



PRESENTATION
For
CII GBC NATIONAL ENERGY AWARD
FOR
EXCELLENCE IN ENERGY MANAGEMENT



Rashtriya Ispat Nigam Limited
VISAKHAPATNAM STEEL PLANT

TEAM MEMBERS

G.NARAYANA RAO, GM(M)- SMS-2

SUDHANSHU KUMAR, SR. MGR.(EMD)

K V BANGAR RAJU, SR. MGR.(O)-EMD

K SUDHAKAR, GM(O)-EMD

Designated Energy Manager

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RINL Corporate Structure

Rashtriya Ispat Nigam Limited

Operating Units

Visakhapatnam Steel Plant

**Madharam mines
Dolomite**

**Jaggyapeta mines
Limestone**

**Garbham Manganes
e**

**Subsidiary company
(51% stake)**

Eastern Investment Limited

**Orissa Mineral
Development
Corp. (OMDC)**

**Bisra
Stone Lime Co.
Ltd. (BSLC)**

Units on Anvil

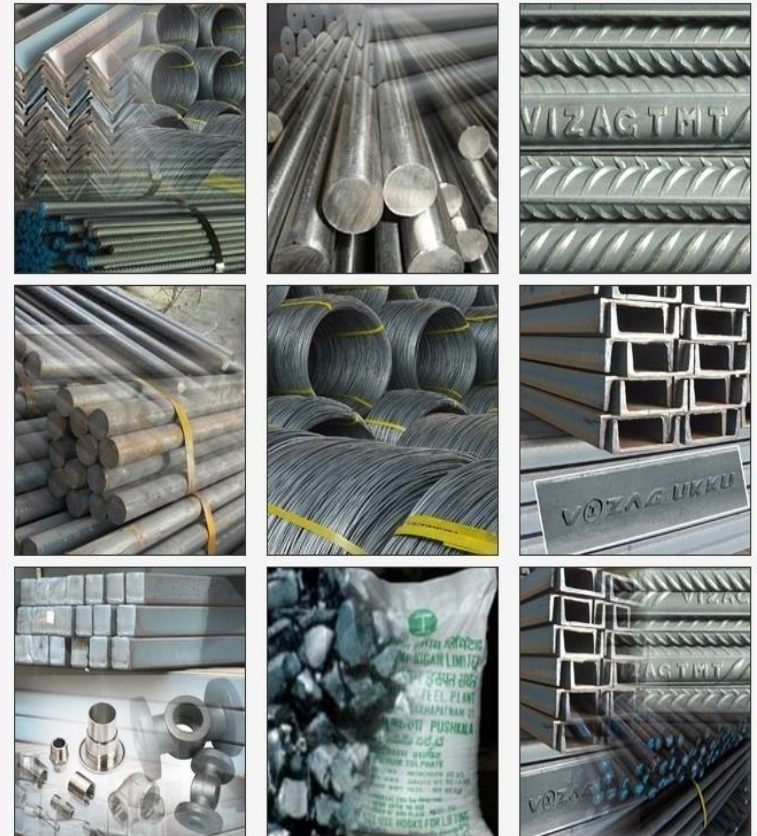
**Transmission Line
Towers Plant**

Wheel Plant

RINL – Growth Plan

- RINL's completed Upgradation & Modernization for 7.3 MTPA of Crude Steel.
- Products includes bars, rods, wire rod and structural's and Value Added Products
- Vision envisages growth to 20 Mtpa by 2032-33 in phases

Turnover (2020-21)- 17969 INR Cr



Major Accreditations

The 1st ISP to be certified for Quality, Health & Safety and Environment

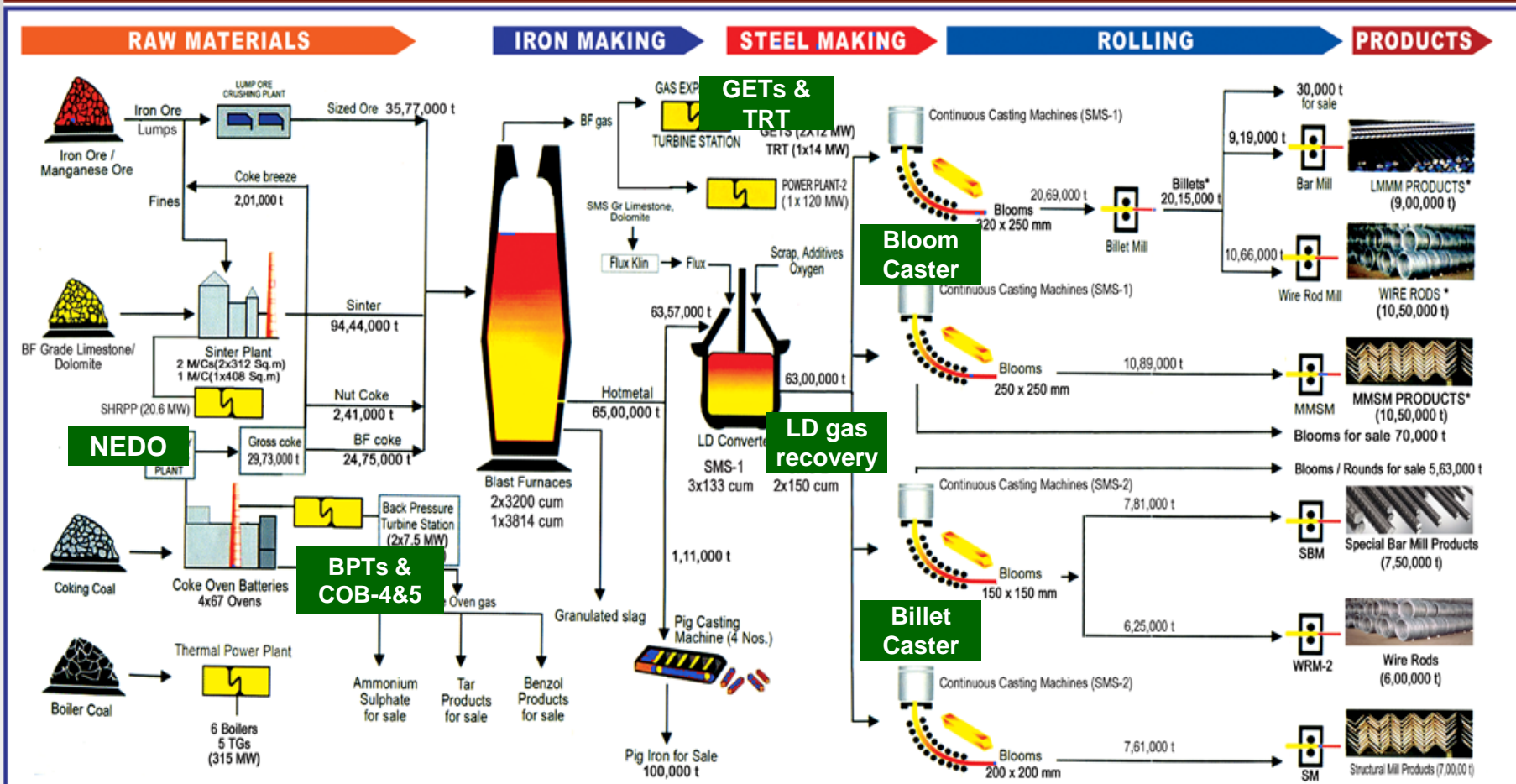
1st Steel Plant to get ISO 50001 certification for Energy Management

