



RAIL COACH FACTORY KAPURTHALA



**PRESENTATION FOR NATIONAL AWARD FOR EXCELLENCE
IN ENERGY MANAGEMENT**

PRESENTED BY :

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HARJIT SINGH GILL SSE/EL/MTC**



ABOUT RCF



INCEPTION

The Inception of the project and the first coach was rolled out on **31.03. 1988**.

PRODUCTS

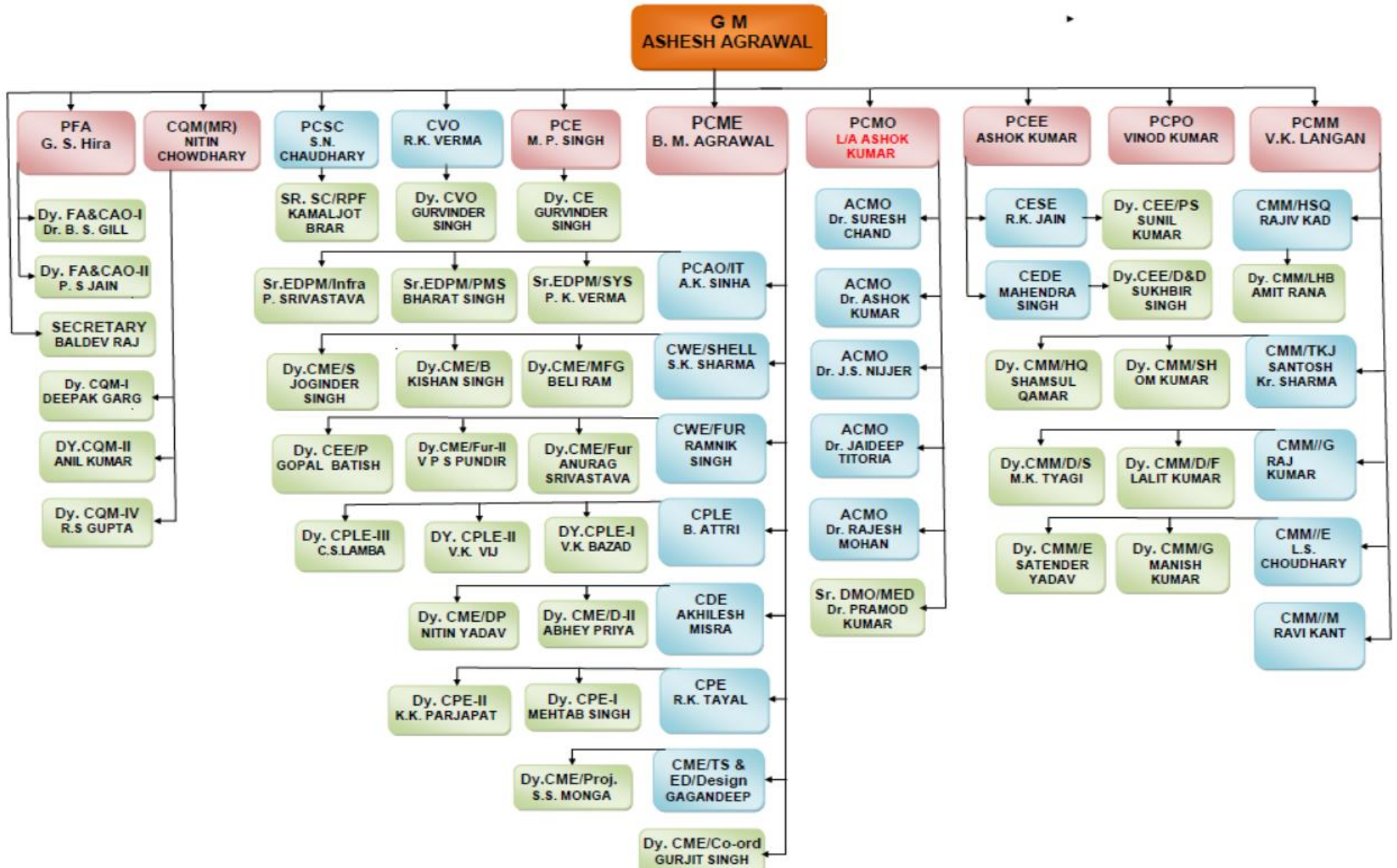
Production capacity of plant IS 1600 COACHES & Main Products are **LHB AC COACH, LHB NON AC COACH, LHB POWER CAR CUM PARCEL VAN, MEMU COACH & LHB AC PANTRY CAR**

FACILITIES

Total area of the complex is 1178 Acres,. Have **Schooling Facilities 4 NOS. Shopping Complex Facilities 2 Nos. Banking Facilities, Staff Canteen ,Handicraft centre, Creche, Community Hall, Play Grounds etc.**



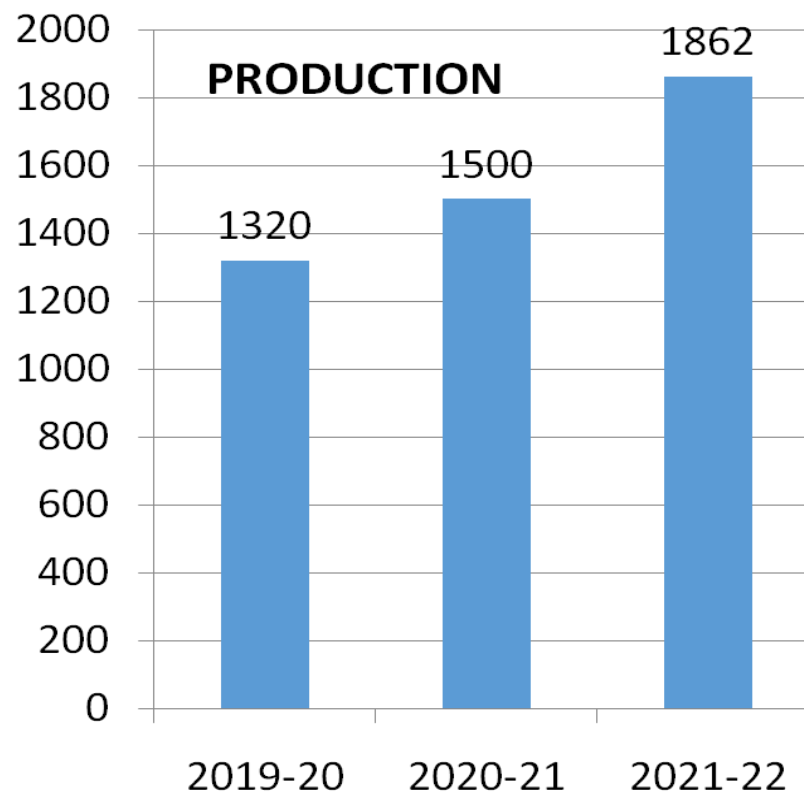
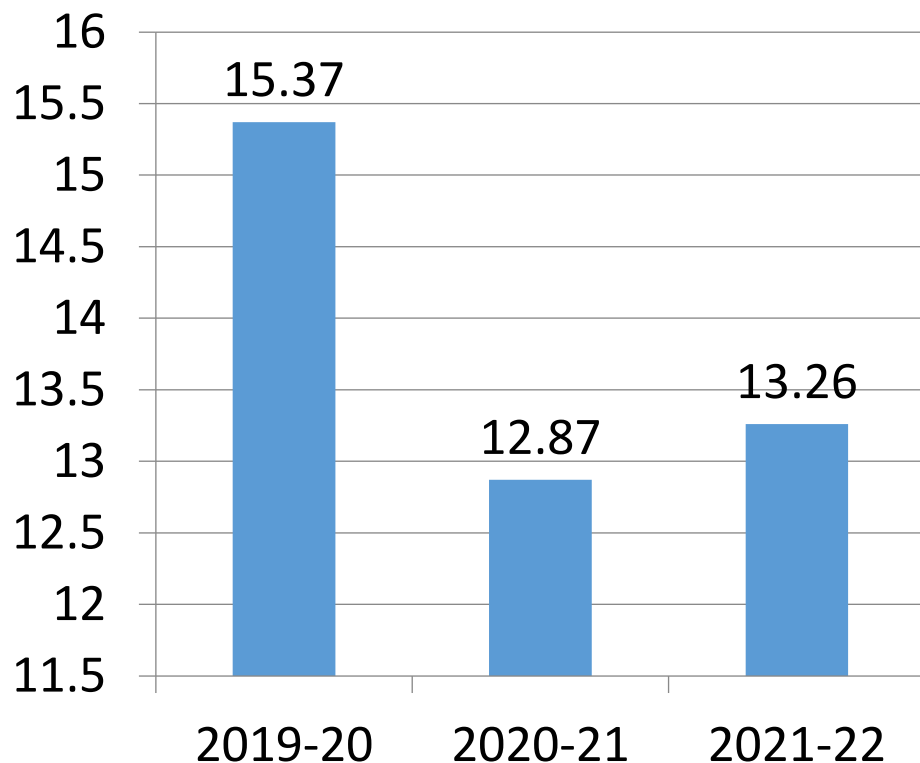
ORGANISATION CHART





