# CII NATIONAL Awards-2023


## ITC Limited-Kidderpore Unit, India Tobacco Division

## Sept 2023

Confederation of Indian Industry

**Presented By :**

R K Himanshu – Head of Engineering | N.M. Prasad – IC Electrical | Ritesh kumar – IC Utilities

# ITC: An Exemplar In Triple Bottom Line Performance

## Environment

- **Water Positive :** 21 years in a row
- **Carbon Positive :** 18 consecutive years
- **Solid waste recycling positive :** 16 consecutive years
- Soil & Moisture Conservation to 1.56 lakh acres.
- Renewable Energy share– 43 %
- Social & farm forestry initiative has greened over 1.5 Acres


## Economic

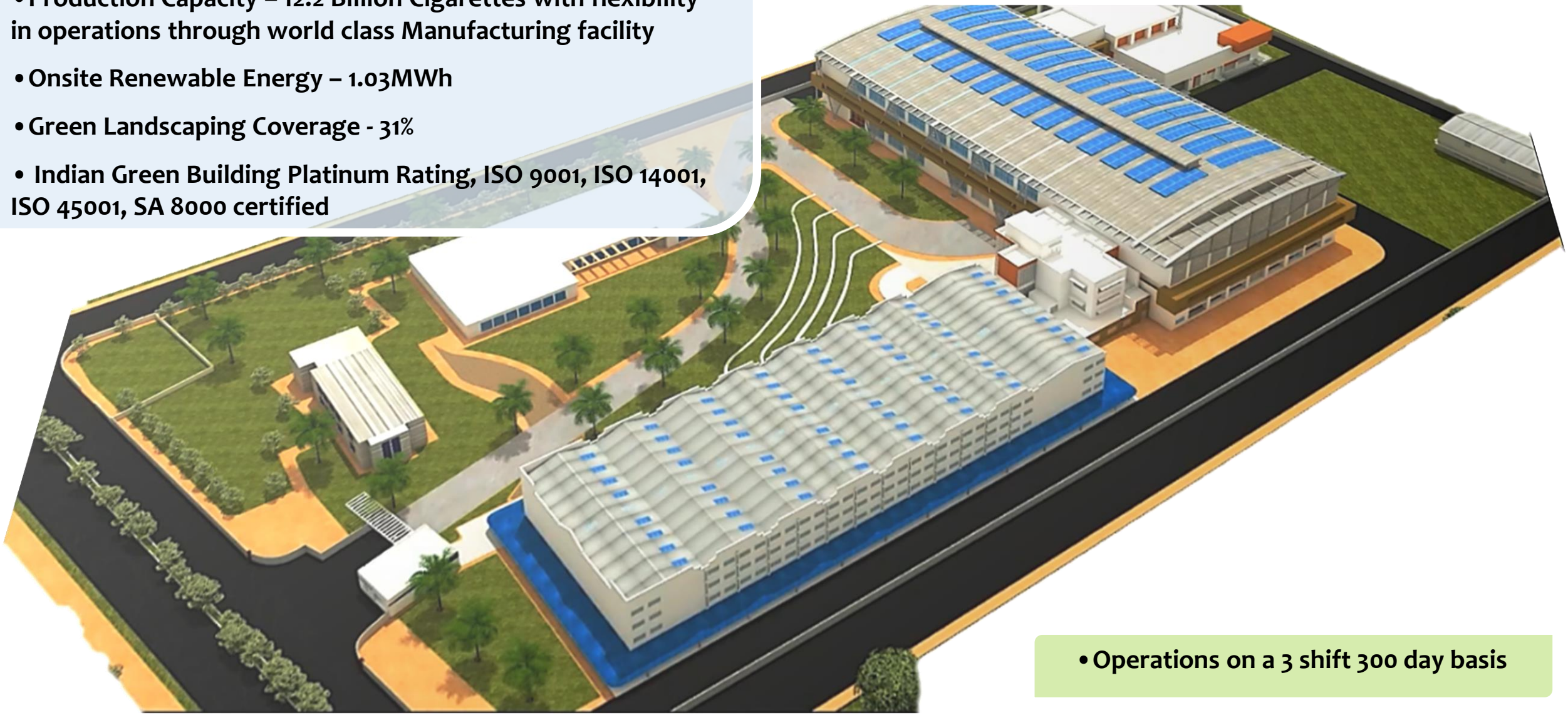
- Market Capitalization Over Rs.550000 Crs.
- Turnover: Over Rs. 69481 Crs.
- Powered by the vitality of world-class brands

## Social

- Creating around 6 million sustainable livelihoods
- Educating 80,00,000 children
- Benefitting 4 million farmers by e-choupal.
- 160 million person-days of employment generated

# ITD Kidderpore

- Cigarette manufacturing operations by ITC commenced in 1935 in Kolkata Port Area
- Production Capacity – 12.2 Billion Cigarettes with flexibility in operations through world class Manufacturing facility
- Onsite Renewable Energy – 1.03MWh
- Green Landscaping Coverage - 31%
- Indian Green Building Platinum Rating, ISO 9001, ISO 14001, ISO 45001, SA 8000 certified



- Operations on a 3 shift 300 day basis

# Manufacturing Process Flow – Cigarette

Encapsulated Flavour

Filter Mfg

Cut Tobacco

Cigarette Making


Dust Recovery System

Cigarette Packing

Finished goods storage

Spiral Conveyor

# Kidderpore Factory Highlights – 22-23

Reduction in Specific energy Consumption by 5 % .

Renewable Energy share increased by 95 % YOY

Total investment of Rs 2.7 Crores for RE and Energy Conservation Initiatives .

First entity in WB to Wheel Green Energy through ISOA

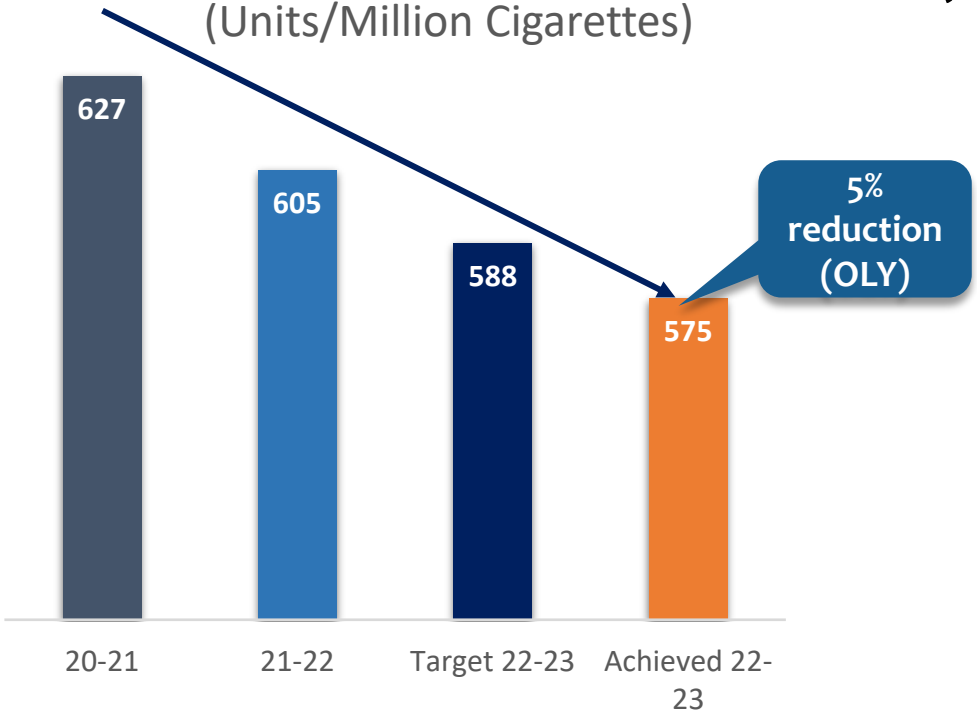
Sustenance of Specific Water Consumption .