1st Steel PSE to sign Integrity Pact of Transparency International

CMMI Level 3 certification for IT Systems and ISO 27001 for ISMS

1st ISP to be 5S Certified for the whole plant

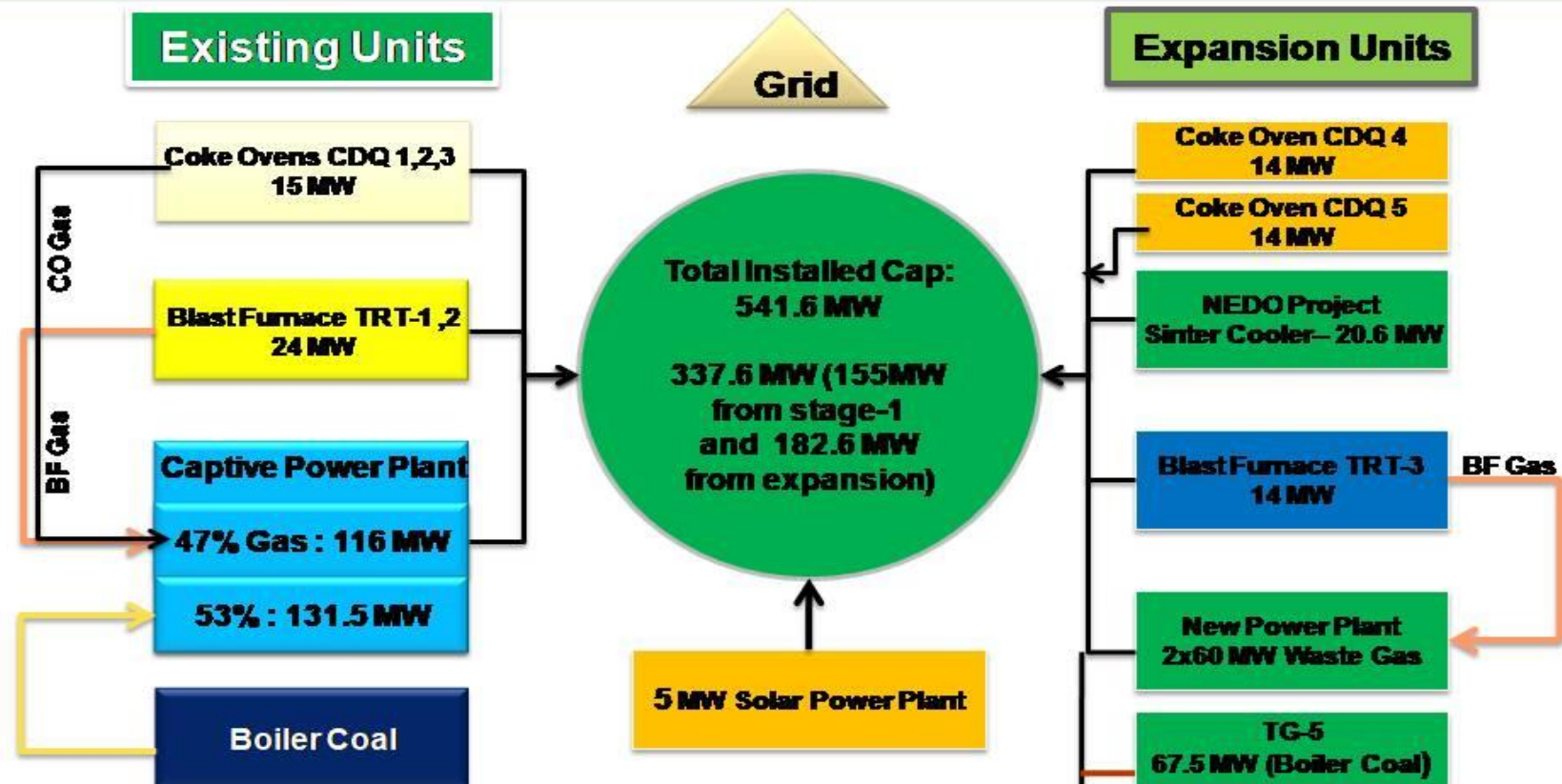




- Sinter Plant with NEDO
- CO Battery with Coke Dry Quenching and Back Pressure Turbine Station.
- BFs with Gas Expansion Turbine & Top Recovery Turbine station.
- SMS-1 & 2 with LD gas recovery plant.
- Continuous Bloom & Billet caster.

Power Generation capacity from Waste Energy (MW)

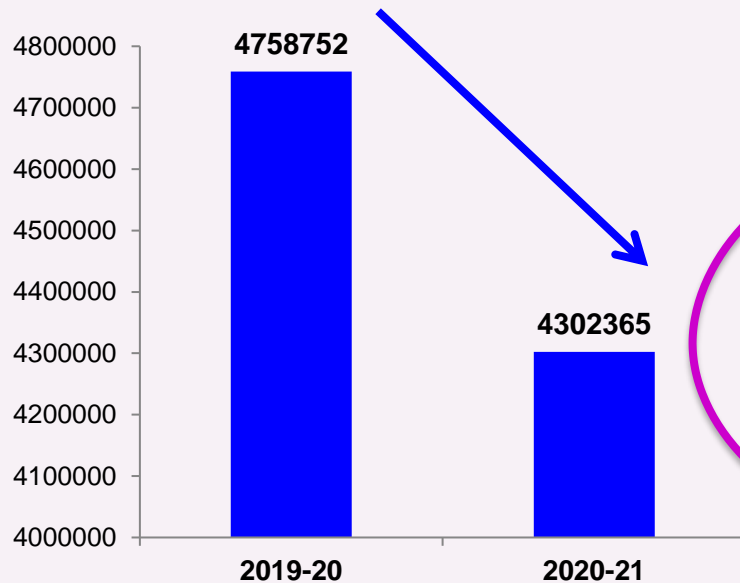
Power Generation capacity from Waste Energy (MW)



Total Installed capacity:	541.6 MW
Total Power Gen from Waste Energy incl Solar	337.6 MW
% of Power Generation through Waste Energy:	63.3%

Impact of Covid-19

Crude Steel Production (tons)

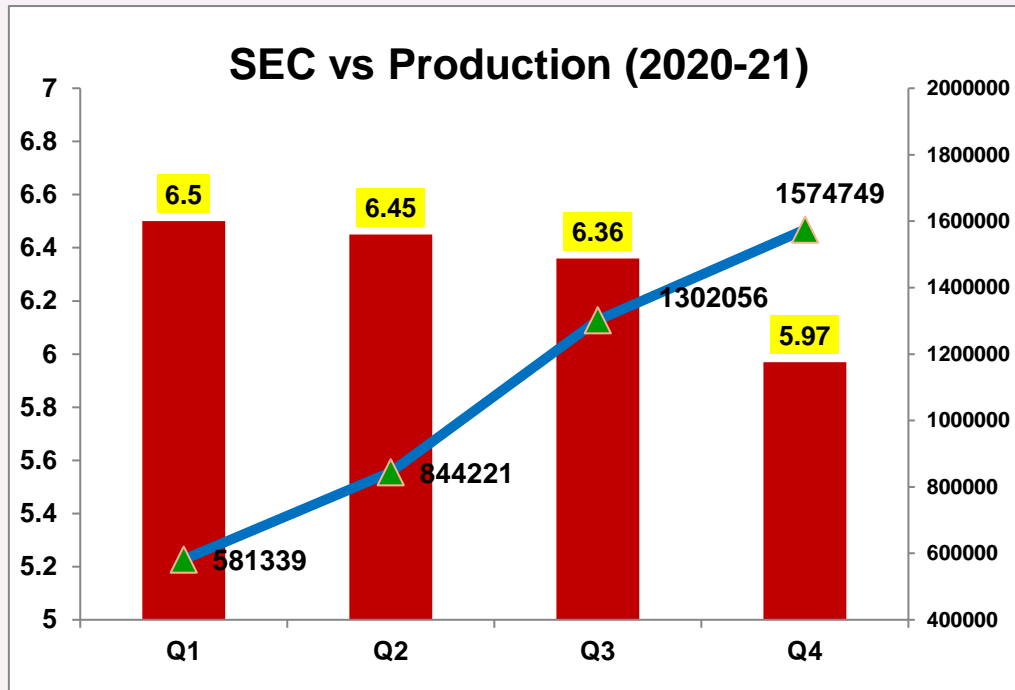


- 1) Reduction of oven pushing at coke oven.
- 2) Stoppage of Sinter M/c
- 3) Stoppage of Blast Furnaces (2 nos.).
- 4) Stoppage of SMS-1
- 5) Stoppage of Rolling Mills

Energy Shortage
High energy consumption (7 Gcal/tCS)

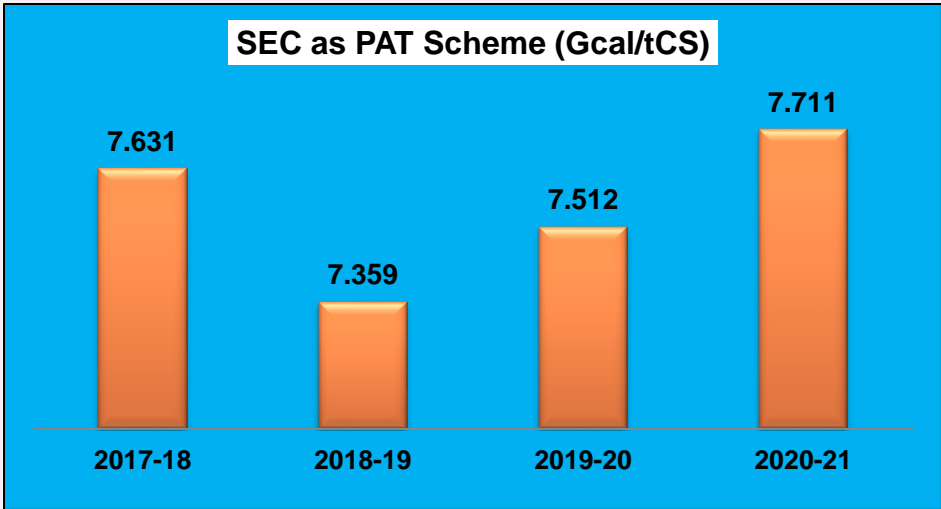
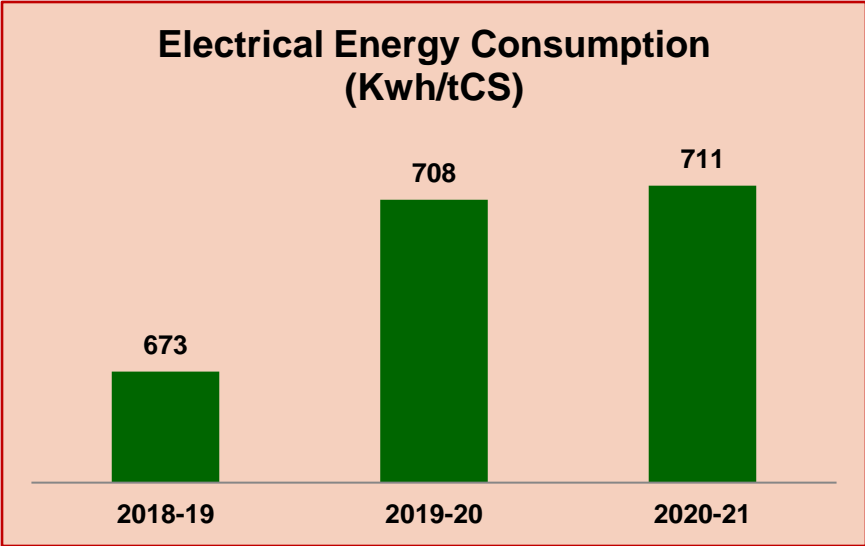
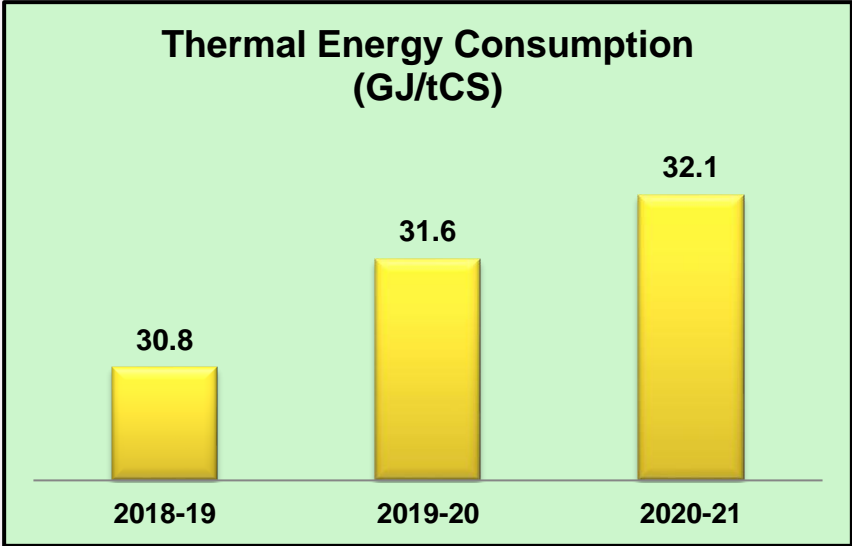
Impact of Covid-19