ELECTRICAL ENERGY CONSUMPTION & PRODUCTION IN FY 19-20 TO 21-22

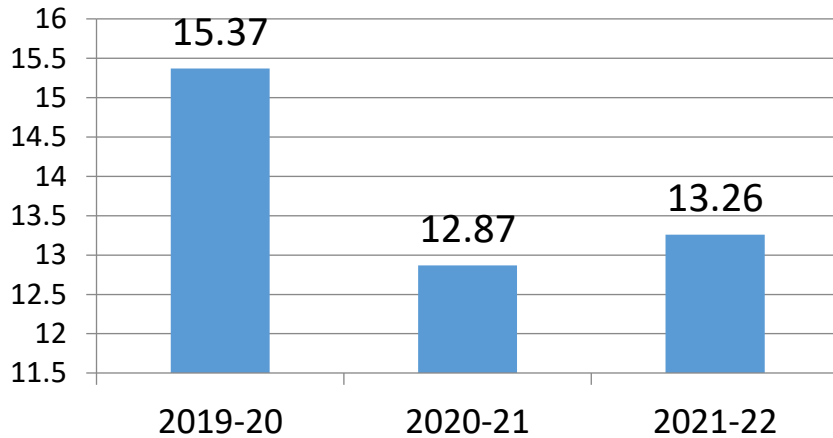
ANNUAL ENERGY CONSUMP.
(Million kWh)



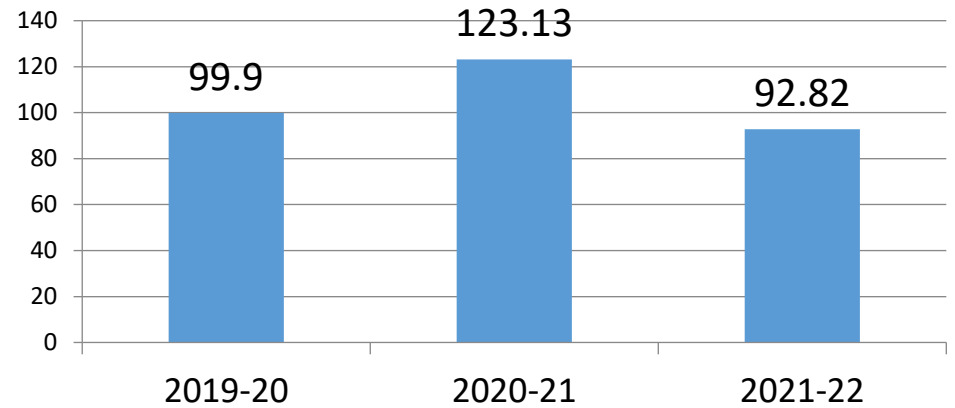


ELECTRICAL ENERGY DATA

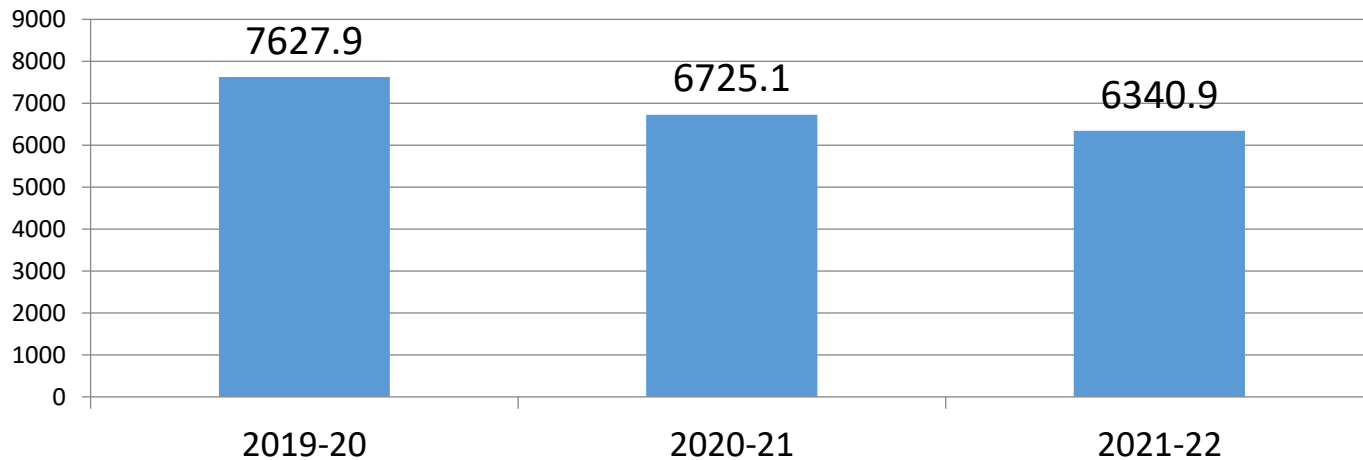
Annual Electrical Energy Consumption Million KWH



Annual cost of Electricity consumption Million Rs.



