



Welcome

CII National Award for Excellence in Energy Management
2024

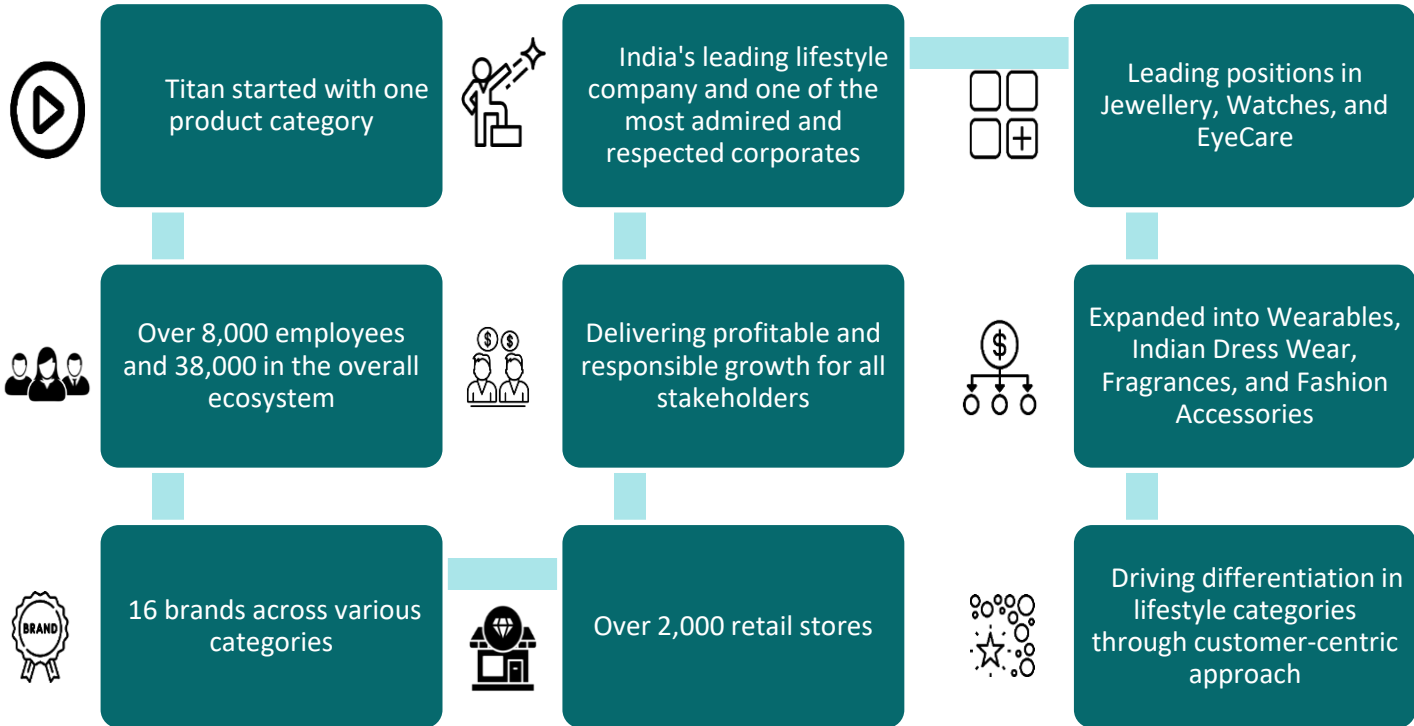


Titan Company Limited

(Watches & Wearable division)


Hosur, Tamilnadu

Company Profile



Our Brands

Watches & Wearables



Jewellery



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Fragrances and Fashion Accessories



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Eyecare

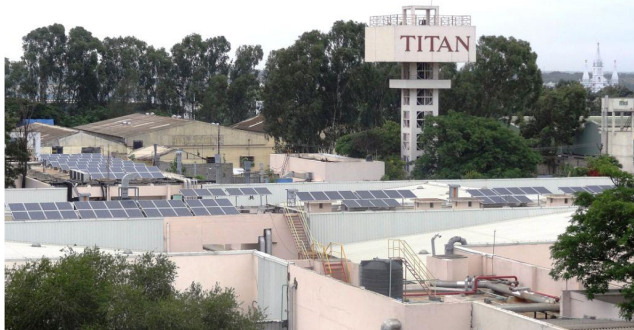


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Indian Dress Wear



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Manufacturing plant
@ Hosur
Area -16 Acres

Energy – 85 % On renewables
Wind + Solar

Systems certifications
ISO 9001,14001,50001
Green Co –Silver



Energy Management Policy



TITAN COMPANY LIMITED
WATCHES & WEARABLES DIVISION

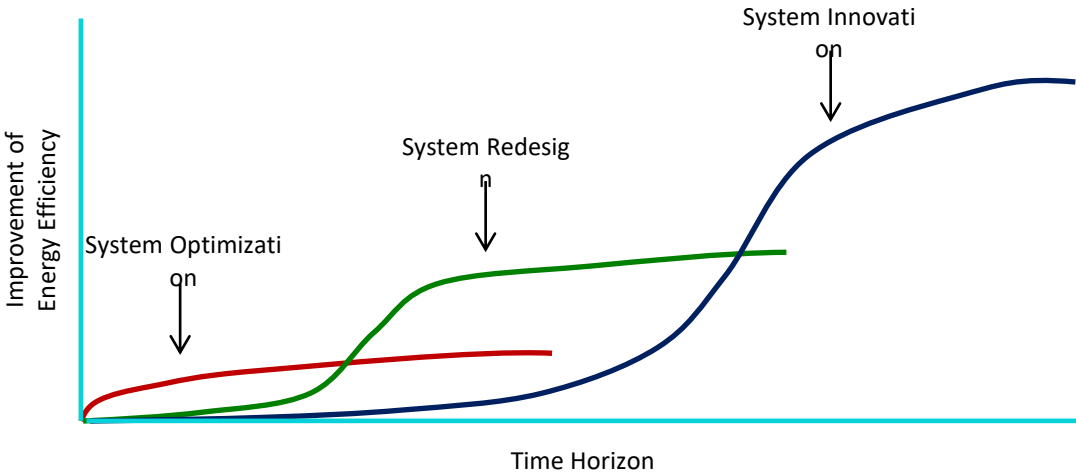
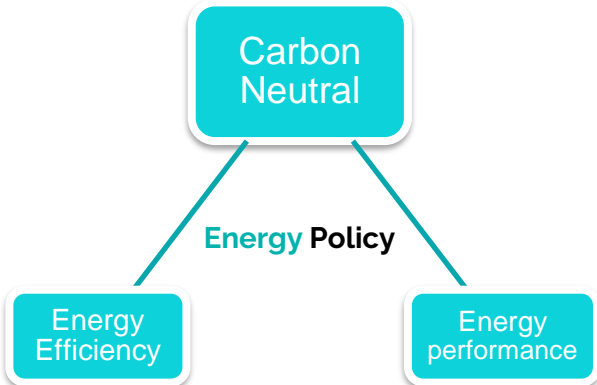
ENERGY POLICY

We, at TITAN – Watch manufacturing, Hosur are committed to continually improve our energy performance at in-house manufacturing activities so as to make it environmentally sustainable for the future generations.

