22nd CII-National Award for Excellence in Energy Management 2021

JSL JINDAL STAINLESS
DELIVERING STAINLESS EXCELLENCE SINCE 1970

Jindal Stainless (Hisar) Limited

Team :

Parvesh Gupta – (Utility)

Vivek Vajpai – (Utility)

Surender Kamboj – (Energy Cell)

JSHL Profile

DELIVERING STAINLESS EXCELLENCE SINCE 1970

Jindal Stainless (Hisar) Limited

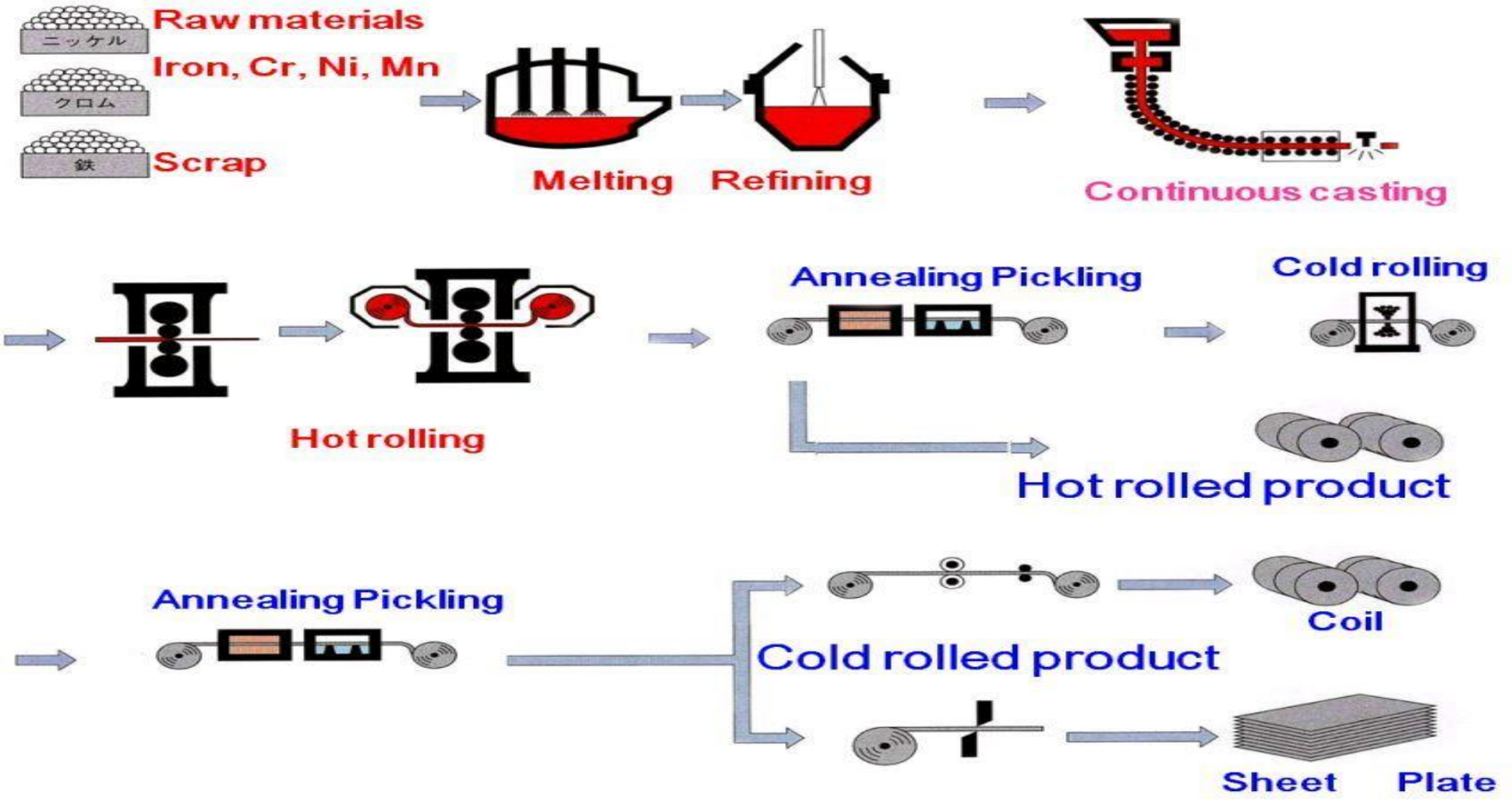
Certifications

- ISO 9001:2015 QUALITY MANAGEMENT SYSTEM
- ISO 14001:2015 ENVIRONMENT MANAGEMENT SYSTEM
- ISO 45001:2018 OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM
- ISO 50001:2018 ENERGY MANAGEMENT SYSTEM
- ISO/IEC 17025:2017 NABL ACCREDITATION TESTING LABORATORY
- BUREAU OF INDIAN STANDARDS (BIS)
- CONSTRUCTION PRODUCTS REGULATION (CE MARKING)
- MARINE CERTIFICATION BY LLOYD'S REGISTER
- PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU
- NORSOK M-650
- AD 2000-MERKBLATT W0

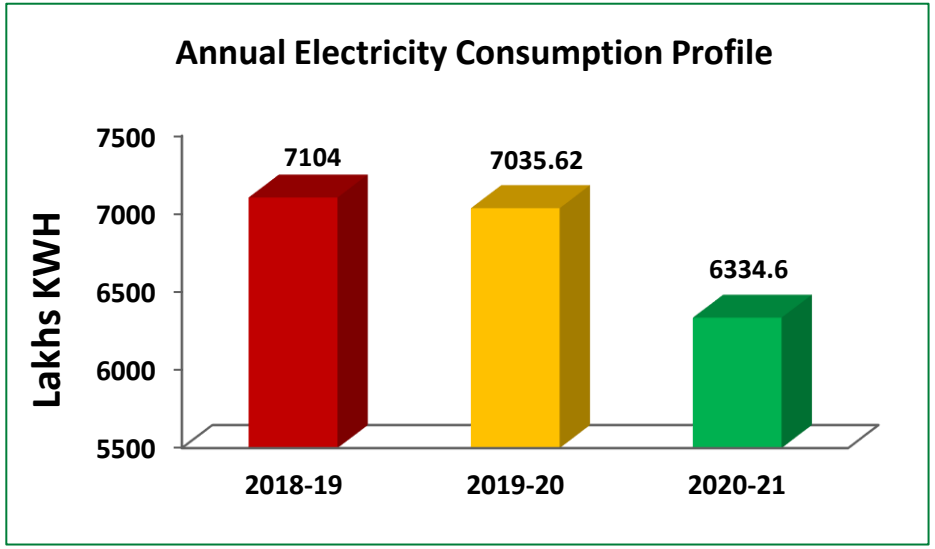
DELIVERING STAINLESS EXCELLENCE SINCE 1970

