

25th

National Award for

Excellence in Energy Management

September 2024

2024

- **APITORIA PHARMA PRIVATE LIMITED**
- **UNIT III, HYDERABAD**
(A 100% SUBSIDIARY OF AUROBINDO PHARMA LIMITED)

S. No.	Name	Designation	Department
01	Mr V Sree Rama Murthy	Sr. General Manager	Operations
02	Mr. Kamalakar B	Dy. General Manager	Engineering
03	Mr. Ramesh Badeti	Sr.Manager	Engineering



1. Brief Introduction on Company



\$2.9B
Global Revenue

Employees **37k+**

Market presence **150+**

Mfg. Facilities **29**

USFDA
All facilities are USFDA & other regulatory approved

2

IPO
Aurobindo Pharma became a public company in 1992

1

Inception
Founded in 1986 by Mr. P. V. Ram Prasad Reddy, Mr. K. Nityananda Reddy

3

4

50+ Billion
Dosage Forms across the World



01

2nd Largest listed Indian pharma company by revenue from operations
Largest generics company in the US (by Rx dispensed)

02

124446 MWh
Total Solar Power Generation

03

CO₂ 237455 tCO₂e
Reduction in carbon emissions from baseline year FY20 (Achieved more than 100% of 2025 target)

04

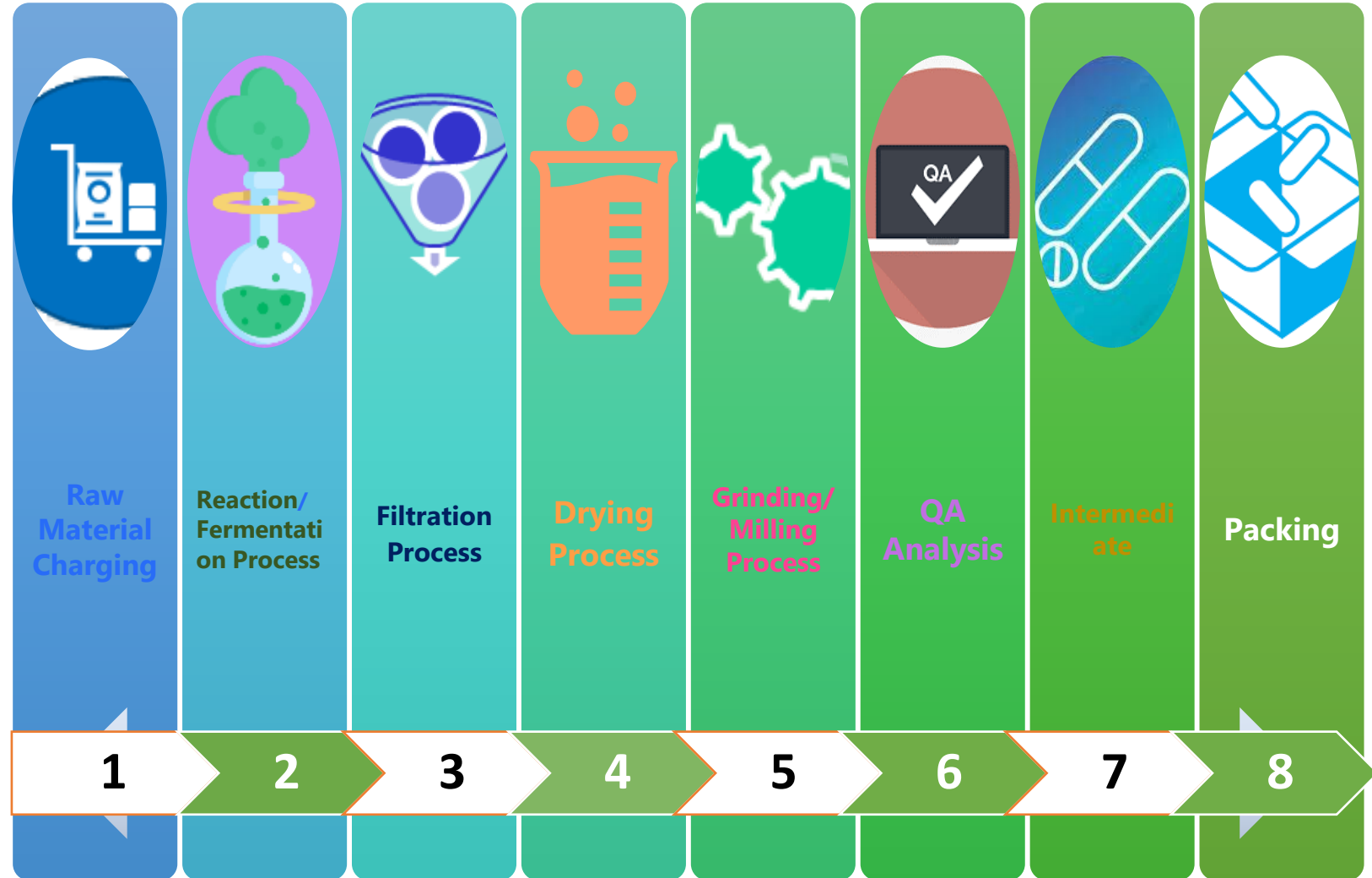
₹ 373 Millions In CSR Spends
8.59 Lakh Beneficiaries

