

23nd National Award for 2022

Excellence in Energy Management
23 - 26 August 2022



AUROBINDO PHARMA LIMITED
Unit - 01
HYDERABAD



Sr. No	Name	Designation	Mobile Number	Email address
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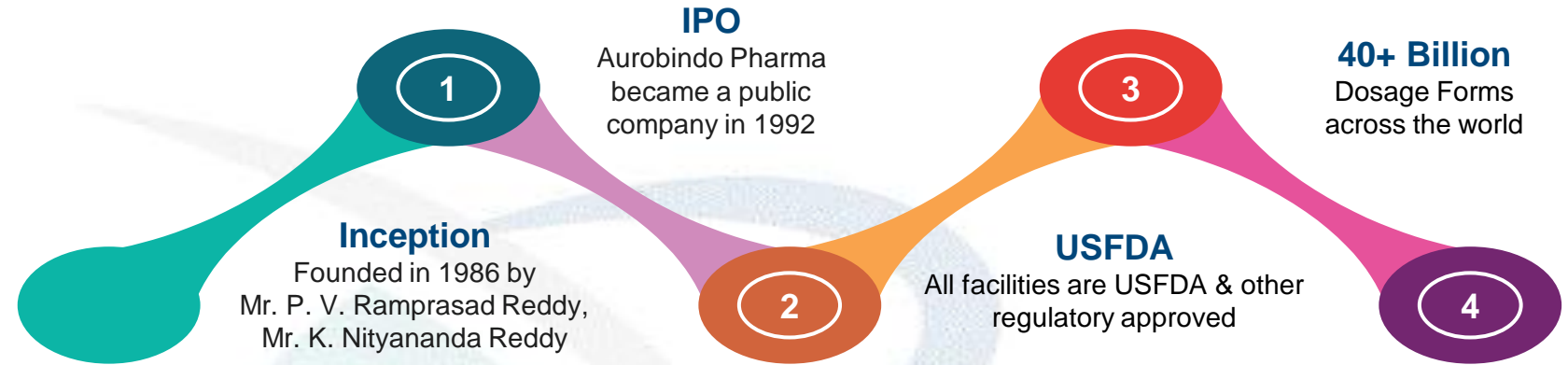
Brief Introduction on Company/Unit



Employees **24k+**

Market presence **155+**

Mfg. Facilities **29**




01 #1
Largest generics company in the US (by Rx dispensed)

02 #2
2nd Largest pharma by revenue (India)

03 #10
Generics companies in six out of nine countries in Europe@



8.64 Lakhs
Lives impacted through CSR interventions



R&D Capabilities
5 in India and 4 in the US
1,500+ Scientists and analysts globally

Facility & Major Equipment of Unit-I

Facility

Total Factory area	465105 m² (115 Acres.)	
Build up Area (m ²)	252645	54%
Roads (m ²)	65114	14%
Green Belt area (m ²)	139531	30%
Open area (m ²)	7815	2%

Process Equipment

- ❖ Reactors : 300 No's
- ❖ Centrifuges : 127 No's
- ❖ ANFD : 05 No's
- ❖ Lyophilizer : 03 No's

Utility Equipment

- ❖ FBC boiler : 35 & 27.5 TPH
- ❖ Air Compressors : 4592 CFM
- ❖ Chillers(+5°C) : 3927 TR
- ❖ Chillers (-20°C) : 1090 TR
- ❖ Chillers (-35°C) : 220 TR
- ❖ Cooling towers : 18475 TR

Electrical

- ❖ CMD : 10500 KVA
- ❖ HT Connected : 34916.25 HP +
3106.32 KW
- ❖ Transformers : 15 No's (65550KVA)
- ❖ DG system : 16 No's (16080KVA)



Details of the Products / Processes

- Metformin Hydrochloride
- Gabapentin
- Metazipine
- Cefuroxime

Major products :



Energy Consumption Overview – Last 4 Years



PRODUCTION

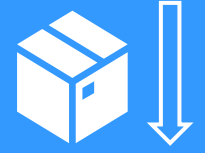
YEAR	VALUE (MT)
FY 2018-19	4582
FY 2019-20	4906
FY 2020-21	3601
FY 2021-22	2963

SPECIFIC ENERGY

YEAR	VALUE (m kcal/MT)
FY 2018-19	48.63
FY 2019-20	42.02
FY 2020-21	59.10
FY 2021-22	79.85



Production
17.7 %



YEAR	VALUE (m kcal)
FY 2018-19	153,501
FY 2019-20	141,300
FY 2020-21	148,860
FY 2021-22	175,824

THERMAL ENERGY




YEAR	VALUE (m kWh)
FY 2018-19	81
FY 2019-20	75
FY 2020-21	74
FY 2021-22	71

ELECTRICAL ENERGY



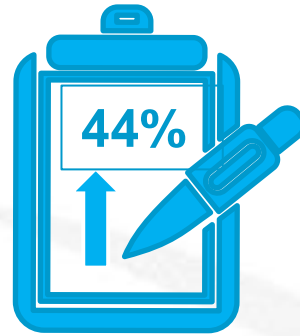
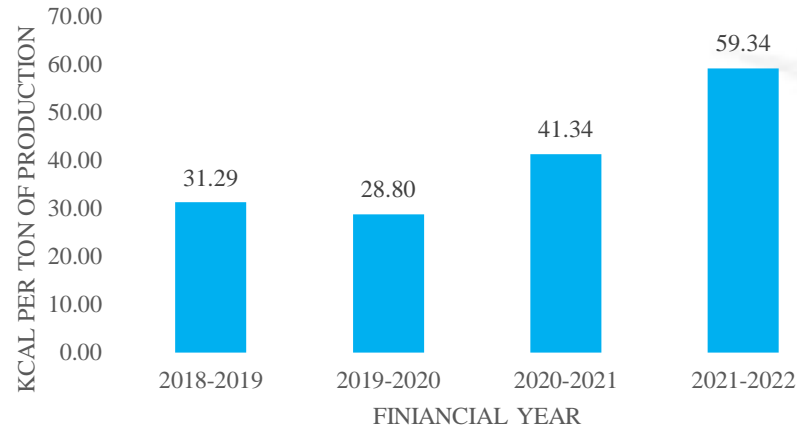
Specific Energy
35.1%



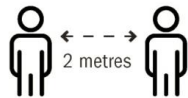
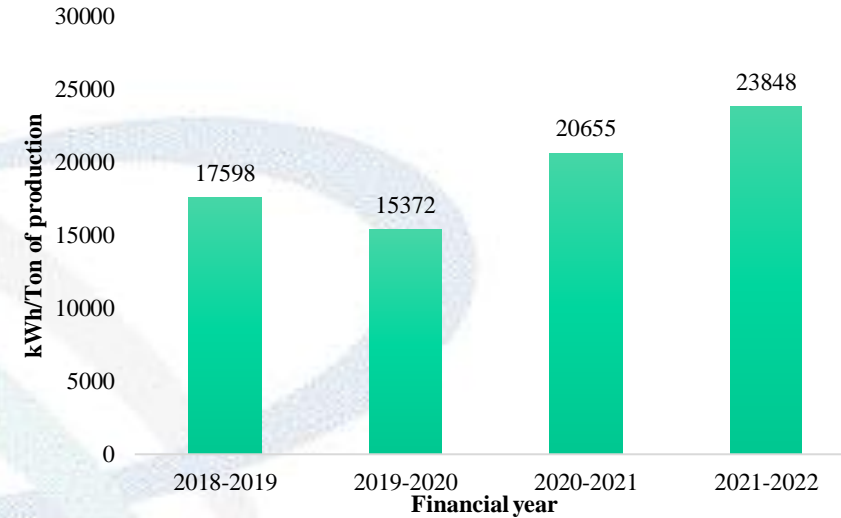
Specific Energy Consumption Overview – Last 3 Years



