CHITTARANJAN LOCOMOTIVE WORKS

PRESENTATION FOR NATIONAL AWARD FOR "EXCELLENCE IN ENERGY MANAGEMENT"

PRESENTED BY:-

Sri A. K. Keshari- CEE/P&I/CLW **Sri A.K. Hira- Dy.CEE/M**

Sri S. K. Mondal- SSE/P&I, Sri Ravindra Kumar- JE/Drg/P&I

ABOUT CLW

INCEPTION

The production activity started on 26th January, 1950 the day when India became Republic

FECILITIES

Area of the Plant boundary is 101.26 hectare & Township area 1834.44 hectares

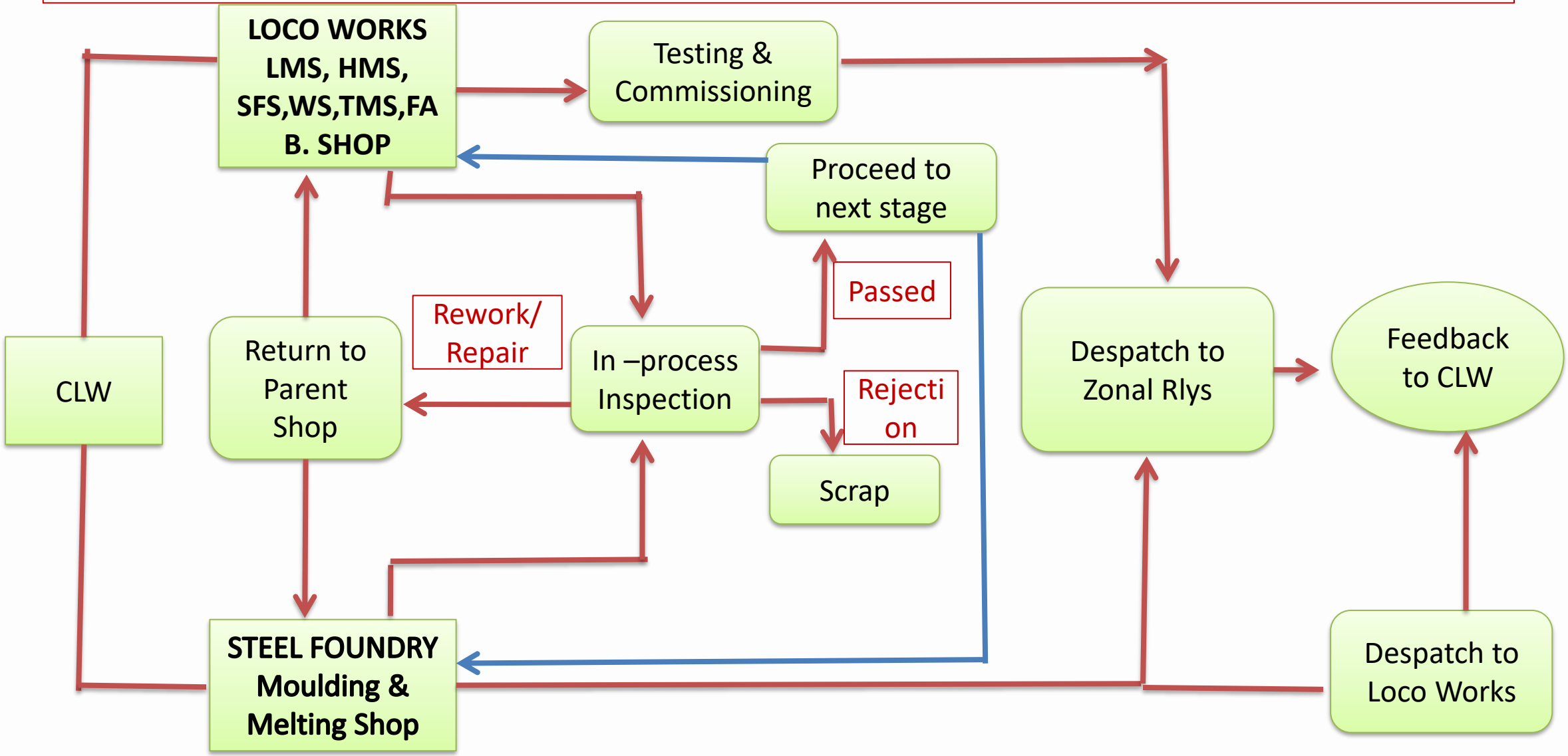
PRODUCTS

CLW Manufacture three types of Electric Locomotive. Capacity- 275 nos. of Loco Per Annum

CERTIFICATION

CLW has acquired IMS(ISO 90001, EMS 140001, OHSAS 180001),ISO 50001, 5S Certification and Green-Co certification.

PROCESS FLOW CHART



IMPACT OF COVID 19

Impact on annual production performance

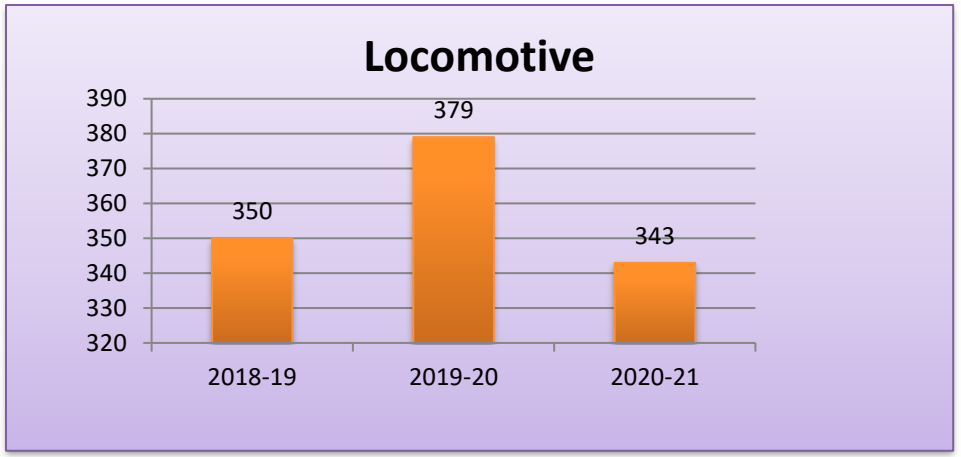
- In 2019-20 annual production-431 nos. Of Locomotive & 2020-21 annual production 390nos. Of Locomotive
- 10% reduction in production