05

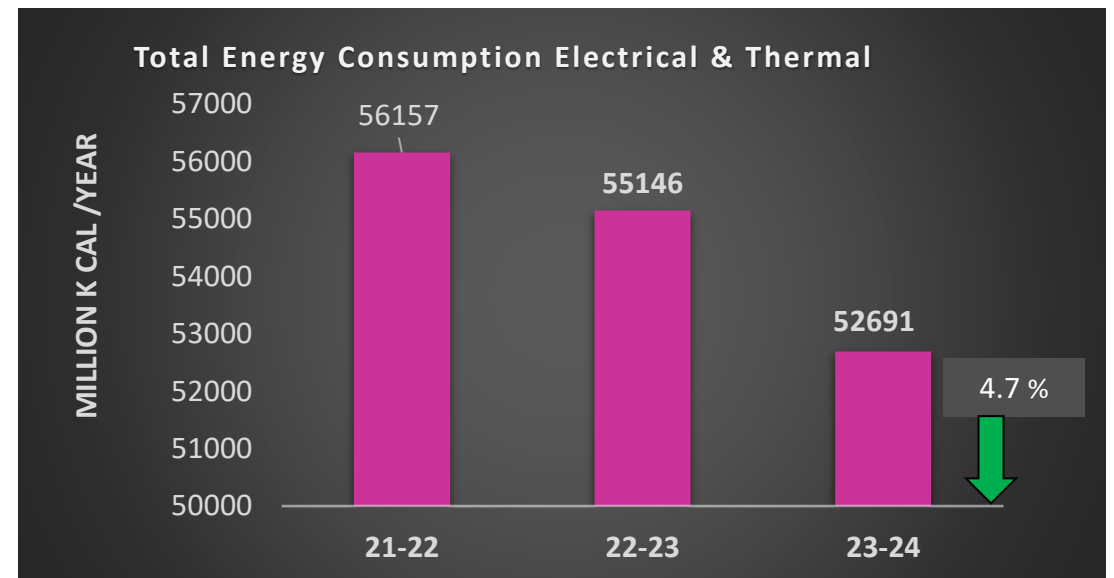
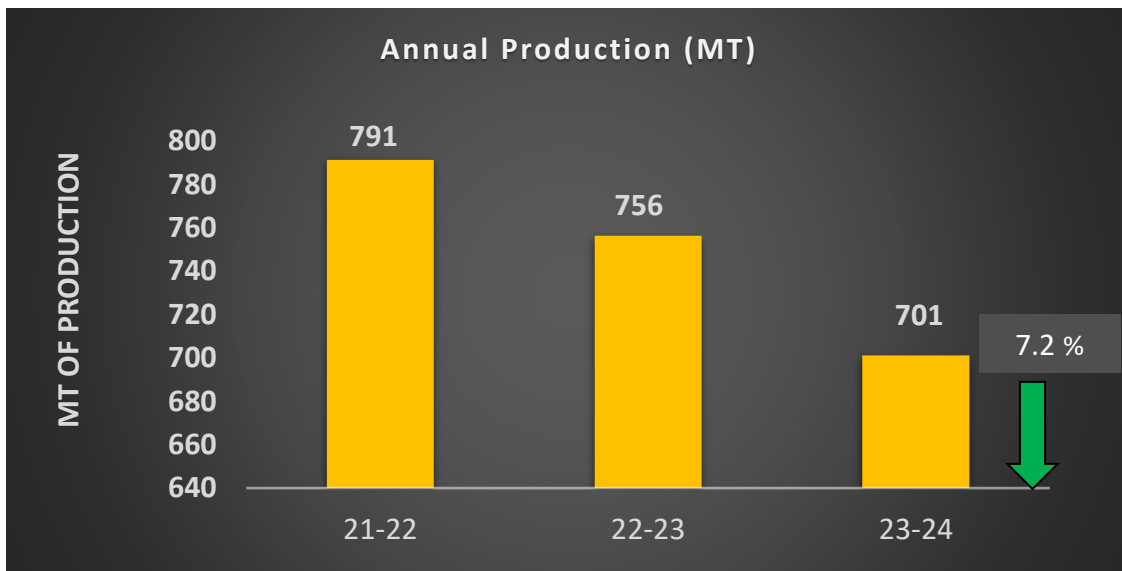
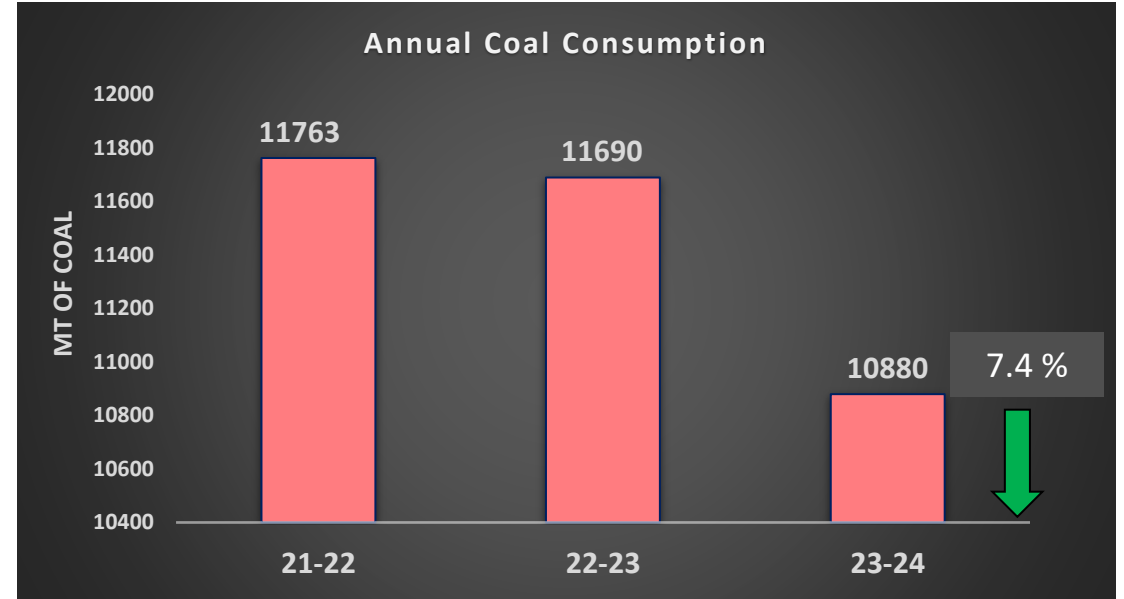
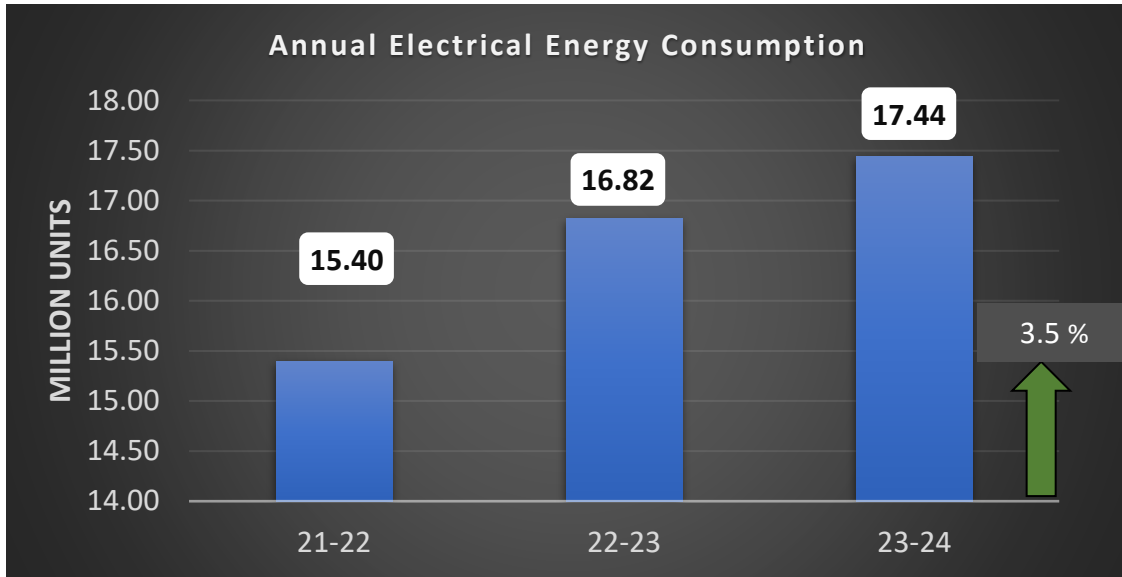
9 R&D Capabilities
1,500+ Scientists and analysts globally

- Sertraline Mandelate
- Polyallylamine Hydrochloride
- Pantoprazole Sodium
- Bohi Hydrochloride
- Darunavir
- Sumatriptan