2020-21 Expected SEC (Gcal/tCS)	2020-21 Actual SEC (Gcal/tCS)
6.35	6.25

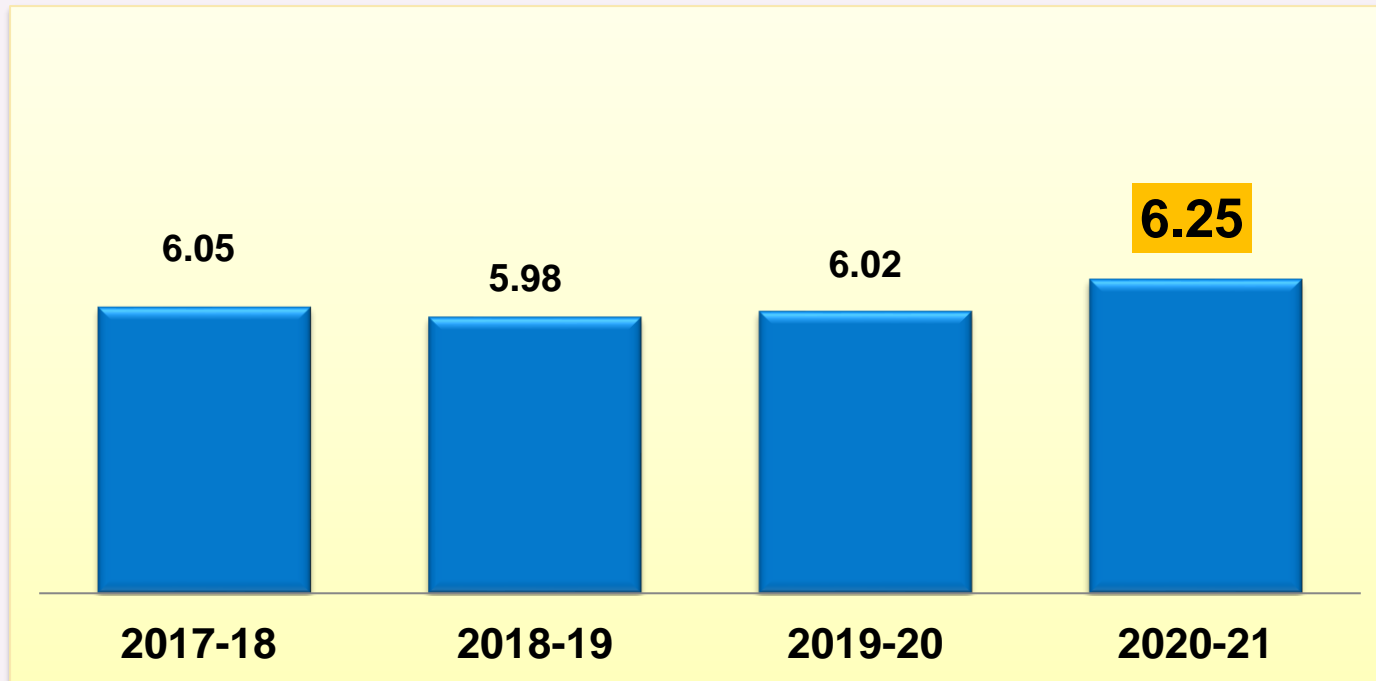


- 1) Inter connection of SMS-1 LD Gas holder with SMS-2 holder pipe line.
- 2) Optimizing electricity load across the plant.
- 3) Focusing on Waste Heat Recovery
- 4) Gradual ramping of production of BFs.

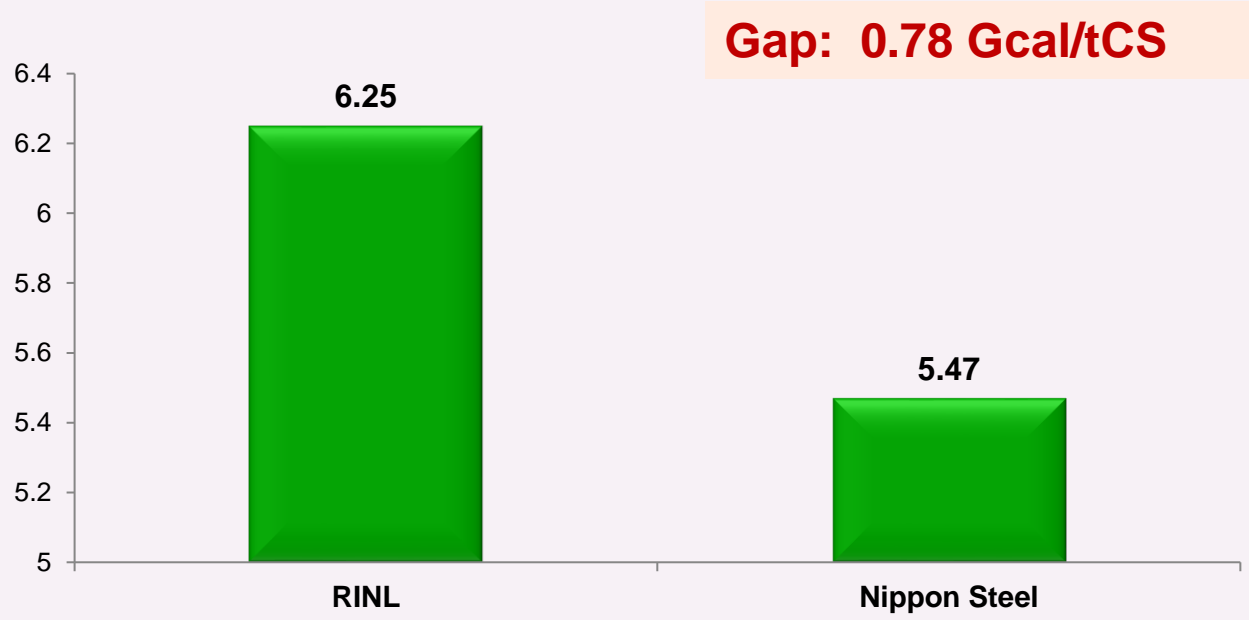
Energy Consumption Overview



Sp. Energy Consumption-Gcal/tCS



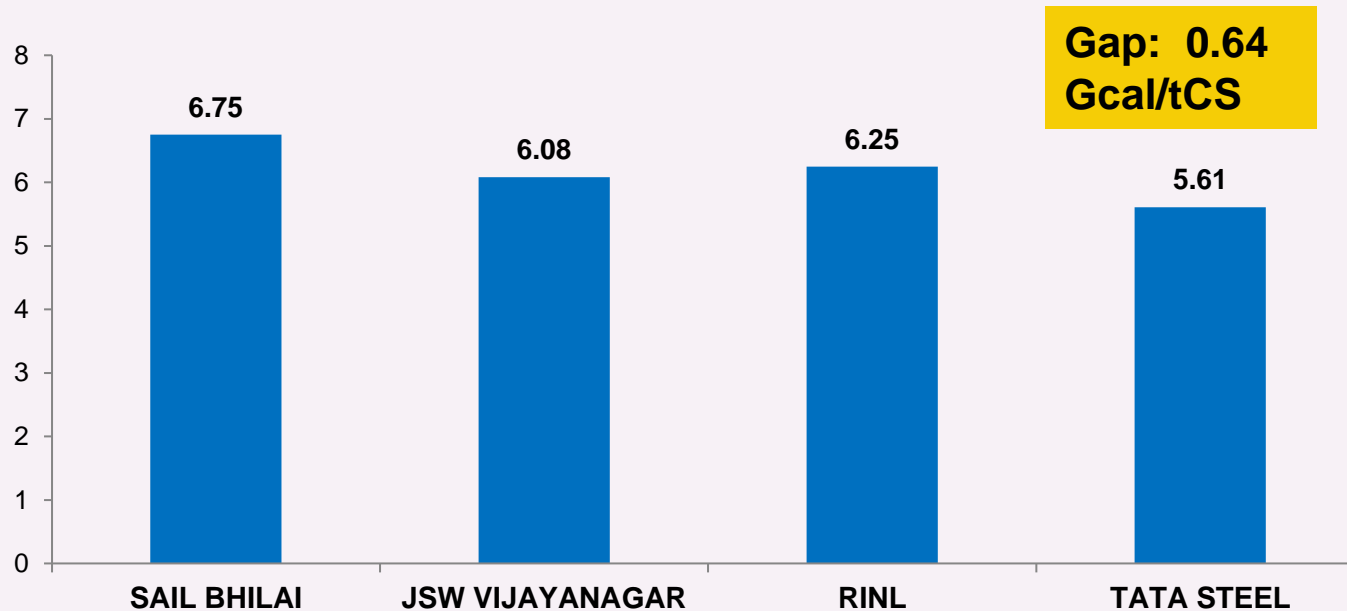
International Bench Marking of SEC(Gcal/tCS)



Bench Marking with Nippon Steel(2020-21)