# Energy Management

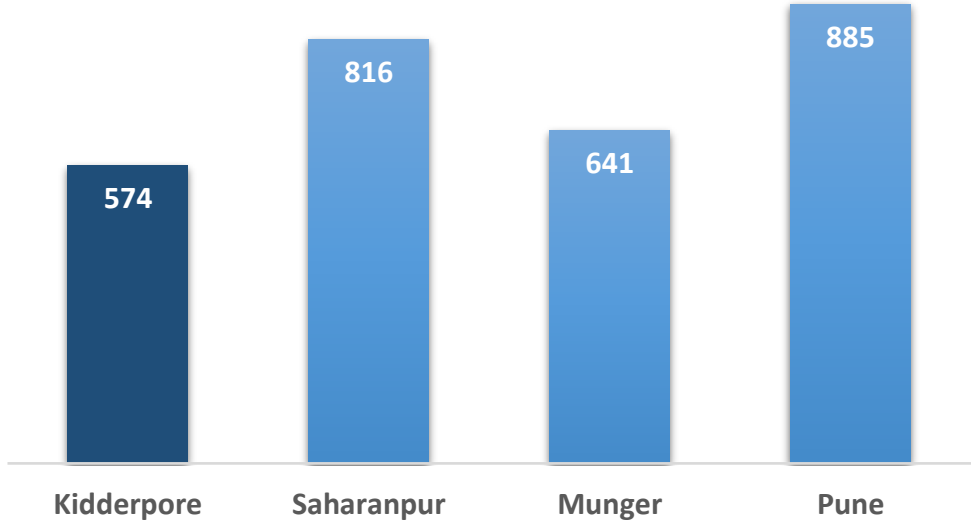
# Energy Performance

## Performance 2022-23

### SPECIFIC ENERGY CONSUMPTION
(Units/Million Cigarettes)




### NATIONAL BENCHMARKING
(Units/Million Cigarettes)




**Additional Load**

- 10 no's Air curtains load increase by 6Kw - 4 Units/MNC
- 18 Inkjet printers added in system Load increase of 6kw load- 4 units/MNC
- Impact of heat load on HVAC – 2 units/MNC

**Initiatives Impact – 20 Units/MNC Volume impact 10 Units/MNC**

**National Benchmark across ITD Units**

| Year | Production (Million Cigarettes) | Energy Consumption (MWH) |
|---|---|---|
| **2020-21** | 8525 | 5348 |
| **2021-22** | 8583 | 5196 |
| **2022-23** | 11611 | 6664 |

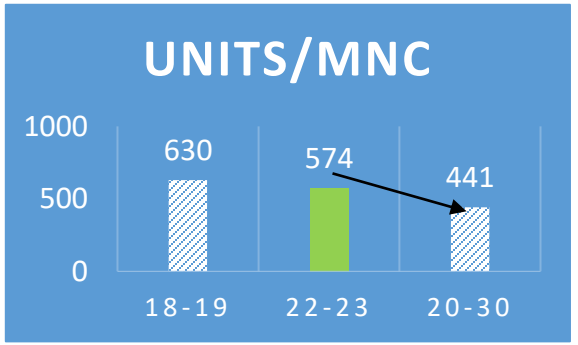
**Production increased by 35% while Absolute energy increase by 28% only.**

# Target SEC

*Short Term & Long Term*

## Target SEC - Long & Short Term & Renewable Energy

- 5% reduction in SEC in 2023-24 through investment of Rs. 1.3 Cr in energy saving initiatives
- 30 % reduction in overall SEC by 2030 (baseline taken as 2018-19)
- 100% renewable energy (Electrical) by 2030




## Road Map – Initiatives Under Planning Stage

- Adopt smart manufacturing and digitalization ( AI/ML controls) to optimize energy consumption by improving productivity / machine efficiency.
- Predictive control of HVAC and Utilities parameters by using AI/ML (Artificial intelligence , Machine learning).
- Replacement of 700 cfm x 2 no's air compressors with energy efficient compressor .
- Exploring latest technologies like Robotic/Drone based cleaning to improve PR of solar plant.
- 20 MWp Offsite Solar Plant in Purulia, West Bengal .(work started )

# Encon Projects Planned in 2023-24


Total Investment:

**₹ 1.3 Crores**

Potential Energy Saving:

**630 MWh**

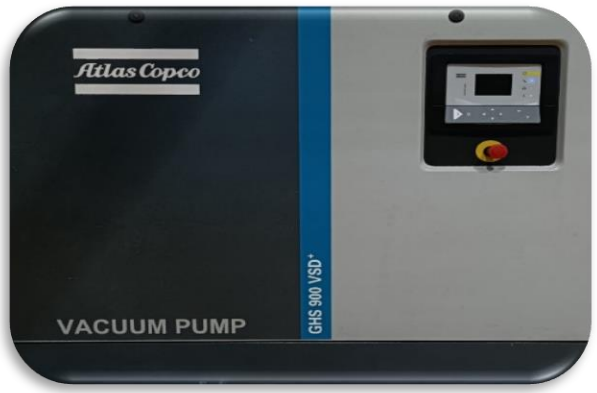
| | |
|---|---|
| R | Centralized Vacuum Pump for Packing machines . |
| R | Continewm Nets for AHU’s to optimize chiller energy reduction. |
| R | Conventional fan replacement with BLDC fan in AHU for Cell1. |
| R | Replacement of Streetlights with battery operated solar street lights. |
| R | Centralized Temperature setpoint control of VRV's |
| R | Induction of light pipes in Finish goods area and goods store and high bay light replacement with energy efficient lights; Celling fans replacement in canteen with BLDC fans HVLS Fans for Case Packer Area |

R: Replicable

# Energy Management – Plan 2023-24

## Centralized vacuum pump for packers .

A centralized vacuum pump is being installed for all the packing machines , removing the individual vacuum pumps .




**Investment:**

- Rs. 81.5 Lacs
- Payback period : 45 months

**Envisaged Benefits:**

- Saving of 298 MWh

## Solar street lights

Replacement of street light with 35W solar street lights to reduce the energy consumption and increase RE Portfolio.

**Investment:**

- Rs. 12.5 Lacs
- Payback period : 72 months

**Envisaged Benefits:**

- Saving of 28 MWh

## Centralized temp set point control for VRV.

A centralized temperature controller for all VRV'S to maintain a uniform temperature and optimization of energy .


**Investment:**

- Rs. 2.5 Lacs
- Payback period : 22 months

**Envisaged Benefits:**

- Saving of 18 MWh

# Energy Saving projects implemented in last three years

| Year | No. of energy savings projects | Investments (INR Million) | Electrical savings (MWH) | Thermal savings (Million Kcal/MTOE) | Savings ( INR Million) | Impact on SEC (Units/MNC) (Electrical, thermal) |
|---|---|---|---|---|---|---|
| 2020-21 | 9 | 37.38 | 1111 | NA | 8.68 | 130.30 |
| 2021-22 | 6 | 25.03 | 1690 | NA | 5.48 | 196.90 |
| 2022-23 | 8 | 27 | 1030 | NA | 8.1 | 90.00 |

# Encon Projects Implemented in 2022-23


Total Investment:

**₹ 2.70 Crores**

Potential Energy Saving:

1036 **MWh**

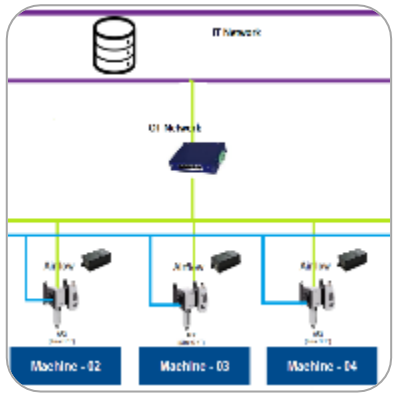
- R — Industry 4.0 based compressed air monitoring and control system
- R — Capsule plant digitization and energy management integration
- R — Compressed Air lines upgradation
- R — PIR lights at utilities
- R — Chemical less water treatment system for Cooling water
- R — Optimisation of motor runs through Smart Automation and machine PLC program modification

R: Replicable

# Encon Projects implemented in 2022-23

## Compressed air line upgradation & monitoring system

- Use of IoT enabled AF2 flow sensors for online monitoring and reporting of compressed air consumption of individual machines
- Replacement of PU pipes with aluminum pipes to eliminate compressed air leakage




**Investment:**

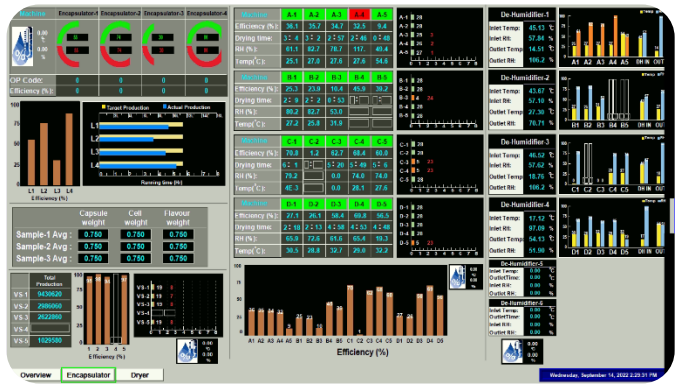
- Rs. 28.5 lacs
- Payback period : 60 months

**Envisaged Benefits:**

- Saving of 284 MWh

## Capsule Plant Digitization

Real time machine performance data from the capsule and filter plant to aid in quick analysis and actioning



**Investment:**

- Rs. 80 Lacs
- Payback period : 53 months

**Envisaged Benefits:**

- Saving of 230 MWh

## PIR Lights at Utilities

Installation of variable lumen lights for low movement areas

**LED Lights with smart PIR sensor**

**Investment:**

- Rs. 5 Lacs
- Payback period : 56 months

**Envisaged Benefits:**

- Saving of 14 MWh

# INNOVATION THROUGH DIGITALIZATION

Smart manufacturing,
unlocking new possibilities

Smart Factory

Enduring Value

# Business Context

Heavy impetus on smart manufacturing & benchmarking against “Lighthouse” standards

Lighthouse approach

- Agile approach
- IIoT platform based architecture
- People capability building

## Key Value Drivers

### Digital assembly & machines

- Shop-floor data integration
- Secondary manufacturing
- Capsule Mfg.
- Capsule Filter Mfg.