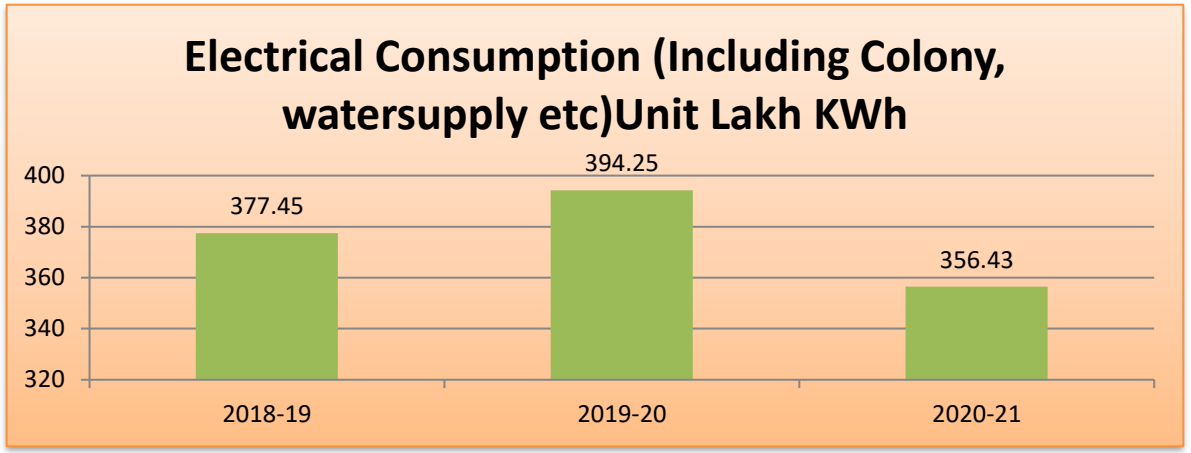
Impact on SEC

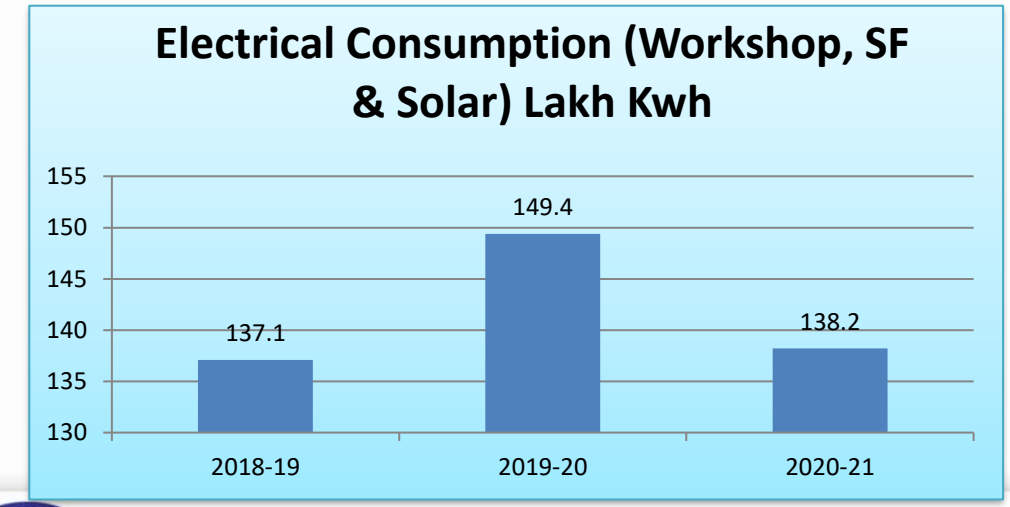
- SEC in 2019-20 was 4923.01 KGOE/no. Of equv. production and 2020-21 is 4785.01 KGOE/no. of equv. production
- SEC(Thermal + Electrical) reduction 2.8%

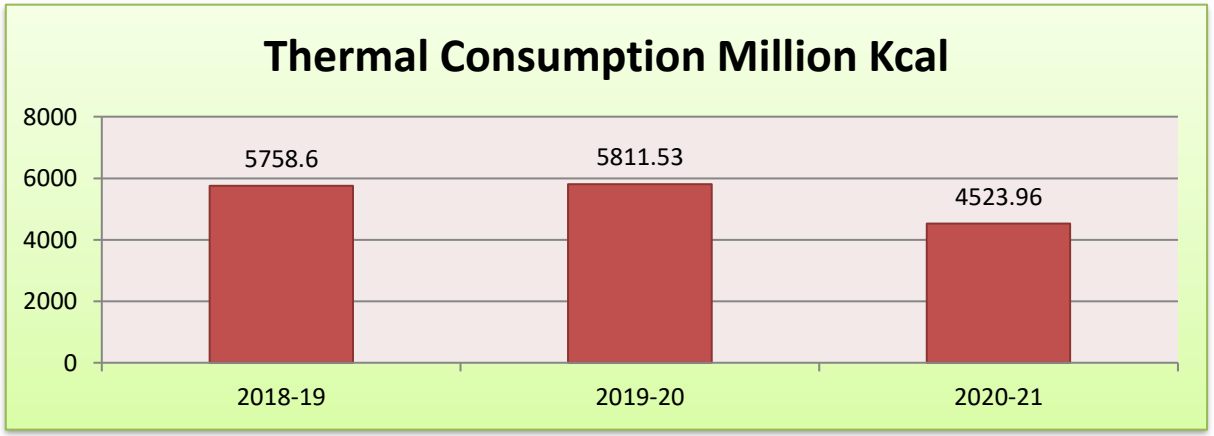
In the first two months of 2020 (Apr-May), there was a total Lockdown, however essential services like water supply, colony consumption continued, so SEC increased by 2%. Due to the pandemic situation, Railway Board has frozen all sanction projects including the investment in energy efficiency measures.

GRAPH CHART FOR PRODUCTION, ELECTRICAL & THERMAL CONSUMPTION









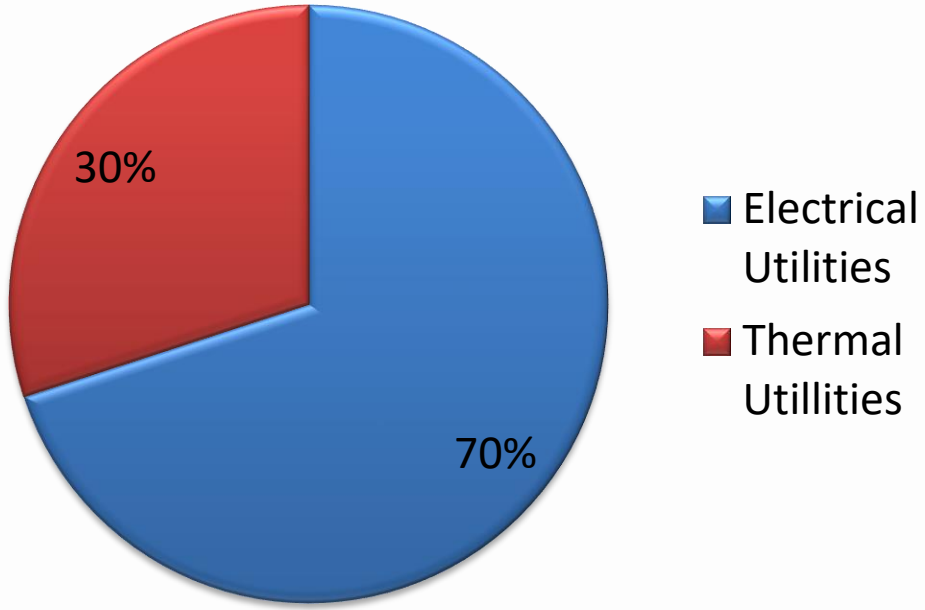
ENRGY CONSUMPTION

Electrical Utilities

- Air Compressor- 05nos reciprocation & 04 nos. Rotary Screw.
- IGBT based MIG welding Plant- 216 nos. & 32nos. Conventional.
- Window/Split AC- cap. 146TR in Main works & SF.
- Paint booth baking oven.
- CNC M/c, Plasma Cutting M/c etc.
- Electric Arc Furnace in Steel Foundry

Thermal Utilities

- HSD & LPG
- The major consumption of HSD is in the material handling system (fork lift, tractors, etc.) and Loco Shunting.
- The use of LPG is in the process section mainly in paint shop (paint shop ovens and hot water generation)
- LPG for Heat Treatment Furnace



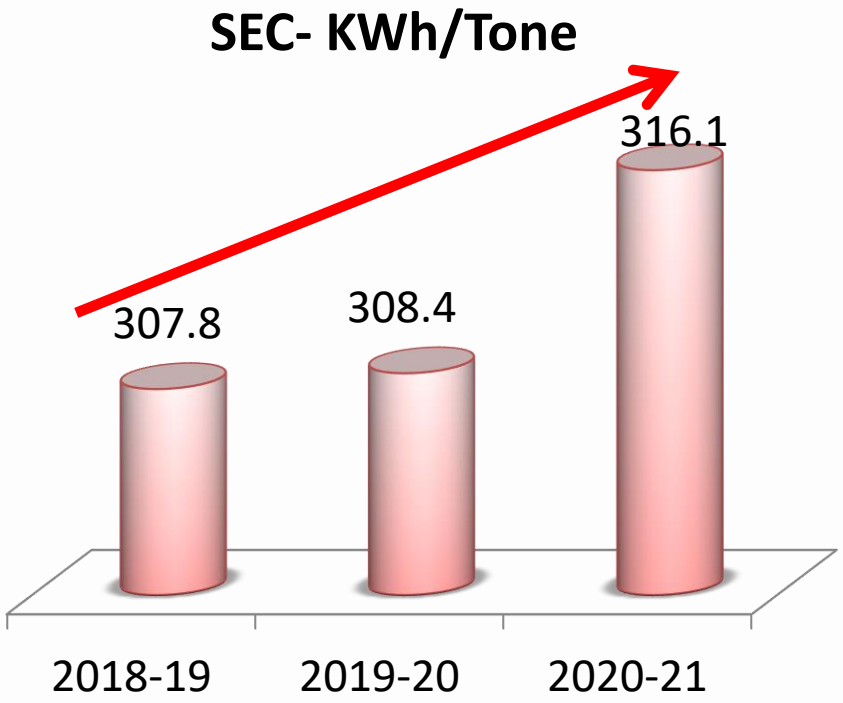
Energy Consumption

SPECIFIC ELECTRICAL ENERGY CONSUMPTION - KWAH/TONNE

Increased Electrical energy (SEC) 2.5% in the FY 2020-21 due to 70days total lockdown for Covid-19 effect.