Specific thermal energy consumption



Specific electrical energy consumption



Social Distancing



Masking



Hand Wash

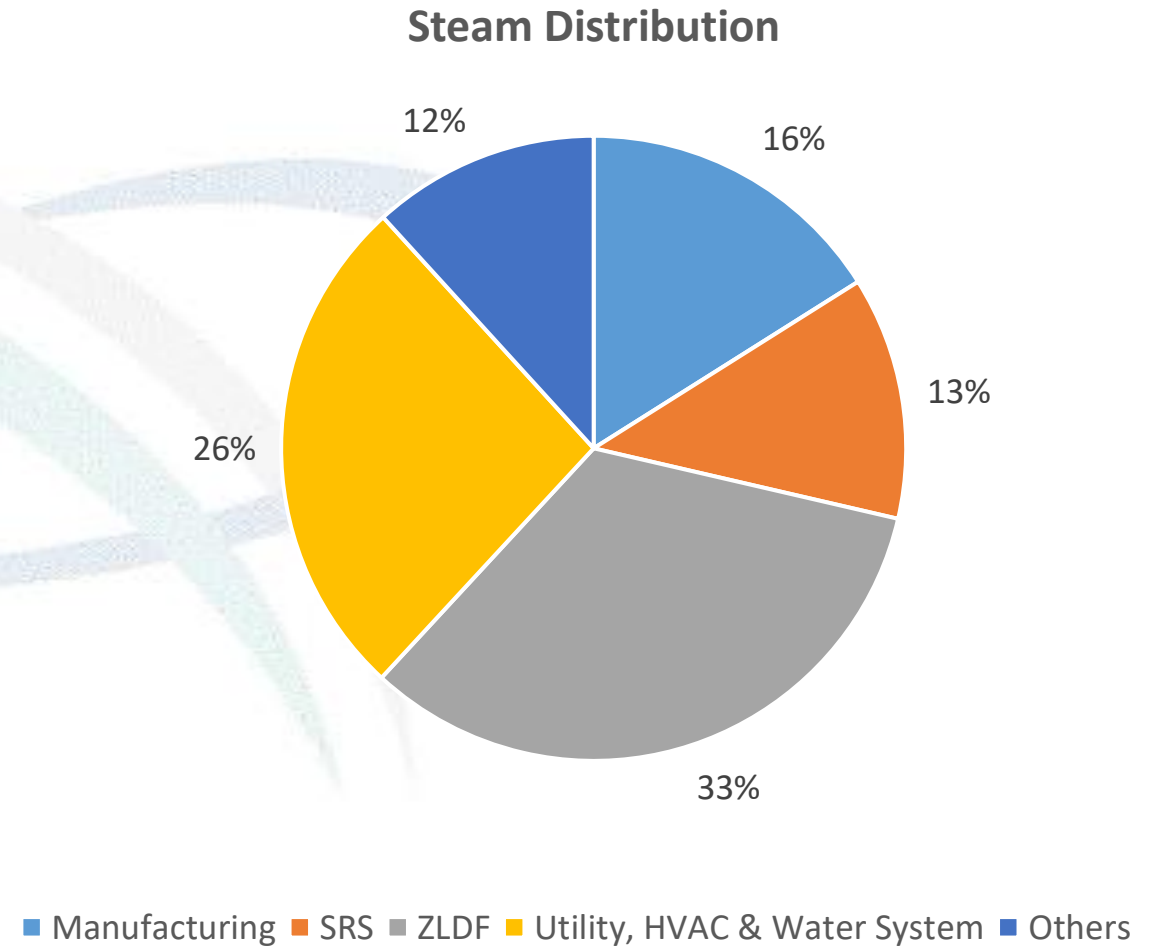
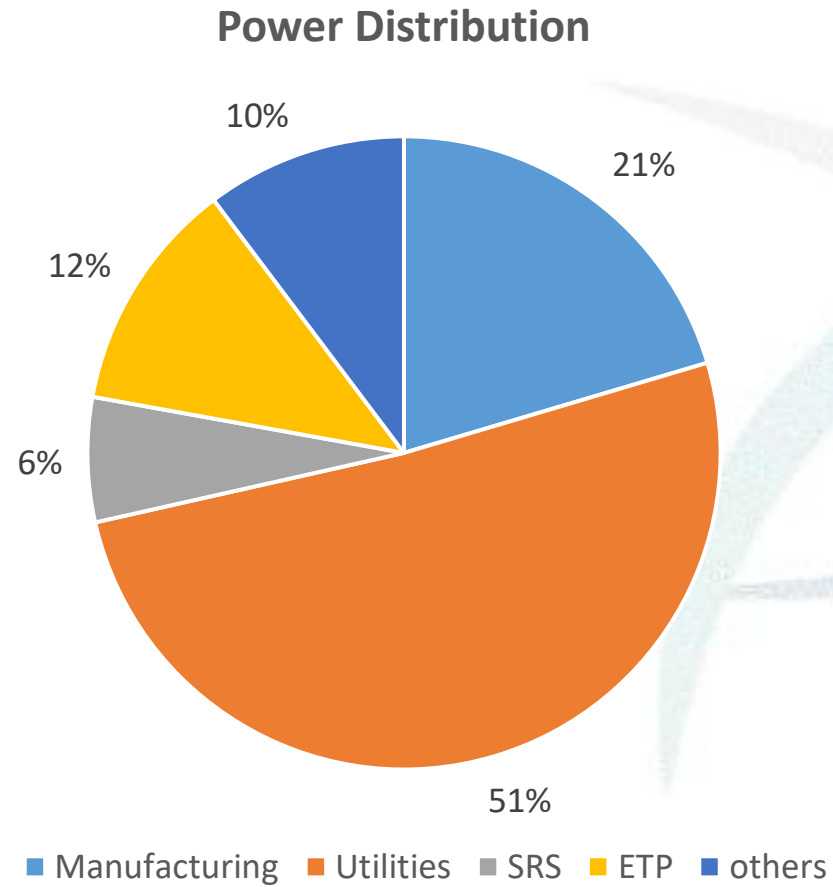


Sanitization

An increase in SEC in the FY 2021-22 was observed due to low production and non-linear nature of consumptions

Implementation of various energy conservation activities contributed reduction of 17.6 % in overall SEC of the Plant

Energy Distribution – Electrical & Thermal



Information on Internal benchmark - Utility

Refrigeration Plants :

Description	Design Temp (oC)	Design SEC (kW/TR)	Operating SEC (kW/TR)	Target SEC (kW/TR)
Reciprocating Chillers (Water Cooled)	+5	0.86	0.91-1.1	0.87
	-20	1.59	1.65-1.72	1.60
	-30	1.83	2.1-2.5	1.9
	-35	1.95	2.52-2.71	2.0
Screw Chillers	+5	0.63	0.68 – 0.82	0.65

Description	Design SEC (kW/CFM)	Operating SEC (kW/CFM)	Target SEC (kW/CFM)
Air Compressors	0.16	0.22-0.29	0.17

