

# 23<sup>rd</sup> CII-National Award for Excellence in Energy Management 2022



## Jindal Stainless (Hisar) Limited

### Team :

Parvesh Gupta - (Utility)

Sanjay Mittal- (HRM)

Surender Kamboj - (Energy Cell)



# About the Organisation

- A first generation entrepreneur & industrialist, Shri O P Jindal founded the group in 1970. Transforming his vision into reality, the group today is a leading industrial conglomerate with an annual turnover of US \$25B\*.
- Jindal Stainless is one of the largest stainless steel conglomerates in India and ranks amongst the top 10 stainless steel conglomerates in the world with annual crude steel capacity of 1.8 MTPA.
- JSHL was Set up in 1970 by its founder & Chairman Late Sh O.P. Jindal. Stainless steel production started in 1979, with setting of first AOD converter in the country.
- It is also the world 's largest producer of steel strips for razor blades and India's largest producer of coin serving the needs of Indian and International mints.
- ISO 50001:2018, ISO-9001:2015, ISO-14001:2015, OHSAS 45001:2018, Aerospace AS 9100,AD, PED, CPD certified company.

**" WHERE OTHERS SEE WALLS, I SEE DOORS**  
**Late Sh. O. P. Jindal**  
 Founder & Futurist – Jindal Group



## DOMESTIC NETWORK



## PRODUCTS

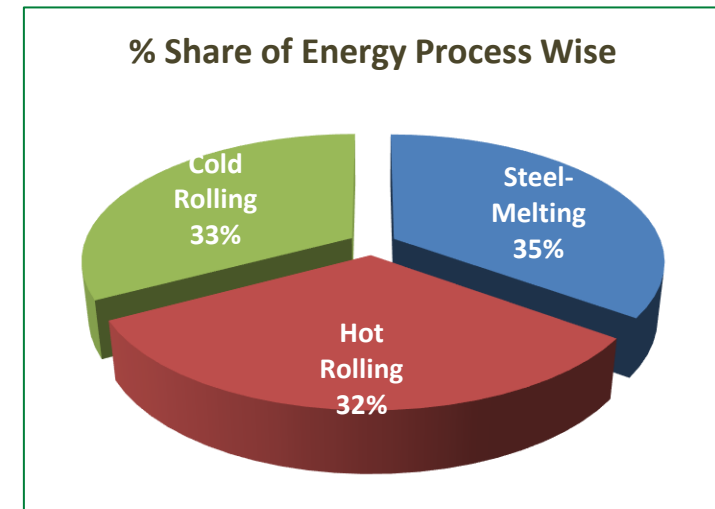
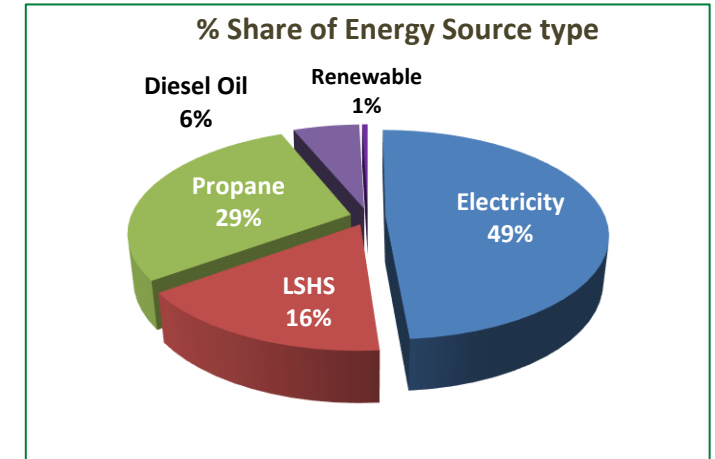
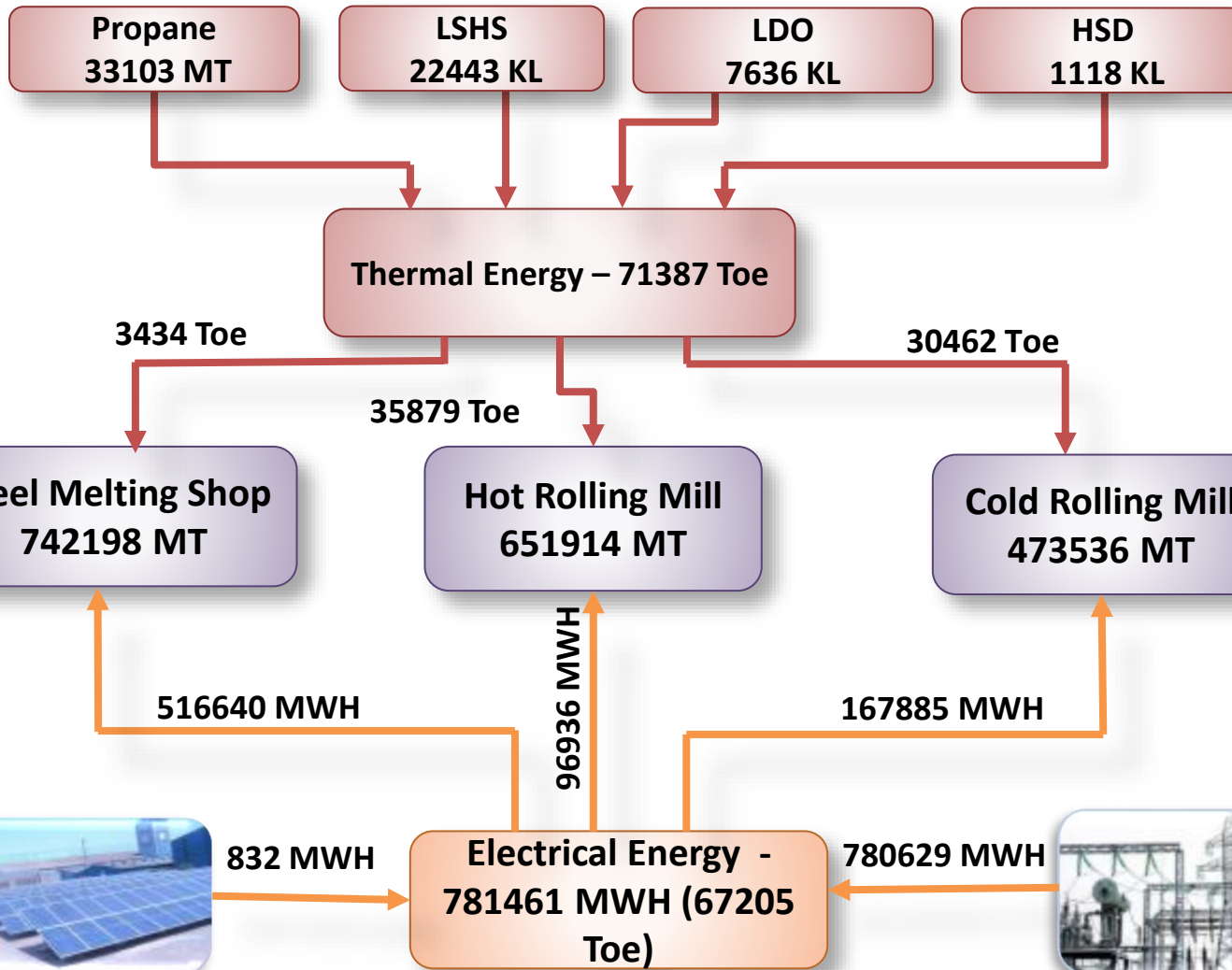