Energy(2020-21)		GHG Emission		Gap :0.78 Gcal/tCS
RINL	NSC	RINL	NSC	
6.25	5.47	2.69	1.98	<p>1) Scrap usage : 200 kg/thm(As per Japanese Industry)-RINL: 80 kg/tCS</p> <p>2) All Energy Conservation technologies Coke Dry Quenching, Top Pressure Recovery Turbine, BOF Gas Recovery, Sinter Cooler waste heat recovery Pulverized Coal Injection, BF stoves Heat Recovery, Billet Caster, Hot Charging, Regenerative Burners, Coal Moisture Control Sensible Heat recovery from BOF gas</p> <p>3) Waste Plastics Injection and tires(0.2 million tons- 6 kg/tCS)</p> <p>4) Petro fuel 16 lts/Tcs</p>

Benchmarking of Energy Consumption-Gcal/tCS



Energy(2020-21)		GHG Emission		Gap :0.64 Gcal/tCS
RINL	Tata Steel	RINL	Tata Steel	
6.25	5.61	2.69	2.28	

Energy Saving projects implemented in last three years-(2018-19)

S.No.	Title of Project	Energy Savings in		Investment (Rs Million)
		Gcal/MKwh	Rs Millions	
1	Commissioning of COB-5 Turbine	21812	145	800

ENCON Projects with NO/Little Investment -2018-19

S.No.	Title of Project	Energy Savings in	
		Gcal/MKwh	Rs Millions
1	Improvement in Gross coke yield at coke oven from 72.34% to 72.88%	206997	261
2	Reduction of heat consumption at Blast Furnace-3 from 432 Mcal/tHM to 403 Mcal/tHM	73035	92
3	Improvement in Pulverized coal injection at BF-2 from 3.8 to 27.8 Kg/tHM at Blast Furnace	54115	68
4	Improvement in Pulverized coal injection at BF-3 from 75.9 to 95.4 Kg/tHM at Blast Furnace	69073	87

ENCON Projects with no Investment (2019-20

S.No.	Title of Project	Energy Savings in	
		Gcal/MKwh	Rs Millions
1	Improvement in Pulverized coal injection at BF-2 from 27.8 to 107.2 Kg/tHM at Blast Furnace	223830	308
2	Improvement in LD gas yield at SMS-1 from 104 to 109 Ncum/tCS	22457	31
3	Reduction in Coke Breeze consumption at SP-1 from 54.8 kg/tGS to 53.5 Kg/tGS	38888	54
4	Reduction in BF Fuel rate from 541.6 kg/tHM to 538.9 kg/tHM	95237	131
5	Enhanced argon production by increasing argon recovery from Air Separation Unit-5	0.16	70

ENCON Projects with Investment (2019-20)

S.No.	Title of Project	Energy Savings in		Investment (Rs Million)
		Gcal/MKwh	Rs Millions	
1	Improvement in Power Generation at GETS from 1.07 MW to 3.37 MW	20	142	5
2	Improvement in Power Generation at TRT from 5.39 MW to 6.80 MW	12	87	10
3	Increasing Hot Blast Temperature of BF 1 &2 by Inter Connection of Turbo Blowers-4 to BF-1&2 cold blast line at Captive Power Plant-1	67752	188	147
4	Modified Pass Design for Round 75 Rolling at MMSM	0.10	0.71	0.02

ENCON Projects with Investment (2020-21)

S.No.	Title of Project	Energy Savings in			Investment (Rs Million)
			Unit	Rs Millions	
1	Interconnection of LD Gas holder -1&2	99150	Gcal	128	8
2	Improvement in Power Generation at GETS from 3.37 MW to 6.16 MW	24.4	Mkwh	174	5
3	Improvement in Power Generation at SHRPP from 0.15 MW to 2.49 MW	20.5	Mkwh	146	10
4	Installation of 0.5MW roof top solar power plant	0.14	Mkwh	1.01	RESCO model

ENCON Projects with no Investment (2020-21)

S.No.	Title of Project	Energy Savings in	
		Gcal/MKwh	Rs Millions
1	Reduction in Sp. Power Consumption at SP-2 from 64.07 to 62.85 Kwh/tGS	2.8	20
2	Reduction in Sp. Heat Consumption at SP-1 from 27 to 26 Mcal/tGS	4080	5
3	Reduction in Sp. Power Consumption at SP-1 from 64.95 to 63.03 Kwh/tGS	7.8	56
4	Improvement in Pulverized coal injection at Blast Furnace-1 from 33.36 to 104 Kg/tHM	256953	331
5	Reduction in fuel rate at Blast Furnace-3 from 530.6 to 526.5 Kg/tHM	29537	38

ENCON Projects with no Investment (2020-21)



S.No.	Title of Project	Energy Savings in	
		Gcal/MKwh	Rs Millions
6	Reduction in Sp. Heat Consumption at SMS-2 from 45 to 35 Mcal/tCS	23544	30
7	Reduction in Sp. Power Consumption at SMS-2 from 119.26 to 113.06 Kwh/tCS	14.6	104
8	Reduction in Sp. Heat Consumption at CRMP-1 from 1380 to 1329 Mcal/tGL	13668	18
9	Reduction in Sp. Power Consumption at CRMP from 55.17 to 41.82 Kwh/tGL	7.27	52
10	Reduction in Sp.Power Consumption at WRM from 120.07 to 118.59 Kwh/tBI	1.12	8

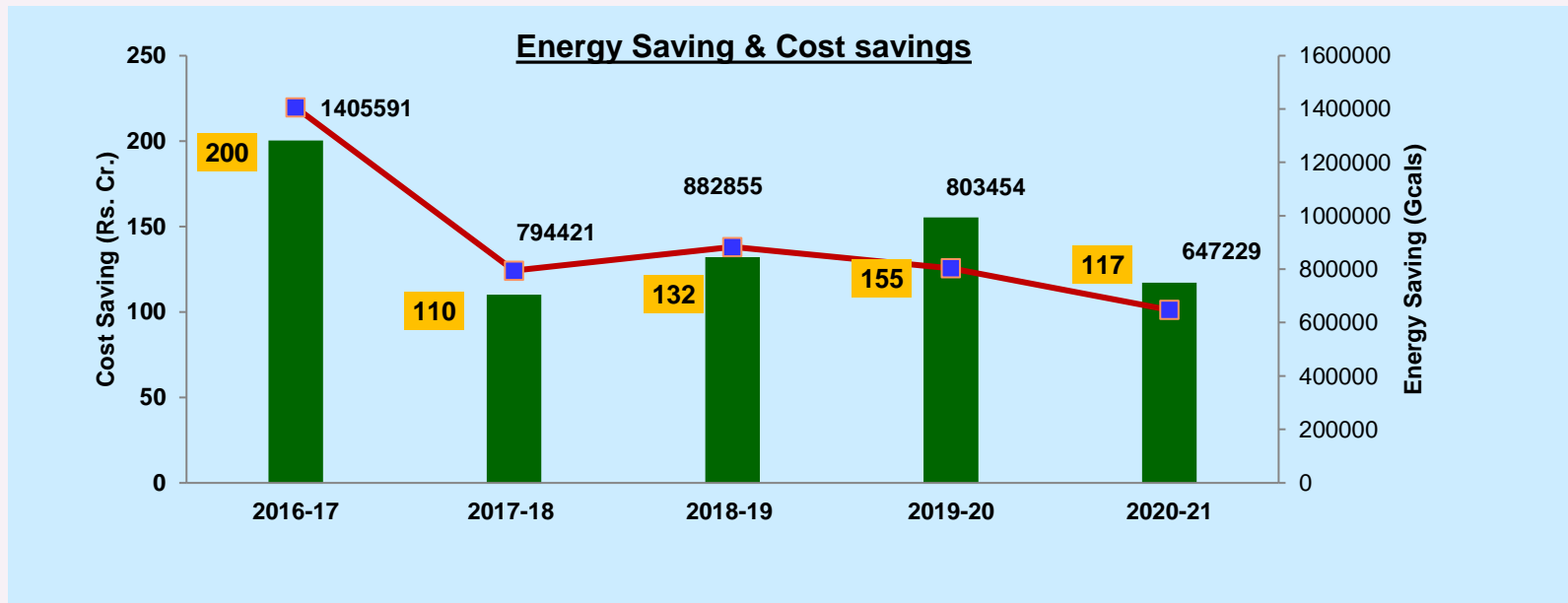
ENCON Projects with no Investment (2020-21)



S.No.	Title of Project	Energy Savings in	
		Gcal/MKwh	Rs Millions
11	Reduction in Sp. Heat Consumption at WRM-2 from 260 to 247 Mcal/tBI	5756	7
12	Reduction in Sp.Power Consumption at WRM-2 from 211.30 to 200.46 Kwh/tBI	4.8	34
13	Reduction in Sp. Heat consumption at BF from 494 Mcal/tHM to 491 Mcal/tHM	14045	18

Summary of the Projects identified & Implemented

YEAR	No of Projects	Thermal Savings (Gcals)	Electrical Savings (Million KWH)	Savings in Rs.Cr	Investment In Rs Cr	Savings (GcaltCS)
2018-19	26	745719	57.14	132	80	0.17
2019-20	25	621918	75.64	155.3	16.2	0.17
2020-21	17	446733	83.54	117	2.3	0.104