Although some of the Energy Efficiency measures taken during the year are:-

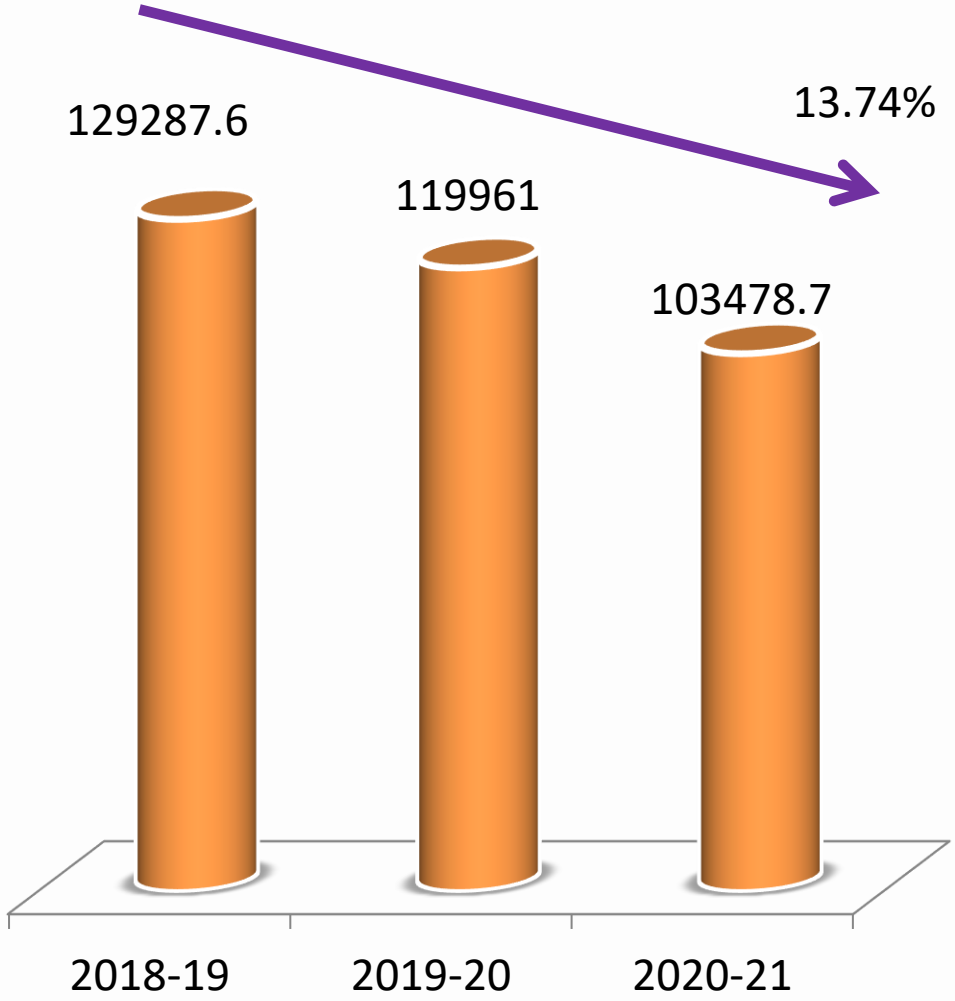
- Replacement of 02 reciprocating compressors with screw compressors. Capacity-1000CFM
- Introduction of 100 % LED light fittings
- For demand management operation of Arc furnace timing is planned to be changed. Arc Furnace not to be operated from 15.00 hrs to 24.00 hrs.
- Capacitor bank have been fitted in 02nos. Sub-station to improve PF.
- Capacitor bank is fitted in GAD Furnace Panel.
- Solar generation-5744223 kwh
- Provision of 30 Nos. of BLDC fans.



SPECIFIC THERMAL ENERGY CONSUMPTION - KCAL/TONNE

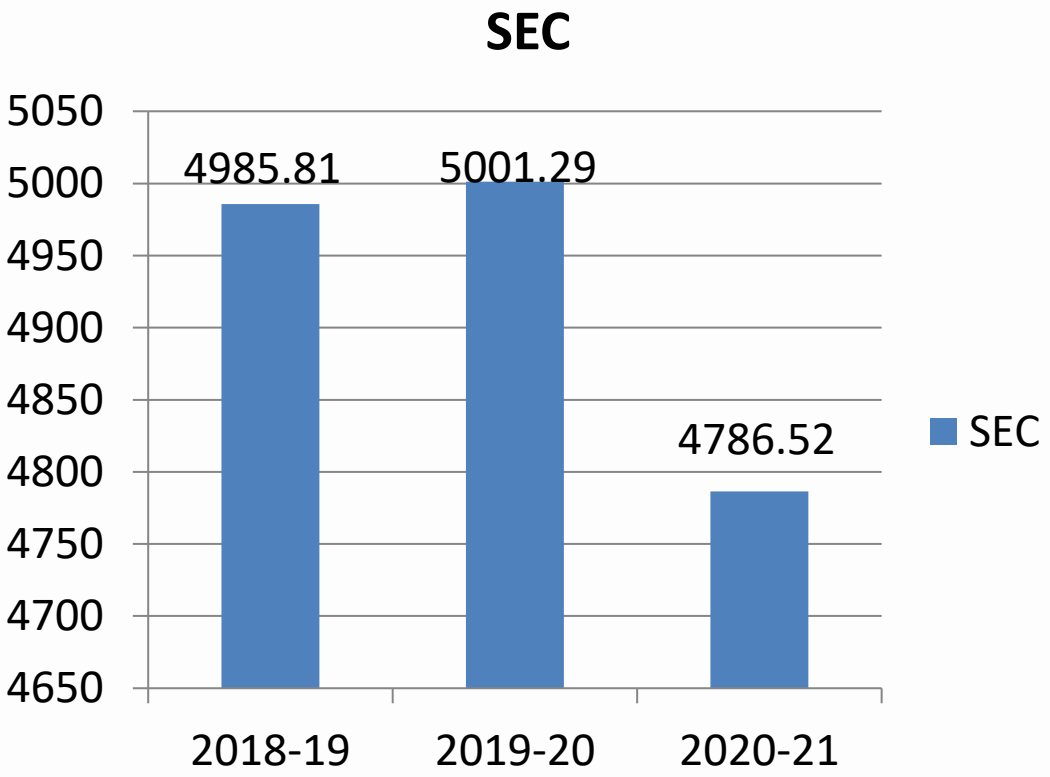
Reduction in Thermal energy (SEC) 13.74% is owing to

- ❖Use of e-vehicles.
- ❖Replacement of 07nos diesel operated fork lift with battery operated fork lift.
- ❖Plasma cutting in place of oxy-acetylene cutting.