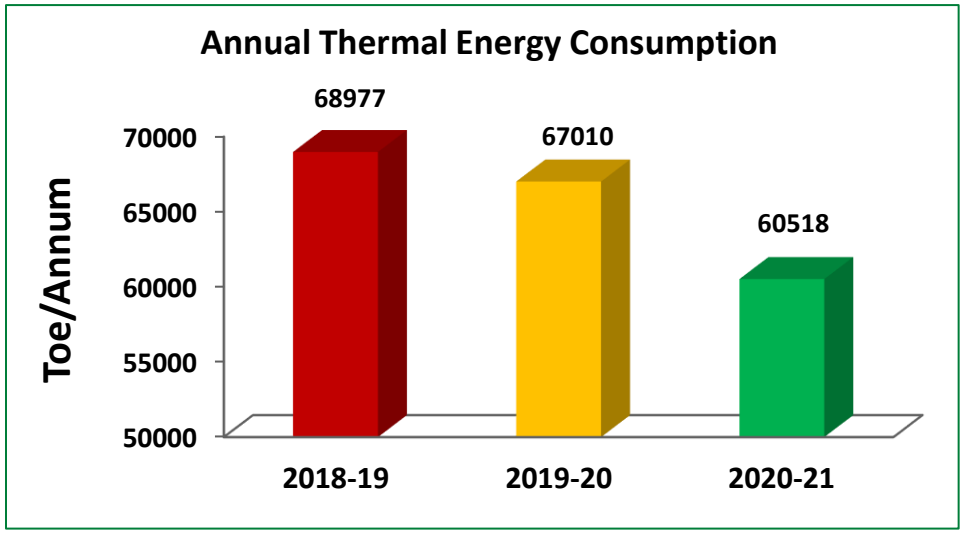
Overseas
Indonesia

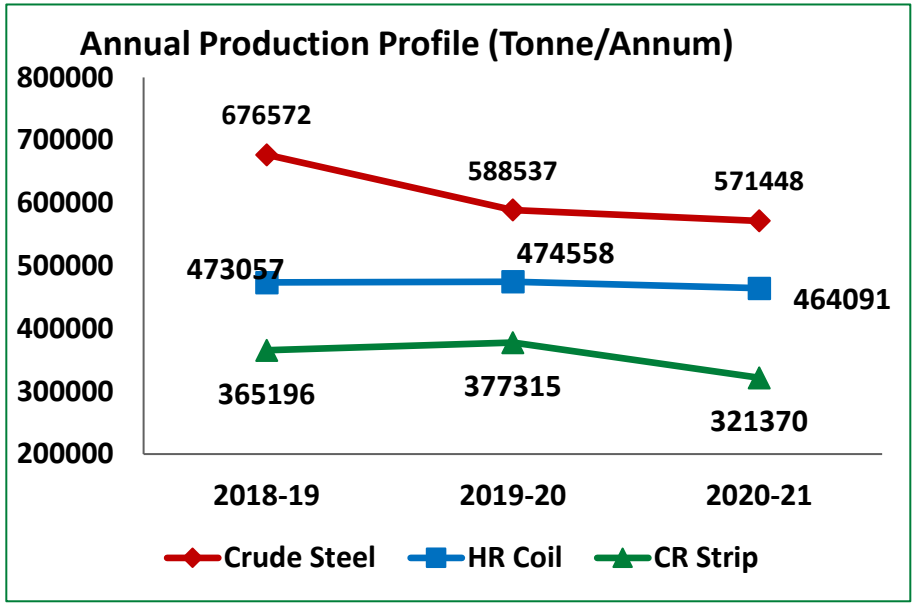
JSHL - Process Overview

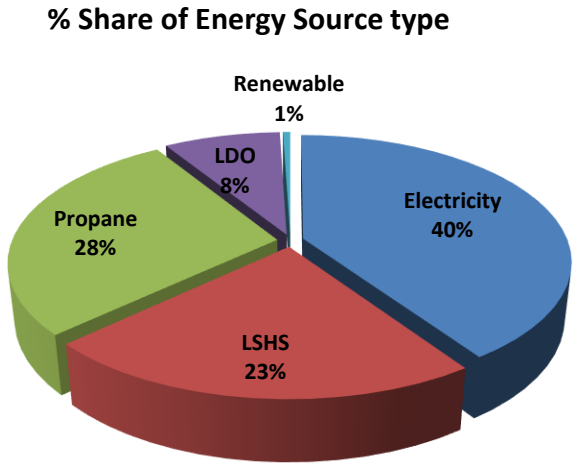


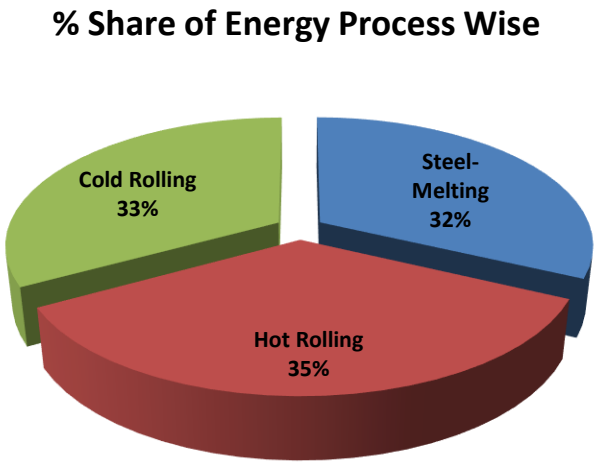
Energy Consumption Overview





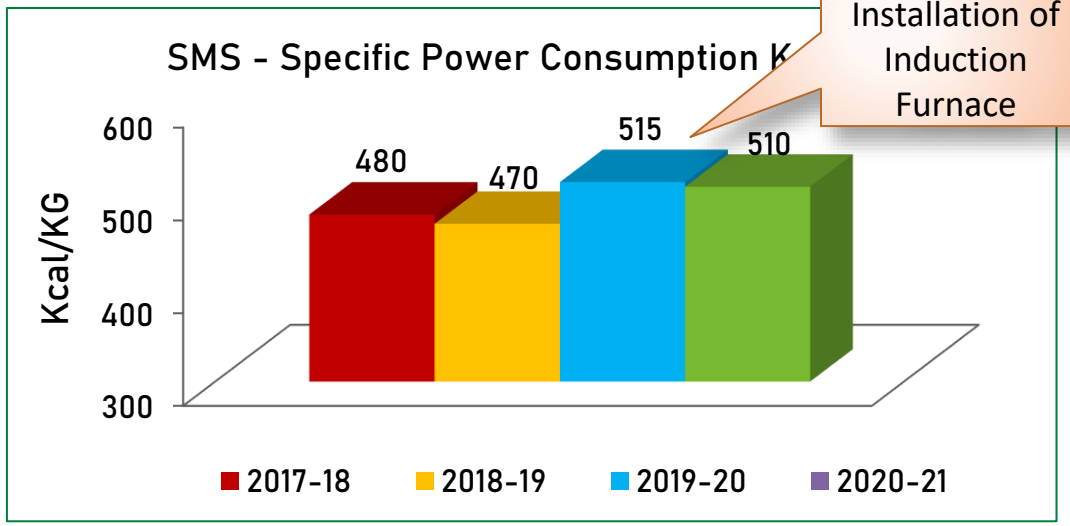


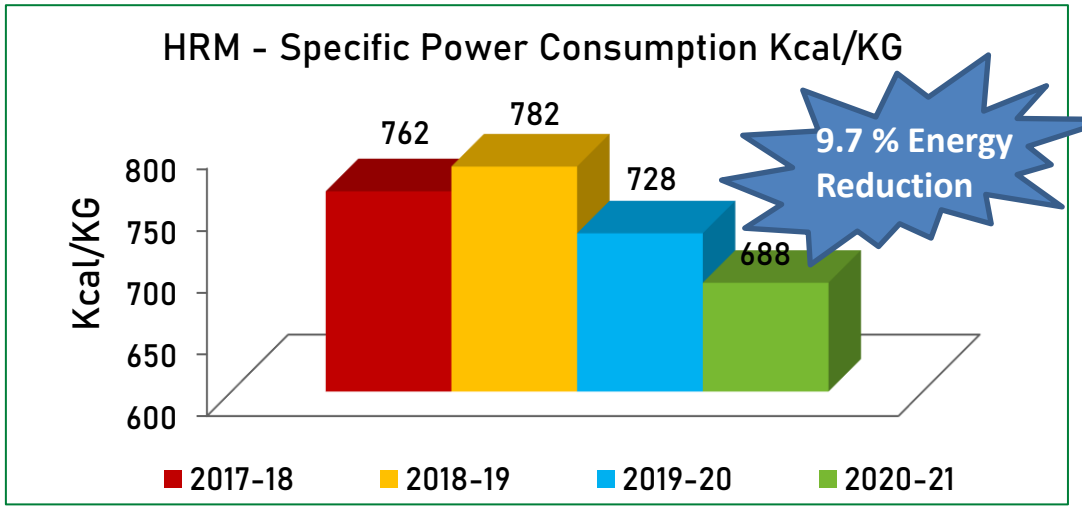


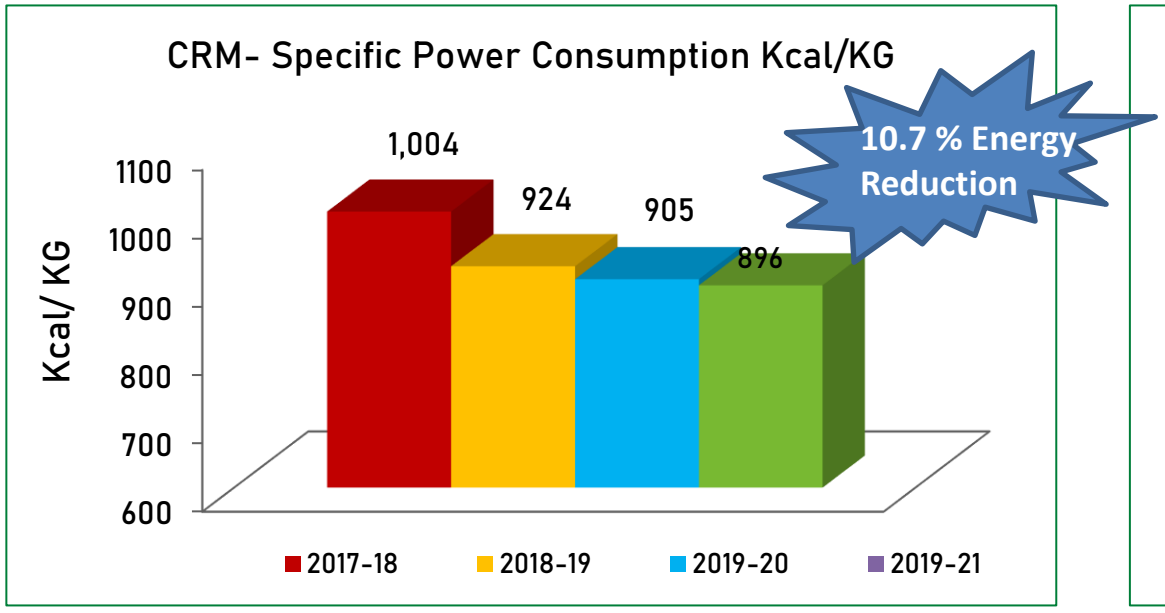


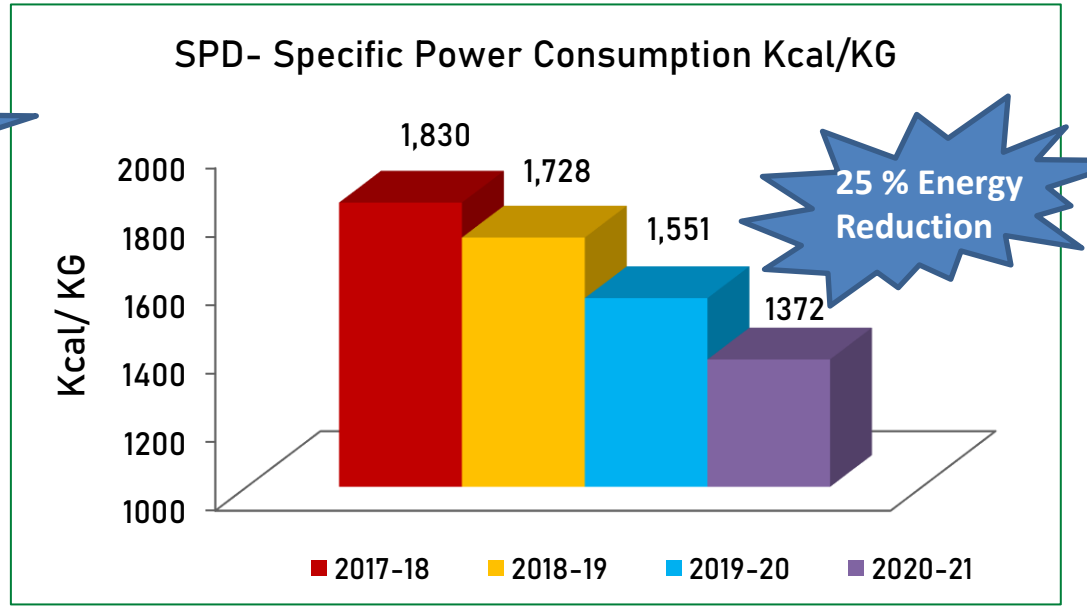
Specific Energy Cons[illegible]n across Processes