### Digital enabled sustainability

- AI / ML based control of HVAC
- IIoT based compressed air monitoring of SMD machines

### Digital performance management

- HVAC equipment performance monitoring & alert generation in case of deviations

### Digital maintenance

- SQL based digital maintenance system for SMD shop floor
- HVAC equipment automatic maintenance alerts generation

# Digitalization Journey so far…

## Journey of manual data collection from machines to advanced analytics

### Data acquisition from shop-floor technology

- Upgradation of obsolete technology on shop floor for facilitating integration
- Exploration and deployment of smart sensors to capture critical process parameters
- Firmware upgradation of machine PLCs to bring it to same platform

### Design of network architecture

- Conceptualization & implementation of contemporary OT network architecture
- Industrial grade active & passive components for 10 GBPS high speed OT network
- ITSS standard segmentation of shop floor machines in line with ICS guidelines

### Visualization of data

- Live display of real time performance for quick analysis and actioning
- Trend analysis of live rejection and downtime data

### OT-IT Integration

- New generation firewall for IT security compliance -
- Visualization of SCADA and historian access on IT network –
- Auto-mails and SMS triggers for quick review and actioning

### Advanced Analytics

- IIoT based platforms for advanced analytics

Azure Grafana MindSphere by SIEMENS

- In-house coding platforms for easy analysis **(Ex. Low code no code)**

Power BI Microsoft PowerApps

**10+** Use Cases identified and under implementation

# IoT based compressed air consumption monitoring system- Case 1

## Problem Statement

- Currently, there is no system of monitoring air consumption of individual machines
- Fixed frequency of third party audit leading to static work on leakage detection & arresting
- Consumption pattern of like to like technologies not similar

## Solution implemented

- IoT enabled sensors installed in each machine for monitoring of compressed air consumption
- All sensors integrated to a central location
- Data aggregation and dashboard development for real time consumption monitoring

## Benefits envisaged

- Reduction in compressed air consumption by 8% -10% **(Rs. 14 lakh/year)**
- Elimination of annual third party compressed air audit **(Savings of Rs. 3 lakh/audit)**
- Benchmarking of compressed air consumption between technologies and factories

**SMD Machines**

*Maker*

*Packer*

**IoT Sensors**

**Connectivity**

*IoT Gateway*

**Data Analytics+ Historian**

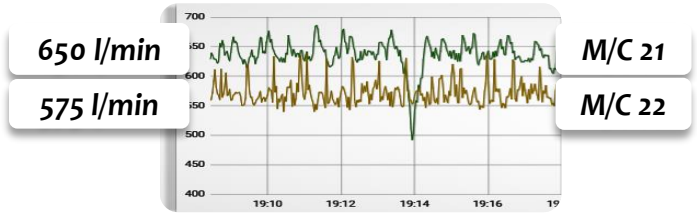
Grafana

*Analytics software*

**Applications**

- ✓ Benchmarking between technologies
- ✓ Alerts in case of deviations from set limits
- ✓ 3 years historical data storage

**Use Case**




- ✓ Compressed air consumption across FOKCE FX2 of cell 2 monitored
- ✓ Discrepancies found in air consumption
- ✓ **Potential savings of 25K /year/machine due to benchmarking**

# Industry4.0 based control of HVAC system- Case-2

## Problem Statement

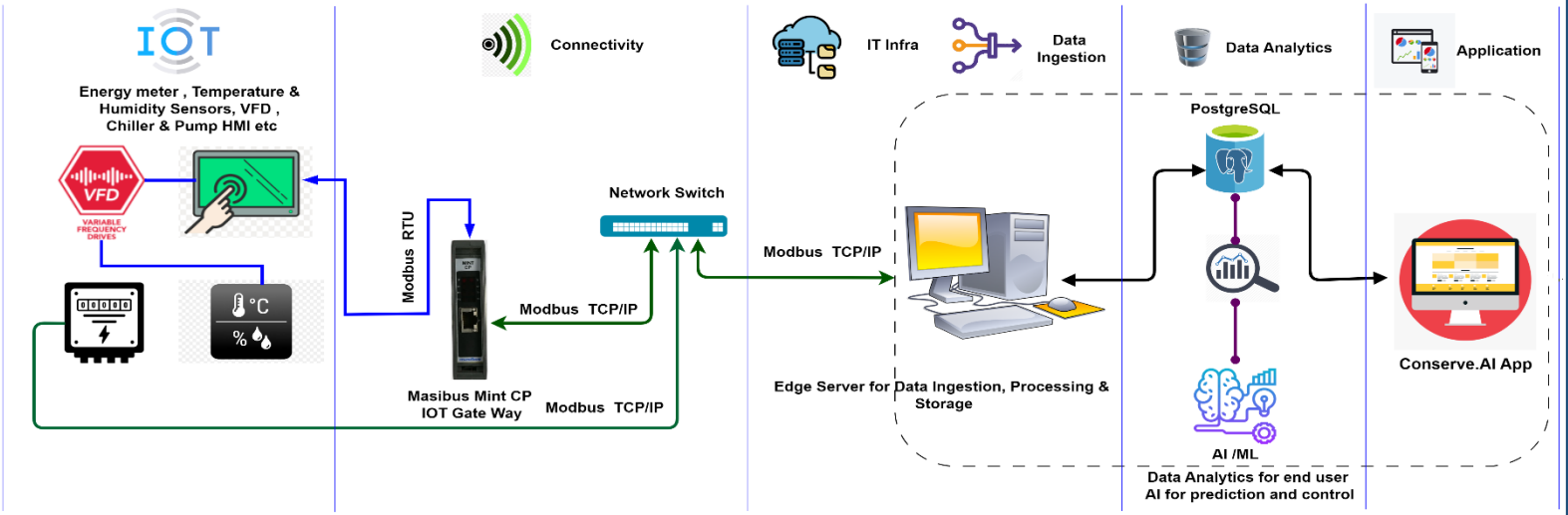
- Manual process of data logging of ambient and shop-floor conditions on hourly basis
- Silo based operations of HVAC equipment; no provision to monitor supply side efficiency
- Chiller set point decided basis manual records and experience of operators, leading to inefficient control

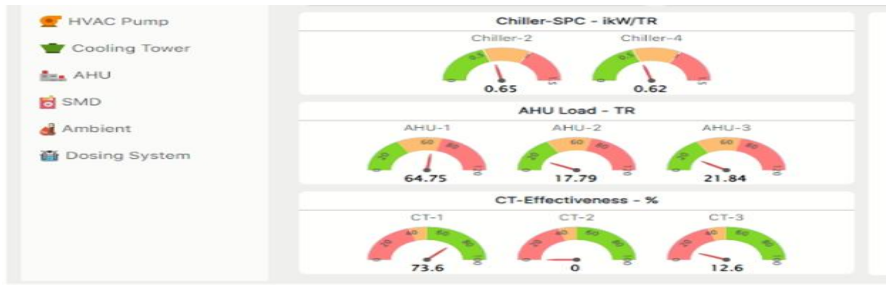
## Solution implemented

- Explored and deployed infrastructure to network HVAC equipment together
- Introduced IoT enabled sensors for real time data logging of ambient and shop floor conditions
- Dashboard development for performance monitoring
- Automatic control of chiller set point based on ambient & shop floor conditions

## Benefits envisaged

- Reduction in HVAC energy consumption by 10-12%
- Automatic report generation for analysing HVAC equipment performance
- Alert generations in case of any deviation from set point
- Potential **savings of Rs. 11.5 Lakhs/year in energy cost**




1. Live dashboard for performance monitoring of all critical equipment installed
2. Data being used for AI/ML based chillers set point optimization.