## JSHL INSTALLED CAPACITY

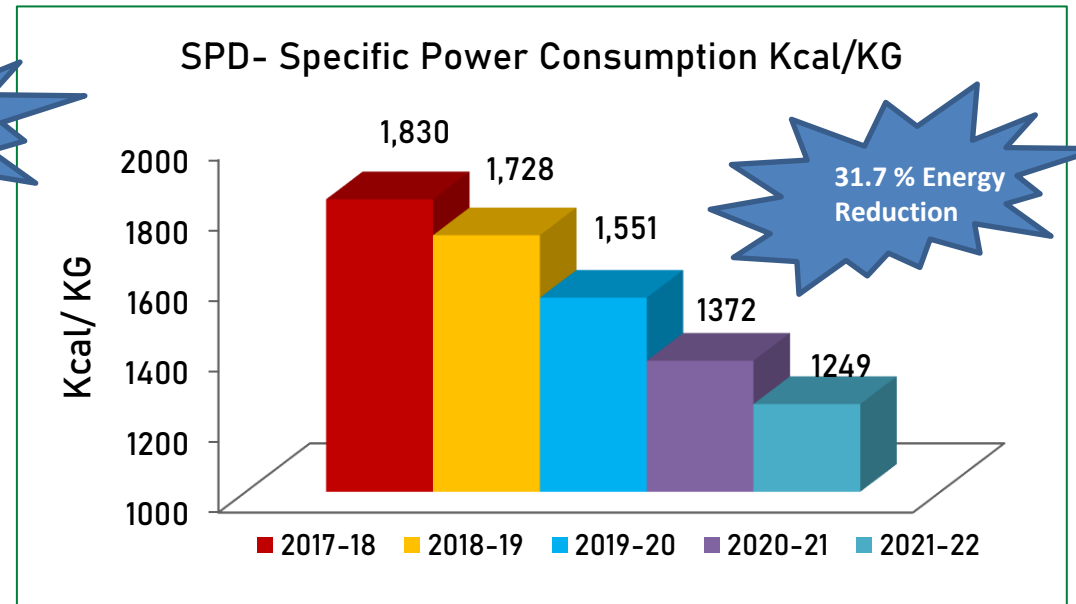
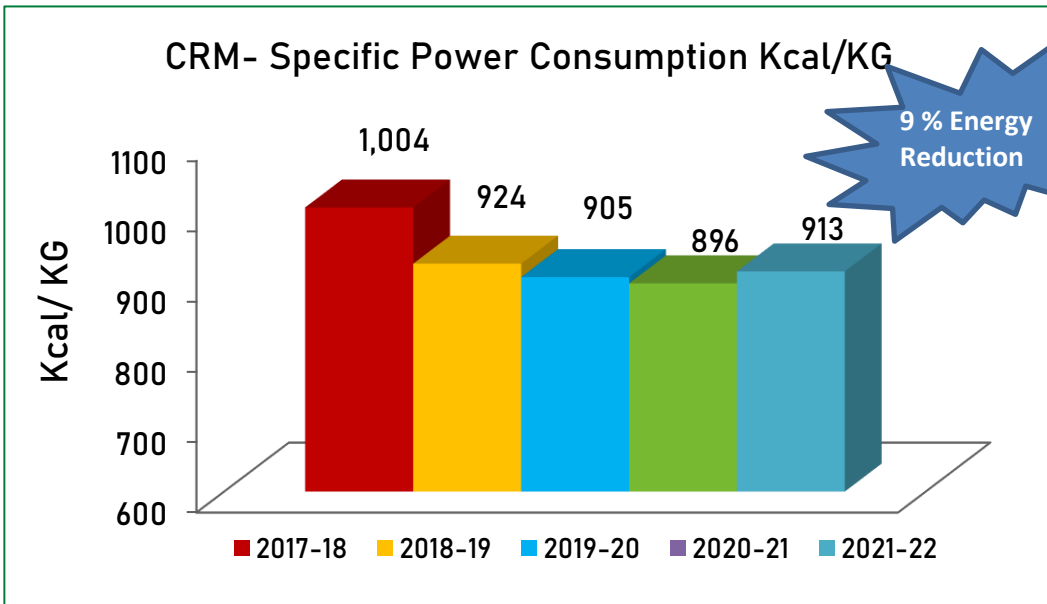
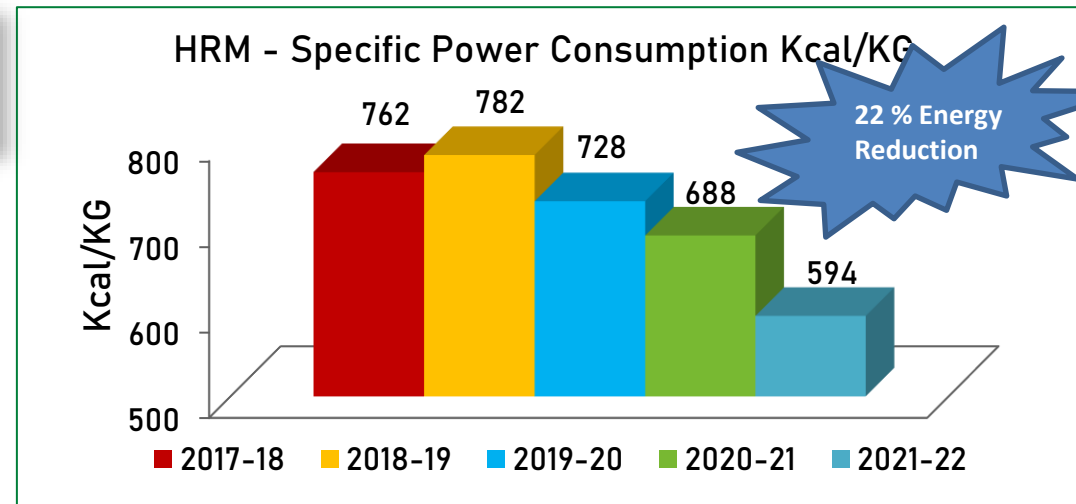
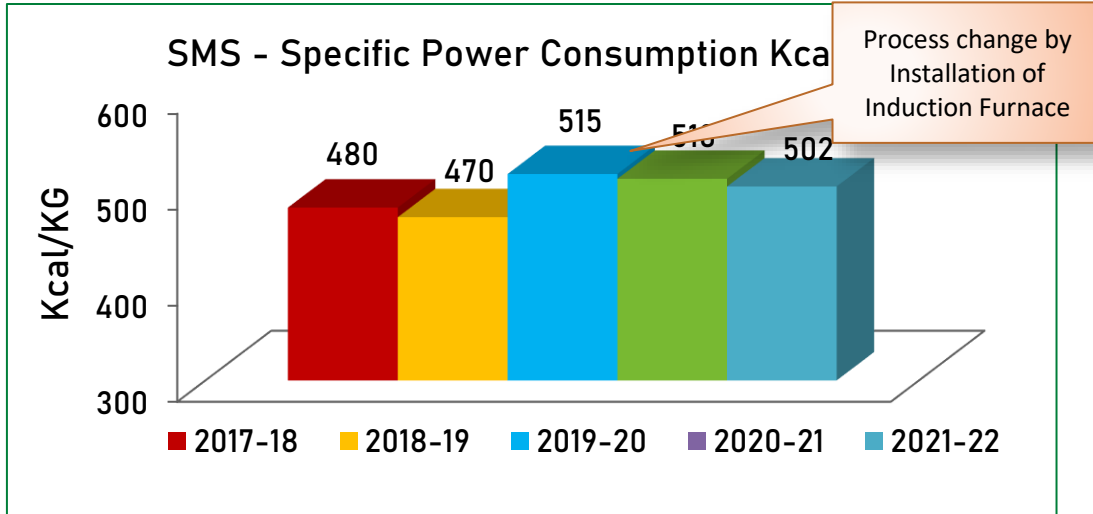
**MELTING CAPACITY-8,00,000 MT**



# Energy Overview

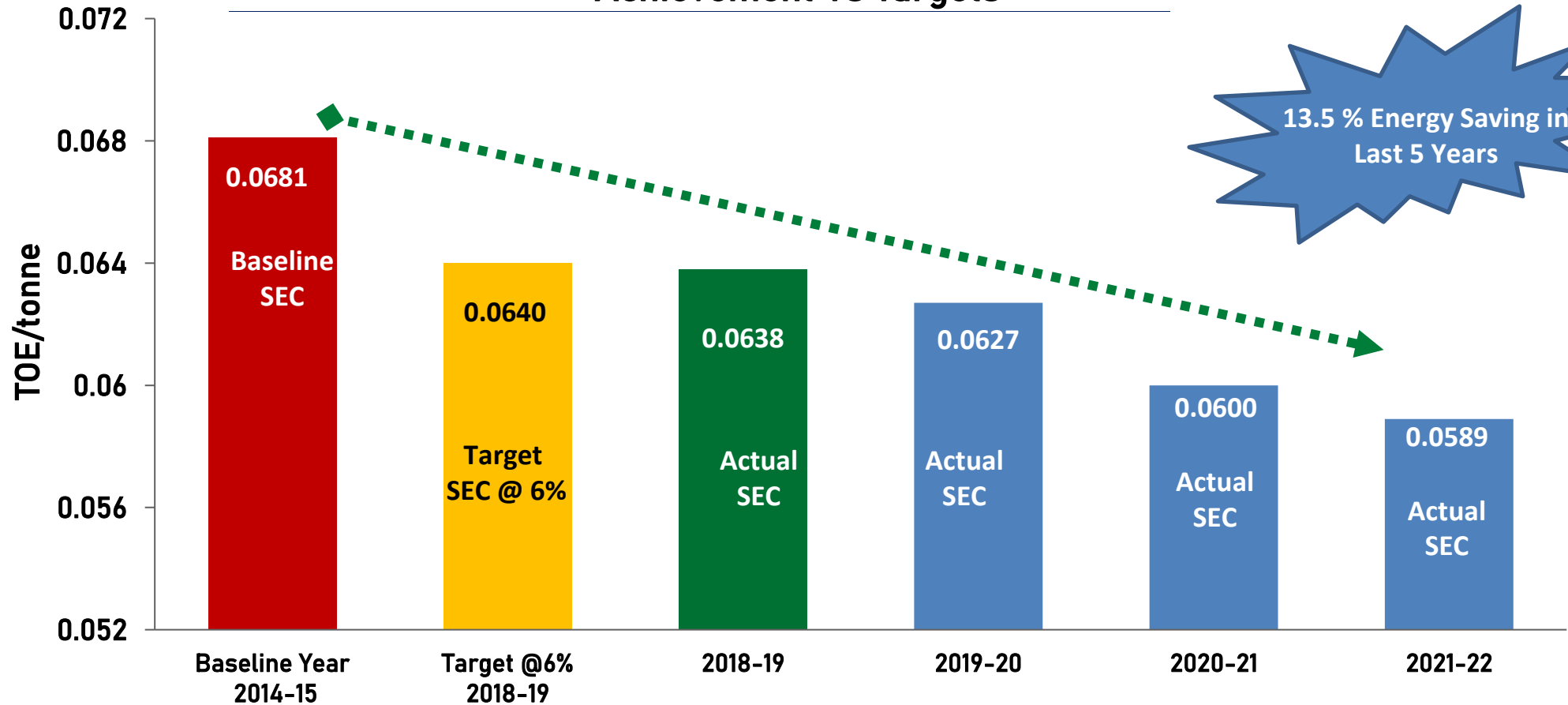


# Specific Energy Consumption across Processes



# SEC Improvement Trend

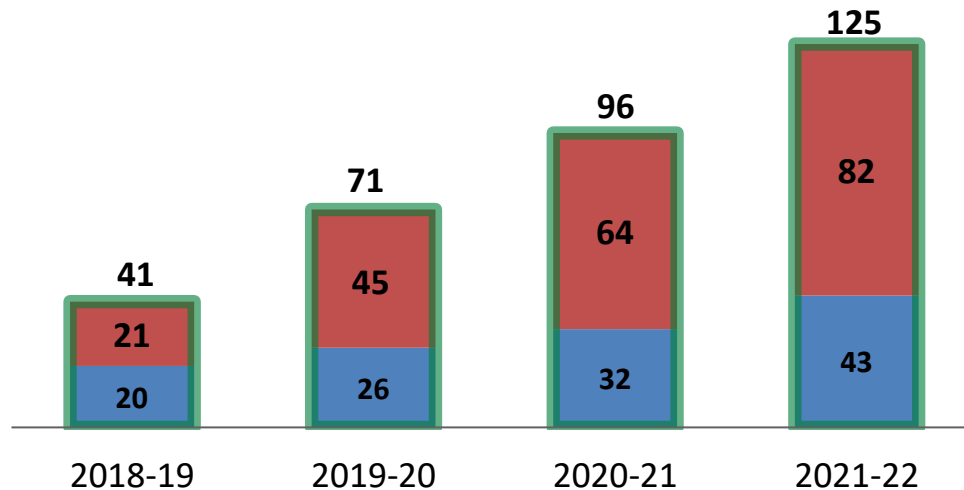
## Achievement Vs Targets



# Energy Conservation Projects Implemented 2018-22

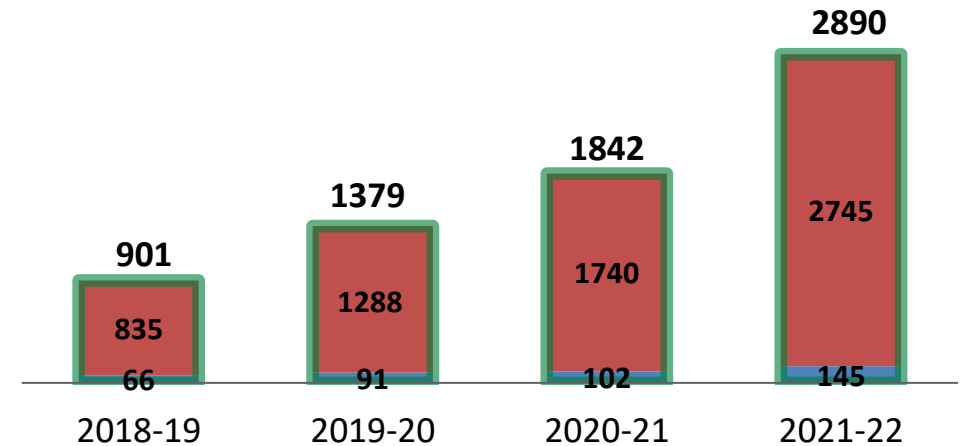
## Encon Projects Trends

■ Without Investment ■ With Investment ■ Total Projects



## Cost Saving Rs. Lacs

■ Without Investment ■ With Investment ■ Total Projects



JSHL has invested more than 29 Cr. INR in various Energy Efficiency and Conservation projects of the last 3 years – saving approx. TOE 3700er year.

