



1

OUR STORY

Tata Chemicals Limited is an Indian global company headquartered in Mumbai, India, and part of Tata Group conglomerate.

Sustainability as a practice is at the core of all of Tata Chemicals' activities, including corporate social responsibility initiatives, and is intricately woven into all the business functions.

TATA Chemicals Ltd at Mambattu, Andhra has set up a bio-technology facility for the manufacture of Fructo Oligo Saccharide in 2019. (5000 TPA).

TATA
TATA CHEMICALS LIMITED

TATA NO Fossence™

AWARD AND RECOGNITION

- The project has been designed & constructed as per IGBC guidelines under their Green Factory Building Rating System.
- The company got certified by IGBC under Green factory building with GOLD rating in Feb 2020&2023
- The company has recently obtained Recertification of the facility by IGBC under Green Factory with GOLD rating in Sep 2023 for a period of three years.
- The company was selected for Diamond Jubilee award for the development of "Technology for production of Fructo-oligosaccharides (FOS) by CSIR in 2020.

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OUR STORY



We manufacture Prebiotics, the food for the beneficial microorganisms in your GUT,
via in-house developed nature inspired Fermentation technology aligned along the principles of Green Chemistry

APPLICATIONS

Sugar Reduction to Sugar replacement / Calorie reduction








FOSSENCE

Short chain Fructooligosaccharide

Sweet tasting Prebiotic and Dietary fiber
made from fermentation of cane sugar



TATA NQ

GUT HEALTH IS THE NEW WEALTH

FOSSENCE®

SUSTAINABILITY ENABLERS

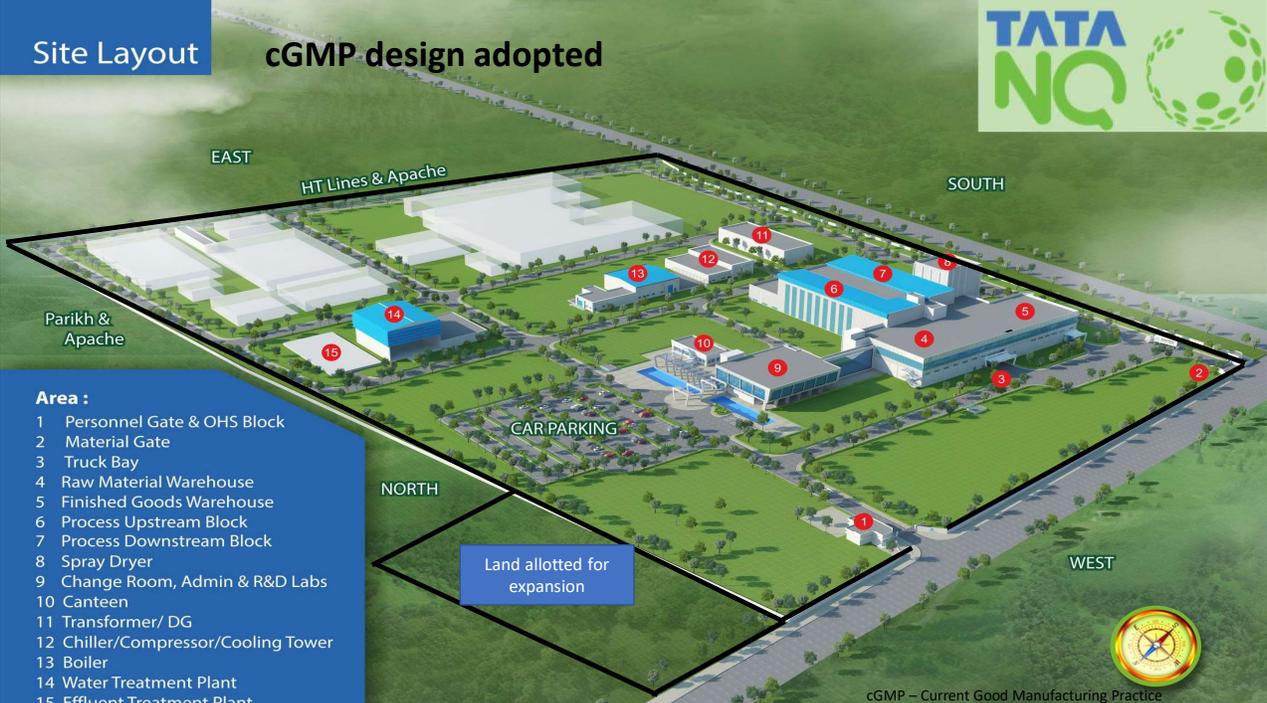
-  - Renewable energy sources contributing to 20% of the plant's electricity demand
-  - India's one of the largest floating solar ponds
-  - Less Water consumption & reduced ETP load
-  - Zero Liquid Discharge (ZLD)
-  - Rain Water harvesting to combat water stress. 88000 KL
-  - Higher Capacity catchment area 97K SQM
-  - Zero Fossil Fuel Usage
-  - IGBC Gold certified manufacturing facility
-  - Reduced Carbon Footprint

