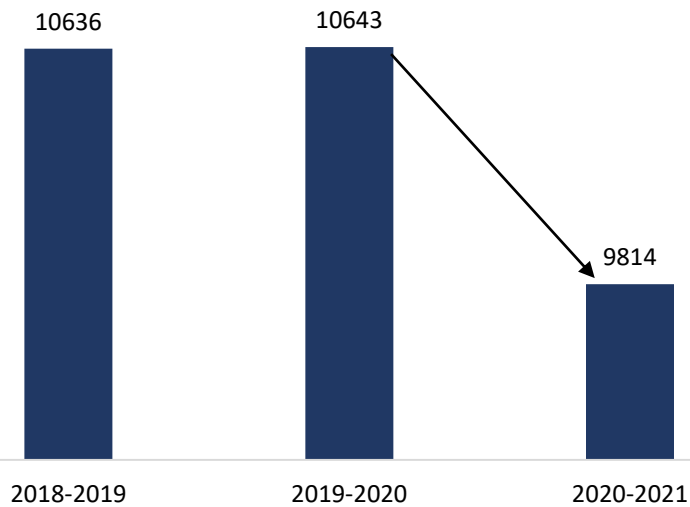
Thermal GJ/MNC



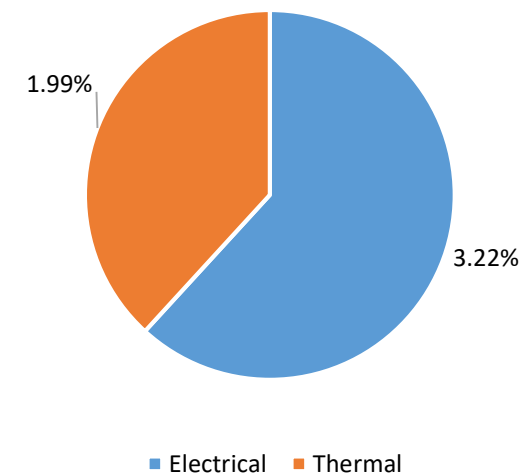
Volume-Million Cigarette



Process Tobacco-Ton



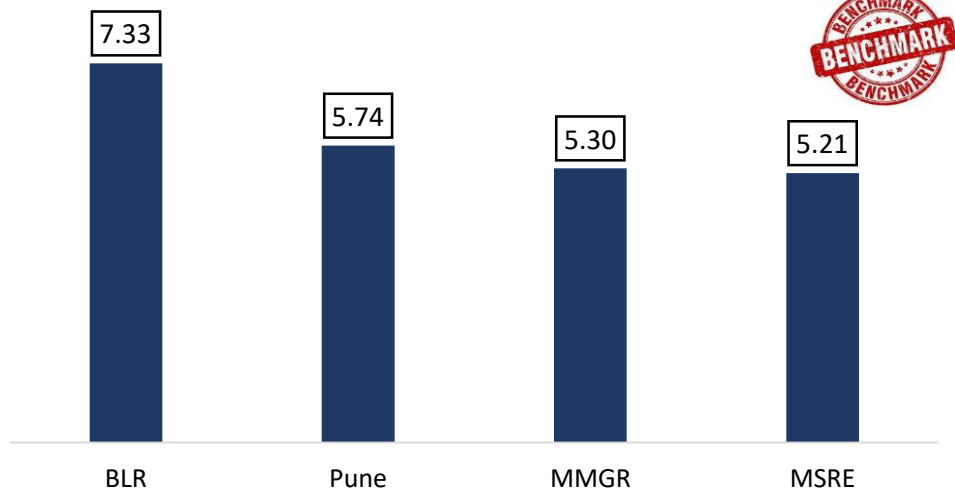
Thermal & Electrical Energy 2020-21



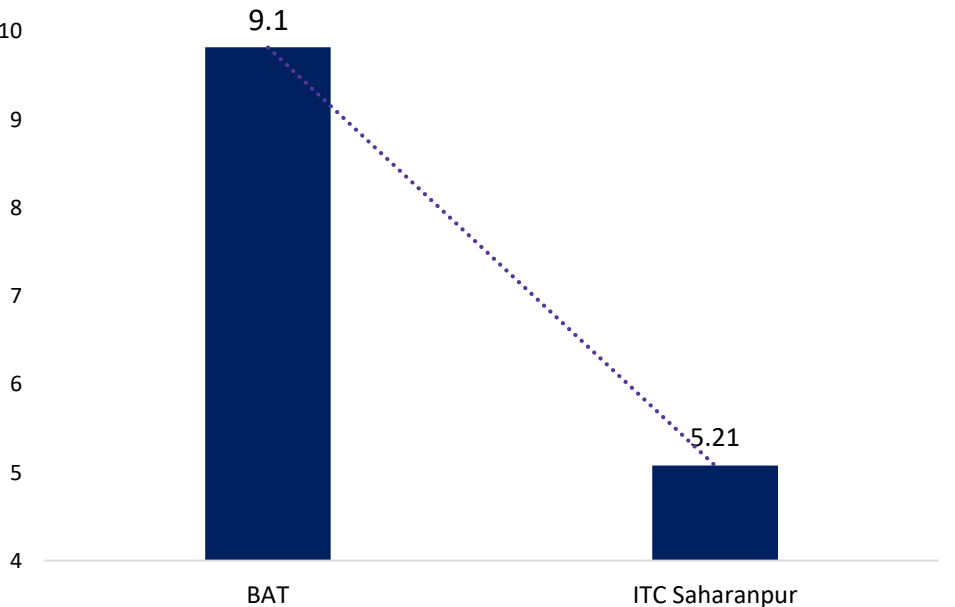
ENERGY PERFORMANCE- BENCH MARKING



Energy GJ/Mnc National Benchmarking



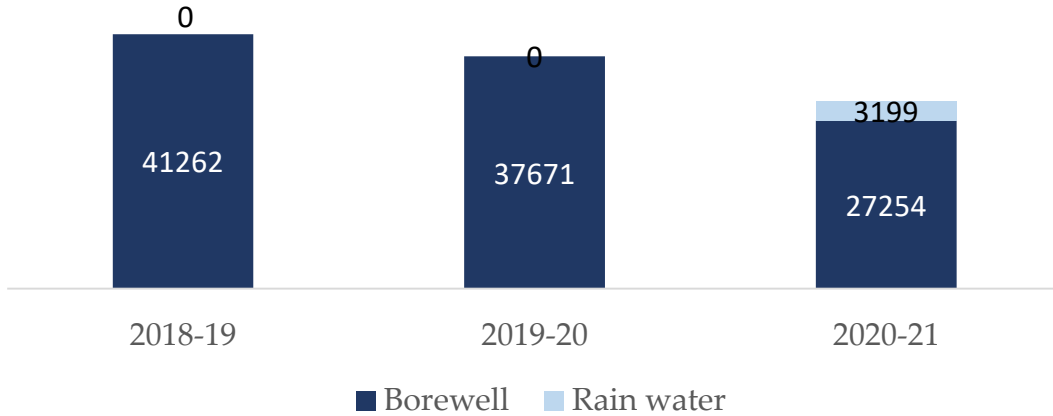
Energy GJ/mnc- International Benchmarking



LIST OF MAJOR ENCON PROJECT PLANNED IN FY 2021-22

S.N O	Project Planned	KWH Savings	Investment In Million	Estimated Savings Lakhs
1	Centrifugal Compressor for SMD	520121	95.00	10.40
2	Smart Chiller	799344	95.00	15.99
3	Utility Command centre with Analytics	121500	75.00	1.38
4	BLDC Fan's	64800	6.00	0.47
5	EC Motor's for Cooling Tower	41400	5.90	0.30

Supply Side Management



Building Sustainable infra to enhance the water table



Rain water Storage – 900 kL



Glue Separation machine – 1 kL/hr

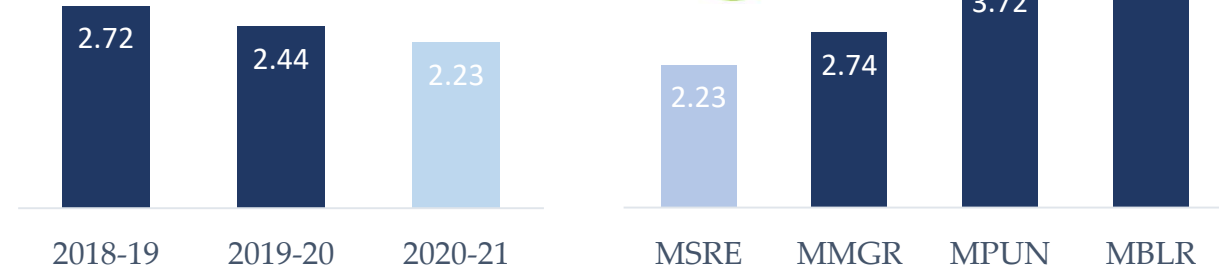


Municipal STP treated water plant – 50 kLD



Building Sustainable Infra in Saharanpur

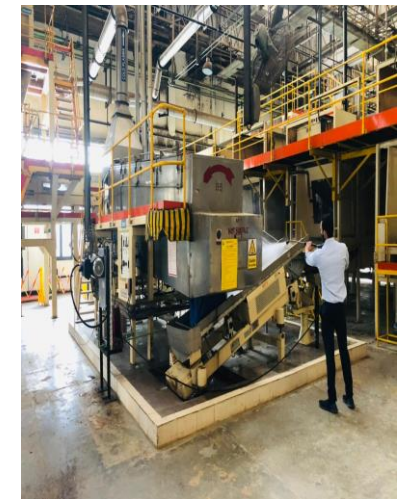
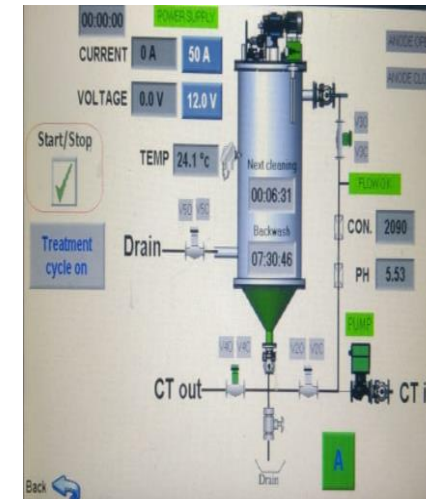
Specific Water Consumption