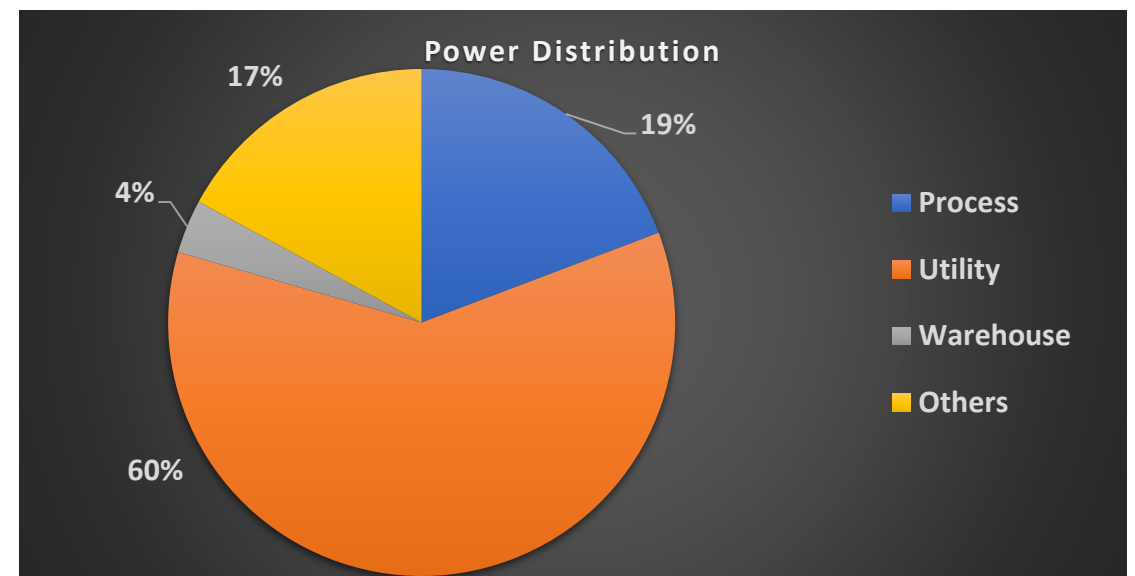
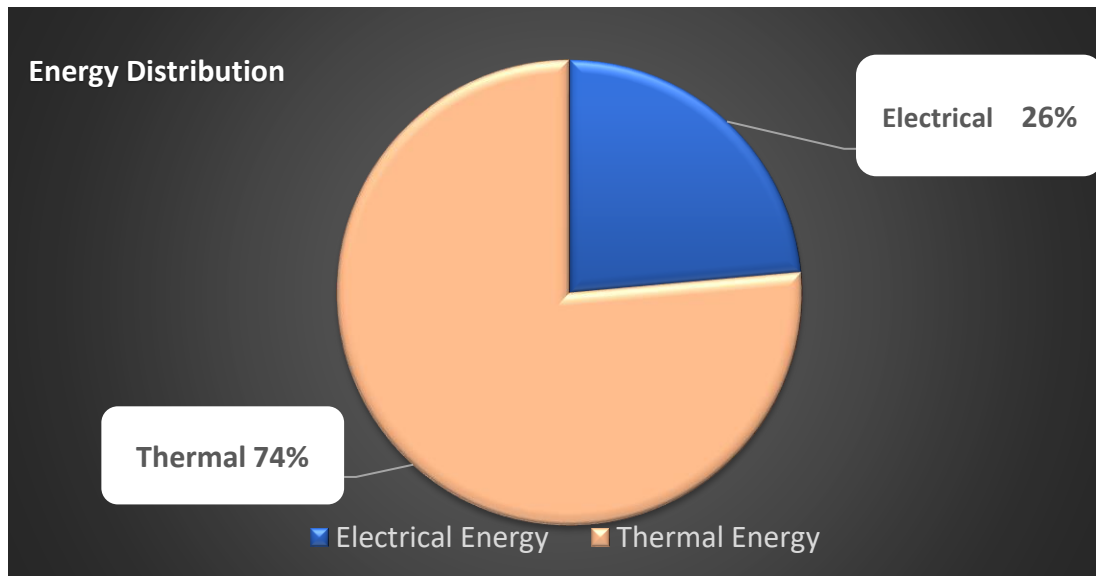
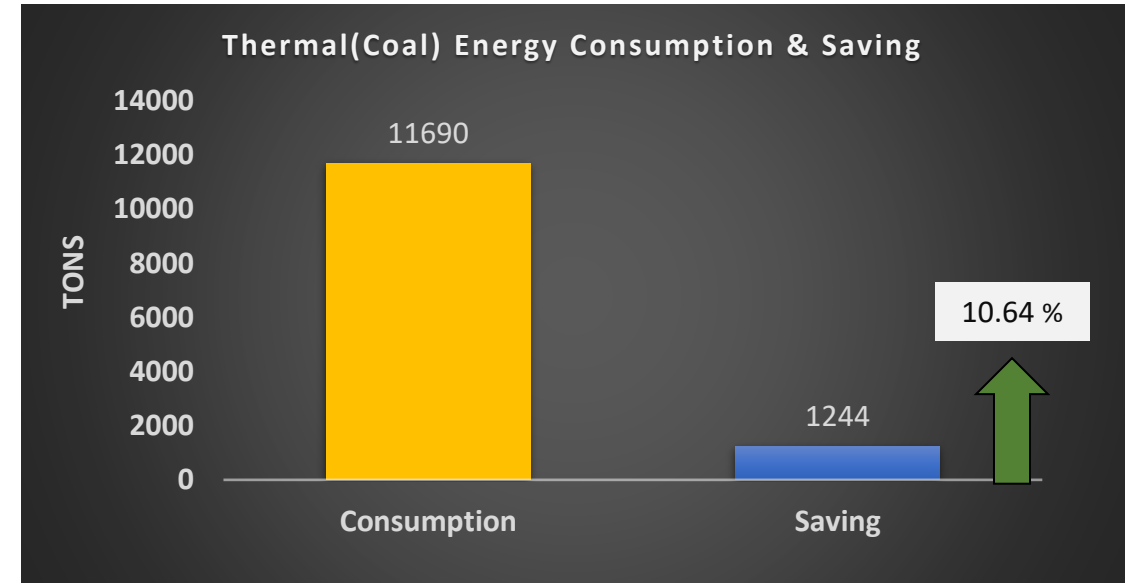
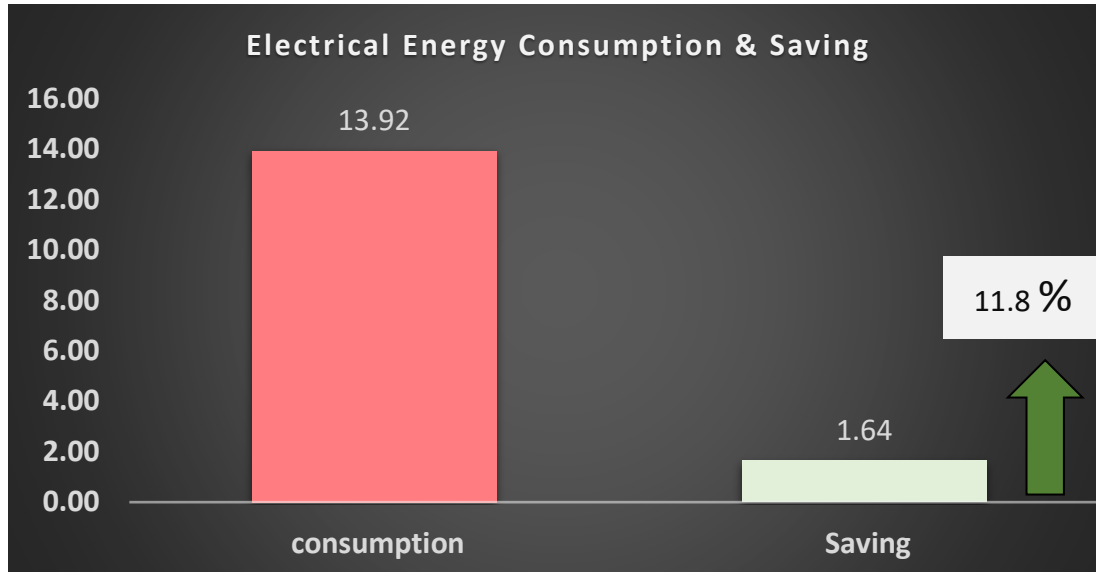
Major Products