# CONTINEWMN Nets for AHU'S- Case 3

## Problem Statement

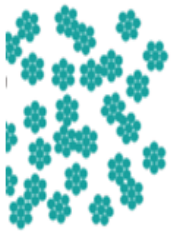
- HVAC system constitutes of 15-16% of total energy requirements of the factory .
- The load was getting increased with the induction of new machine into the system and its reduction in energy consumption will lead to reduction in specific energy consumption.

## Solution implemented

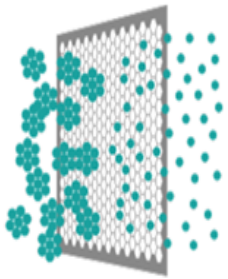
- Explored and installed Continewmn nets for AHU's.
- These Nets are installed on AHU suction Filter ,which emits far infrared rays creating disturbance in water molecule present in air.
- Resulting in increased area of contact between air and heat exchange leading to better heat exchange and better chiller compressor efficiency .

## Benefits envisaged

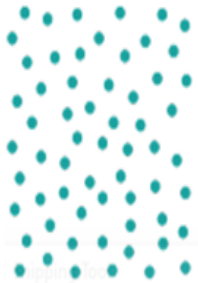
- Reduction in HVAC energy consumption by 10-12%
- potential **savings of Rs. 8 Lakhs/year**



*Naturally occurring air molecules – Irregular cluster*

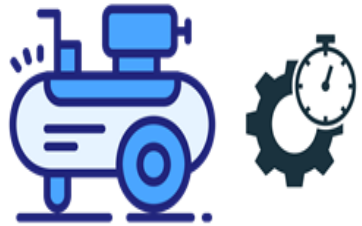


*Air passing through CONTINEWM nets*



*Molecules atomized – increasing air flow and heat exchange properties*

*Reduction in ΔT of chiller; compressor load decreased*



*Improvement in compressor efficiency*

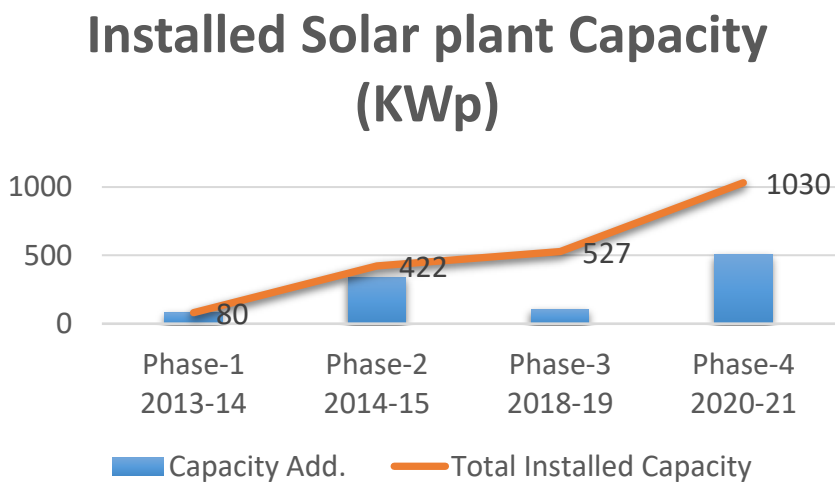
# Sustainability – RE Portfolio

*“ITC aspires to meet 100% of its electrical energy consumption from renewable sources by 2030”*

# Phase wise Investment made for Onsite Solar

**2013-2019**
**Phase-1,2 & 3**

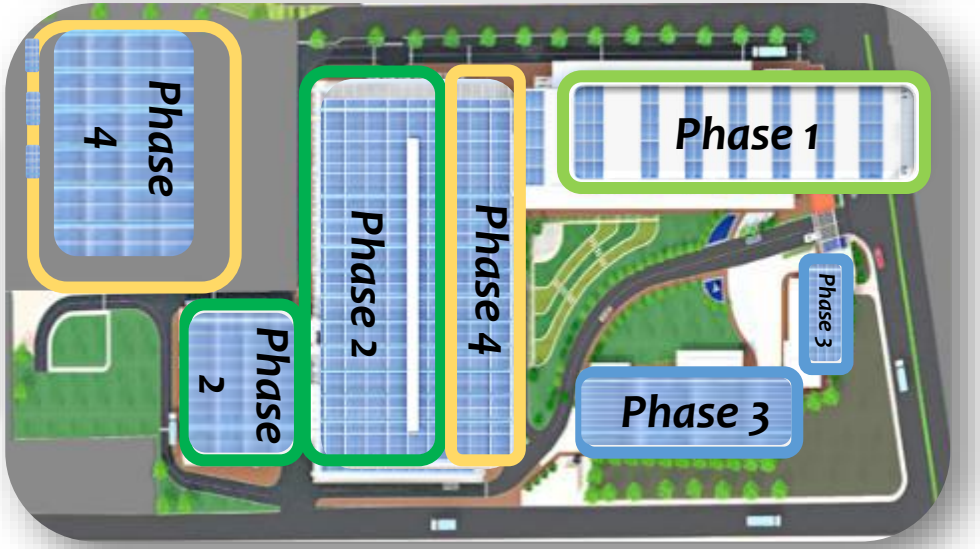
**2020-21**
**Augmentation by 0.5Mwp**




**Key Features**

- Modules Mounting Structure Designed considering Seismic Zone and Amphan Cyclone Wind Load
- **Industry 4.0 based Online monitoring system**

**Total Capex Investment ~ Rs 5.6 Crores**



# Utilization of renewable energy sources

| Year | Type of energy | Offsite/Onsite | Installed Capacity (MW) | Generation (MWh) | % of overall electrical energy |
|---|---|---|---|---|---|
| **2020-21** | Solar | Onsite | 0.53 | 354.93 | 5 |
| **2021-22** | Solar | Onsite | 1.03 | 725.34 | 10 |
| **2022-23** | Solar | Onsite | 1.03 | 866 | 10 |

| Year | Type of energy | Offsite/Onsite | Generation (MWh) | % of overall electrical energy |
|---|---|---|---|---|
| **2019-20** | Wind | Offsite | NA | NA |
| **2020-21** | Wind | Offsite | 316.00 | 5 |
| **2021-22** | Wind | Offsite | 640.18 | 9 |
| **2022-23** | Green energy DISCOM | Offsite | 1489 | 15 |
| **2022-23** | Wind | Offsite | 682 | 6 |

# Net Zero Action plan

Action plan

Completed

**12-13**

Phase –I(old SMD building )
80 KWp

**14-15**

Phase-II and III
(SMD,EC Roof, canteen, solar tree,gate house
439.4 KWp

**20-21**

Phase-IV
(Ground mount solar)
504.3 KWp

**10%**

**2023-24**

- Improve generation efficiency of onsite solar
- Interstate open access.
- Green Power through IEX.
- Green Power from DISCOM

**~ 40-43%**

**2025-30**

Other sources

- Off-site solar plant in West Bengal -20Mw by 2025-26.
- Interstate open access.
- Green Power through IEX.
- Green Power from DISCOM (Started)

**~ 90-95%**

**Other technologies under evaluation.**

- Hybrid solar-wind mill –
- Solar lights for street lights –

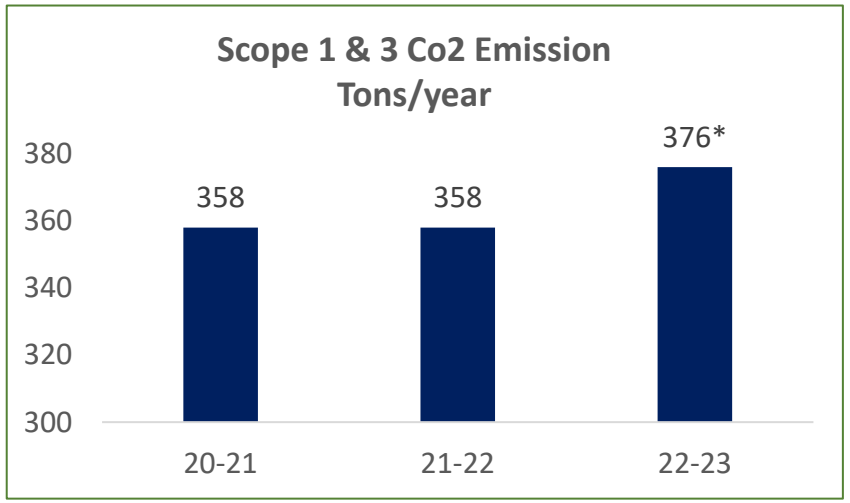
*Hybrid solar wind farm*

*Solar street lights*

# GHG Inventorisation

## *Cigarette Mfg GHG Emission*

*Scope 2 Co2 Emission-Tons*


* 35% Production Volume increase

## Approach & Initiatives

- In the year 20-21, we have augmented the Onsite solar power plant from 0.53 MWp to 1.03 MWp.
- Started wheeling green energy from IEX and DISCOM in 2022 to cut down the CO2 emissions in coming years.
- Explored and started Purchase of green energy from Discom (CESC). In the year 2022-23 total 1489 Mwh purchased from DISCOM at an additional cost of Rs 0.50 / kwh
- Set up in progress for installation of 20 MW offsite solar plant at Purulia, West Bengal .