Description	Design SFR (KG/KG)	Operating SFR (KG/KG)	Target SFR (KG/KG)
Boiler	4.8	3.8	4.3

Major Encon Projects Planned in FY 2022-23



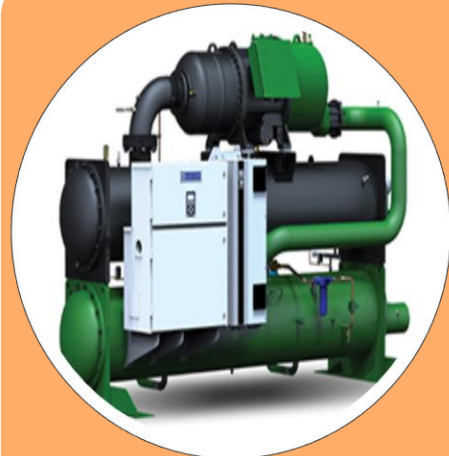
Installation of Vent Steam Heat Recovery System in Cogeneration Power Plant

Investment : ₹ 3.43 million
Savings : ₹ 6.0 million
Payback : 6.8 Months



E Glass Epoxy FRP Blades for Cooling Towers

Investment : ₹ 6.68 million
Savings : ₹ 6.4 million
Payback : 12.5 Months



WC Screw Chiller by Replacing Reciprocating Chiller in Sub Zero Temperature Applications

Investment : ₹ 14.9 million
Savings : ₹ 10.5 million
Payback : 17 Months



Vertical Inline Energy Efficiency Pumps by Replacing Energy Intensive Pumps

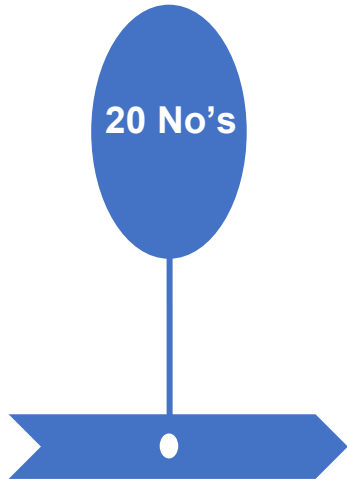
Investment : ₹ 1.55 million
Savings : ₹ 4.85 million
Payback : 4 Months

Encon Projects Planned in FY 2022-23

No	Title of Project	Annual Electrical Saving (Million kWh)	Annual Coal Saving (Tons)	Investment (Rs in Million)	Monetary Savings (Rs in Million)	ROI
1	Proposal for Installation of VFD for Feed Water Pump 180 kW in Cogeneration Power Plant for adjusting flow or pressure to the actual demand.	0.33	0	1.98	2.1	11.4
2	Proposal for Installation of VFD for CT FAN MOTR 11 KW in Cogeneration Power Plant for adjusting air flow as per the requirement	0.02	0	0.09	0.1	8.6
3	Proposal for Installation of VFD for CT PUMP MOTR 22 kW in Cogeneration Power Plant for adjusting flow or pressure to the actual demand	0.03	0	0.15	0.2	9.5
9	Install VFDs for secondary pumps and Process RT Pumps to regulate the flow as per the requirement for reducing the pump consumption.	1.33	0	5.93	8.4	8.5
4	Replacement of pumps with Energy Efficient Pumps for improving the operational efficiency and conservation of energy	0.94	0	4.85	5.9	9.8
5	Replace CMU 014, 100 TR, -20 oC with energy efficient water-cooled screw system with -20 , 87 TR system	0.71	0	6.5	4.5	17.4
6	Replace CMU 023 & CMU 024, 80 TR, -20 oC with energy efficient water-cooled screw system with -20 , 87 TR system	0.6	0	5.2	3.8	16.5
8	-50°C 15TR chilling plant with all accessories required for D&E blocks Cefprozil, Ceftibuten and Cefdoxime proxetil products	0.36	0	3.21	2.3	17.0
10	Cooling tower CT fan blade replaced with E Glass Epoxy FRP blades, in place of Aluminium blades, Qty : 09 No's	1.02	0	6.68	6.4	12.5
7	Replacement of higher size (kW) motors with Premium Efficiency Optimum Size Motors (CMU 504 & 505) for conservation of energy	0.07	0	0.64	0.4	17.4
11	Installation of Vent Steam Heat Recovery System for Avoiding the Bleeding of Steam in Cogeneration Power Plant	0	703	3.43	6.0	6.8
12	Installation of Automatic Pump Trap (APT)- 50NB for condensate Stall Prevention on Stripper	0	42	0.22	0.4	7.3
13	Installation of Flash Pump and 8 Nos TOFT for Closed loop condensate management & Twin Orifice Float Trap	0	164	2.02	1.4	17.2
14	Installation of Automatic Pump Trap (APT)- 50NBfor condensate Stall Prevention on MEE	0	864	0.44	7.4	0.7
Total		5.4	1829.8	41.5	49.8	10.0