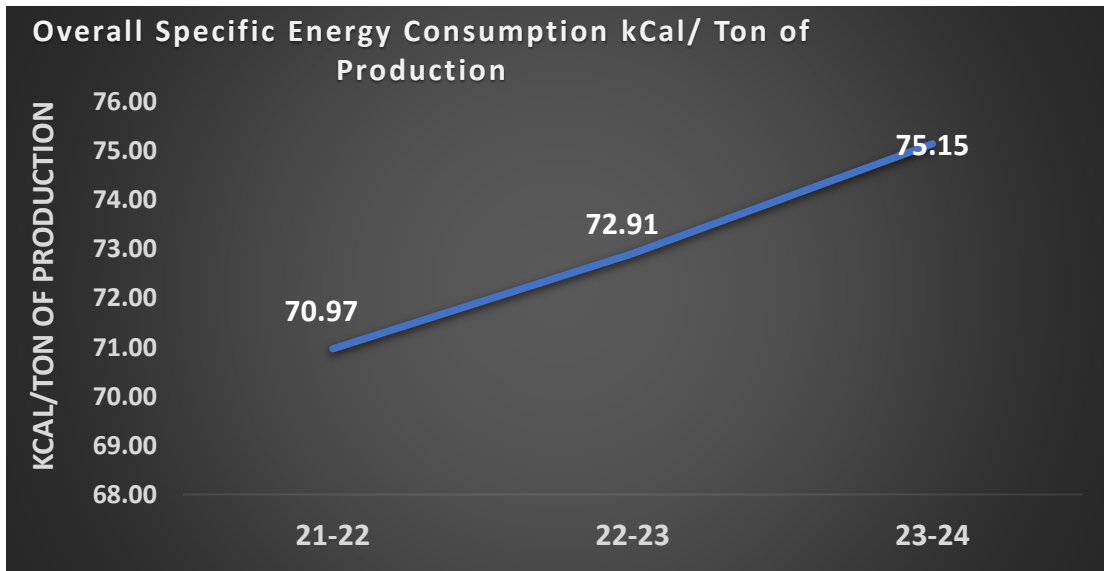
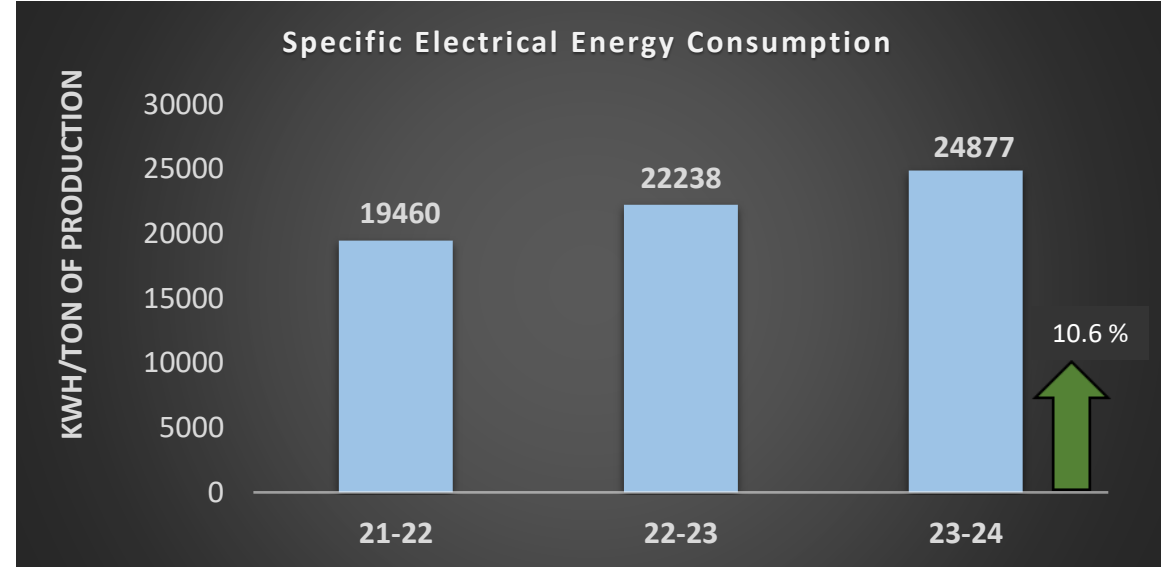
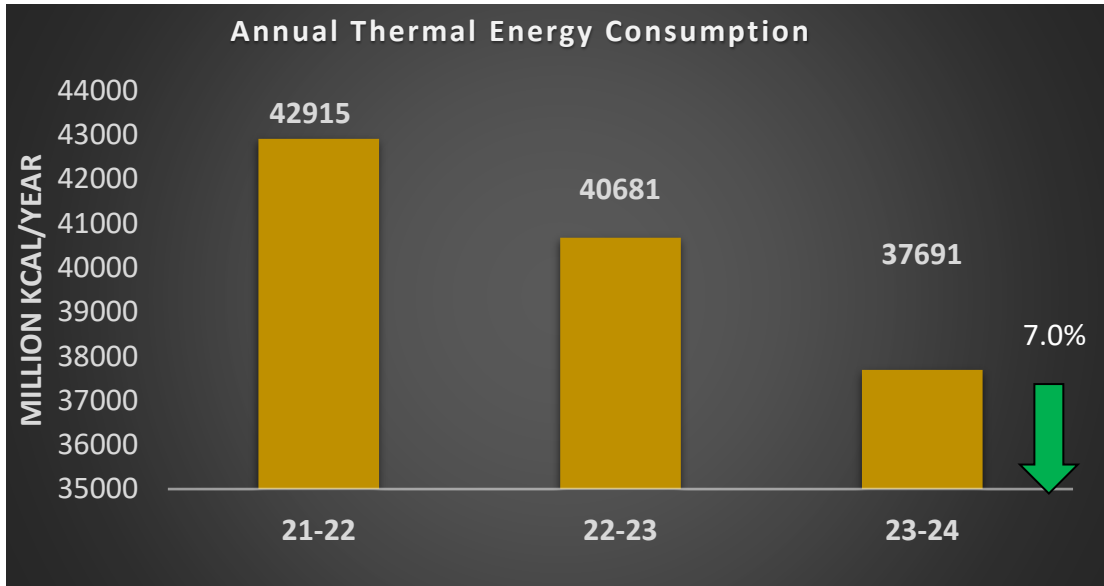
3. Specific Energy Consumption in Last three years



apitoria 3. Specific Energy Consumption



3. Specific Energy Consumption in Last three years



An increase in Specific Energy Consumption (SEC) during the FY 2023-24, which was caused by changes in the products being manufactured, where the new products have longer production processes, leading to non-linear energy consumptions

4. Information on Internal Benchmark - Utility

Description	Design Temp (°C)	Design SEC (KW/TR)	Operating SEC (KW/TR)	Target SEC (KW/TR)
Reciprocating Chillers (Water Cooled)	+5	0.86	0.89 - 0.91	0.86
	-15	1.39	1.41 - 1.43	1.39
	-20	1.58	1.60 - 1.62	1.58

Description	Design SEC (kW/CFM)	Operating SEC (kW/CFM)	Target SEC (kW/CFM)
Air Compressors	0.16	0.18 – 0.20	0.16

Description	Design SFR (KG/KG)	Operating SFR (KG/KG)	Target SFR (KG/KG)
Boiler	4.25	4.20	4.25