***Electric Vehicle Charging Facility in parking area***

***100% renewable energy (Electrical Energy) by 2030 – Long term plan***

# Waste Management

## In house innovations for Waste Reduction


### Interlock of machine with high filter rejection

Machine run interlocked in order to stop M/C when high rejection due to quality defect.


### Vision system for laser print detection.

Machine run interlocked with laser print defect detection .Will stop machine in case of high misprint rejections .


### WMS integrity to check correct material is loaded on machine

WMS integrity will eliminate wrong material loading and eliminate waste due to wrong WMS.

### Winnow recovery machine

Installation of in-house developed cigarette cutting machine for shorting of capsule brand cigarettes.

Waste reduction & Productivity improvement

# Green Supply Chain

## Beyond the Boundary

### *Solid Waste Management*

**45,230 Household** Covered and 3,920 **MT Waste** Handled in 2022-23.

Plan to cover 79.956 Household and 11,674 MT waste will be handled in 2023-24.

### *Renewable Energy for Society*

- Solar Panel Installation in Schools
  - 6 Nos of schools covered
  - Total Renewable Energy Installed – 12 KW
- Plan to cover more schools in the current FY 2023-24

### *School Wash*

**8 School Toilets** Constructed in 2022-23.

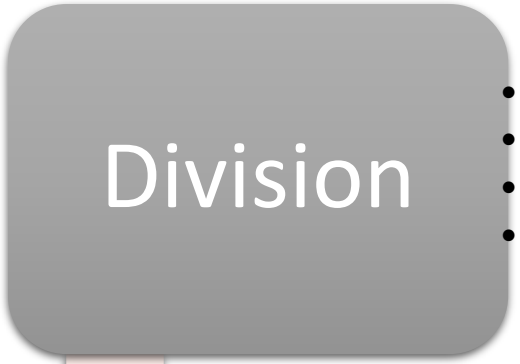
Plan to construct 30 School Toilets in 2023-24.

**31 Community Toilet** Constructed in 2022-23.

Plan to construct 56 Community Toilet in 2023-24.

# Energy Management – Monitoring & Review Mechanism


- Yearly Sustainability review and reporting
- Corporate EHS Audit
- Sustainability Audit by third party




- Divisional EHS Audit
- Monthly Dashboard reporting
- Quarterly Sustainability reporting
- Annual Unit review

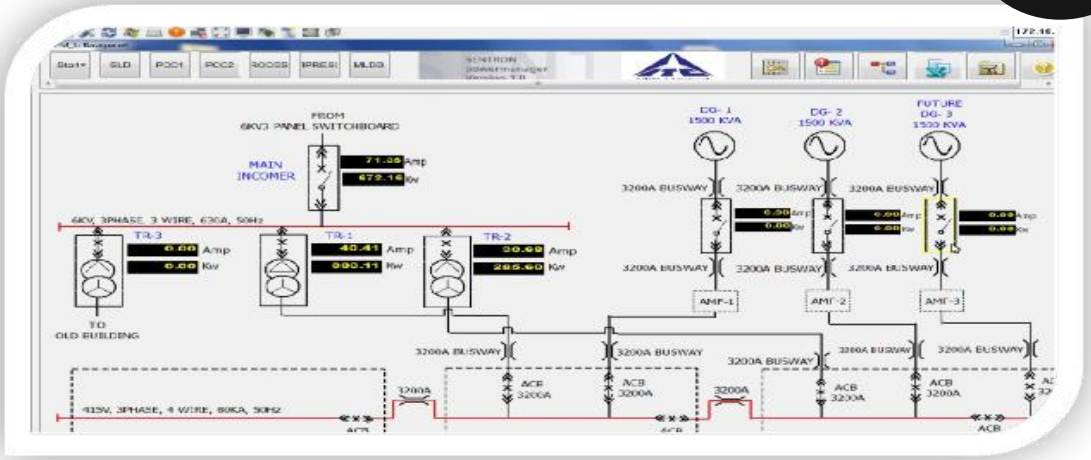

- Daily review by departments and BE
- Month review by Unit Head

# Energy Management – Monitoring & Review Mechanism

## Energy Monitoring System In ITC Kidderpore.

**Energy Management Committee**

- General Manager — Abhishek Dixit
  - Sr. Manager - Engineering — R K Himanshu
    - Central Management Committee — Energy Manager: R K Himanshu
      - **Engineering**: N M Prasad, Sourish Chakroborty, Geetashree Moitra, Anup Kumar Mondal
      - **Safety & Security**: Himadri Das
      - **MFG**: Rajeev Kumar Singh Gola, Balbir Singh Bhabani Mitra, Gopal Prasad, Subhash Dutta, Jamil Ahmed
      - **HR**: Utsav Vatsayan Jha
      - **EHS**: Nirjhar Bandyopadhyay
      - **Service Provider**: Dilbahadur Paresh Choudhury, Dinesh
      - **Commercial**: Tusher Kanti Das