ITD Comparison



Scale and bio removal for Cooling tower
Net Impact-1000 KL



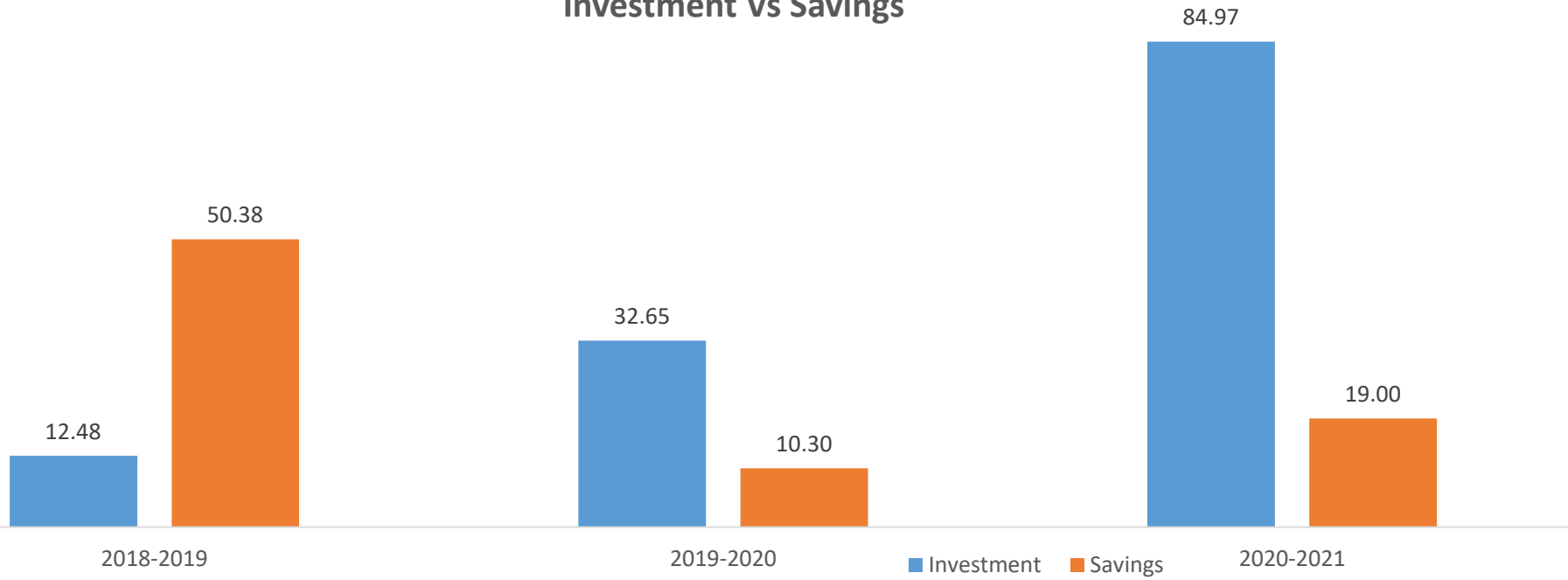
High Pressure cleaning machine for VOV Flow-900 L/h, Potential saving-30% on cleaning demand

Encon Projects



Year	Number of Energy Saving Projects	Investment(Rs Million)	Electrical Savings(Million Kwh)	Thermal Savings(Million Kcal/Mtoe)	Savings(INR Million)	Impact On Sec (Electrical,Thermal)
2018-2019	10	12.48	0.52	20	50.381	0.9%
2019-2020	10	32.65	1.0	0.00	1.03	2%
2020-2021	9	8.49	0.215	0.00	1.57	1.4%