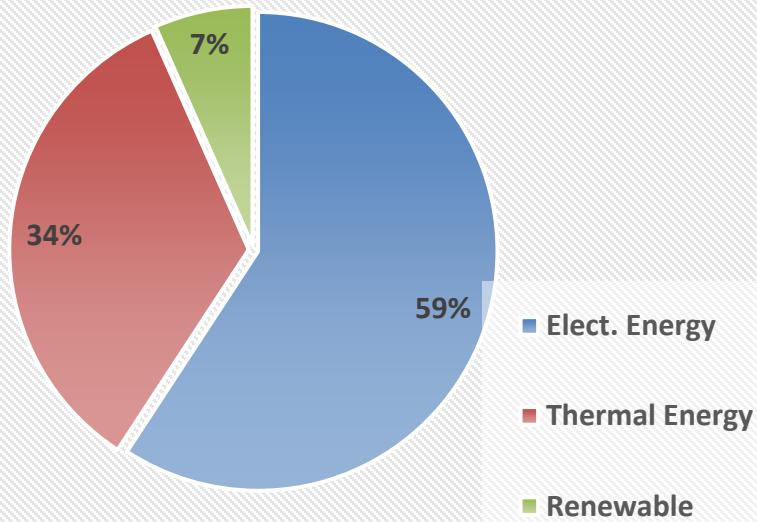
The major projects are listed in the following slides

# Major EC Projects Implemented in 2018-22

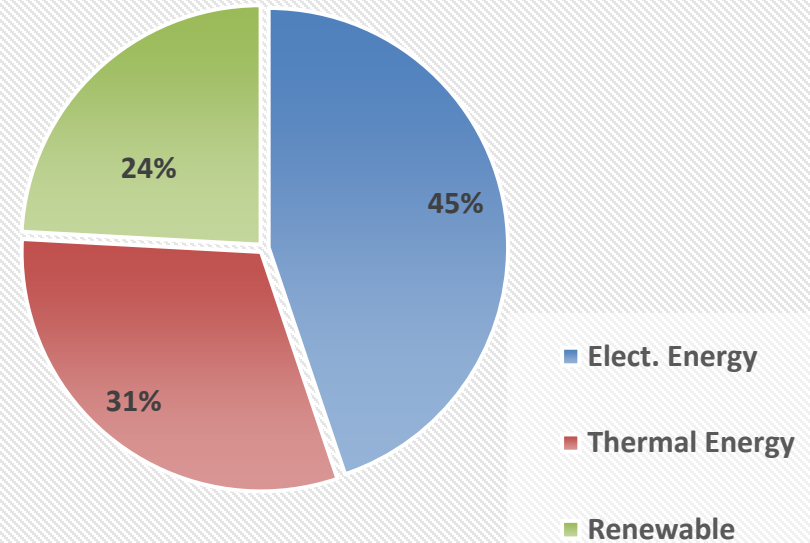
SR.	Title of Energy Saving project implemented	Total Saving	Invest. Made	Payback
		Rs Lacs	Rs Lacs	Months
1	O2 Enrichment in Re-heating Furnace of Hot-strip Mill	443.44	150	4
2	Installation of 1.83 MWp solar plant at CRD-3 Shed	176.64	732	50
3	Utilisation of waste flue gas to raise temperature of purging gas in ammonia-cracker dryer instead of electrical heater	10.64	0.25	1
4	Minimize Heat-Loss by Synchronize & auto Slab transfer mechanism between PWBF and WBF & Improving Thermal Insulation	80	0	0
5	Improve Steam Boiler Efficiency by installation of Heat exchanger in feed water line of 6TPH Boiler	11.30	0.5	1
6	Reduction in specific power Consumption by changing Gear box of ETR & DTR at Z2 mill.	162.9	550	41
7	Reduction n Specific Power Consumption Installation of VFD screw compressor at Air plant	70.35	46.5	8
8	Use of energy efficient lighting (LED Light) in Each Section of Plant	239	257	13
9	Replacement of Old & Inefficient Pump with High Energy Efficient Pump with required matching Capacity	386	106	1
10	Reduction n KVA Demand by Improvement in Power Factor (From 0.9969 to 0.9988) by Installation of Capacitor Bank.	82.36	35	5
11	Replacement of old Motor (Rewind More than 3 Times) with IE3 motors	247	323	17
12	Reduction of specific power cons by Installation & commissioning of two centrifugal compressor of 5500Nm <sup>3</sup> /hr	69.6	146	25
13	Installation of Separate Descaling system at Strip Mill	202.4	170	10
14	To save energy by replacing aluminium fan hub assembly of cooling towers with FRP fan hub assembly.	26.9	9.2	4
15	Uses of Main Air Compressor venting air to compressed air supply of SMS-1	48.8	3	1
16	Replacement of old and inefficient parallel pumping system by energy efficiency pump & separation the secondary pipe lines for bloom & slab caster separately.	9	6	8
17	Reduction in Heat Loss by revamp the walking beam Furnace	298	224	11

# Investment on Energy Conservation Projects

### Saving in Energy type



### Investment in Energy type



Total energy saving is 3712 TOE

Investment made: INR 29.7 cr.

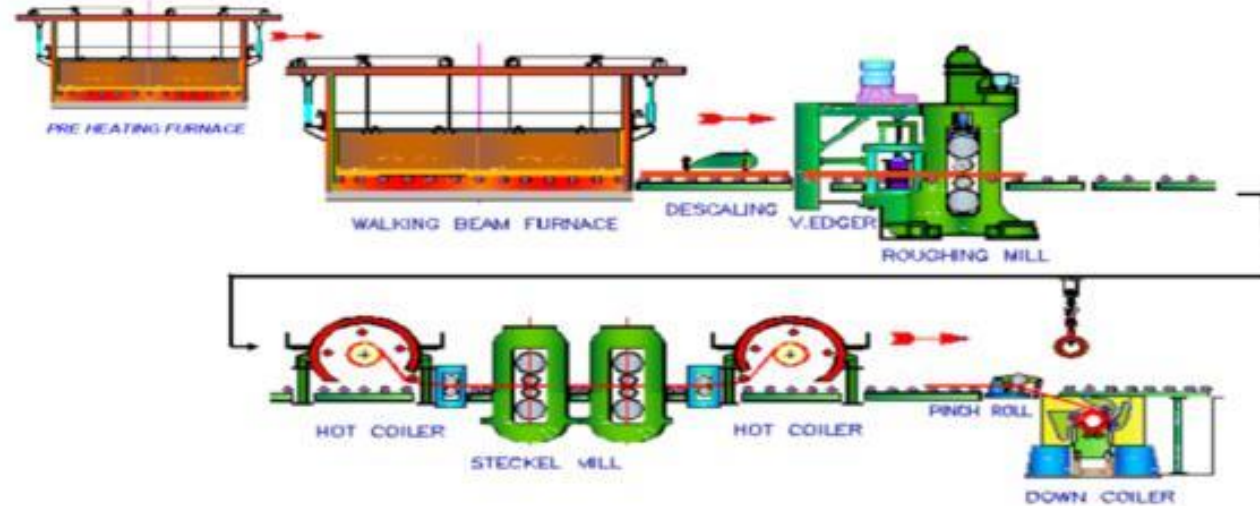
Cost Saving – 28.9 Cr

Average payback: 1 year

CO<sub>2</sub> emission reduction: 26,628 tons



## HRM Process Flow Diagram



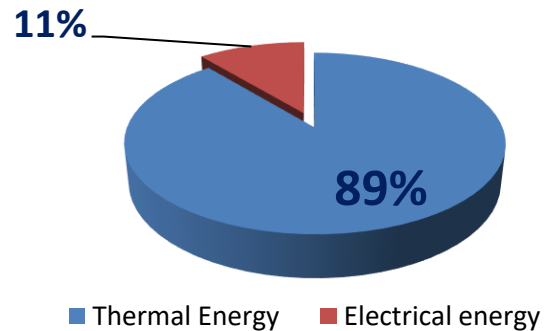
### About the Project:-

- To increase the Oxygen content in Combustion air of Reheating furnace by introducing **Oxygen enrichment**.