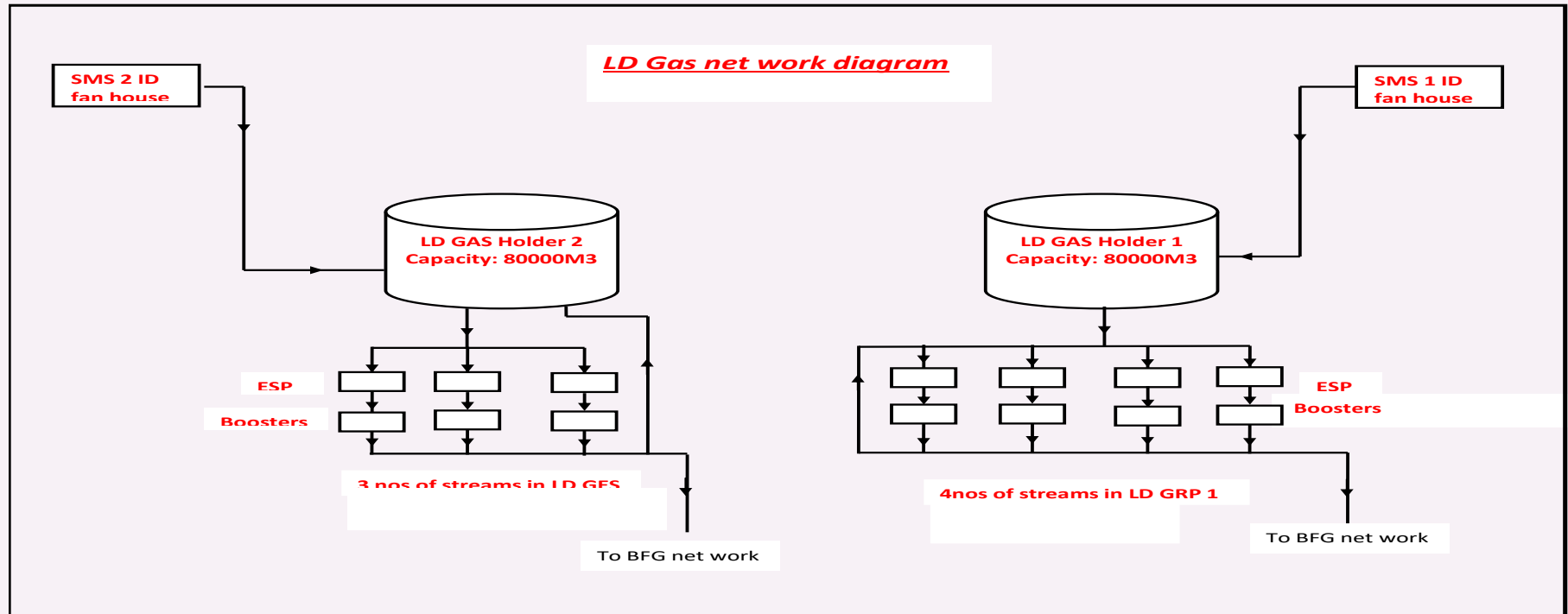
INNOVATIVE PROJECTS IMPLEMENTED

Name of the Project	Replicability	Impact on SEC (Gcal/tCS)	Annual Savings	Investment
			(Rs. In lakhs)	(Rs. In lakhs)
Inter connection of LD gas holder of SMS-1 & 2	Yes	0.023	1728	50
Connecting Gas holder 2 inlet duct from SMS2, directly to ESP suction header	Yes			30

INNOVATIVE PROJECTS IMPLEMENTED (2020-21)

LD GAS RECOVERY SYSTEM:

Steel is produced in LD converter. During the process of oxidation, waste LD gas is generated and it will be stored in LD gas holder to supply as a fuel of Reheating furnaces



Both are independent gas recovery systems. The gases are hazardous in nature and highly poisonous. The Gas has Calorific value of 1800-1900 Kcal/Ncum

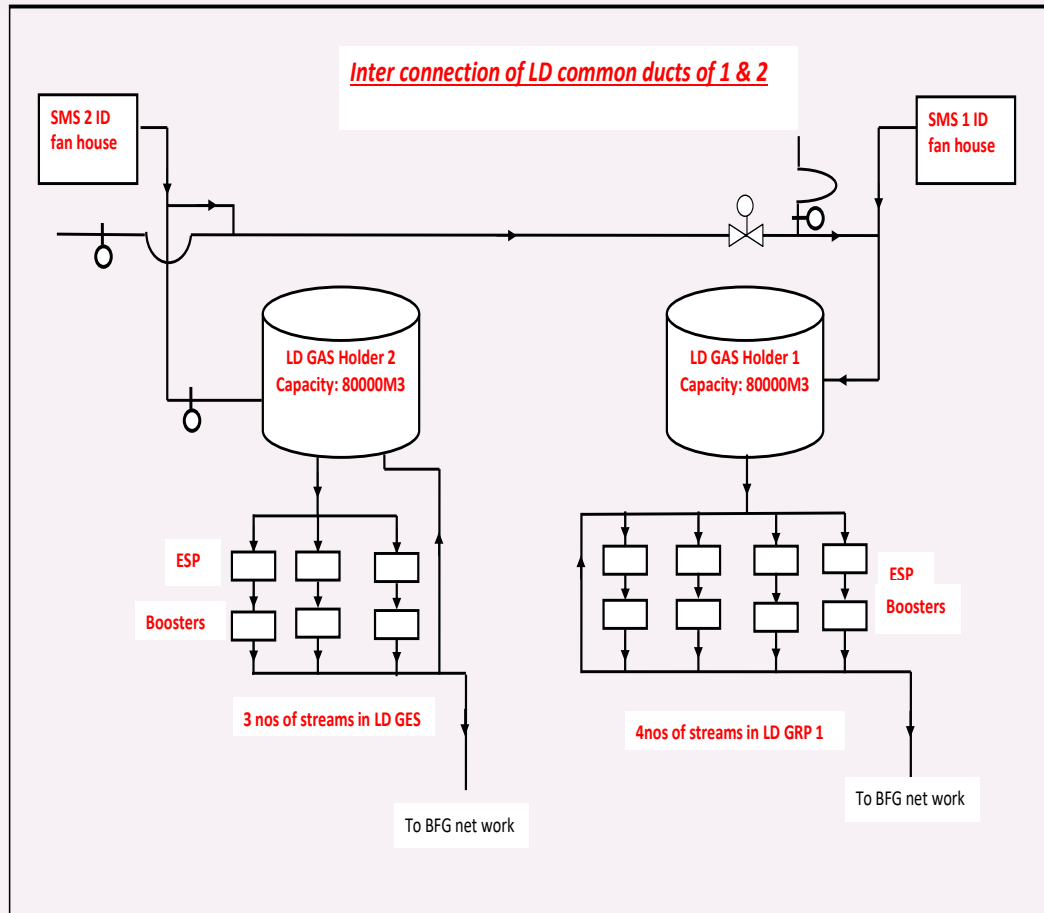
SMS-2 Gas holder break down in Sep-19 due to slippage of piston. Discussions with OEM for repair of gas holder.

Gas is not recovered and vented out in atmosphere.

INNOVATIVE PROJECTS IMPLEMENTED (2020-21)

Present Scenario (Problem)	Modification Done
<ol style="list-style-type: none"> 1. LD gas holder-2 is under Shutdown and No LD Gas recovery from SMS-2. 2. During COVID-19 Pandemic, Steel is produced from SMS-2 and rolling mills require energy. 3. SMS-1 is not producing Steel but Gas Recovery System is available. 	<ol style="list-style-type: none"> 1. Interconnecting of LD Gas holder-1 & 2

INNOVATIVE PROJECT-1 IMPLEMENTED (2020-21)



- New DN 1500 pipeline was laid to interconnect DN 2800 LD 2 common duct with the available DN 1500 COG line in the vicinity.
- New DN 1500 pipe line for a length of 22 mts was laid to interconnect DN 2800 LD 1 common duct with DN 1500 CO gas line.
- New DN 1500 valve is erected along with electrics and modification in PLC was also done for auto operation.
- Logic modifications were done in the PLCs of LD GRP 1, SMS1 and SMS 2 converters by incorporating additional safety interlocks

INNOVATIVE PROJECT-1 IMPLEMENTED (2020-21)

Benefits	
Volume Recovered	126.8 Million Ncum
Energy Savings	232163 Gcals
Cost Saving	31.8 Crores
Investment	50 Lakhs

INNOVATIVE PROJECT-1 IMPLEMENTED (2020-21)

Constraints

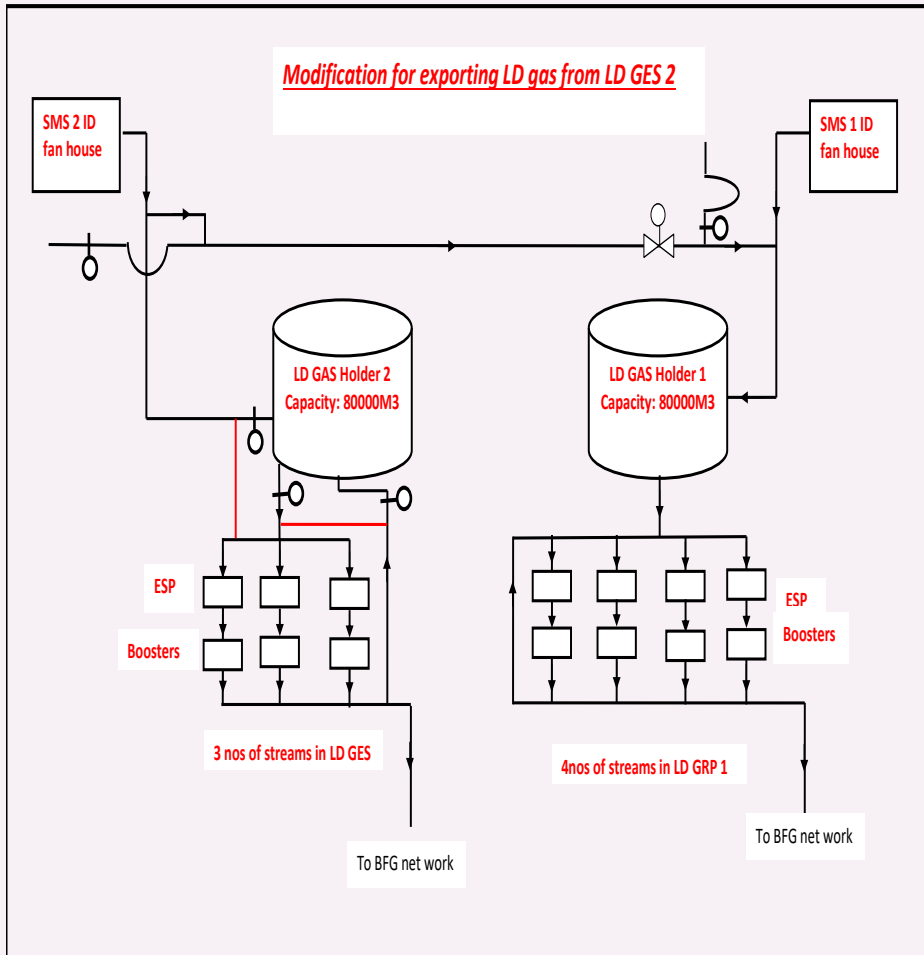
1. 99% heat recovered from Jun'20 to Sept'20
2. With increase in production from SMS-1, about 150 heats/month could not be recovered due to export constraint.
3. Risk of failure of gas booster due to non-availability of maintenance activity (as all boosters are continuously running)
4. Variation in Calorific value of Mixed Gas
5. During BF3 off blast, fluctuation in Mixed gas pressure.

