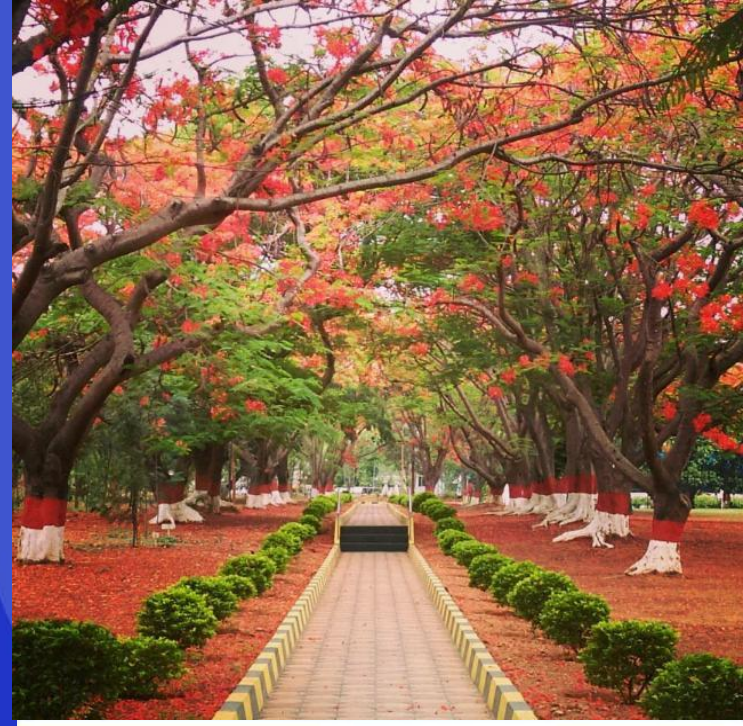
HINDUSTAN UNILEVER LIMITED
HOSUR BEVERAGES FACTORY
CII-ENVIRONMENT AWARDS-2023

PROJECT TITLE

HIGH CONCENTRATION SPRAY TO REDUCE CO2 EMISSIONS & ENERGY CONSUMPTION

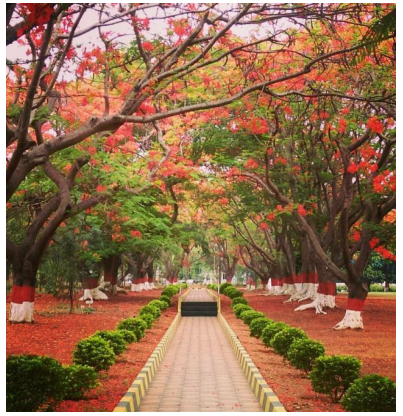


PARTICIPANTS:

1. VINTI ARORA, FACTORY MANAGER
2. SAI SREE, FACTORY ENGINEER
3. NELSON ISAC, SR. UTILITIES EXECUTIVE

Unilever

HOSUR SITE PASSPORT



GENERAL

- Unit setup by **Brooke Bond** in **1983** for Instant Coffee.
- Situated **40KM** from Bangalore
- **Population-**300,000 (Males constitute 53%, Females constitute 47%) .
- Average literacy rate of **75%.**
- Official Language – Tamil (Alternate - Telugu and Kannada)
- Total Site Area **– 67217 Sqm** (Constructed Area–15665 Sqm)
- Site GBV: 162 Cr , TO: 400 Cr

MANPOWER

- **5** Managers, **19** Executives and **169** Shopfloor employees.
- Average Age -44 years (shopfloor)
- Direct + Indirect Employment -322

MANUFACTURING

- **14K Tons** Annual Volume (IC ~ 8000 Tons ; CC ~ 6000 Tons)
- Highly process intensive IC production (Roaster, Extraction, Evaporation , Spray Drier)
- **5** packing lines (IC – 3 ; CC- 2)
- **Zero** Discharge plant

HOSUR BUSINESS CONTEXT

14 K Tons of Installed Capacity
(IC~8000 Tons ; CC~6000 Tons)

8.3K Tons Annual Volume in 2022
(IC ~ 5367 Tons ;
CC ~ 2952 Tons)

275 Crore Turn Over
162 Cr GBV

Highly Process Intensive IC manufacturing
Roaster, Extractor, Evaporator, Spray Drier