Specific Electrical Energy consumption kWh/ECU

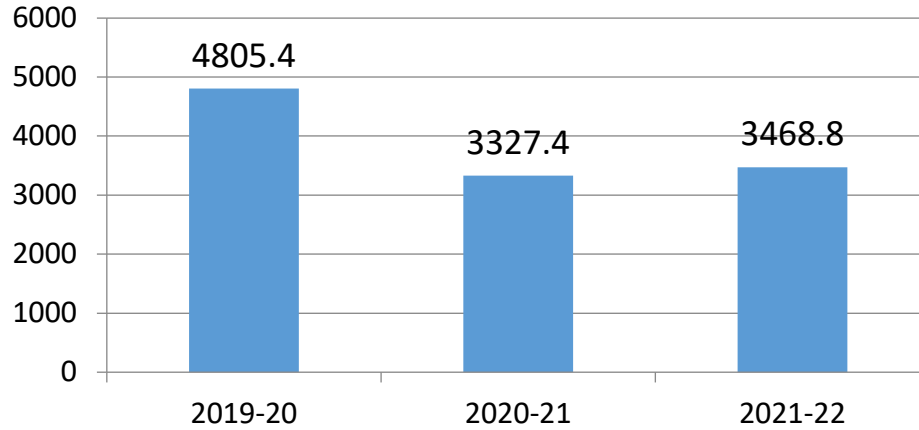


Note: Where ECU is Equivalent Coach Unit

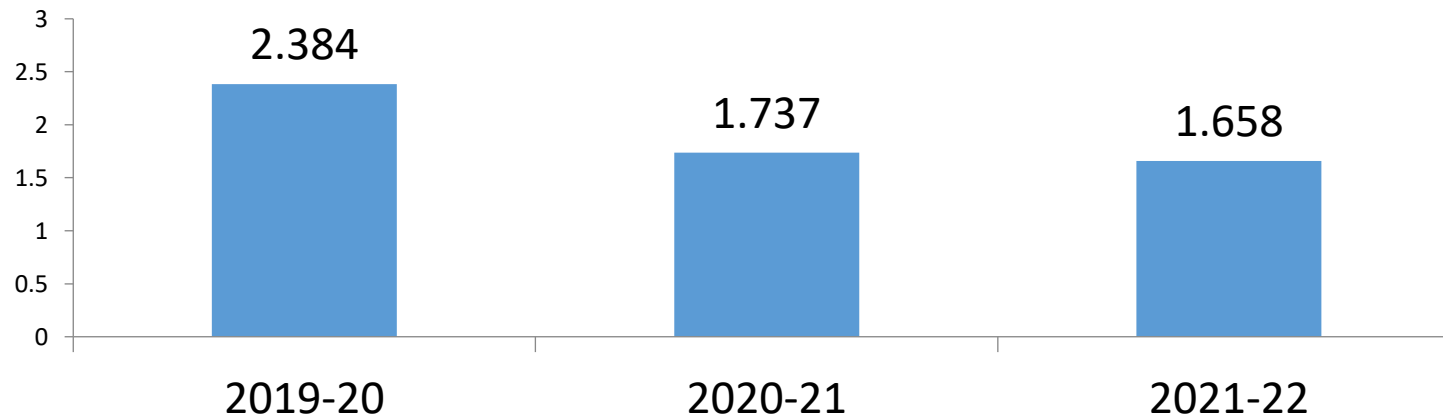
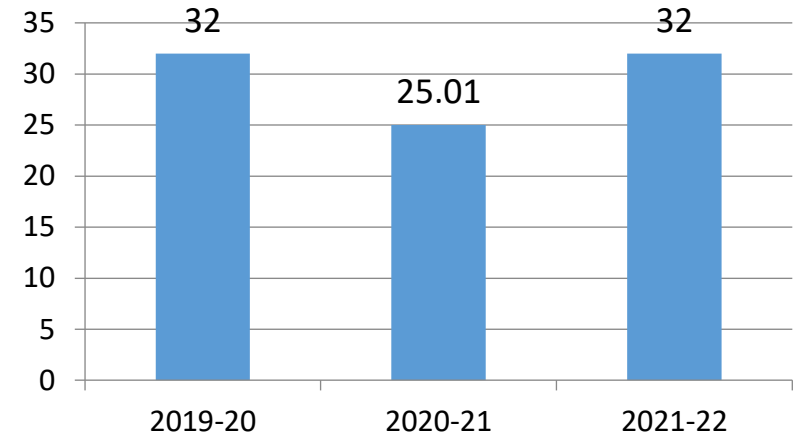


THERMAL ENERGY DATA (LPG+HSD)

**Annual Thermal Energy Consumption
Million KCAL**



**Annual cost of Thermal Energy
consumption Million Rs.**



**Note: SPECIFIC THERMAL ENERGY CONSUMPTION (MILLION KCAL)/ECU
Where ECU is Equivalent Coach Unit**



ENERGY SAVING PROJECTS IMPLEMENTED

SR. NO	YEAR	DESCRIPTION	ESTIMATED ENERGY SAVING /YEAR (KWH)
1	2019-20	Implementation of Energy Efficiency Measures at RCF on Deemed Energy Saving Based Esco Model with 100% Financing by EESL, REPLACED 146 NOS Acs With Inverter based Acs, 536 nos 400 watt HPSV lamps with 190 watt LED lights, 1675 nos 250 watt HPSV lights with 110 watt LED lights, 1195 nos 70 watt HPSV lights with 35 watt LED lights, 4662 nos 35 watt Tube lights with 20 watt LED lights, 138 nos 20 watt bulbs with 9 watt LED bulbs	43,03,000
2	2019-20	Replacement of Old slip ring Resistance based Dual Starter of EOT Cranes with VVVF Drives 42 Nos.	1,20,600
3	2019-20	Replacement of Air Pipe line with Aluminum Pipe line 17000 mtr	Saving Electrical Energy In directly
4	2020-21	Replacement of 200Nos. Old CO2 Welding SET with IGBT based Welding Sets	4,88,100
5	2020-21	Re-cyclic Timers have been provided in 1200 Nos. of man-coolers (out of 1300 Nos.) of 0.75 kW for switching off at regular intervals.	3,60,000
6	2021-22	Implementation of 886.17 kWp grid connected rooftop Solar PV project at RCF Kapurthala	
7	2021-22	Installation of Occupancy Sensors in 126 offices/Rooms in Factory Area,	



ENERGY SAVING PROJECTS IMPLEMENTED



**VVVF DRIVES PROVIDED IN
EOT CRANES**



**TIMERS PROVIDED IN
MANCOOLERS CIRCUITS**



INNOVATIVE PROJECTS IMPLEMENTED

NAME OF PROJECT	BRIEF DESCRIPTION	MAIN APPLICATION	YEAR IMPLEMENTATION
CENTRALISED ELECTRICAL ENERGY MANAGEMENT SYSTEM	<ul style="list-style-type: none"> •WORKING ON INTRANET. • APPROX. 240 MEASUREMENT DEVICES •TO MONITOR ELECTRICAL PARAMETERS 	<ul style="list-style-type: none"> •GENERATES VARIOUS TYPES OF REPORTS AND •LIVE DATA OF ELECTRICAL ENERGY 	2019
INDUSTRY 4.0 CNC MONITORING SYSTEM	<ul style="list-style-type: none"> •28 CNC MACHINES CONNECTED THROUGH LAN /WI-FI 	<ul style="list-style-type: none"> •DISPLAYS LIVE STATUS • STORE DATA LIKE RUN-TIME/STOP-TIME •IDLE-TIME/PARTS COUNTS PER SHIFT AND • GENERATES VARIOUS REPORTS LIKE EFFICIENCY, AVAILABILITY AND BREAKDOWNS 	2022



CENTRALISED ELECTRICAL ENERGY MANAGEMENT SYSTEM DASHBOARD

Browser tabs: You are signed in as u457356 x Google x Dashboards - FOX EMS x seven eleven store toooom x 7-Eleven Stores Pty Ltd in 22 x

Address bar: Not secure | 10.12.24.255/EMS/Dashboard/Index

Page Title: FOX EMS - Dashboard - Main

Navigation: Dashboards, SLD, Trends, Alarms, Events, Entity Explorer, Reports, Admin, Configuration

Alerts: [16] Modbus communication degraded. SS06_SMSShop_VM SS-06 SM Shop OTHER 31-Jan-2022 09:27:01:217

User: foxadmin Log off

Time: 31-Jan-2022 11:14:45

POWER ANALYSIS

Plant

VOLTAGE

CURRENT

Power: **1979.188** kW

ENERGY CONSUMPTION AND COST

Daily Energy	10.713 MWh	69631.90 INR
Per Day Avg.	19.653 MWh	127745.06 INR
Since 01-Jan-2022 00:00	589.593 MWh	3.83 M INR

DEMAND PROFILE

Plant

Sanction Load Threshold

ENERGY USAGE

Plant

Daily (kWh) Baseline low

EMISSION SINCE 01-Jan-2022

Plant

Carbon footprint

453.805 Tons CO₂e

124 Tons Carbon

Carbon neutrality

997.37 Trees to plant.

RECENT EVENTS

Occurred On	Title	Info
31-Jan-2022 11:01:08:000	Report Generated	Monthly - Day:temp
31-Jan-2022 10:56:04:7...	Report Generated	Monthly - Day:abcd
31-Jan-2022 10:55:18:0...	Report Generated	Compressor Energy.Co...
31-Jan-2022 10:50:59:8...	Report Generated	Alarm Log:tempAlarm
31-Jan-2022 10:46:35:2...	Report Generated	Daily - 15 Min:D15Min
31-Jan-2022 10:01:03:8...	Report Generated	Monthly - Day:temp
31-Jan-2022 09:56:02:9...	Report Generated	Monthly - Day:abcd
31-Jan-2022 09:50:59:0...	Report Generated	Alarm Log:tempAlarm
31-Jan-2022 09:46:22:7...	Report Generated	Daily - 15 Min:D15Min

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Taskbar: Type here to search | 18°C Cloudy | 11:23 AM 1/31/2022



INDUSTRY 4.0 CNC MONITORING SYSTEM DASHBOARD

Connect to network x You are signed in as u453800 x Google x WhatsApp x Dashboards - FOX IloT x

← → ↻ Not secure | 10.12.24.211/IloT/Dashboard/Index

FOX IloT - Dashboards :: Bogie Shop - Day

Ping Err. 18 Comm OK. 12 Comm Err. 1 RCF

Dashboard M/C Live Alarms Analytics Trends Production PM Schedules Entity Explorer Reports Admin Logs Configuration Mobile App Help U453800 Log off

[19] Thread Stopped. Modbus 10.12.252.45 04-Aug-2022 10:11:31:593

Now Day Sh1 Sh2 Sh3 All Shops Wheel Machine Sheet Metal **Bogie**

Statistics - Now

Total Machines	9
Comm. Err	1
Ping. Err	3
Avg. OEE	0.50
Avg. Availability	0.50
Avg. Quality	1.00
Avg. Performance	1.00
ActualPlan	13.98%