Energy Saving projects implemented in last 3 Years

2019-20



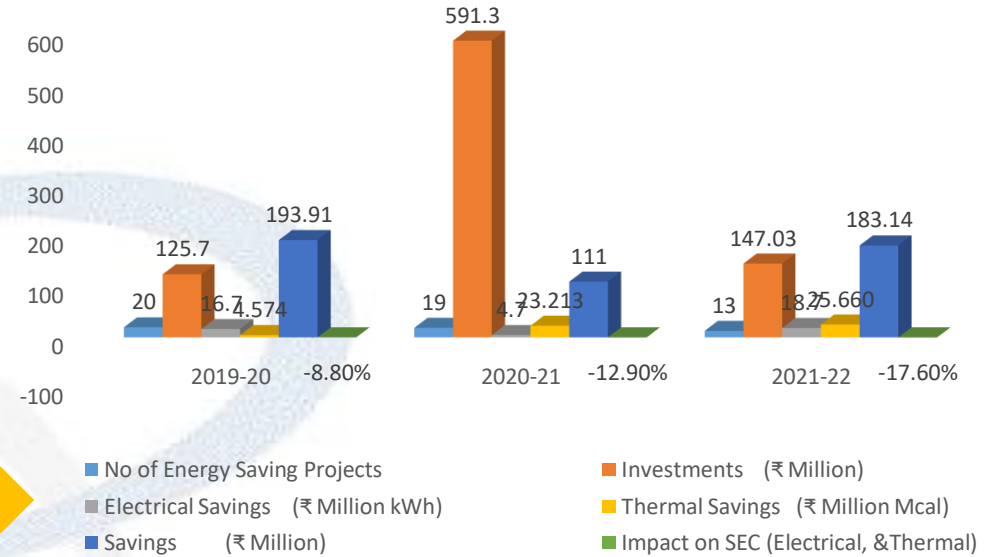
2020-21



2021-22

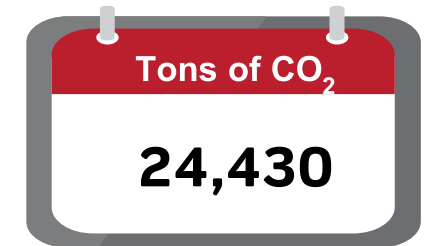


Energy Conservation Projects last 3 years



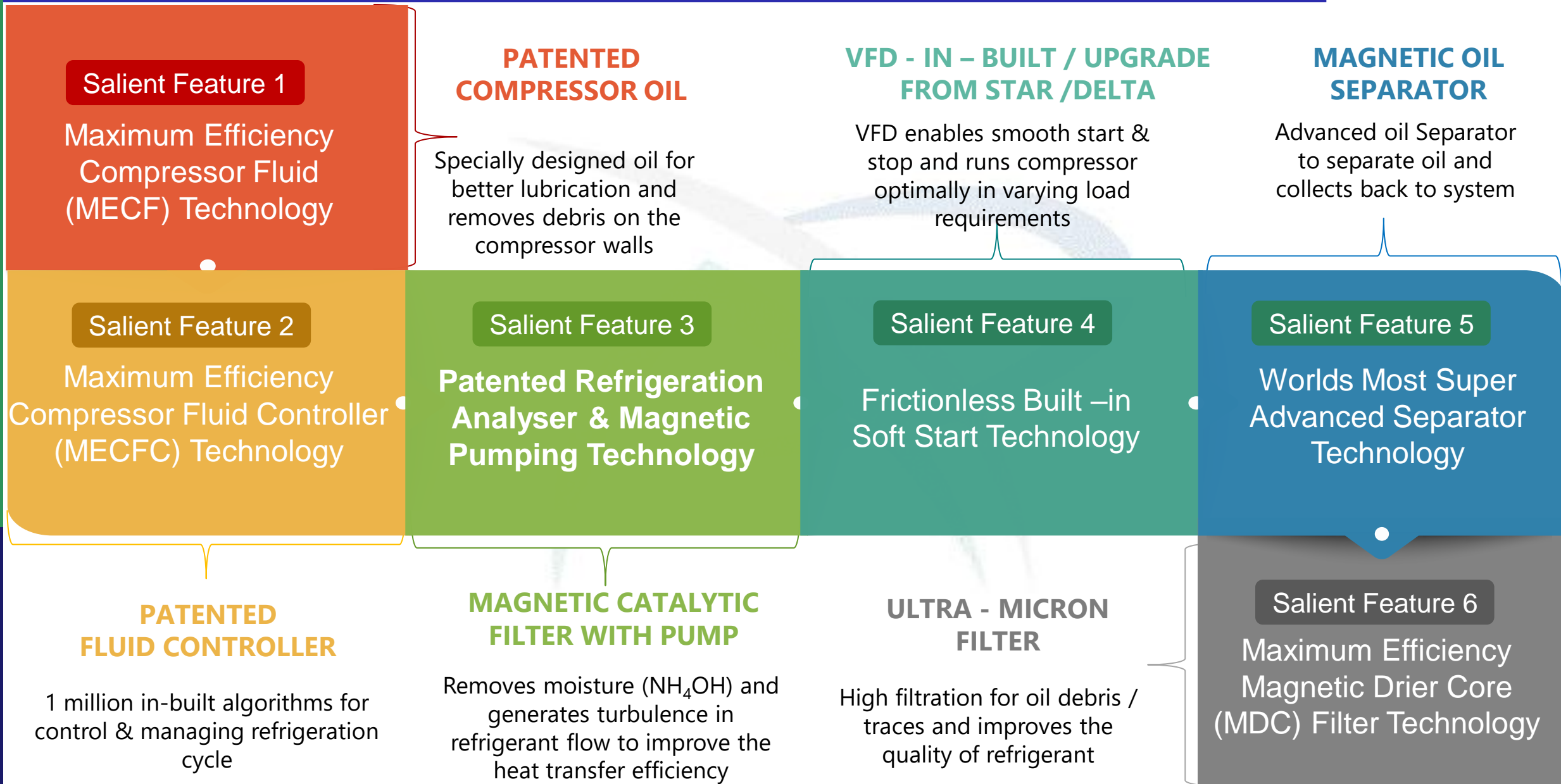
Investments(₹ Million)	: 125.7	Investments(₹ Million)	: 591	Investments(₹ Million)	: 147.1
Electrical (Million kWh)	: 16.7	Electrical (Million kWh)	: 4.7	Electrical (₹ Million kWh)	: 18.7
Thermal (Million kcal)	: 4574	Thermal (Million kcal)	: 23212	Thermal (₹ Million kcal)	: 25660
Monetary Savings (₹ Million)	: 193.9	Monetary Savings (₹ Million)	: 111	Monetary Savings (₹ Million)	: 183.4
Impact on SEC (%)	: -8.8	Impact on SEC (%)	: -12.9 %	Impact on SEC (%)	: - 17.6%

FY 2021-22



CO₂
EMISSION
REDUCTIONS

Oil Free Refrigeration Systems – State-of-the-art Technology



Oil Free Refrigeration (OFR) Systems – State-of-the-art Technology

Other Benefits:

- Lower maintenance / reduction in Compressor overhauling
- Higher reliability due to increased equipment life
- Low environmental impact



Design of the System : -65 °C , 50 TR

Particular	Unit	Before OFR		After OFR	
		CMU 523	CMU 524	CMU 523	CMU 524
Suction Temperature	°C	- 0.3	- 4.5	- 9	- 19.5
Suction Pressure	kg/cm ²	0.1	0.1	0.2	2
Discharge Temperature	°C	242	71.8	149	56.8
Discharge Pressure	kg/cm ²	15	14.4	12.5	11.5
Oil Temperature	°C	51.4		42.6	
Compressor Operating Load	kW	86.0	98.4	75	70.5
Evaporator (Delta T) (Brine)	°C	4.6		4.7	
Refrigeration load	TR	45.3		46.3	
Specific Energy Consumption (SEC)	kW/TR	3.83		3.14	
Decrement in SEC	%	~ 18%			

kWh SAVINGS
8.7 Lakh /Y

SAVINGS
₹ 5.6 million

INVESTMENT
₹ 17.2 million

PAYBACK
2.9 Years

Major Encon Projects Implemented – High Investment - FY 21-22



5 No's of 330 TR VAM Chillers

- Replaced existing reciprocating chiller & aged VAM system
- Compared on cost per TR generation VAM has a reduction from 7.3 Rs / TR to 4.9 Rs / TR
- Ranking of technologies
- Investment : ₹ 54.5 million
- Payback : 19 months



8 No's of 200 CUMPH Vertical Inline pumps

- Installed 08 No's Vertical Inline pumps with low speed motor of 30 HP in place of Conventional centrifugal pumps having high speed motor of 40HP For the same pump specifications.
- Cost of each pump is 2 Lakhs , Savings per annum is 3.8 Lakhs ROI is 6 Months.

