AUROBINDO

24th National Award for Excellence in Energy Management

13-15 September 2023

2023

AUROBINDO PHARMA LIMITED
UNIT-VIII, HYDERABAD

S. No.	Name	Designation	Department
01	Mr. Sridhar Surat	Senior General Manager	Operations
02	Mr. Ravi Kumar Akella	Asst. General Manager	Engineering
03	Mr. Battu Vikram	Manager	Engineering

Brief Introduction on Company

₹ 24,855 CR
Revenue

Employees 33k+

Market presence 150+

Mfg. Facilities 25

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

IPO
Aurobindo Pharma became a public company in 1992

USFDA
All facilities are USFDA & other regulatory approved

41 Billion
Dosage Forms across the world

01 Largest generics company in the US (by Rx dispensed)

02 **43,000 MWh** Solar Power Generation

03 **17%** Reduction in carbon emissions from baseline year FY20 (Achieved more than 100% of 2025 target)

₹ 76.3 Cr In CSR Spends

7. 38 Lakh Beneficiaries

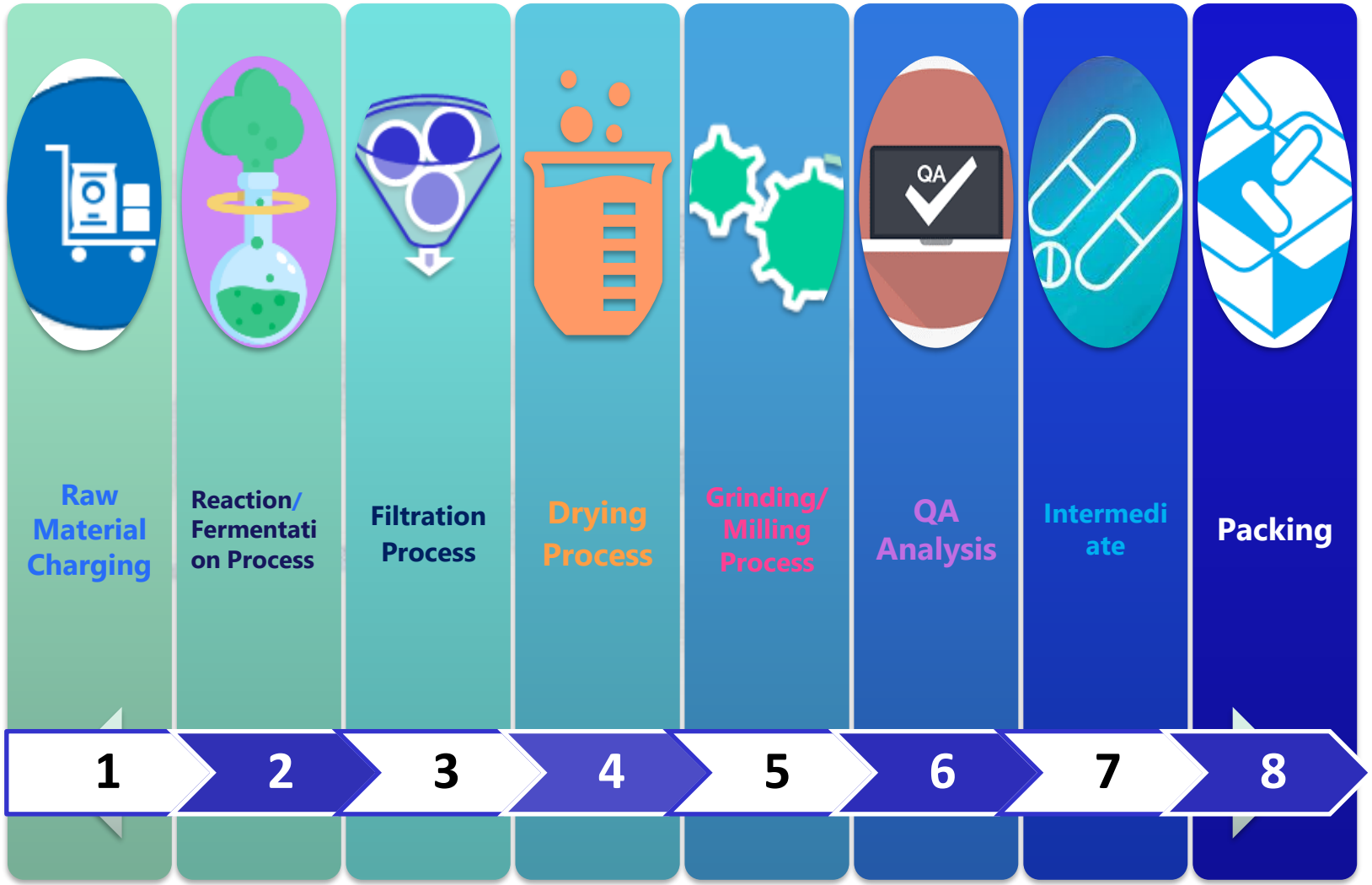
R&D Capabilities

5 in India and 4 in the US
1,500+ Scientists and analysts globally

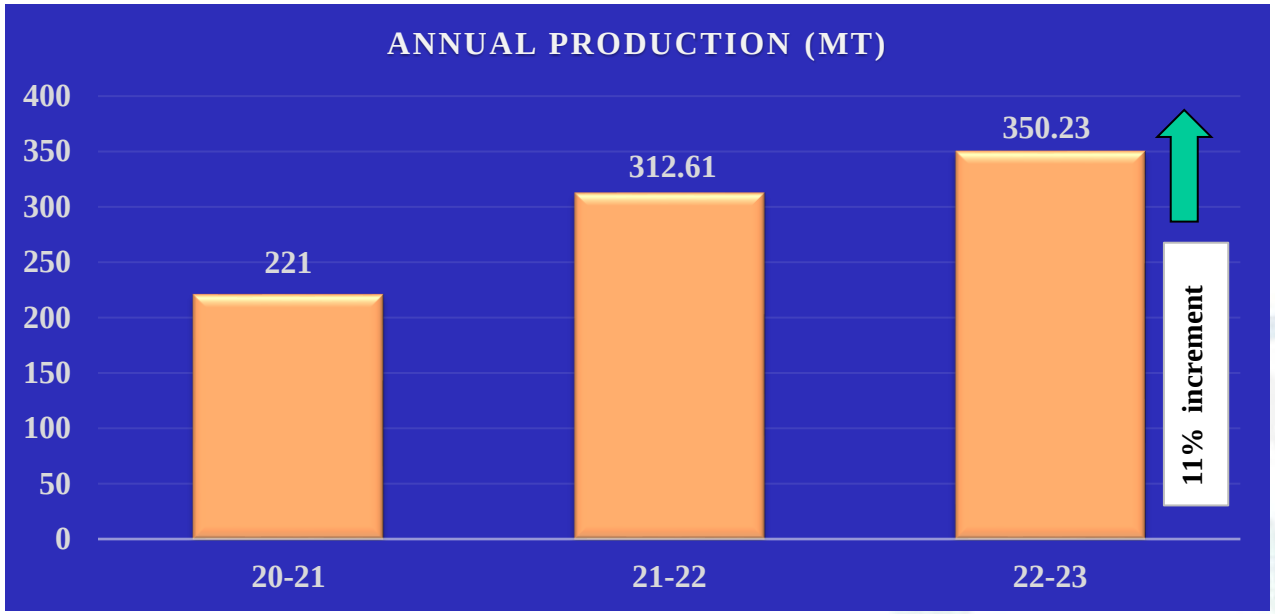
Details of the Products / Processes

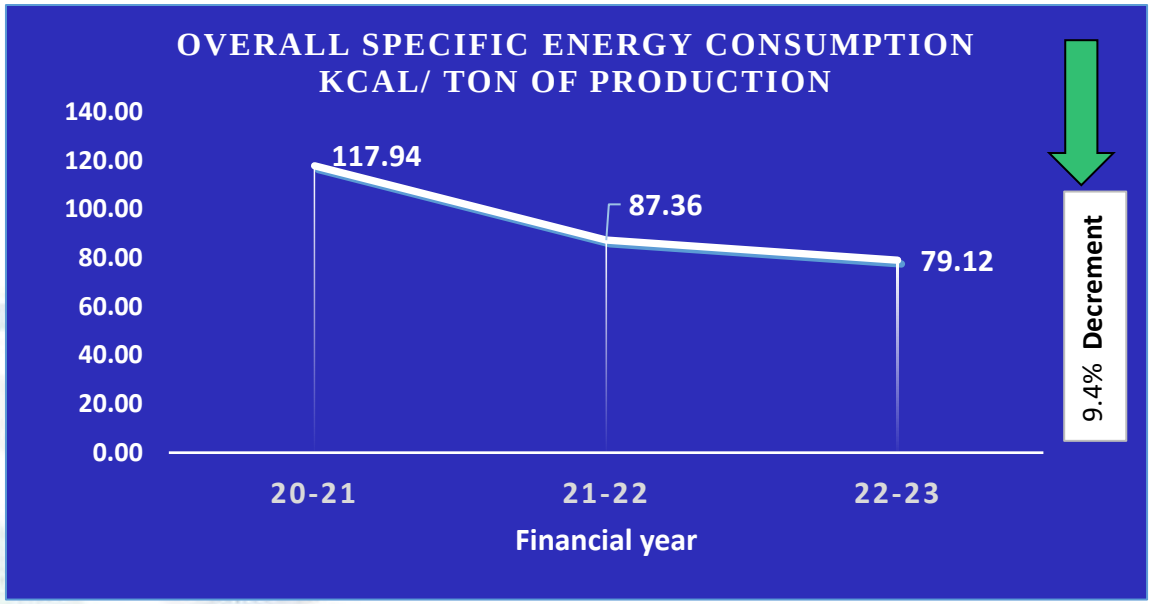
- Finasteride Pure
- Fluconazole form-II
- Benazepril API
- Fluoxetine Hydrochloride
- Fluoxetine HCL - API
- Eletriptane