SPECIFIC ENERGY CONSUMPTION

Year	Overall Energy Consumption (KGOE)	Production (SU)	SEC (KGOE/SU)
2018-19	1755005.12	352	4985.81
2019-20	1895488.91	379	5001.29
2020-21	1641776.36	343	4786.52



BENCHMARK

- Benchmark fixed by BEE for reduction in SEC 4972.3932 KGOE/no. Of equv. product as per Gazette of India
- Target SEC for CLW for the FY 2018-19 was 4985.81 KGOE/no. Of equv. product
- Achieved SEC by CLW for the FY 2020-21 is 4786.52 KGOE/no. Of equv. product

ENCON PROJECT PLANNED IN FY 2021-22

SN	Energy Conservation Project	Annual Electrical Saving (KWh)	Annual Thermal Saving (Kcal)	Comment
1.	Reduction in Contract demand from 10MVA to 9 MVA and its monitoring	0	0	Resulting approx Rs . 50 Lakh per Yr. reduction in Electricity bill
2.	Provision of Prepaid Energy Meter for Work Shops	0	0	For day to day energy monitoring system
3.	Replacement of old pump motor set with energy efficient motor pump set at Filter House and dam pump house-02 Pump	72583	0	
6.	Procurement of IGBT based welding sets against conventional - 10 Nos.	12000	0	IGBT-216Nos., Conventional-32 nos.
7.	Procurement of Battery operated FLT trauck. (3T- 06nos., 02 T-02nos.)		5000	Diesel FLT-40 nos. Battery FLT- 07 nos.

ENCON PROJECT PLANNED IN FY 2021-22

SN	Energy Conservation Project	Annual Electrical Saving (KWh)	Comment
8.	Awareness Program towards Energy Conservation and close monitoring of energy consumption	50000	Better energy management
9.	Replacement of conventional fan with 30Nos. BLDC fan have been procured	3,24,000	Already 30nos. Are procured in 2020-21.
10.	For demand management operation of Arc furnace timing is planned to be changed. Arc Furnace not to be operated from 15.00 hrs to 24.00 hrs.		Demand side Management
11.	53 Acre vacant barren land has been Identified for Land Based Solar Project through REMCL.		Approx. 10MW Solar Power Plant can be Installed.
12.	Up gradation of MSS for reliable power supply.		Break down time can be reduced with the productivity can be improved.
13.	Overhauling of 32 Panels VCB at MSS, CPH/CLW.		Better energy management

ENERGY SAVING PROJECTS IMPLEMENTED IN LAST THREE YEARS

Year	No. Of Proposal	Investments	Savings
2018-19	04	123.735 lakhs	50.62 Lakh
2019-20	05	319.94 Lakh	8.867 Lakh
2020-21	02	360.01 Lakh	34.46Lkah

ENERGY SAVING PROJECTS IMPLEMENTED IN 2018-19

SN	Name of the Projects	Investments (Lakh)	Annual Electric Saving (KWh)	Savings(Lakh)	Pay back Month
1.	01 no. EOT crane of 5T capacity Conventional system converted with Drive operation	9.735	1728	0.9100	0
2.	All Sodium vapour (SV), MH & Incandescent Light fittings of EOT crane have been replaced by LED light fittings.	5.53	235008	12.41	0
3.	All conventional light fittings of Main Shop replaced by LED light fittings (Supplied by EESL) ESCO Model	97.53	6,61,776	36.39	36
4.	Replaced non star AC units with 3/5 starred AC units- 30nos.	10.94	14000	0.91	10 month
	TOTAL	123.735	912512	50.62	

ENERGY SAVING PROJECTS IMPLEMENTED IN 2019-20

SN	Name of the Projects	Investments (Lakh)	Annual Electric Saving (KWh)	Savings(Lakh)	Pay back
1.	Replacement of inefficient furnace cooling water pump with energy efficient pump.	Nominal	10440	0.67860	0
2.	Replacement of pollution delivery pump with energy efficient pump (one pump)	1.0	2166	0.14079	0
3.	Replacement of pollution suction pump with energy efficient pump (one pump)	1.0	1032	0.067	
4.	Replaced non star AC units with 3/5 starred AC units- 30nos.	10.94	14000	0.91	10 month
5.	10 nos of EOT crane (02 nos. 30T and 8nos. 5T capacity) are provided with VFD drive.	307	123000	7.99500	25years
	TOTAL	319.94	150638	8.867	

ENERGY SAVING PROJECTS IMPLEMENTED IN 2020-21

SN	Name of the Projects	Investments (Lakh)	Annual Electric Saving (KWh)	Savings (Lakh)	Pay back
1.	Replacement of old compressor with energy efficient screw compressor	41.16	620000	6.20	09 month
2.	30Nos. Of BLDC Energy Efficient Fan have been Installed	0.91	324000	21.06	0
3.	Capacitor Bank have been fitted in LT side in Sub-station 1& 2 to improve the Power Factor.				
4.	Replaced non star AC units with 3/5 starred AC units- 30nos.	10.94	14000	0.91	10 month
5.	08 nos of EOT crane (03 nos. 50T and 5nos. 5T capacity) are provided with VFD drive.	268	110770	7.20	30Years
	TOTAL	360.01	1068770	34.46	

INNOVATIVE PROJECTS

Provision of Hotel Load Converter in Passenger Loco

❖In present EOG system the electrical load (i.e. load of lights, fans and air conditioning, pantry etc. referred to as “Hotel Load”) in the coaches of Rajdhani and Shatabdi Express trains are fed from the power cars placed at either ends of the rake. Each power car is installed with 2 DG sets generating 3-phase (4 wire) power supply at 750 Volts 50Hz and the same is transmitted to entire rake through two cable feeders, running through the whole length of the train.

❖Now passenger locomotives are turn out from CLW with HOG schemes. In HOG scheme power is fed from the Electric locomotive to the train to cater for the Hotel Load of the train. In Electric locomotives, power is taken from the OHE through pantograph to traction transformer of the locomotive which is provided with a hotel load winding of 1245 kVA, at nominal voltage of 960 V single-phase, which shall vary with the OHE voltage variations. This 960 Volts single-phase supply shall be fed to Hotel Load Converter, which shall give 750 Volts 3-phase 50 Hz supply as output, for feeding the hotel load of the train.

❖The above saving in diesel consumption and cost saving as electricity through DG set costlier. Annual cost saving due to HOG scheme is approx 130lac per loco.

INNOVATIVE PROJECTS

एक भारत श्रेष्ठ भारत

INDIAN RAILWAYS

www.clw.indianrailways.gov.in

Head on Generation Green Initiative

- Environment friendly
- No noise and air pollution
- Eliminates use of fossil fuel
- Direct saving (fuel cost) with one round trip of Kolkata /Mumbai Rajdhani: Rs. 1.5 lakhs
- Less Maintenance vis-à-vis Power car
- Higher reliability
- Composite Converter for WAP-5,**high speed loco**
  - Compact Design
  - Single unit for Traction and Hotel Load Converter
- More than 300 locomotives fitted with the system
- Operation of Prestigious trains like Rajdhani,Shatabdi and Duronto trains.

Innovative Projects

Replacement of Reciprocating Compressor

New Compressor 1000CFM Screw type

UTILISATION OF RENEWABLE ENERGY SOURCES

YEAR	Technology (Electrical)	Type of Energy	Onsite/ Offsite	Installed Capacity(MW)	Generation (Million KWh)	% overall Electrical Energy
2019-20	Rooftop Solar in All Service Buildings-1MW/Main Workshop-4.25MW	Solar	Onsite	5.25	2.829380	7%
2020-21	Rooftop Solar in Main Workshop	Solar	Onsite	0.760	5.744223	20%
	TOTAL			5.910		

WASTE MANAGEMENT

SN	Year	Type of Waste	Quantity	GCV	Waste as percentage of Total Fuel
01.	2018-19	Dry Varnish, Paint Sludge, Used Oil	23.32MT	--	7%
02.	2019-20	Dry Varnish, Paint Sludge, Used Oil	39.534MT	--	12%
03.	2020-21	Dry Varnish, Paint Sludge, Used Oil	26.781MT	--	11%

SN	Year	Type of Waste	Quantity of Waste Generated (MT/Year)	Disposal (MT)
01.	2018-19	Ferrus, Non Ferrus	--	--
02.	2019-20	Ferrus, Non Ferrus	6015.467 123.982	5704.074 128.691
03.	2020-21	Ferrus, Non Ferrus	5737.842 115.5	6577.5 116.767

WASTE UTILIZATION MANAGEMENT

CHITTARANJAN LOCOMOTIVE WORKS

Achieves highest ever figure of Scrap disposal in FY 2020-21

SCRAP DISPOSAL

₹20.65 Cr.