Zero Liquid Discharge Plant

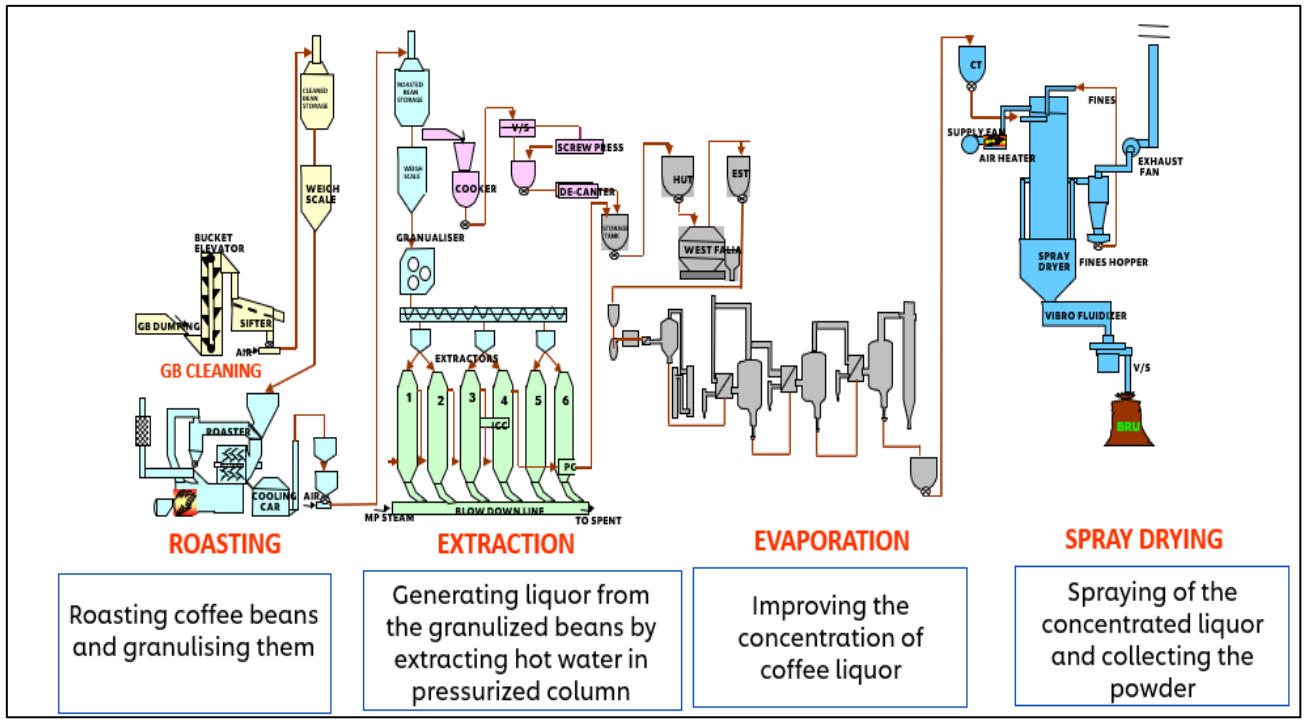
11 SKUs
Only Sourcing unit for SS, HTS , BGL KE & BGL Nice

Total Site Area – 67217 Sqm (16.6 Acres)
Constructed Area–15665 Sqm (3.87 Acres)

5 Packing Lines
(3-IC & 2-CC)

5 Managers
19 Executives
169 Shopfloor Employees
322 Contractual Employees

PROJECT TITLE: HIGH CONCENTRATION SPRAY TO REDUCE CO2 EMISSIONS, LPG & STEAM CONSUMPTION



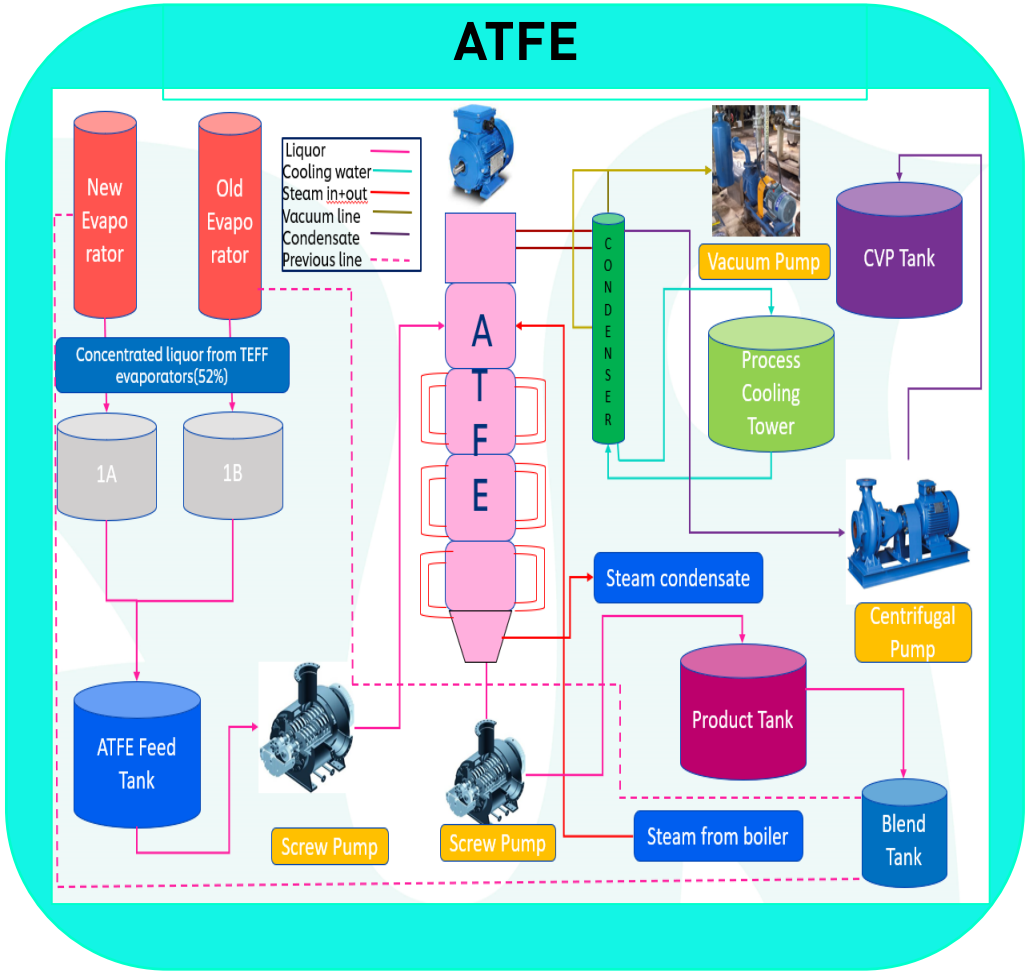
Extraction → **Evaporation** → **Agitated Thin Film Evaporator** → **Spray Drier**