Major Products



Energy Consumption Overview Last 3 years

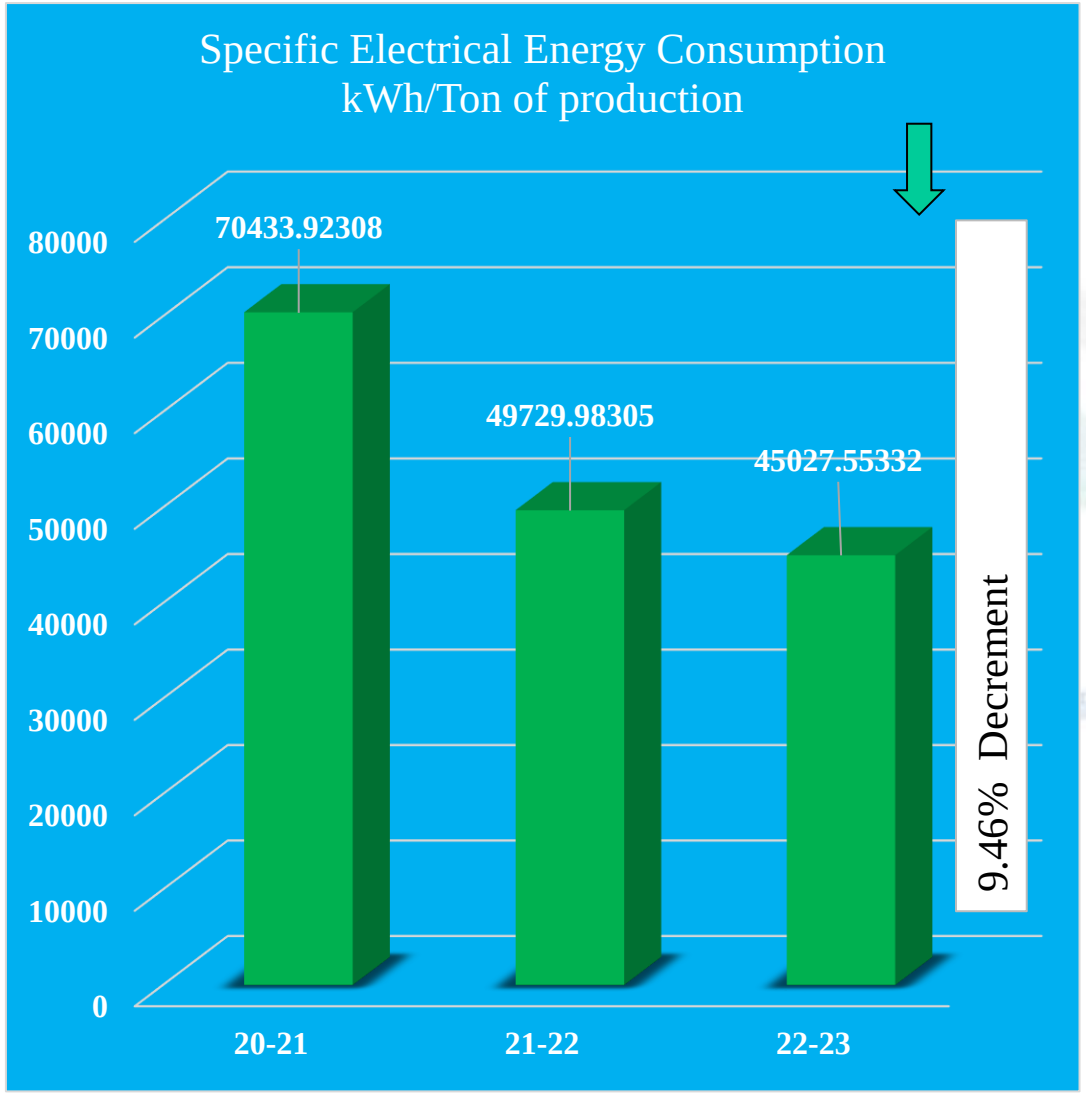


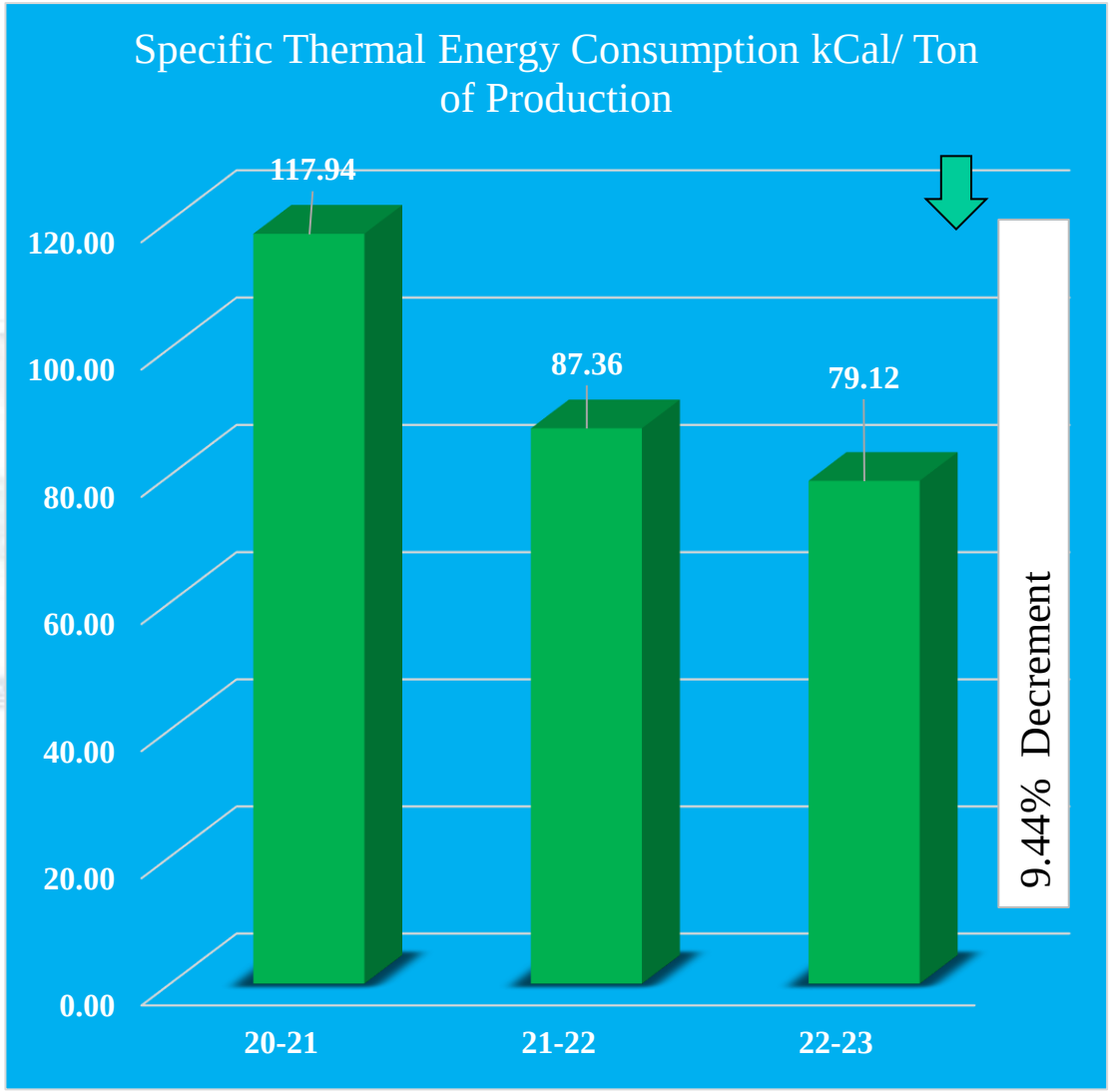


We achieved SEC reduction consistently over last 3 years . This was possible due to implementation of energy conservation projects like

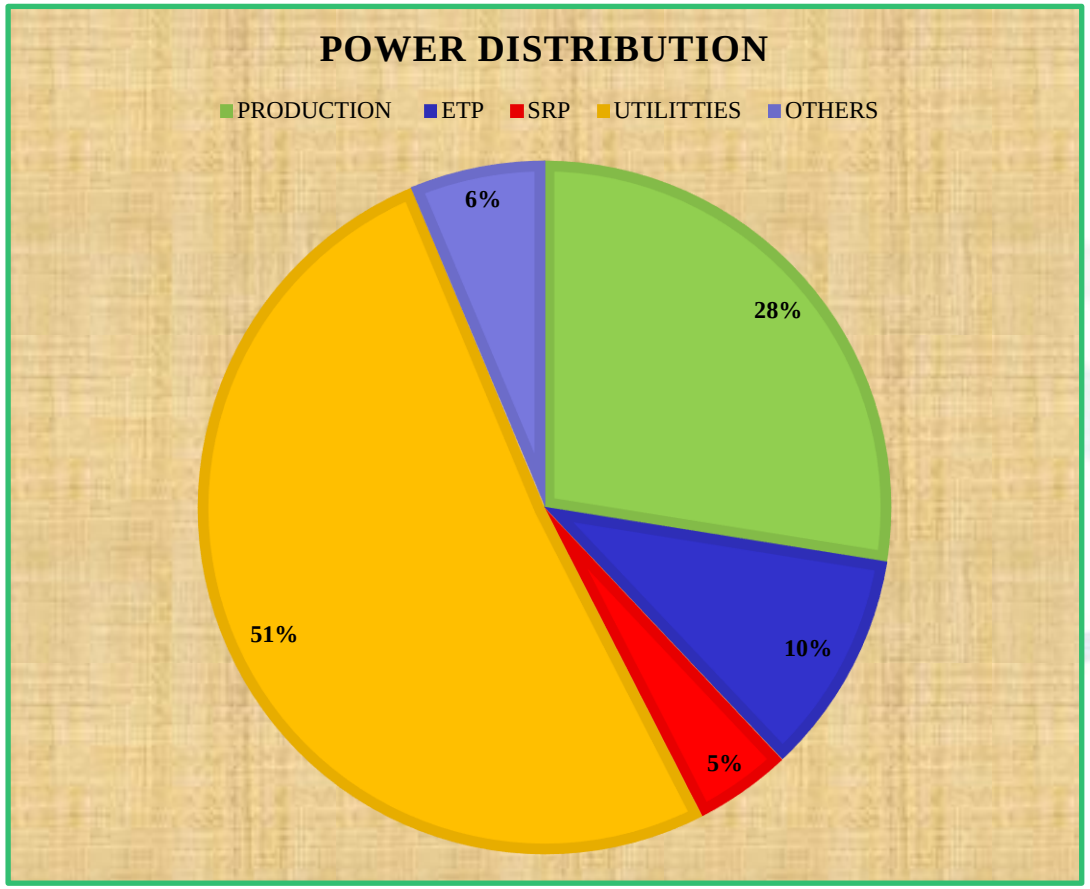
1. Auto cut-off all auxiliary equipment of refrigeration system , as and when the required Temperature achieved .
2. Energy optimization in high energy intense products through process improvements projects
3. Pumps swapping in chillers to ensure the adequate flow in chillers to meet the designed flow as TR rating