Investment Vs Savings



Encon Projects 2018-2019



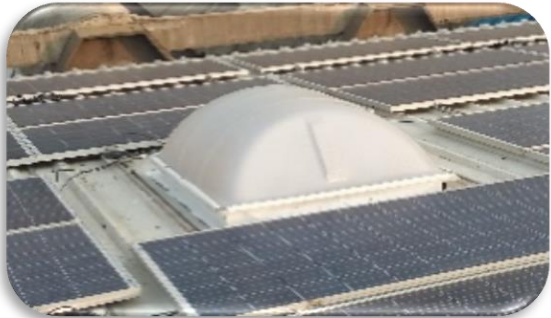
HRC COMPRESSOR



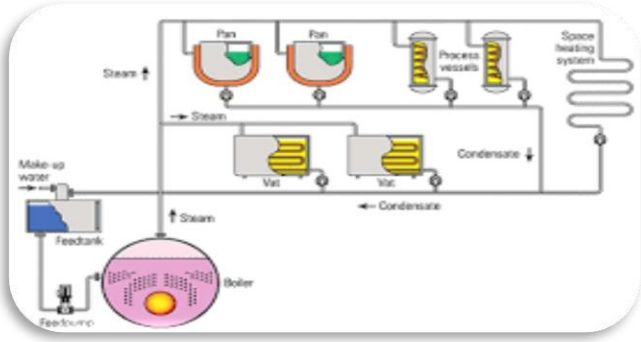
Energy Efficient Boiler



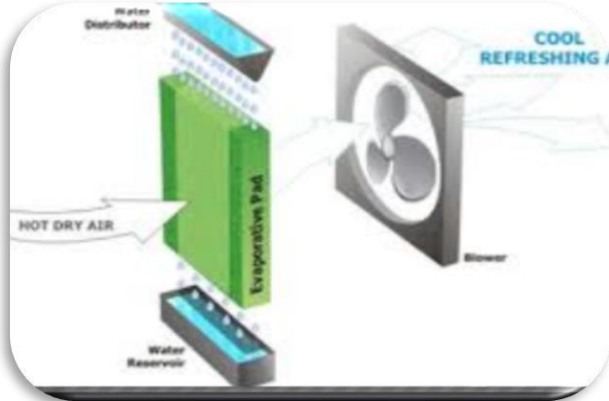
WHEELING OF POWER-ISOA



LIGHT PIPE



CONDENSATE RECOVERY



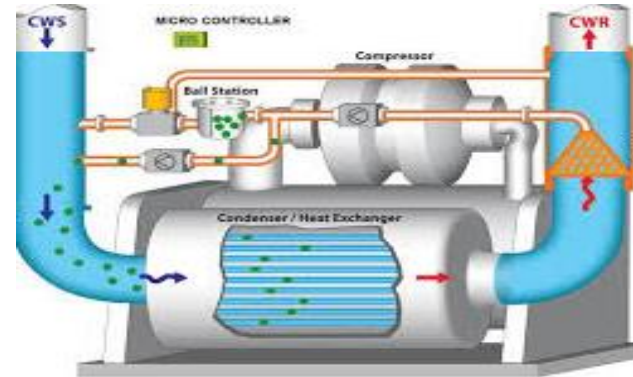
CELDEK PAD



LED LIGHT



EC motor for SUPS Condenser



Automatic Tube Cleaning system in chiller



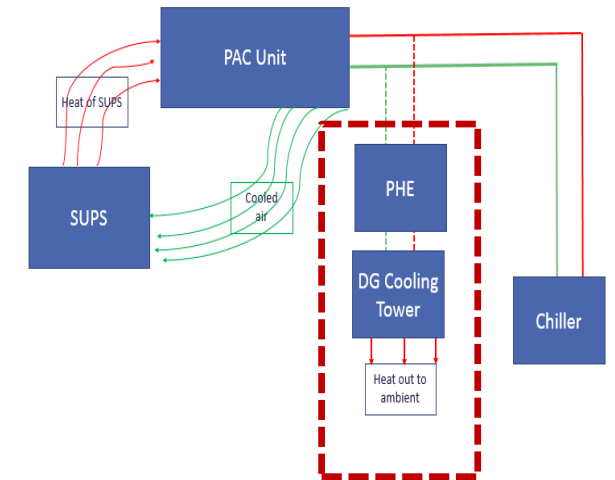
Compressed Air Audit



Energy efficient pumps and motors



Energy optimization in DRF operation



Innovative SUPS Cooling



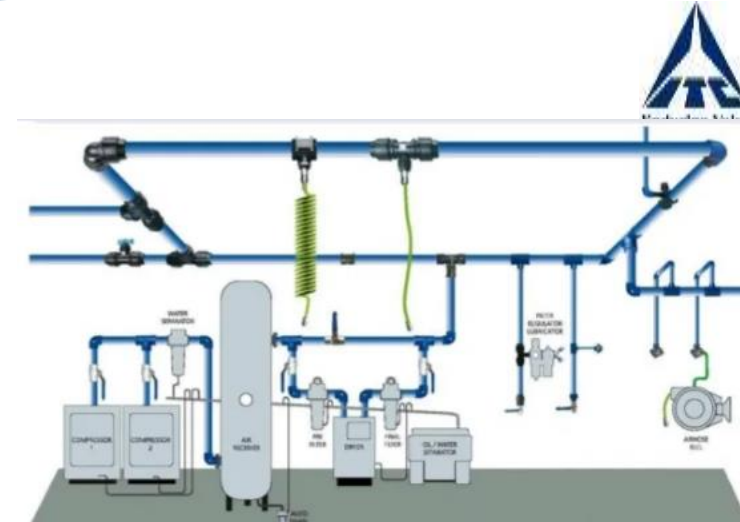
VFD for cold Plasma



Turbos vents for PMD



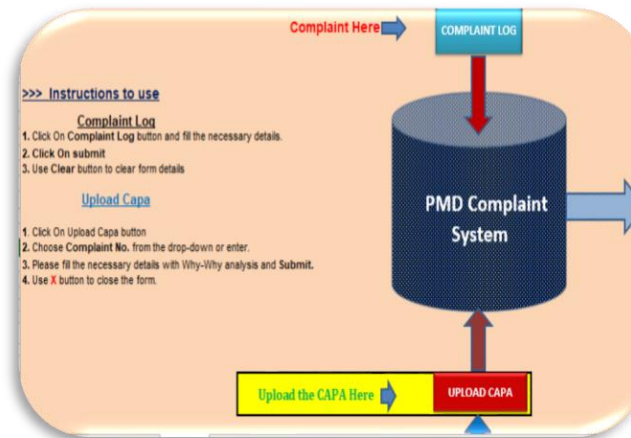
EE air conditioning



Compressed Air Management system



Energy efficient fan CDRF



Innovative Breakdown logger & QR-based maintenance

- Smooth communication between operations and maintenance team
- Record of all downtimes
- QR based breakdown & complaint register
- On-phone access to everyone

Renewable Energy



Year	Technology	Onsite/offsite	Installed Capacity	Units thru ISOA	% Over all Electrical Energy
2018-2019	Electrical	Offsite	46 MW	7153	51%
2019-2020	Electrical	Offsite	46MW	5570	41%
2020-2021	Electrical	Offsite	46MW	3685	32%

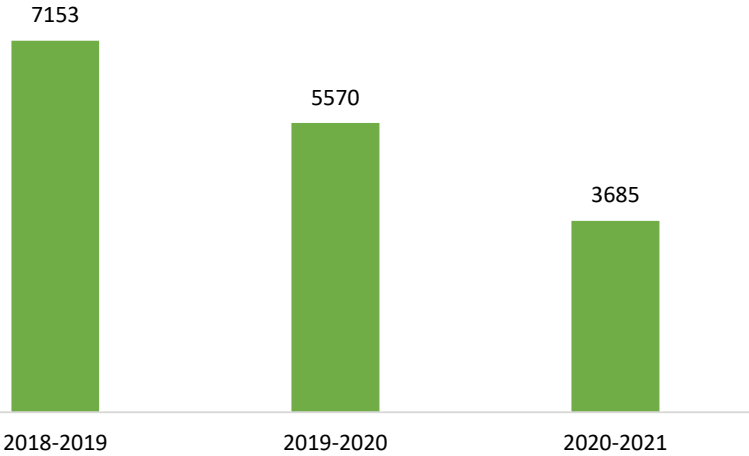
Year	Technology	Onsite/offsite	Installed Capacity	Generation(MW)	% Over all Electrical Energy
2018-2019	Solar	Onsite	770 Wp	830	6.3%
2019-2020	Solar	Onsite	770 Wp	792	5.9%
2020-2021	Solar	Offsite	770Wp	738	6%

Year	Technology	Onsite/offsite	Installed Capacity	Generation(GJ)	% Over all Thermal Energy
2018-2019	Solar	Onsite	500LPD	106	0.50
2019-2020	Solar	Onsite	500LPD	117	0.65
2020-2021	Solar	Offsite	500LPD	127	0.85