Liquor at 10.6% concentration

Liquor concentration increased to 50%

Liquor concentration increased to 60%

Liquor sprayed to produce IC powder

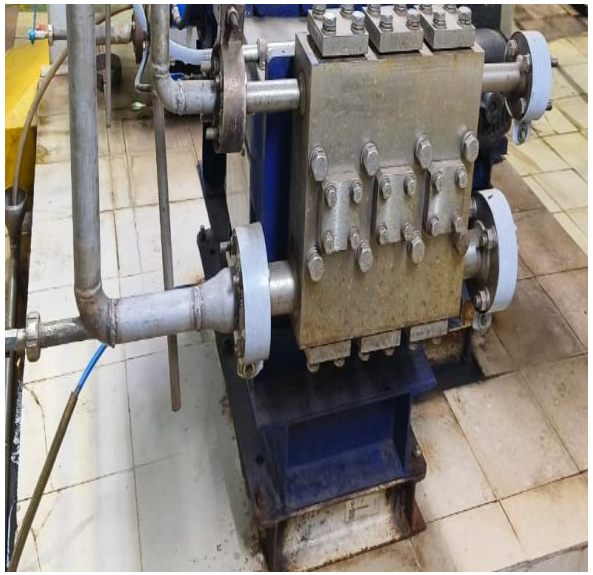


Capex INR 2.6Cr

Annualized Savings INR 1.9Cr

CHALLENGES

High Pressure Pump

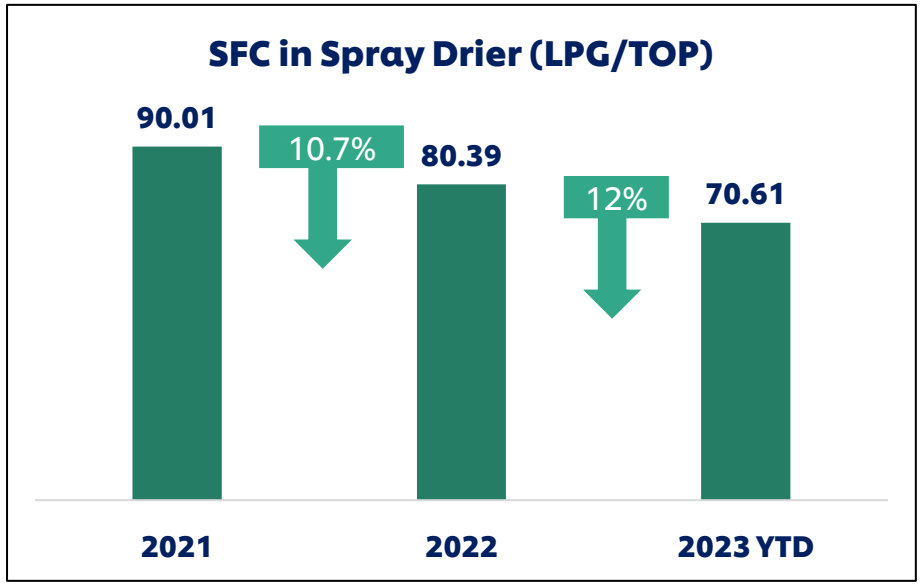


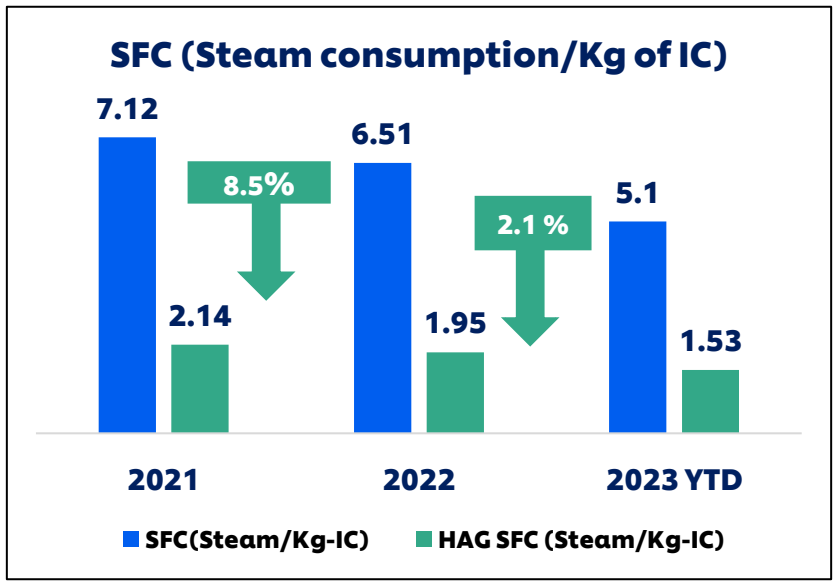
Pre-Heated Liquor temperature

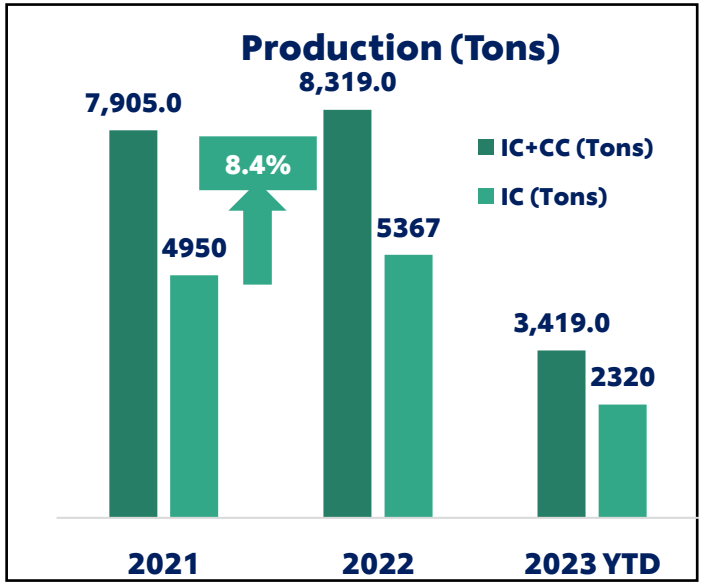
Cone Mouth Blockage

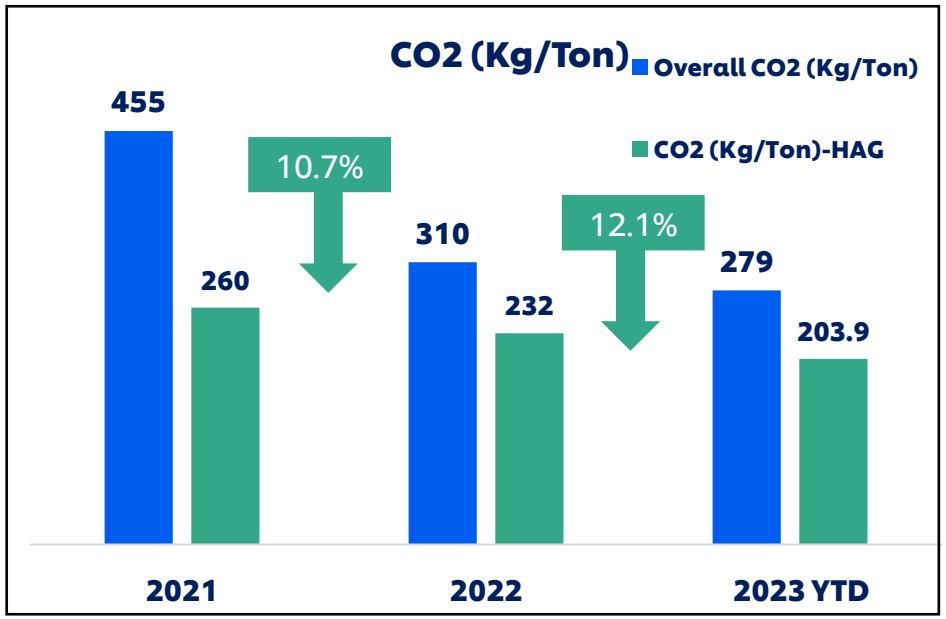
Parameters like pressure, temperature of concentrated coffee liquor, temperature of cone cooling air, temperature of hot air inlet to the drier were optimised

TANGIBLE & INTANGIBLE BENEFITS