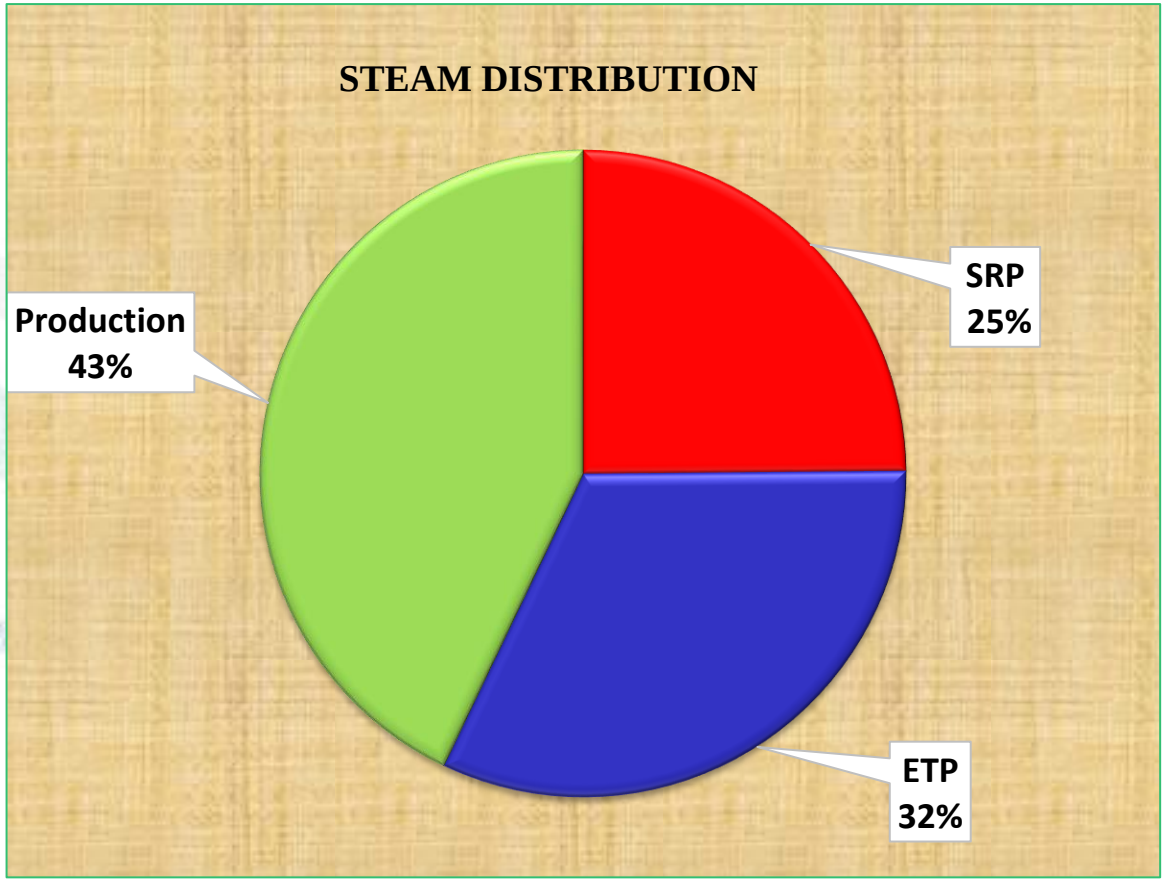
Specific Energy Consumption in last 3 years (FY 2020-23)





Power & Steam Distribution





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	0.88
	-15	1.39	1.41 - 1.43	1.40
	-35	1.95	1.97-1.99	1.96
Screw Chillers (Air Cooled)	+5	1.10	1.20 – 1.28	1.15

Description	Design SEC (kW/CFM)	Operating SEC (kW/CFM)	Target SEC (kW/CFM)
Air Compressors (Reciprocating)	0.16	0.20 - 0.23	0.18

Description	Design SFR (KG/KG)	Operating SFR (KG/KG)	Target SFR (KG/KG)
Boiler	4.8	4.6	4.8

Major Encon Projects in FY 2023-24

S.NO	Title of Project	Total Annual Savings (Rs million)	Investment Made (Rs million)	Payback (Months)	Remarks
1	Replacement of existing reciprocating chillers with Screw Chiller +5 Deg @ 215 TR	4.63	5	13.21	Capex Approval U/P
2	Replacement of existing conventional Pumps with energy efficient pumps for Utilities	2.29	2.3	12.1	Capex Approval U/P
3	Cooling tower CT fan blade replaced with E Glass Epoxy FRP blades, in place of aluminum blades	1.5	1.16	9.53	Capex approved, Work U/P
4	Install VFDs for secondary pumps and Process RT Pumps to regulate the flow & pressure as per the requirement tom optimize the power consumption of the pumps	0.63	0.48	9.11	Capex approved, Work U/P
5	Auto Combustion system for Boiler for fuel efficiency	4.26	2.90	8.17	Capex Approval U/P
6	Flash Steam recovery	0.40	0.80	24.00	Capex Approval U/P
7	Flash Jet Pump	1.97	1.40	8.52	Capex approved, work U/P
	Total	**15.6**	**14.2**	**12.00**	

Energy Saving Projects Implemented in last three years

2020-21

8 No's

2021-22

8 No's

2022-23

14 No's

Summary of Energy Saving Projects Implemented in the Last 3 Years			
Year	**No of Proposals**	**Investments (Lakhs)**	**Savings (₹ Million)**
2020-2021	8	6.1	10.27
2021-2022	8	7	5.82
2022-2023	14	0.9	10.5
TOTAL	**30**	**14**	**26.77**