Major Encon Projects Implemented – High Investment - FY 21-22



IPA Dehydrator

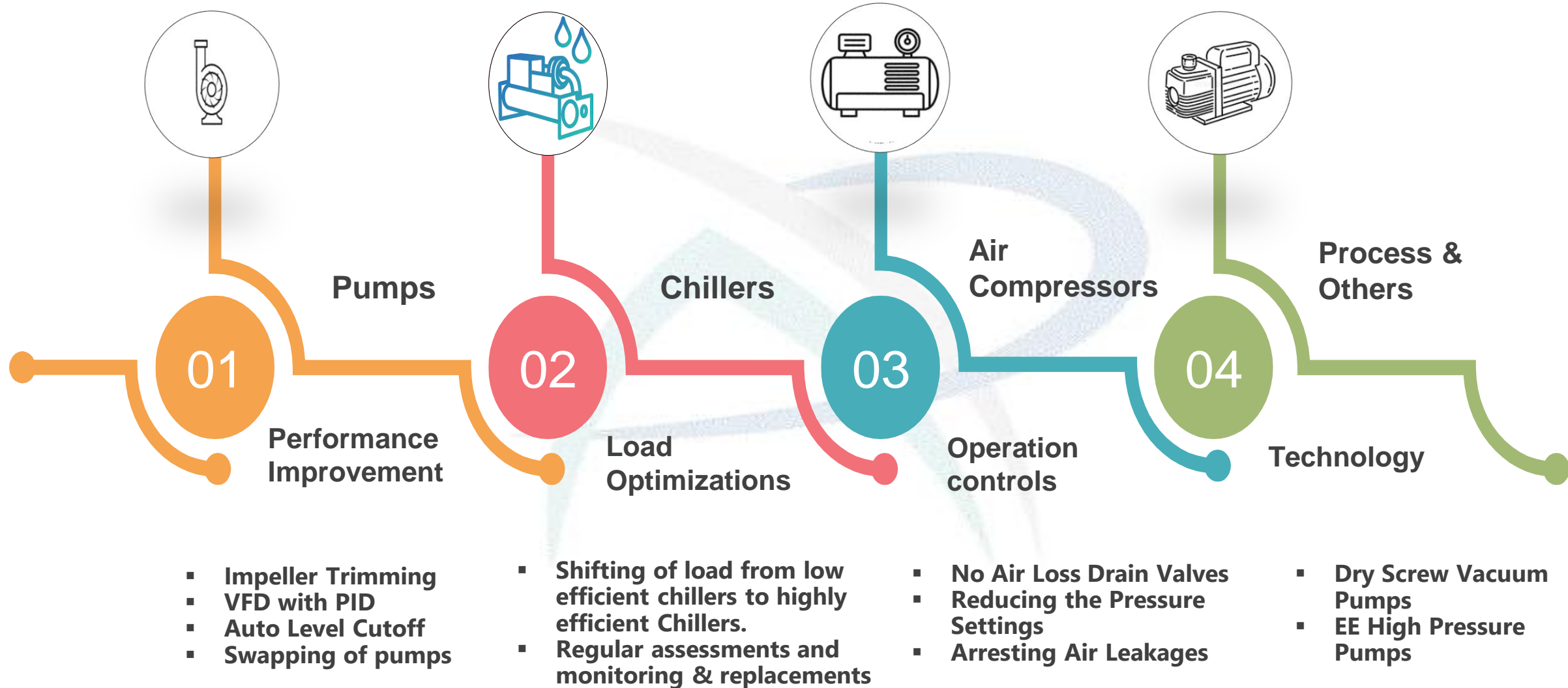
- IPA Recovery is being done Flash distillation in Reactor and in Distillation column for 60% recovery and process was repeated for second crop recovery
- Installed an Absorption type Dehydrator to improve the recovery
- Single pass recovery improved from 60 % to 92 %.
- Steam consumption for recovery reduced from 4 Kg/ Kg to 1 Kg / Kg.



Co-Gen capacity Utilization

- Co-Gen plant installed for meeting the Plant steam requirement and generate Power from this capacity
- Reduction in production has led to poor capacity utilization and inefficient operations
- Installed VAM's and increased the Steam consumption
- Increased the Co-Gen load from 2 MW to 3 MW.
- Captive generation improved by 8 Million Units reducing cost by Rs. 2.64 Crores

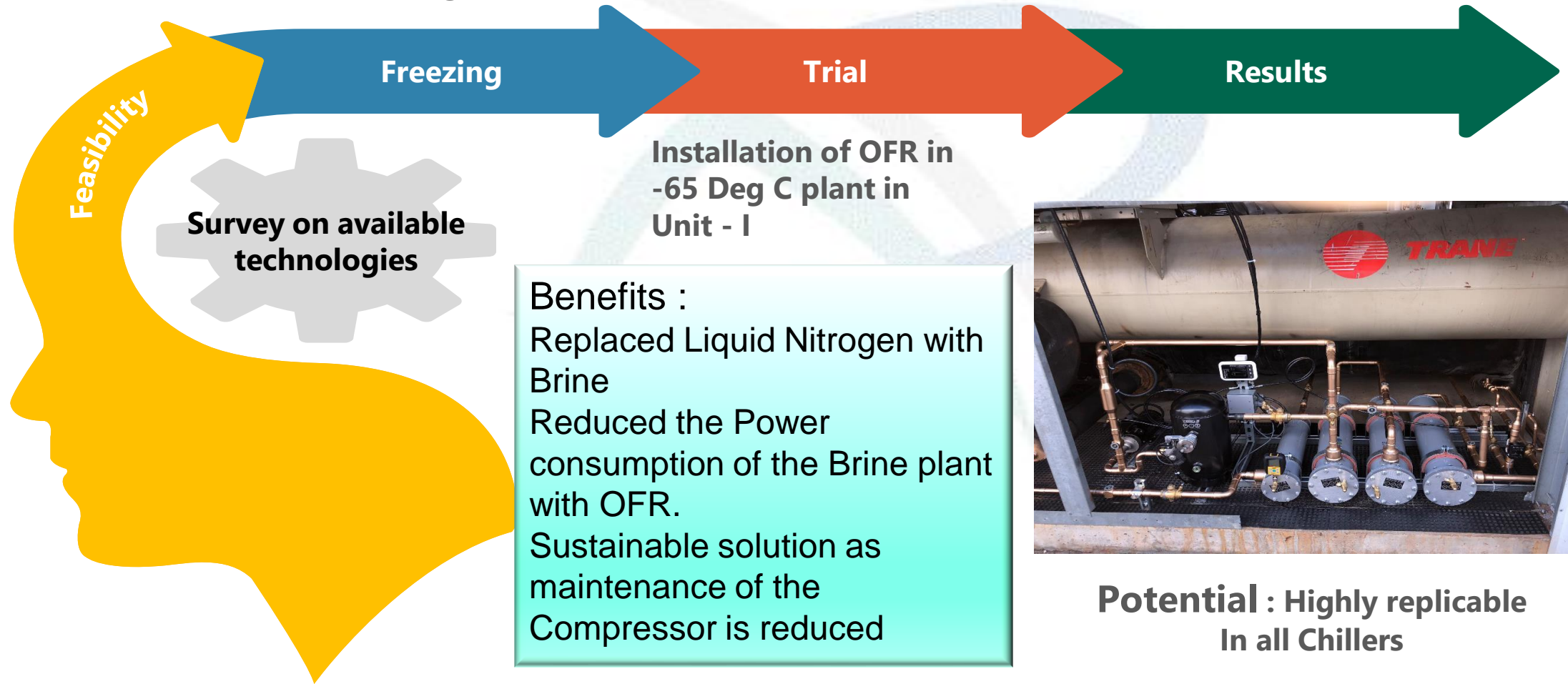
Major Encon Projects – Medium / Low Investment - FY 21-22