Process change by Installation of Induction Furnace

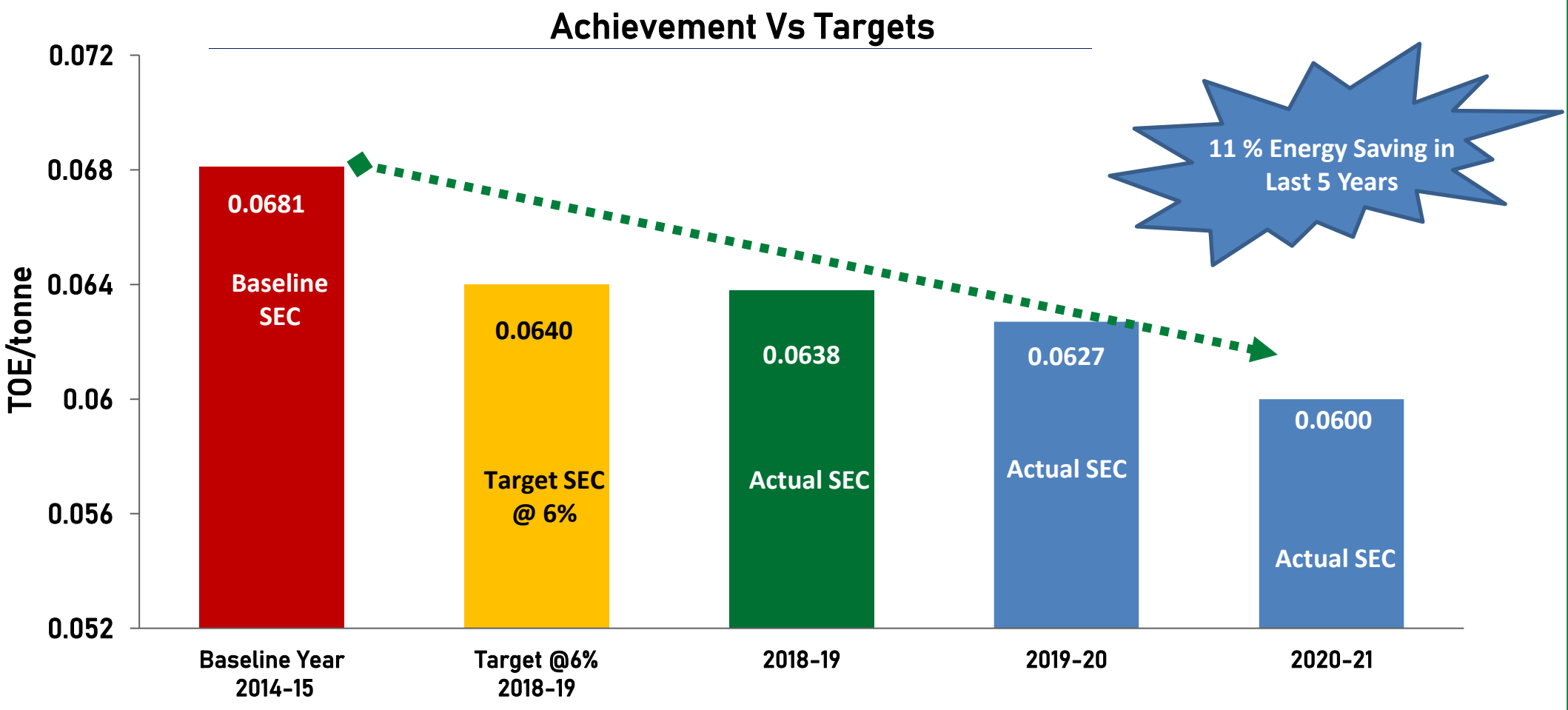




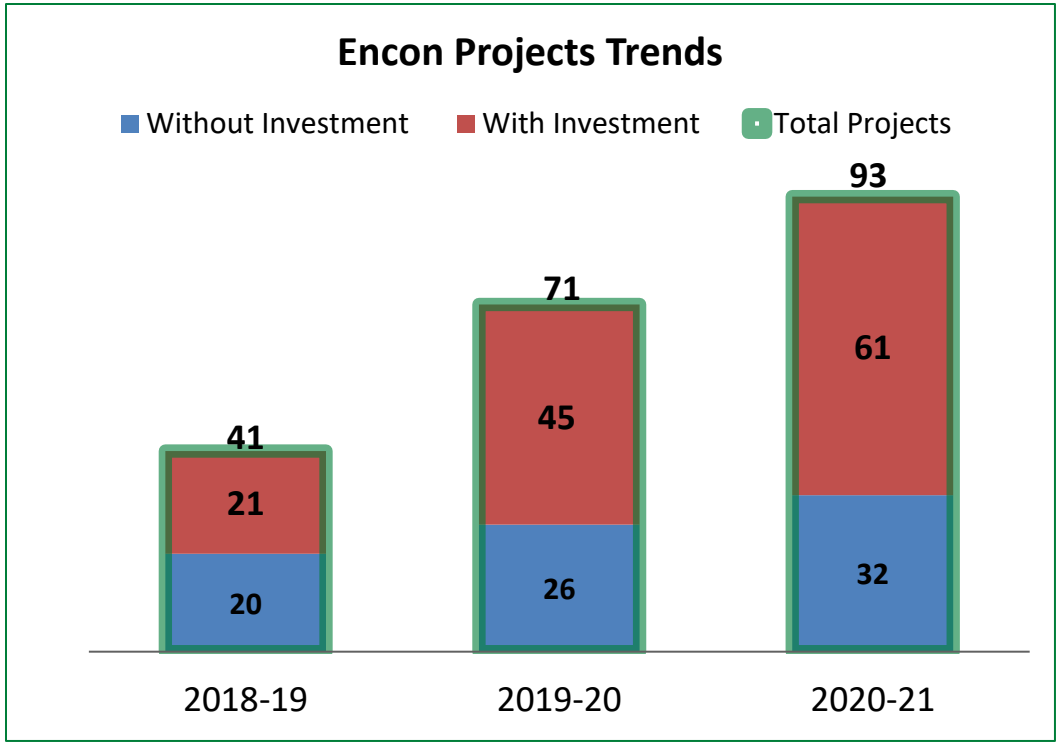


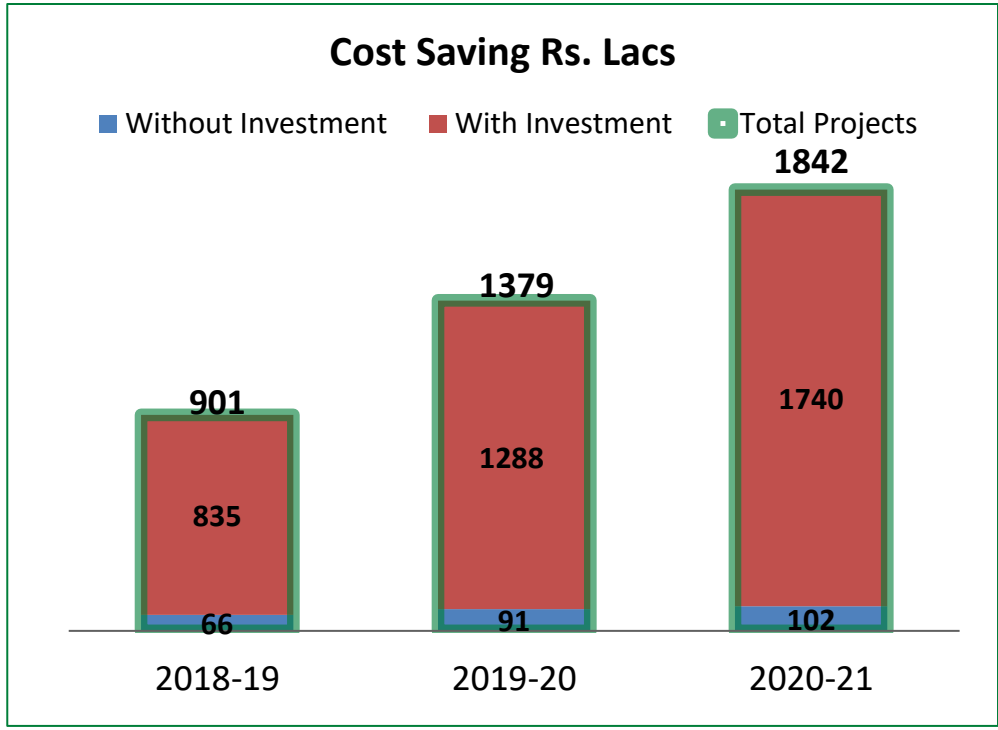


SEC Improvement Trend



Energy Conservation Projects Implemented 2017-20





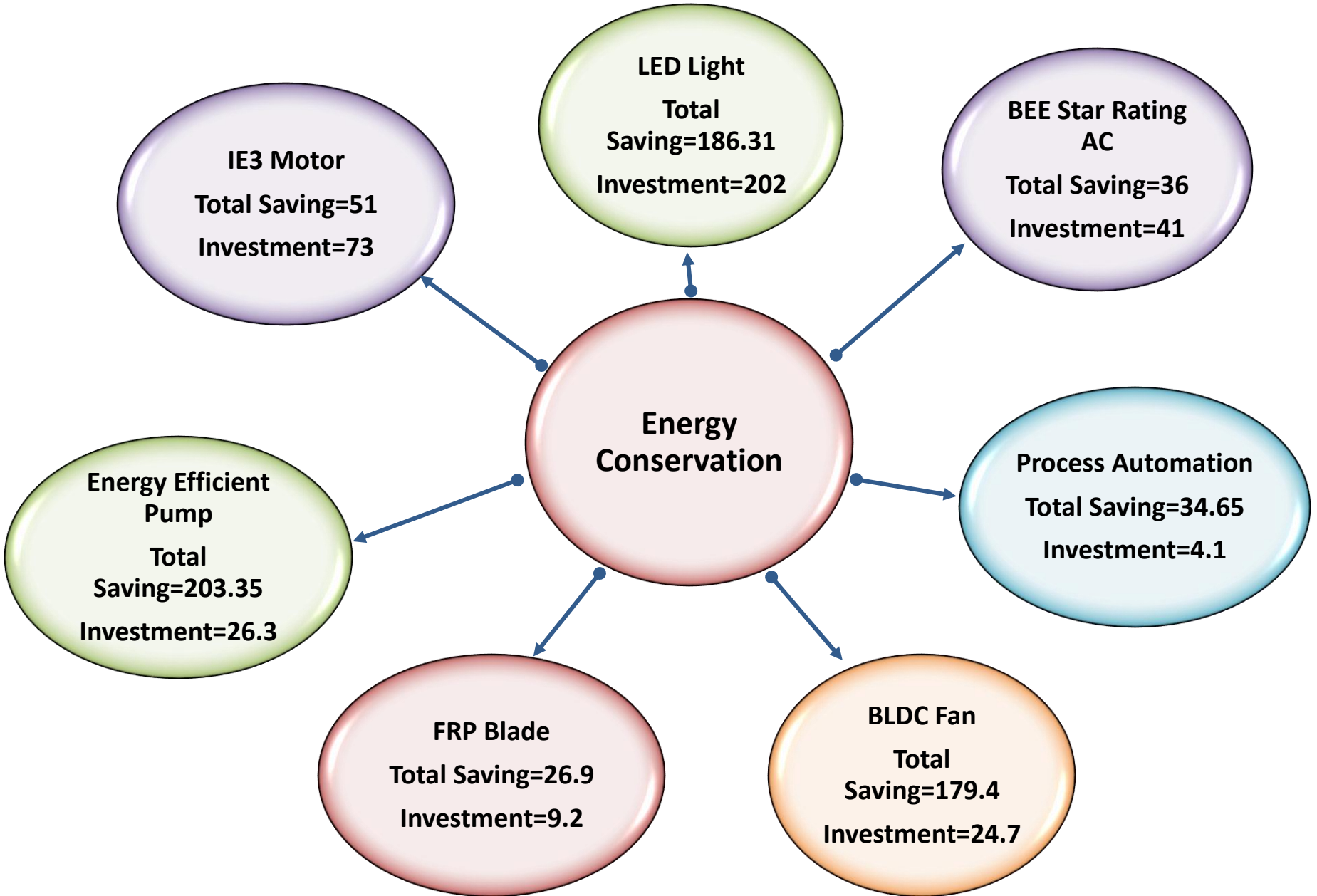
JSHL has invested more than 17 Cr. INR in various Energy Efficiency and Conservation projects of the last 3 years – saving approx. 2200 TOE per year.

The major projects are listed in the following slides

Major EC Projects Implemented in 2018-21

SR.	Title of Energy Saving project implemented	Total Saving	Invest. Made	Payback
		Rs Lacs	Rs Lacs	Months
1	Minimize Heat-Loss by Synchronize & auto Slab transfer mechanism between PWBF and WBF & Improving Thermal Insulation	80	0	0
2	Improve Steam Boiler Efficiency by installation of Heat exchanger in feed water line of 6TPH Boiler	11.30	0.5	1
3	Reduction in specific power Consumption by changing Gear box of ETR & DTR at Z2 mill.	162.9	550	41
4	Reduction n Specific Power Consumption Installation of VFD screw compressor at Air plant	70.35	46.5	8
5	Use of energy efficient lighting (LED Light) in Each Section of Plant	186.31	202	13
6	Replacement of Old & Inefficient Pump with High Energy Efficient Pump with required matching Capacity	170.02	14.5	1
7	Reduction n KVA Demand by Improvement in Power Factor (From 0.9969 to 0.9988) by Installation of Capacitor Bank.	82.36	35	5
8	Replacement of old Motor (Rewind More than 3 Times) with IE3 motors	51	73	17
9	Reduction of specific power cons by Installation & commissioning of two centrifugal compressor of 5500Nm3/hr	69.6	146	25
10	Installation of Separate Descaling system at Strip Mill	202.4	170	10
11	To save energy by replacing aluminium fan hub assembly of cooling towers with FRP fan hub assembly.	26.9	9.2	4
12	Uses of Main Air Compressor venting air to compressed air supply of SMS-1	48.8	3	1
13	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
14	Reduction in Heat Loss by revamp the walking beam Furnace	298	224	11
15	Utilization of flue gas heat to raise the temperature of purging gas in dryer instead of electrical heater	1.3	0.4	4
16	Installation of 33KWp roof-top Solar Plant	3.1	12	47

Other Major Energy Conservation Activity



Innovative Project-1

Waste Heat Recovery – Utilization of Quench water heat to raise the temperature of feed water of Boiler

Quench water process :-
Quench process is a heat treatment process used to improve mechanical properties mechanical in steel and cast **iron alloys are strengthened and hardened**.

Water after quenching process has a temperature of around 100 Degree C which was going waste .
We have an idea to utilization of heat of quench water to raise the temperature of feed water to improve the efficiency of the Boiler .

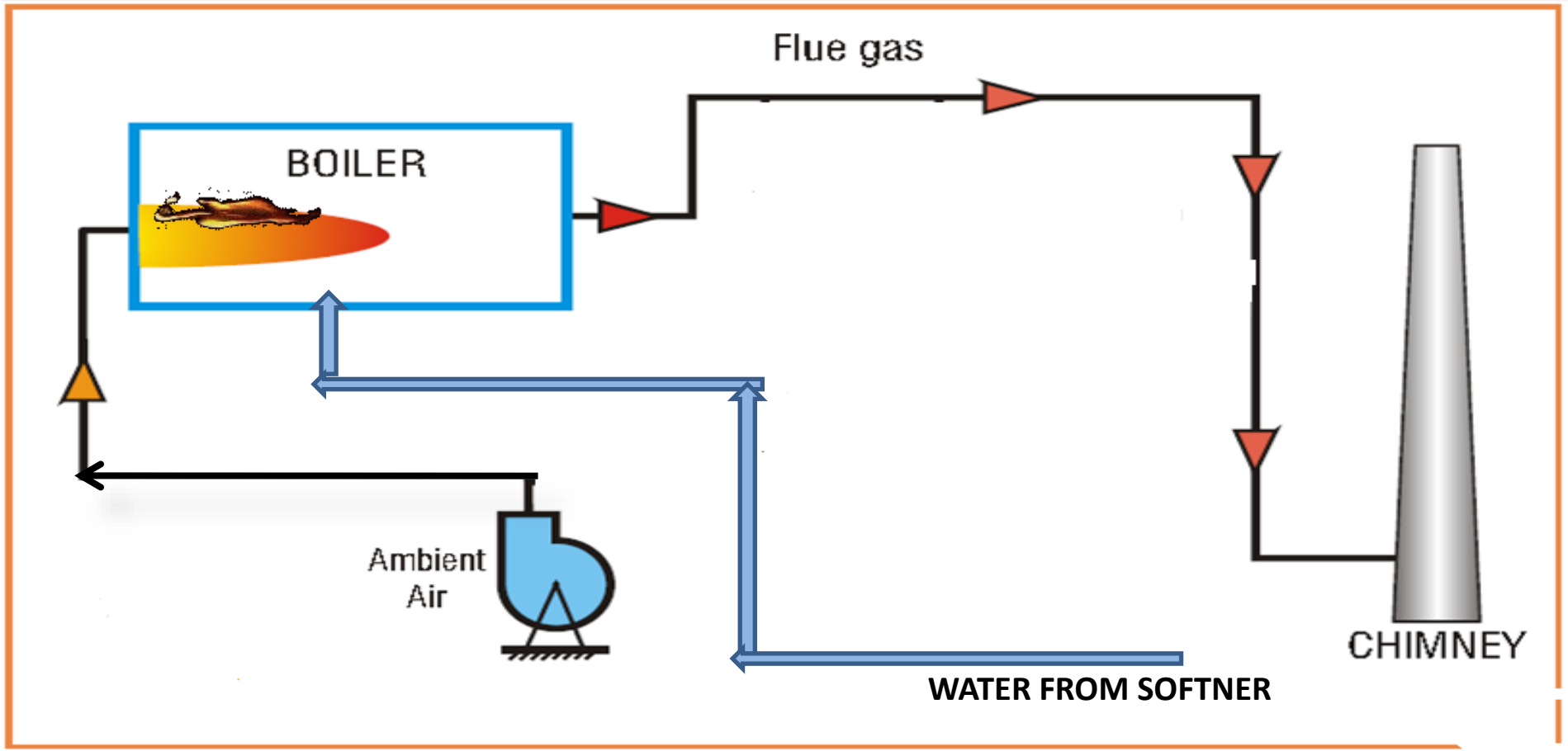
Heat Exchanger :-

The function of the Heat exchanger unit is to transfer the heat of quench water & to raise the temperature of feed water of the Boiler