State - Now

State	Nos.
Auto	3
Manual	6
Alarm	0
Run	3
Stop	2
Idle	1
Off	5
Maint	0

Performance - Day OEE

Seq	Shop	Machine	Unit
1	Bogie Shop	Bolster M/C (BMK)	
2	Bogie Shop	Welding Robot (IGM)	
3	Bogie Shop	Welding Robot (Hitech-II)	
4	Bogie Shop	Welding Robot (Hitech-I)	
5	Bogie Shop	Plasma Cutting (Stako)	

Maintenance-Now All

Seq	Shop	Machine	hh:mm

21. Welding Robot (IGM)

Auto hh:mm % Plan/Act. (0/1)

Run	02:00	60
Stop	00:00	0
Idle	00:15	7
Off	01:05	32
Maint	00:00	0
AvgCyc	01:57	83

00:03

22. Welding Robot (Hitech-II)

Auto hh:mm % Plan/Act. (0/1)

Run	03:15	97
Stop	00:00	0
Idle	00:00	0
Off	00:03	2
Maint	00:00	0
AvgCyc	01:57	83

03:15

23. Welding Robot (Hitech-I)

Manual hh:mm % Plan/Act. (0/0)

Run	00:00	0
Stop	00:00	0
Idle	00:00	0
Off	03:20	100
Maint	00:00	0
AvgCyc	00:00	0

03:20

24. Bolster M/C (BMK)

Manual hh:mm % Plan/Act. (1/0)

Run	00:00	0
Stop	00:00	0
Idle	00:00	0
Off	03:20	100
Maint	00:00	0
AvgCyc	00:00	0

01:18

26. Laser Cutting (LVD-II)

Manual hh:mm % Plan/Act. (780/0)

Run	00:00	0
Stop	00:00	0
Idle	00:00	0
Off	03:20	100
Maint	00:00	0
AvgCyc	00:00	0

03:20

27. Plasma Cutting (Stako)

Manual hh:mm % Plan/Act. (0/28)

Run	00:09	4
Stop	00:06	2
Idle	02:36	78
Off	00:29	14
Maint	00:00	0
AvgCyc	00:01	116

00:03

28. Plasma Cutting (Adore)

Manual hh:mm % Plan/Act. (0/62)

Run	00:54	27
Stop	00:25	13
Idle	01:44	53
Off	00:12	6
Maint	00:00	0
AvgCyc	00:01	102

00:08

29. Edge Milling (Zayer)

Manual hh:mm % Plan/Act. (0/0)

Run	00:00	0
Stop	00:00	0
Idle	00:04	1
Off	03:16	98
Maint	00:00	0
AvgCyc	00:00	0

01:33

30. Edge Milling (TOS)

Auto hh:mm % Plan/Act. (0/17)

Run	371:26	27
Stop	231:53	16
Idle	00:00	0
Off	766:03	55
Maint	00:00	0
AvgCyc	00:00	0

370:48

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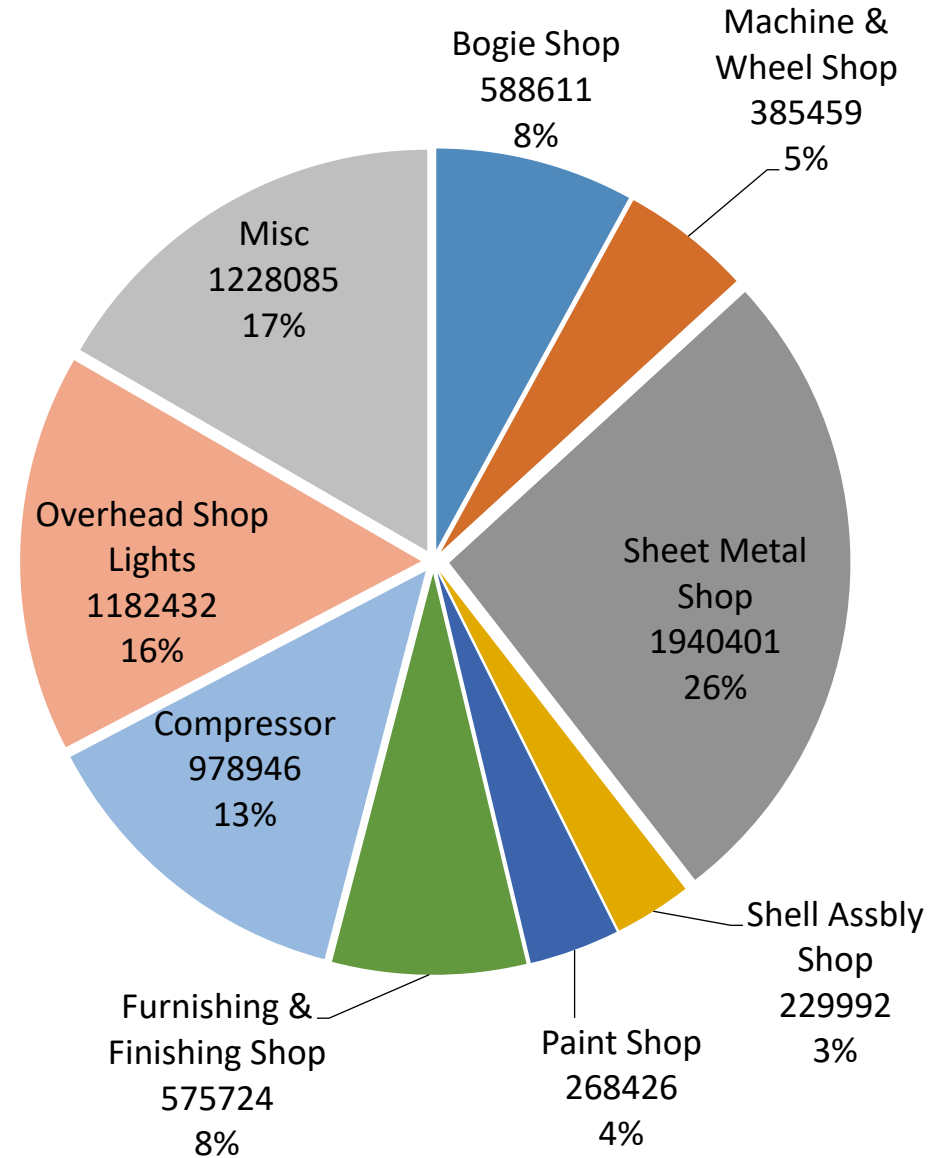
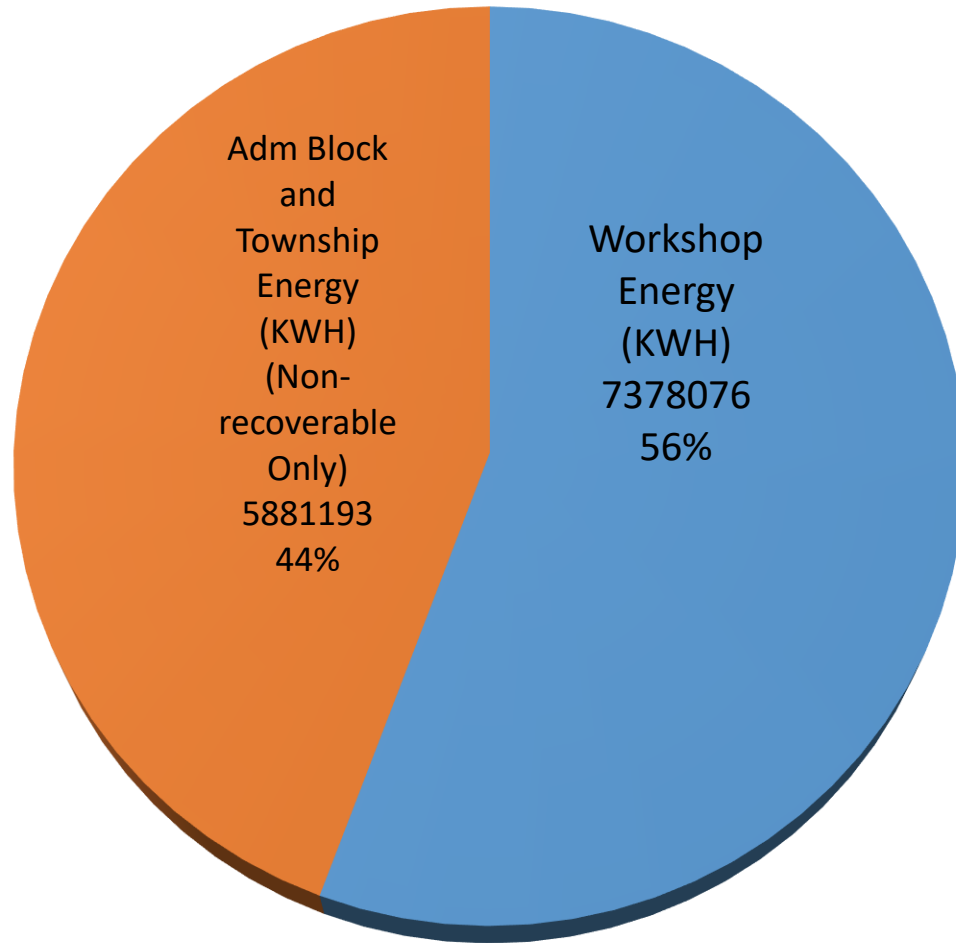
Show all