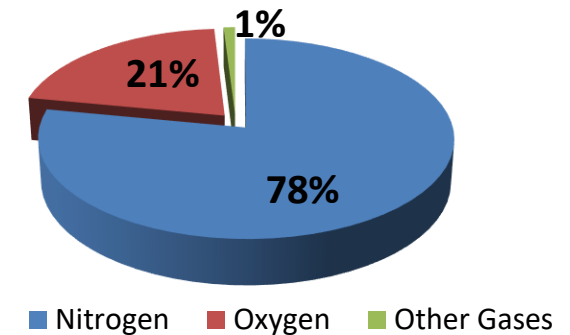
### Purpose of Project:-

- To Reduce thermal energy consumption & minimizing Carbon emission
- Thermal energy consumption at Hot Rolling Mill is 89%

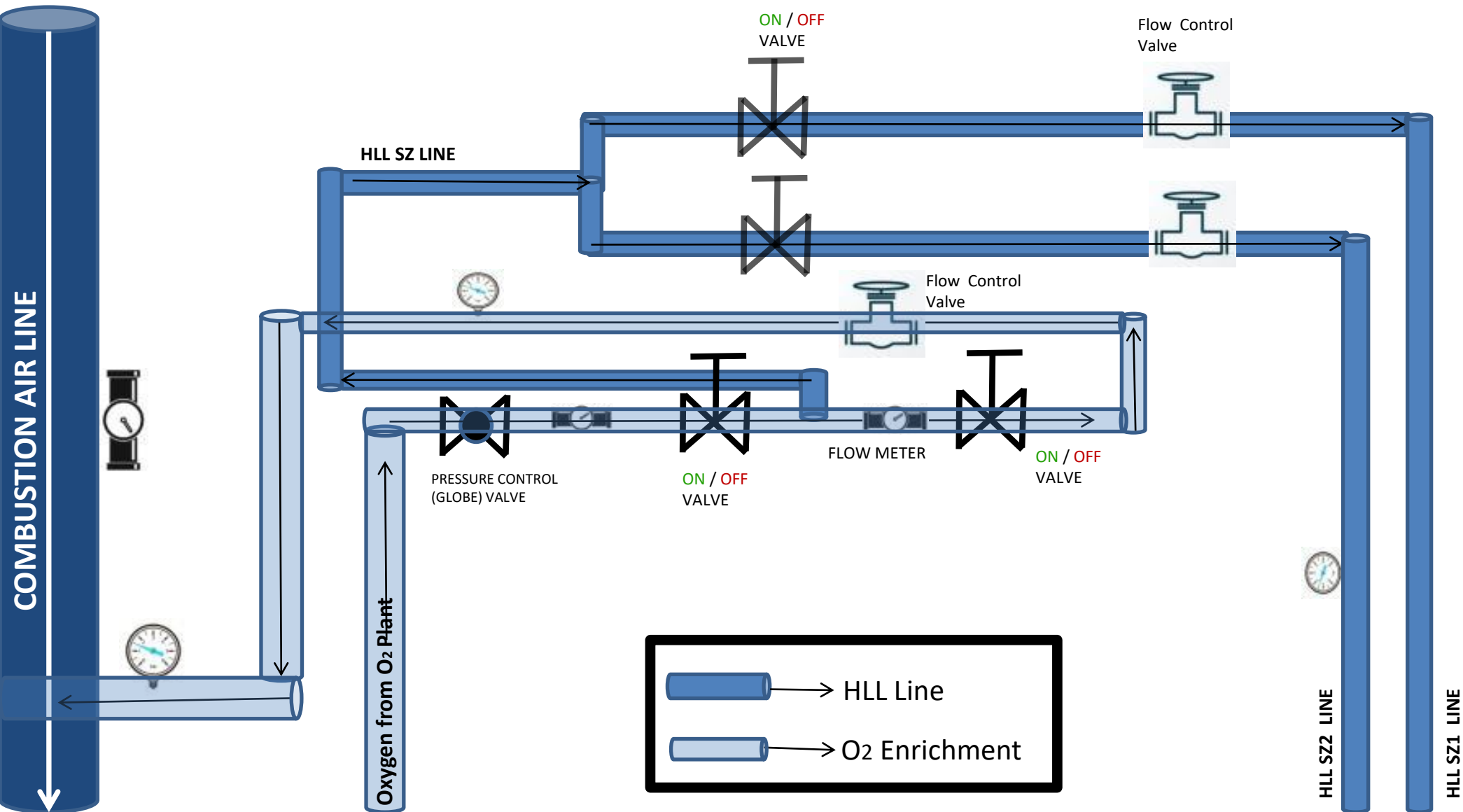
**% Energy share at Hot Rolling Mill**



**Composition of Air (before O<sub>2</sub> Enrichment)**



# Oxygen Enrichment (Layout)



# Oxygen Enrichment (Equipments)



**Pressure Gauge**



**Control Valve Stand**



**Flow Meter – Comb. Air Line**

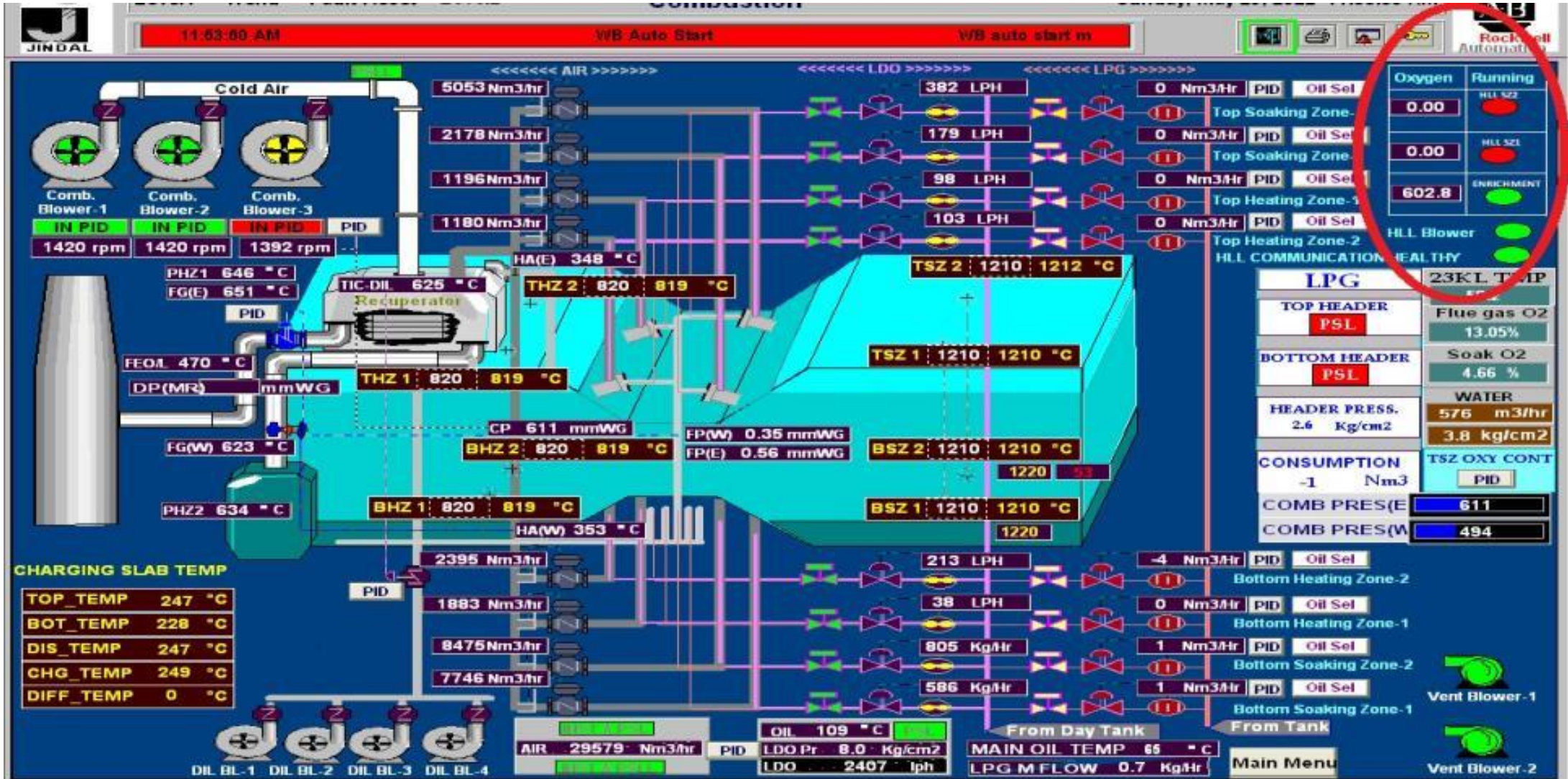


**Oxy Enrichment Line Joint with Combustion Air Line**



**Main Valve Stand**

# Oxygen Enrichment in WBF (SCADA)



# Fuel Consumption & Saving

Material Series <sup>16</sup>	UOM	Without Oxygen Enrichment	With Oxygen Enrichment
200 Series	Mcal/MT	278	269
300 Series	Mcal/MT	292	283