490%

₹3.50 Cr.

2014-15

2020-21

Chittaranjan Locomotive Works has earned Rs 20.65 crores by selling scrap in the FY2020-21 against the target of Rs 17 crores surpassing the all previous records. The biggest manufacturing unit of electric locomotives, has managed to accrue Rs 64.66 crores by selling of scrap during last 5 financial years . Due impetus has been given on timely identification and disposal of scrap, generated at various stages of loco production.

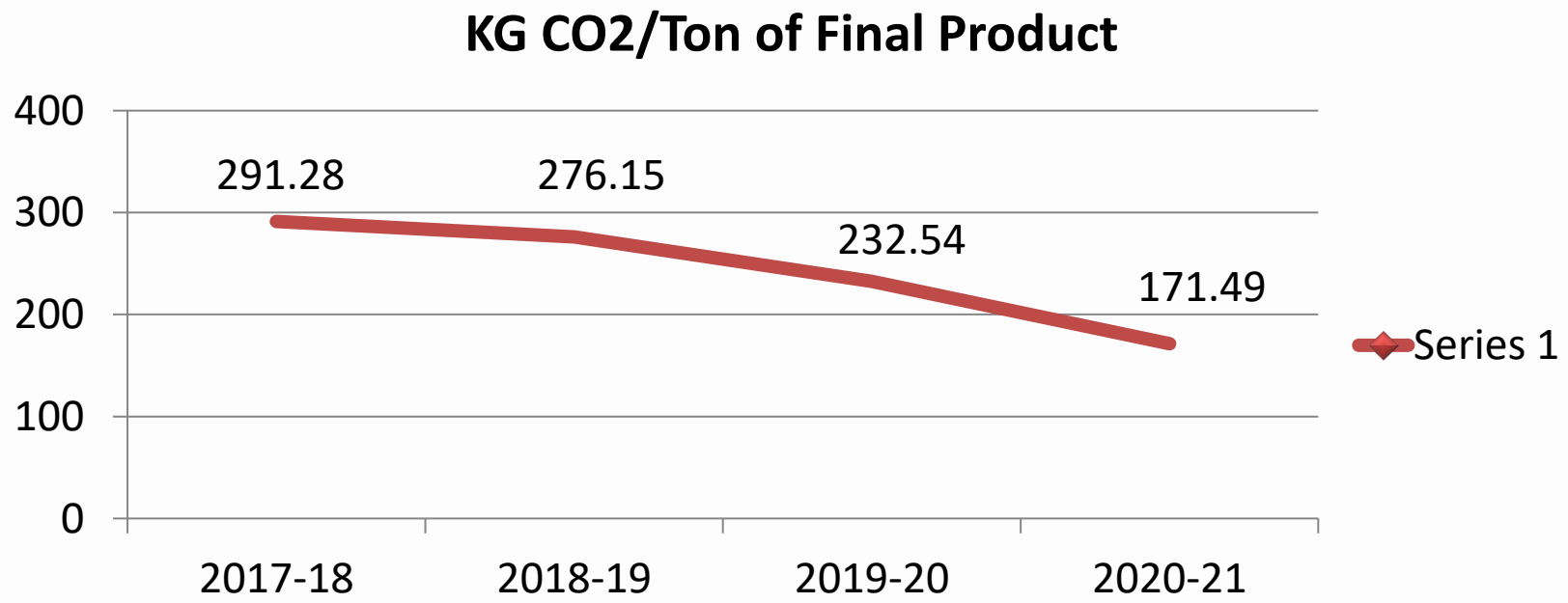
An increase of 490%

facebook.com/clwrailways twitter.com/clwrailindia instagram.com/clwrailways

CLW WORLD'S LEADING ELECTRIC LOCO MANUFACTURER

GHG INVENTORISATION

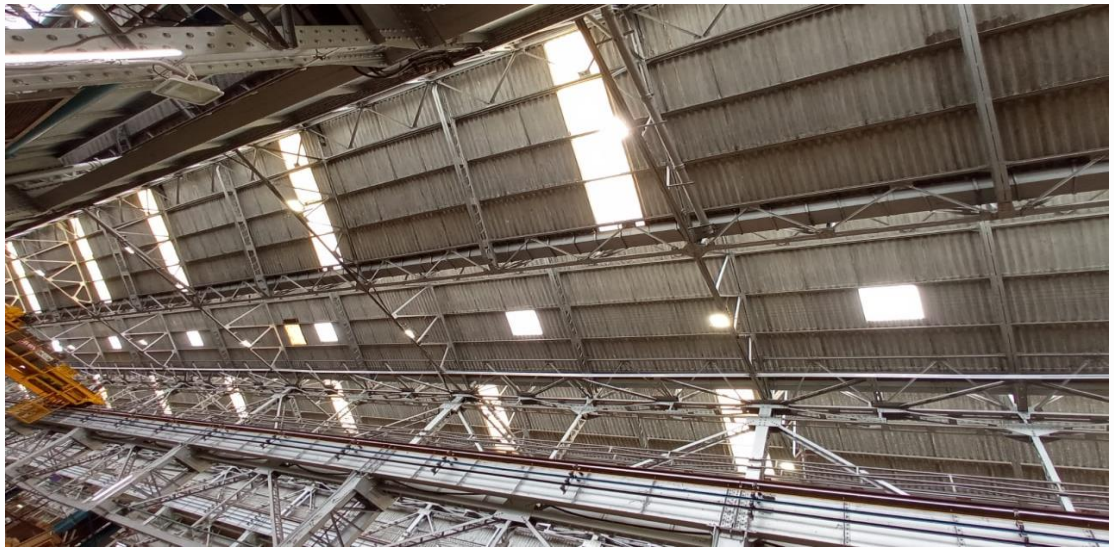
Year	KG CO2/Ton of Final Product
2017-18	291.28
2018-19	276.15
2019-20	232.54
2020-21	171.49