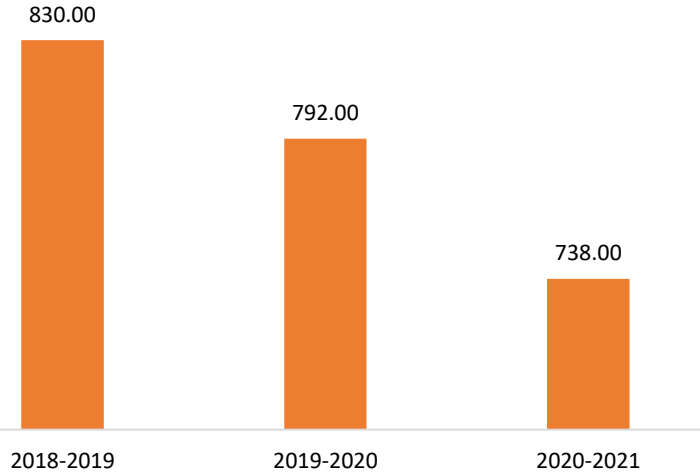
Renewable Energy Footprint



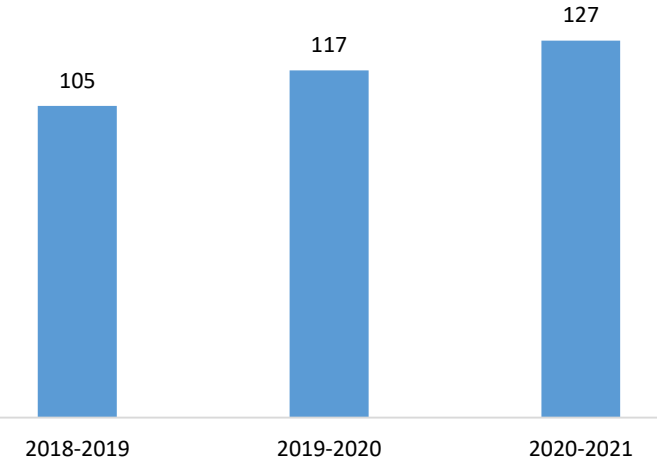
Wind Energy Consumption



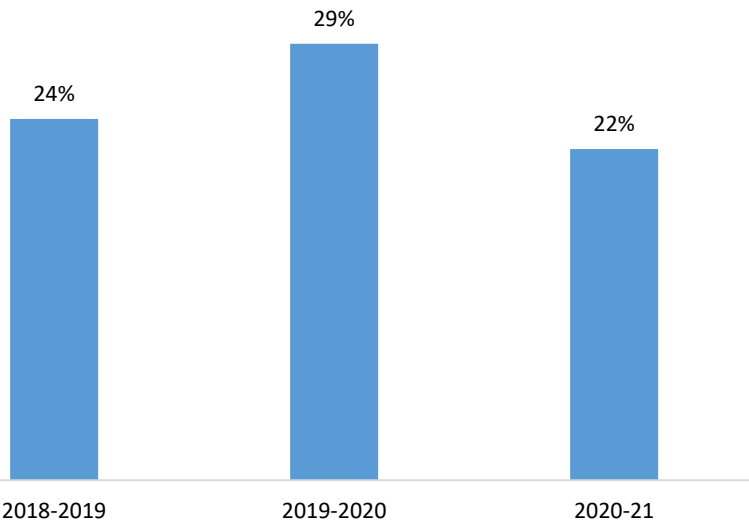
Roof Top Solar Consumption



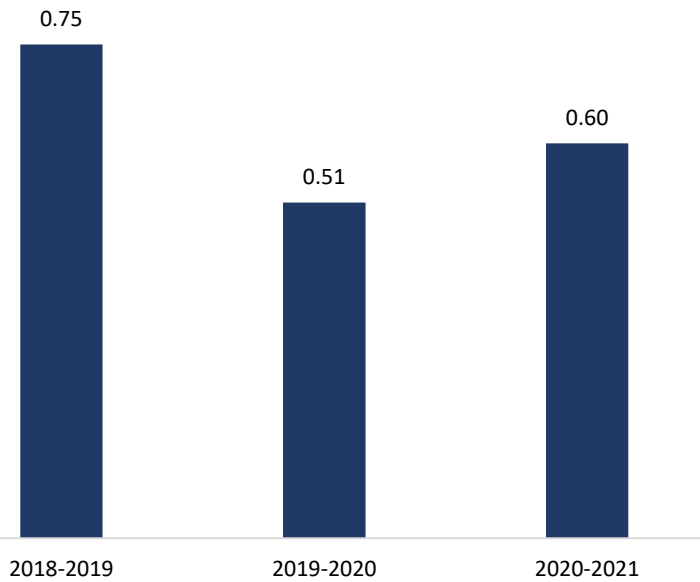
Solar Thermal



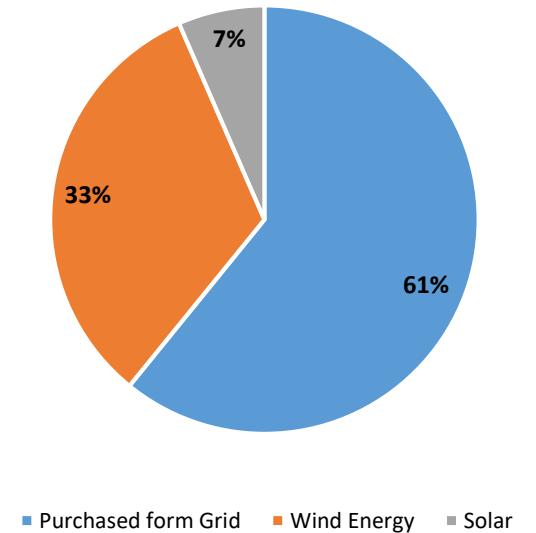
Total Renewable Energy Footprint %



Co2/Mnc



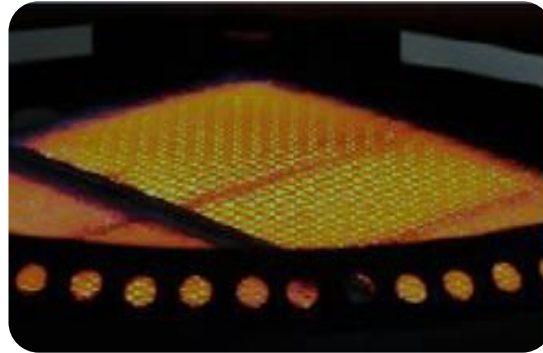
Source Energy Utilisation 2020-21



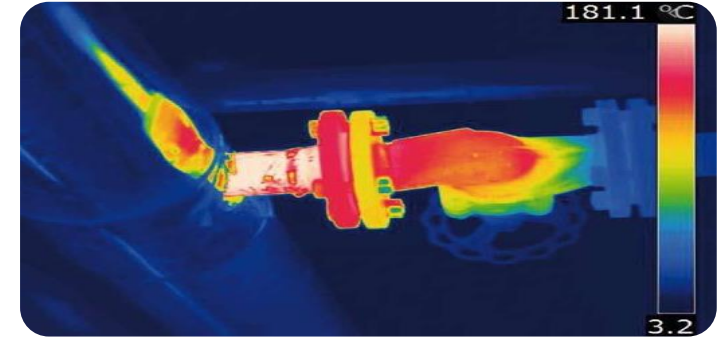
Key Interventions



DRF with closed loop integration



Energy Efficient Burner in canteen with reduction of almost 25% in LPG demand Uniform Heating, high Thermal Efficiency



2.4% reduction in specific PMD steam demand through Thermographic evaluation of heat loss and Smart evaluation of steam demand through vortex flowmeter

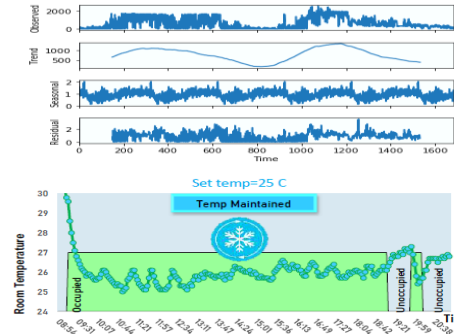
Technology Adaption



Centrifugal compressor



Centrifugal EE Chiller



Smart Chiller Load Optimization



BLDC fans for cooling towers

Encon Industry 4.0 IOT- Compressed air monitoring system



ZERO-DOWNTIME IMPLEMENTATION



DYNAMIC CONTROLS & ADJUSTMENTS



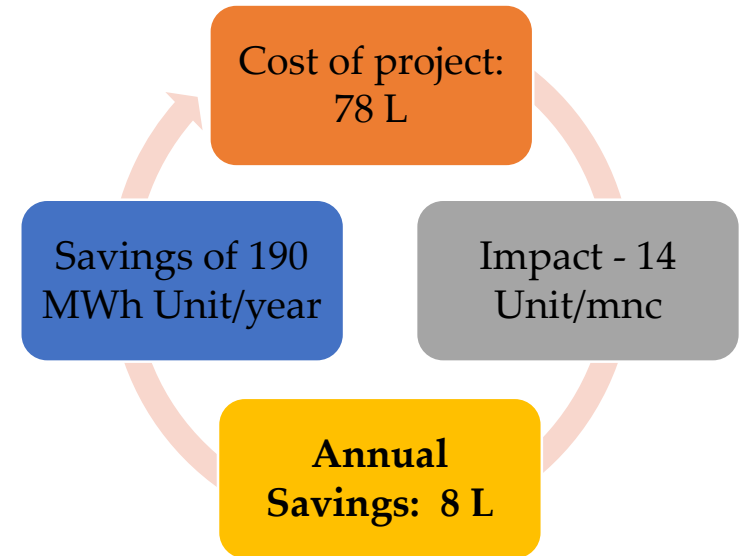
IMMEDIATE MONITORING & REPORTS

Air Audit Assessment

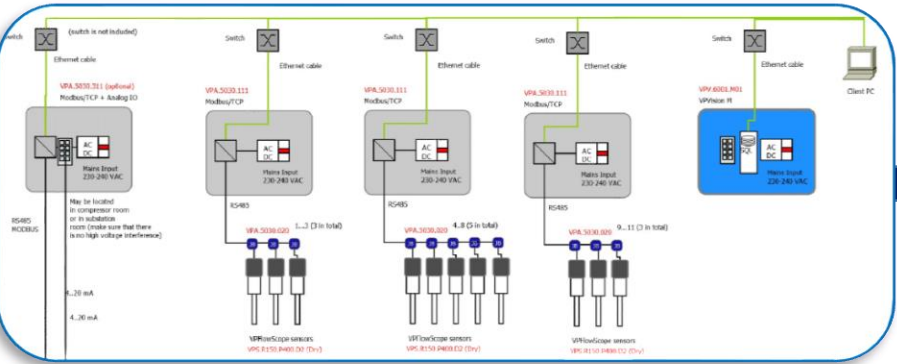
Digital Network enabling, Flowmeters, Smart Analysers, cloud platform.

Equipment Consumption pattern benchmarking.

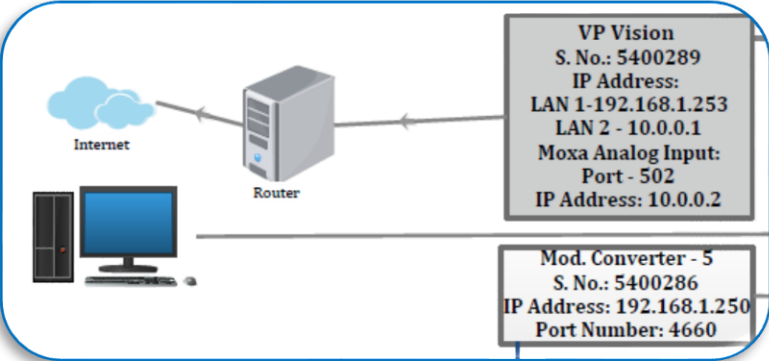
Daily Tracking of performance



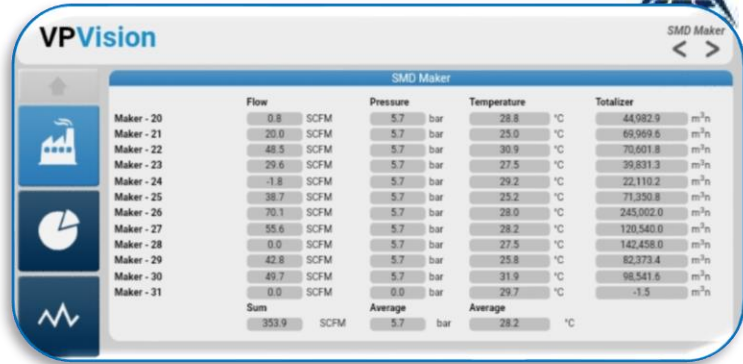
Encon Industry 4.0 IOT- Compressed air monitoring system Architecture



Flow meter network



Flow meter Server



Local monitoring of live data

Compressed Air Management System Report (15-Dec-20)
VP Vision Compressed Air Monitoring
 To: Jwala Prasad Karadiya, Bablu Kumar Dey, Rajkumar Chawat, Vinod Kumar, Amod Chauhan, Chandan Kumar
 Cc: "Ankit Jain", "Balkrishna Aroa"

5 attachments

5. Air Consumption in m3.pdf 2. Air Consumption in SCFM.pdf 4. Compressed Air Temperature.pdf 1. Compressed Air Pressure.pdf 3. Air Consumption in m3 Pie.pdf

***Received from external e-mail address (non ITC domain). Exercise caution while clicking any attachments or links!!!!**

Dear All,

Please find the attached reports of the Compressed Air Management System for date 15-Dec-20.

Thanking you,
 VP Vision

- Report types:
- Daily report for average CFM, pressure & temperature machine wise area wise
 - Monthly report average CFM, pressure & temperature machine wise area wise
 - Customize report for any time period

Daily mail to stake holders



Data on mobile

Average CFM used per month for producing 1 MNC

Maker	Oct-20	Nov-20	Packer no.	Oct-20	Nov-20
20	6.2	3.1	33	2.3	1.8
21	1.4	1.1	34	3.0	1.0
22	3.0	2.4	36	5.3	2.7
23	4.9	6.3	46	1.4	1.2
25	4.1	4.5	47	1.6	1.0
26	1.8	1.7	64	20.8	1.8
27	4.2	4.2	66	1.0	0.9
28	1.1	1.3	50	10.1	9.7
29	8.0	7.2	53	3.6	4.0
30	2.6	2.6	54	4.0	4.3
			62	2.6	2.2
			63	3.0	2.9
			58	3.1	2.7
			59	5.2	3.8
			60	0.2	3.8
			70	2.9	2.5
			72	2.7	1.8
			73	4.4	2.8