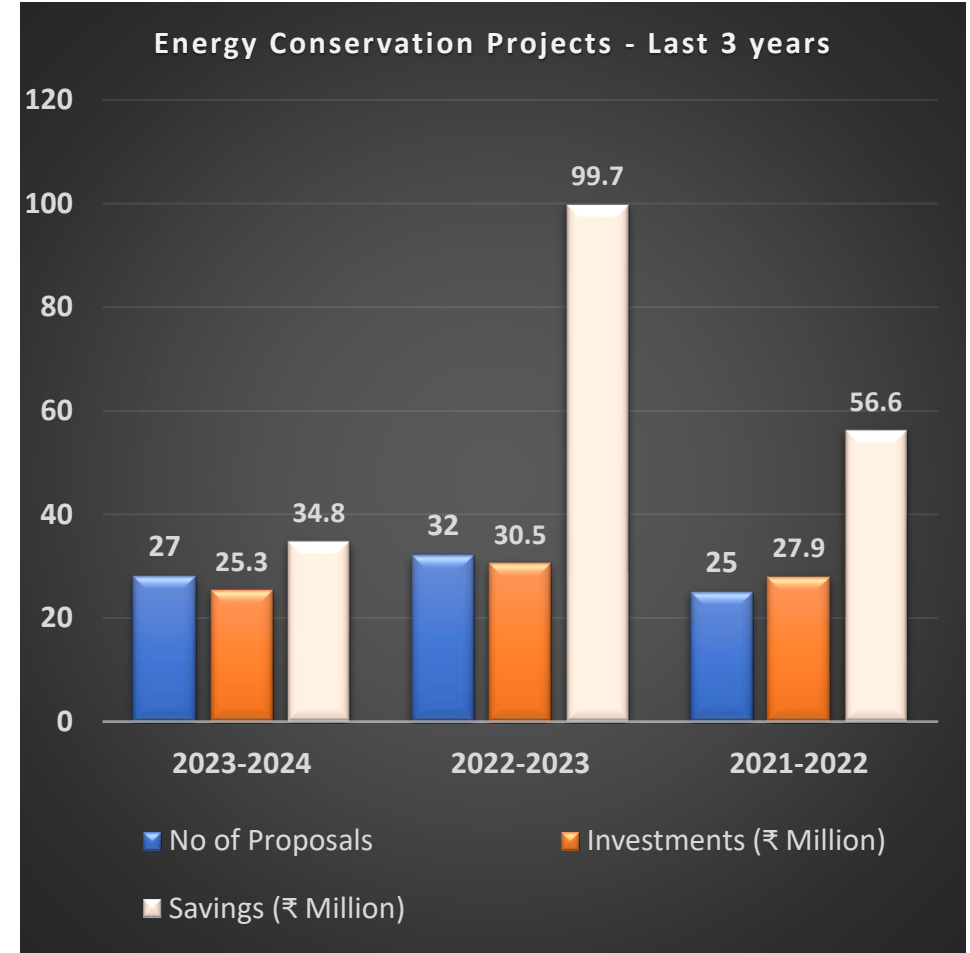


4. Major Energy Saving Projects in FY 2024-25

S.NO	Title of Project	Total Annual Savings (Rs million)	Investment Made (Rs million)	Payback (Months)
1	Boiler Efficiency Monitoring with Automatic Combustion Control System Model: CMS0102 for boiler	3.39	2.34	8.3
2	Energy Efficiency pumps and motors -08No's	2.79	2.00	8.6
3	FRP fans to be replaced with E-Glass Epoxy FRP Fans-19No's	2.17	2.78	15.4
4	OFR Technology for CMU702 & CMU804 Refrigeration compressors, Make: Hi-Freeze	2.05	4.65	27.2
5	Online pipe cleaning machine for Chiller condenser - Anti-scale impulse tech	1.72	1.00	7.0
6	Steam traps in Main line and production area to be increased	1.55	0.90	7.0
7	Install SOPT(Steam Operated Pressure Trap) for reduction of steam consumption at ETP	1.55	0.80	6.2
8	Based on load condition operating the boilers 8TPH or 12TPH	1.55	0.00	0.0
9	Implementation of VFD's for utility pumps	0.90	0.24	3.2
10	NPU003 IR vertical air compressor to be replace with New horizontal air cooled compressor	0.35	1.50	50.7
11	VFD's to be arrange for CMU806& 807 secondary pumps-02No's	0.29	0.08	3.3
12	VFD's to be arranged for aerator with DO System-04no's	0.26	0.19	8.7
13	VFDs to be arranged for centrifuges to control RPM and run on need basis	0.25	0.95	46.3
14	B block M-I RT pump connected to B block M-II cooling tower resultant 10HP CT fan stopped	0.22	0.03	1.6
15	Interlocking given for Pump and CT fans to avoid unnecessary running during system in OFF condition	0.15	0.00	0.0
16	VFD to be arranged for vacuum pumps 4nos	0.07	0.16	27.8
	Total	19.26	17.62	10.9

5. Energy Saving Projects Implemented in last three years

Summary of Energy Saving Projects Implemented in Last 3 Years						
Year	No of Energy Saving projects	Investments (₹ Million)	Electrical savings (Million KWh)	Thermal Savings (Tons)	Savings (₹ Million)	Payback period (In Months)
2023-24	27	25.3	1.6	1465	34.8	8
2022-23	32	30.5	2.2	1743	99.7	3
2021-22	25	27.9	2.5	1768	56.6	2



5. Energy Saving Projects Implemented in last year

Projects Implemented in FY 23-24				
S. No.	Name of Energy saving projects	Annual Savings (₹ Million)	Investments (₹ Million)	Payback (Months)
1	275KLD RO plant Reject water given to 120KLD RO plant feed resultant increasing of recovery and 22KL of reject water load reduced on MEE plant	7.05	0.08	1
2	Ejector vacuum pumps, and water ring vacuum pumps replaced with dry vacuum pumps-13No's	2.91	4.00	17
3	VFD's are arranged for RT Pumps, Secondary pumps & Vacuum pumps -10No's	1.01	0.40	5
4	Energy Efficiency pumps & motors arranged -04No's	1.64	0.60	4
5	Composite FRP fans arranged in place of FRP fans for J Block & SRP	0.20	0.27	16
6	ETP Fixed Aerators (50HP) replaced with energy efficiency Aerators(28HP) – 02 No's	0.95	2.50	32
7	ATFD-IV RT pump(20HP) stopped by connected stripper feed line to ATFD condenser	0.42	0.05	1
8	Interlocking given to refrigeration plant condenser pumps and CT Fan	0.86	0.12	2
9	Heat exchanger arranged in MEE condensate line for preheating of MEE feed	0.44	0.15	4
10	Coal handling plant loss including crushing, handling and moisture is reduced	1.85	0.00	0
11	Vapour condenser RT lines replaced with stripper feed to ATFD for preheating resultant feed temperature increased	0.71	0.04	1
12	SOPT Traps -02No's arranged for Columns at SRP & Steam traps replaced -15Nos in Manufacturing blocks	0.44	0.30	8
13	Productivity increased 9.752MT by Yield improvement by modifications in process	1.95	2.79	17
14	Boiler feed water line connected to air preheater, resultant air Preheater pump 7.5HP stopped	0.31	0.03	1

5. Energy Saving Projects Implemented in last year

Projects Implemented in FY 23-24				
S. No.	Name of Energy saving projects	Annual Savings (₹ Million)	Investments (₹ Million)	Payback (Months)
15	Energy efficiency motors arranged in place of Standard motors	0.27	0.55	25
16	MEE and stripper column pump separated resultant saving achieved	0.16	0.15	11
17	By modification in process batch sizes are increased resultant number of batches reduced	12.68	12.70	12
18	B II & BIV reactor RT pump 40HP replaced with 25HP motor and pump due to low utilization	0.13	0.00	0
19	Common Scrubber arranged for ATFD –II & III resultant one blower stopped	0.13	0.05	5
20	+5°C Chilled Water pump separated for SRP & column resultant power saving achieved	0.13	0.00	0
21	Receivers shifted to second floor to avoid pumping system resultant power saving achieved	0.13	0.10	9
22	B Block MI Graphite vacuum pump 15HP motor replaced with 10HP motor	0.10	0.05	6
23	Common pump arranged for MEE condensate and Low TDS	0.09	0.04	5
24	Steam saving achieved in column by modification in process	0.09	0.26	33
25	Pump replaced with N2 pressure transferring for REB331 receiver	0.04	0.01	3
26	In SRP solvent distillation done without reactor stirring	0.03	0.04	15
27	Line modification done for Hot water pumps at Vacuum dryer in B block thereby stopped one 5HP Motor	0.02	0.05	24
	Total	34.8	25.3	8.7