Brainstorming was done to overcome the constraints and to ensure PPM for the existing boosters (to avoid break down).

- Both shops SMS1 & SMS-2 are running from Oct-20 onwards.
- Innovative idea has conceptualized to utilise the boosters of GRP-2 and considering the gas pipeline (DN 2800) as virtual Gas holder.

Connecting Gas holder 2 inlet duct from SMS2, directly to ESP suction

INNOVATIVE PROJECT-2 IMPLEMENTED (2020-21)



INNOVATIVE PROJECT-2 IMPLEMENTED (2020-21)

Benefits	
Volume Recovered	22 Million Ncum
Energy Saving	40164 Gcals
Cost Saving	5.5 Crores
Investment	30 Lakhs

Utilisation of renewable energy sources-Solar

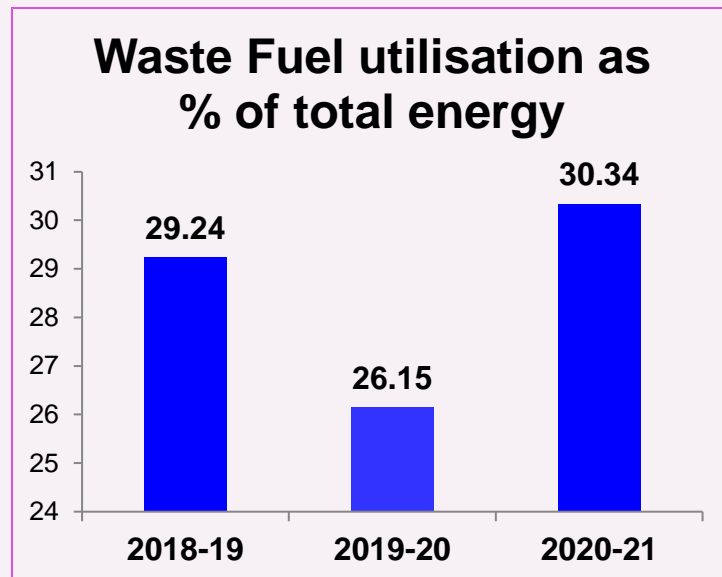
Energy Utilization

- ❑ RINL has been exempted from complying RPPO.
- ❑ RINL commissioned 5 MW Solar Power Plant
Investment: Rs 36 cr
- ❑ RINL commissioned 0.5 MW Roof Top Solar Power Plant at three Building
Investment: RESCO Model



Utilization of Waste Material as fuel

Type of Waste Material used	Quantity of waste material used (Tons or any other eqvt Unit)	Equivalent of Conventional energy used (kWh of electricity or Tons of Coking Coal)	Gcal
Coke Dust	20397	6802	138740
LD Slag	110744	1000	110744
Met Waste	389213	500	194607
Tar sludge	4425	7100	31418
Benzol muck	199	7100	1413
ASP sludge	242	7100	1718
BF gas	7929000	831	6588999
LD gas	346400	1831	634258
Coke dust(sold)	37917	775	29386
Granulated Slag	2135256	1070	2284724



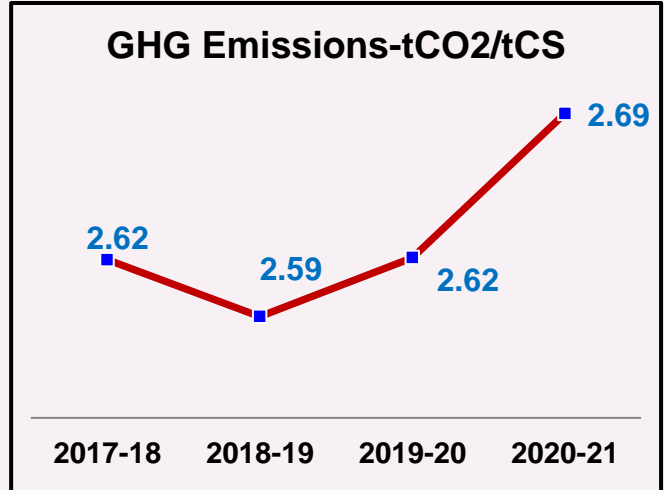
GHG Inventorisation

As per ISO:14064:-

Emission	Details
Scope 1	Direct emissions from site chimneys determined from straight carbon balance
Scope 2	Upstream emissions of electricity and steam from site.
Scope 3	Other upstream emissions by-products from site



Scope 1	Scope 1.1	Scope2	Scope 3	Total CO2(t CO2/TCS)
87,79,241	31,38,975	4,69,261	-8,31,472	2.686



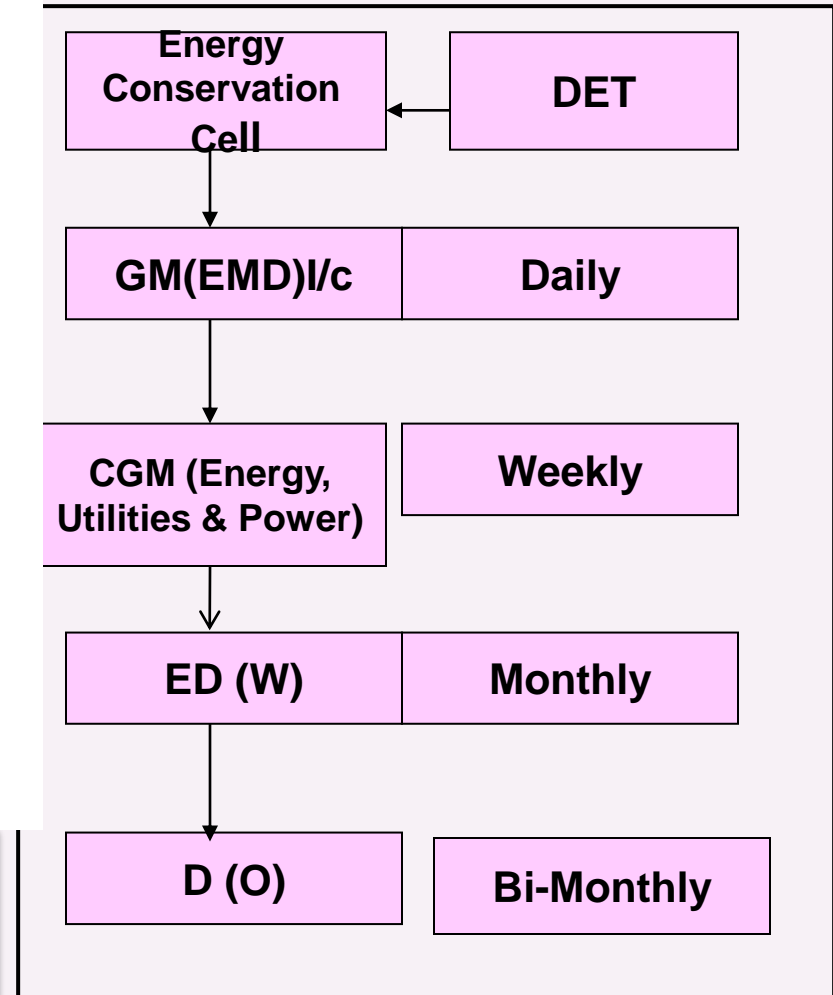
Involvement of employees, Team Work and Monitoring



- **Employee Involvement Through**
 - Quality Circles, Suggestion Schemes, Department Energy Teams, Participation in Energy Conservation Campaigns, Cost Control Campaigns, Water Saving Campaigns
- **Implementation Methods**
 - Low Cost/No Cost Ideas (Process Improvements, House Keeping Measures, etc) will be Implemented by Frontline officers
 - Medium Investment Projects through AMR Schemes
 - High Investment Schemes through Board Approval/COM
 - Special Task Forces for Implementing Important Energy Conservation Projects for Sinter Cooler, Steam Utilization and By product gases usage.