Windows taskbar with icons for File Explorer, Google Chrome, Microsoft Edge, Word, and other applications. System tray shows language (ENG, INTL), time (11:10), and date (04-08-2022).

11



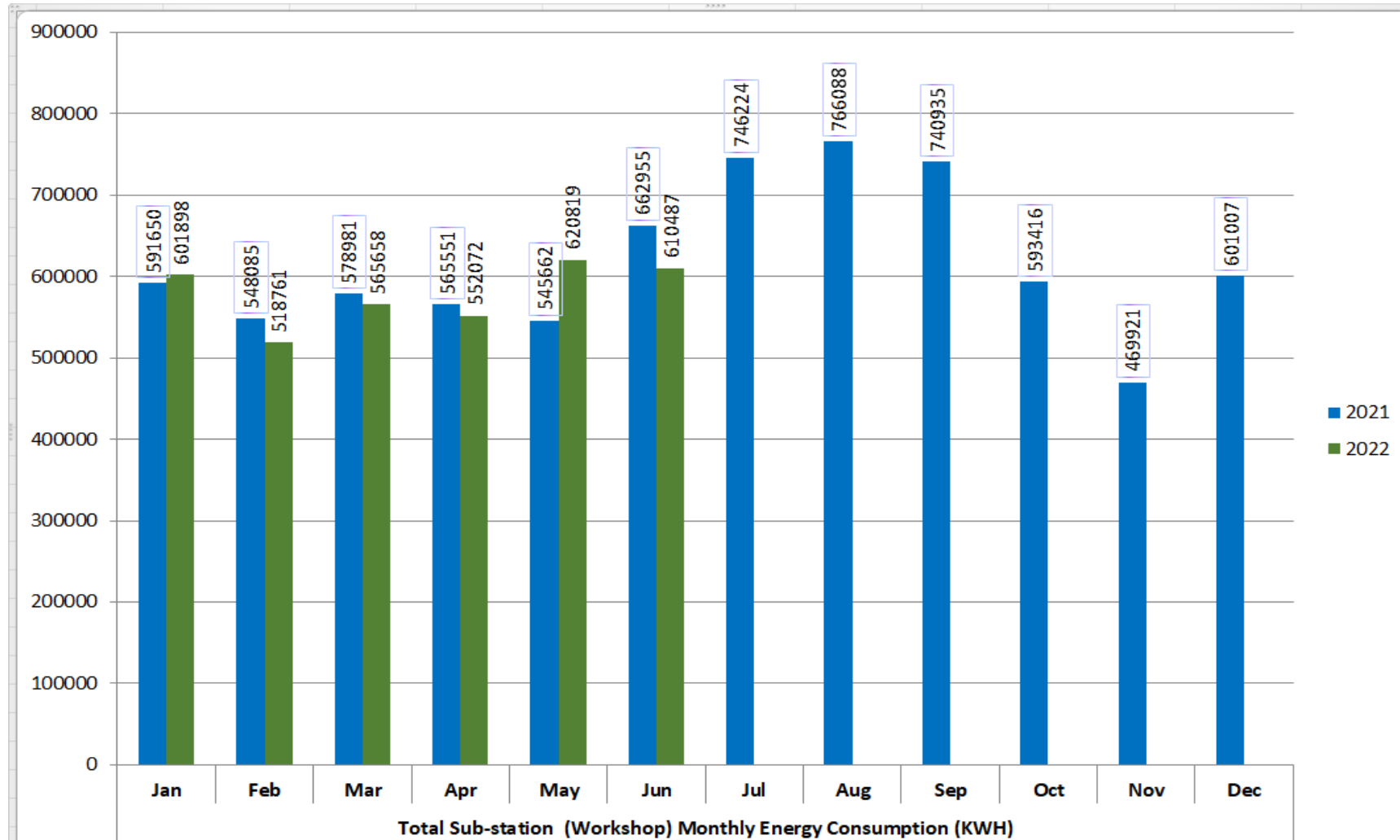
ELECTRICAL ENERGY ANALYSIS 2021-2022



WORKSHOP ELECTRICAL ENERGY CONSUMPTION ANALYSIS



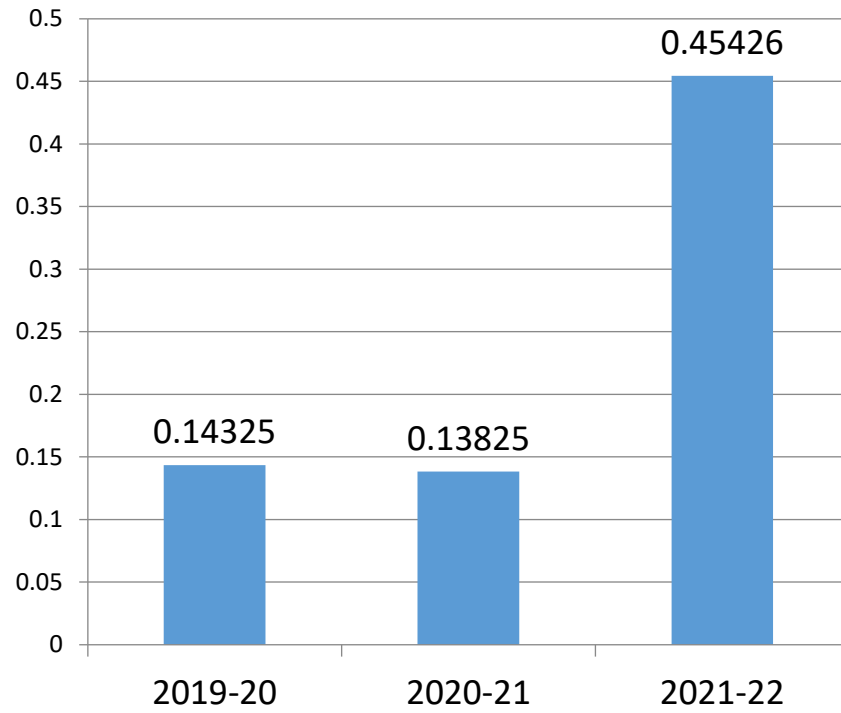
TOTAL WORKSHOP ELECTRICAL ENERGY MONTH WISE (kWH)