ETP RO plants 275 KLD & 120 KLD both run in sequence

Solution Implemented

- 275KLD RO plant is set to discharge its Reject water into the feed of 120KLD RO plant and kept running both RO plants in sequence

Advantages

- Reduction of Steam Consumption
- Increase of RO recovery from 60% to 80%
- Reject water 22KL/Day load reduced on MEE plant


1.44 Lakh
KWh /year

Coal
837
MT/year

SAVINGS: **70.54** Lakhs/Year
INVESTMENT: ₹ **0.75** Lakh





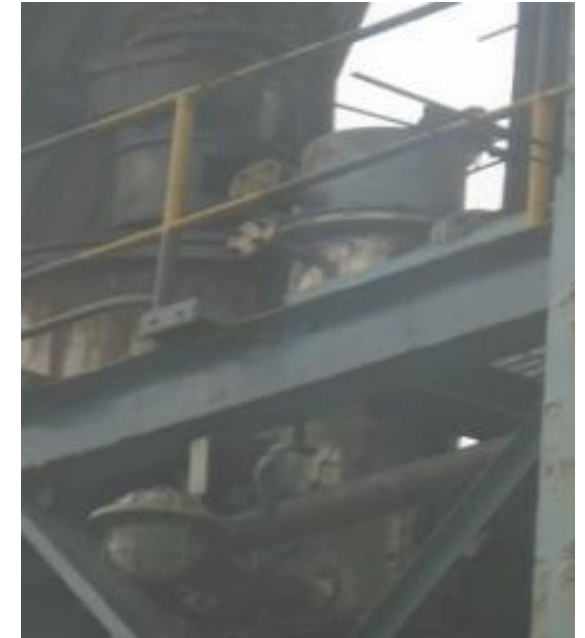
ATFD vapor condenser RT replaced with stripper feed for preheating

Solution Implemented

- Replaced the RT lines with a stripper feed for the ATFD vapor condenser

Advantages

- Reduced Power Consumption by stopping 20HP RT pump
- Increased Stripper feed Temperature




52416
KWh /year

Coal
42
MT /year

SAVINGS: **7.14** Lakh/Year
INVESTMENT: ₹ **0.35** Lakh



Start
May-23

Composite FRP Fan installed in place of FRP Fan

Solution Implemented

- Replaced FRP fans in a Cooling tower with Composite FRP fan.

Advantages

- Reduced Power Consumption
- High air lift ratio.



Composite FRP Fan



FRP Fan


13234
Kwh/year

SAVINGS: **1.06** Lakh/Year

INVESTMENT: ₹ **1.3** Lakh

ROI MONTHS

12

Start
Apr-23

Energy Efficiency Vertical Inline and Horizontal Single stage Pumps with motors

Solution Implemented

- Replaced standard efficiency motors with energy efficient pumps and motors.
- Performance evaluation done and identified the opportunity .

Advantages

- Less Maintenance and Low space.
- Power saving
- Efficiency improvement
- Pump sizing and load matching



2.06

Lakh Units/Year

SAVINGS: **16.44** Lakh/Year

INVESTMENT: ₹ **6** Lakh

ROI MONTHS

4



VFD with pressure Transmitter for utility pumps



Solution Implemented

- Installed Variable Frequency Drive(VFD) with a pressure transmitter for the automatic control of Utility pumps

Advantages

- Reduced power consumption
- Increasing of life by Smooth starting of pump and motor
- Reduced the mechanical wear and tear



1.27

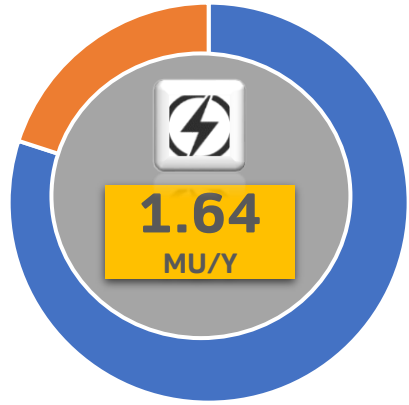
Lakhs of Units/Year

SAVINGS: **10.14** Lakh/Year

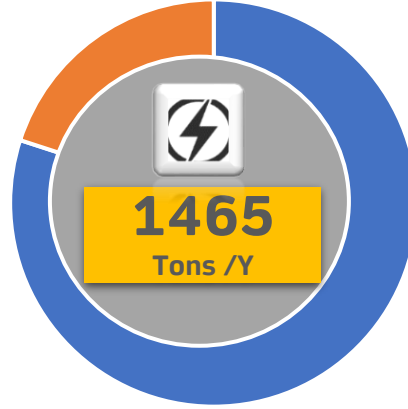
INVESTMENT: ₹ **6.0** Lakh

ROI MONTHS

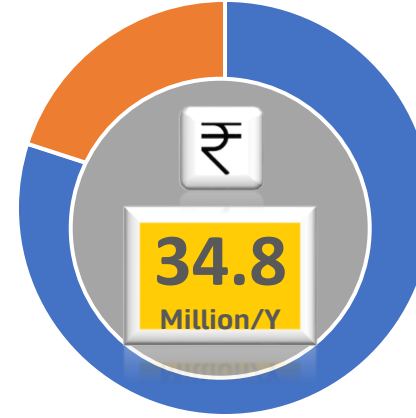
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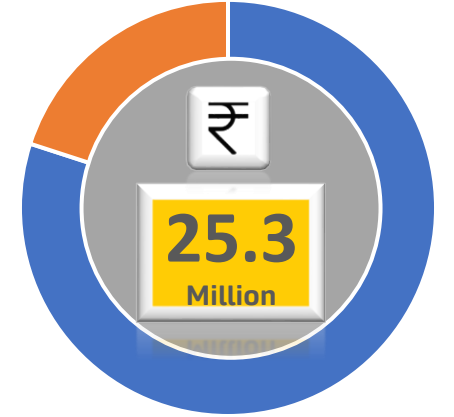
**TOTAL
ELECTRICAL
SAVINGS**



**TOTAL
THERMAL
SAVINGS**



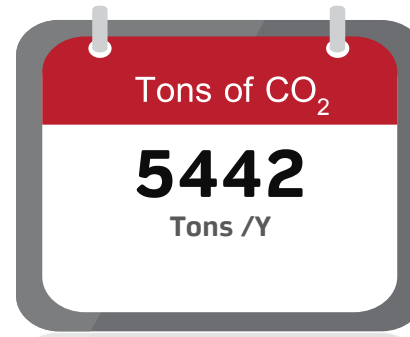
**TOTAL
MONETARY
SAVINGS**



**TOTAL
INVESTMENT**



**PAYBACK
PERIOD**



**CO₂
REDUCTIONS**



1. Auto Sampler System arranged For Reactors

Trigger for implementation :

- During Batch process sampling to be collected in hot condition and sending to QC for testing.
- Present sampling is taken manually by stopping the reactor and removing the vacuum and utilities.
- Auto sampler system is arranged for six reactors and each batch ~30Min batch cycle time is reduced



Benefits

- Product cycle time reduced.
- Reduction of Power
- Reduction of steam
- Safety Improvement

Replicability :

- Yes, huge replication opportunities
- Based on product requirement

Results :

- Monetary Savings = 2.5 Lakh / Y
- Investment = 3.5 Lakh
- Payback = 16 Months



2. Heat exchanger arranged in MEE condensate line for preheating of MEE feed

Trigger for implementation :

- Heat exchanger is installed in MEE condensate line by modification.
- Before Heat exchanger installation MEE condensate water sending at above 80⁰ C to Low TDS tank.