Monitoring Format

DAILY ENERGY REPORT									
Production			Shop	PARAMETER	UNIT	31-Mar-21			
Monthly Plan	ACTUAL On Site	For The Month				INSTR	CON	QJM	
7000	414	406	COCCP	GROSS COKE YIELD :	%	73.0	73.1	73.1	
Plan/day	77	2293	Bot-1	Met.Coke Yld :	%	68.2	65.8	65.8	
	87	2621	Bot-2	C.O. GAS YIELD :	kg/MTM	335	338	331	
	79	2450	Bot-3	SP. HEAT. CONS :	kg/MTM	623	668	660	
	88	2681	Bot-4	C.O. GAS C.V. :	KCAL/MTM	4150	4246	4200	
	83	2546	Bot-5						
806000	25825	781851	SP	SP. HEAT. CONS :	kg/MTM	21	19	20	
	8925	290749	SP-1(M/c-1)	SP. HEAT. CONS :	kg/MTM	28	18	20	
	6890	193540	SP-1(M/c-2)	SP. HEAT. CONS :	kg/MTM	28	35	35	
	10010	297562	SP-2	SP. HEAT. CONS :	kg/MTM	9	8	10	
6100	191450	579350	BF-1	SP. HEAT. CONS-1 :	kg/MTM	508	505	479	
5500	179700		BF-2	SP. HEAT. CONS-2 :	kg/MTM	308	575	526	
7400	208200		BF-3	SP. HEAT. CONS-3 :	kg/MTM	400	456	473	
19000	579350		BF(All)	SP. HEAT. CONS (All) :	kg/MTM	493	506	491	
0	0		BF(All)H&BF	H.P. GAS YIELD :	kg/MTM200	3007	3149	3104	
0	0		BF(All)H&BF2	COKE RATE BF1 :	kg/MTM	325	455	424	
0	0		BF(All)H&BF3	COKE RATE BF2 :	kg/MTM	433	461	433	
0	0		BF(All)H&BF3	COKE RATE BF3 :	kg/MTM	420	400	408	
1037	1112		BF(All)H&BF3	COKE RATE (All) :	kg/MTM	433	466	421	
1039	1110		BF(All)H&BF3	Pul Coal BF1 :	kg/MTM	20	112	112	
1037	1113		BF(All)H&BF3	Pul Coal BF-2 :	kg/MTM	100	103	104	
1035	1114		BF(All)H&BF3	Pul Coal BF-3 :	kg/MTM	110	106	113	
2.0	2.0		BF-SP1	Pul Coal (All) :	kg/MTM	82	107	110	
1.6	2.0		COBB-2	H.P. GAS C.V. :	KCAL/MTM	710	837	827	
2.5	2.3		COBF-3	COAL RATE :	kg/MTM	786	793	787	
320000	10227	301491	SMS-1	HOT METAL RATE@ :	kg/MTM	1000	995	1007	
270000	9582		LS	SP. HEAT. CONS :	kg/MTM	94	26	27	
2160	70	66.5	CS	CONV.GAS YIELD :	kg/MTM	93	105	99	
			Hearts	SP OXYGEN CONS :	kg/MTM	57	57	57	
				SP ARSON CONS :	kg/MTM	226	47.7	84.8	
				SP LHM CONS :	kg/MTM	0.19	0.28	0.27	
270000	7590	263575	SMS-2	HOT METAL RATE@ :	kg/MTM	1013	1014	1014	
261000	7324	254116	LS	SP. HEAT. CONS(TOTAL) :	kg/MTM	42	32	28	
1740	50	56.0	CS	CONV.GAS YIELD :	kg/MTM	88	74	78	
590000			Total Hearts	kg/MTM	130	120	122.5		
531000			LD Gas CV	kg/MTM	1760	1870	1851		
			Liquid Steel	kg/MTM	19032	17817	565066		
			Crude Steel	kg/MTM	18129	16906	536615		
			Sp. Heat(COBF-2)	kg/MTM	940	857	857		
195000	5630	196037	BILLETS	SP. HEAT. CONS :	kg/MTM	421	408	450	
83000	1901	74524	BARs	SP. HEAT. CONS :	kg/MTM	20	28	21	
0	3577	94031	WRM-1	SP. HEAT. CONS :	kg/MTM	248	250	255	
99000	2023	49814	WRM-2	SP. HEAT. CONS :	kg/MTM	263	243	254	
58000	1897	75336	MMSA	SP. HEAT. CONS :	kg/MTM	400	406	440	
70000	2240	43620	SBA	SP. HEAT. CONS :	kg/MTM	300	227	267	
19000	1398	43669	STM	SP. HEAT. CONS :	kg/MTM	310	303	282	
TRP	236	236	TRP	SP. HEAT. CONS :	kg/MTM	749	776	781	
PP-2	119	114	PP-2	SP. HEAT. CONS :	kg/MTM	720	753	764	
CEST	7.5	7.4	PP-2	Heat Rate (pp-2) :	kg/MTM	3071	3124	3092	
TRT	9.9	9.0		Steam Rate (PP-2) :	kg/MTM	3.93	3.76	3.73	
WHR	47.6	42.8		POWER GEN. -BPTS	MW	25.9	26.8	23.6	
Temp	40.8	36.0		POWER GEN. - TRT + BPT	MW	13.7	17.4	16.5	
Plant Load	444.0	429.3		POWER GEN. -NED0	MW	5.0	3.4	2.8	
Steam (PP-1)	34650	165645	LOSSES	C.O.GAS BLEEDING :	%	0.2	0.00	0.00	
B Coal (PP-1)	4486			H.P.GAS BLEEDING :	%	2.0	4.36	8.21	
Steam (PP-2)	10717	314772		OXYGEN BLEEDING :	%	2.2	3.6	2.7	
VM (C Cool)	25.59	25.86	PLANT	NITROGEN BLEEDING :	%	13.9	38.4	40.0	
Ash (C Cool)	9.23	9.11	A.P.P	SP. POWER CONS :	kg/MTM	297	399	380	
VM (Coke)	12.27	0.98	TRP	SP. ENERGY CONS :	kg/MTM	3.80	5.92	6.09	
Ash (Coke)	0.60	11.81		OIL CONSUMPTION	KL	167	0	0.0	
				Oil used NG	kg/MTM	298	324	314	



- Energy Savings are quantified with respect to displacement of Boiler Coal
- Electrical Savings are quantified by pegging with Electricity imported.
- Savings are certified by Energy Auditors

Energy Management System ISO:50001

Features:

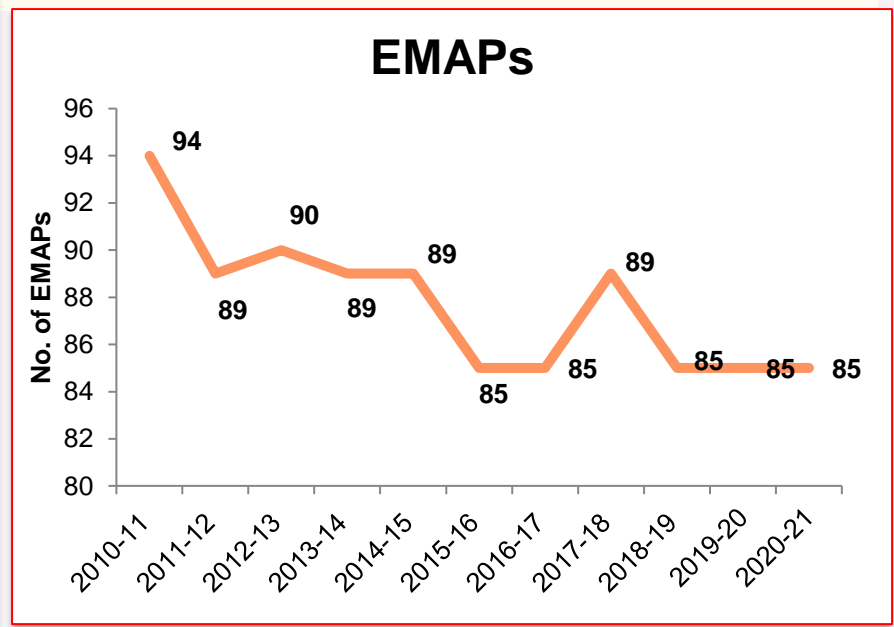
- ❑ Significant Energy Use
- ❑ Developing Energy Management programmes.
- ❑ Operational control of identified energy aspects
- ❑ Monitoring and Measurement
- ❑ Risk & Opportunities
- ❑ Internal Audit
- ❑ Management Review
- ❑ **Certified for ISO: 50001, Ver 2018 in July'21.**