CO2 EMISSION REDUCTION AND ACTION PLAN

- Installed 100 nos. of Sky light

  CO2 reduction-93688Kg



07nos. Of Battery operated FLT

CO2 reduction-14468256Kg

CO2 EMISSION REDUCTION AND ACTION PLAN

- 6MWp roof top solar installed in CLW

  CO2 reduction-6945804Kg

100% LED in CLW

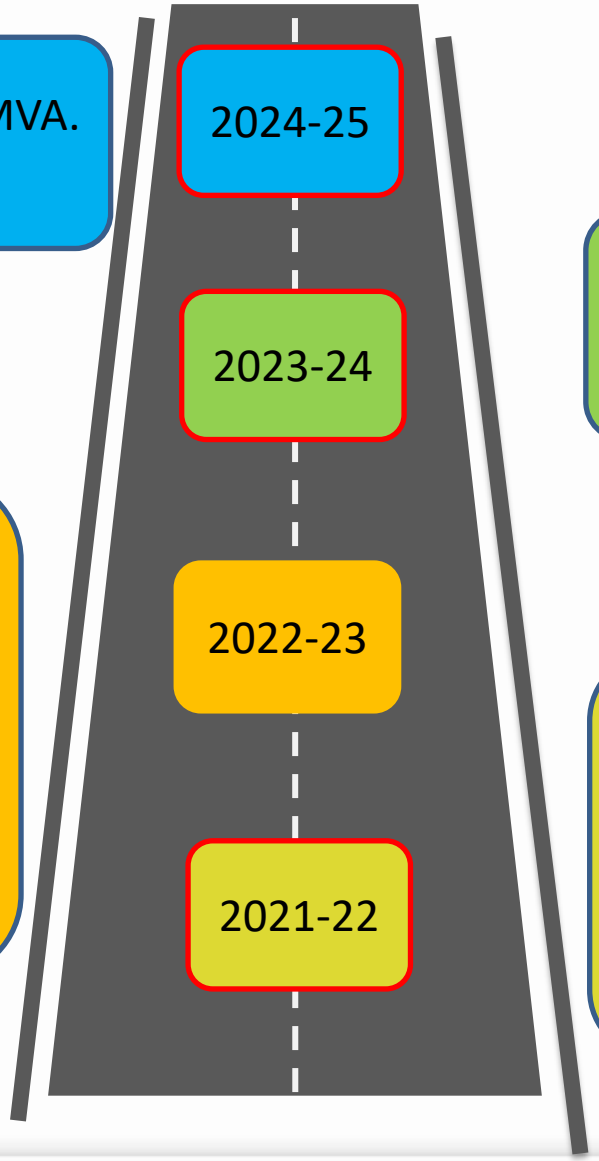
CO2 reduction-588220Kg

CO2 EMISSION REDUCTION AND ACTION PLAN

With seven lakes spread over 870226 sqm Chittaranjan and roughly 67% forest cover, CLW is a true example of Environment preservation and consciousness. Lush green ambience talks of the efforts of the Administration as well as the residents of the township in the conservation of Environment, as well as using of all the existing natural resources in an eco-friendly manner.

CLW has covered sizable portion of unused land with trees and thus adding every year more than 5000 plants.

ROAD MAP



•5MWp Land Based Solar
•Reduction of contract demand by 1 MVA.
•Recertification of ISO-50001

•5MWp Land Based Solar (1st phase)
• Reduction of contract demand by 1 MVA.
•Reduction of LPG consumption in Paint Shop Oven with CNG.

•Replacement of Old Pump with Energy Efficient pump
•Green-co recertification
•Use of BLDC fans
•Installation of Prepaid Energy Meter in Shops
•Astronomical timer base street lights

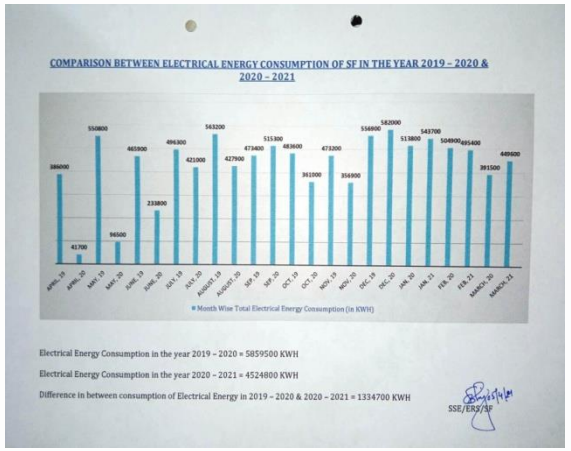
• Installation of Electric crematorium at Burning Ghat
•Reduction of Contract demand from 10MVA to 9MVA
•Battery operated FLT truck 06nos. 3T and 02 nos-5T
•Use of e vehicle

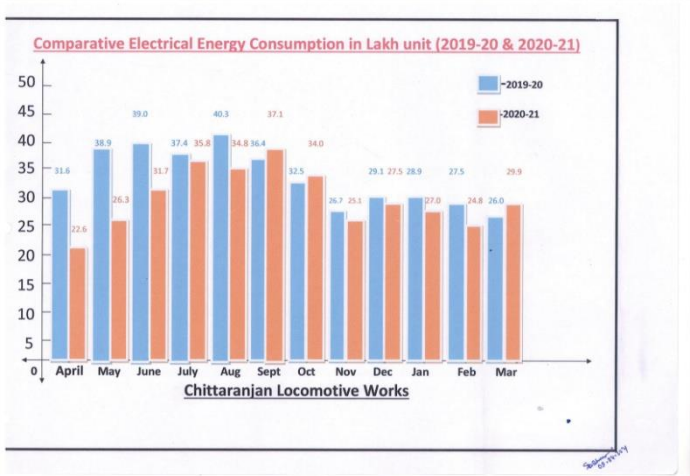
GREEN SUPPLY CHAIN MANAGEMENT

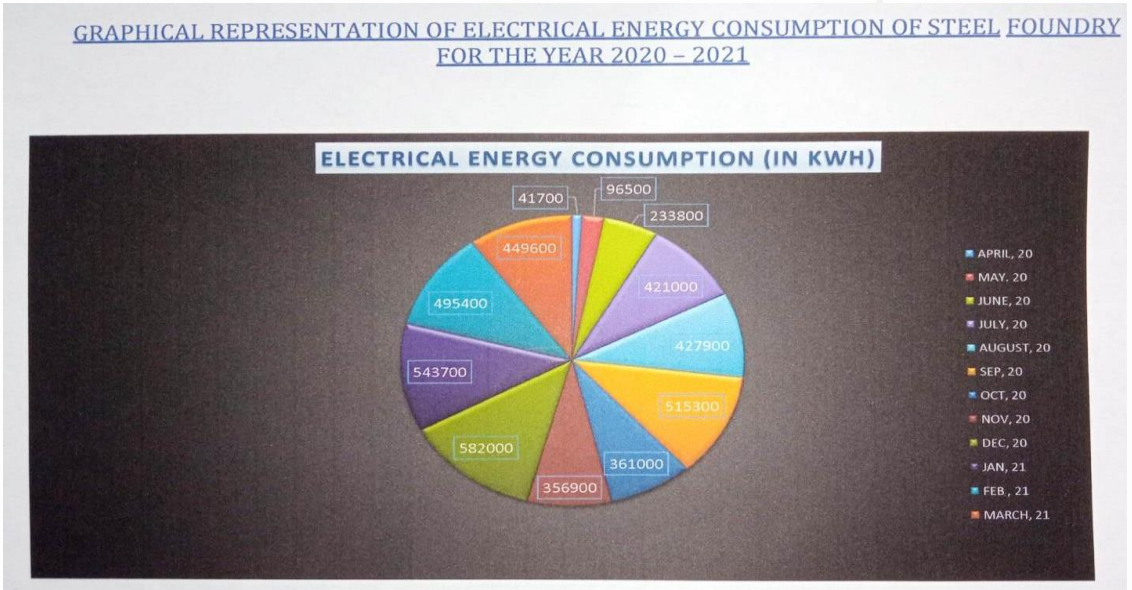
Vendor development & Ease of doing business effort

- Renewed focus on expanding vendor base & simplification of procedures.
- Vendor approval powers extended to BLW.
- All drawings, Specs and STRs of imported/ limited source items have been put on website.
- Specification are being made more generic.
- Vendors are being encouraged to come forward with development of loco items.
- Mandatory trial period of total 379 items including Traction motors wing have been reduced to fast track development.
- Details of items with less as well as having only imported sources have been made available in public domain(CLW website) for information of all interested firms.
- CLW organised Vendor Meets to increase vendor base; specially for items having only imported/ limited sources.

MONITORING ENERGY CONSUMPTION







- Energy consumption is being monitored on hourly basis at MAIN SUB-STATION of 33/11 KV grid round the clock.
- Daily monitoring at Deputy HOD level of Electrical Power House Department.
- Monthly consumption report of each shop /service buildings for comparison with last month and last year same period consumption in Energy Cell
- Monthly PCDO to Railway Board through HOD .
- Monitoring at Railway Board level .
- Submission of Form -1 of each FY before 30th June to BBE, PEDA (SDA) & Railway Board under PAT CYCLE Scheme.

ALLOCATION OF FUNDS FOR ENERGY CONSERVATION PROJECTS

Revenue Fund	• Provision of LED light fitting • Procurement of Solar Day Light • Procurement of BLDC Fans
Modernisation Programme	• Procurement of EOT crane with VFD drive • Workshop Construction for capacity building with latest technology Machineries like Automatic Winding Machine
M&P Programme	• Replacement of Old inefficient machineries with VFD/CNC. • Procurement of Capacitor Bank for improve PF. • Procurement of Battery operated FLT
Environment Related Works	• Energy Audit Consultancy. • Implementation of Other Green Energy Projects.