OFR Technology in Brine Chillers

Study of installed OFR in Air Conditioning Chillers

Energy Savings: 18 %
Payback : 1.5 Years





Enhancement of production capacity - Entacapone



Existing

- Existing Batch size is 100 Kg per hour and capacity is 1.1 MT per month

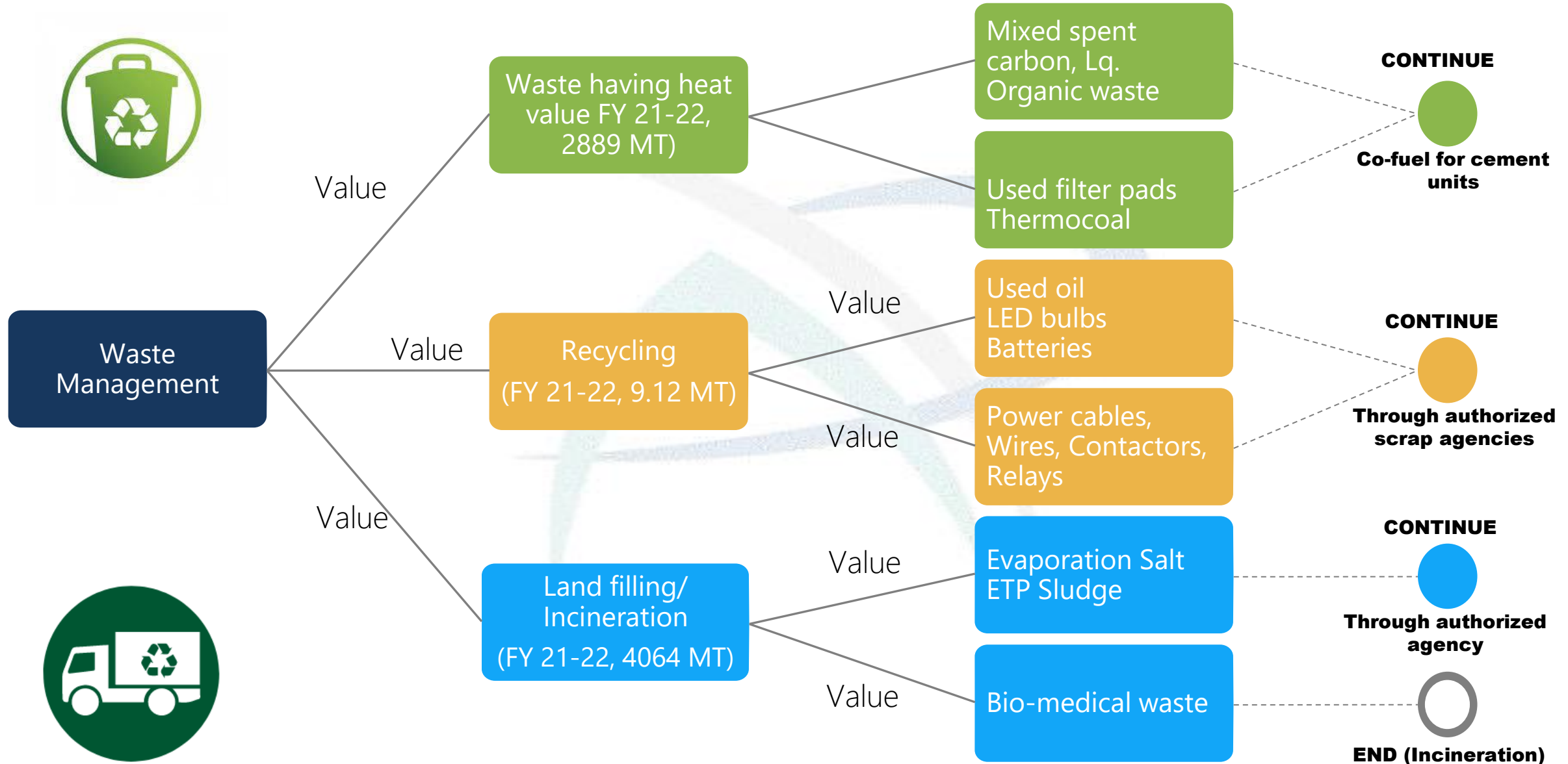
Proposed

- Installation of 4 KL SS Reactor in place of 2.5KL and Installation of 60" centrifuge in place of 48" centrifuge.

Benefits

- Benefit/Month=Rs.12,33,000.
- Pay Back = 12 Months

Waste utilization and management



01 Sustainability Report



2020-21

Published maiden sustainability report for FY 2020-21

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

02 Goals & Targets -2025



FY 2019- 22

FY	Total Scope 1 emissions (tCO2e)	Total Scope 2 Emissions (tCO2)	Total GHG Emissions (tCO2e)
2019-20	80,608	42,681	1,23,289
2020-21	59,923	50,239	1,10,162
2021-22	61,090	62,520	1,23,610

03 GHG Emissions

Green Supply Chain Management

Single Stuffing/ Double Stacking Project

- Achieved benefits of Rs 190 Million
- 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.

01

02

Paperless / Digital Logistics

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

GST – e Invoicing

04

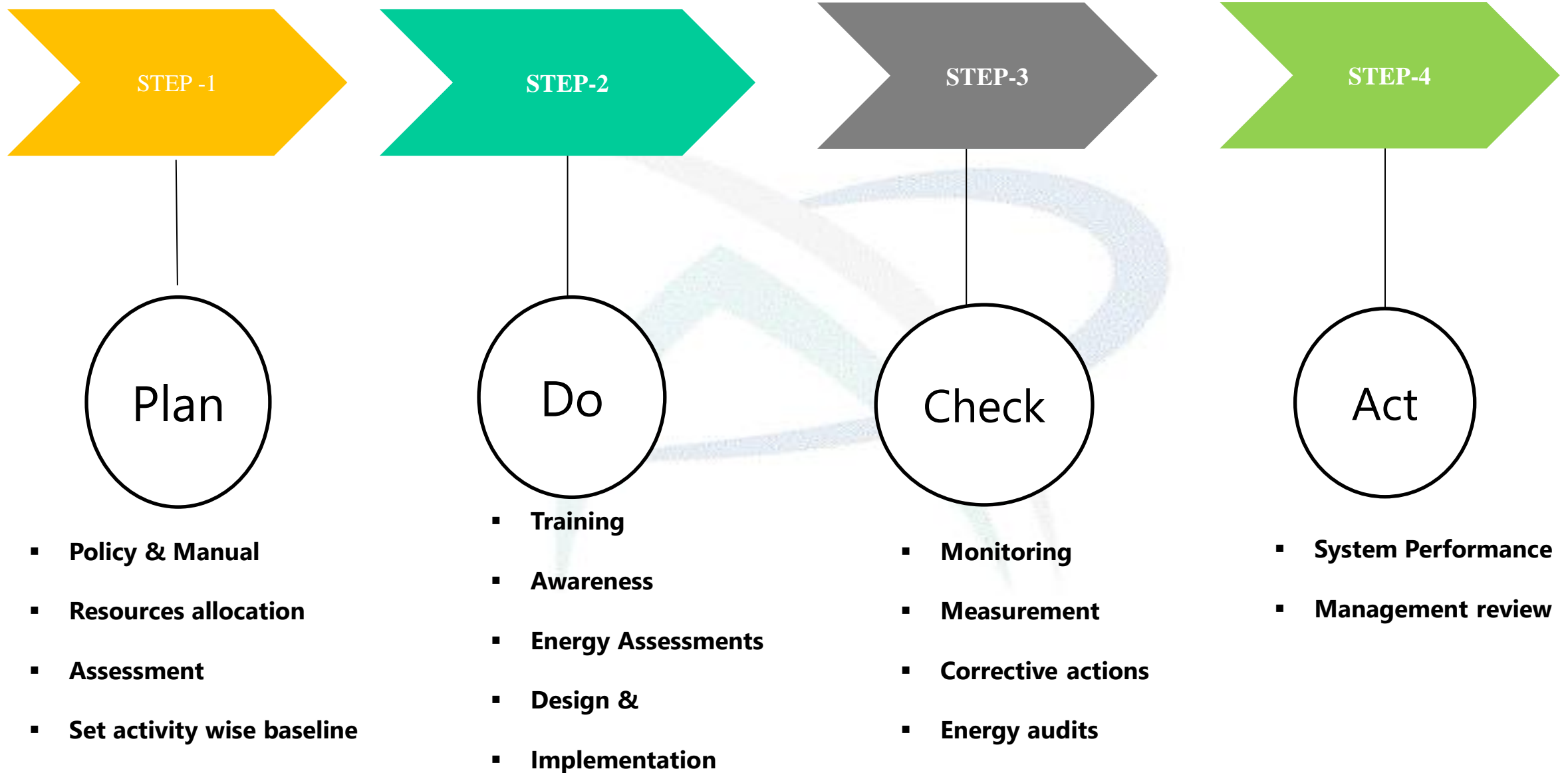
03

- First Pharma company in India to adopt OTM.
- Cloud based Solution
- Freight Payments linked from OTM to ERP.