Energy Saving Projects Implemented FY 22-23

Projects Implemented (FY22-23)				
S. No.	**Project Details**	**Annual Savings (₹ Million)**	**Investment (₹ Million)**	**Payback (Months)**
1	By changing the primary pump to increase flow and utilize optimum capacity of -35°C chiller	0.48	0.00	0.0
2	Reducing of RT pump pressure by varying speed and frequency of a motor by using VFD at A block & B block	0.74	0.07	2.1
3	AHU's condensate recovery and reuse , to reduce the water consumption	2.90	0.00	0.0
4	Installed PPPPU pump which is steam operated in the place of Electrical Pump	0.043	0.0160	4.4
5	Arranged Steam Operated pump trap for Evacuating the condensate without any steam loss	0.10	0.007	0.8
6	SEC reduction for Finasteride Pure product through process optimization	2.03	0.000	0.0
7	SEC reduction for Fluconazole form-II product through process optimization	0.88	0.000	0.0
8	SEC reduction for Benazepril API product through process optimization	0.90	0.000	0.0
9	SEC reduction for Finasteride Toluene recovery product through process optimization	0.07	0.000	0.0
10	SEC reduction for Fluoxetine Hydrochloride product through process optimization	0.20	0.000	0.0
11	SEC reduction forFluoxetine Hydrochloride product through process optimization	0.11	0.000	0.0
12	SEC reduction for Fluoxetine Hydrochloride product through process optimization	0.74	0.000	0.0
13	SEC reduction forFluoxetine HCL - API product through process optimization	0.42	0.000	0.0
14	pd/Acetate recovery and savings from Eletriptane	0.89	0.000	0.0
	Total	**10.50**	**0.09**	**1**

Energy Saving Projects Implemented FY 21-22

Projects Implemented (FY21-22)				
S. No.	**Project Details**	**Annual Savings (₹ Million)**	**Investment (₹ Million)**	**Payback (Months)**
1	Implementing auto cut-off interlock between primary pump, condenser pump w.r.t compressor operation condition.(BCU005,BCU 006,&BCU007)	0.57	0.15	3.1
2	Auto Temp controller for CT fans auto cut-off based on CT basin Temp .	0.70	0.15	2.6
3	At Utility area by replacing of pumps with motors as per the Calculated required parametres energy saving.	0.996	0.2	2.4
4	(BCU 008)' +5oC, 200 TR compressor Auto cut off switch Between primary pump and RT water pump.	1.02	0.05	0.6
5	Replacement of Mechanical/ Timer Air Drain Valves with NAD Valves	0.21	0.05	2.8
6	Replacement of 160w & 240w HPMV lights with 40w & 80w LED lights	0.54	0.05	0.1
7	Energy savings due to Peak & Off-peak hours	1.40	0.0	0.0
8	Energy savings in lighting through installation of separate transformer for lighting	0.38	0.05	1.6
	Total	**5.82**	**0.70**	**13.21**

Energy Saving Projects Implemented FY 20-21

Projects Implemented (FY20-21)				
S. No.	**Project Details**	**Annual Savings (₹ Million)**	**Investment (₹ Million)**	**Payback (Months)**
1	Replacement of high energy intensive convention lighting with LED lights	0.41	0.20	5.9
2	Interlocking of CT fans to Auto switching off fans based on CT water basin Temp.	0.43	0.0	0.0
3	Replacement of Condensers and evaporators in Chilling Plants and Operational Improvements	0.29	0.0	0.0
4	Chilled brine -15C primary pump replacement to ensure adequate flow through chiller	1.08	0.0	0.0
5	Optimizing the Nitrogen plants running through proper piping network for production blocks and arresting the leakages	2.76	0.0	0.0
6	Separate Air compressor Installing for instrumentation air	0.92	0.0	0.0
7	Procurement of Energy Efficient (IE3) Motors for New Projects & Replacement of Motors with New Energy Efficient Motors	4.01	0.35	1.0
8	Implementing VFD for Boiler ID Fan & FD fans	0.38	0.1	1.7
	Total	**10.27**	**0.61**	**8.71**

#1 OPERATIONAL IMPROVEMENTS

AUROBINDO

Start
01/04/22

AHUs Condensate water recovery

Finish
31/03/23

• Pain Area

- AHUs supplied with +5 gets condensate which is mixed with CT water which is pure.

• Solution Implemented

- Condensate is collected and used for the makeup of cooling tower water
- Condensate water meets all the required parameters of CT water makeup.

• Benefits

- Utility got improved performance due to better water quality

3.0
Kl of water/day

SAVINGS: ₹ **29** *Lakh/Year*

INVESTMENT: ₹ **0** *Lakh*

MOTNHS
0

AUROBINDO

Start
01/04/22

Installation of VFD with pressure Transmitter for pumps

Finish
31/03/23

Solution Implemented

- Installed VFD with pressure transmitter for RT pumps

Advantages

- To control the wastage of power
- Smooth starting of pump and motor
- Reduce the mechanical wear and tear

0.92
Lakhs of Units/Year

SAVINGS: ₹ **7.39** *Lakh/Year*

INVESTMENT: ₹ **0.6** *Lakh*

MOTNHS
1.1

#3 OPERATIONAL IMPROVEMENTS

AUROBINDO

Start 01/03/21

Implementation of PPPPU pump for condensate transfer with out electrical pump

Finish 01/09/22

Solution Implemented

- Installed PPPPU pump to transfer the condensate from SRP to Boiler.

Advantages

- Eliminates the use of Electrical power
- Transfers condensate at higher temperature to boiler

5400 *KWH*

SAVINGS: ₹ **0.43** *Lakh/Year*

INVESTMENT: ₹ **0.16** *Lakh*

MOTNHS 4.4

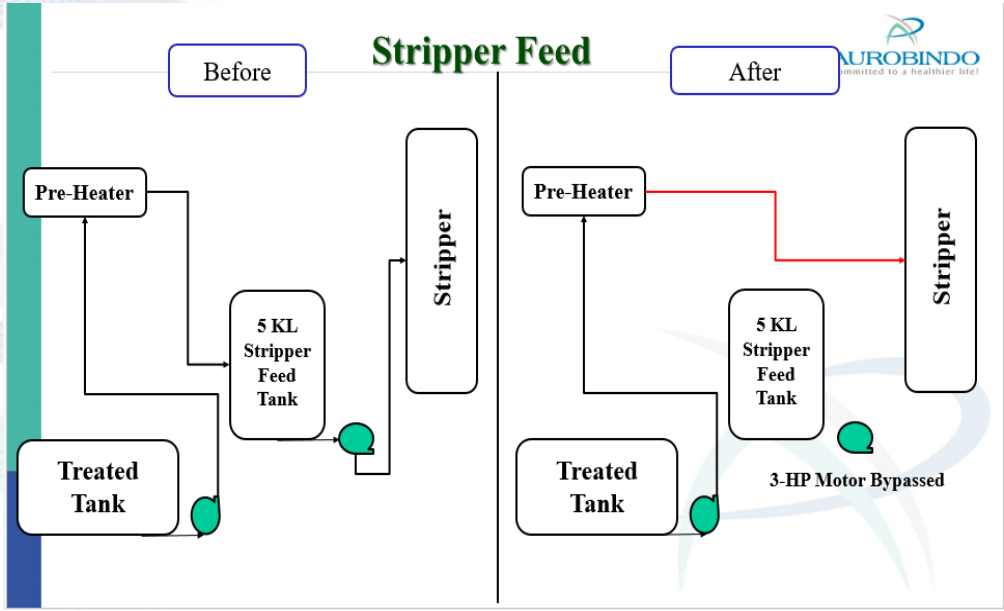
Stripper feed line Modification

Solution Implemented

- Stripper feed line modified to directly feed to stripper column

Advantages

- To control the wastage of power
- Availability of spare pumps for other pumps in case of breakdown