ENERGY POLICY

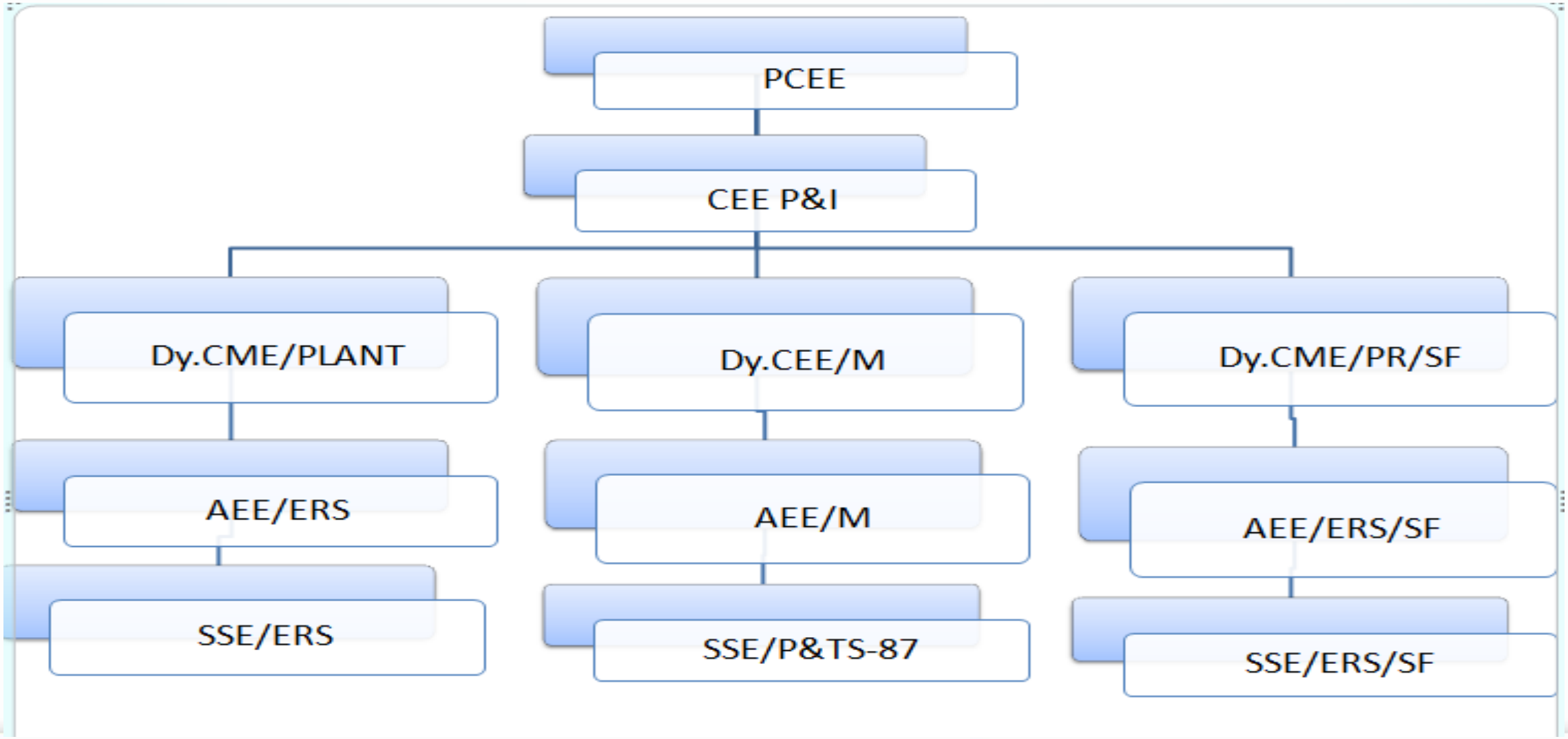
CLW is committed to:

- Continual reduction of energy consumption by improving the process and adopting effective energy conservation measures.
- Explore use of non-conventional sources of energy to the maximum extent possible for manufacturing and allied processes.
- Comply with legal and statutory requirements related to energy use and conservation.
- Periodic review of energy baseline and Pursue efficient energy use strategy and objective by an established system of documentation and effective communication across organization.

Chief Electrical Engineer/P&I

CLW/Chittaranjan

ENMS ORGANIZATION



Objective & Target of EnMS

Objective	Target
Reduction in Energy Consumption in year 2021-22	3% improvement on previous year energy consumption
Training and awareness on Energy conservation	5 Man days per person
Ensure compliance of all applicable legal requirements	Within valid time frame

ISO 50001:2018 Certificate

UKcert
Certification & Inspection

Certificate of Registration

This is to certify that the

Energy Management Systems

of

CHITTARANJAN LOCOMOTIVE WORKS

at

CHITTARANJAN DISTRICT. BARDHAMAN (W), WEST BENGAL - 713331, INDIA

has been independently assessed and is compliant with the requirements of:

ISO 50001:2018

For the following scope of activities:

MANUFACTURING OF ELECTRIC LOCOMOTIVES AND SPARES INCLUDING ELECTRIC MAINTENANCE OF CHITTARANJAN LOCOMOTIVE WORKS

Certificate Number: UQ - 2021032440

Validity of this certificate can be verified at www.ukcertifications.org.uk/verify

Date of Certification	24th March 2021
1st Surveillance Audit Due	23rd March 2022
2nd Surveillance Audit Due	23rd March 2023
Certificate Expiry	23rd March 2024

Authorised Signatory

EMPLOYEE INVOLVEMENT & CAPACITY BUILDING

Awareness seminar on Energy Conservation for Staff and Supervisors during Energy Conservation week

Awareness Training on Energy Management System ISO 50001

Factory /other workshop visits by Supervisory staff

Energy Conservation & GHG mitigation Training of staff under Project Saksham

Motivate Employees with Cash Awards for Excellent work

ENERGY CONSERVATION DAY CELEBRATE

Review Meeting

Drawing Competition Organised by CLW for Energy Awareness on 14th December,2019

SCRAP BEUTIFICATION

POLICY OF CLW

CHITTARANJAN LOCOMOTIVE WORKS
Product Safety Policy

We, at Chittaranjan Locomotive Works commit ourselves to develop, provide and maintain products/ components that are safe for their intended use & service with respect to passengers, users and other stakeholders.

We shall:

- actively support the implementation of product safety policy/objectives throughout our areas of responsibility;
- ensure analysis of reported incidents to review the safety performance of product/components;
- ensure continual review of the product safety management processes by evaluating effects of process and product changes on product safety;
- identify and control the product safety-related characteristics of components at the point of Design & Manufacturing;
- communicate requirements and ensure traceability of product/component safety throughout the supply chain;
- impart training identified by the organization or customer for personnel involved in safety related components and design & manufacturing processes. Disseminate best practices related to product safety.

Date: - -2020

General Manager
Chittaranjan Locomotive Works

CHITTARANJAN LOCOMOTIVE WORKS
Quality Policy

We, at Chittaranjan Locomotive Works commit ourselves to continual improvement in our product and processes to strive for Customer Satisfaction to establish ourselves as a Leader in Manufacturing of Electric Locomotives and accessories.

We shall:

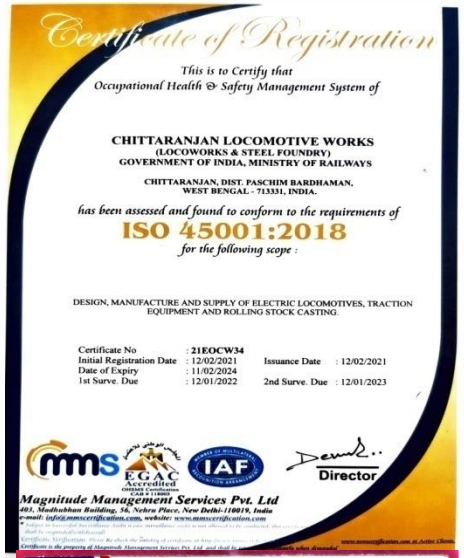
- develop a product development strategy based on analysis of customer needs & expectations leading to zero defects;
- comply with all statutory or regulatory requirements, guidelines, obligations applicable to product & processes;
- ensure failure prevention by incorporating risk management in our all processes;
- create an atmosphere of quality awareness by training and educating employees & contract personnel;
- promote a framework of improvement and innovation at CLW making the RQMS suitable & effective;

This Quality Policy is established in line with core values of the Indian Railway Organization and its best management practices. It shall form the framework for Quality objectives & Targets and is available to all.