3

Site Layout

cGMP design adopted





Area :

- 1 Personnel Gate & OHS Block
- 2 Material Gate
- 3 Truck Bay
- 4 Raw Material Warehouse
- 5 Finished Goods Warehouse
- 6 Process Upstream Block
- 7 Process Downstream Block
- 8 Spray Dryer
- 9 Change Room, Admin & R&D Labs
- 10 Canteen
- 11 Transformer/ DG
- 12 Chiller/Compressor/Cooling Tower
- 13 Boiler
- 14 Water Treatment Plant
- 15 Effluent Treatment Plant



cGMP – Current Good Manufacturing Practice

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Most Innovative Environmental Project -1



• **Project:**
Incidental Steam Pressure Energy into Electricity

• **Category :**
Green Energy Saving Project

• **Name of Organization :**
TATA CHEMICALS LTD



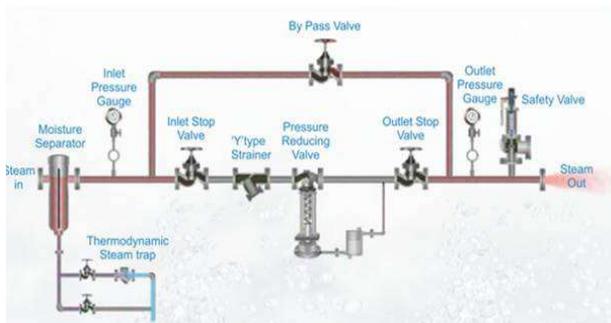
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EXISTING SCENARIO



- ❑ We have 16 TPH boiler with pressure of 17.5 bar.
- ❑ There are 3 different application of steam requirement with different pressure(16 bar/3 bar/1bar).
- ❑ Currently to reduce steam pressure we are using Pressure Relief Valve (PRV station).

Steam Consumption/Day	
Steam Consumption	200 ton
16 Bar Steam	50 ton
3 bar and 1 BAR	150 ton

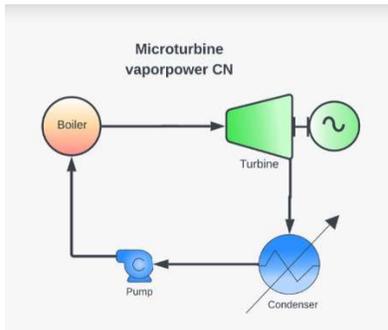


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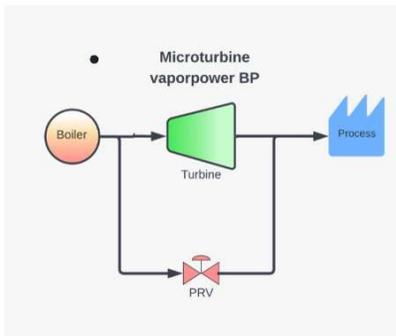
IDEA GENERATION



HIGH PRESSURE STEAM TURBINE IN POWER PLANT



Steam condensing turbine – High pressure application



Low pressure turbine for process application



Forbes Marshall – Pressure reducing turbine

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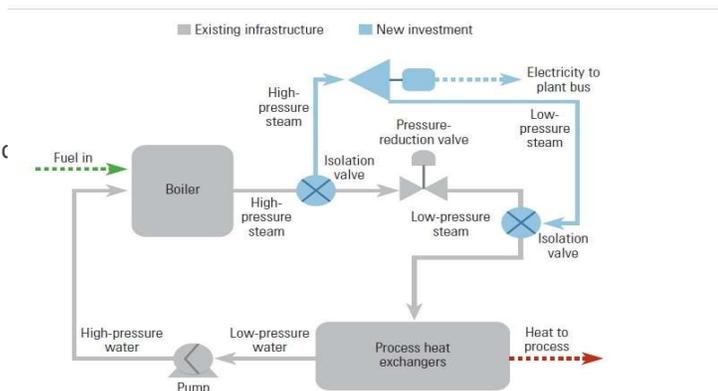
IDEA EVALUATION



We can capture this incidental potential energy by placing the Pressure Reducing Turbine (PRT) in parallel with PRS. This allows generation of valuable electricity and also reduces steam pressure to the required level.