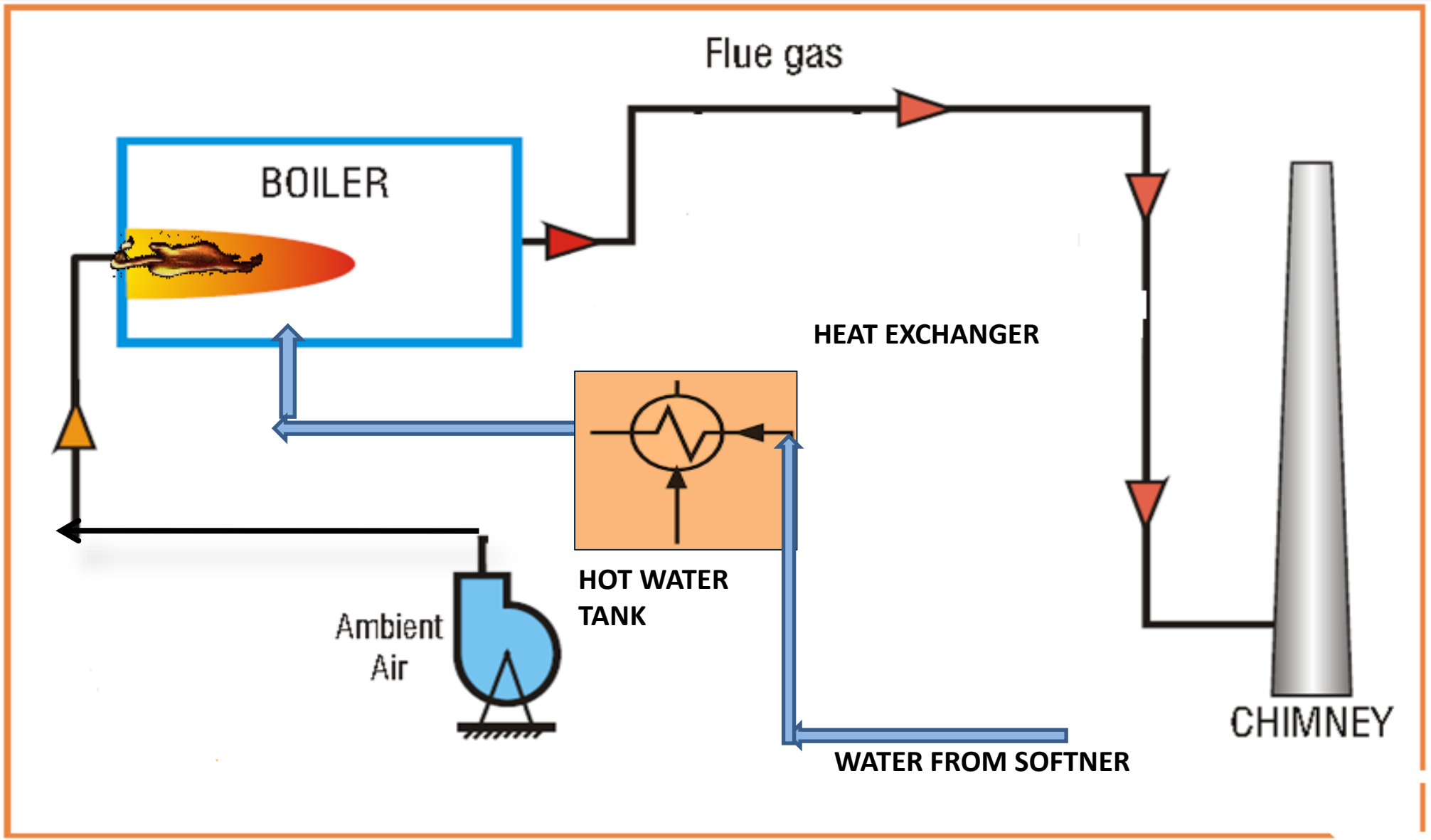
Innovative Project-1

Boiler working :-

➢A boiler is an enclosed vessel that provides a means for combustion heat to be transferred into water until it becomes heated water or steam. The hot water or steam under pressure is then usable for transferring the heat to a process.



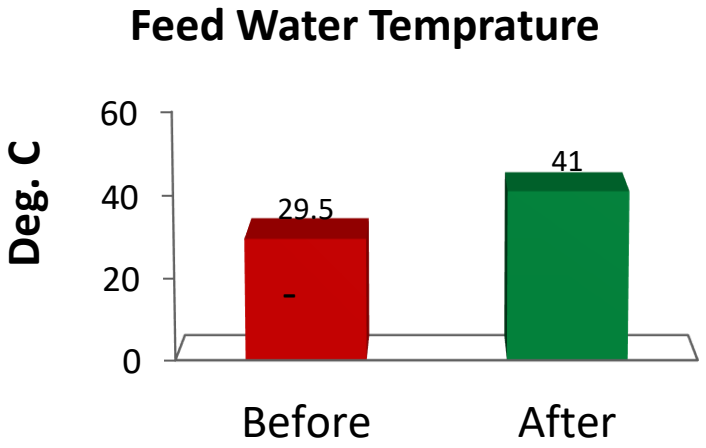
Innovative Project-1

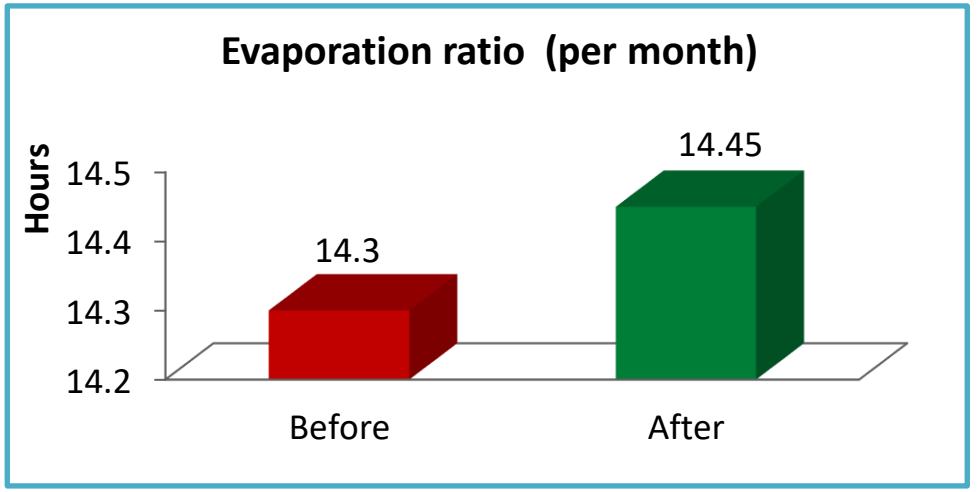


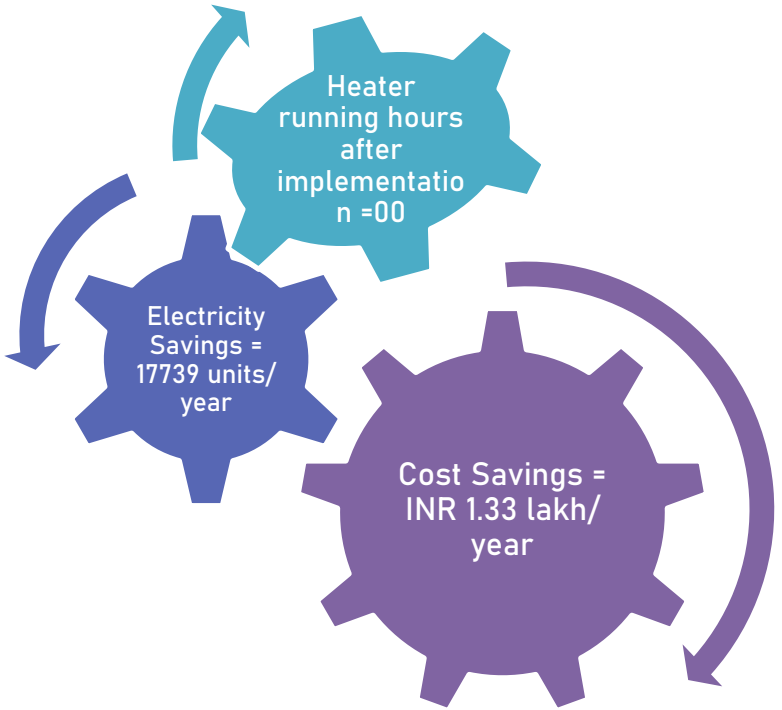
After Modification

Innovative Project-1

Benefits Achieved :







Intangible Benefit Achieved :-

- Reduction in Co2 Emission
- Reduction in Manufacturing Cost.
- Increase Energy Performance of plant.
- Awareness Among people to save Energy for benefit of Self & Nation.

Innovative Project-2

Reduction in energy consumption by Installing Matching Pump & separation the secondary pipe lines for bloom & slab caster separately.

Slab Caster:

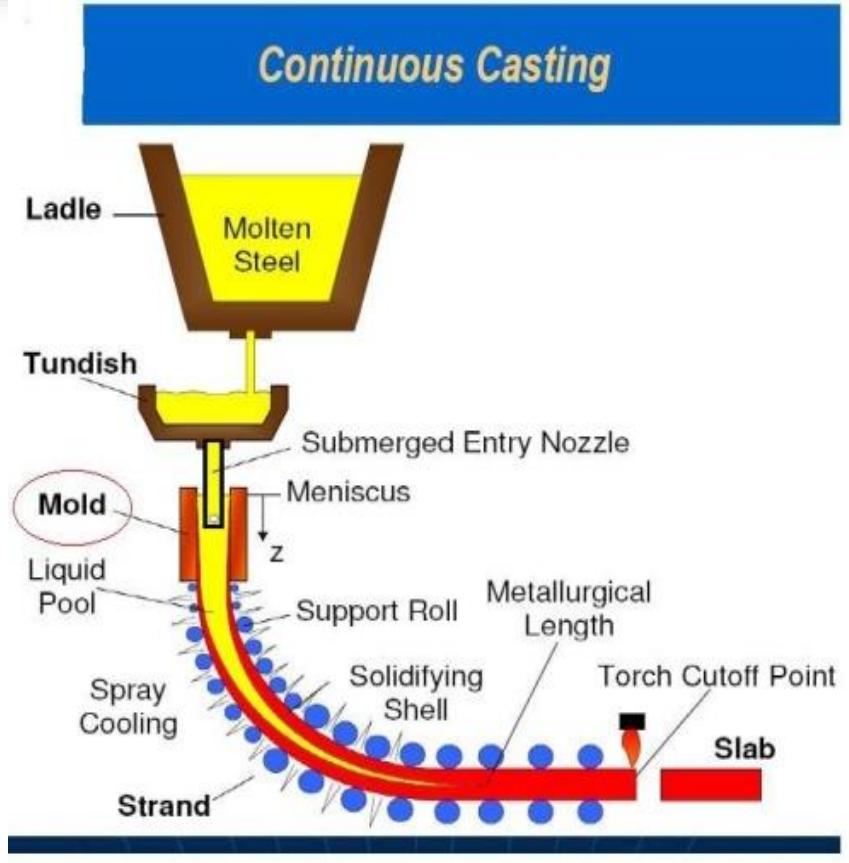
Continuous casting machine where liquid metal solidify in desired shape of Slab & Bloom.

Major observation

a.)Secondary cooling water pump (H:90M,Q:840,M KW : 260) running for slab & bloom caster both where as flow required for Slab Caster is 500 m3/Hr while Bloom caster is 350 m3/Hr.

B.)Both Slab & Bloom caster pipe lines are pressurized while only one caster is in operation.

c.)Frequent leakage in Isolation Valves of Slab & Bloom Caster.



Innovative Project-2

CT Fan

Cooling Tower

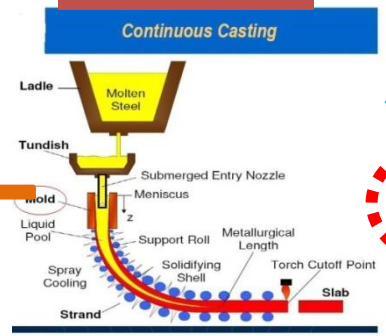
Cooling Tower Tank

Hot Water

Single pump run for both (Slab & Bloom) Circuit. Both caster run simultaneously only 4 to 5 days in a month.