## Cost Saving

₹ 443 Lacs/Year

## Investment

₹ 150 Lacs

## Payback Period

4 Months

## Environmental - Benefit

Reduction in CO<sub>2</sub> emission by  
17 Lacs Kg/Year

## Waste Heat Recovery – Utilization of waste heat of Flue Gas from Ammonia Cracker Furnace in Dryer.

**Ammonia Cracking:** Process by which Ammonia ( $\text{NH}_3$ ) is Decomposed into Hydrogen & Nitrogen

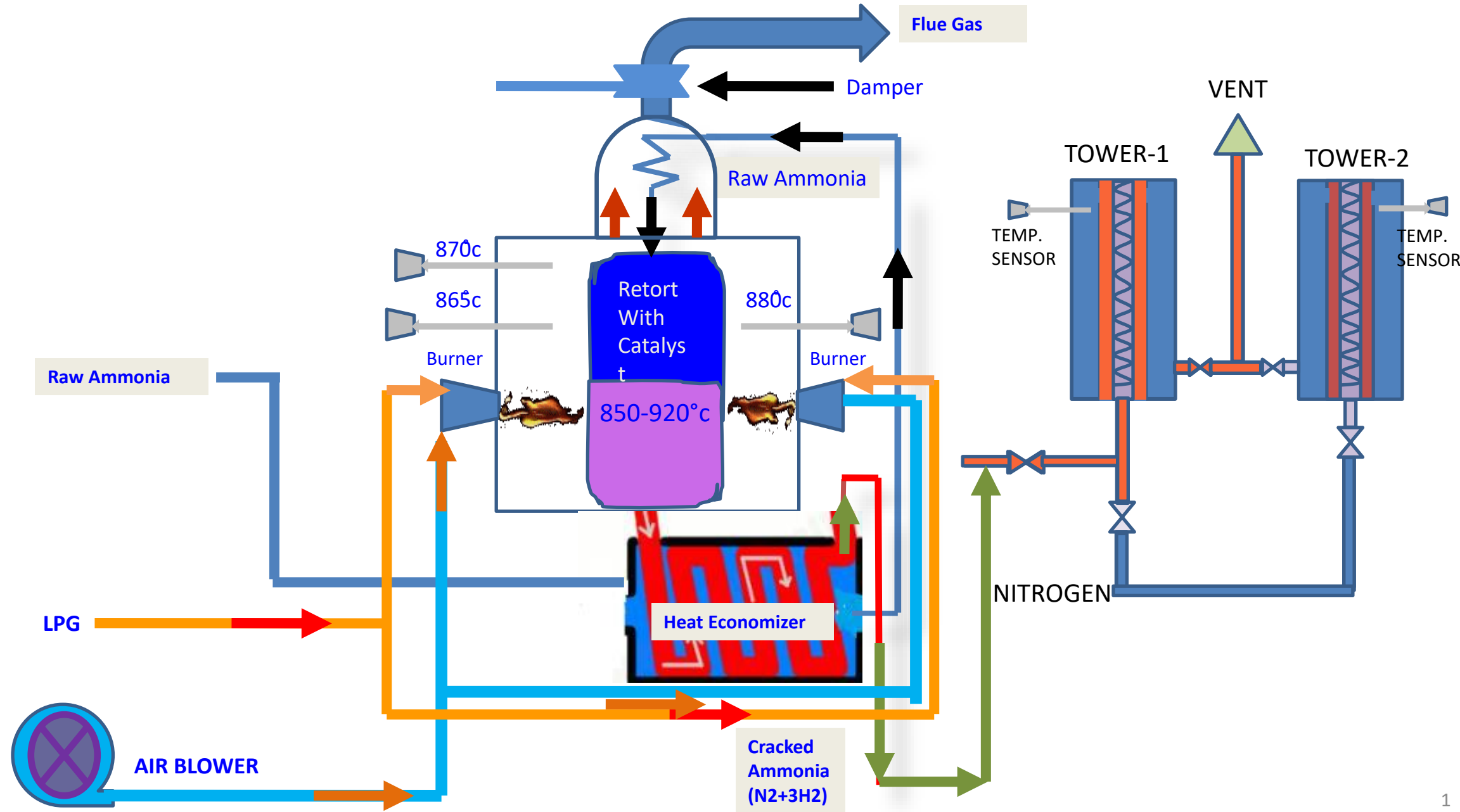
**Ammonia Cracker :** It is used to provide all necessary conditions for ammonia to crack in an efficient manner. Ammonia Cracker Consist of Furnace Section, Dryer Section for Processing of Ammonia Gas to Cracked Ammonia gas.

**Dryer :** Dryer Section of Ammonia Cracker Plant is used to Remove Moisture, Uncracked Ammonia Gas & Maintain Dew Point of Cracked Ammonia that came out from Furnace of Plant.

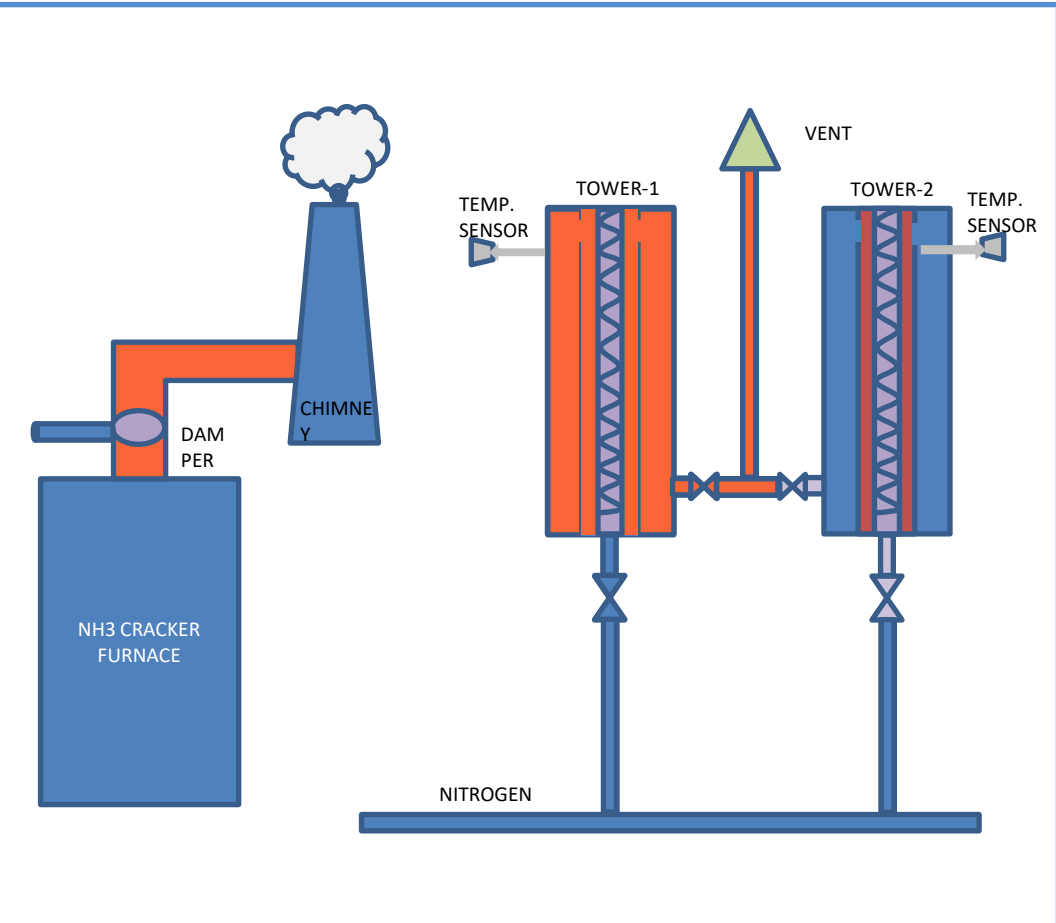
- Moisture present in Cracked Ammonia gas is removed by using twin dryer out of which one remains in moisture removing cycle while other tower remains in automatic regeneration .
- Nitrogen gas is used as purge gas for regeneration of saturated bed of zeolite molecular sieves.
- Regeneration takes place at a temperature of 90 to 150 Deg. C.
- The bed is heated with the purge gas being heated to the desired temperature by