Pressure Reducing	16 bar to 3 bar
Steam Flow	5 – 10 T/H
Steam Consumption	150 Ton
PRT Rating	250 KW

Total PRT capacity : 250 KW



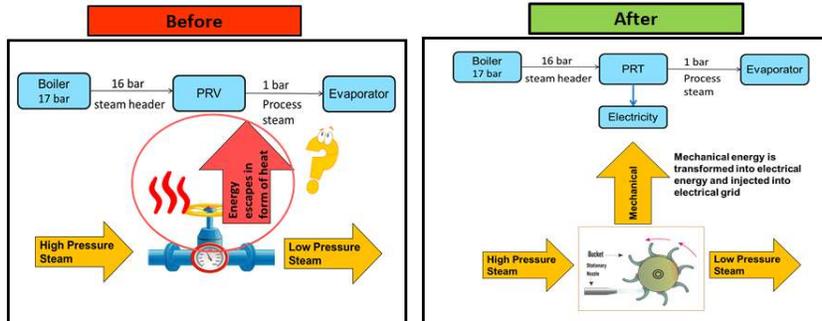
Reliability: In case of any tripping, system work in auto mode and PRV come in line without process interruption.

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PRESSURE REDUCING TURBINE



Pressure Reducing Turbine



Renewable Energy



10.8Lakh Units/Annum



64 Lakhs/annum

ADVANTAGES

- Using renewable energy to reduce the grid energy consumption – Cost on energy is saved.
- Automatic change over from PRT to PRV based on pressure set point.
- Consistent steam supply at saturated steam temperature

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CAPEX VS OPEX



CAPEX	Unit	PRT-250KW
Plant Operation	Day	300
Annual Unit Generated (000)	KWH	10.8 Lac
Gird Electricity power	Rs / KWH	5.85
Annual Saving	Rs (Lac)	64
Price (PRT set)	Rs (Lac)	112
Low Side Work	Rs (Lac)	10
Total Investment	Rs (Lac)	122
Pay back	Year	2.5

OPEX	Unit	PRT- 250 KW
		Maxi
Plant Operation	Day	300
PRT Generator output	KW	150 (60% rated flow)
Operating hours daily	Hour	24
Daily Electrical Output KWH	Unit	3600
Annual Unit Generated	KWH	10.8 Lac
Annual Saving (5.85 Rs/KWH)	Rs	64 Lac



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TANGIBLE BENEFITS & KEY LEARNINGS

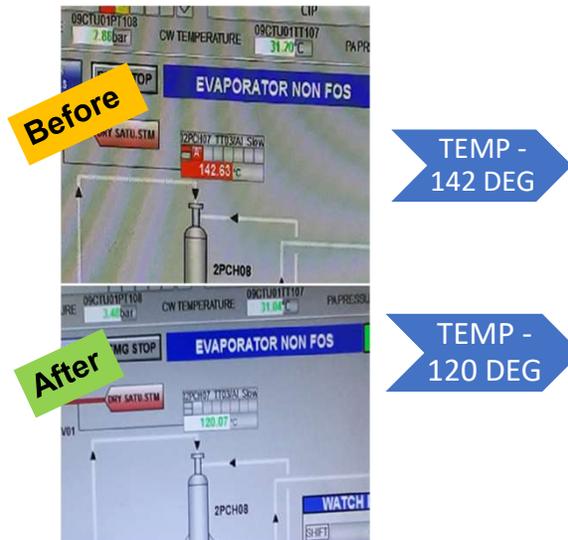


Advantages

- Saturated steam temperature received at inlet
- Reduced steam consumption
- Consistent operating Temperature
- Impact of temperature on shell side reduced due to operation at design temperature

Key Learnings

- ❑ Important learning from this project is, It is a need of time to expand focus area of business from just commercial benefits to Sustainability benefits.
- ❑ From this project it is learnt that along with commercial benefits, environmental benefits can also be achieved if awareness is built.