AIR vs SEA – Mode Control

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

Energy Management System - Procedures



Teamwork, Employee Involvement & Monitoring



Teamwork

- Block level teams responsible for Energy monitored on KPI.
- Awards & appreciations for best programs.
- Implementing 5S programmes by the same teams



Employee Involvement

- Organized Energy Conservation Week Celebrations and involved all employees
- Energy KPI review



Training Programmes

- Given training programmes on Root cause analysis (RCA), 5S, Good Engineering Practices
- Training on steam / utility systems

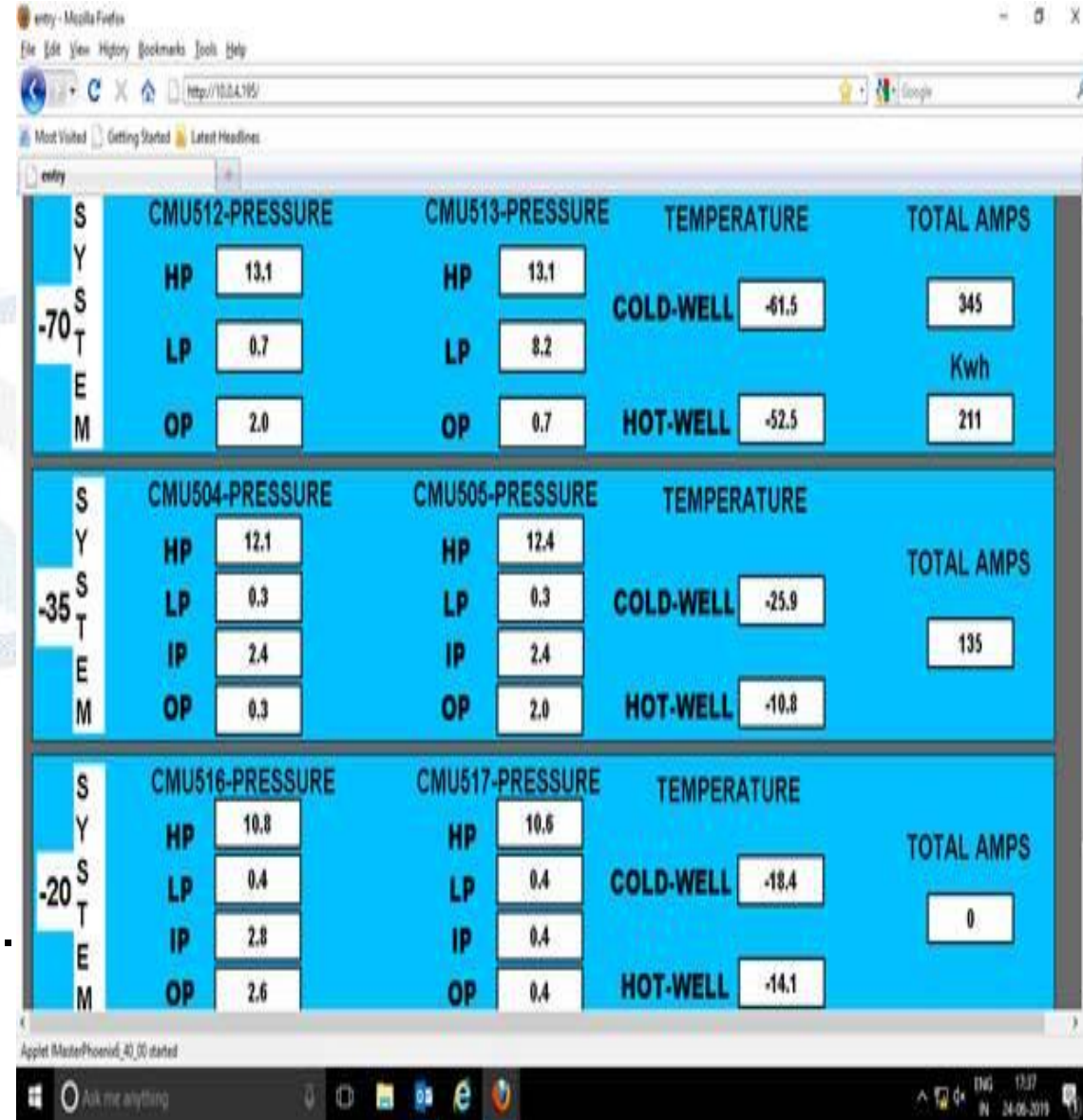


Monitoring

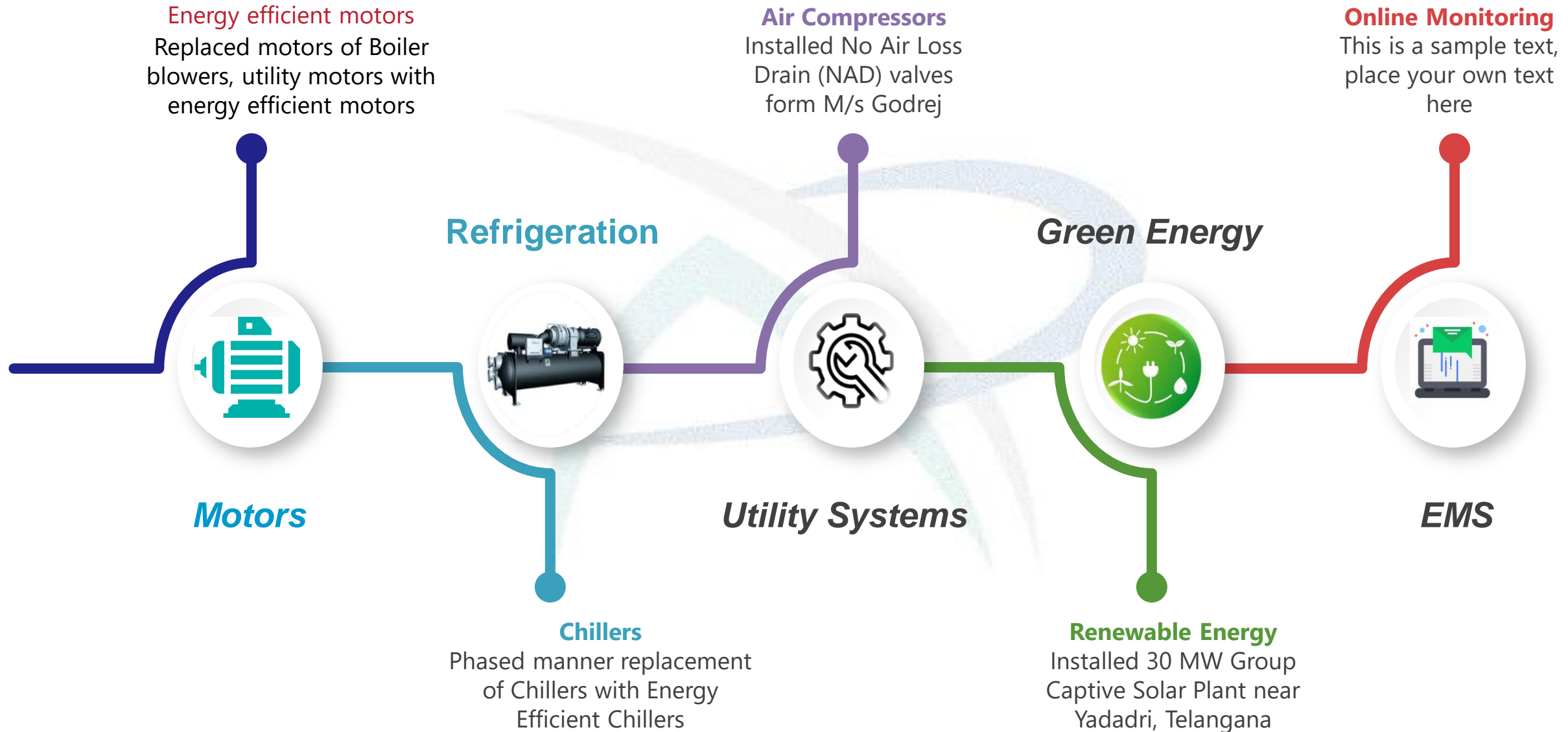
- Daily / weekly monitoring of Energy Consumption areas / major equipment.
- Review of KPIs, Performances in the presence of plant heads.