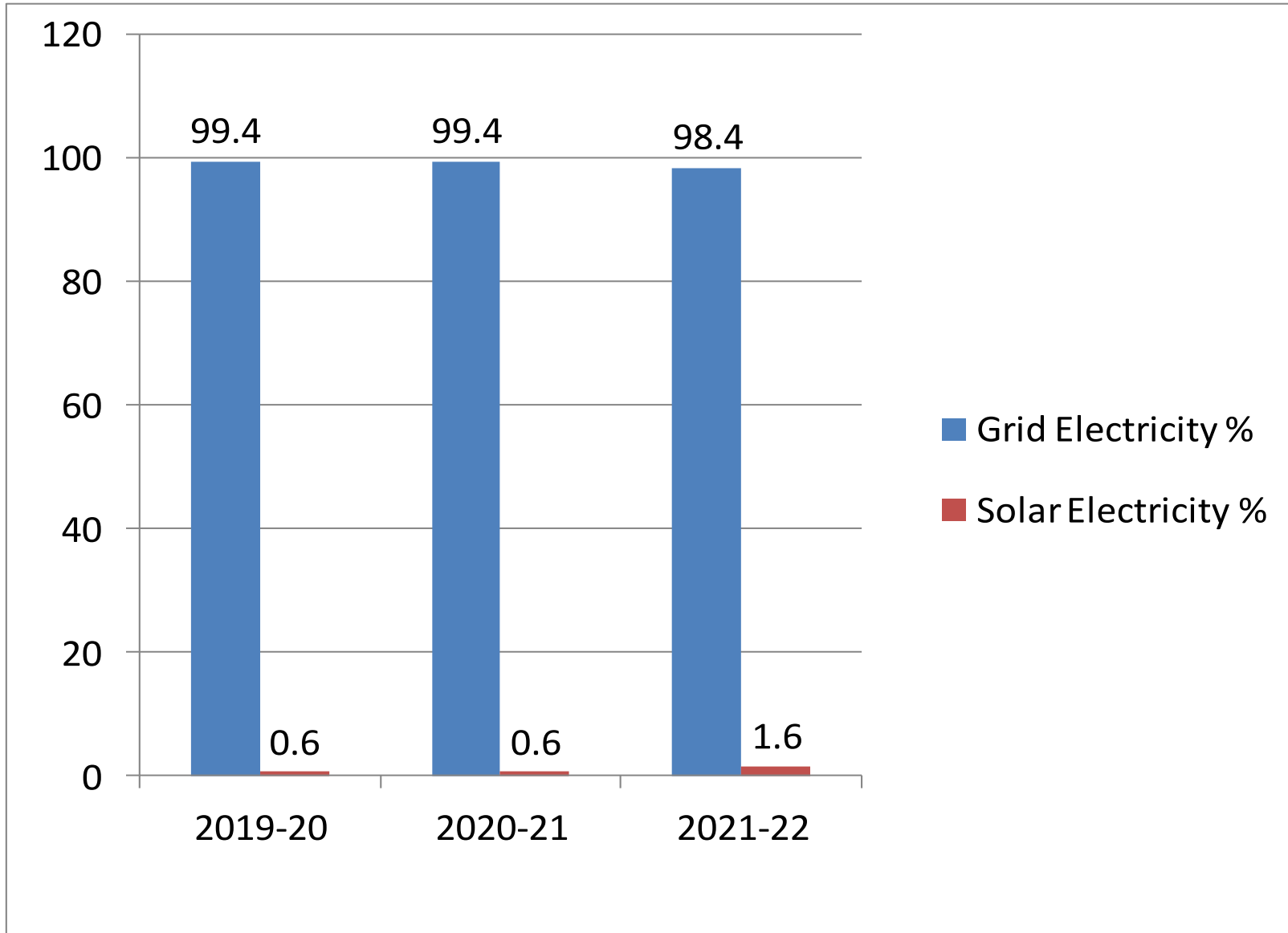
RENEABLE ENERGY

Solar Energy Generated (Million kWh)



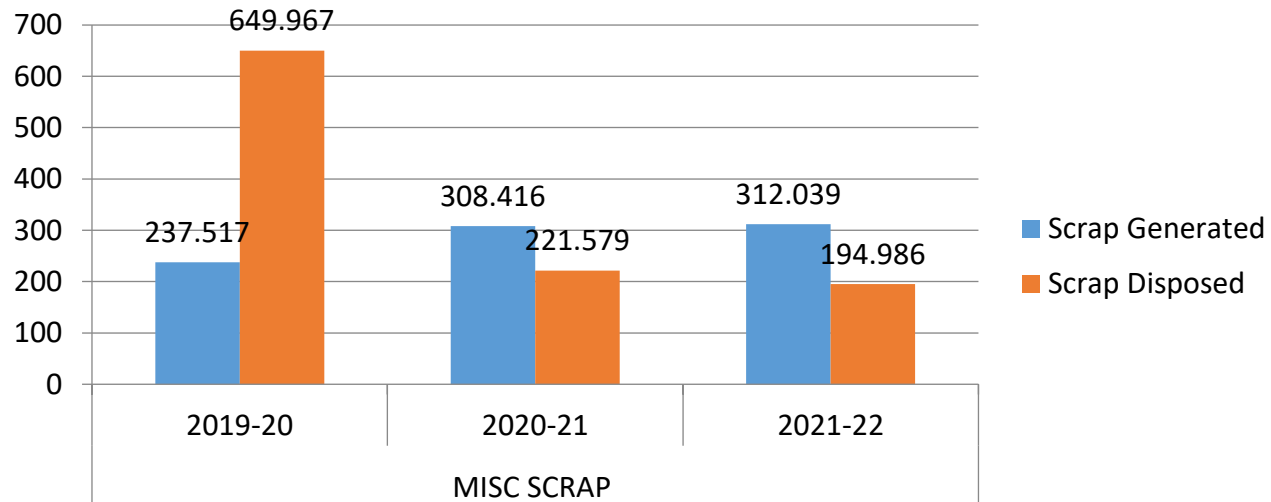
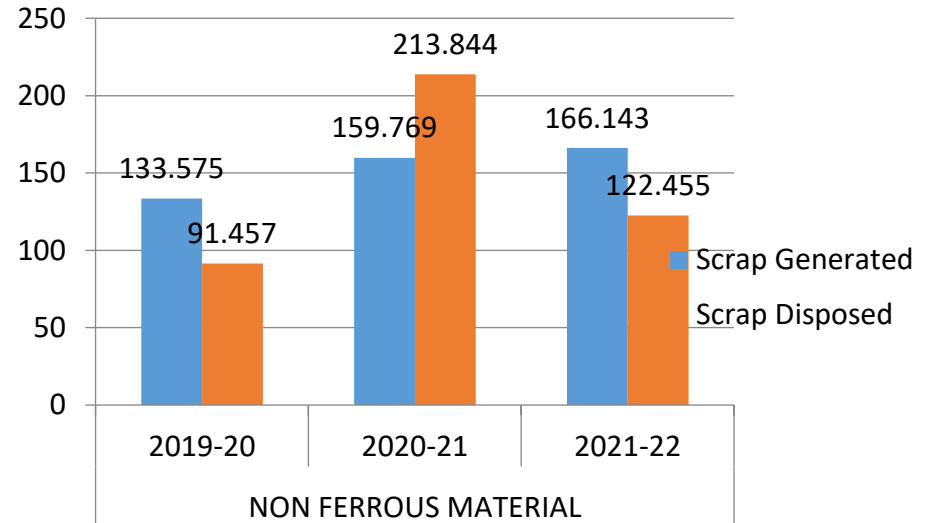
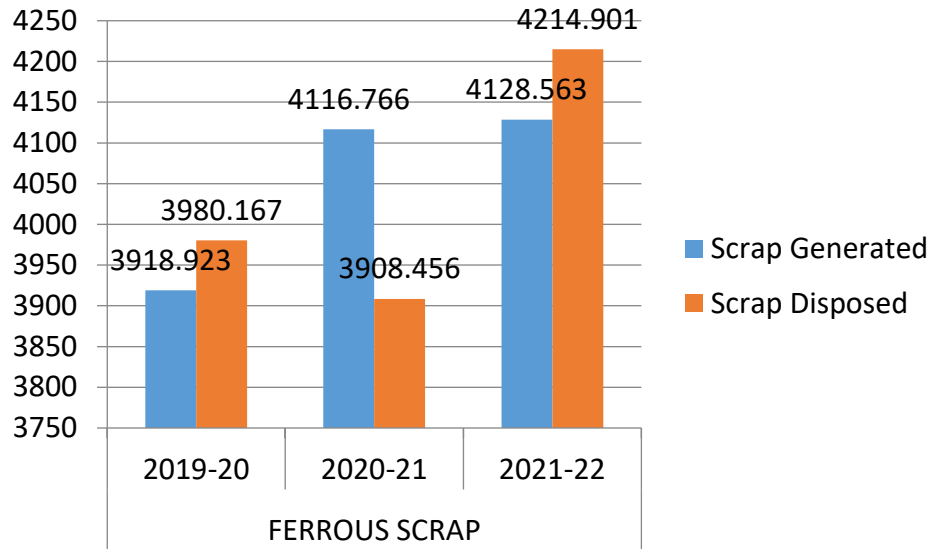