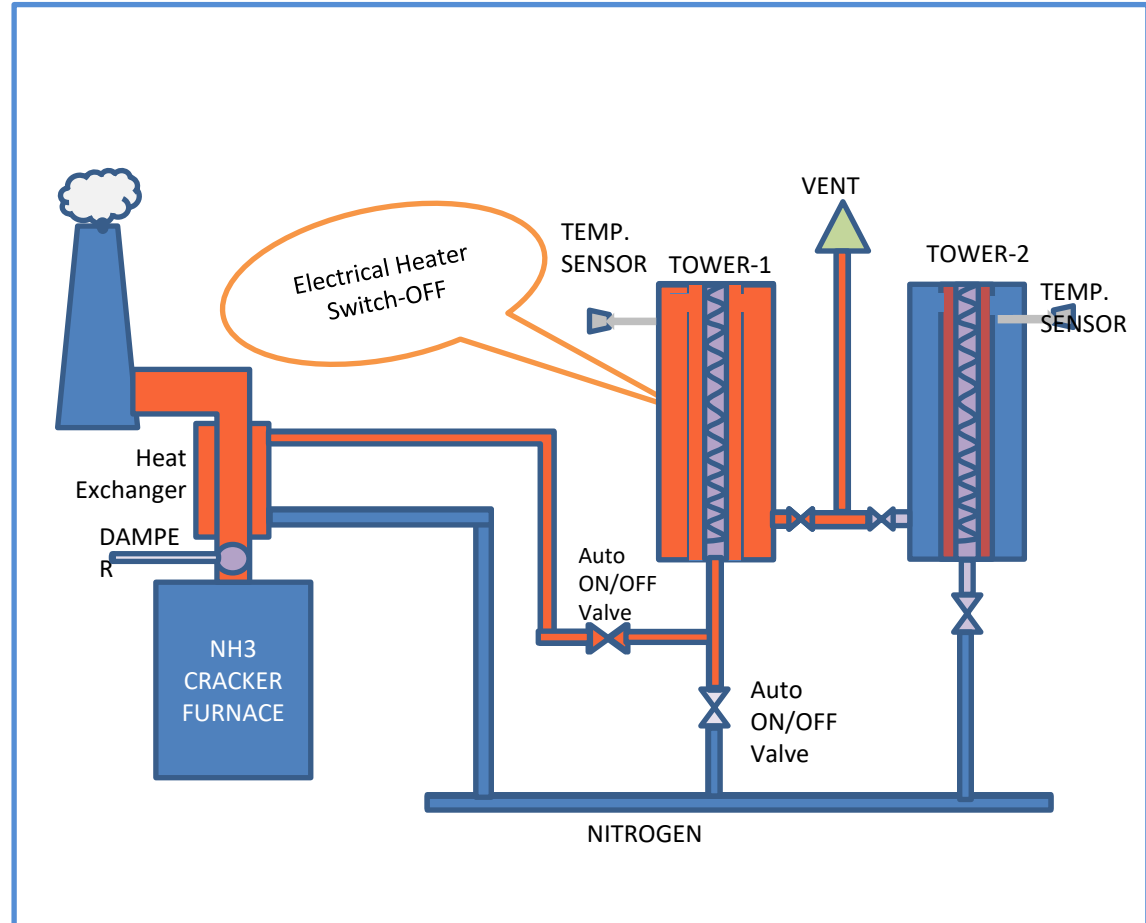
# Innovative Project-2



# Innovative Project-2



Before Modification

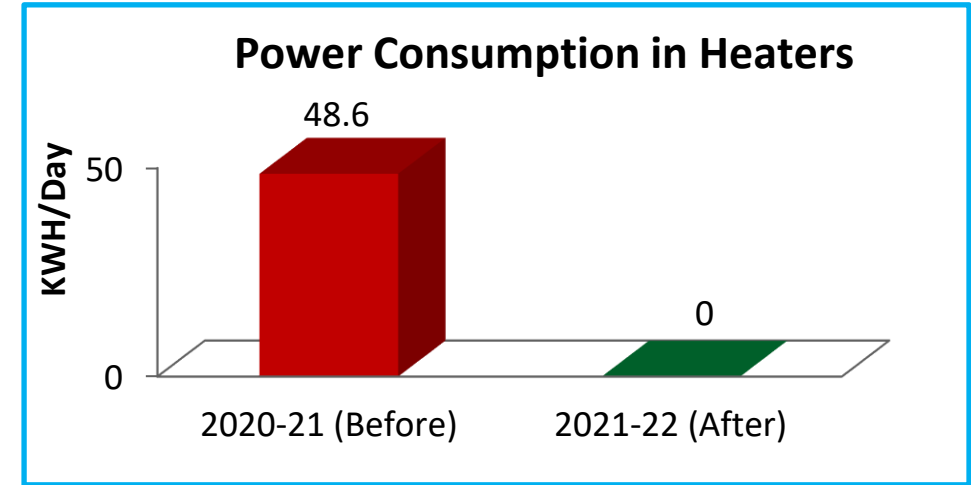
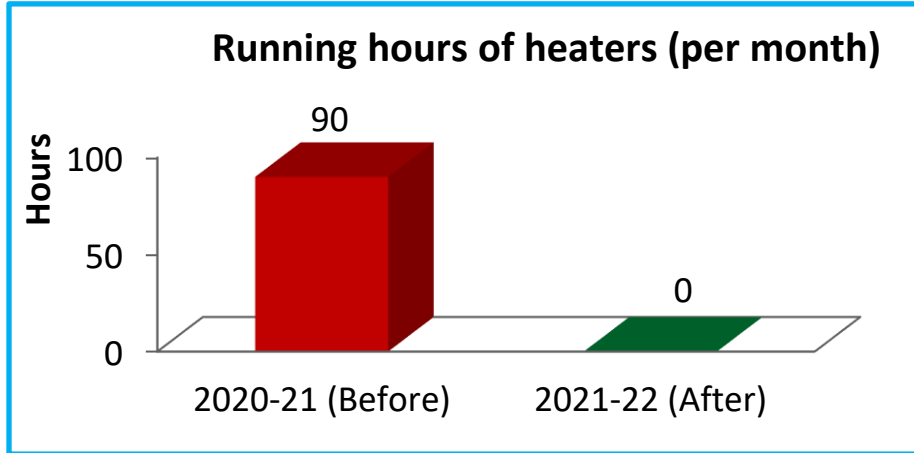


After Modification



# Innovative Project-2

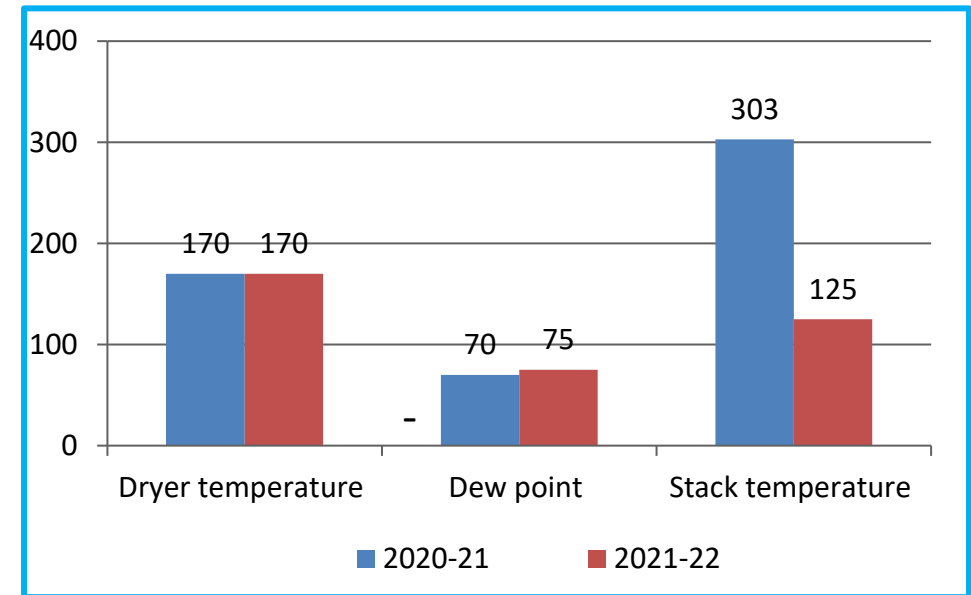
## Benefits Achieved :



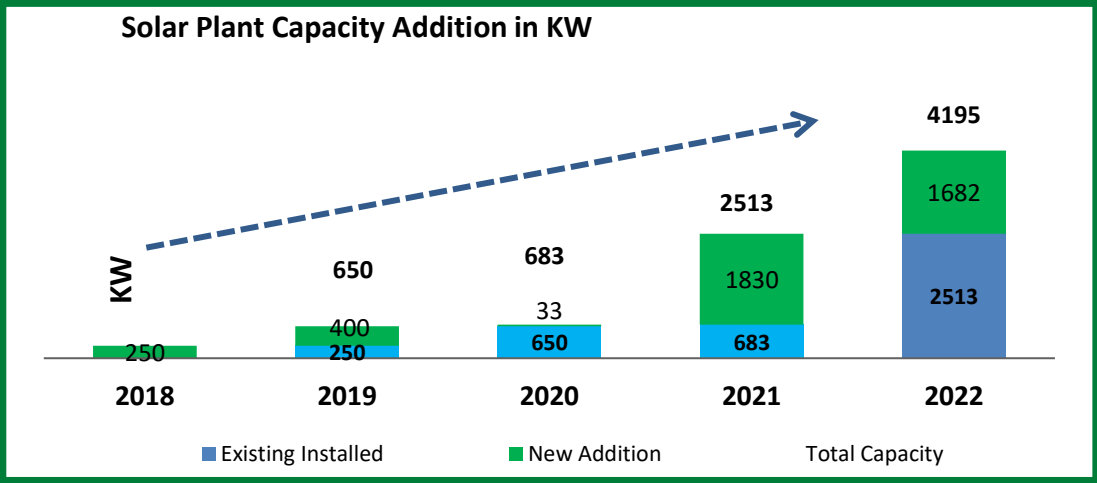
Total Investment of ₹ 25000

Electricity Savings = 141912 units/ year

Cost Savings = INR 10.64 lakh/ year



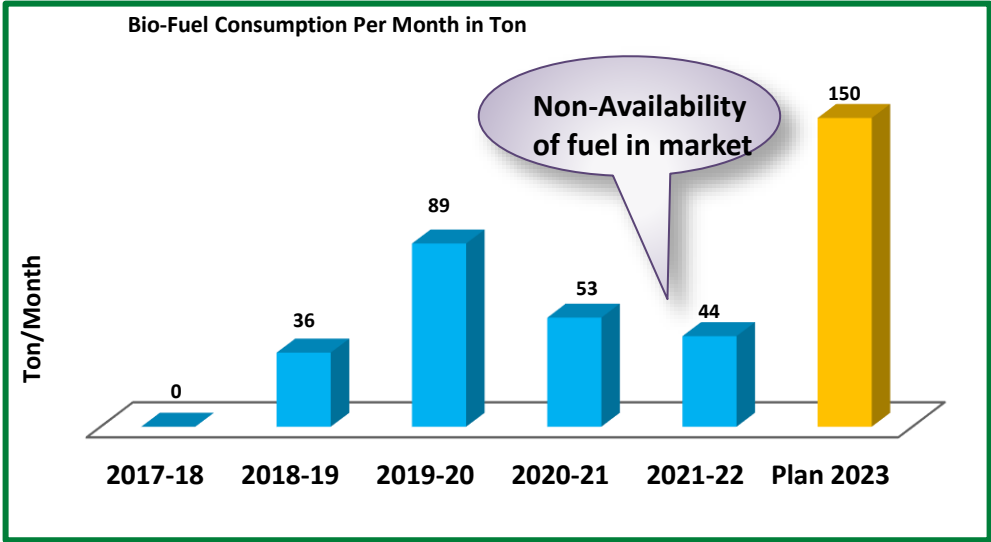
# Renewable Energy Intervention



### Bio-Gas Plant –

Bio-Gas Plant set-up on 12 Sep'2018 to produce Bio-Gas from Canteen Waste - Raw Veg/Cooked Food to save approx. 1 KG LPG /Day.

**Benefit:- Saving of 360KG LPG/Annum**



# Solid-Waste Treatment Plant Utilization

## Awareness.



## Primary Segregation



## D2D Collection



## Secondary Segregation



## Compost

### Waste Treatment

Dry Waste – 250-350 KG

Wet Waste – 650-700 KG

Compost – 130-150  
KG/Day



## Treatment



# Environment, Health & Safety

JSHL has always been proactive in addressing the environment, health and safety concerns of the unit and its staff members.

Some of the prominent measures undertaken by the plant in this regard are listed below;

- Water Audit by M/S TUV for conservation of water.
- Implementation of ISO 46001:2018 is under-progress.
- Zero Liquid Discharge (ZLD) policy.
- Noise Monitoring of each section of plant on monthly basis.
- Stack & Ambient Monitoring every month
- Implementation of Safety Calendar & Monthly Safety Themes.
- Implementation of BBS (Behavioural Based Safety) in Plant.