***Online Energy Management system***

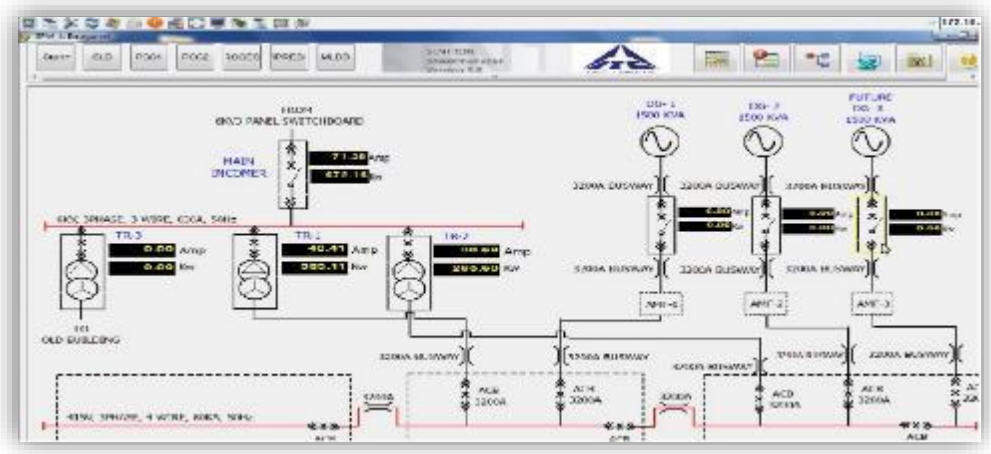
| | Target Units/ mnc | 1/Mar | 2/Mar | 3/Mar | 4/Mar | 5/Mar | 6/Mar | 7/Mar | 8/Mar | 9/Mar | 10/Mar | 11/Mar | 12/Mar | 13/Mar | 14/Mar | 15/Mar | 16/Mar | 17/Mar | 18/Mar | 19/Mar | 20/Mar | 21/Mar | 22/Mar | 23/Mar | 24/Mar | 25/Mar | 26/Mar | 27/Mar | 28/Mar | 29/Mar | 30/Mar | 31/Mar | MTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Production (mnc) | 82 | 85 | 41 | 31 | 25 | 27 | 1 | 33 | 43 | 39 | 41 | 39 | 39 | 1 | 39 | 82 | 43 | 42 | 1 | 1 | 1 | 35 | 40 | 35 | 34 | 32 | 1 | 1 | 29 | 33 | 31 | 38 | 856 |
| Total Unit Consumed | 634015 | 26654 | 27056 | 24723 | 22746 | 25051 | 9174 | 18634 | 16827 | 28021 | 29515 | 27856 | 28344 | 11064 | 17776 | 51052 | 29559 | 27008 | 5240 | 6844 | 8400 | 26744 | 30282 | 30699 | 27534 | 28739 | 14029 | 7586 | 27996 | 31338 | 32036 | 32032 | 710538 |
| Total UNIT/MNC | 767 | 751 | 664 | 798 | 911 | 932 | 9174 | 556 | 387 | 727 | 722 | 711 | 731 | 11064 | 460 | 980 | 685 | 644 | 5240 | 6844 | 8400 | 763 | 759 | 888 | 814 | 898 | 14029 | 7586 | 883 | 943 | 1020 | 951 | 930 |
| Machines - Unit/mnc | 195 | 191 | 172 | 199 | 250 | 248 | 1234 | 122 | 81 | 198 | 204 | 187 | 189 | 1095 | 98 | 250 | 185 | 172 | 555 | 647 | 762 | 186 | 175 | 183 | 198 | 189 | 1087 | 1153 | 260 | 215 | 228 | 198 | 196 |
| Compressor Units/mnc | 115 | 112 | 100 | 109 | 142 | 138 | 287 | 67 | 50 | 118 | 118 | 107 | 109 | 168 | 98 | 198 | 109 | 104 | 65 | 59 | 100 | 122 | 110 | 138 | 115 | 139 | 194 | 110 | 168 | 130 | 140 | 129 | 116 |
| SMD PDRF Units/mnc | 18 | 16 | 14 | 14 | 22 | 21 | 32 | 8 | 6 | 14 | 15 | 14 | 15 | 51 | 7 | 18 | 14 | 14 | 3 | 3 | 17 | 15 | 15 | 20 | 15 | 15 | 22 | 31 | 18 | 15 | 16 | 15 | 15 |
| SMD CDRF Units/mnc | 16 | 17 | 15 | 16 | 24 | 22 | 14 | 6 | 6 | 18 | 18 | 17 | 17 | 10 | 9 | 23 | 17 | 15 | 2 | 2 | 17 | 18 | 17 | 17 | 15 | 12 | 2 | 11 | 23 | 19 | 16 | 17 | 16 |
| Laser Fan Units/mnc | 5 | 5 | 5 | 6 | 7 | 6 | 5 | 3 | 2 | 4 | 4 | 4 | 4 | 6 | 2 | 5 | 4 | 4 | 0 | 0 | 6 | 5 | 5 | 5 | 5 | 6 | 0 | 3 | 6 | 5 | 5 | 5 | 5 |
| Lighting Units/mnc | 18 | 22 | 20 | 23 | 32 | 29 | 635 | 31 | 20 | 30 | 28 | 26 | 27 | 697 | 20 | 28 | 33 | 33 | 530 | 716 | 646 | 32 | 37 | 33 | 33 | 37 | 1447 | 678 | 30 | 34 | 30 | 30 | 44 |
| AHU Units/mnc | 85 | 20 | 19 | 23 | 23 | 25 | 84 | 11 | 7 | 20 | 19 | 20 | 20 | 44 | 10 | 24 | 17 | 18 | 19 | 28 | 56 | 23 | 21 | 23 | 21 | 21 | 211 | 51 | 28 | 24 | 23 | 20 | 20 |
| HVAC Units/mnc | 60 | 56 | 48 | 53 | 59 | 72 | 390 | 39 | 30 | 47 | 45 | 57 | 57 | 712 | 57 | 88 | 44 | 57 | 572 | 508 | 636 | 81 | 79 | 123 | 139 | 120 | 684 | 564 | 127 | 132 | 127 | 105 | 77 |
| Others Units/mnc | 29 | 23 | 20 | 32 | 19 | 18 | 1932 | 16 | 52 | 41 | 17 | 14 | 33 | 3063 | 70 | 29 | 26 | 21 | 1793 | 605 | 1783 | 25 | 22 | 21 | 6 | 19 | 396 | 412 | 25 | 30 | 26 | 26 | 60 |
| Others Utility Units/mnc | 52 | 48 | 42 | 56 | 63 | 61 | 1147 | 37 | 65 | 93 | 90 | 96 | 96 | 2130 | 35 | 131 | 40 | 40 | 900 | 1079 | 1068 | 47 | 41 | 47 | 48 | 52 | 1561 | 1078 | 53 | 47 | 53 | 65 | 73 |
| Filter Making Units/mnc | 140 | 35 | 29 | 37 | 35 | 42 | 3462 | 35 | 27 | 51 | 28 | 30 | 30 | 2464 | 26 | 57 | 27 | 28 | 79 | 2507 | 2597 | 35 | 31 | 38 | 32 | 39 | 1549 | 2628 | 45 | 39 | 38 | 34 | 48 |
| Capsule Mfg. Units/mnc | 84 | 194 | 167 | 211 | 218 | 230 | 955 | 91 | 43 | 164 | 150 | 127 | 124 | 684 | 52 | 204 | 179 | 137 | 725 | 696 | 716 | 184 | 201 | 191 | 179 | 156 | 7076 | 867 | 217 | 283 | 264 | 179 | 184 |

**ABSOLUTE CONSUMPTION**

| | 1/Mar | 2/Mar | 3/Mar | 4/Mar | 5/Mar | 6/Mar | 7/Mar | 8/Mar | 9/Mar | 10/Mar | 11/Mar | 12/Mar | 13/Mar | 14/Mar | 15/Mar | 16/Mar | 17/Mar | 18/Mar | 19/Mar | 20/Mar | 21/Mar | 22/Mar | 23/Mar | 24/Mar | 25/Mar | 26/Mar | 27/Mar | 28/Mar | 29/Mar | 30/Mar | 31/Mar | MTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Machines | 6772 | 7024 | 5984 | 6373 | 6603 | 1234 | 4099 | 3507 | 7637 | 8325 | 7342 | 7567 | 1035 | 3769 | 8071 | 7997 | 7227 | 555 | 647 | 762 | 6523 | 6977 | 6454 | 6682 | 5968 | 1087 | 1153 | 6850 | 7096 | 7303 | 7383 | 165822 |
| Compressor | 3966 | 4085 | 3398 | 3504 | 3743 | 287 | 2248 | 2178 | 4530 | 4812 | 4209 | 3979 | 168 | 1795 | 4412 | 4703 | 4369 | 65 | 59 | 100 | 4264 | 4642 | 4459 | 3840 | 4259 | 194 | 110 | 4233 | 4330 | 4682 | 4687 | 96110 |
| SMD PDRF | 555 | 578 | 443 | 552 | 552 | 32 | 254 | 259 | 527 | 502 | 563 | 575 | 51 | 282 | 589 | 612 | 569 | 3 | 3 | 17 | 542 | 592 | 560 | 523 | 472 | 22 | 31 | 505 | 509 | 503 | 580 | 12447 |
| SMD CDRF | 612 | 627 | 507 | 588 | 578 | 14 | 200 | 274 | 703 | 739 | 647 | 645 | 10 | 540 | 691 | 726 | 638 | 2 | 2 | 17 | 644 | 667 | 607 | 455 | 386 | 2 | 11 | 632 | 624 | 609 | 634 | 13826 |
| Laser Fan | 187 | 185 | 187 | 186 | 186 | 5 | 95 | 79 | 189 | 189 | 189 | 170 | 6 | 88 | 172 | 170 | 183 | 0 | 0 | 6 | 192 | 192 | 191 | 178 | 180 | 0 | 3 | 170 | 189 | 189 | 177 | 3991 |
| Lighting | 1298 | 1337 | 1351 | 1279 | 1321 | 635 | 1026 | 866 | 1357 | 1389 | 1386 | 1431 | 697 | 941 | 1425 | 1364 | 1401 | 530 | 716 | 646 | 1460 | 1480 | 1511 | 1440 | 1468 | 1447 | 678 | 1435 | 1480 | 1555 | 1504 | 37849 |
| AHU | 698 | 754 | 713 | 573 | 682 | 84 | 364 | 813 | 768 | 787 | 796 | 763 | 44 | 405 | 788 | 719 | 746 | 19 | 28 | 54 | 794 | 824 | 811 | 727 | 663 | 211 | 51 | 805 | 788 | 719 | 750 | 17249 |
| HVAC + VRV & Ventilation | 1971 | 1965 | 1944 | 1448 | 1963 | 390 | 1292 | 1296 | 1796 | 1854 | 2244 | 2229 | 712 | 1644 | 2192 | 1908 | 2397 | 572 | 508 | 636 | 2851 | 3141 | 4332 | 4712 | 3791 | 684 | 564 | 3633 | 3740 | 3973 | 3873 | 66045 |
| Others | 811 | 808 | 671 | 470 | 497 | 1932 | 1943 | 2265 | 1657 | 699 | 558 | 1277 | 3063 | 2768 | 924 | 1128 | 869 | 1793 | 605 | 1783 | 876 | 865 | 736 | 217 | 597 | 396 | 412 | 705 | 985 | 917 | 974 | 34195 |
| Others Utility | 1701 | 1694 | 1670 | 1561 | 1644 | 1147 | 2900 | 2822 | 3666 | 3691 | 3781 | 3734 | 2130 | 2952 | 3926 | 1712 | 1661 | 900 | 1079 | 1068 | 1641 | 1644 | 1647 | 1480 | 1646 | 1561 | 1078 | 1560 | 1574 | 1651 | 1682 | 62751 |