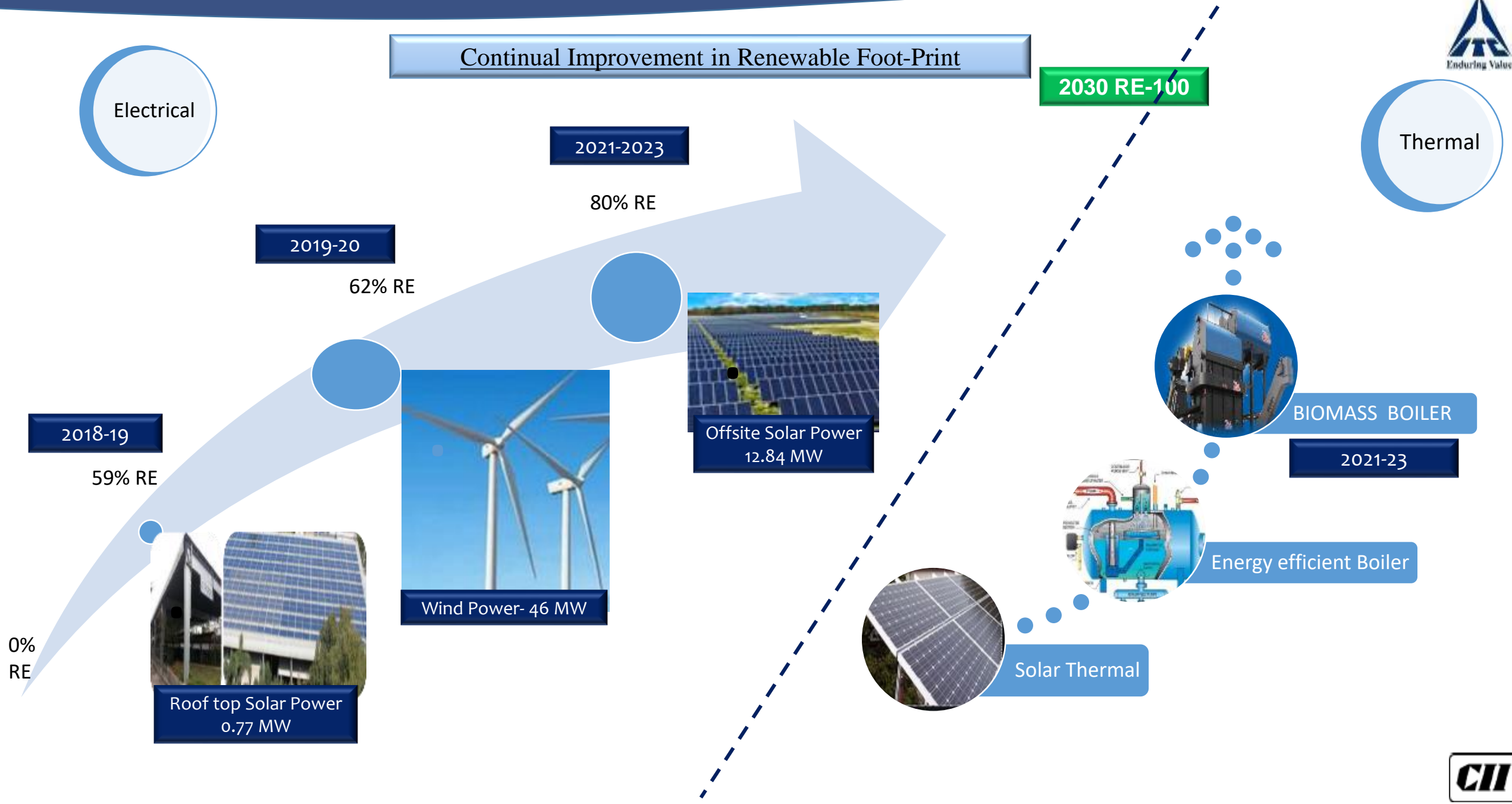
Correction based on flow meter readings



RENEWABLE JOURNEY



Continual Improvement in Renewable Foot-Print



Electrical

Thermal

2021-2023

2030 RE-100

2019-20

80% RE

62% RE

2018-19

59% RE

0% RE

Roof top Solar Power
0.77 MW

Wind Power- 46 MW

Offsite Solar Power
12.84 MW

BIOMASS BOILER

2021-23

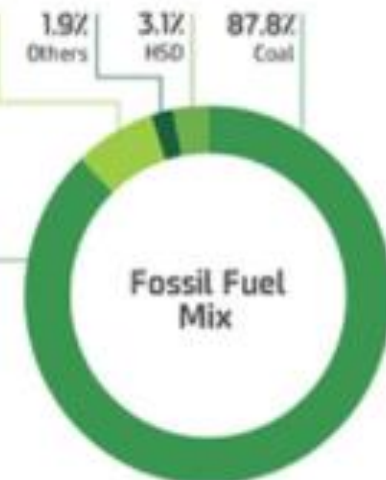
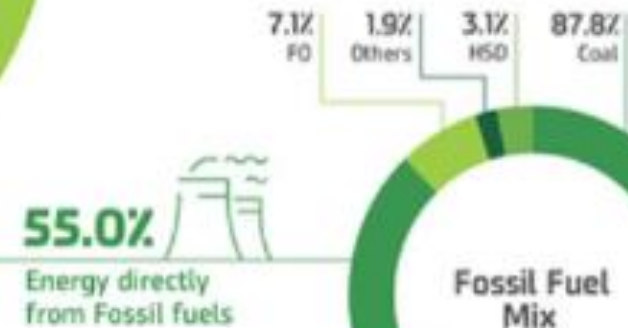
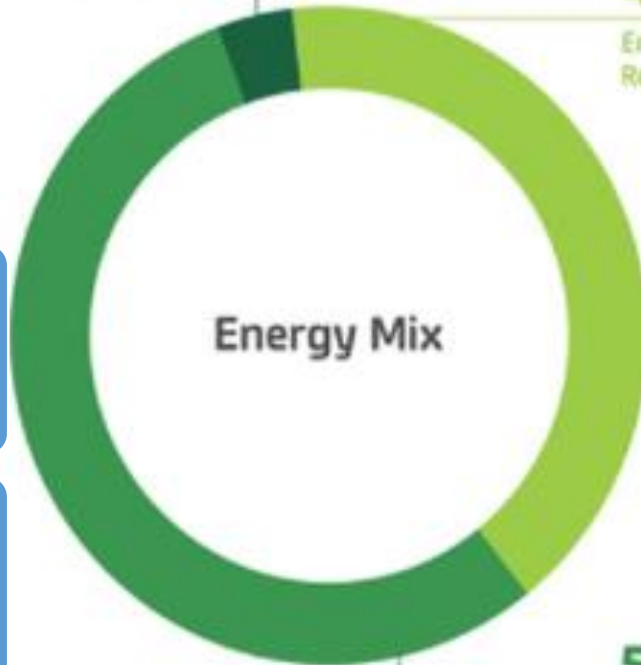
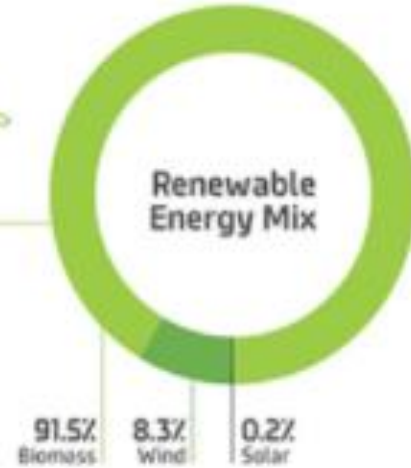
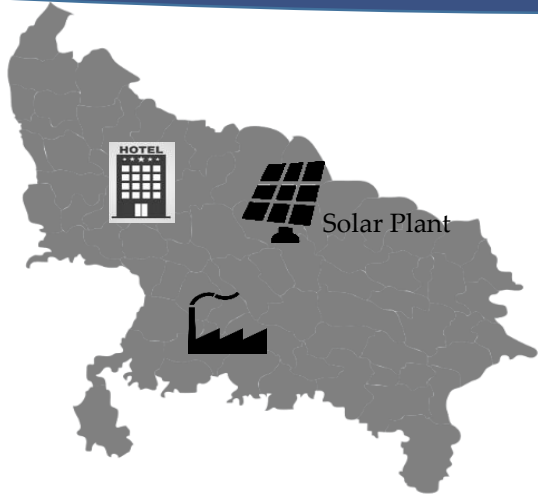
Energy efficient Boiler

Solar Thermal





OFF-SITE SOLAR- 12.84 MW

2030 100% renewable
Energy Footprint



 Land Procurement Completed

 EPC Kick Off and Procurement Q3

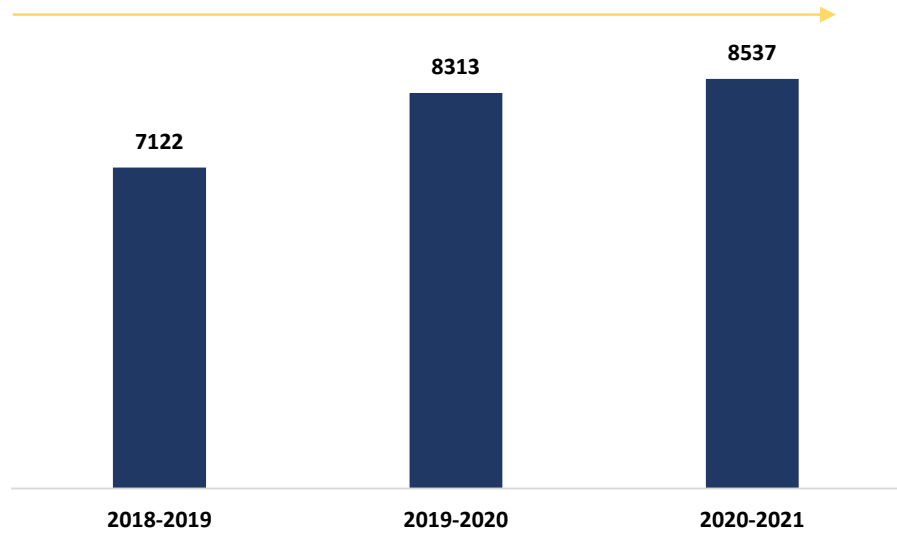
 Commissioning of project and connectivity to grid Q4 21-22