0.15
Lakhs of Units/Year

SAVINGS: ₹ **1.21** *Lakh/Year*

INVESTMENT: ₹ **0** *Lakh*

MOTNHS
0

AUROBINDO

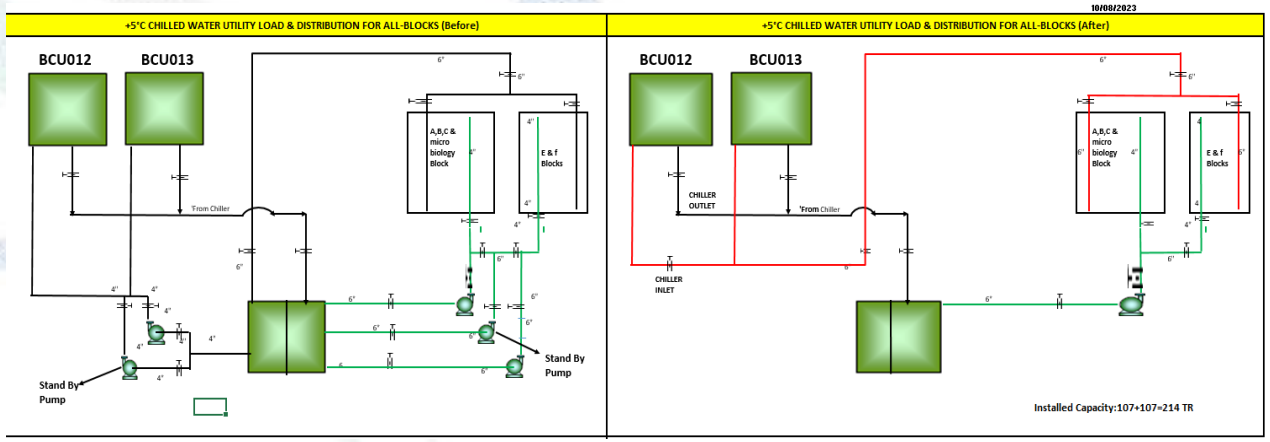
Elimination of primary pump by directly connecting to chiller

Solution Implemented

- Removed the primary pump for chiller outlet of blocks such that +5 is directly connected to the chiller
- Arranged VFD to secondary pump and controlled pressure for various distribution blocks

Advantages

- To control the wastage of power
- Availability of spare pumps for other pumps in case of breakdown



2.83
Lakhs of Units/Year

SAVINGS: ₹ **22.67** *Lakh/Year*

INVESTMENT: ₹ **0** *Lakh*

MOTNHS
0

#6 OPERATIONAL IMPROVEMENTS

AUROBINDO

By changing the primary pump to increase flow and utilize optimum capacity of -35°C plant

Solution Implemented

- Arranged higher capacity flow pump to reduce he SEC for KW/TR

Advantages

- To control the wastage of power
- To improve the compressor efficiency
- Meets the required flow for Evaporator