Implementation of Corrective/Preventive actions

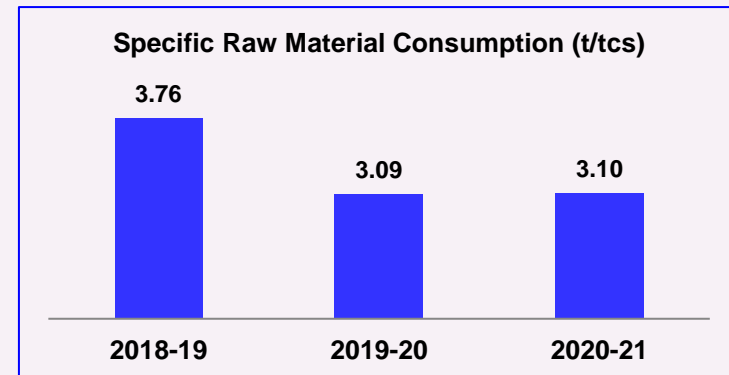
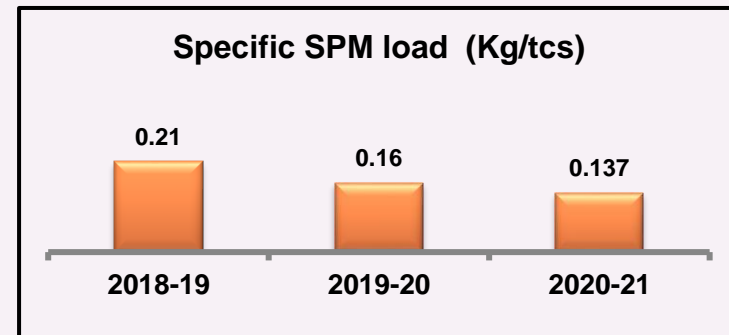
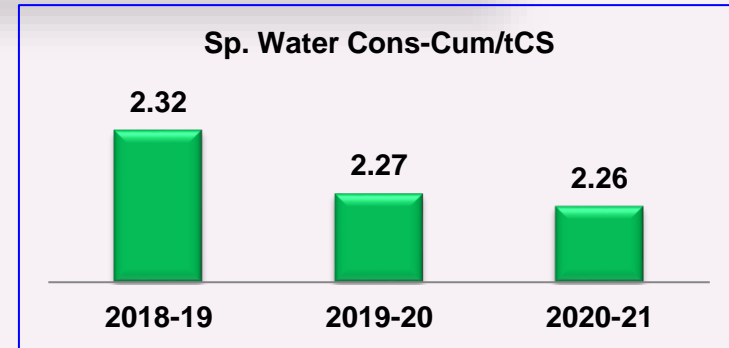
Bureau Veritas (India) Pvt. Ltd.		RASHTRIYA ISPAT NIGAM LTD		
To be completed by Bureau Veritas				
Date	Organization	Contract n°	Report n°	
23-02-2021	RASHTRIYA ISPAT NIGAM LTD	4506174	50kS2VSS-JN02	
Non Conformity Observed During		2nd Surveillance audit		
Process		SMS - Steel Melting Shop -2		
Standard		ISO 50001:2018		
Clause		50k-6.1 Actions to address risks and opportunities		
Site Name		HEAD OFFICE		
Non Conformity Description				
Standard requirement: 6.1.2 The organization shall plan: a) actions to address these risks and opportunities; b) how to: 1) integrate and implement the actions into its EnMS and energy performance processes;				
Description of the Non-conformity: The process of implementation of Risk mitigation measures is not effective.				
Objective Evidence: Following Risk mitigation measures have been decided as recorded in Risk assessment record EnMS-R-SP-14 dated 21 Jan 2021 since the total risk score is 59 out of 225 due to external and internal issues. 1. Ensuring alternate suppliers/maintain buffer stock 2. Contract maximum demand agreement with Andhra Pradesh Government 3. Achieve Sustainable plan target by implementing various energy savings – Core business objectives and strategy (Internal issue) 4. Operating facility (Plant) at rated (Envisaged capacity) – Asset Management Plan 5. Augmentation of capacity to enhance output (Asset Management Plan). However, there is no evidence of implementation of above-mentioned Risk mitigation measures.				
Grade	Lead Auditor	Auditor		Organization Rep.
Minor	V S SATISH KUMAR	V S SATISH KUMAR		Mr. K Srinivas / Mr. M Laxmi Nayak.
To be completed before				
27-03-2021	VSS-IN	1-1CM9LMJ	VSS-IN	1-1CM9LMJ
To be completed by the organization				
Root Cause Analysis (What failed in the system to allow this non conformity to occur ?)				
Status of implementation of Risk mitigation measures for various energy using facilities was recorded in different log book which could not be shown due to misinterpretation of the standard requirements.				
Correction (What is done to solve this problem)				
Status of risk mitigation measures implementation has been now added as Annexure-3 in risk assessment document and filled up.				
Corrective Action (What is done to prevent reoccurrence)				
Procedure for Risk management is revised by incorporating the Annexure-3. An awareness session is conducted on the revised procedure and importance of updating the annexure-3 with teh details of implementation of risk mitigationmeasures.				

- Plant has taken up Energy Objectives and Energy Management Action plans(795 Nos) to reduce energy consumption.
- DEPARTMENTAL ENERGY TEAMS** were constituted in various departments. The teams identified specific projects
- Departments conducted energy audits at various equipment through Departmental Energy Audit Teams



Environmental Projects & Projects linking with Carbon Emission Reduction

Projects	Benefits
Revamping of Burden handling & Cast House FE system of Blast Furnace-1.	Reduce Dust emissions
Balacheruvu, Waste Water Treatment Plant - Commissioned in July 2014.	253 Million Gallons
Commissioning of Appikonda Waste Water Treatment Plant	220 Million Gallons
The Digital display board at Main Gate was inaugurated by CMD on 5th June 2014 for displaying the CAAQM and Stack analyzers.	Awareness
Dry Fog Dust Suppression System (DSS) in Expansion area of Raw Material Handling Plant, Sinter Plant & Blast Furnace.	Reduced fugitive emissions
Rain water harvesting scheme near 18 MLD plant	Ground water recharging



Energy Conservation Projects identified for next three years

SI No	Name of Energy Conservation Activity	Year	Impact (Mcal/tCS)
1	To improve Pulverized coal injection at BF-1 from 104 Kg/tHM to 125 kg/tHM at Blast Furnace	2021-22	16.05
2	To improve Pulverized coal injection at BF-2 from 83 Kg/tHM to 125 Kg/tHM.	2021-22	32.11
3	To improve power generation at NEDO from 2.5 MW to 5 MW.	2021-22	12.26
4	Re-commissioning of LD Gas holder-2	2021-22	34.16
Total Savings			94.58

Environmental Projects & Projects linking with Carbon Emission Reduction

Name of Projects	Registration Number	Expected CERS
BF3 Top Pressure Recovery Project	9613	60410
COB-4 Turbine at Battery-4	9988	68540
Waste Heat Recovery from Stoves of BF-3	10024	44932

- ❑ 4 No. of projects registered (TRT, COB4, BF3-WHR).
- ❑ UNFCCC issued 1,29,356 CERs to RINL for two CDM projects.
- ❑ Verification of CDM Project “BF3-WHR” completed, UNFCCC issued 42,573 CERs .

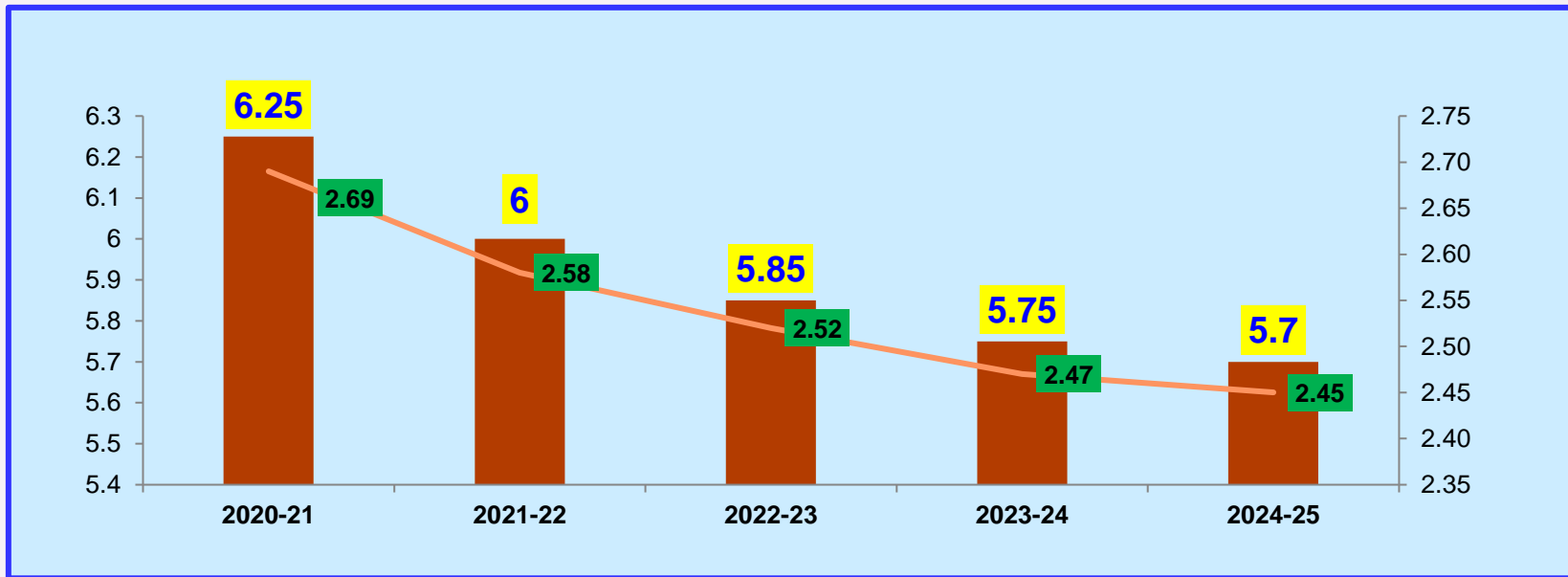
Adoption of Green Technologies

Name of Technology	Features	Energy Savings(TOE)	GHG redn(tCo2)
<u>Coke Dry Quenching Plant</u>	Power gen: 2X7.5MW	115285	689586
<u>Top Pressure Recovery Turbine</u>	Power gen; 2x12 MW	21257	127152
<u>LD Gas Recovery System</u>	80000 Cum	58022	347060
<u>Evaporative Cooling System</u>	13 ata steam: 19 t/hr	12173	72814
Preheating of combustion air at CRMP	Air preheating: 250degc	3469	21062
Gas and air recuperators in ROLLING MILLS	Air : 450 degC Gas:250 degC	16105	57088
Reducing GHG emission by about 13 lakh tons annually			

Adoption of Energy Efficient Technologies-Unique Features of RINL

Name of Technology		Level of Diffusion
<u>Coke Dry Quenching Plant</u>	First Time in India(1990)	13.5%
<u>Top Pressure Recovery Turbine</u>	First Time In India(1993)	13.9%
<u>LD Gas Recovery System</u>	First Time in India(1991-93)	50%
<u>Evaporative Cooling System</u>	First Time in India(1993)	25%
Sinter Cooler Waste Heat Recovery(Power Gen)	First Time in India(2014)	5%

Long Term Target/Roadmap for Energy Consumption & GHG emissions.



Beyond 5.7 Gcal/tCS, RINL explore

- Injection of PCI more than 150 kg/THM*
- Increased use of Scrap based on circular economy*
- Usage of Natural Gas in Blast Furnace.*
- Harnessing JV with Multinational agencies for Technology deployment in Coal Moisture control, Regenerative Burners, Sp Exhaust Gas heat recovery etc.*

Awards

- **CII National Award for Excellence in Energy Management & National Energy Leader Award-2020**
- **National Energy Conservation Award-1st Prize from Ministry of Power-2019**
- **CII National Award for Excellence in Energy Management & National Energy Leader Award-2019**
- **CII National Award for Excellence in Energy Management-2018**
- **CII National Award for Excellence in Energy Management-2017**

Thank you



राष्ट्रीय इस्पात निगम लिमिटेड
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