Daily Monitoring & Reporting System

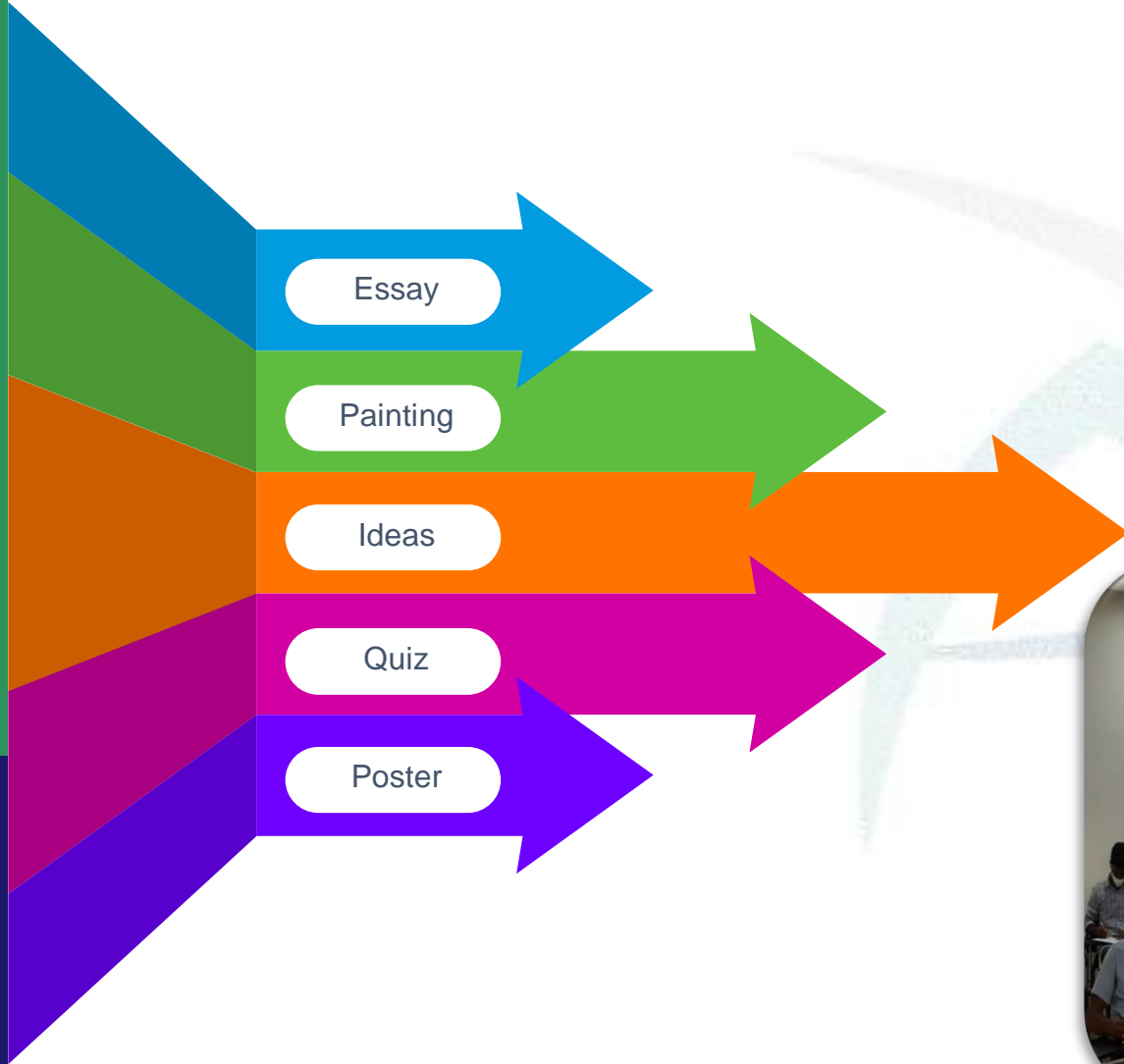
- Co-gen being operated a max capacity utilization based on steam demand.
- Benchmarks for each block power consumption established and being tracked on daily basis.
- Specific energy consumption of all Utility equipment being routinely monitored and reviewed on monthly basis.
- Water conservation and monitoring. All streams of water are studied and recycled. Purified Water RO reject are used for Cooling Tower make up.



Learnings from CII - last 4 Years



Energy Week / Energy Conservation Day Celebrations –



Awareness

Participated got from all departments like Production, Engineering & EHS, SRS and TSD etc



Winner

Awarded Most No of Energy Conservation Ideas Implemented Unit from Corporate Energy cell and L&D team



Awards & Recognitions

1



Operational Excellence



Global Operational Excellence Company of the Year 2022
Global Healthcare Awards

2



Human Resources



HR Innovation & Techfest 2021
Most Collaborative Hiring Team
Innovation in Employee Engagement

3



Environment, Health & Safety



Winner of the Golden Peacock Occupational Health & Safety award 2021 (GPOHSA)

Awards & Recognitions



Confederation of Indian Industry

22nd National Award for Excellence in Energy Management 2021

This is to certify that

Aurobindo Pharma Limited, Unit 9, Hyderabad

has been recognized as

"Excellent Energy Efficient Unit"

This acknowledgement is based on the evaluation by panel of judges at the "National Award for Excellence in Energy Management" held during 24 - 27 August 2021.



K S Venkatagiri
Executive Director
CII - Godrej GBC



Ravichandran Purushothaman
Chairman, Energy Efficiency Council
CII - Godrej GBC



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CII - Godrej GBC



CSR Activities



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



Thank You