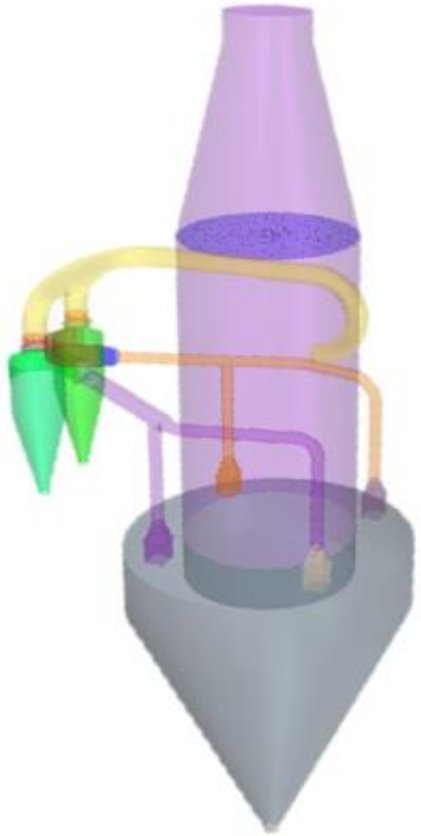
TANGIBLE BENEFITS

- Unlocked Capacity of Spray Drier by increasing inlet concentration to Spray Drier from 46% to 55% in 2021 & 55% to 59% in 2022.
- Reduction in LPG consumption by 22%, steam consumption by 11% for Spray Drier and CO2 by 23%
- 300 TPA of capacity debottlenecked.

INTANGIBLE BENEFITS

- Capex avoidance for additional spray drier.

REPLICATION POTENTIAL



- This project can be replicated in Instant Coffee Manufacturing Sites with Spray Drier.
- Spray Drier Workshop has been conducted for knowledge sharing between coffee sites in HUL (Replicated in Mysore).
- Replication in other food manufacturing processes and Home Care Factories can also be evaluated.