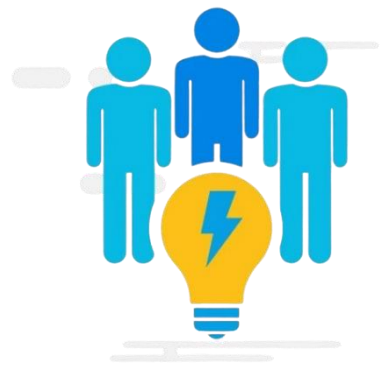
TITAN will demonstrate the above by:

- Ensuring evaluation & review of the energy requirements and performance at the highest level.
- Providing appropriate resources to enhance the energy performance of manufacturing activities including utility services.
- Incorporating the energy performance requirements, while designing the manufacturing processes and procurement of energy products & services.
- Complying with applicable legal & other requirements.
- Harnessing Renewable Energy Resources wherever feasible, to reduce Carbon / Green House Gas emissions.
- Communicating the policy and importance of energy management to all personnel in watch manufacturing, Hosur, and to the interested parties as appropriate.

...sd.
Chief Manufacturing Officer
Watches & Wearables Division
January 2021



Energy Management Team



Top Management

Policy establishment
Budget approvals
Management reviews

Mid Management

Projects design & Validation
Department reviews /
Continuous improvements

Line Management

Execution of projects /
Daily reviews / Analysis
Sustenance of projects



Energy Management Approach

Pursue energy conservation initiatives

- In-house experience
- External expertise

Maximize the renewable energy substitution

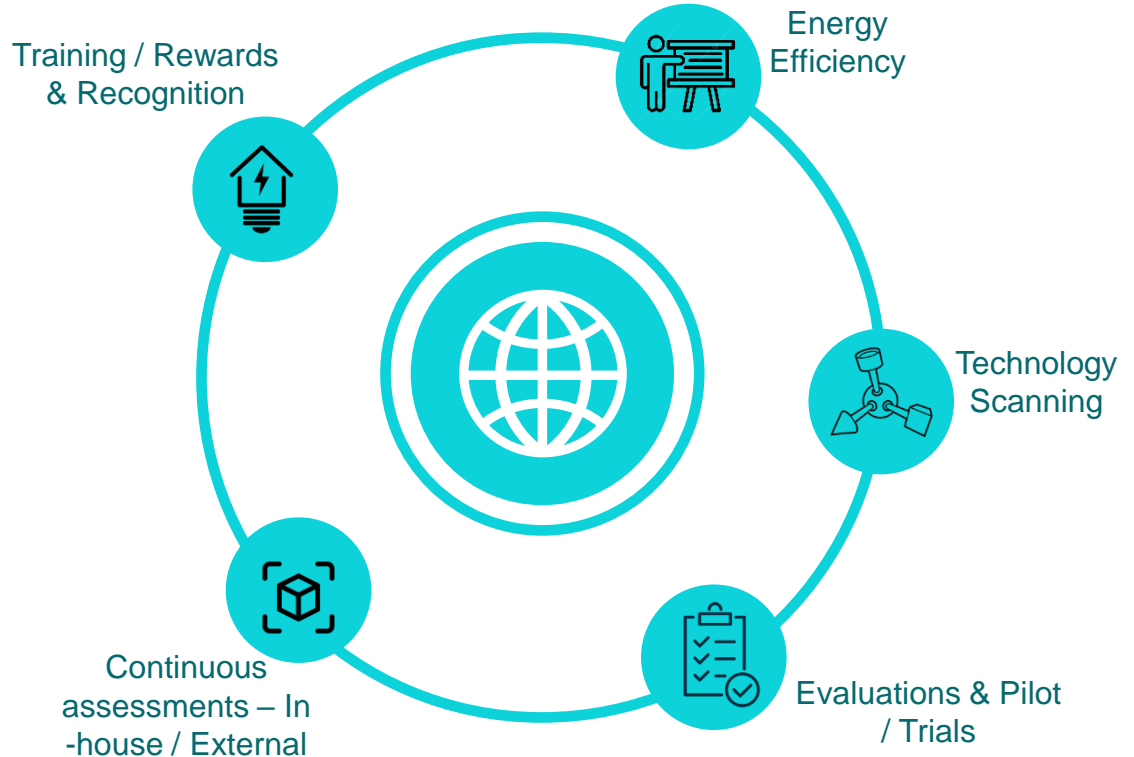
- Wind energy
- Solar energy

Minimize the impact on Environment

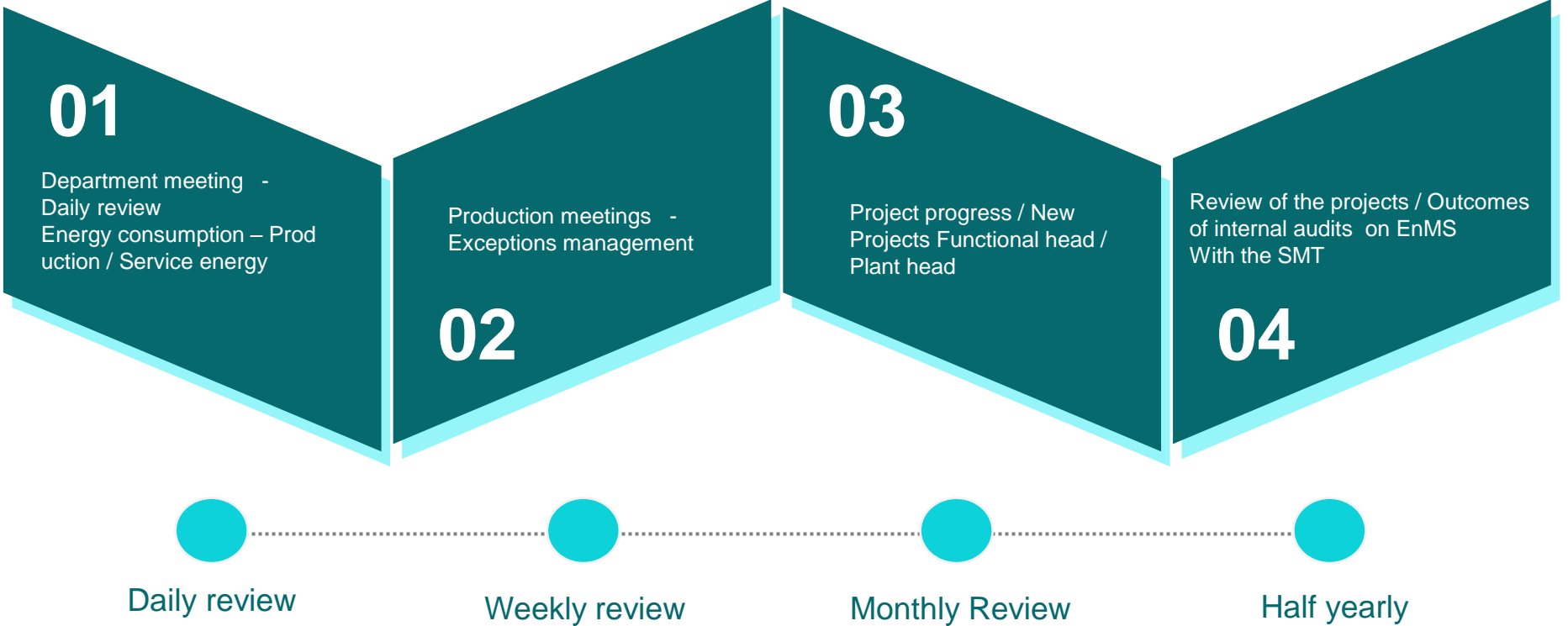
- CO2 emission reduction

Systems and procedures to sustain

- EnMS ISO 50001
- GreenCO Certified - Silver



Energy Management Reviews



Energy Management KRA linkage



Goals ▾

Search for actions or people
Q

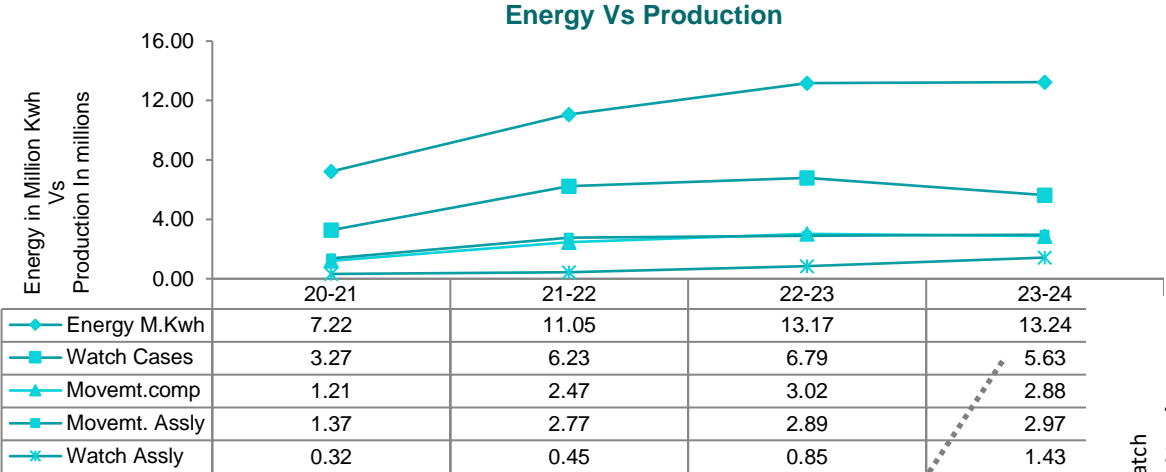
<div style="display: flex; align-items: center;"> <input style="margin-right: 5px;" type="checkbox"/> <div style="margin-right: 10px;"> </div> <div> <p>Energy conservation, Cost optimisation, Alternate fuel, Sustainability, Green, Carbon Neutral</p> <p>Edit</p> </div> </div>	<ol style="list-style-type: none"> 2. Installation of 200TR high energy efficient water cooled chiller for energy conservation & Elimination