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BENCHMARKS



14th EXCEED Green Future Award 2023
BEST ENERGY MANAGEMENT

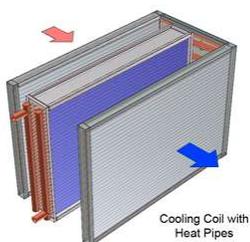
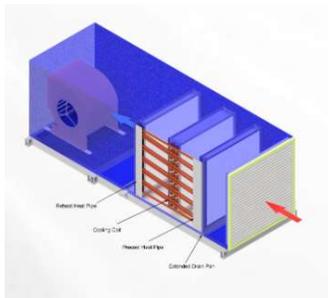


IGBE Performance Challenge Award for Green Built Environment At Chennai 2023

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Most Innovative Environmental Project -2



• **Project:**
Heat pipes in Air handling Unit

• **Category :**
Green Energy Saving Project

• **Name of Organization :**
TATA CHEMICALS LTD

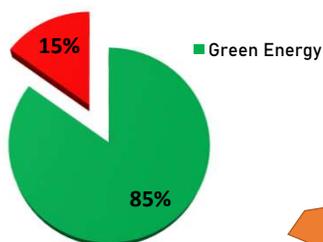
Installation date – 15/08/2023

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FACTORY ENERGY MANAGEMENT

Total Energy of Plant



Energy conservation initiatives

- Floating solar plant (1.4MWp)
- Rooftop Solar plant (0.5 MWp)



Reduction in CO2 equivalent emissions

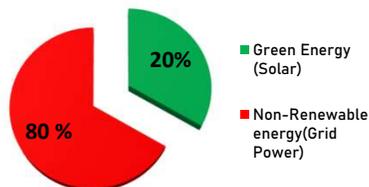
2100 Ton



Units saved

25 lacs

Electricity



FY 20-21

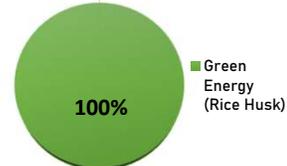
FY 21-22

- Pressure Reduction Turbine (160kW).

220 Ton

3 lacs

Thermal



FY 22-23

- VFDs for Boiler critical pumps Fans
- Chilled water and CT water consumption optimization.
- AHU Heat Pipes

746 Ton

72 Lacs

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OVERALL ENERGY PROJECTS

PLANT POWER CONSUMPTION

Others: 13%

Production: 20%

Utility-WTP,ETP,Boiler: 30%

HVAC: 37%

PROJECT BACKGROUND

- In Mambattu, plant power consumption HVAC – 37%,Utility -30%,Production -20% , Others -13%
- Only HVAC and Utility contributes to 67 % of total power.
- We identified the opportunity to Reduce the power consumption and improvement in energy generation

PROJECT BACKGROUND

ENERGY OPTIMIZATION

ENERGY OPTIMIZATION

- Pressure Reducing Turbine-PRT
- VFD For Boiler Feed Pump Motors
- Installation Of Heat Pipes In Ahu.
- EC Fans Installation In Ahu (Capex Under Proposal)

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HEAT PIPES IN AHU

HOT WATER GENERATION SYSTEM

SUPPLY HOT WATER AHU HEATING COIL

PROJECT BACKGROUND

- ❖ There are 7 Nos classified AHU to maintain the RH & Temp.
- ❖ Hot water is generated using steam @ 2.5 MT/day
- ❖ This hot water is transferred through Pumps –(15KWH motor)

Energy consumption

STEAM -750 MT/ANNUM

FUEL – 250MT/ANNUM

1 Lakh KW/ANNUM

OPEX

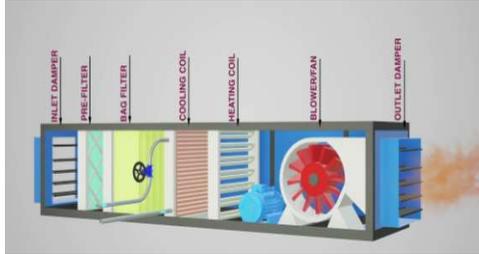
9 LAK/ANNUM

16

IMPLEMENTATION OF HEAT PIPES



Before



After



Heat pipe background -

- ❖ Heat pipes are a key component of many heating, ventilation, and air conditioning (HVAC) systems.
- ❖ A heat pipe is a simple device that can transfer heat from one point to another without the use of an external power supply.
- ❖ It is a sealed tube that has been partially filled with a working fluid. In HVAC applications, this fluid is most often refrigerant.
- ❖ Currently we have installed For 5 Nos AHUs out of 7 Nos

Advantages

- Reduces Humidity, Improves Air Quality And Comfort Level.
- No Moving Parts, No Additional Energy Required To Operate,
- Recovers Cooling From Exhaust Air.
- Reduces Air-Conditioning Energy, Reduces HVAC Load.



35 Lakh



1 Lakh Units/ANNUM



5 MTOE



10 LAK/ANNUM

17



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