Benefits

- Increased MEE feed temperature
- Reduction of Steam Consumption

Replicability :

- Yes, replication opportunities

Results :

- Monetary Savings = 4.44 Lakh / Y
- Investment = 1.5 Lakh
- Payback = 4 Month



3. Auto control valve arranged for distillation column main steam line

Trigger for implementation :

- Pressure regulating valve is installed in distillation column steam main line, but steam fluctuations are happening whenever four columns are running.
- Due to steam fluctuations temperatures are disturbing resultant column distillations are delaying
- Auto control valve is arranged in steam line and set pressure is 3.5Kg/Cm²



Benefits

- Reduced batch cycle time in distillation column
- Reduced Steam Consumption

Replicability :

- Yes, replication opportunities

Results :

- Monetary Savings = 8.0 Lakh / Y
- Investment = 4.5 Lakh
- Payback = 4 Month

7. Utilisation of Renewable Energy sources



1. **Renewable Energy** The most important feature of renewable energy is that it can be harnessed without the release of harmful pollutants.
2. **SO₂ Emission:** Sulphur dioxide is a corrosive acid gas, which combines with water vapor in the atmosphere to produce acid rain
3. Rain water Harvested 129936KL



INSTALLED CAPACITY
 30MW Solar Power Plant
 Generated : 43000 MW
 Total Consumed renewable Power : 124446 MW (Self & purchased) for FY24



LOCATION & DEVELOPER
 M/s NVNR Ramannapet- I & II Power Plant
 P. Limited
 15MW Solar Power Plant Open Access Power Purchase Agreements(PPAs) for 25 Years
 Starting : July 022



% SHARE TO APITORIA UNIT-III
 % Share in Energy Consumption : 17.65%
 Allotted Generation: 0.26 Cr Units / Year



Biomass(Rice Husk and Briquettes)
 Energy Utilized : 365278 GJ



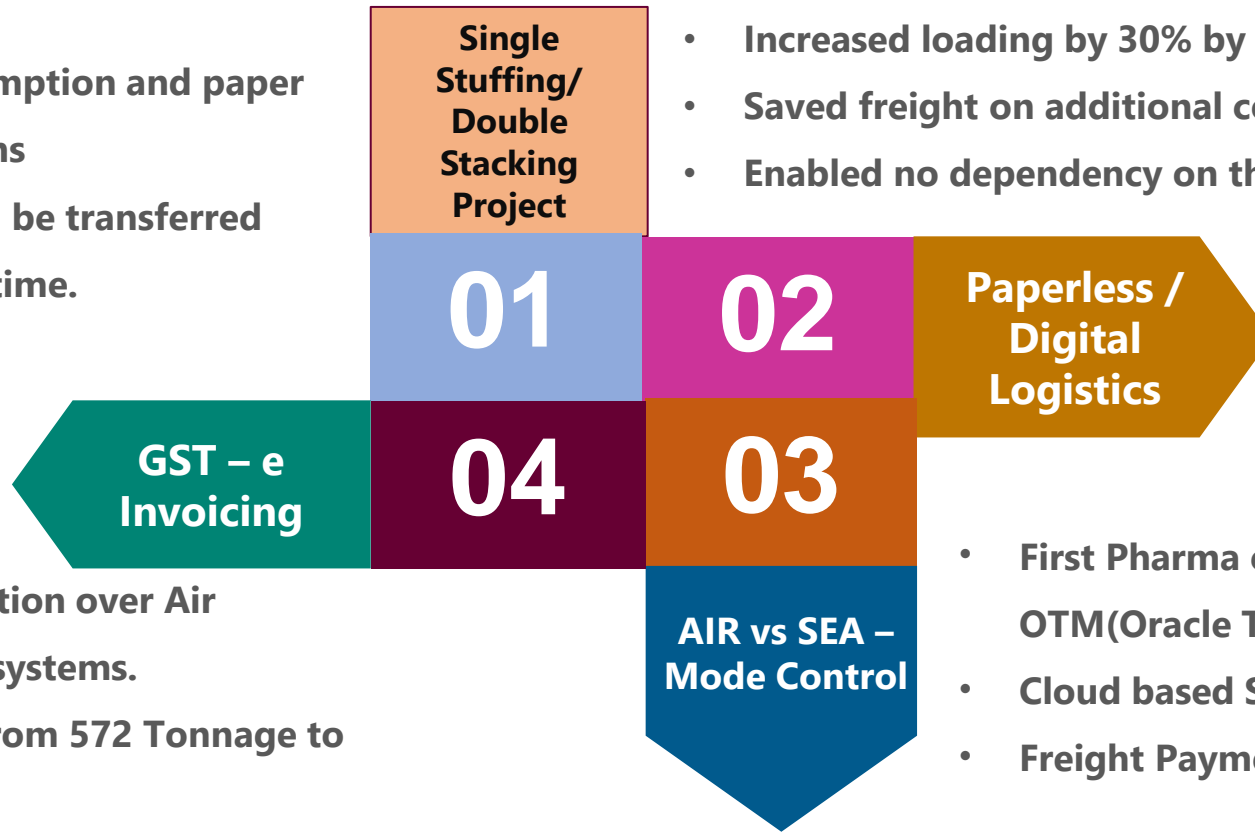
- ▶ 20% Renewable Energy Share (Power to Power)
- ▶ 12.5 % Reduction in Emissions
- ▶ 35% water conservation / restoration
- ▶ 60% co-processing of hazardous waste
- ▶ 100% reuse & recycling nonhazardous waste
- ▶ 25% hours of learning per employee



Year	Total Scope 1 emissions (tCO ₂ e)	Total Scope 2 Emissions (tCO ₂)	Total GHG Emissions (tCO ₂ e)
2021-22	14839	12780	27619
2022-23	14704	13961	28665
2023-24	13651	14477	28128

Management

- Decreased Paper consumption and paper less / Digital transactions
- Invoice information will be transferred from the portal in real-time.



- Increased loading by 30% by optimizing with shipper stuffing,
- Saved freight on additional container with 50% extra space
- Enabled no dependency on the wooden pallets.

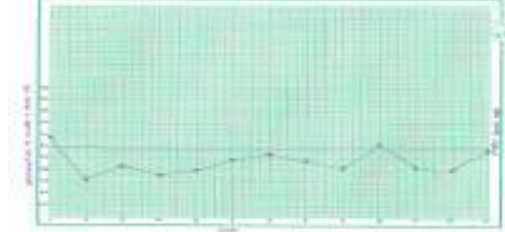
- Increased Sea transportation over Air transportation by pallet systems.
- Decreased air Tonnage from 572 Tonnage to 456 Tonnage