OTHER KEY INITIATIVES

Replacement of Bag Filters with ESP

Reduction in PM from 150 Mg/Nm^3 to 50 Mg/Nm^3

Installation of DG RECD to reduce emissions

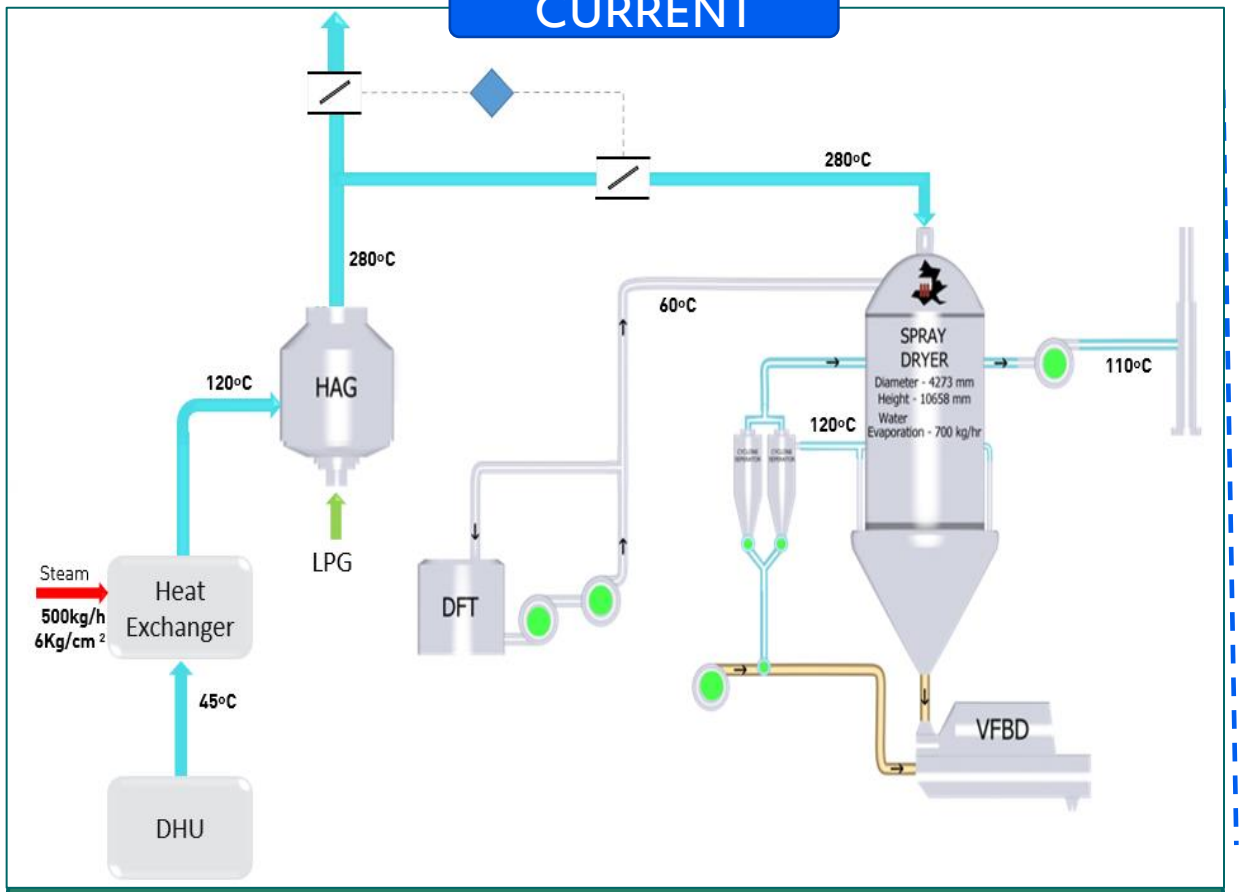
~90% reduction in PM & CO, 50% reduction in NO2 and SO2