GHG EMISSION (YOY)

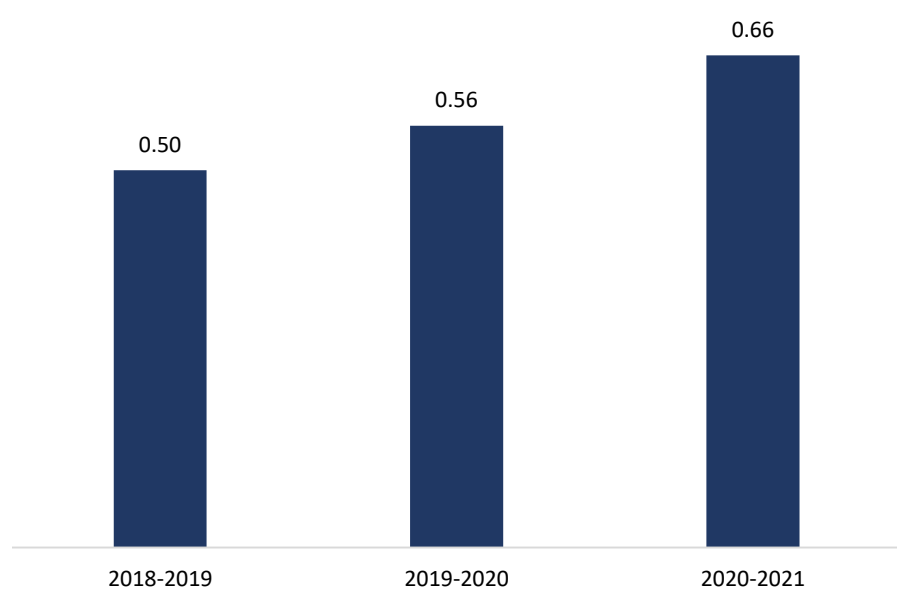


GHG Emission Scope 1& 2

2016-2017 Base line



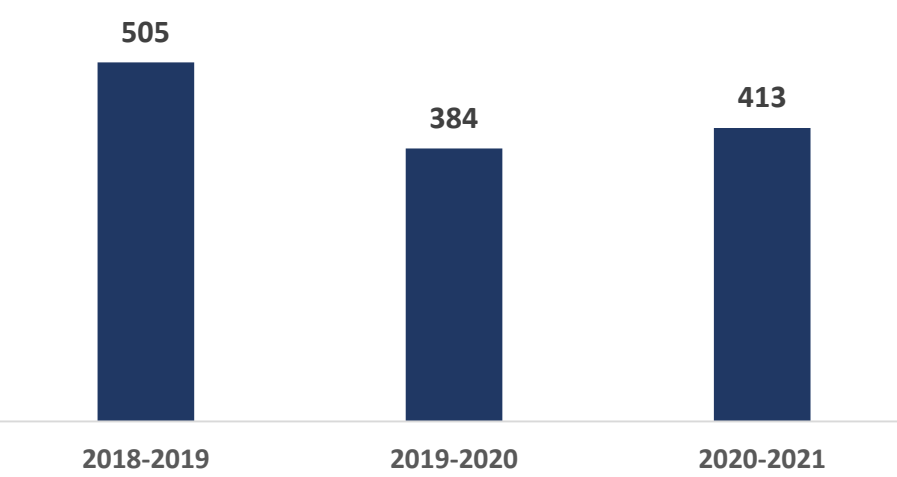
Total Emission Ton CO₂/MNC of Final Product



Plan for Ton Co₂ reduction

- Offsite solar plant to enhance renewable footprint by 100%
- Minimal OCM Dispatch.
- Channelizing better supply chain management with optimal transportation.

GHG Emission Scpoe-3(Tons)



Carbon Positive
15 YEARS IN A ROW



Water Positive
18 CONSECUTIVE YEARS



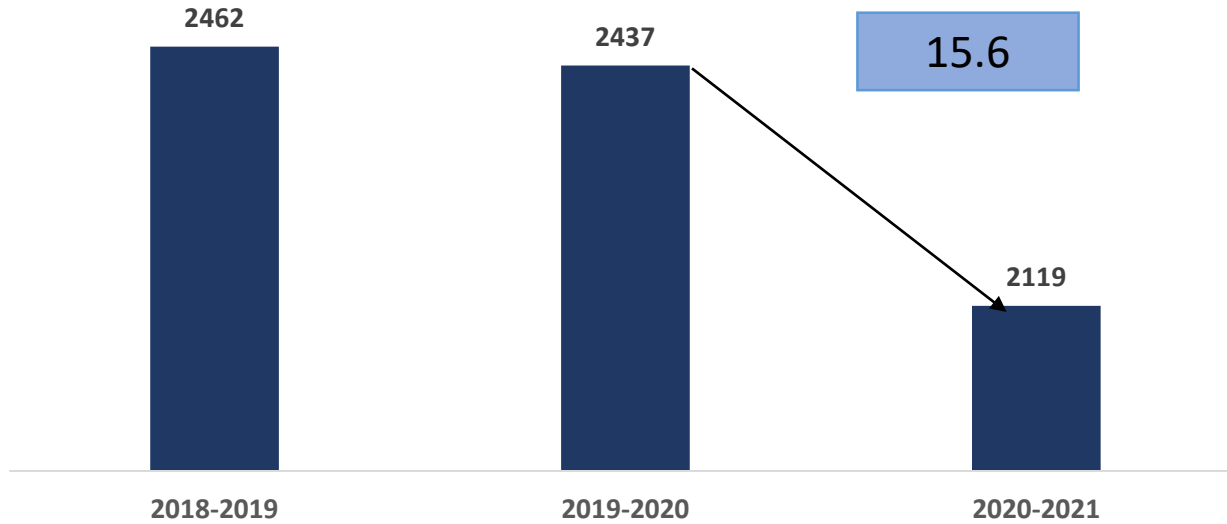
Solid Waste Recycling Positive
FOR LAST 13 YEARS



WASTE MANAGEMENT



Waste in Tons



Waste Classification:

- Solid waste
- Plastic Waste
- E-waste
- Hazardous waste
- C&D
- Others



Plan FY 2021-23

Tobacco waste



Cigarette paper



Agro waste



Convert into biomass fuel





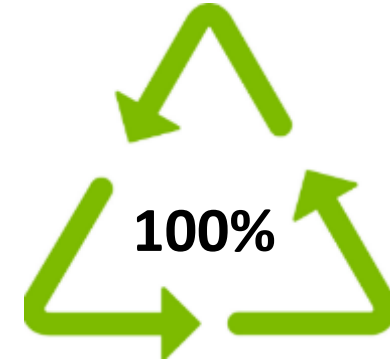
Bio mass boiler



FUEL SUBSTITUTION WITH UTILIZATION OF PROCESS WASTE



Waste material	Vendor	Use of the waste
	TVT Chennai	Reused
	PPB Haridwar	Reused
	PPB Munger	Reused
	Max Speciality Films Limited Mohalli	Reused
	General metalized Nasic	Reused
	RGL Maneser	
Waste cigarette Paper and HLCs	PSPD Kovai	Recycle
	PSPD Bhadrachalam	Recycle



Green Supply Chain-Policy

All ITC Units continue to pursue efficient use of raw materials through focused efforts on waste elimination/reduction. Moreover, as most of ITC's Businesses are vertically integrated, this provides the Company unique opportunities for exercising greater control over optimum utilisation of raw materials, recycling/reuse of wastes as well as efficient logistics.