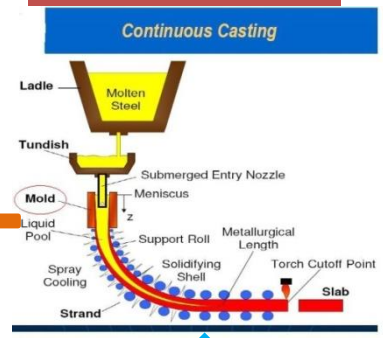
Secondary Cooling Pump Details
Head : 90 Meter
Flow : 840 CMH
Motor : 260 KW
Running Load : 161 KW

Slab Caster



Isolation Valve

Bloom Caster



Isolation Valve

Cold Water

Before Modification

Innovative Project-2

Secondary Cooling Pump Details (Bloom Caster)
Head : 100 Meter
Flow : 350 CMH
Motor : 110 KW
Running Load : 94 KW

Secondary Cooling Pump Details (Slab Caster)
Head : 100 Meter
Flow : 500 CMH
Motor : 200 KW
Running Load : 140 KW

CT Fan

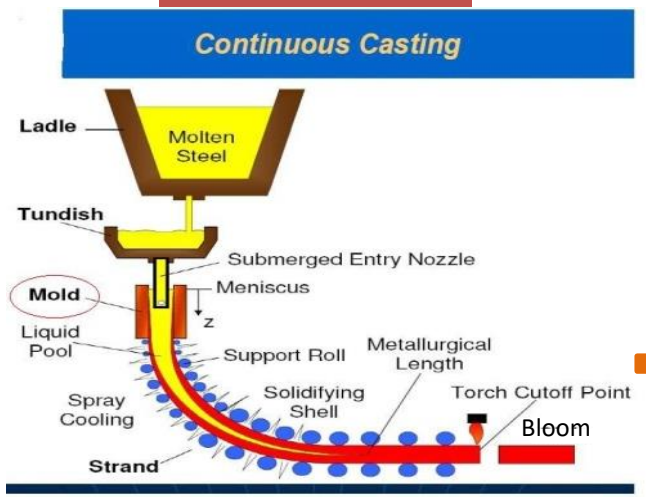
Cooling Tower

Cooling Tower Tank

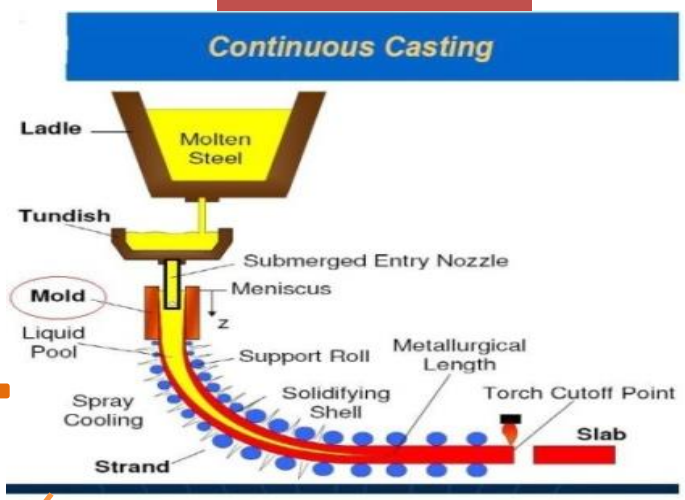
Hot Water

Hot Water

Bloom Caster



Slab Caster



Cold Water

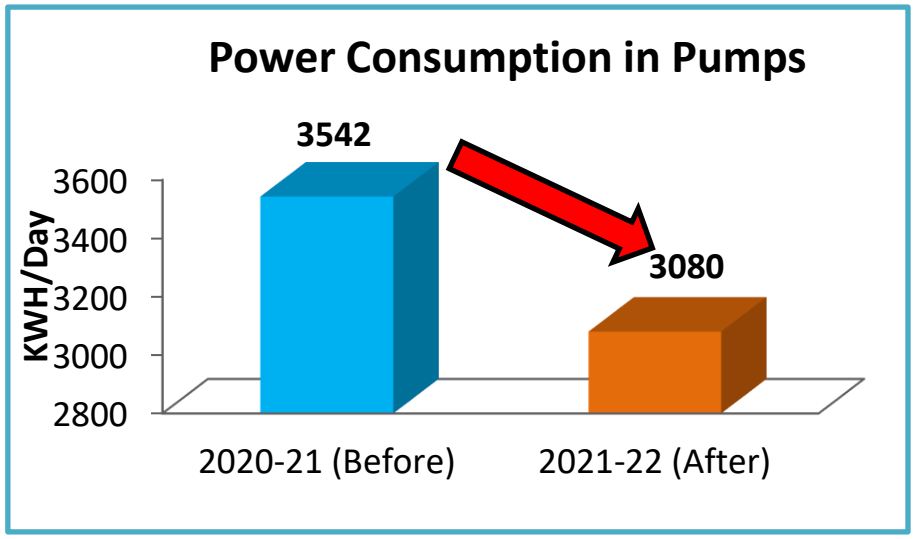
Cold Water

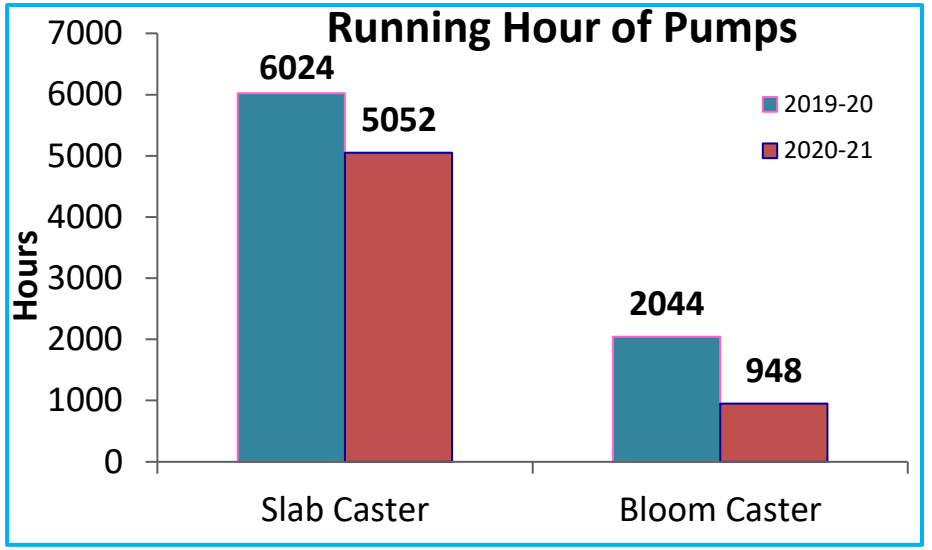
Matching parameter pump runs for each (Slab & Bloom) Circuit separately.

After Modification

Innovative Project-2

Benefits Achieved :





120000 KWH Power saved per annum

9.00 Lakhs/Yr

Intangible Benefit Achieved :-

- Reduction in CO_2 Emission
- Reduction in Power Consumption
- Reduction in Maintenance Cost.
- Increase Energy Performance of plant.
- Awareness Among people to save Energy for benefit of Self & Nation.

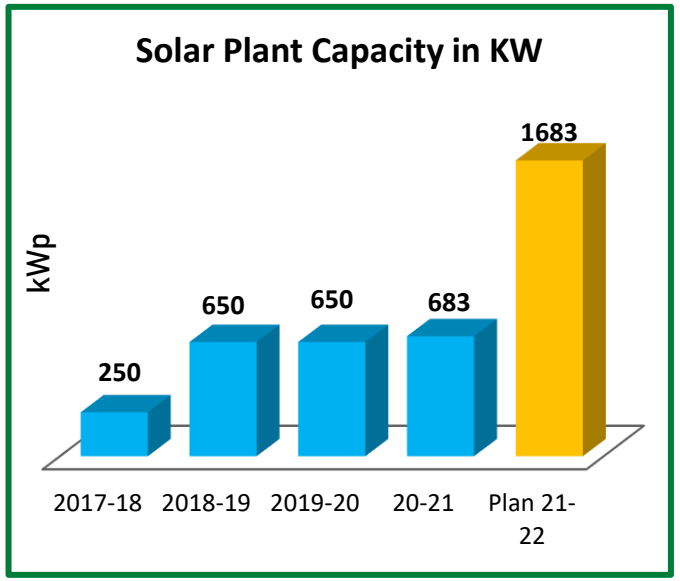
Innovative Project-2

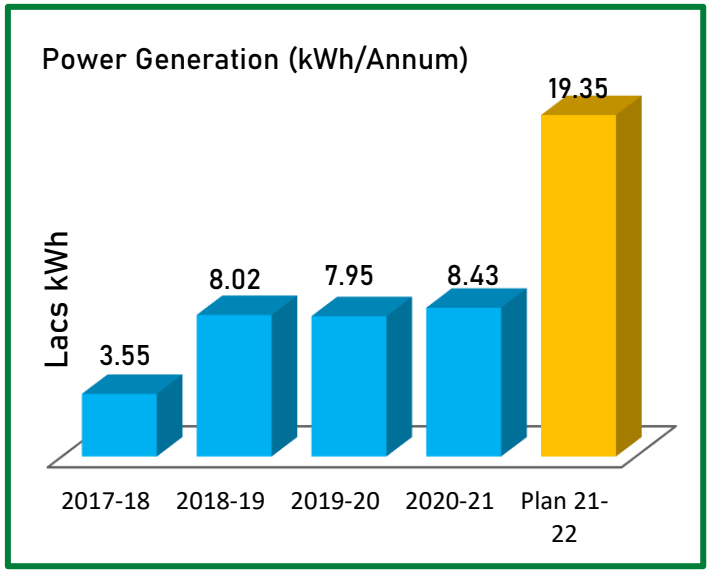
Benefits Achieved :

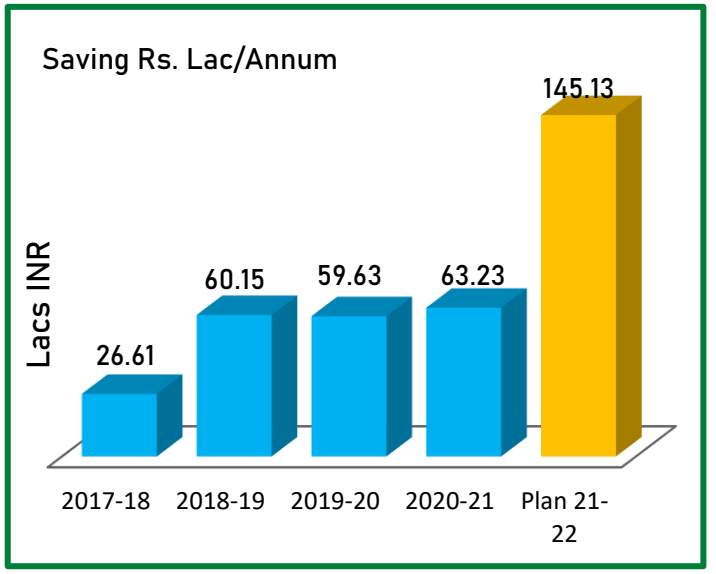
Saving Sheet of Slab caster SMS 2 pump house				
Trail Taken on 20.06.2020				
Before : H: 90M, Q : 840 CMH,225 KW Motor,1440 rpm				
After : H: 100 M, Q : 500 CMH,200 KW Motor,1450 rpm				
Area	**Section**			**Remarks**
SMS 2 Pump House	CCS 2 Slab Caster Pumps			
Item Description	**Unit**	**Value**	MKW	
Before modification				
Power Consumed	KW	160	225	
Pressure at Pump House	kg/sqcm	10		
Flow	LPM	4298		
After modification				
Power Consumed	KW	140	200	
Pressure at Pump House	kg/sqcm	10.2		
Header Pr.at slab caster	kg/sqcm	9.5		
Difference in power	KW	20		
Pump Running	Hrs	6000		
Investment	Rs in Lakh	4.4		
Unit Rate	Rs	7.5		
Saving	Rs in Lakh	**9**		
Net Saving	Rs in Lakh	4.6		
Payback Period	Month	6		

Saving Sheet validated by Caster Incharge, Electrical Incharge & Utility Incharge