Moving from under ground Anaerobic Lagoon to Above ground Anerobic Digestor

~9900 kl/year increase in water reuse

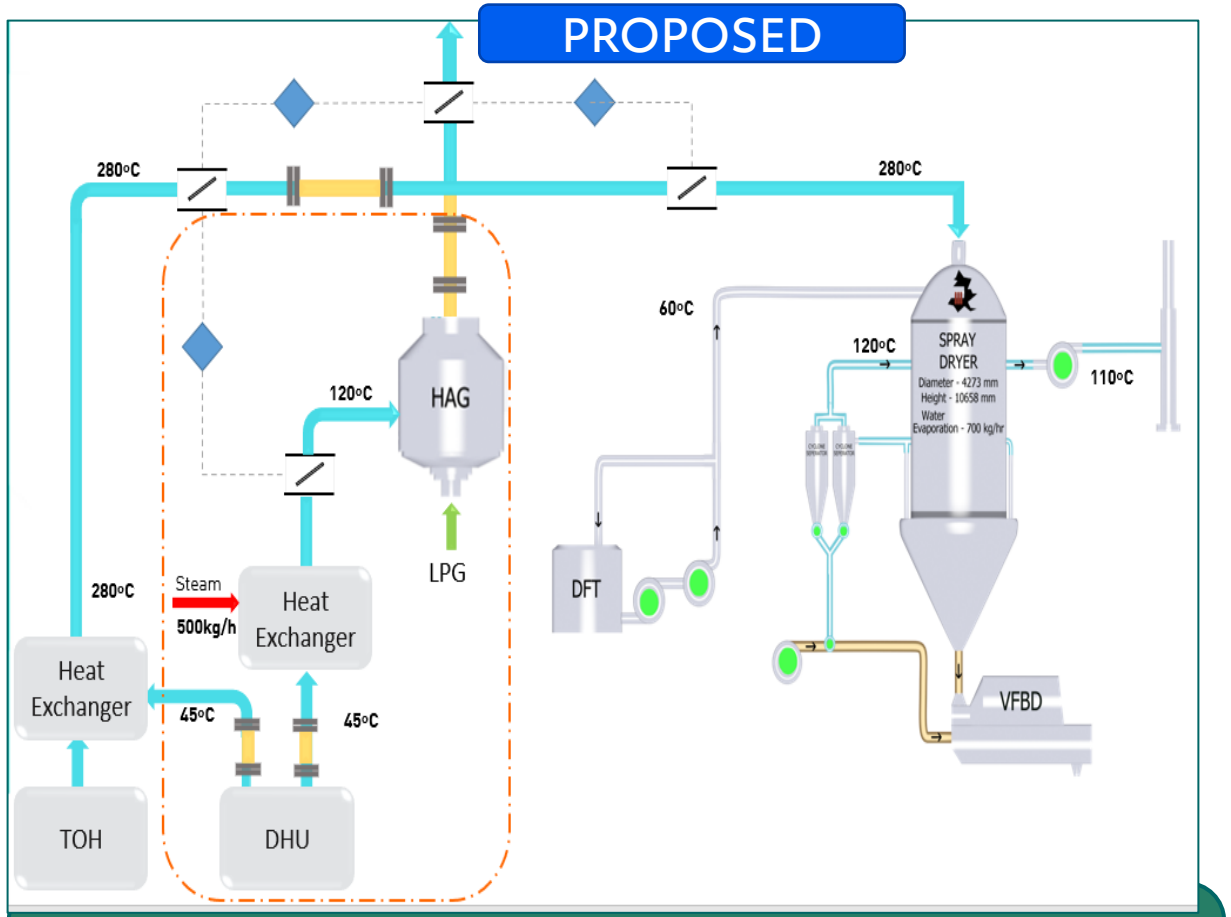
WAY FORWARD: BIOMASS BASED HAG TO ELIMINATE LPG USAGE IN SPRAY DRIER

CURRENT



DIRECT FIRED WITH LPG AS FUEL
HAS MULTIFUEL OPTION FOR BIODIESEL/ HSD AND LPG

PROPOSED



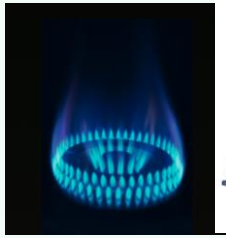
BIOMASS THERMIC FLUID HEATER WITH LIQUID TO AIR HEAT EXCHANGE
MOVING FROM DIRECT FIRED TO INDIRECT FIRED
EXISTING HAG USED AS BACK UP