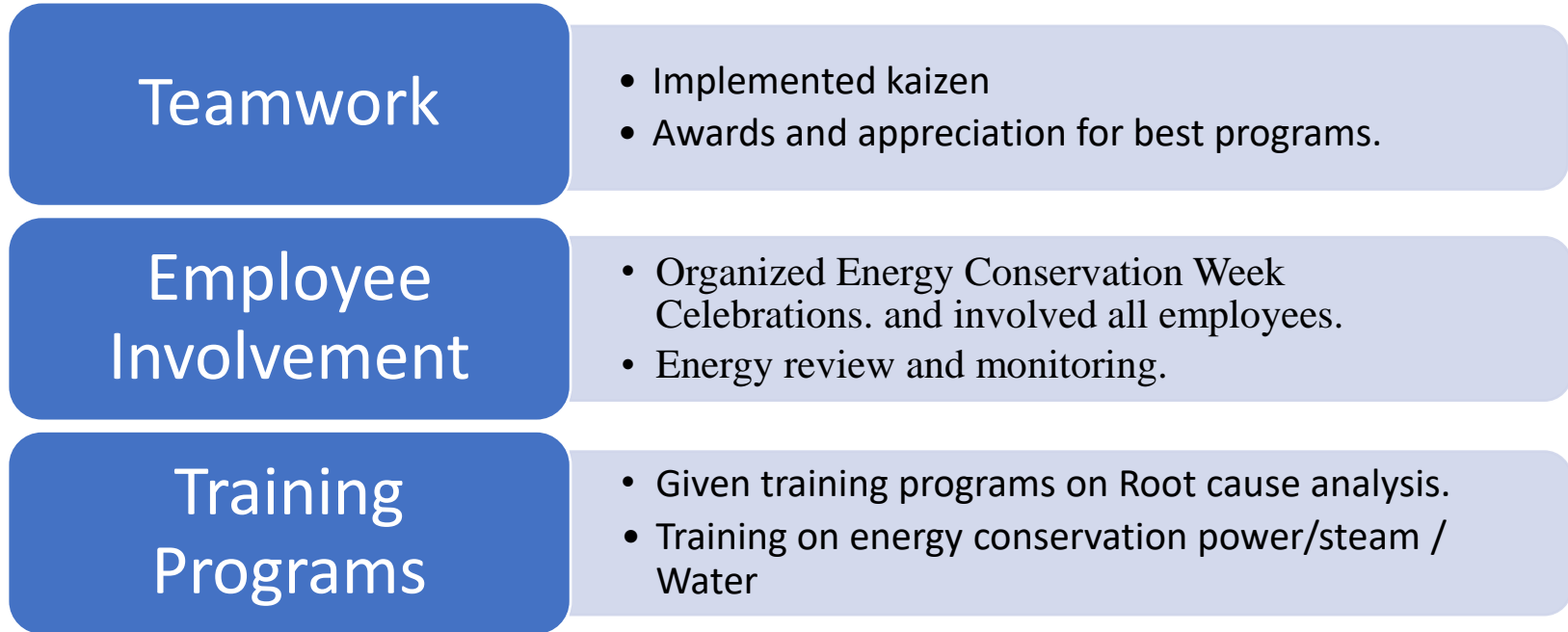
- First Pharma company in India to adopt OTM(Oracle Transportation Management).
- Cloud based Solution
- Freight Payments linked from OTM to ERP.

Key initiatives

- 76% of spending Local suppliers for key raw materials
- Packing material reduction
- Green belt development efforts helped avoid 14,901 tCO2e emissions
- Plantation in and around manufacturing facilities
- Participation in external plantation programmes

- Daily LDM review meeting conducting by HOD
- Daily/Monthly review meeting by Plant Head
- Monthly review meeting by Senior Management
- Energy assessment audit done by Internal & External and action plans for implementations
- Daily power consumptions and steam consumption sharing to all end users
- Idea generation and Implementation on kaizen's
- Optimized working of various electrical equipment's, like Utility Motors, pumps, lighting, lift uses, AC's
- Daily monitoring of utility equipment efficiencies and leakages of air, nitrogen & steam
- To ensure all employees involvement in internal & external awareness training programs





DAILY/Weekly



MONTHLY

- Performance Reports
- KPIs
- Overall Consumption
- LDM Meeting
- KAIZENS Implementation

- Avg. Monthly Report
- Recommendation for any service / Maintenance
- Inter - Unit Comparisons





Awareness



Banner Hosting



IDEA Generation



Quiz Competition



Essay Writing



Poster Making




S No	Instruments	Make
1	Power Quality Analysers (2 Nos)	Krykard
2	Flue Gas Analyser	Kane(NEVCO)
3	Thermal Imager	Testo
4	Ultrasonic Flow Meter	Eesiflo
5	Ultra Sonic Thickness Gauge	Eqinox
6	Pitot tube	Nevco
7	Digital Manometer / Pressure meter	Comark
8	Hotwire Anemometer	Testo
9	TDS / pH Meter	Aquisol
10	Stroboscope / Tachometer	Extech
11	Humidity, DBT & WBT Meter	Testo
12	Digital Pressure Guage	Testo
13	Lux Meter	Extech
14	Stop watch	Extech
15	Psling Psychrometer	Dimple



11. NET ZERO COMMITMENT

Sustainability pillars

To assess our sustainability performance, we evaluate the extent to which we have achieved our short- and long-term goals across six pivotal dimensions of sustainability, known as the sustainability pillars. These pillars serve as guiding principles, helping us navigate our sustainability efforts and measure our progress effectively.

Sustainability pillars	Goals 2025	Progress made so far	Status
Responsible manufacturing 	20% Renewable energy share (power-to-power)	14%	In progress
	12.5% Reduction in carbon footprint	16%	Achieved
	35% Water neutrality (water conservation/restoration)	36%	Achieved
	60% Co-processing of hazardous waste	64%	Achieved
	100% Reuse/Recycle of non hazardous waste	100%	Achieved



Implementation of OFR Technology – Refrigeration Systems

- Improved reliability & safety in Refrigeration Systems.
- Savings to the tune of 32-48% observed in the existing plants.



Procurement of No Air Loss Drain Valves in Compressed Air Systems

- Avoided loss of compressed air to atmosphere.
- Attractive payback period of 3 months.



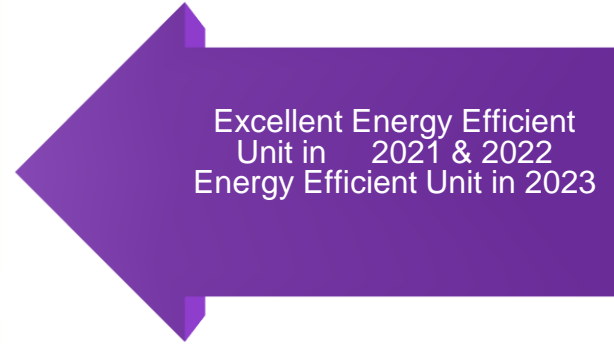
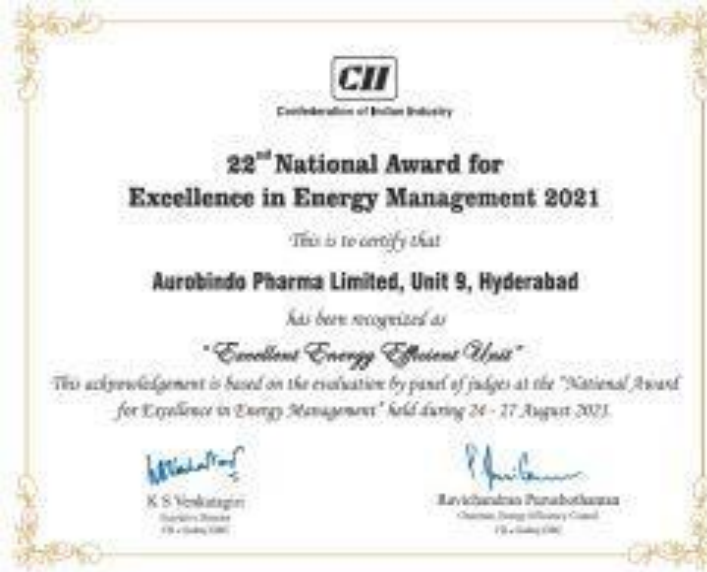
Procurement of Vertical Inline Pumps replacements & New projects

- Energy Efficient and reduced power consumption.
- Low foot print , Less maintenance and down time.



Composite FRP Fans

- Reduced Power Consumption 20 - 24%
- High air lift ratio and increase air velocity.





- 373 million investment in CSR
- 8.59 Lakh Beneficiaries
- Education and skill development
 - Eradication of hunger and poverty
 - Sustainable agriculture and environment protection
 - Disaster and healthcare relief programmes
 - Other rural development activities





THANK YOU...



A 100% subsidiary of Aurobindo Pharma Limited