Renewable Energy Intervention





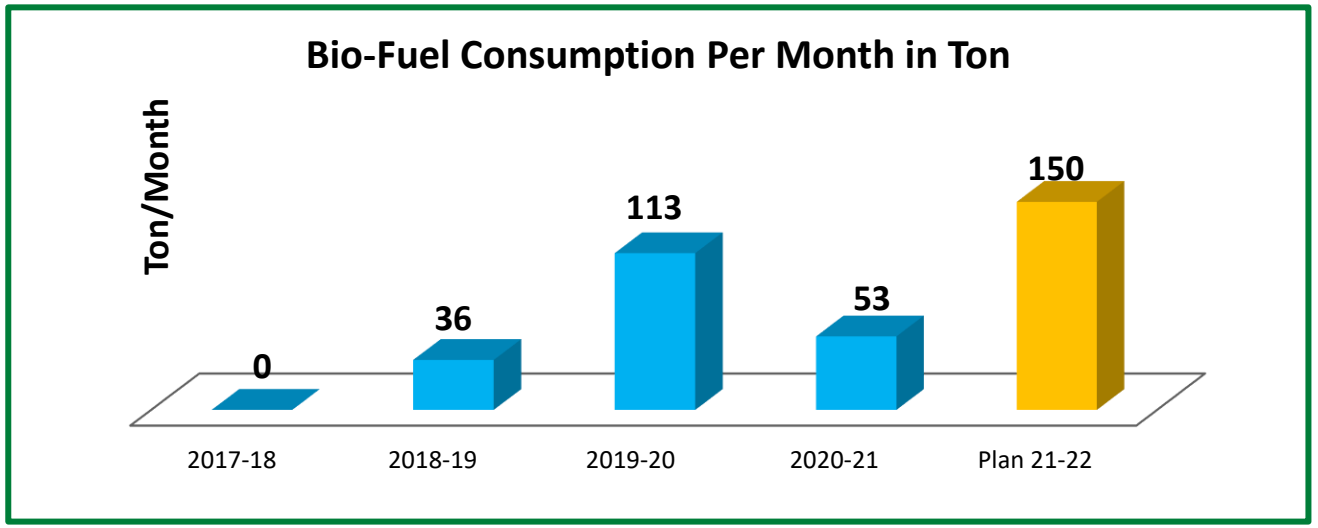


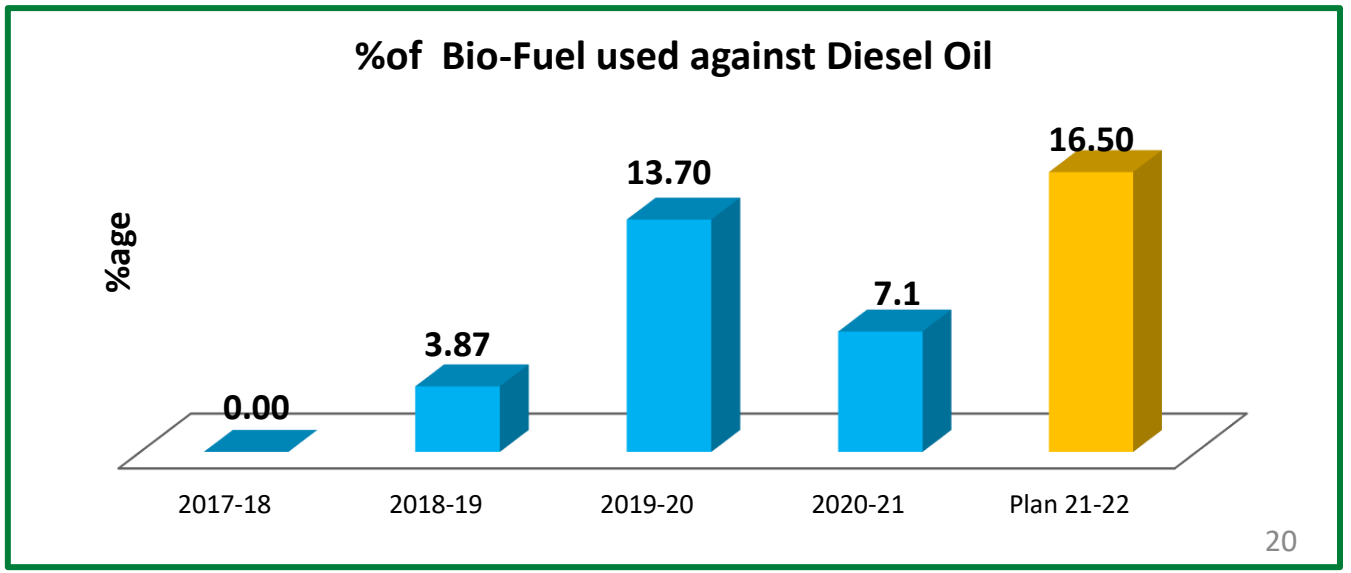
SOLAR GENERATION PERFORMANCE:-

- Location Wise Plant Capacity vs Generation (KWH/KWp)
- String wise Monitoring
- Inverter Wise Detail
- Weather Monitoring – Irradiance in Watt/M2
- Regular Cleaning of PV Module

Renewable Energy Intervention

Gradual replacement of Diesel with Bio-Fuel





Waste Utilization

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Awareness.

Primary Segregation

D2D Collection

Secondary Segregation

Waste Treatment

Dry Waste – 250-350 KG

Wet Waste – 650-700 KG

Compost – 130-150 KG

Compost

Treatment

Waste Utilization

DELIVERING STAINLESS EXCELLENCE SINCE 1970

Bio-Gas Plant –

- One localised Mini Bio-gas Plant was set up on 12 Sep'2018 in the CRD section of the plant, adjacent to the cafeteria/canteen.
- This generates Bio-Gas from kitchen and canteen food waste and utilize it as a substitute to LPG in the canteen.
- This bio-gas saves a minimum of 360 kg of LPG per year which is generated from about 4,000 litres of organic waste obtained from the canteen per year.

Benefit

- Saving of 360 KG LPG/Annum
- Reduction of Green House Emission 5,040 kg/annum
- 4000 Liter/annum of organic manure is available

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;

- Installation of Zero Liquid Discharge (ZLD) facility within its premises.
- Monitoring of plant Noise Level every month
- Conducting Stack Monitoring every month
- Implementation of Safety Calendar & Monthly Safety Themes
- Up-gradation from OHSAS 18001:2007 to ISO 45001
- Implementation of BBS (Behavioural Based Safety) in Plant.
- Conducting E-HAZOP Study

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

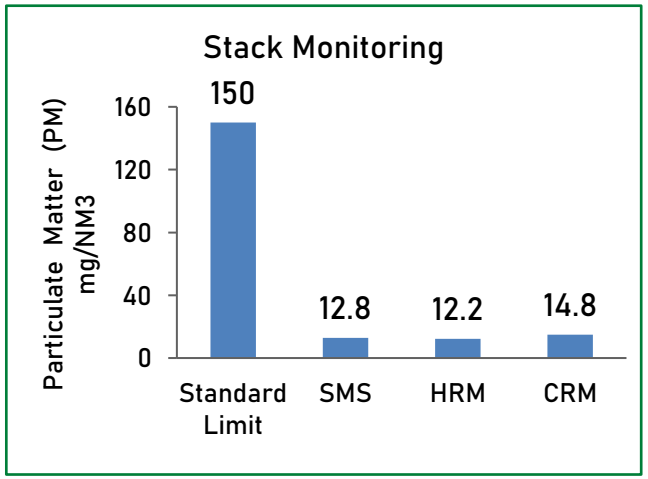
Other Environment Conservation Initiatives

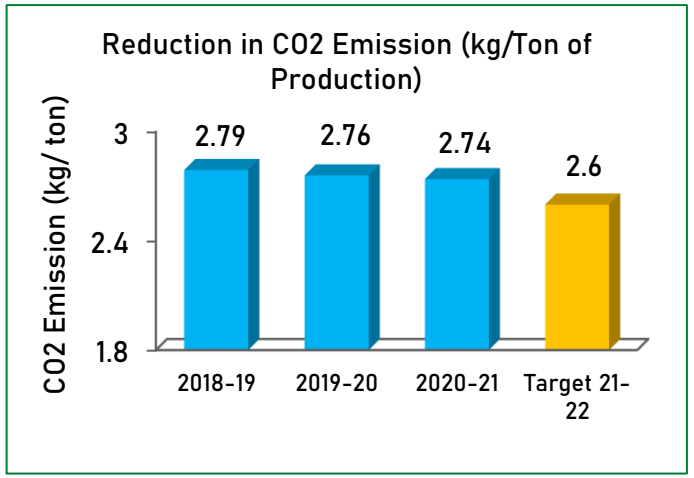
Under its CSR activities, JSHL has undertaken certain other measures for conservation of the environment

Year	Plantation(Trees, Palm, Shrubs)	Lawn Grass(SFT)
2016-17	3870	4500
2017-18	34625	212050
2018-19	20706	3550
2019-20	17218	29150
2020-21	18620	20062
Total	95039	269312

- 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
- Tree plantation in JSHL industry,Schools,Hospital & parks
- Cycle rally is also conducted every year

A check on GHG Emission





Type of System	Flue gases	PPM (without Denox)	PPM (After Processing)	Propane Consumption (Average)	Ammonia Consumption (Average)
De-Nox System - LiAP-	CO2, NH3	>1000	<100	14 Kg/hr	12 Kg/hr
De-Nox System - Line 2	CO2, NH3	>1000	<100	26 Kg/hr	22 Kg/hr
De-Nox System -Line 3	CO2, NH3	>1000	<100	26 Kg/hr	22 Kg/hr

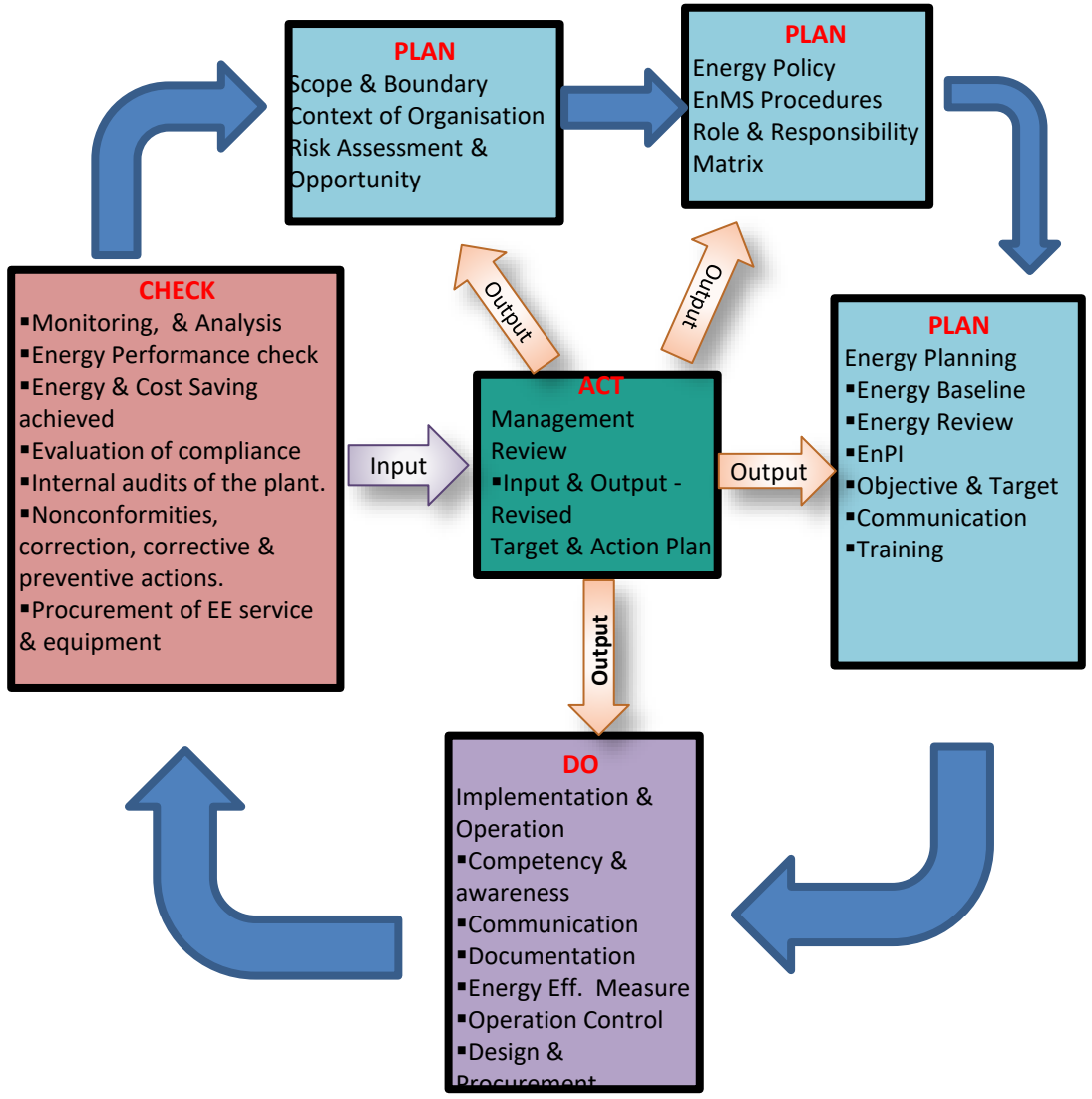

HARYANA TEST HOUSE
& Consultancy Services
NABL ACCREDITED LABORATORY
TEST CERTIFICATE

- 17537 MT — Energy Conservation Project
- 2500 MT — Tree-Plantation
- 743 MT — Renewable Energy
- 568 MT — Use of Bio-Fuel
- 14 MT — Bio-Gas Plant & Cable Stripping
- 21362 MT — Net Reduction

Implementation of ISO:50001

JSHL is the First Steel Industry in India to be certified with ISO 50001:2018 Energy Management System (EMS).

	Aug. 2018	Sep. 2018	Oct. 2018	Nov. 2018	Dec. 2018	Jan. 2019	Feb. 2019	Mar. 2019	Apr. 2019
Awareness training	■								
Initial Energy Usage calculation based on measurement	■	■	■						
Review of Energy Usage calculation and consumption for all department			■	■					
Identification of Significant Energy Consumption			■	■					
Identification of Improvement Programs and Action Plans				■	■				
Review of Energy Performance Indicators (EnPI) baseline				■	■				
Preparation of EnMS Manual & Procedure	■	■	■	■					
Energy policy approval & display				■	■				
Review and Finalization of EnMS Formats & Work Instructions			■	■	■	■			
Implementation of Documents on Shop floor					■	■			
Internal Audit training					■	■			
Internal Audit of the Plant						■			
Management Review as per ISO 50001:2011 Agenda						■	■		
Certification audit for ISO 50001:2018								■	■



Energy Policy & Energy Cell

JINDAL STAINLESS

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.