TOTAL PERCENTAGE ELECTRICAL ENERGY CONSUMPTION IN RCF





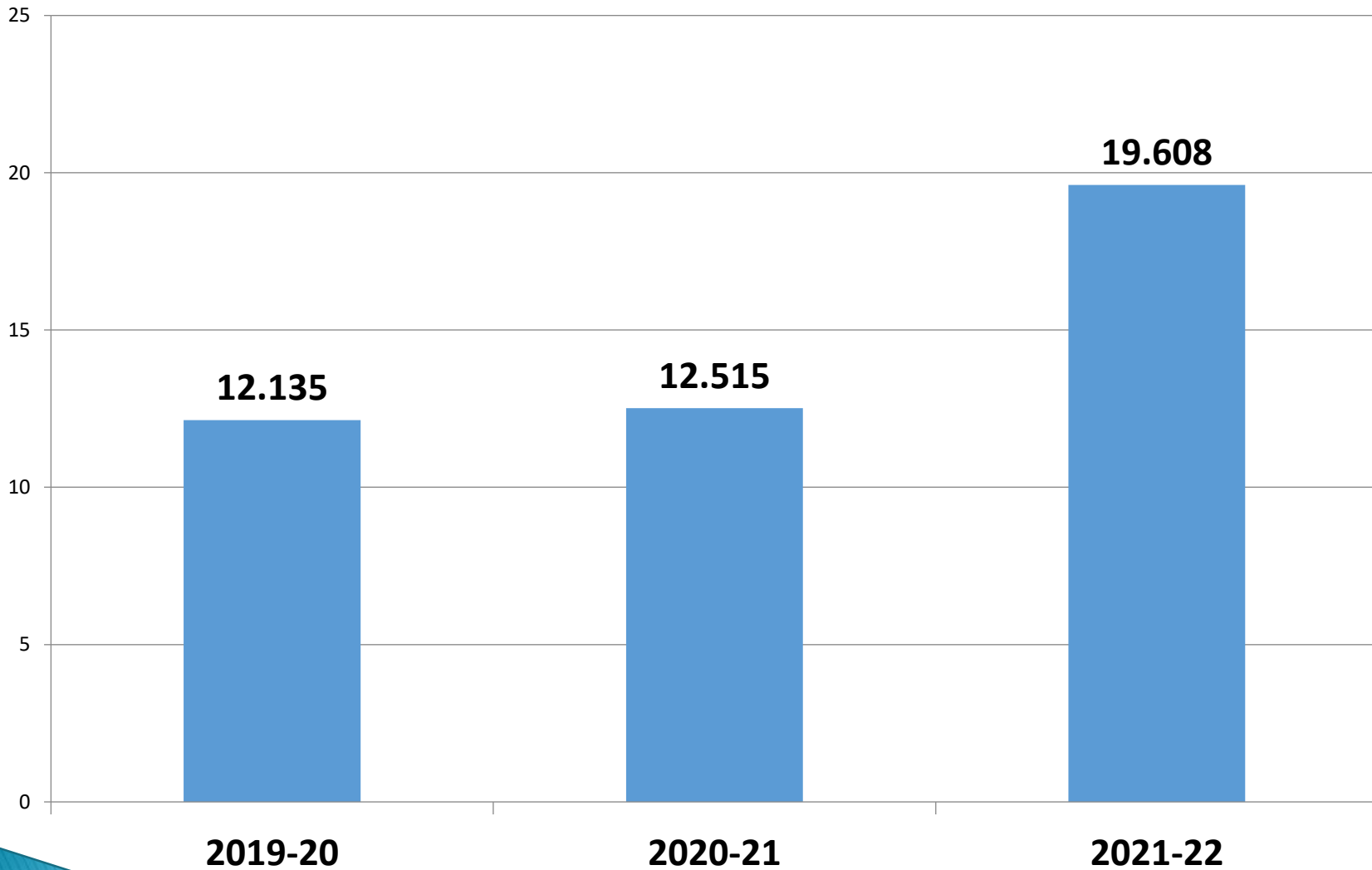
WASTE MANAGEMENT SCRAP GENERATED/DISPOSED (MT)





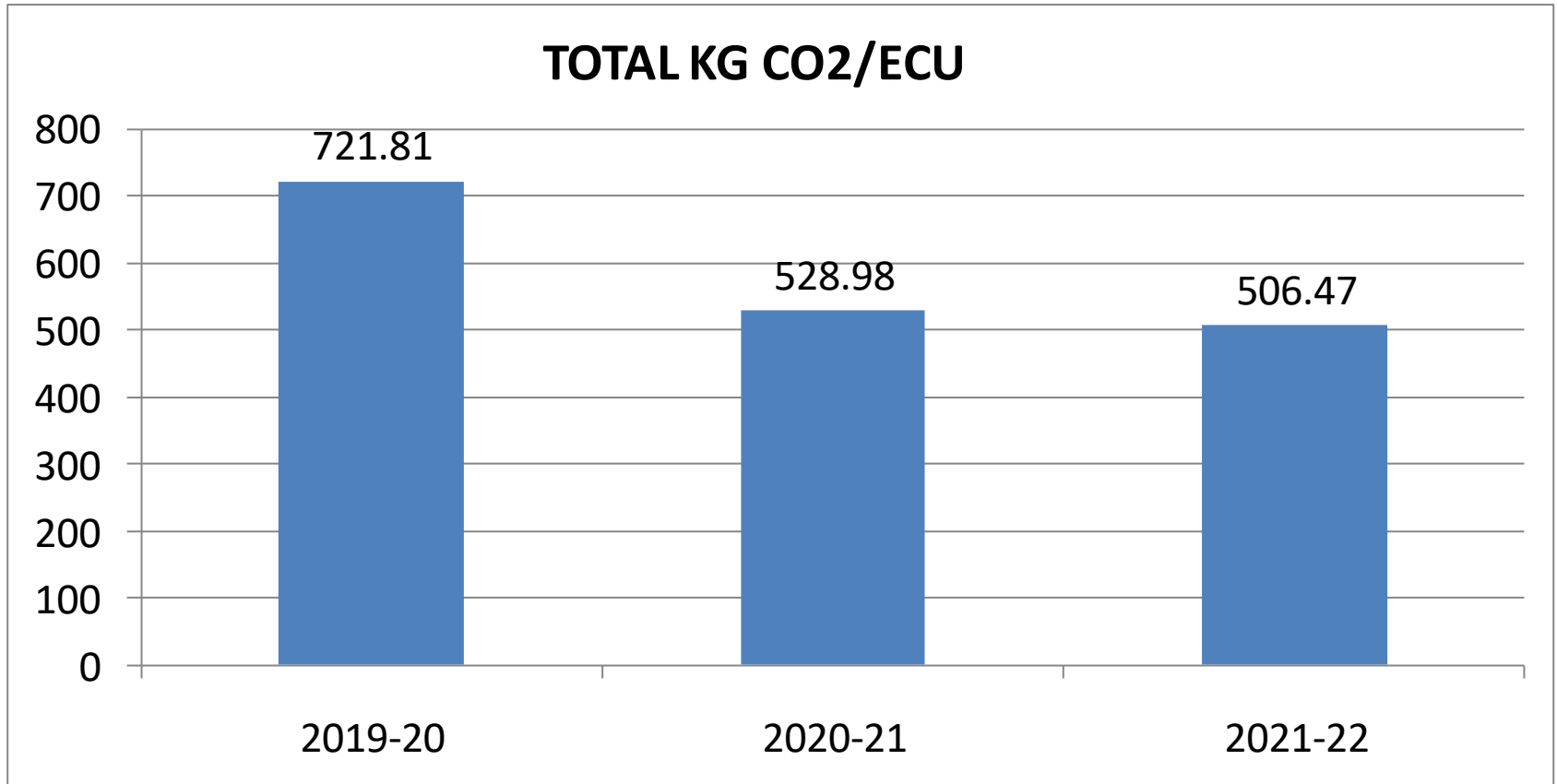
WASTE MANAGEMENT

Value of Scrap disposed (Rs in Crores)