of 100KG of R22 refrigerant 3. Installation of the design envelope pumps in the central air conditioning system and optimise the real time flow of the air conditioning system 4. Upgrade the Euro block MCC 1-26 & MVP 1-27, Case polishing & Scrubber systems MVP 1-24 electrical distribution panel with Power optimization smart analyser 5. Initiate the overall Air conditioning system study with IIT team, and improve the energy performance of air conditioning system by 5% 6. Initiate the overall Air compressor system study with M/s.Vertiv team, and improve the energy performance of air compressor system by 5% 7. Exploration of Heat pump for heating applications in Canteen, ETP and other process areas 	<p>reduction from grid</p> <ol style="list-style-type: none"> 2. 75,000 units / annum energy conservation in Air conditioning system energy consumption 3. 25,000 units / annum energy conservation in Air conditioning system energy consumption 4. 75,000 units / annum energy conservation in Euro building power consumption 5. 5% energy consumption reduction in the existing air conditioning energy consumption 6. 5% energy consumption reduction in the existing compressed air energy consumption 7. Feasibility and savings potential proposal submission
		01/04/2024

Energy conservation / Improvement is part of KRA and specific weightage is allocated

Results / Savings through the projects are captured under the head of ASPIRE

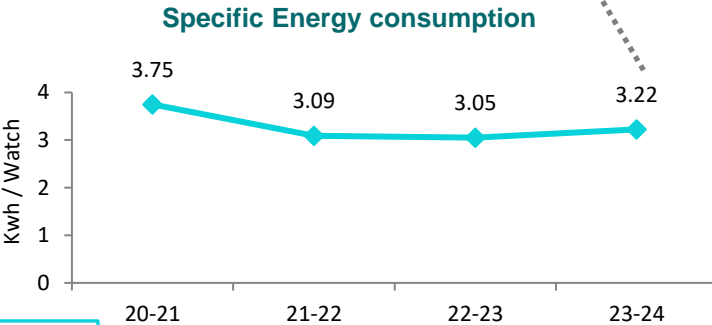
Department level KRA - ABIP & Individual KRA is linked with this ABIP

Production & Specific Energy Consumption



14%

*14% improvement in SEC in last 4 years
*5.6% decrease in SEC last year due to less production volume



17%

*Major product quantity has been reduced

60 ~ 70% of the energy consumption is fixed , the decrease in production volume will impact the specific energy consumption performance

Year	Total Energy in M.kWhr	Diesel Energy in Lakh. L	LPG Energy in KG	Equivalent Energy in G.Cal
20-21	7.2	1.78	19532	8294
21-22	11.1	2.19	27759	12110
22-23	13.2	1.52	33991	13300
23-24	13.2	1.39	33535	13220