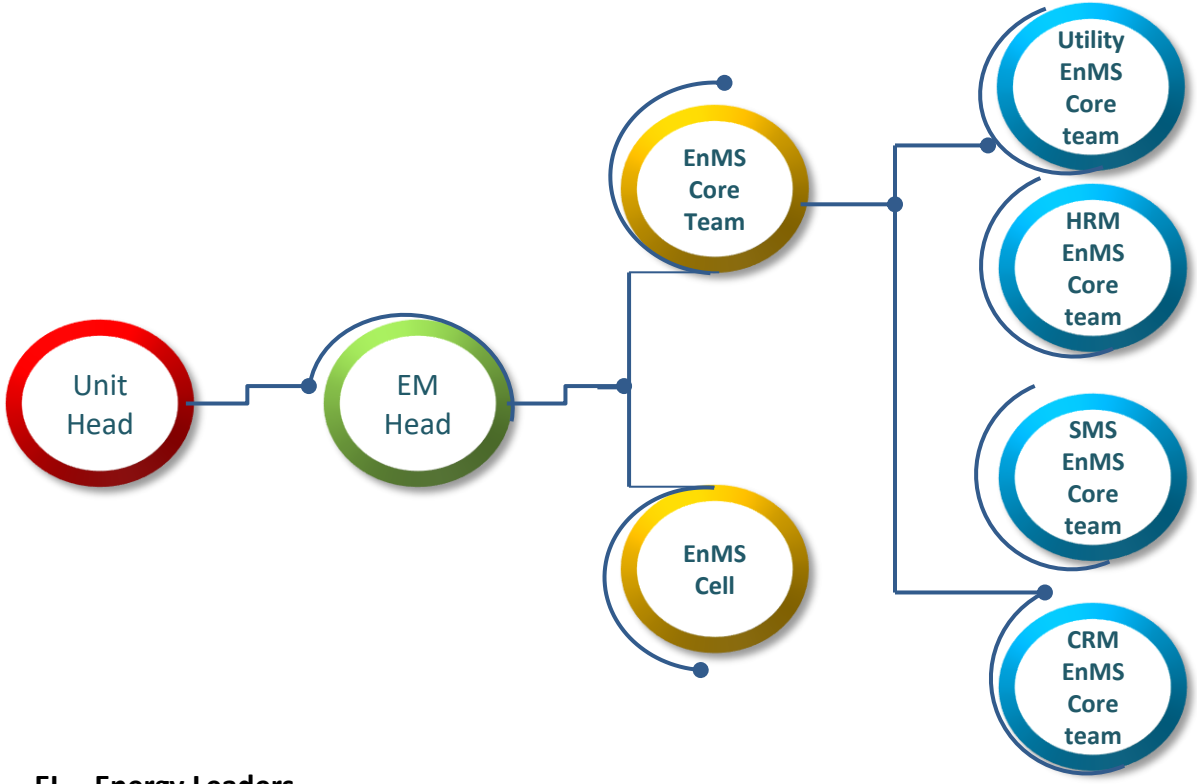
For achieving this, we devote ourselves to:

- Promote use of energy efficient processes, equipment, device and system in the manufacturing of steel and sustain continuous reduction is 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.

DATE: Nov.12, 2018

J. SOOD
Director & Chief Operating Officer

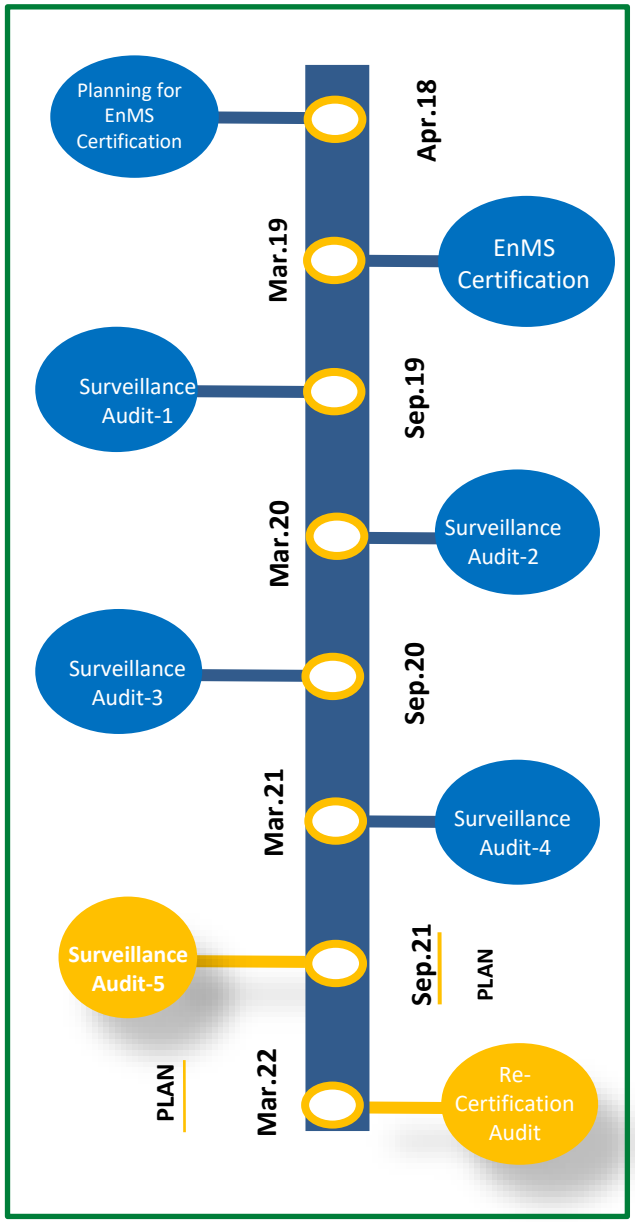


EL – Energy Leaders
CEM – Certified Energy Manager

***Note**

- **We have BEE Certified 3 Energy Auditor & 2 Energy Manager.**
- **Also we have 24 Certified Internal Energy Auditor as per ISO 50001.**

Implementation of ISO:50001



Operation Control:-

- 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
- Setting ECR temp @ 25°C.

Design-Control

- Designing based on life-cycle cost assemenent 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) .
- Consideration of latest technology i.e. Designing of new air-knife blower to dry the SS strip instead of steam.
- Waste-Heat recovery system installed after economiser to heat degreasing section water instead of Elect. Heater.

Procurement Control

- Procurement of BLDC Ceiling Fan 28Watt instead of 60Watt Conventional fan
- 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

DELIVERING STAINLESS EXCELLENCE SINCE 1970

ISO 50001:2018 Certificate

TÜV NORD

Management system as per
ISO 50001: 2018

In accordance with TÜV INDIA procedures, it is hereby certified that

JINDAL STAINLESS (HISAR) LIMITED
(HR & CR DIVISION)
O. P. Jindal Marg,
Hisar - 125 005, Haryana,
India

applies a management system in line with the above standard for the following scope

Manufacture of Hot Rolled and Cold Rolled Stainless Steel Products.

Certificate Registration No. **ENMS 04 00003**
Audit Report No. **Q 9507/2019**
Valid until **24.04.2022**

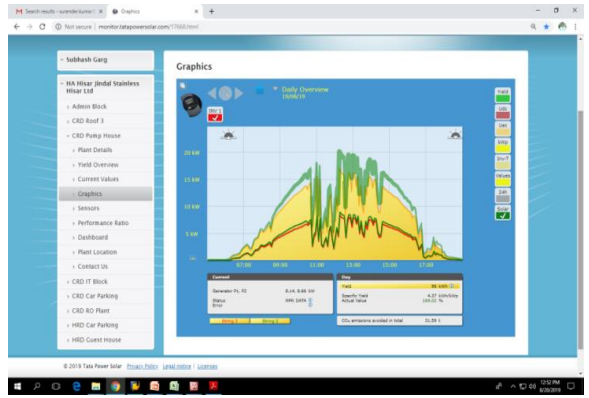
Certification Body
at TÜV INDIA PVT. LTD.
Issue **25.04.2019**
Place : **Mumbai**

This certification was conducted in accordance with the TÜV INDIA auditing and certification procedures & shall be valid subject to regular Surveillance Audits.

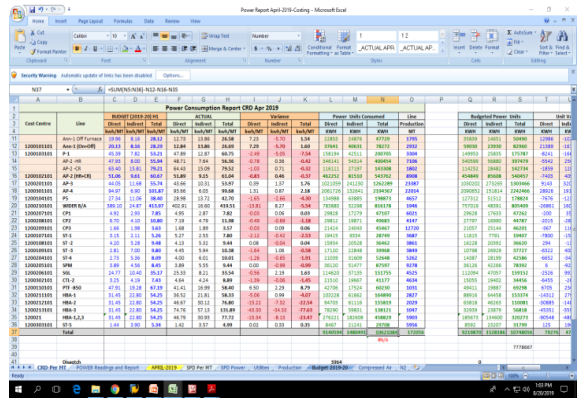
TUV India Pvt. Ltd., 801, Raheja Plaza – 1, L.B.S. Marg, Ghatkopar (W), Mumbai - 400 086, India cert.helpdesk@tuvindia.co.in