Purchase & Reuse Policies for Renovation and Future Expansion

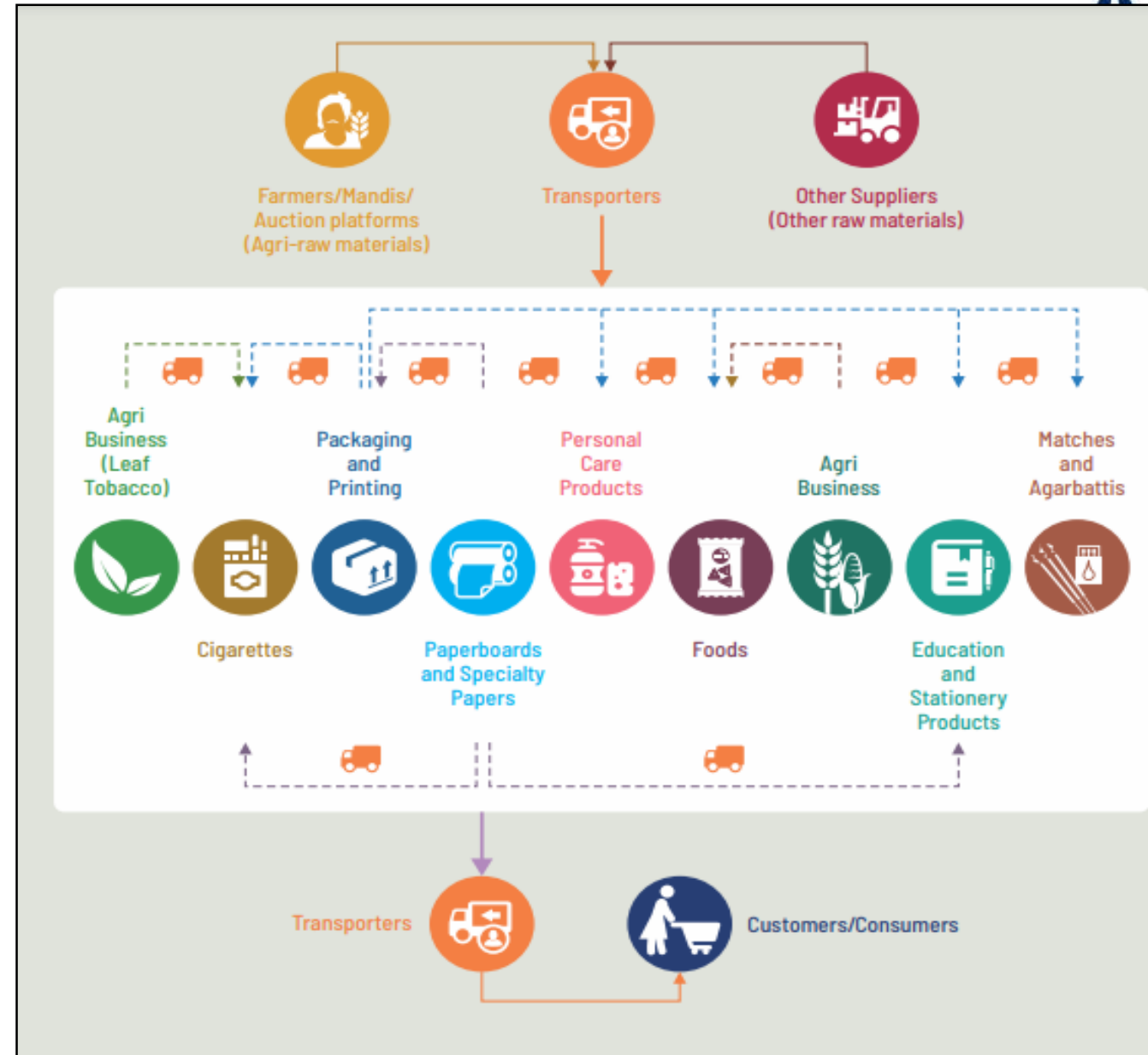
The purpose of this policy is to reduce the environmental harm from materials purchased, used, and disposed of in the operations, maintenance and upgrades of buildings.

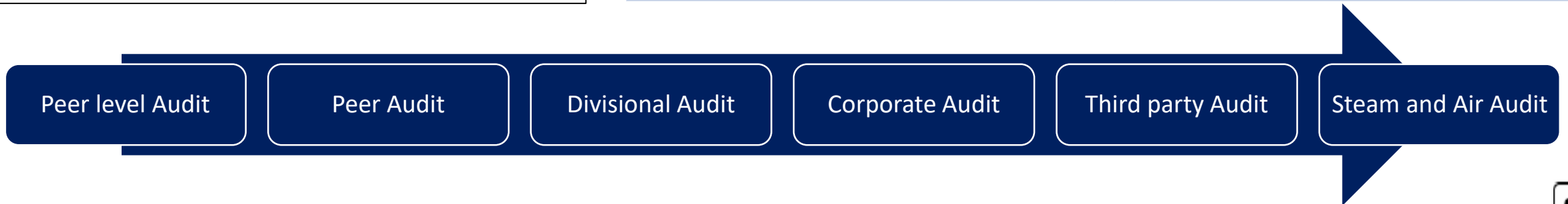
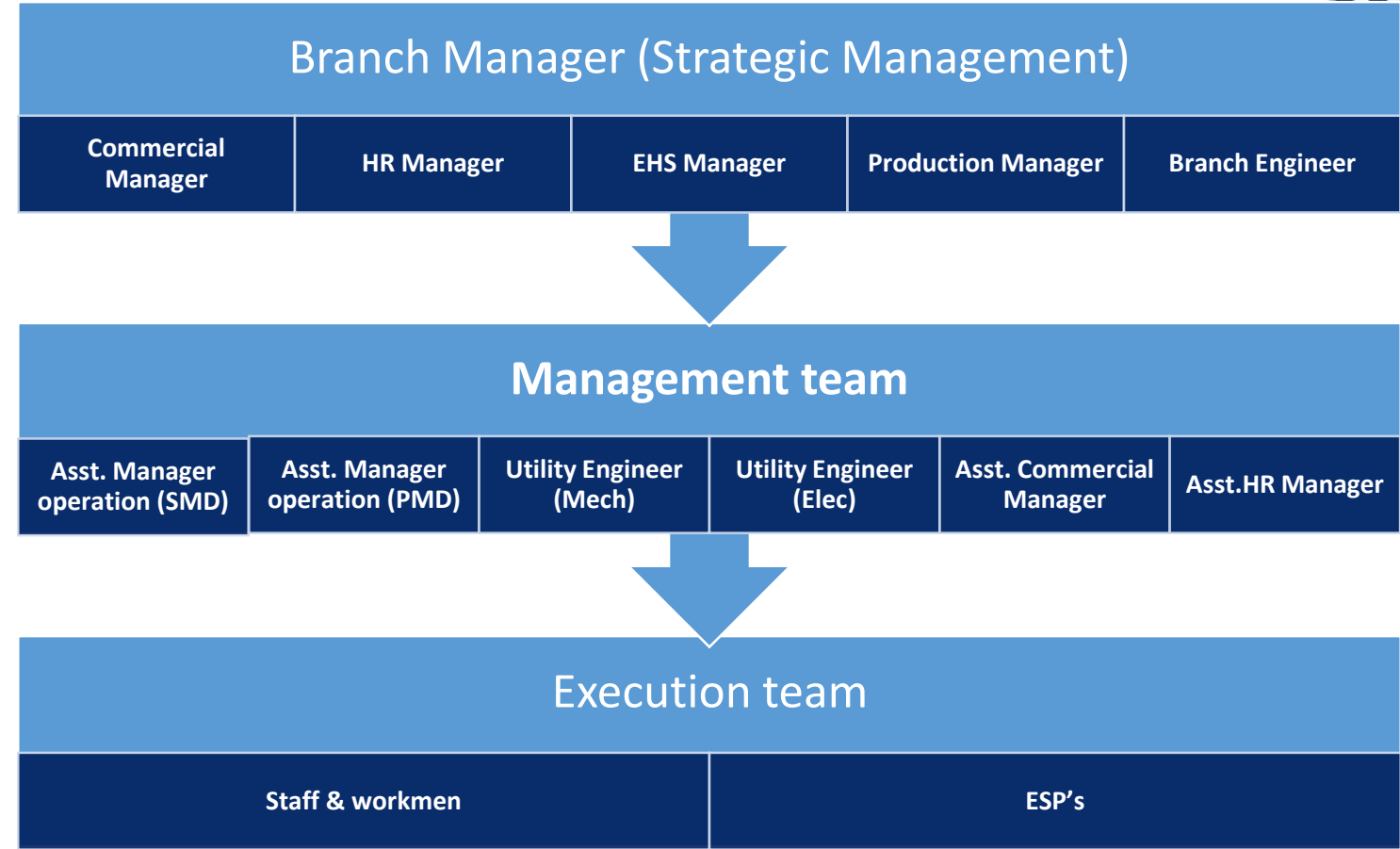
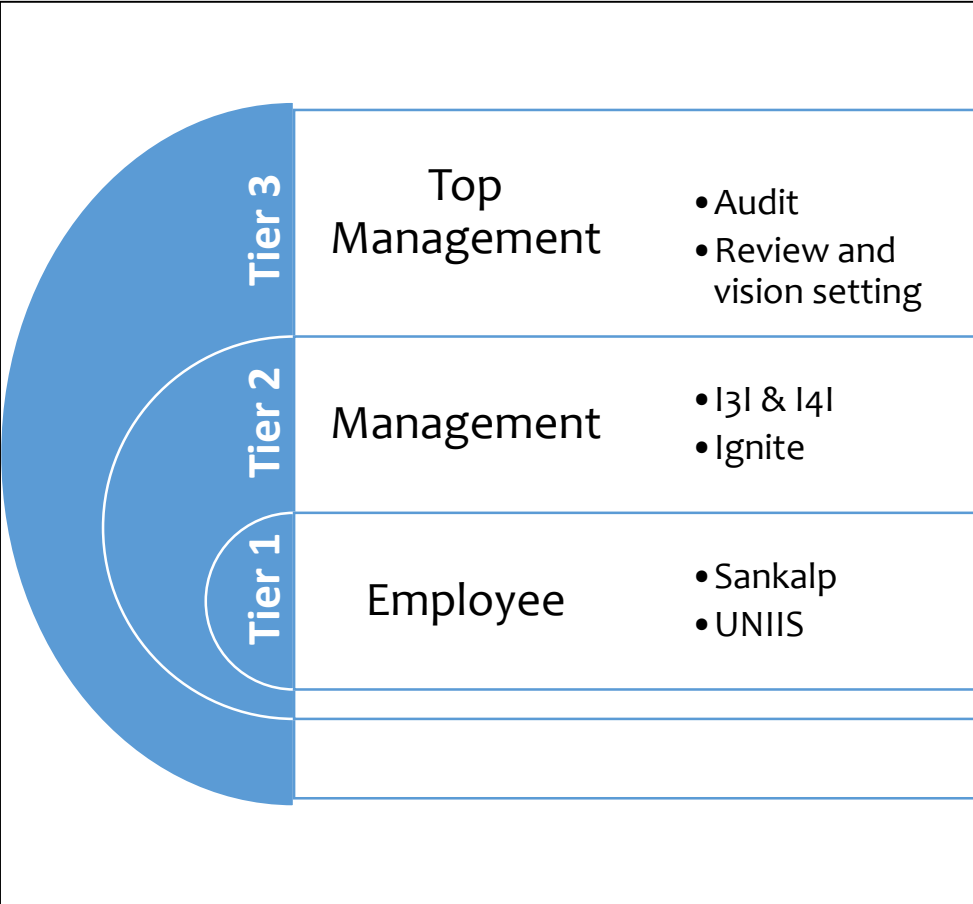
The purchase policy requires adopting following sustainable measures during any renovation and future construction work at ITC Limited Saharanpur and to follow sustainable purchasing for any major renovation and future expansion work at project site.