JSHL has adopted a strategic approach in implementation of its key manufacturing areas (KMFAS) to ensure zero pollution, zero accidents and a healthy and clean working environment

# Other Environment Conservation Initiatives

JSHL has undertaken certain other measures for conservation of the environment

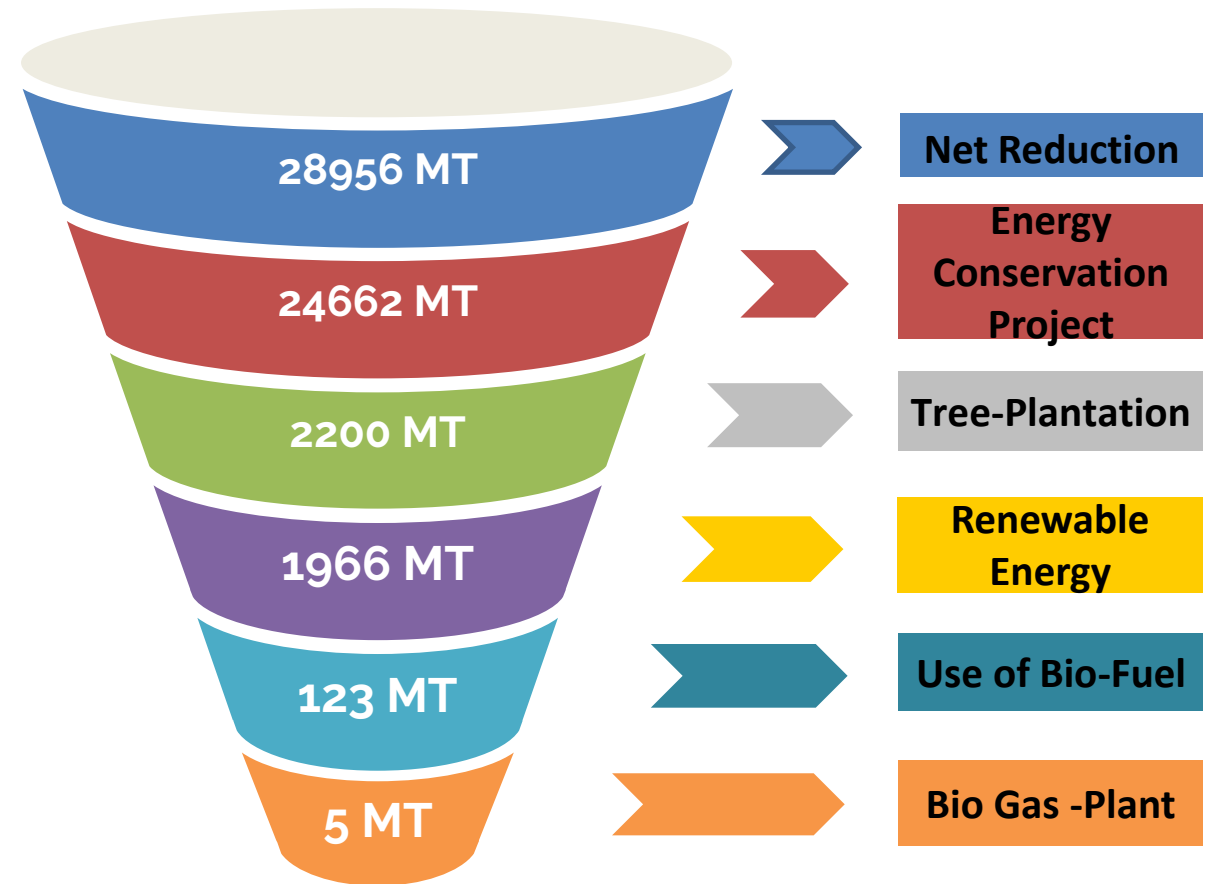
Year	Plantation(Trees, Palm, Shrubs)	Lawn Grass(SFT)
2017-18	34625	212050
2018-19	20706	3550
2019-20	17218	29150
2020-21	21321	20062
2021-22	29263	21098
<b>Total</b>	<b>123133</b>	<b>285910</b>

- Renovation of water harvesting structures
- Installation of the Green Wall at the entrance of the O.P. Jindal Memorial Park
- Installation of Safe drinking water unit
- Cycle rally is also conducted every year
- Total CO<sub>2</sub> emissions reduction from tree plantation is 2200 Tonne /Annum

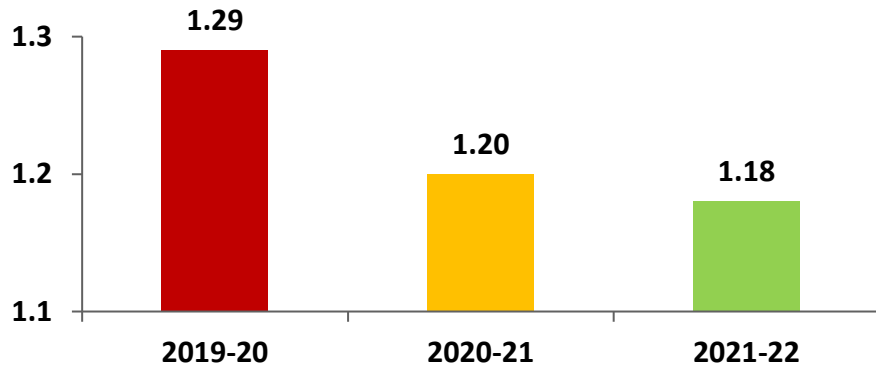


# A-CHECK ON GHG EMISSION

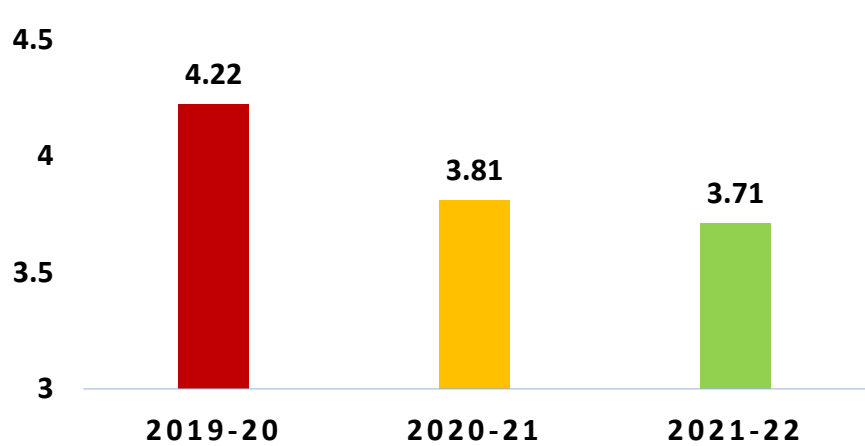
## Reduction in Carbon Emission (MT)



Specific CO2 Emission MT of CO2/MT of Crude Steel



SPECIFIC WATER CONSUMPTION M3/MT





## ENERGY POLICY

We at Jindal Stainless (Hisar) Limited, are committed towards Energy conservation through efficient utilization of various form of Energy in a cost effective manner.

For achieving this, we devote ourselves to:

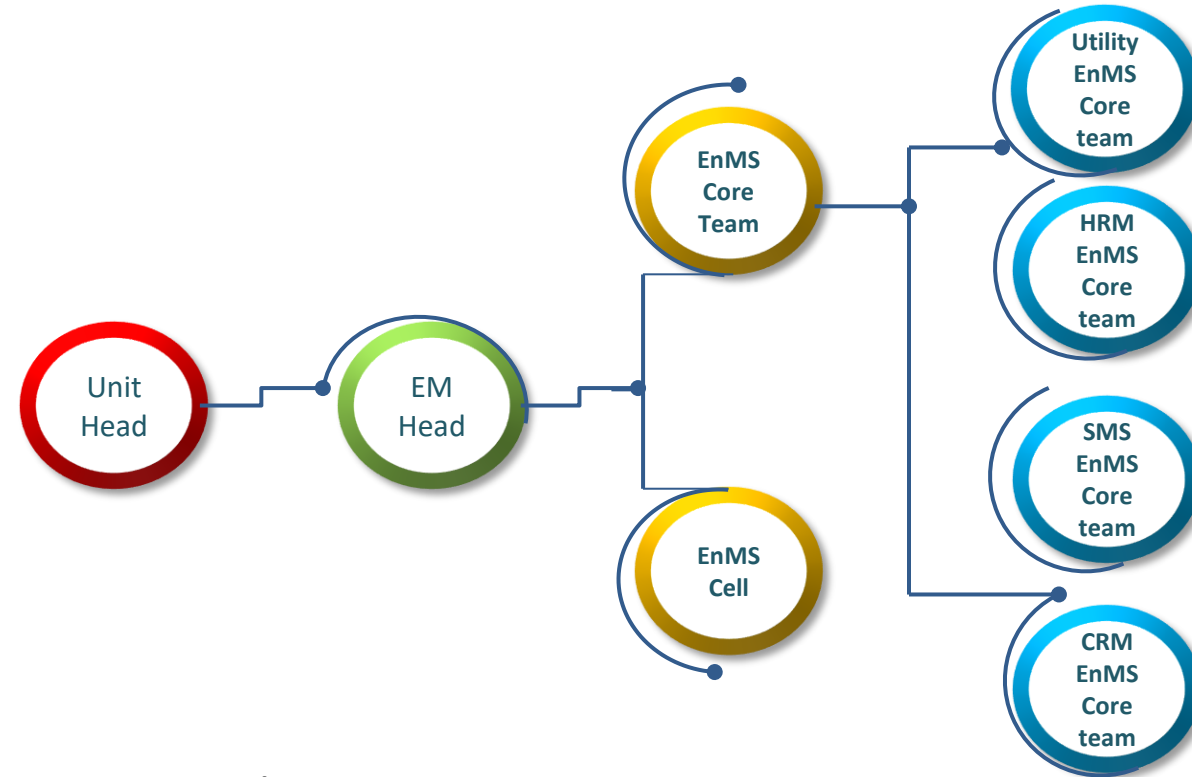
- Promote use of energy efficient processes, equipment, device and system in the manufacturing of steel and sustain continuous reduction in specific energy consumption year-on-year
- Maintain sound and efficient energy management system to continuously improve and raise performance bar.
- Monitor and improve the energy usage in all process
- Constantly identify the areas of improvement of energy performance and the EnMS and work for its implementation
- Support the procurement of energy efficient products and services that impact energy performance;
- Support design activities that consider energy performance improvement.
- Commitment to ensure the availability of information and of necessary resources to achieve objectives and targets;
- Benchmarking with the global best in the industry.
- Create awareness for efficient use of energy & its conservation and make energy conservation integral to our work culture & personal habit.
- Adherence to all applicable statutory requirements and other requirements related to energy efficiency, energy use and energy consumption.

This will be achieved by dedicated team work and active participation & commitment from employees at all levels. Since, it is an ongoing process; we here at JSHL, try to continuously achieve the best and further keep on improving.