TUV INDIA NABCB IAF

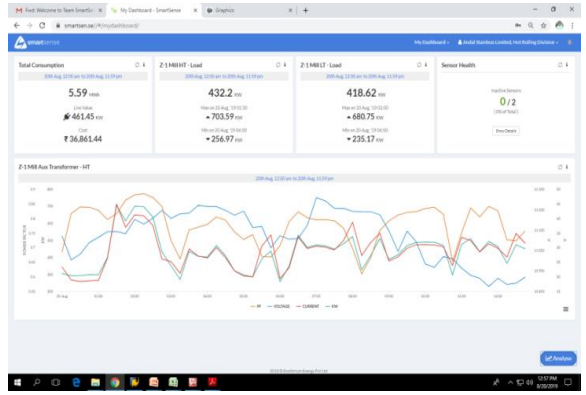
Online EMS Scada System



Solar Energy Generation Trends

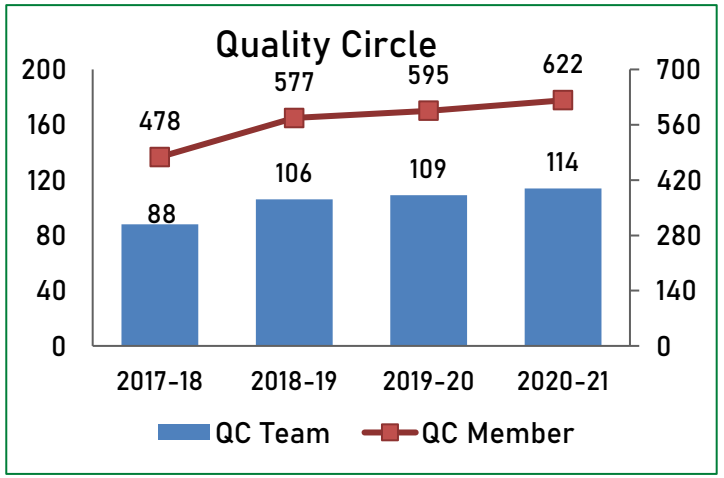


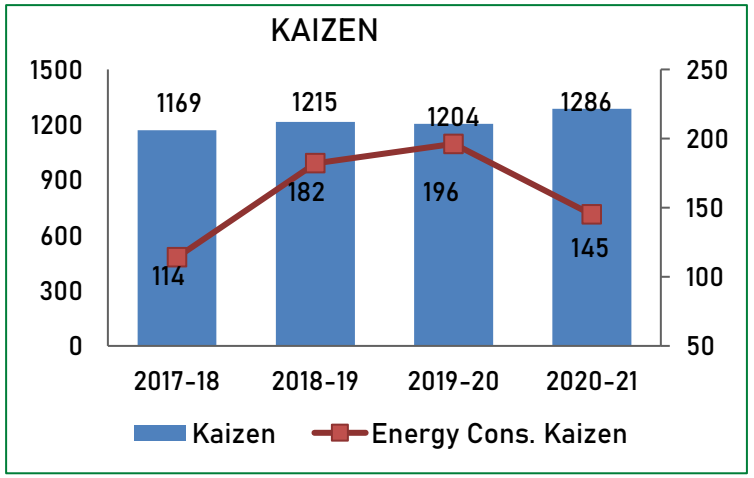
Daily MIS Report

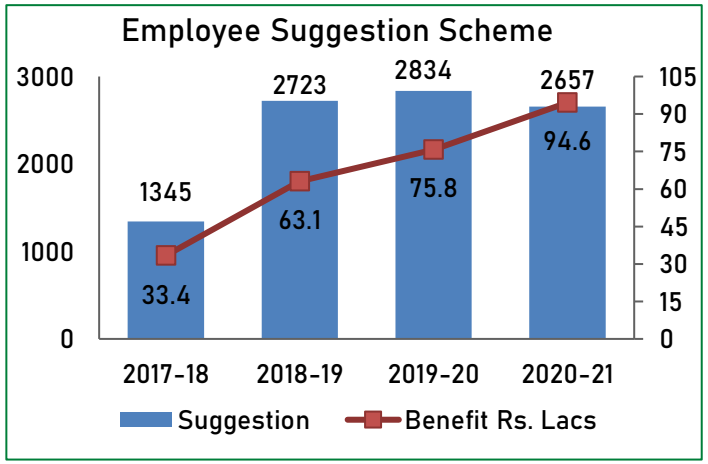


Online Loading Monitoring of Transformers & Major Equipments

Employee Involvement & Team Work







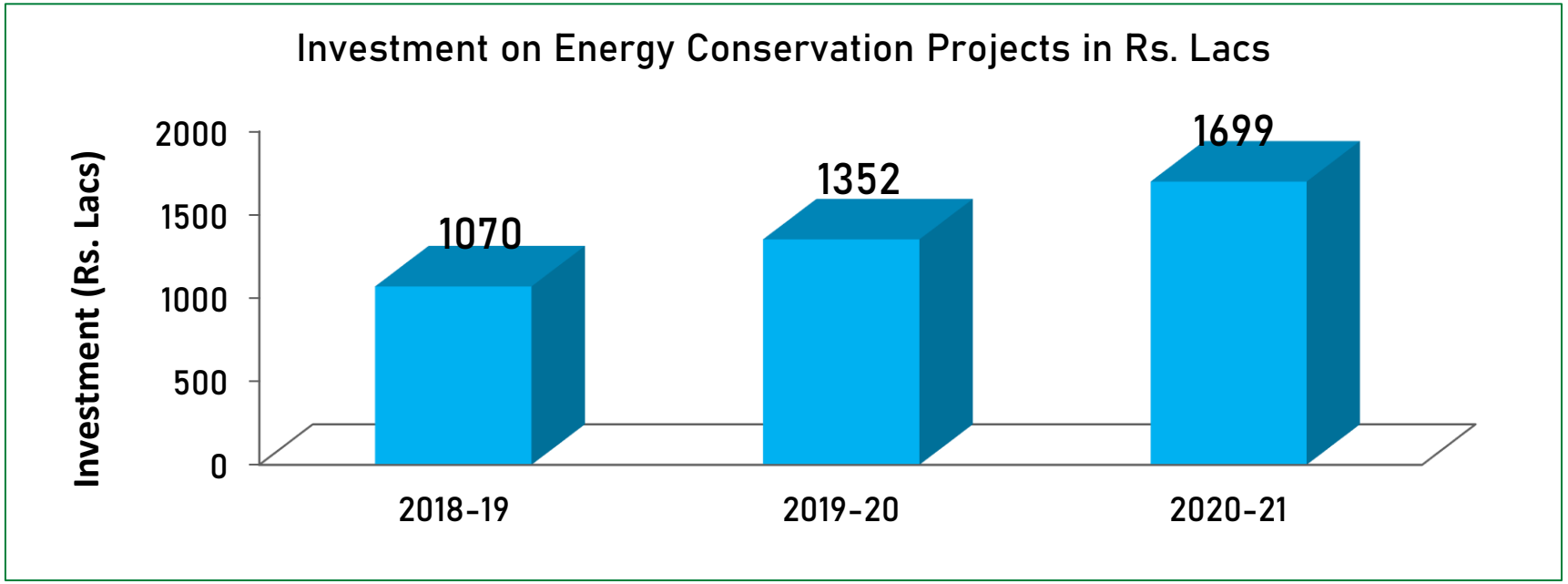
Energy Training

Quality Circle Competition

Energy Saving Pledge

Energy Saving Pledge

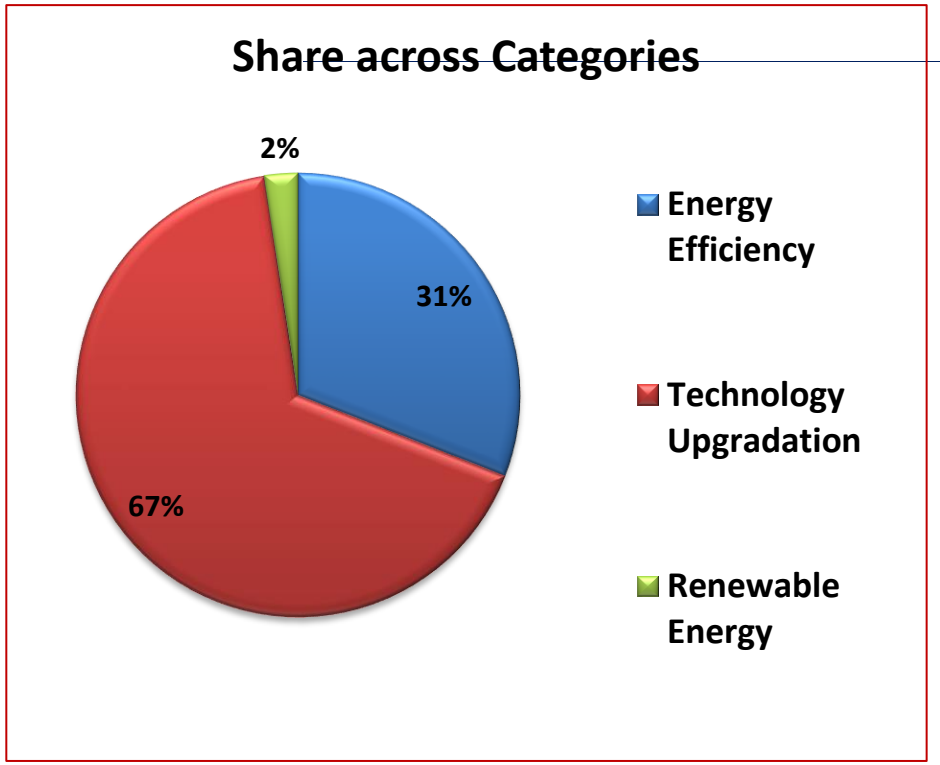
Investment on Energy Conservation Projects

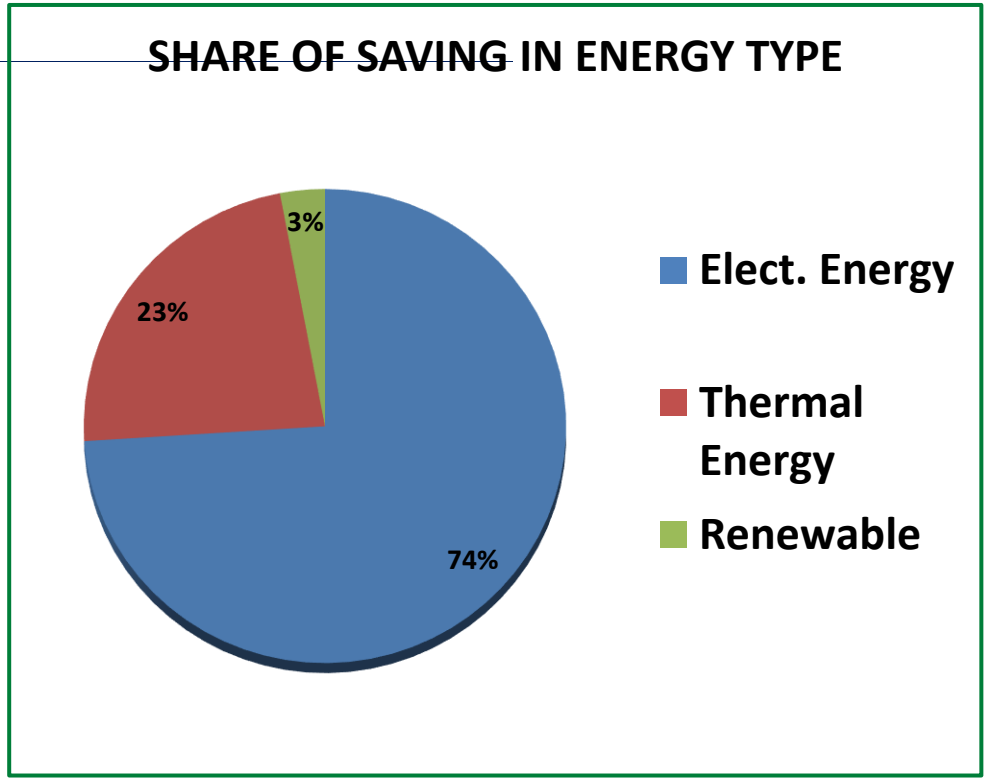


Renewable Purchase Obligation (in Lacs)			
	2018-19	2019-20	2020-21
RPO - Target	20.555	51.65	48.570
RPO - Achieved	21.14	50.53	6.86

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

Investment on Energy Conservation Projects



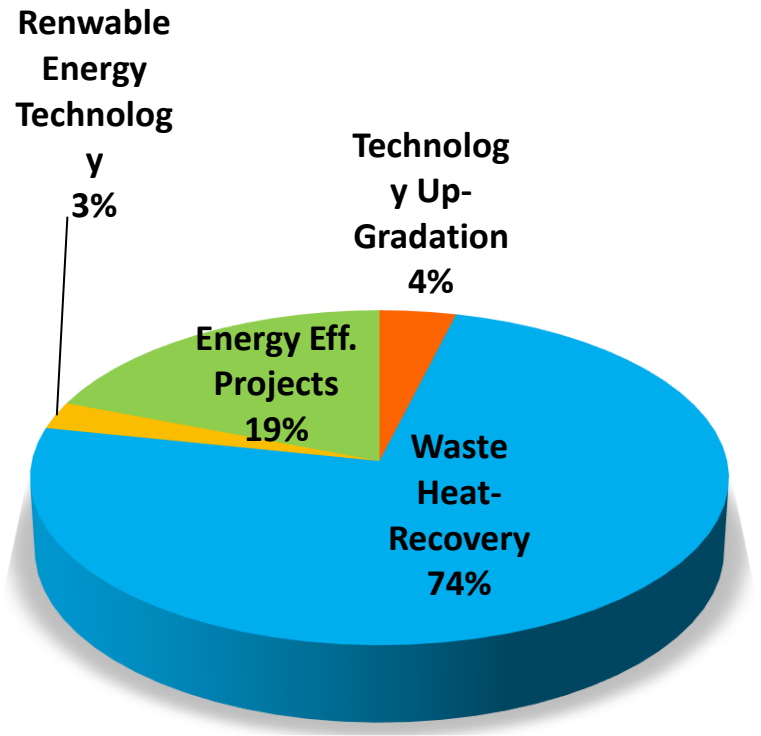


- Total energy saving is 2205 TOE
- Investment made: INR 16.9 cr.
- Cost Saving – 18.4 Cr
- Average payback: 1year
- CO_2 emission reduction: 17,537 tons

Way Forward – Activities Planned & Budget Allocations

Value in Rs. Lacs

Activities / Projects Planned 2021-22	Total Budget	Expected Saving
Energy Efficiency Project		
Energy Efficient LED lamps – Oil Cellar/ Looper Area	31	47
Premium Efficiency Class IE3 Motors	353	259
Energy efficient BLDC man coolers (Work space)	34	50
Use of High Efficiency pumps with VFD.	84	184
Replacement of belt driven fan with direct driven energy efficient fan	41	20
Waste-Heat Recovery		
Power Generation from SMS Flue Gases by waste heat recovery	522	1844
Implementation of Slag Heat Recovery for Scrap Pre-Heating	612	229
Installation of waste heat recovery system on AP4 furnace	41	89
Waste heat recovery in EBNER Furnace	7	16
Technology Up gradation projects		
To replace the diesel operated forklifts with battery-operated forklifts	77	218
Air compressor monitoring system,	20	35
Installation of modulating burner in Bright Annealing Furnaces	55	17
Renewable energy technology		
Installation of Solar PV System of 1000 kW	300	77
Total	**2177**	**3085**



Major Achievements & Awards

CII
Confederation of Indian Industry
125 Years - Since 1895

21st National Award for
Excellence in Energy Management 2020

This is to certify that

Jindal Stainless (Hisar) Limited

has been recognized as

"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 25 - 28 August 2020.

K. S. Venkatagiri
Executive Director
CII - Godrej GBC

Ravichandran Purushothaman
Chairman, Energy Efficiency Council
CII - Godrej GBC

Energy Efficiency Award from CII last 3 consecutive year

Award in "The Energy & Environment Foundation Global Award-2020

Certificate of Award

This is to certify that
Jindal Stainless (Hisar) Limited
has participated and awarded as Winner,
under Large Scale Deployment EE Motor
Category in the
5th Edition of CII National Energy Efficiency Circle
Competition held on 16-18 June 2021.

CII
Confederation of Indian Industry

5th Edition of CII National Energy Efficiency Circle Competition

Mr Shreekant Somany
Chairman,
CII – Centre of Excellence for Competitiveness for SMEs

Dr Sudhir Kapoor
Chief Jury,
CII National Energy Efficiency Circle Competition

Mr Pikender Pal Singh
Executive Director
Confederation of Indian Industry

Date: 18-06-2021

Certificate No: 'EC21/A37'

Winner in CII-EC from last 5 consecutive year

First Prize in "State Level Energy Conservation Award" by HAREDA, Govt. of Haryana

Platinum Award in "Iron & Steel Sector" by SEEM from last 4 consecutive year.

Major Achievements & Awards

National Energy Conservation Award - BEE

1st Prize
(Steel Re-Rolling Sector) in Year 2007

2nd Prize
(Steel Re-Rolling Sector) in Year 2012

2nd Prize
(Steel Re-Rolling Sector) in Year 2011

1st Prize
(Steel Re-Rolling Sector) in Year 2013

Certificate of Merit
(Steel Re-Rolling Sector) in Year 2015


Thank You