Date: - -2020

General Manager
Chittaranjan Locomotive Works

CERTFICATES & ACHIEVEMENTS



Certificate of Registration

This is to Certify that
Occupational Health & Safety Management System of

CHITTARANJAN LOCOMOTIVE WORKS
(LOCOWORKS & STEEL FOUNDRY)
GOVERNMENT OF INDIA, MINISTRY OF RAILWAYS

CHITTARANJAN, DIST. PASCHIM BARDHAMAN,
WEST BENGAL - 713331, INDIA.

has been assessed and found to conform to the requirements of
ISO 45001:2018
for the following scope :

DESIGN, MANUFACTURE AND SUPPLY OF ELECTRIC LOCOMOTIVES, TRACTION EQUIPMENT AND ROLLING STOCK CASTING.

Certificate No : 21EOCW34
Initial Registration Date : 12/02/2021 Issuance Date : 12/02/2021
Date of Expiry : 11/02/2024
1st Surve. Due : 12/01/2022 2nd Surve. Due : 12/01/2023

mms EGAC Accredited IAF Director

Magnitude Management Services Pvt. Ltd

Certificate of Registration

This is to Certify that
Quality Management System of

CHITTARANJAN LOCOMOTIVE WORKS
(LOCOWORKS & STEEL FOUNDRY)
GOVERNMENT OF INDIA, MINISTRY OF RAILWAYS

CHITTARANJAN, DIST. PASCHIM BARDHAMAN,
WEST BENGAL - 713331, INDIA.

has been assessed and found to conform to the requirements of
ISO 9001:2015
for the following scope :

DESIGN, MANUFACTURE AND SUPPLY OF ELECTRIC LOCOMOTIVES, TRACTION EQUIPMENT AND ROLLING STOCK CASTING.

Certificate No : 21EQCX20
Initial Registration Date : 12/02/2021 Issuance Date : 12/02/2021
Date of Expiry : 11/02/2024
1st Surve. Due : 12/01/2022 2nd Surve. Due : 12/01/2023

mms EGAC Accredited IAF Director

Magnitude Management Services Pvt. Ltd

Certificate of Registration

This is to Certify that
Environmental Management System of

CHITTARANJAN LOCOMOTIVE WORKS
(LOCOWORKS & STEEL FOUNDRY)
GOVERNMENT OF INDIA, MINISTRY OF RAILWAYS

CHITTARANJAN, DIST. PASCHIM BARDHAMAN,
WEST BENGAL - 713331, INDIA.

has been assessed and found to conform to the requirements of
ISO 14001:2015
for the following scope :

DESIGN, MANUFACTURE & SUPPLY OF ELECTRIC LOCOMOTIVES, TRACTION EQUIPMENT AND ROLLING STOCK CASTING INCLUDING TOWNSHIP OF CHITTARANJAN.

Certificate No : 21EECK24
Initial Registration Date : 12/02/2021 Issuance Date : 12/02/2021
Date of Expiry : 11/02/2024
1st Surve. Due : 12/01/2022 2nd Surve. Due : 12/01/2023

mms EGAC Accredited IAF Director

Magnitude Management Services Pvt. Ltd

Certificate

Otabu

Certificate of Registration

This is to certify that

TRACTION MOTOR SHOP (SHOP-20, 21 & 23)
CHITTARANJAN LOCOMOTIVE WORKS

P.O., CHITTARANJAN, DIST. BURDWAN, WEST BENGAL-713331, INDIA

has been assessed and certified by Otabu Certification Limited as meeting the requirements of

5S
Work Place Management System

Date of Registration : 10 February 2021
1st Surveillance Due : 09 February 2022
2nd Surveillance Due : 09 February 2023
Certificate Expiry (subject to the company maintaining its system to the required standard) : 09 February 2024

Certificate No:- 210210602

To Verify this certificate please visit at www.otabucert.co.uk

Otabu Certification Limited (UK)

Validity of this Certificate is subject to Annual Surveillance audits done successfully

Suite 48, 88-90 Hatton Garden, London, EC1N 8PN, UK

UK Merit Assessments

Certificate of Registration

This is to certify that the

CHITTRANJAN LOCOMOTIVE WORKS

ADDRESS: - CHITTRANJAN, WEST BARDHAMAN-71331 INDIA

Has been independently assessed by UK Merit against the requirements of the standard of:

ISO 3834-2:2005
(Quality Requirements For Fusion Welding Of Metallic Materials Comprehensive Quality Requirements)

For the Quality Management System for welding is applicable of

"MANUFACTURING OF SHELL BODY OF ELECTRIC LOCOMOTIVES"

Certificate Number: 20/AVS/Q/4041

validity of this certificate can be verified at www.ukmeritassessments.com

DATE OF INITIAL REGISTRATION- 2nd Feb 2021 1st Surveillance – 1st Jan 2022
DATE OF CERTIFICATE- 2nd Feb 2021 2nd Surveillance – 1st Jan 2023
DATE OF EXPIRY- 2nd Feb 2024

Authorised Signatory Date 2nd Feb 2021

UK MERIT ASSESSMENTS LTD.

Certificate Certificate Certificate

Scanned with CamScanner

IGBC

CII Confederation of Indian Industry

Indian Green Building Council (IGBC)

hereby certifies that

Administrative Building West Block
CLW, Chittaranjan, Distt- Paschim Bardhaman (W.B.) - 713331, India
(IGBC Registration No. GEB 18 1074)

has successfully achieved the Green Building Standards required for the following level of certification under the
IGBC Green Existing Buildings Rating System

Certified
March 2019
(This certification is valid for 3 years)

Gurmit Singh Arora, Chair, IGBC Green EB O&M
Dr Prem C Jain, Chairman, IGBC
S Raghupathy, Deputy Director General, CII
K S Venkatagiri, Executive Director, CII-Godrej GBC

सत्यमेव जयते
भारत सरकार
विद्युत मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF POWER
ऊर्जा दक्षता ब्यूरो
Bureau of Energy Efficiency
द्वितीय पुरस्कार
SECOND PRIZE
2019
राष्ट्रीय ऊर्जा संरक्षण पुरस्कार
रेलवे उत्पादन इकाइयाँ क्षेत्र
NATIONAL ENERGY CONSERVATION AWARD
RAILWAY PRODUCTION UNITS SECTOR
चित्तरंजन लोकोमोटिव वर्क्स
पश्चिम बर्दवान (पश्चिम बंगाल)
CHITTARANJAN LOCOMOTIVE WORKS
PASCHIM BURDWAN (WEST BENGAL)

CLW Achievements 2020-21

PRODUCTION

390 locomotives

Produced in 264 working days of FY2020-21 which is best ever in terms of working days

255 locomotive

Produced in only 6 months (2nd half of 2020-21). That is 42 locos per month

390 Locos
in 264 working days

255 Locos
in 2nd half of 2020-21

1500cr. worth inhouse components produced

CLW produces many major sub-assemblies, inhouse such as Traction motors, Shells, Bogies, Cable harness, Electrical panels, Ballast weights etc.

Indigenous development of high horsepower locomotive

- First loco of high horse power 9000HP in single units.
- First three prototype locomotives turned out.
- Totally indegeneous design.
- With this CLW has put India on world map for capability to produce such high power locomotives.
- 50% power augmented with only incremental cost.
- For "right powering" of trains, a project of production of 9000 HP electric locomotive was unveiled.
- This up-gradation is a cost effective alternative which provide better accelerations, increased average speed and reduction in stalling cases of locomotives.

CLW WORLD'S LEADING ELECTRIC LOCO MANUFACTURER

THANK YOU