***Daily Energy Analysis & Reporting***

# Energy Management – Monitoring & Review Mechanism



*Online Energy Management system*

**Energy Demand 2018 - 19**

MWH

| | | 2017-18 | Tocbte | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Electricity** | | | | | | | | | | | | | | | |
| **Secondary** | | | | | | | | | | | | | | | |
| Machines | Units | 1785399 | 1899801 | 104973 | 131933 | 170898 | 204174 | 152201 | 127830 | 154204 | 163092 | 166648 | 163159 | 180474 | 180214 |
| | Units/mnc (cig) | 197 | 196 | 206 | 207 | 189 | 196 | 194 | 232 | 200 | 186 | 194 | 207 | 187 | 184 |
| Compressors+Laser Suction fan | Units | 1056222 | 999283 | 63774 | 79606 | 97490 | 113240 | 82295 | 71187 | 75490 | 80047 | 85708 | 85118 | 78227 | 87102 |
| | Units/mnc (cig) | 117 | 103 | 125 | 125 | 108 | 108 | 105 | 129 | 98 | 91 | 100 | 108 | 81 | 89 |
| CDRF | Units | 163192 | 185130 | 9434 | 10468 | 14382 | 17268 | 12813 | 13030 | 13182 | 14523 | 17851 | 17723 | 22503 | 21955 |
| | Units/mnc ( Making cig) | 18 | 19 | 18 | 16 | 16 | 17 | 16 | 24 | 17 | 17 | 21 | 22 | 23 | 22 |
| Vaccum Blower | Units | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Units/mnc ( MK8 cig) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pneumatic feed | Units | 286831 | 259637 | 17334 | 21166 | 25417 | 28362 | 21368 | 18860 | 22269 | 23593 | 20105 | 19051 | 20493 | 21620 |
| | Units/mnc ( Making cig) | 32 | 27 | 34 | 33 | 28 | 27 | 27 | 34 | 29 | 27 | 23 | 24 | 21 | 22 |
| Lighting | Units | 738049 | 659052 | 47781 | 51449 | 58365 | 62576 | 57398 | 53823 | 53524 | 52306 | 53660 | 56022 | 53023 | 59126 |
| | Units/mnc ( cig) | 82 | 68 | 94 | 81 | 64 | 60 | 73 | 88 | 70 | 60 | 62 | 71 | 55 | 61 |
| **Subtotal** | | 4029693 | 4002903 | 243296 | 294622 | 366552 | 425619 | 326075 | 284730 | 318669 | 333562 | 343971 | 341072 | 354719 | 370017 |
| **Production(mnc)** | | 9055 | 9670.57 | 510 | 636 | 906 | 1044 | 784 | 551 | 770 | 876 | 861 | 788 | 966 | 977 |
| **units/ mnc (cig.)** | | 445 | 414 | 477 | 463 | 404 | 408 | 416 | 517 | 414 | 381 | 399 | 433 | 367 | 379 |
| **units/mnc (conv.)** | | 445 | 414 | 477 | 463 | 404 | 408 | 416 | 517 | 414 | 381 | 399 | 433 | 367 | 379 |
| **Filter Making** | **Units** | 0 | 197649 | 0 | 0 | 0 | 11287 | 15680 | 21285 | 26118 | 25582 | 24616 | 22630 | 24326 | 26129 |
| | **Units/mnc** | | 20 | 0 | 0 | 0 | 11 | 20 | 39 | 34 | 29 | 29 | 29 | 25 | 27 |
| HVAC | | | | | | | | | | | | | | | |
| Chillers 1 | | 833340 | 832362 | 69174 | 96926 | 109875 | 126648 | 98854 | 82085 | 66226 | 51271 | 21518 | 9175 | 38480 | 62130 |
| Chillers 2 | | 0 | 0 | | | | | | | | | | | | |
| Sub total - Chillers | 86.07163927 | 833340 | 832362 | 69174 | 96926 | 109875 | 126648 | 98854 | 82085 | 66226 | 51271 | 21518 | 9175 | 38480 | 62130 |
| No of Chiller working days | | 0 | 0 | | | | | | | | | | | | |
| HVAC utility(Chiller & cond pumps, CT) | | 233057 | 217601 | 16142 | 23577 | 22575 | 23777 | 19260 | 16710 | 17005 | 14390 | 12296 | 10307 | 17181 | 24383 |
| AHU 2 | | 0 | 0 | | | | | | | | | | | | |
| Subtotal AHU (SMD+Roulette) | 22.50140535 | 233057 | 217601 | 16142 | 23577 | 22575 | 23777 | 19260 | 16710 | 17005 | 14390 | 12296 | 10307 | 17181 | 24383 |
| **Subtotal** | | 1066397 | 1049963 | 85316 | 120503 | 132451 | 150426 | 118114 | 98795 | 83230 | 65660 | 33813 | 19481 | 55661 | 86513 |
| **No. of AC working days** | | 285 | 292 | 19 | 22 | 26 | 28 | 24 | 23 | 22 | 24 | 26 | 25 | 26 | 27 |
| **No. of AHU working days** | | 290 | 292 | 19 | 22 | 26 | 28 | 24 | 23 | 22 | 24 | 26 | 25 | 26 | 27 |
| **units/AC working days** | | 3742 | 3596 | 4490 | 5477 | 5094 | 5372 | 4921 | 4298 | 3783 | 2736 | 1301 | 779 | 2141 | 3204 |
| **units/mnc(conv.)** | | 118 | 109 | 167 | 189 | 146 | 144 | 151 | 179 | 108 | 75 | 39 | 25 | 58 | 89 |
| Others (UPS, Delphi, Roulette, Lift, Vehicle section charging, RO Plant, Innerframe slitter machine, etc.) | 87.03324583 | 826841 | 841661 | 62388 | 62655 | 80354 | 70173 | 80919 | 64160 | 73160 | 72716 | 59990 | 61099 | 66687 | 87359 |
| **Subtotal** | | 826841 | 841661 | 62388 | 62655 | 80354 | 70173 | 80919 | 64160 | 73160 | 72716 | 59990 | 61099 | 66687 | 87359 |
| **units/production day** | | 6296 | 6409 | 4159 | 2238 | 3494 | 2924 | 2890 | 2291 | 3048 | 2693 | 2307 | 2656 | 3176 | 3494 |
| **units/mnc(conv.)** | | 91 | 87 | 122 | 98 | 89 | 67 | 103 | 116 | 95 | 83 | 70 | 78 | 69 | 89 |
| **Grand Total** | **Units** | 5922931 | 6092177 | 391000 | 477780 | 579357 | 657504 | 540789 | 468970 | 501172 | 497520 | 462390 | 444283 | 501393 | 570019 |
| **Total Units Supplied** | **Units** | 5922931 | 6092177 | 391000 | 477780 | 579357 | 657504 | 540789 | 468970 | 501172 | 497520 | 462390 | 444283 | 501393 | 570019 |
| **units/mnc(conv.)** | | 654 | 630 | 766 | 751 | 639 | 630 | 690 | 851 | 651 | 568 | 537 | 564 | 519 | 583 |