Energy efficient chiller - centralized AC

Replacement of chiller with energy efficient chiller -capacity – 200 TR

- Energy savings - 0.70 L kWhr /Year
- CO2 reduction - 60 tons / Year
- Investment - Rs 45 L

AI power optimization system

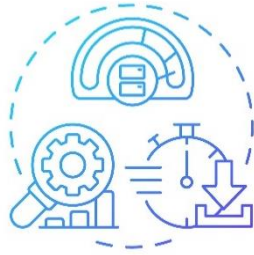
Power distribution panel with smart algorithms

- Energy savings – 0.70 L kWhr /Year
- CO2 reduction – 60 tons / Year
- Investment – Rs 40 L

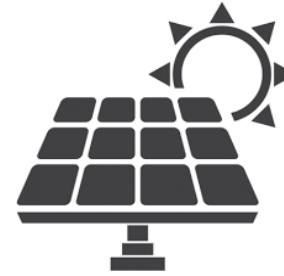
Design Envelope Pumps

Air conditioning system pumps upgradation with Design Envelope systems - No's

- Energy saving – 1.26 L kWhr / Yr
- CO2 reduction – 100 tons / Yr
- Investment – Rs 14.50 L



PERFORMANCE MANAGEMENT



Air conditioning system optimization

Optimization of the air conditioning system operation process

- Energy saving – 1.5 L kWhr / Yr
- CO2 reduction – 120 tons / Yr
- Investment – Rs 15.00 L

Rooftop solar system - Assembly

Installation of 160 kWp capacity of roof top solar system @ Main Assembly

- Energy generation - 2.0 L kWhr
- CO2 reduction - 160 tons / Year
- Investment - Rs 60 L

Energy Saving projects - last 3 years



Energy saving projects	Investment (Lakhs INR)	Electrical savings (Lakhs kWh)	Fuel Savings (Lakh Litres)	Total Savings (Lakhs INR)	Payback period (in months)
Installation of Energy Efficient Chiller	30.00	1.50	0.00	14.20	2.1
Installation of Electrical boilers for Canteen (2 Phases)	20.00	0	0.80	33.30	0.6
Retrofit of EC (Electronically Commutated) fans for the AHU's (3 Phases)	55.00	1.30	0.00	12.20	4.5
Power Optimization Panels (3 phases)	100.00	2.80	0.00	29.40	3.4
Design Envelope Pumps	14.50	1.26	0.00	12.00	1.2
Upgradation of Screw air compressor	15.00	0.40	0.00	4.40	3.4
ATFD system establishment	105.00	0.00	0.30	29.10	3.6
Conversion of existing motors into IE4 energy efficient motors	7.50	0.30	0.00	3.10	2.4
Installation of Fuel catalyst system for boilers	6.00	0.00	0.04	4.20	1.4

Energy Saving projects - last 3 years



Installation of Energy Efficient Chiller

Replacement of existing chiller with high-energy efficient chiller in centralized air conditioning system

- Energy Savings - 1.5 L kWhr / Year
- CO2 reduction - 120 tons / Year
- Investment - 30.0 L INR
- Payback - 2.1 Years



Installation of Electrical boilers for Canteen (2 Phases)

Eliminated the diesel fired boilers and installed the electrical fired boilers 2 no's in canteen cooking

- Fuel Savings - 80,000 Ltrs
- Investment - 20.0 L INR
- Payback - 0.6 Years



Retrofit of EC (Electronically Commutated) fans for the AHU's (3 Phases)

17 no's conventional blower systems for the Air Handling Units retrofitted with latest EC fans as phased manner

- Energy Savings - 1.30 L units
- CO2 reduction - 130 tons / Year
- Investment - 55.0 L INR
- Payback - 4.5 Years

Energy Saving projects - last 3 years



Power Optimization Panels (3 phases)

Power distribution panel with smart algorithms installed in various locations in the power distribution – 6 No's

- Energy saving – 2.9 L kWhr / Year
- CO2 reduction – 147 tons / Year
- Investment – Rs 100 L INR
- Payback – 3.4 Years



Design Envelope Pumps

Air conditioning system pumps upgradation with Design Envelope systems - Secondary pumps for A/c chilled water system - 22 kW Capacity

- Energy saving – 1.26 L kWhr / Year
- CO2 reduction – 117 tons / Year
- Investment – Rs 14.50 L INR
- Payback – 1.2 years



Upgradation of Screw air compressor

560 CFM capacity compressor upgraded high energy efficient (96.8%) screw air compressor

- Energy saving – 0.40 L kWhr / Year
- CO2 reduction – 32 tons / Year
- Investment – Rs 15.00 L INR
- Payback – 3.4 years

Energy Saving projects - last 3 years



ATFD system establishment

Agitated Thin Film Dryer system installed for the High concentrated effluent evaporation process

- Fuel Savings - 30,000 Ltrs
- Investment - 105.0 L INR
- Payback - 3.6 Years



Conversion of existing motors into IE4 energy efficient motors

Conventional / low energy efficient motors retrofitted with energy efficient IE4 class motors

- Energy saving – 0.30 L kWhr / Year
- CO2 reduction – 25 tons / Year
- Investment - Rs 7.5 L INR
- Payback – 2.4 years



Installation of Fuel catalyst system for boilers

The fuel catalysts system installed in the diesel fired boilers and optimised the fuel consumption

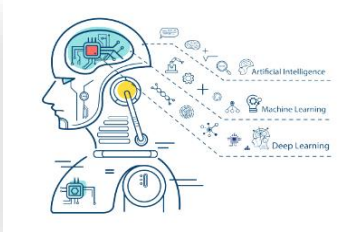
- Fuel Savings - 4,000 Ltrs
- Investment - 6.0 L INR
- Payback - 1.4 Years

Innovative Project – PO system panels

AI based SmartPO with Advanced Machine learning strategy



Delivering an optimal output at the distribution point varying the voltage and current to an optimal level closer to Rated parameters of equipment



The machine learning is the latest technology - using it for the electrical distribution panels is the unique one
 Worked with the start up and developed a panel

- Replacement of panel is the scope
- 65% capex investment leverage benefits

Power distribution panels feeding to multiple type of loads built with AI algorithm optimizes the electrical parameters

8 to 12% energy savings



Rather than addressing an individual equipment for the energy optimization - Addressing the distribution level optimization is the trigger