Reduction in CO2 by 1887.5 Tons/Year || Annual Savings 4 Cr

CARE FOR PLANET – GREEN ENERGY KPIS

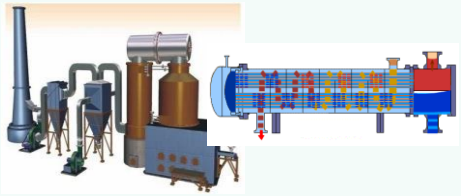
Key initiatives

Alternate Fuel usage



HSD → LPG in HAG & Roaster ✓

HSD → Biodiesel in Boiler ✓



Biomass based TFH for HAG ●

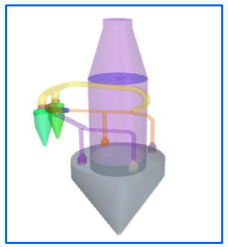
Thermic Fluid Based FWH & HRS ●

Reduce Energy Consumption

Boiler Digitization

Steam Fuel ratio improved from 4.4 → 4.8 ✓

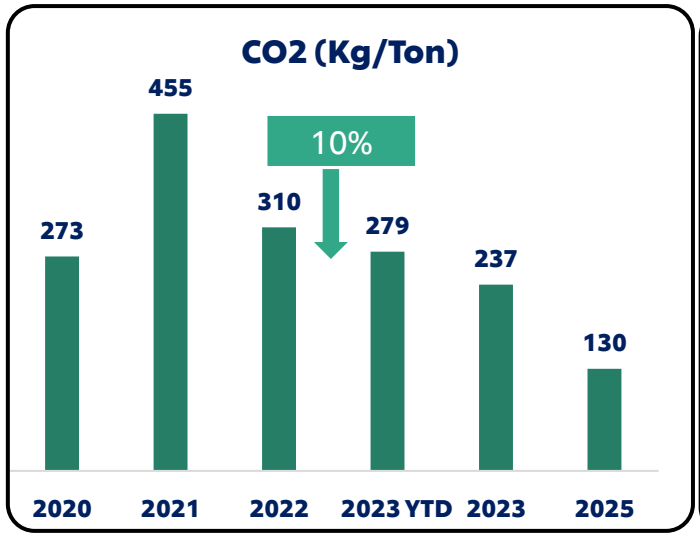
Air Preheater in Roaster ✓

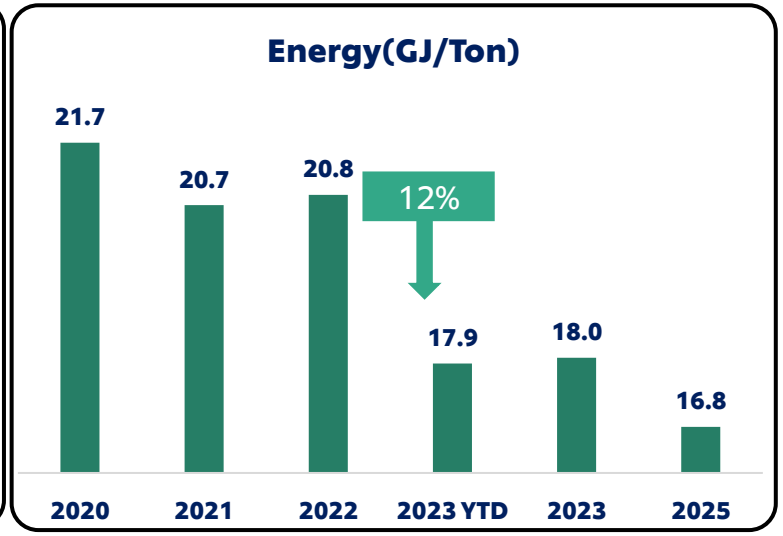


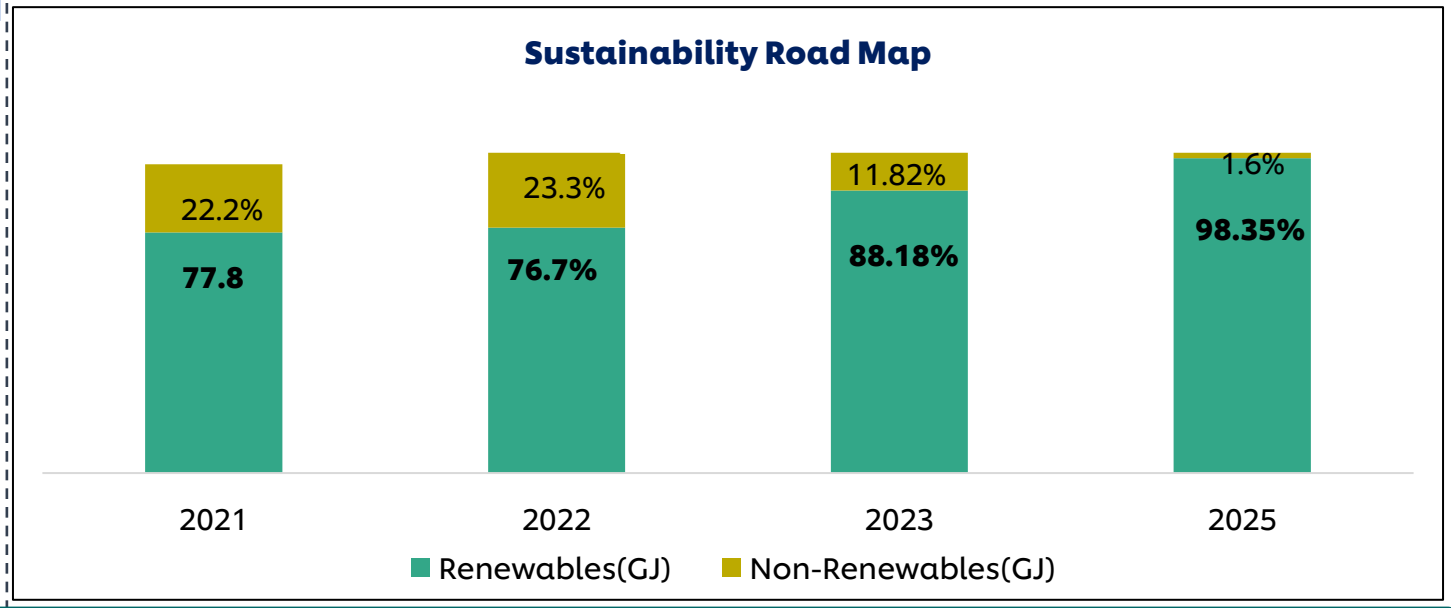
Increase in Spray concentration ✓

- EC Motors for DHUs
- ATCS for Chillers
- FRP Fans in Cooling Towers

●



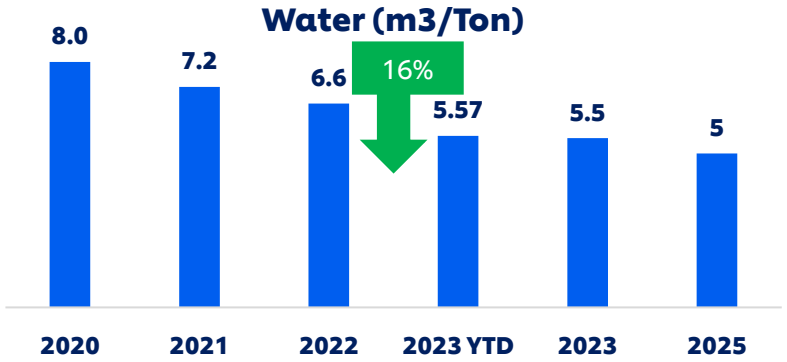




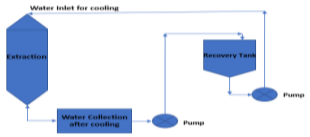
Ambition is 58% reduction in CO_2 & 98% of energy sourced to be GREEN ENERGY by 2025

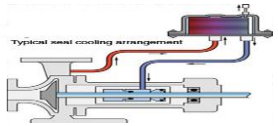
CARE FOR PLANET-WATER & WASTE KPIS

Water



Extraction quench water recovery
10 KL/day water savings





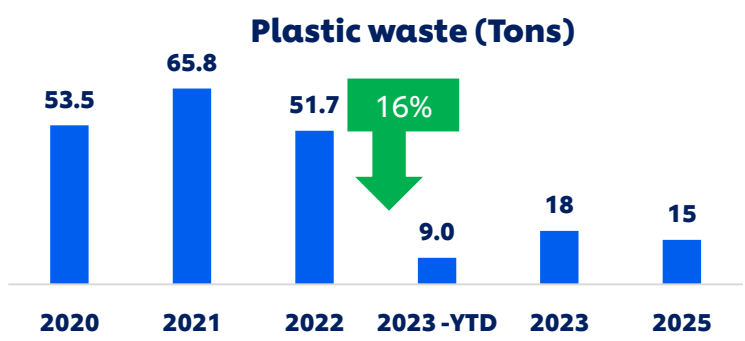
Recovery and reuse of Pump seal cooling water and quench water
3 KL/day water savings

RO system is used in the place of DM to reduce regeneration water.
20 KL/day water savings

Eco-Clean Dosing in Cooling Towers to reduce frequency of blow down

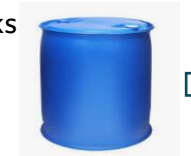
30% reduction in water consumption in past 5 years

Plastic Waste



24 Kl Liquid Chicory SS Tanks instead of Plastic Tanks

25 tons/year



Elimination of outer carry bags in HTS Coffee packs.