*Monthly Dashboard System sharing with HO*

**DAILY ENERGY REPORT - MARCH, 2019**

| | Target Units/mnc | 1/Mar | 2/Mar | 3/Mar | 4/Mar | 5/Mar | 6/Mar | 7/Mar | 8/Mar | 9/Mar |
|---|---|---|---|---|---|---|---|---|---|---|
| Production (mnc) | 30 | 44 | 42 | 40 | 41 | 36 | 35 | 40 | 44 | 43 |
| Total Unit Consumed | 514414 | 20479 | 18422 | 17807 | 21420 | 19416 | 18746 | 20668 | 22360 | 22774 |
| Total UNIT/MNC | 680 | 469 | 441 | 451 | 526 | 534 | 538 | 511 | 513 | 533 |
| Machines - Unit/mnc | 188 | 184 | 166 | 168 | 173 | 180 | 181 | 172 | 183 | 182 |
| Compressor Units/mnc | 85 | 61 | 81 | 89 | 77 | 90 | 92 | 71 | 68 | 84 |
| SMD PDRF Units/mnc | 25 | 22 | 20 | 20 | 20 | 21 | 22 | 21 | 21 | 20 |
| SMD CDRF Units/mnc | 18 | 21 | 18 | 19 | 18 | 20 | 21 | 19 | 25 | 25 |
| Laser Fan Units/mnc | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 |
| Lighting Units/mnc | 74 | 44 | 43 | 47 | 52 | 57 | 58 | 49 | 45 | 46 |
| AHU Units/mnc | 18 | 18 | 19 | 20 | 19 | 21 | 21 | 20 | 22 | 21 |
| HVAC Units/mnc | 97 | 22 | 20 | 26 | 56 | 60 | 55 | 35 | 32 | 38 |
| Others Units/mnc | 48 | 37 | 19 | 3 | 39 | 5 | 5 | 59 | 56 | 56 |
| Others Utility Units/mnc | 44 | 34 | 30 | 37 | 43 | 47 | 50 | 36 | 33 | 33 |
| Filter Making Units/mnc | 77 | 21 | 21 | 19 | 25 | 28 | 29 | 26 | 23 | 24 |
| | | | | | | | | | | |
| Machine efficiency (%) | 70 | 65 | 79 | 80 | 77 | 74 | 71 | 77 | 67 | 66 |

**ABSOLUTE CONSUMPTION**

| | | 1/Mar | 2/Mar | 3/Mar | 4/Mar | 5/Mar | 6/Mar | 7/Mar | 8/Mar | 9/Mar |
|---|---|---|---|---|---|---|---|---|---|---|
| Machines | | 8012 | 6928 | 6655 | 7037 | 6543 | 6314 | 6965 | 7998 | 7796 |
| Compressor | | 2684 | 3389 | 3524 | 3130 | 3283 | 3203 | 2879 | 2970 | 3590 |
| SMD PDRF | | 952 | 828 | 780 | 818 | 780 | 753 | 833 | 923 | 867 |
| SMD CDRF | | 915 | 752 | 738 | 747 | 731 | 734 | 774 | 1097 | 1060 |
| Laser Fan | | 154 | 155 | 156 | 153 | 141 | 133 | 123 | 127 | 148 |
| Lighting | | 1939 | 1816 | 1868 | 2120 | 2081 | 2009 | 1986 | 1983 | 1981 |
| AHU | | 801 | 800 | 772 | 785 | 758 | 729 | 813 | 962 | 903 |
| HVAC + VRV & Ventilation | | 961 | 817 | 1008 | 2268 | 2190 | 1925 | 1432 | 1415 | 1645 |
| Others | | 1637 | 796 | 109 | 1579 | 181 | 189 | 2377 | 2441 | 2379 |
| Others Utility | | 1499 | 1275 | 1452 | 1759 | 1702 | 1736 | 1442 | 1453 | 1396 |
| Filter Making | | 926 | 865 | 745 | 1024 | 1024 | 1022 | 1043 | 991 | 1009 |
| | TOTAL | 20479 | 18422 | 17807 | 21420 | 19416 | 18746 | 20668 | 22360 | 22774 |

| | | |
|---|---|---|
| Legend | Holiday | Greater than Target |
| | Shut Down | Lower than Target |
| | Sunday | |

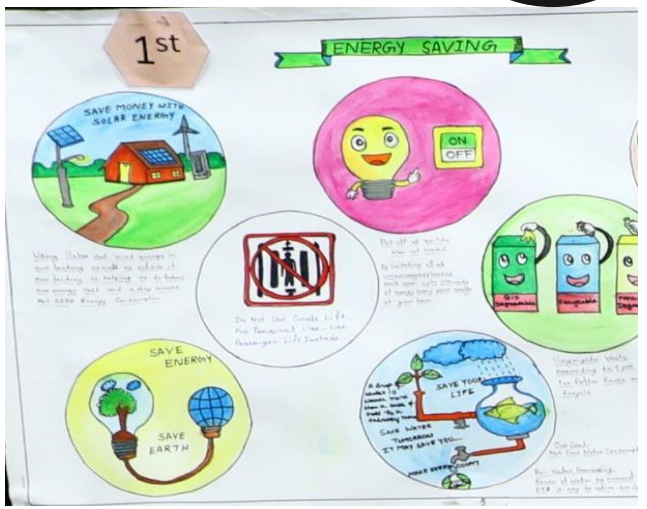
*Daily Energy Analysis & Reporting*

# Awareness building

## National Energy Conservation Day Celebration

Energy saving pledge by employees.

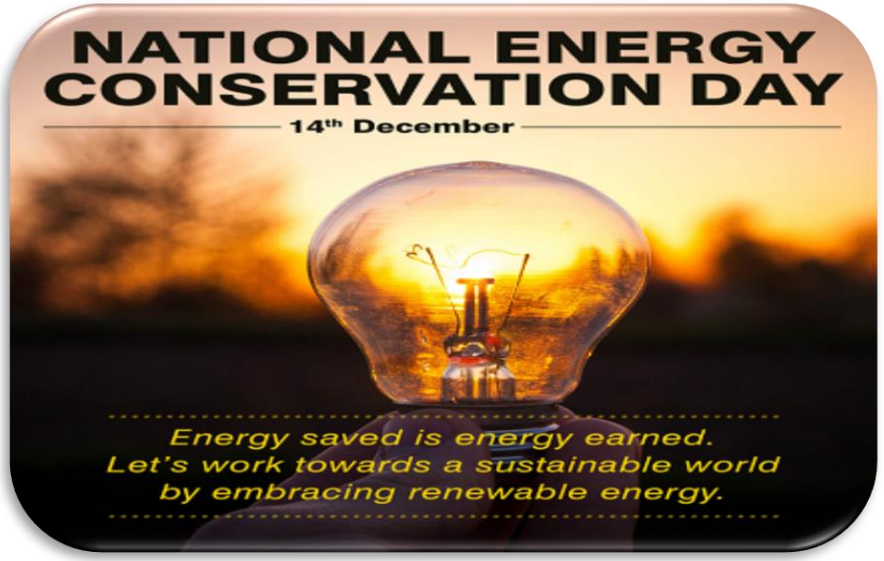
Energy Quiz for employees .


Poster making competition arranged for Energy Conservation Day

Energy Skit by employees .

Glimpse of energy conservation week celebration in factory .



# Teamwork and Employee Participation

| DESCRIPTION | Project - 1 | Project - 2 | Project - 3 | Project - 4 |
|---|---|---|---|---|
| Source of En-Con Idea | Electrical supervisor | Operator | ESP | Production |
| Name of the Project | Interlocking of Compressor run depending on cell running. | Maker machine suction fan off logic developed if machine stop. | DRF operation on timer based | Machine drying drum heater off when machine not running |
| Idea Originated in the Year | 2023 | 2023 | 2023 | 2023 |
| Idea Implemented | Yes | Yes | Yes | Yes |
| Members in the Implementation Team | Shift IC and Electrical Supervisor | Shift I/C and electrical supervisor. | Shift I/C and electrical supervisor. | Electrical supervisor and Electrician |
| Date of Implementation | May,22 Completed | Aug 22Completed | July 22 Completed | Oct 22 Completed |
| Energy Saved | 8 MWH | 9 MWH | 6 MWH | 4 MWH |

# Implementation of ISO 140001/ Green CO / IGBC Rating

The ITC Kidderpore Unit has been certified "Platinum" rating by IGBC Green Factory Building Rating System

The ITC Kidder pore unit has been certified with ISO 450001, ISO 90001 and SA 800.

270 Lakhs invested in Encon projects in 2022-23

130 Lakhs investment planned in 2023-24


# CII Learnings Implemented


Intelligent Flow Controller

*Implemented in FY 20-21*

BLDC fan ahu

*Implemented in FY 19-20*


AC Energy Saver

*Implemented in FY 19-20*

Automatic Tube Cleaning System

*Implemented in FY 20-21*

*2 of our managers attended and cleared the CII Online Course on Certified Professional in Energy Efficiency in 21-22*

# Awards & Recognitions in 2022-23



*Excellent energy efficient unit 2022 – CII National Awards*



*Winner of CII EXCELLANCE Award in safety ,health and environment*



Winner- 15th CII –Eastern Region- Encon Awards



Winner of SHE Excellence Award by CII

# Thank You

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