Capex	• 100 Lakhs INR
Returns	• 29.0 Lakhs INR
Payback	• 3.4 Year

Innovative Project - DRUPS

Alternate for the conventional UPS – European technology

Combination of DG with induction coupling mechanism

Serves as rotary UPS – delivering power during power interruptions through flywheel

Supports for 8 Nos PVD equipment – conventional UPS eliminated

Air conditioning system operated for 24 X 7 eliminated

95 % Conversion efficiency with unity power factor

Serves as Captive back up to that extent



Net Capex

• 250 Lakhs INR

Returns

• 50.0 Lakhs INR

Payback

• 5.0 Year


Innovative Projects – Electrical boilers



Elimination of HSD – 80000 Litres
 Electrical energy requirement off set through wind power
 Co2 reduction – 220 T
 Raw water reduction -1500 KL / Year

- Steam is used @ Canteen for cooking
- Diesel fired boilers are used
- HSD is used as fuel

Capex	• 20.0 Lakhs INR
Returns	• 40.0 Lakhs INR
Payback	• 0.6 Year



Why

Diesel fired boilers used for steam generation @ Canteen substituted by electrical boilers – Energy requirement is substituted with green power

Elimination of fossil fuel
 Moving towards carbon neutral manufacturing



Trigger

Renewable Energy sources

Onsite

Year	Source (Solar, wind, etc.,)	Installed capacity (in MW)	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2021-22	Rooftop solar	0.216	0.25	1.9
FY 2022-23	Rooftop solar	0.303	0.35	2.7
FY 2023-24	Rooftop solar	0.123	0.15	1.2



Offsite

Year	Source (Solar, wind, etc.,)	Installed capacity (in MW)	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
	Wind	6 MW	10.5	80.8

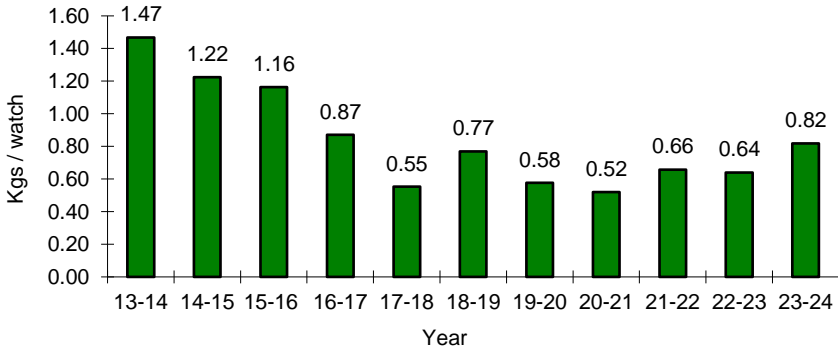


GHG Inventorisation



Parameters		FY 2020-2021	FY 2021-2022	FY 2022-2023	FY 2023-2024
Scope 1 Emission (direct emission from fuels used)	Kg CO2/ Equivalent Product	0.38	0.23	0.17	0.17
Scope 2 Emission (indirect emission from grid electricity)		0.14	0.43	0.47	0.65
Scope 3 Emission (employee commuting, business travel, purchased goods)		0	0	0	0
Total Emission		0.52	0.66	0.64	0.82

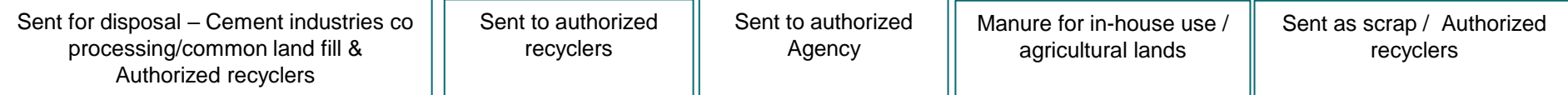
Moving towards 90% renewable energy contribution by enhancing the onsite solar capacity for another 300kWP and enhancing the wind power by another 1 MW in the year 2025-26



Waste utilization & management

Waste category	Description of Waste
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21 Wastes
 Hazardous – 12
 Non Hazardous – 7
 Non hazardous Organic waste -2



Waste utilization & management

S.No	Year	Type of waste generated	Quantity of waste generated (MT/year)	Disposal Method
1	2023 -2024	Haz waste	113.29	Cement Industry co processing/ Authorised Recyclers
2	2023 -2024	Non Haz waste	252.88	Authorised Recyclers
3	2023 -2024	Solid waste	160.00	Manure for Gardening/ Agriculture Application

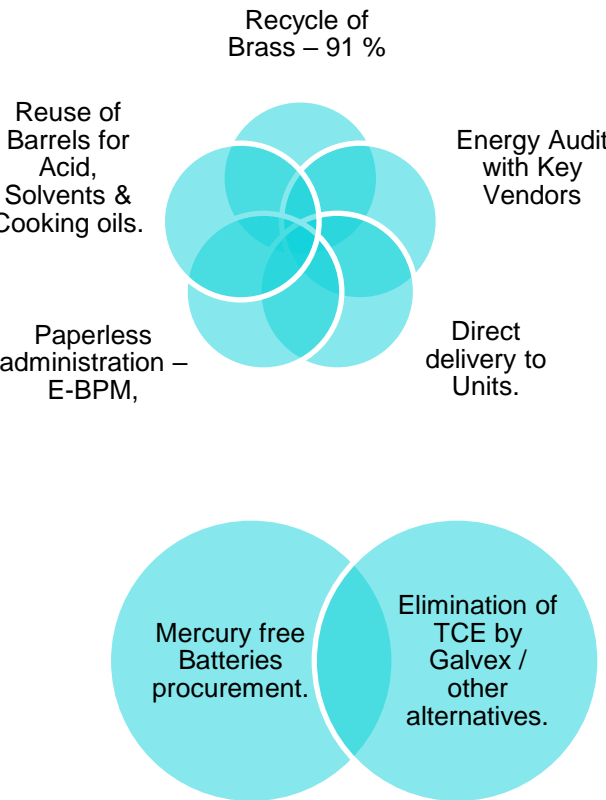
Approach on Zero Waste Landfill Concept

At present 46% of Haz waste disposal through Co processing

Hazardous waste disposal – raw material to Cement industries for co processing

FY 2026 -27 – 100 % of waste disposal through co processing route

Green Supply Chain Management



In Resource Conservation / Optimization

Green Supply Chain Policy

TITAN COMPANY LIMITED
Watches & Wearables Division

GREEN SUPPLY CHAIN POLICY

Titan Company Limited, Watch Manufacturing, in its endeavor towards attaining a world-class green company status is committed to implementing green supply chain practices. The policy indicates the supply chain practices and processes adopted by Titan Company Limited, Watch Manufacturing to accelerate the greening of its supply chain.