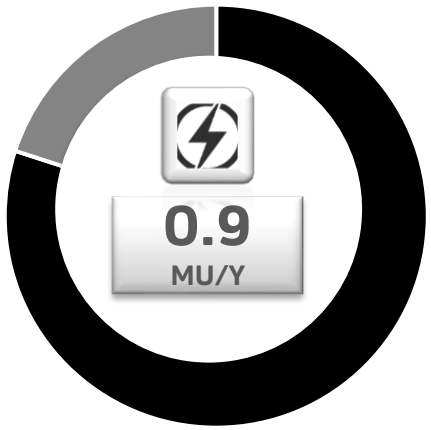
0.6
Lakhs of Units/Year

SAVINGS: ₹ **4.8** *Lakh/Year*

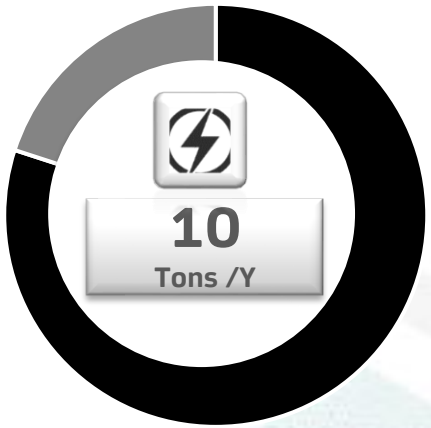
INVESTMENT: ₹ **0.5** *Lakh*

MOTNHS
2

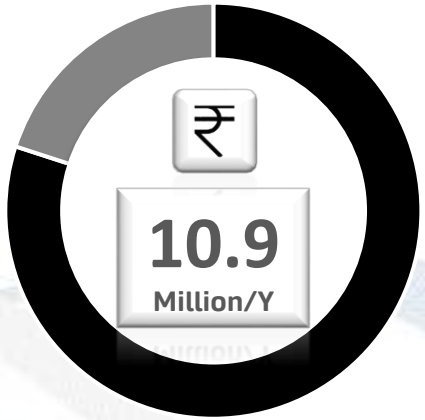
Results Achieved FY2022-23



TOTAL ELECTRICAL SAVINGS



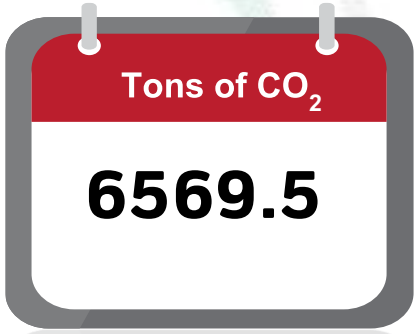
TOTAL COAL SAVINGS



TOTAL MONETARY SAVINGS

TOTAL INVESTMENT

PAYBACK PERIOD

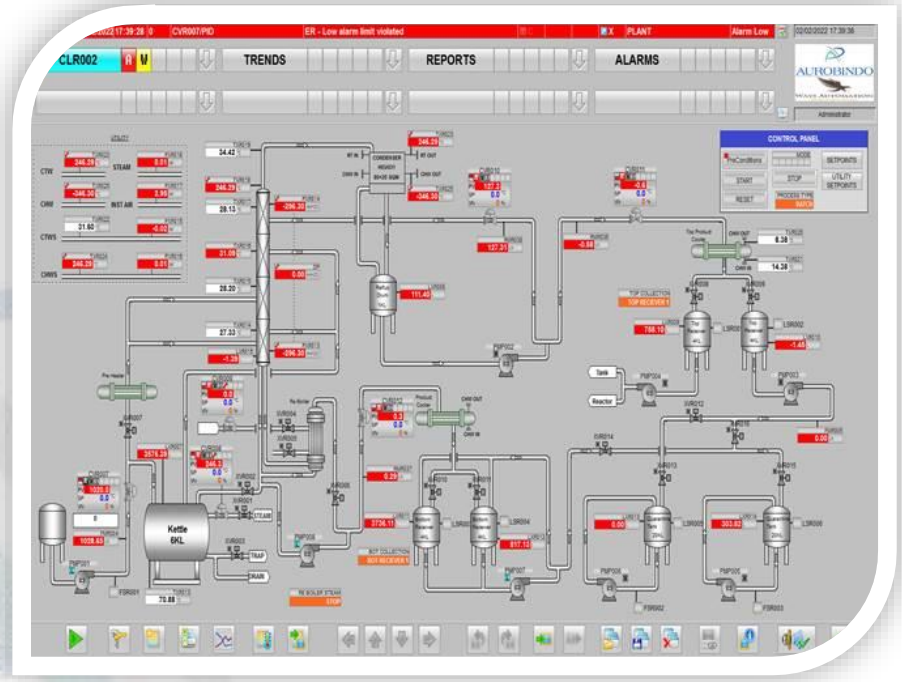


CO_2 REDUCTIONS

Innovative Projects implemented

Start
Sep 2022

I. Column with Automation



Trigger for implementation :

- To reduce the fresh solvent consumption
- To reduce utility consumption
- Precise reflux ratio control there by ensuring quality output and recovery %
- To adhere safe operation, every parameter in place with interlock system.

Indirect Benefits

- Effective start/stop up process will be ensured
- Overflow and wastage of solvents can be controlled
- Increased safety

Replicability :

- Yes, huge replication opportunities at columns

Innovative Projects implemented

Start
Oct 2022

II. Mobile Solvent Dispensing SKID

Trigger for implementation :

- To Dispense accurate quantity of solvents into reactors from receivers.
- To avoid the operational errors of human.

Replicability :

- Yes, huge replication opportunities
- All process areas
- Taken up for other areas implementation

Utilisation of Renewable Energy sources

INSTALLED CAPACITY

30MW Solar Power Plant Under
Mode : Group Captive Mode
Project Timeline: 2021-22
Project mode : Off Site Generation

LOCATION & DEVELOPER

Ramannapet, Yadadri Bhuvanagiri District, Telangana
M/s NVNR Ramannapet- I & II Power Plant P. Limited
Investment : ₹ 5.382 Cr.

TYPE OF AGREEMENT

Open Access & 25 Years
Starting : July 022
Total 7 Nos units of Aurobindo considered

% SHARE TO UNIT-VIII

% Share in Energy Consumption : 21 %
Allotted Generation: 0.49 Cr Units / Year
CMD allotted from Solar : 600 KVA (21 %) out of 2800 kVA

Waste utilization and management FY 2022-23

Waste Management

For Co-processing **(FY 22-23, 1233.7 MT)**

- 83.2 MT → **ETP Sludge Spent carbon Process organic residue**
- 1150.5 MT → **Lq. Organic waste Used filter pads**

Recycling **(FY 22-23, 7 MT)**

- 2.3 MT → **Used oil/waste lubricating oil Batteries**
- 4.7MT → **Power cables, Wires, Contactors, Relays**

Land filling/ Incineration **(FY 22-23, 371.4 MT)**

- 331.2 MT → **Forced Evaporation salts**
- 40.2 MT → **ETP Sludge**

CONTINUE → **Co-fuel for cement units**

CONTINUE → **Through authorized scrap agencies**

CONTINUE → **Through authorized agency**

END (Incineration)

Waste Utilization and Management

Waste Management & Utilization									
S.No	2020-2021			2021-2022			2022-2023		
	Type of waste generated	Quantity of waste generated (MT/year)	Disposal method	Type of waste generated	Quantity of waste generated (MT/year)	Disposal method	Type of waste generated	Quantity of waste generated (MT/year)	Disposal method
1	Forced Evaporation Salts	643.0	For Land Filling	Forced Evaporation Salts	501.8	For Land Filling	Forced Evaporation Salts	331.2	For Land Filling
2	Sludge from wastewater pre-treatment	29.1	For Land Filling	Sludge from wastewater pre-treatment	48.9	For Land Filling	ETP Sludge	40.2	For Co-Processing
3	Process Organic Residues, Mixed Spent Solvents & Stripper Distillate and Solvents recovered	1264.4	For Co-Processing	Process Organic Residues, Mixed Spent Solvents & Stripper Distillate and Solvents recovered	1220.6	For Co-Processing	Process Organic Residues, Mixed Spent Solvents & Stripper Distillate and Solvents recovered	1148.5	For Co-Processing
4	Spent Carbon	61.0	For Co-Processing	Spent Carbon	84.1	For Co-Processing	Spent Carbon	31.0	For Co-Processing
5	Used Sparkler filter pads	3.3	For Co-Processing	Used Sparkler filter pads	2.6	For Co-Processing	Used Sparkler filter pads	2.0	For Co-Processing
6	Used oil/waste lubricating oil	2.3	For Recycling	Used oil/waste lubricating oil	0.8	For Recycling	Used oil/waste lubricating oil	1.2	For Recycling
7	Thermocoal	2.0	For Co-Processing	Thermo coal	4.0	For Co-Processing	Thermo coal	5.5	For Co-Processing
8	Glasswool	2.6	For Co-Processing	Glass wool	7.4	For Co-Processing	Glass wool	5.0	For Co-Processing
9							Process Organic Residue (Solid)	1.0	For Co-Processing
10							Miscellaneous waste	0.2	For Co-Processing
11							Off specification raw material / products	3.3	For Co-Processing

Sustainability / GHG Incentivisation

01 Sustainability Report

2020-21

Published Integrated Annual Report for FY 2022-23

02 Goals & Targets -2025

2025

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

03 GHG Emissions

Emissions	Measurement	FY 20-21	FY 21-22	FY 22-23
Scope 1 emissions	Tons of CO2	9,456	9991	10123
Scope 2 emissions	Tons of CO2	12,707	12898	12898
Scope 3 emissions	Tons of CO2	-	-	-
Total emissions	Tons of CO2	22,163	22889	23021