J. SOOD

Director & Chief Operating Officer

DATE: Nov.12, 2018

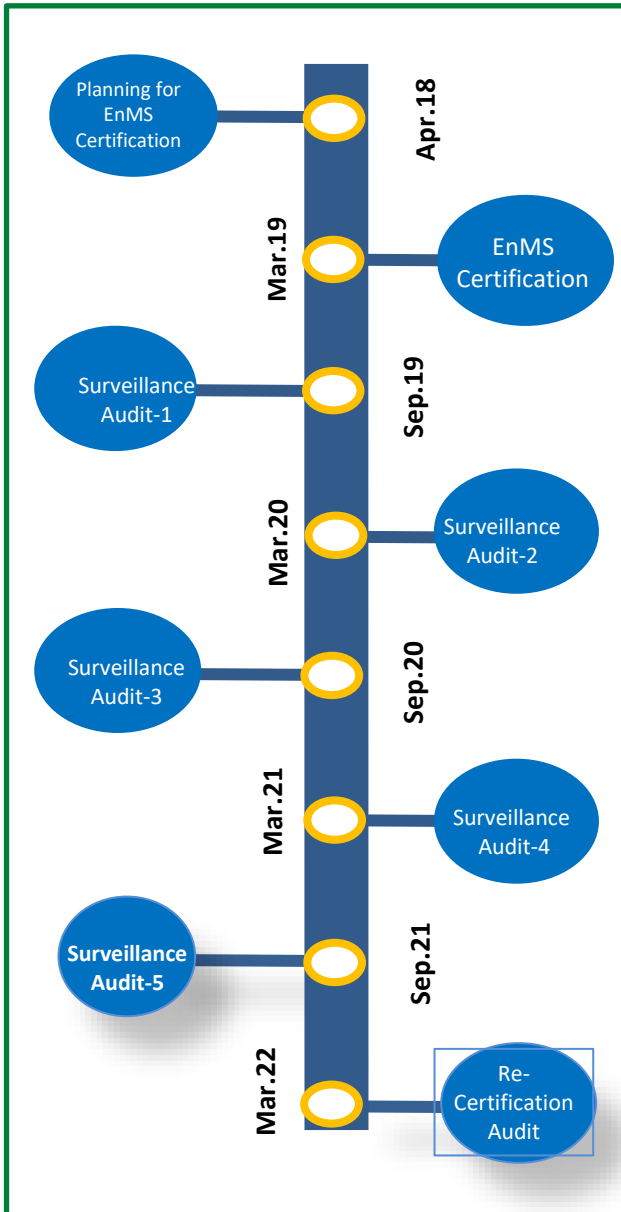


EL – Energy Leaders

CEM – Certified Energy Manager

### \*Note

- We have BEE Certified 3 Energy Auditor & 5 Energy Manager.
- Also we have 24 Certified Internal Energy Auditor as per ISO 50001.



## Operation Control:-

Established criteria for the processes where their absence can lead to a significant deviation from intended energy performance

Implemented control of the processes in accordance with the criteria

- Heat-Loss reduction by defining the range of Min. Gap-Setting .
- Program Modification to avoid heat-loss in slab transfer from Pre-Heating furnace to Re-Heating furnace
- Set. Min. Temp to improve furnace efficient.
- Low-Excitation of Z-Mill DC Motor during mill idle time .
- Optimize running of Descaling pumps by running of Single Pump instead of two in JT grade

## Design-Control

Consider energy performance improvement opportunities and operational control in the design of new, renovated facilities, equipment, systems and energy-using processes that can have a significant impact on its energy performance.

- Designing based on life-cycle cost assessment i.e. Water-Cooler Chillers Water System (Power consumption 0.64KW/Tr) for air-conditioning of new project instead of Water-cooler package AC unit (Power consumption 1.1KW/Tr) .
- Waste-Heat recovery system installed after economiser to heat degreasing section water instead of Elect. Heater in Ammonia Cracker plant
- Designing of new air-knife blower to dry the SS strip instead of steam.

## Procurement Control

Establish and implement criteria for evaluating energy performance over the planned or expected operating lifetime, when procuring energy using products, equipment and services which are expected to have a significant impact on the organization's energy performance

- Procurement of Man-cooler 250Watt BLDC 0.750/1.5 KW Conventional man-cooler.
- Procurement of Energy Intensive equipment(Motor, Pump, blower and compressor etc.) based on the life-cycle cost assessment.
- Procurement of IE3 rating motor, AC rating more than 3 star, Lighting lux level >130Lm/Watt
- Procurement of fuel based on the Rs./Kcal, earlier it was being procurement on the basis of Rs/ Litre or Rs/Kg.



# Energy Management System (EnMS)

## ISO 50001:2018 Certificate



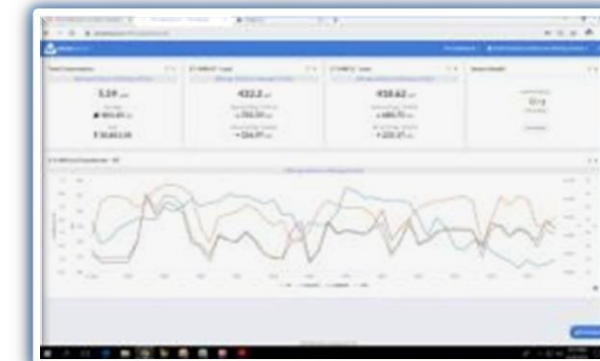
Online EMS Scada System



Solar Energy Generation Trends



Section Wise CO2 Emission Report



Online Loading Monitoring of Transformers & Major Equipments

# Capacity Buildup-Program

## Awareness Program:-

- I. JSHL Sponsored Employee to Enroll in professional course i.e. Certified Energy Manager/Auditor conducted by BEE, Govt. of India & Energy Management & Climate Action by CII in collaboration with Thapar University.
- II. JSHL nominated employee to attend various online/offline professional course/ Training/Seminar organized by CII,BEE, Hareda, PCRA etc.
- III. Awareness given to employees regarding their contribution to the effectiveness of the EnMS, including achievement of objectives and energy targets and the benefits of improved energy performance;
- IV. National Energy Conservation week is being celebrated every year on 7th to 14th December to bring awareness among the people & motivated about energy conservation. Various events i.e. poster competition, slogan/poem competition.
- V. Monthly Training calendar circulated to all employee to attend the training on latest technology, Energy Conservation tips,5S,TPM,KAIZEN etc.



Internal Energy Training



Energy Saving Pledge

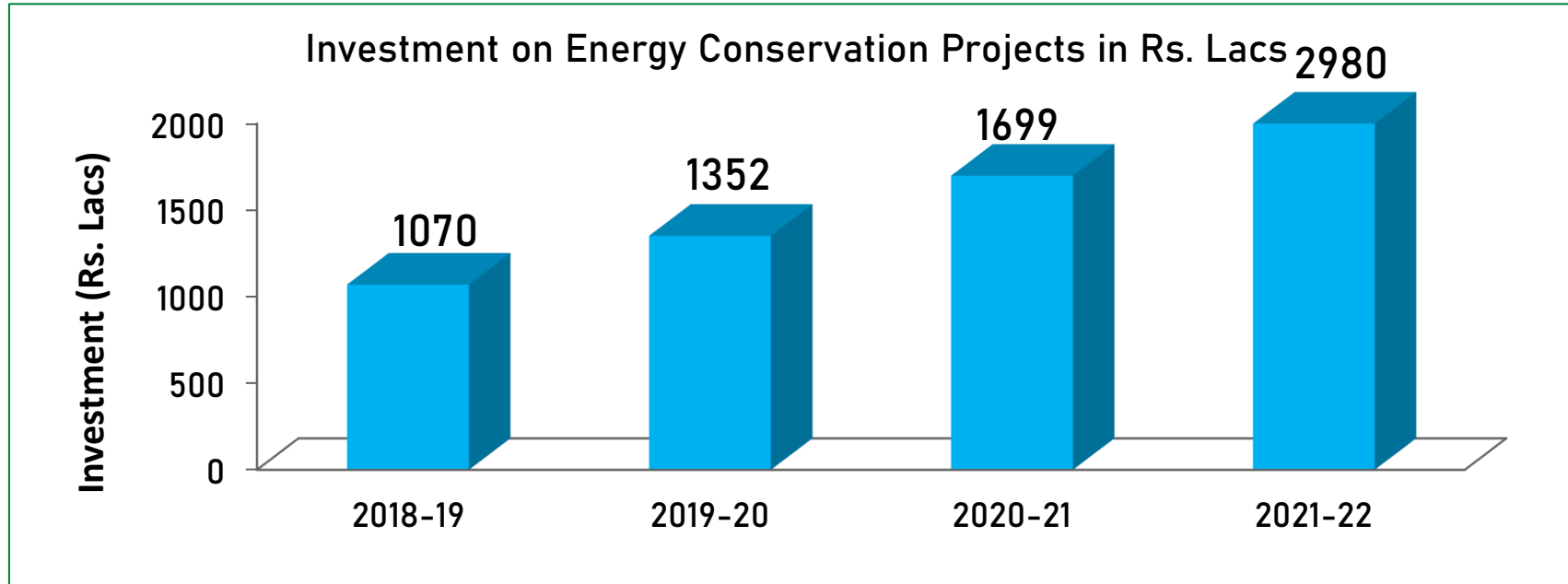


Poster Competition



External Energy Training

# Investment on Energy Conservation Projects



Renewable Purchase Obligation (in Millions)				
	2018-19	2019-20	2020-21	2021-22
RPO - Target	20.555	51.65	48.570	28.35
RPO - Achieved	21.14	50.53	6.86	70.06

JSHL has invested about 0.20% for the Energy Conservation activity against total turnover of the company.

# JSHL Way Forward Strategy Vision



Technology-upgradation (LED, IE3 Motor, 5-star AC etc. ) by 2022



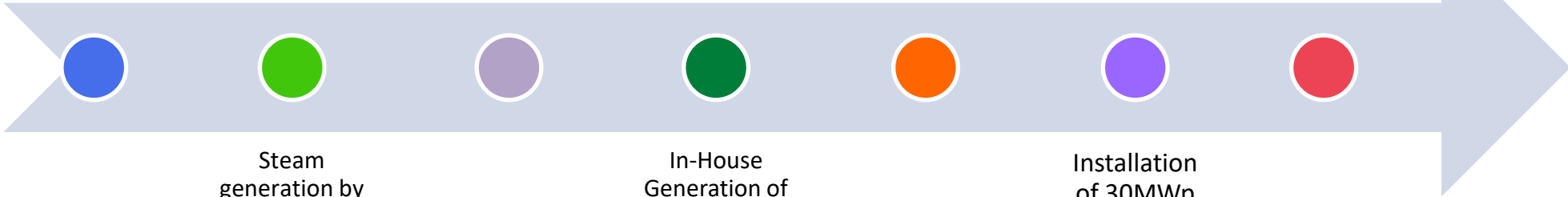
Conversion of fuel (LSHS, PNG,LDO) into Natural Gas by 2023



100% Hydro Power & Renewable power purchase 2030



Electrification of Raw-Material Transfer system 2030



Carbon-Neutral by 2050

Steam generation by Waste-heat recovery by 2022 Boiler



In-House Generation of Green-Hydrogen 2024



Installation of 30MWp Solar by 2025





**Thank You**