Towards this, Titan Company Limited, Watch Manufacturing, will:

- Support its supply chain partners to meet their environmental legal compliance requirements stated by the State and Central Government of India
- Take proactive steps to engage with its key supply chain partners, wherever applicable, and encourage them in improving their environmental performance
- Continuously create awareness and develop competencies of its key supply chain partners in the areas of environmental performance including, but not limiting to energy efficiency, water conservation, waste management, carbon management and resource conservation
- Provide a preference to working with supply chain partners exhibiting good environmental performance and recognize best-performing partners
- Develop processes to facilitate simultaneous learning and growth for Titan and its supply chain partners
- Adhere to its green procurement guidelines that apply to the procurement of raw materials, components, finished products, capital goods, packaging material, spares, and consumables
- Maintain an efficient inbound logistics management system to implement green logistics practices

The policy will be reviewed periodically for its relevance and suitability. The policy shall be communicated to all stakeholders and made available to all interested parties on request.

Raj
R.Rajagopalan,
Chief Manufacturing Officer

Dec 2020

Green Supply Chain Manual

Green Supply Chain

Waste Management

Water Conservation

Green Innovation

Energy Efficiency

GHG reduction

Renewable Energy

Material Conservation

TITAN COMPANY

Green Supply Chain Manual

Sourcing – Watches & Wearables



Benchmark Practice



IoT driven Energy Management System

TECHNOLOGY

- Integrated equipment operations & performance online monitoring and control SYSTEM
- Fully automated operations for AHU systems controls based on the temperature requirement
- Fully automated compressed air system operation & auto shut off valve system
- 100% elimination of conventional lighting systems inside the facility
- Process cooling system integration – Temperature / valve control
- Utilization of wastes – Installation of Waste heat recovery system

PROCESS

- Coming out of manual interventions and stand alone systems
- Continuous optimization of process for improve the energy performance in certain intervals
- Utility systems / equipment upgradation with latest energy efficient class
- Energy audits and horizontal deployment of energy conservation projects to the vendors
- Systematic energy review / Specific energy monitoring and control at shop level
- Make use of the BMS as base and to integrate with multiple systems through different protocols

SYSTEMS

- ISO 50001:2018 Energy Management System certified facility
- GreenCo Silver rated certified facility
- Purchasing policy for Energy efficient equipment procurement
- Affiliation with professional bodies for the latest updates on Energy conservation
- Utilization of natural resources – Installation of Light pipe system, Roof top solar system
- Working towards 100% Green substitution & Carbon neutral manufacturing facility target

ISO 50001



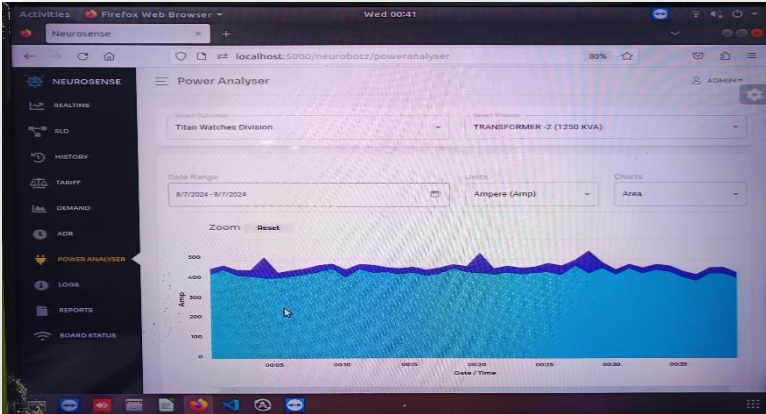
GreenCo



EMS System - Online Monitoring

ON line monitoring system connected across load centres - 120+ Multi function energy meters

- Real time monitoring
- Demand management
- Energy consumption reports – Customized
- Data analysis / history
- Wireless connectivity
- Inbuild server access with storage redundancy



Daily energy reports to production team

Production energy daily report 12-08-2024 Internal

MR. Muniaraj R (Engineering services)
 To: Arumugam V (Case Press Shop); +14 others
 Tue 13/08/2024 09:29
 Cc: balasubramanian@titan.co.in; +2 others

Daily EnMS report 12-08-2024... 16 KB

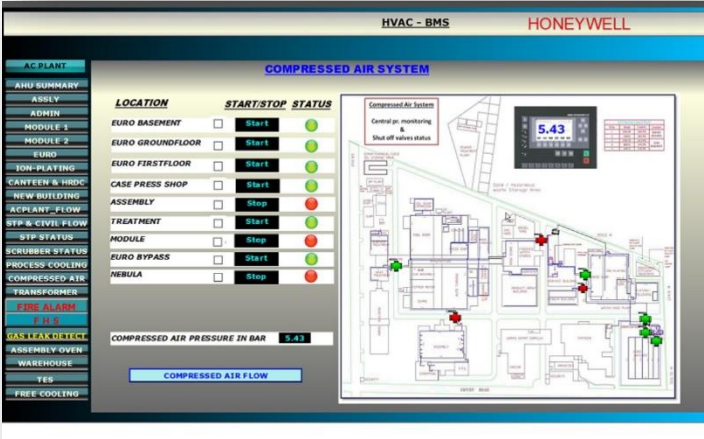
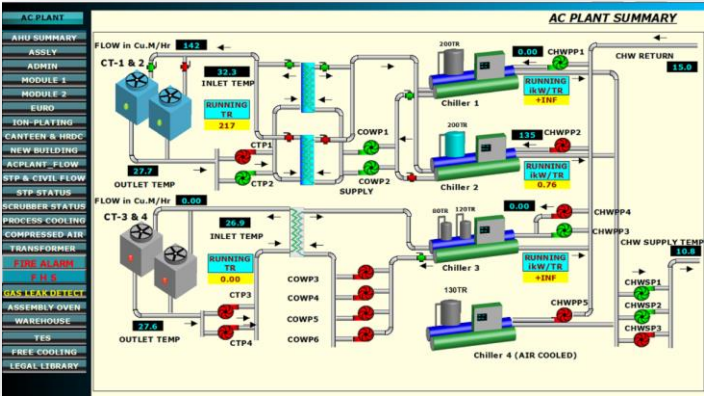
Dear all,

Please find the attached daily production energy consumption report.

Any deviation with respect to the specific energy for daily production shall be analysed.