GREEN HOUSE GASES/CO2 EMISSION



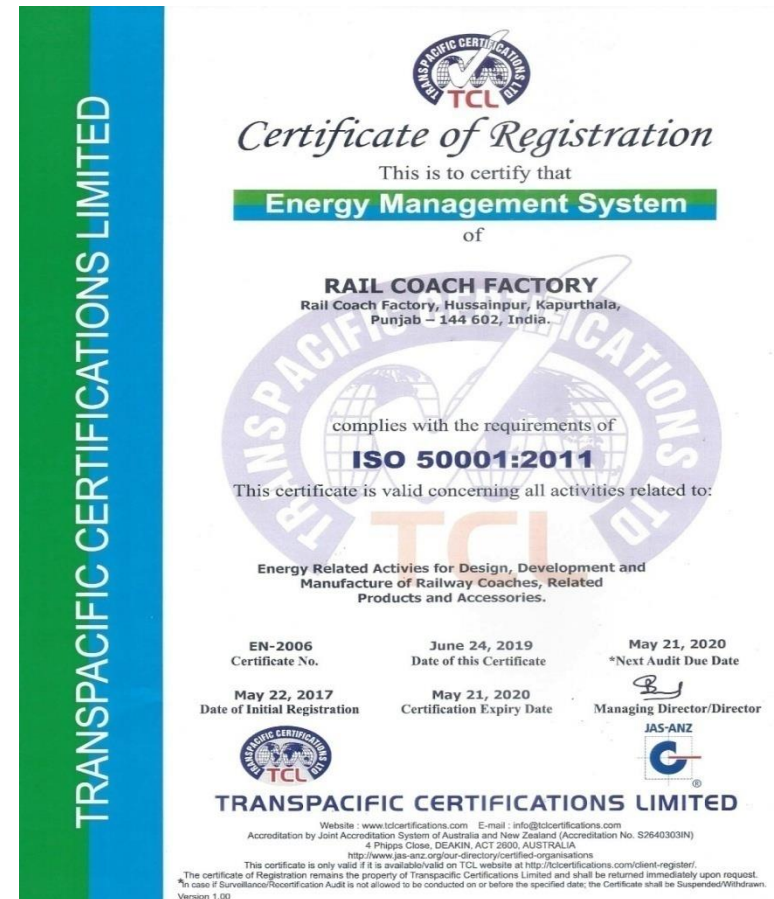
Where ECU is Equivalent Coach Unit



IMPLEMENTATION OF ISO 50001/ENERGY POLICY IN RCF

Energy Policy

- ▶ We, at RCF- Kapurthala are committed for continual improvement in our Energy Performance and optimization of Energy Use, Consumption & Efficiency and thus shall endeavour to employ Energy Efficient Products and services and design and shall ensure the availability of Information and Resources. We shall endeavour to enhance and promote the use of suitable Renewable Energy in our day to day activities.
- ▶ We are further committed to comply with the applicable legal & other requirements pertaining to energy use, consumption and efficiency.



ISO 50001
ENERGY MANAGEMENT SYSTEM

PRESENT ENERGY SAVING PROJECT

SR. NO	DESCRIPTION	REMARKS
1	Solar Plant 1.958 MWP on PPP Mode	LOA Issued by M/s REMCL to Surayam International on 22-06-2021



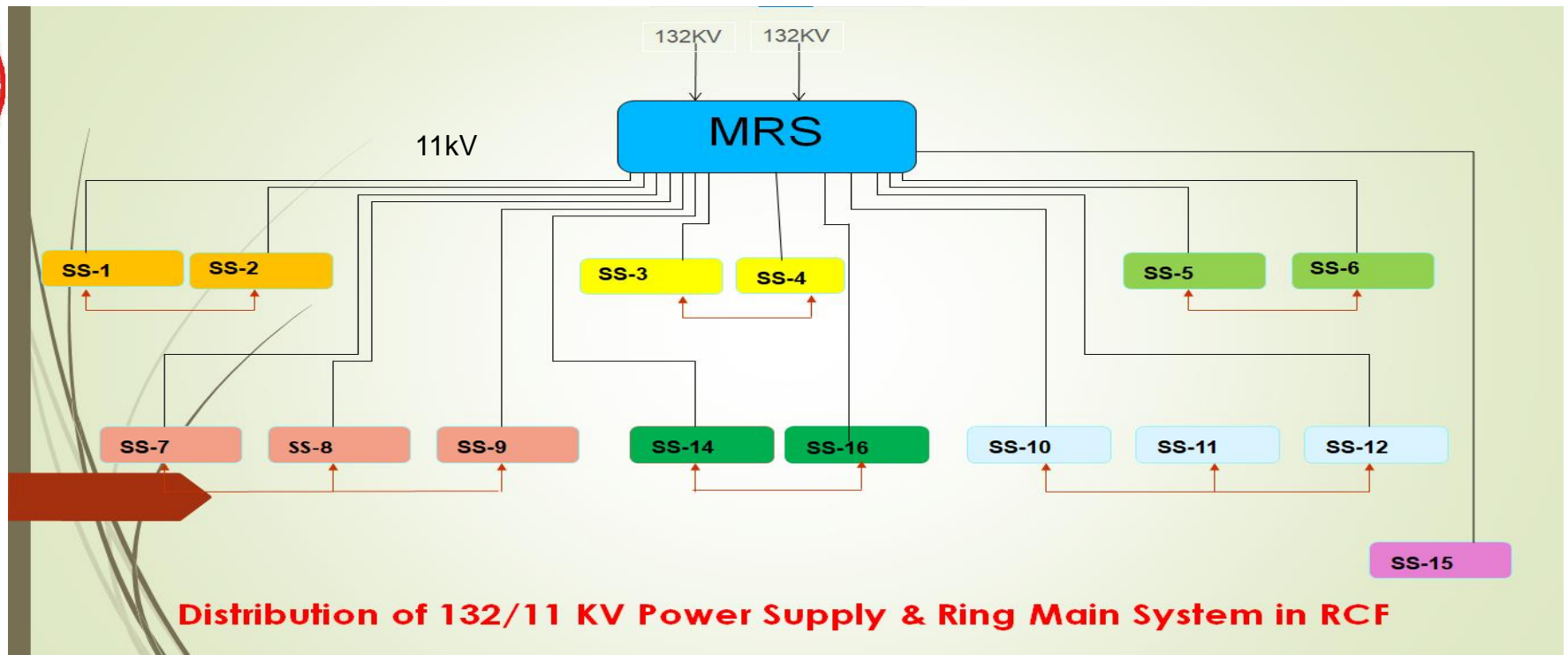
MAIN ENERGY CONSUMPTION

ELECTRICAL UTILITIES

- Paint booths
- CNC & NON CNC Machines
- Skin Tensioning Machine
- EOT Cranes
- Mancoolers
- IGBT Based MIG & MAG Welding Set
- Compressor houses
- Shop Overhead Lights

THERMAL UTILITIES

- HSD & LPG
- THE MAJOR CONSUMPTION OF HSD IS IN THE MATERIAL HANDLING SYSTEM (FORK LIFTER, TRACTORS ETC.)
- THE USE OF LPG IS IN THE PROCESS OF PAINT SHOP ONLY



3 Phase, 132 kV Electric supply (Open Access) is received at Main Receiving Station (MRS) through two dedicated transmission feeders from (PSTCL)

This supply is stepped down to 11 kV by two 132/11 kV, 12.5 MVA power transformers. At any instance, supply from one feeder is taken and other feeder acts as standby.

11 kV supply is further distributed to 15 nos, 11kV/415V distribution sub-stations. Nine nos of sub-stations feed workshop area & 06 nos feed Admin Block & Township Area

Complete flowchart of RCF Power supply is [MRS FLOW CHART.pdf](#)



ELECTRICAL UTILITIES



EOT CRANES



COMP. HOUSE



MIG/MAG WELDING SETS



CERTIFICATION AWARDED TO RCF



ISO 45001 : 2018
TO CONFORM THE
OCCUPATIONAL HEALTH &
SAFETY MANAGEMENT
SYSTEM



ISO 9001:2015
TO CONFORM THE QUALITY
MANAGEMENT SYSTEM



CERTIFICATION AWARDED TO RCF



CERTIFICATION OF FIVE "S"
WORKPLACE MANAGEMENT
SYSTEM



CERTIFICATION UNDER GREEN Co GREEN
COMPANY RATING



CERTIFICATION AWARDED TO RCF



ISO 14001:2015
TO CONFORM ENVIRONMENTAL
MANAGEMENT SYSTEM STANDARDS



* Providing that the subsequent surveillance audits are successful before the validity date of the previous audit
Certification body address: Schnieringhof 14, 45329 Essen, Germany

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IRIS CERTIFICATION FOR
GLOBAL BUSINESS ASSURANCE

THANKS

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