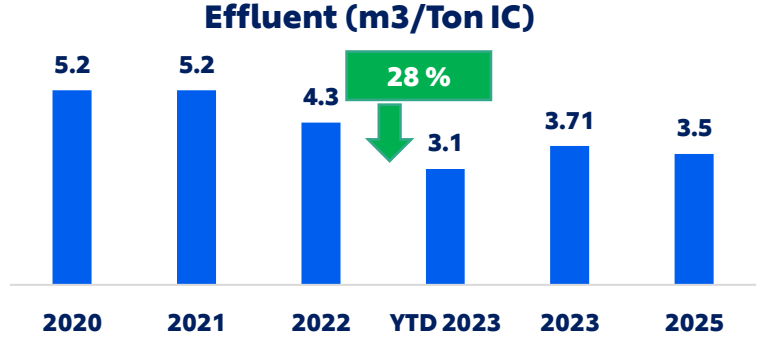
7.8 tons/year

MLP laminate change in SS/Tripti 200g

Repurposing of shredded laminate for making biofuel

75% reduction in plastic waste generation

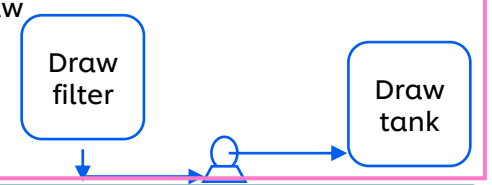
Effluent



Anaerobic Lagoon to Digester
9900 kl/year increase in water reuse

ETP sludge to boiler briquette
746 tons/year

Recovery of extractor draw filter liquor
360 kl/year of effluent reduction



18% reduction in Effluent generation

AWARDS & RECOGNITION

2019

Achievements

1. Co2 Reduction – 680 Kg/ ton
2. Water Reduction- 1.8 Kl/ton
3. Energy Reduction – 0.7 GJ/ton
4. Waste Reduction - 6.7 tons

2020

Achievements

1. Co2 Reduction – 187 Kg/ton
2. Water Reduction – 0.6 Kl/ton
3. Energy Reduction – 0.1 GJ/ton
4. Waste Reduction – 4.5 tons

2021

Achievements

1. Co2 Reduction – 25 kg/ ton
2. Water Reduction – 0.8 Kl/ton
3. Energy Reduction – 1.0 GJ/ton
4. Waste Reduction – 22.4 tons

2022

Achievements

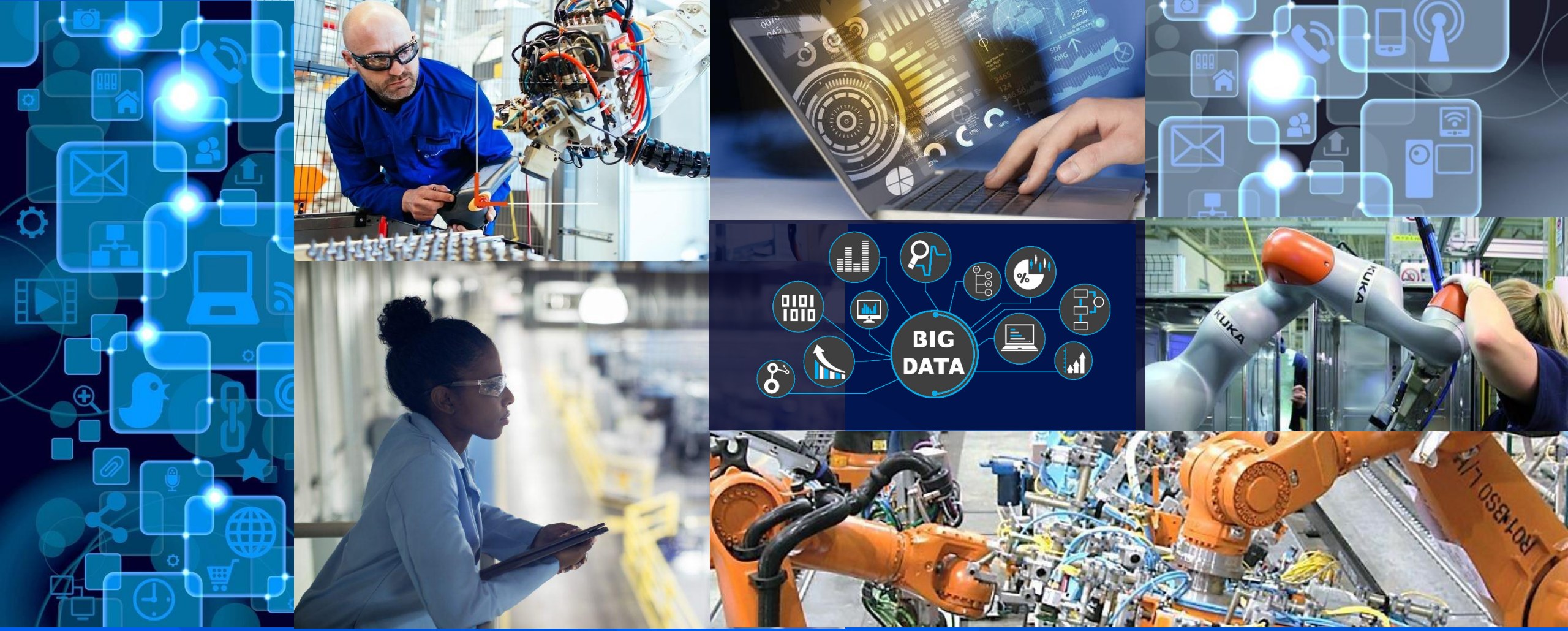
1. Co2 Reduction – 133 Kg/ton
2. Water Reduction – 0.1 Kl/ton
3. Energy Reduction – 0.2 GJ/ton

2025

Forecast

1. Co2 Reduction – 99%
2. Water Reduction – 50%
3. Energy Reduction – 19%
4. Waste Reduction – 65%

AMBITION TO BE PLASTIC AND WATER NEUTRAL WITH 98% GREEN ENERGY BY 2025



THANK YOU