Regards,
 Muniaraj R

BMS System - Online Monitoring



- 50+ Significant Alerts
- 1500+ data points
- 600+ Metering points
- Modbus Bacnet Hart
- 200+ Equipment
- 500+ hardware

Alarms



Real time status



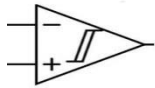
Trends



Reports



Trigger



Results & Impacts



7.5 L.kWHR

Recurring Energy Conservation savings

Energy



Rs 140 L

Recurring Overhead Cost savings - Power & Fuel cost

Cost



100 %

Legal / Statutory / Safety compliances

Compliance



90 %

Monitoring - In-house renewable generation and emissions

Renewables



870 T

Recurring Carbon footprint reduction by Energy savings

CO2 Emission

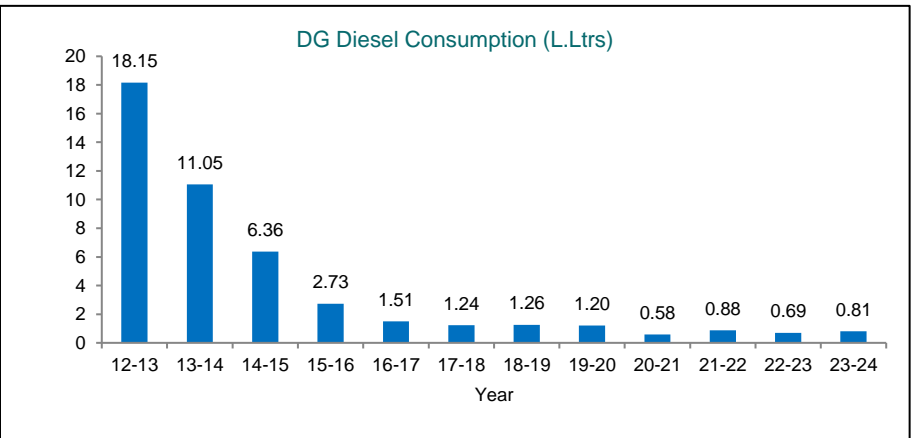
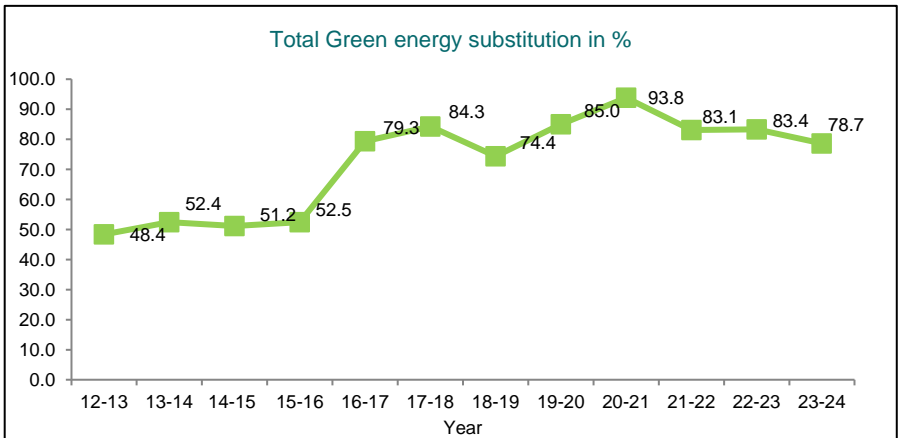
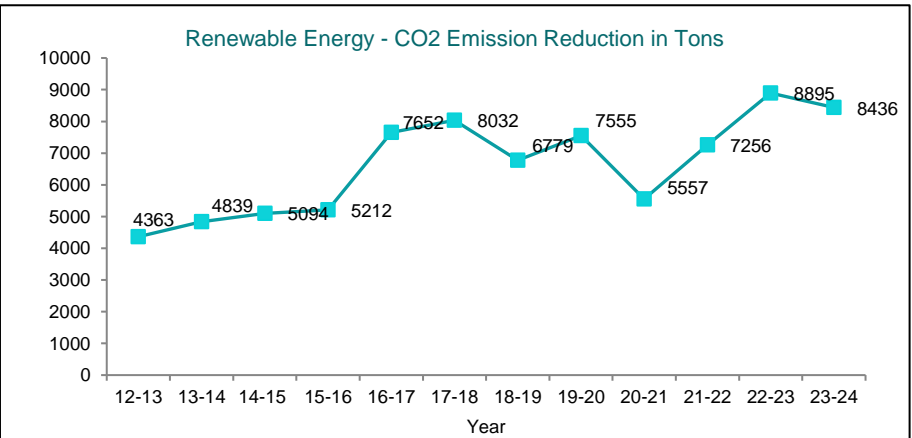
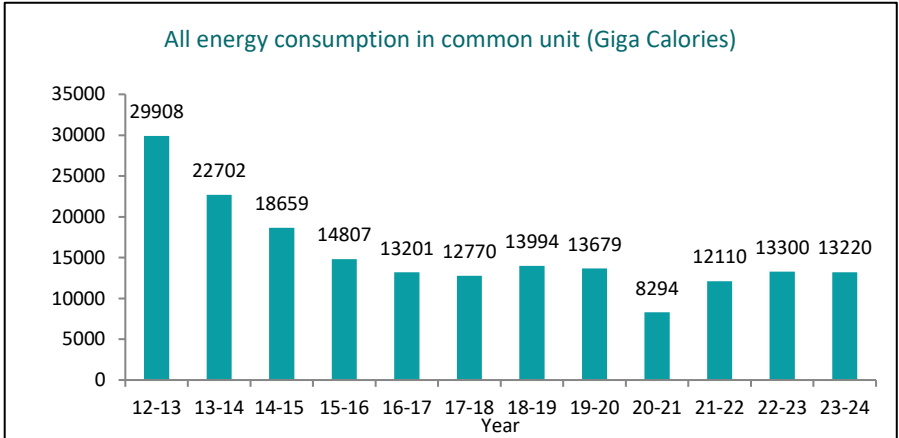