- Purchases should have building construction materials such that the total sum of post-consumer and post-industrial recycled material shall be at least 20% of total building material cost.
- Purchases should have at least 75% material manufactured or extracted and processed within 500 km of the project site.
- Purchases should have at least 75% Forest Stewardship Council (FSC) – certified wood/paper products.
- Purchase should have VOC limits of all interior finishing products (paints, adhesives, sealants and coatings) within prescribed limits of IGBC green factory building.
- Purchase should not have any asbestos based materials.
- For any construction at least 10% construction materials of the total cost of the building materials should be salvaged, refurbished and reused.

This is the responsibility of project manager/purchase manager that whenever any renovation or construction activity will be performed at site, he must follow all guidelines for sustainable purchase policy. The responsible person must execute the policy to strictly follow all guidelines as described must keep the records of all building material procured within site, which must include extraction/manufacturing distance, recycle content, certification etc.


By Order
Branch Manager
For ITC LTD





ENERGY MONITORING SYSTEM




Electrical

Thermal



Daily monitoring of Grid utilization



Real time monitoring of power factor for all major load



Daily performance monitoring of DG and Solar plant



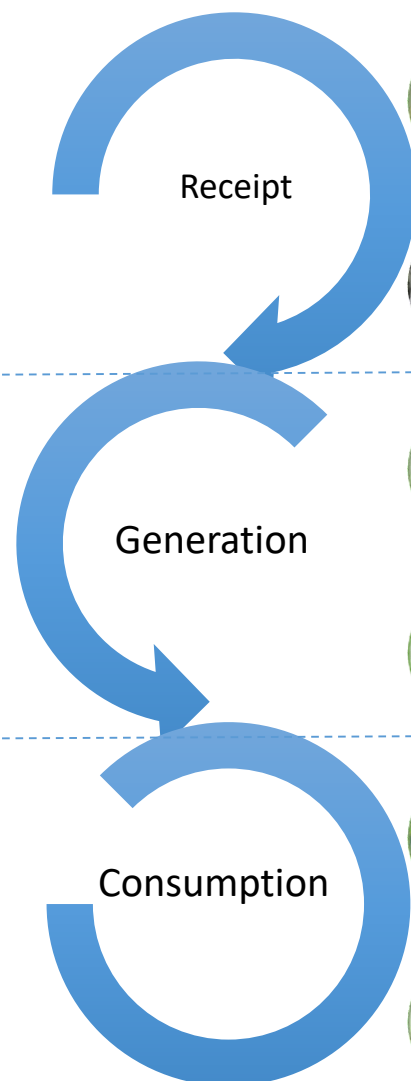
Real time monitoring of power consumption of major equipment by energy management system



Online monitoring of electrical loading of all sources by energy management system



Industry 4.0 solution for monitoring health of energy intensive equipment, Compressed air alerts etc.



On receipt Fuel quality monitoring



Normalization as per ASTM (In line with oil company)



Daily Steam consumption monitoring



Daily boiler performance monitoring-EVR



Monthly Steam trap monitoring



Condensate recovery monitoring and analysis

ENERGY REPORTING AND REVIEW MANAGEMENT



Unit

Daily
(Dept.
Management
team)

Weekly
(Deptt. HOD)

Monthly (Strategic
Management
team)

Division

Quarterly
Sustainability
Reporting
(Divisional EHS)

Yearly Unit Review
(Divisional
strategic
Management)

Yearly Divisional
EHS Audit

Corporate

Yearly
Sustainability
Review and
reporting

Yearly Corporate
EHS Audit

Third party Audit
by AEM
(Three year once)



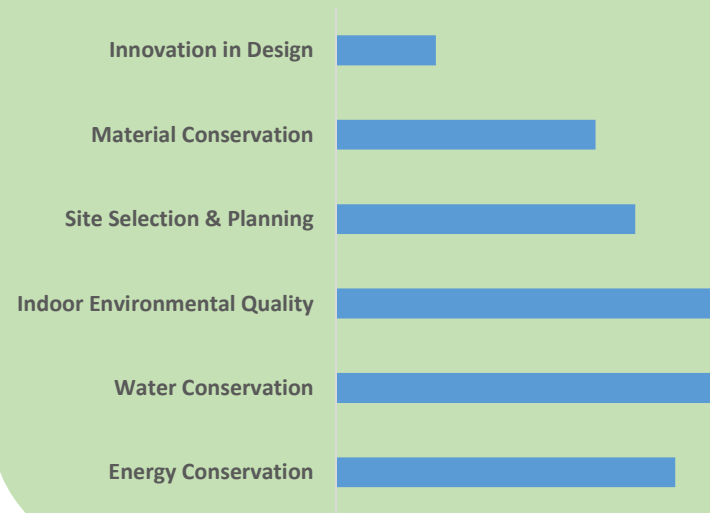
... grid)
... from Electricity
... suppliers for the
... notes/research centres/offices only. The
... of energy from renewable resources
GENERATED BY ITC (such as ITC-owned wind farms)
should be reported in Section 'Energy generated from
renewables (by ITC)'. If any certified green energy has
been purchased in the reporting period, report in the
data field 'Certified Green electricity purchased'.
Energy supplied to colony or for any other welfare
activities should be excluded.

	Value	Unit	Quality	Comment
1st quarter	2306.1	MWh	Exact	from 22.03.2018 to 30.06.2018
2nd quarter	3001.62	MWh	Exact	from 16.06.2018 to 15.09.2018
3rd quarter	3143.58	MWh	Exact	from 15.09.2018 to 31.12.2018
4th quarter	2940.72	MWh	Exact	from 15.09.2018 to 31.12.2018



Green Building Certification

(Platinum Rating)



ISO 50001 Energy Management system

Agreement with DNV GL

Initial Assessment
in Progress

2016-2021

- Improvement of Specific Energy by 10 %
- Improvement in Renewable Share 40 %
- Improvement in Specific Water 40 %



2021-22

- Offsite Solar plant-12.86MW
- Renewable footprint-60%
- Green Energy Modelling for Group Level



2020-30

- GHG reduction by 50% over 2014-2015 baseline
- Digital & Robotic Operations
- Exploring environment friendly biodegradable Materials

2021-23

- Long Term Derisking on Ground water
- Bio Mass Boiler- 100 % thermal renewable.



Key initiatives

Design



Overground fire hydrant system



Lifelines on trusses in PMD



Roof edge protection system



Air blower for confined space



Machine Guarding design improvement



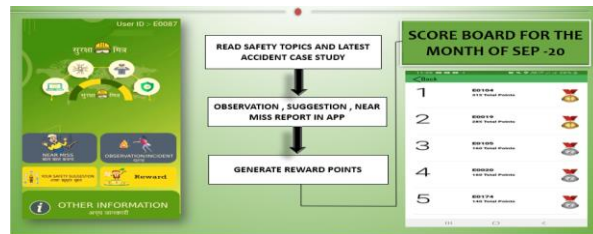
Safety Platforms for high reach activities

Systems & Processes



iComply Portal and Mobile App stabilization and usage for daily monitoring of COVID practices

Engagement & Capability development



Recognition based approach implemented through in-built quizzes in order to maximize the reach and participation at the ground level

Awards



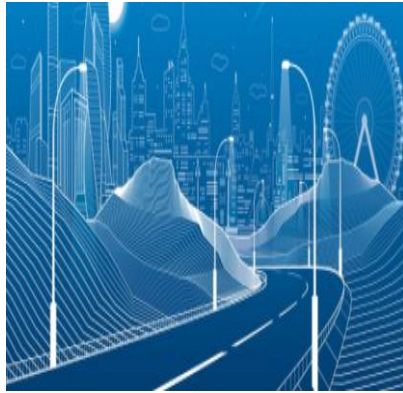
COVID-19 at workplaces – Best Workplace Practices



Excellent Energy Efficient Unit CII



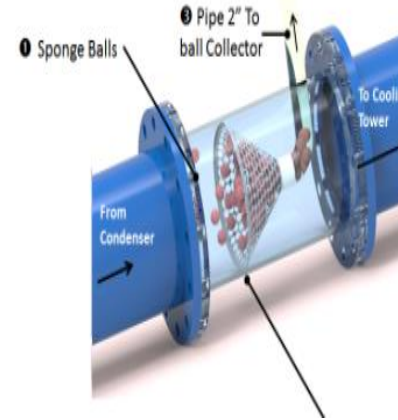
Runner up in Environment Excellence Award - ICC



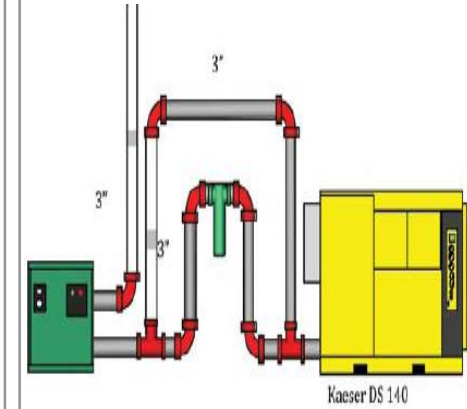
Smart
Lighting
system



Energy
efficient
fans



Automatic
Chiller Tube
cleaning
system.



Compressed
air
monitoring
system





THANK YOU