Tons of CO_2

6569.5

FY 2022- 23 GHG REDUCTIONS

Net Zero Commitment

Pillar	Goals-2025	Progress made so far	Status
Responsible manufacturing 	**20%** Renewable energy share (Power-to-Power)	Achieved 12% renewable energy share (Power-to-Power)	In progress
	12.5% Reduction in carbon footprint (as per SBTi – WB2C	Achieved >100% -17% reduction in carbon footprint from baseline year FY20	Achieved
	Towards water neutrality **35%** Water conservation / restoration	Achieved >100% -38% water conservation/ restoration	Achieved
	60% Co-processing of hazardous waste	Achieved > 100% - 62% Co-Processing of hazardous waste	Achieved
	100% Reuse / recycle of non-hazardous waste	Achieved 100%	Achieved

Green Supply Chain Management

- Less paper / Digitalization
- Limited physical/ hard copy as per the initiative taken by Govt of India. It requires no physical examination for AEO T2 certified , and hence less paperwork. All documents needs to be upload to ICEGATE through e-Sanchit. This supports Airlines/ Ocean Liners for the Paperless transactions

01 Double Stacking Injectable Project

- 190 millon Benefits
- Successfully implemented with 50% extra space optimization with shipping Injectable with double stacking.

02 GST e-Invoicing

- Decreased Paper consumption and paper less / Digital transactions
- All invoice information will be transferred from the portal in real-time
- Govt. Initiatives for ease of doing business such for the ease of exporters/importers to ease and streamline the business ecosystem

03 AIR vs SEA – Mode Control

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

04 AEO (Authorised Economic Operator) Certification

Energy Management System

Senior Management

Driving Energy Management System	Approval & Budget Sanctions	Allocation of all required resources

Senior General Manager (Corporate Engineering)

Providing Technical Inputs	New and Innovative Energy Conservation Ideas	Review and Submissions to Senior Management

Energy Cell (Corporate)

Energy Assessments with all portable instruments	Review and of Energy Conservation Proposals	Coordinating with all stake Holders for Implementation

Engineering Head (Unit wise)

Support in Energy Assessments (Allocation of all Resources)	Prepare and submission of energy conservation	Seeking approvals at plant level

Energy Team - PoC (Unit Wise)

Daily data monitoring and reporting on energy projects	Participate in Energy Assessments along with Energy Cell	Ground level implementation of energy conservation proposals

Teamwork, Employee Involvement & Daily Monitoring

AUROBINDO

Yearly Energy Monitoring System

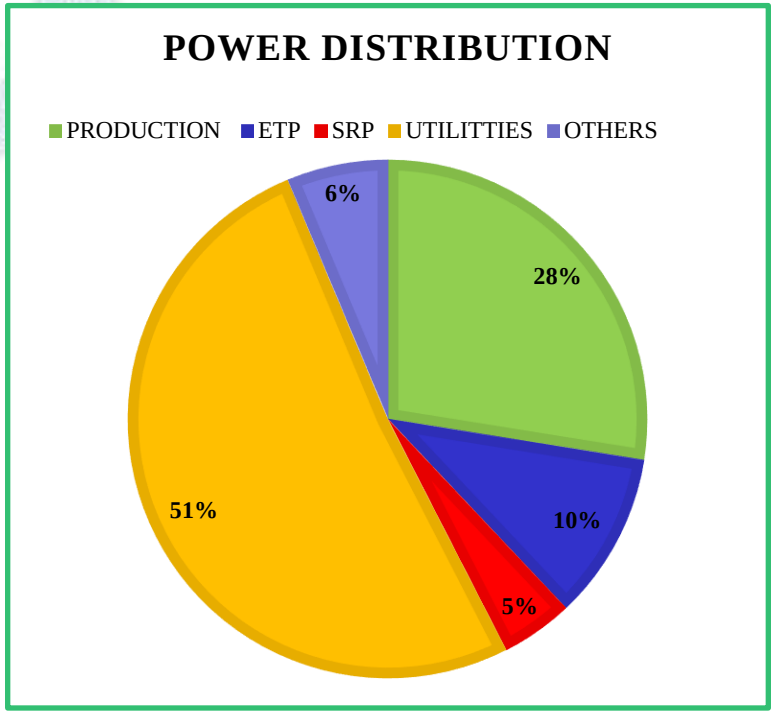
S.NO	LOCATION	Cumulative KWH	%
1	A - BLOCK	838431	5.32
2	B - BLOCK	771525	4.89
3	C - BLOCK	991059	6.28
4	E - BLOCK	1277574	8.1
5	F - BLOCK	463637	2.94
6	QUALITY CONTROL	477511	3.03
7	MEE & ETP	1647338	10.44
8	SRP COULOMN	711534	4.51
9	UTILITIES	8082004	51.23
10	LIGHTING	513978	3.26
	TOTAL	**15774589**	**100**

DAILY

- Performance Reports
- KPIs
- Overall Consumption

MONTHLY

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



Teamwork

- Implemented Kaizen & 5S programmes by forming teams.
- Awards & appreciations for best programs.
- Higher Management Reviews.

Employee_Involvement

- Organized Energy Conservation Week Celebrations. and involved all employees.
- Energy review and monitoring.

Energy Week / Energy Conservation Day Celebrations –

Banner Hosting

Awareness

Quiz Competition

Awareness

100+ Participants participated from all departments like Production, Engineering, EHS, SRS and TSD etc.

Winner

Awarded best opportunity assessment award from Corporate Energy cell and L&D team

Presentation Ceremony

Idea Generation runner-up

Learnings from CII - last 4 Years

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 footprint , Less maintenance and down time.

Replaced motors of Boiler blowers, utility motors with energy efficient motors.

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

Online Monitoring system.

- Implementation of Ems system for Transformers, panels, compressors and temperature indicators

CSR Activities

- 14 Villages Adopted
- 48 Water Drinking Plants
- 350 + Healthcare Programme
- 21 Educational Institutions

Awards & Recognitions

1

Operational Excellence

Global Operational Excellence Company of the Year 2022
Global Healthcare Awards

2

Human Resources

Significant Achievement in HR Excellence, 13th CII National HR Excellence Award, 2022

3

Business Development

- **Excellence in Business Partnering, Economic Times Human Capital**
- **Awards, 2022**

Thank You

A. Ravi Kumar-AGM (Engg.)

Contact: 9963534523

Email: Ravikumar.akella@aurobindo.com

AUROBINDO

Committed to healthier life!

Unit-VIII SY.NO. 10 and 13,

GADDAPPOTHARAM VILLAGE, JINNARAM MANDAL,
SANGAREDDY DISTRICT, TELANGANA - 502319

Email: info@aurobindo.com