Rs 350 L

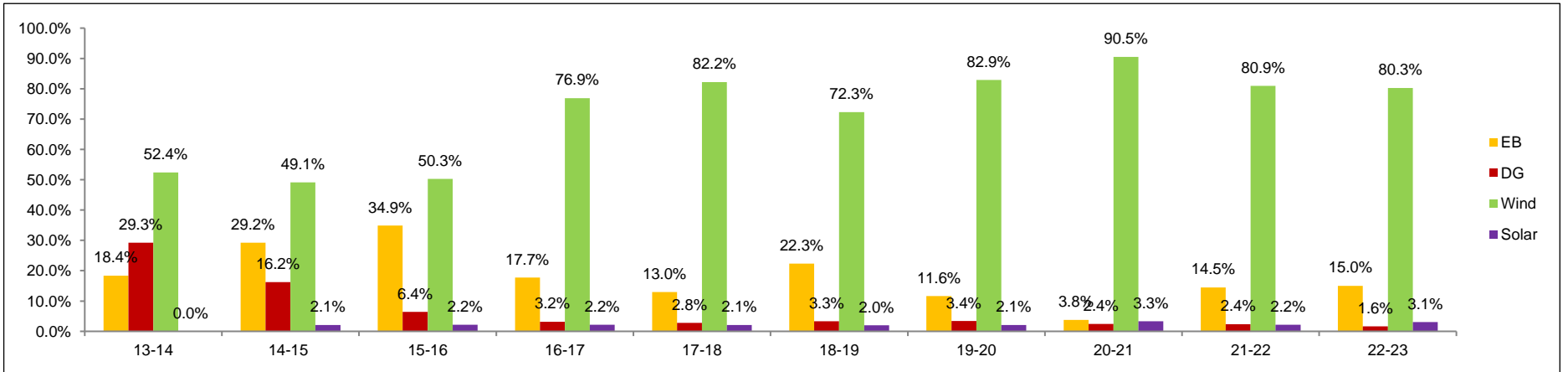
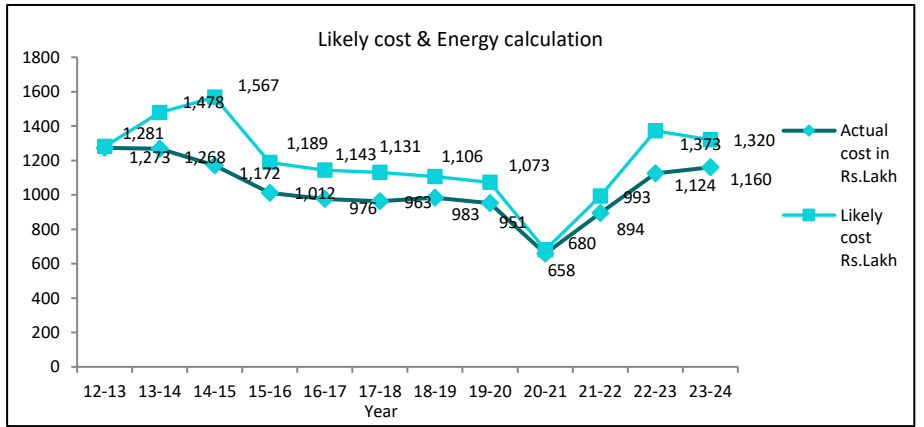
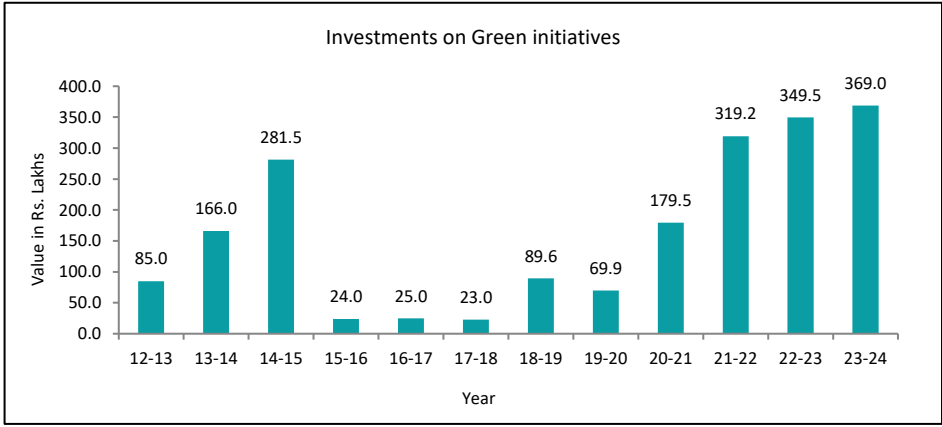
Total capex investments for energy & Green projects

Investment

Results & Impacts



Results & Impacts



Rewards & Recognition



Excellence in Energy Management

CII
2017, 2018, 2019, 2022

Green tech environment award – Greentech

Greentech
2017, 2018, 2019, 2020

Green tech environment award - Greentech

Greentech
2021

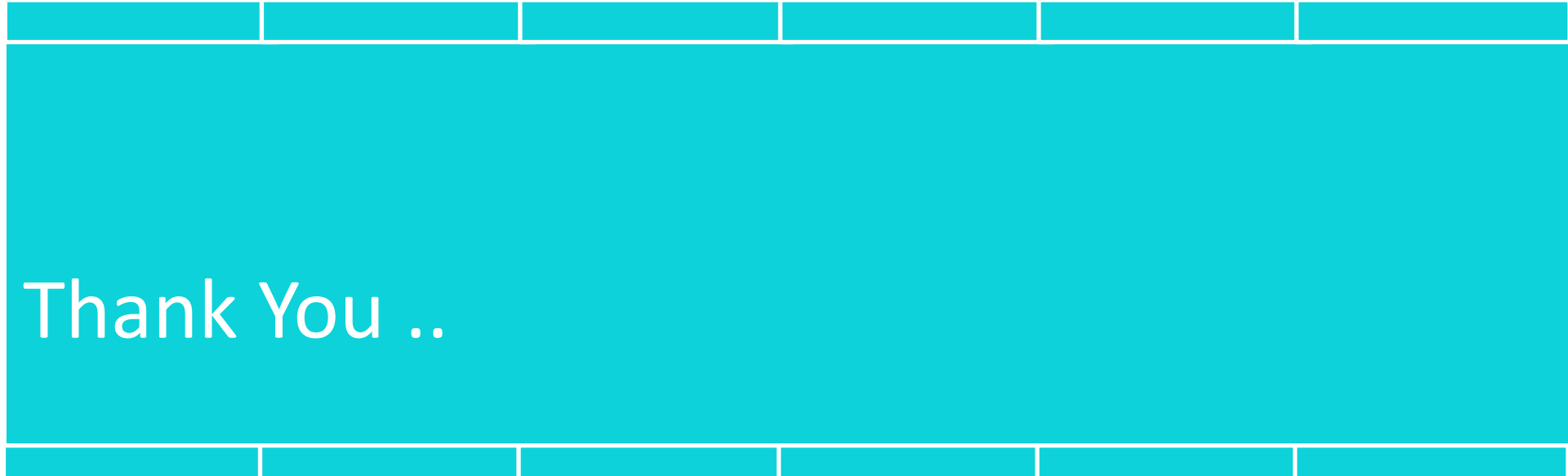
Environmental Best Practices Award – CII

CII
2020

National Competition on DRA & Industry 4.0 - CII

CII
2021





Thank You ..