Seshasayee Paper and Boards Limited, Erode

Fine Papers - LasTing Impressions

EXCELLENCE IN ENERGY MANAGEMENT

14.09.2023

Team: D Radhakrishnan, CM (Pulp Mill Operations) & A Kavinkumar, AM (Boiler)

"Healthy Performance Based on Conservation & Sustainability Principles"

SPB's Commitment for Excellence

RE share – 68.33%

All our products are 100% Recyclable & Biodegradable

Pioneer in Circular Economy

Plantations - 19.38 crores of seedlings in 22,500 acres of land

Carbon & wood positive

Substitution of coal with Biomass in Power Boiler

ISO 9001

ISO 14001

ISO 45001

ISO 50001 Implementation In Progress

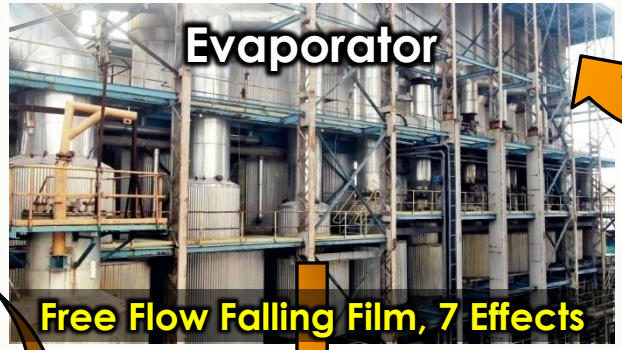
FSC www.fsc.org MIX Paper from responsible sources FSC® C084458

ELEMENTAL CHLORINE FREE - ECO-FRIENDLY ECF PAPER

Sustainable Practices – Paper Manufacturing Process

White Liquor

Black Liquor



Burnt Lime

Lime Mud

Green Liquor

"To Manufacture Quality Products at Competitive Cost through Technology and Team Work"

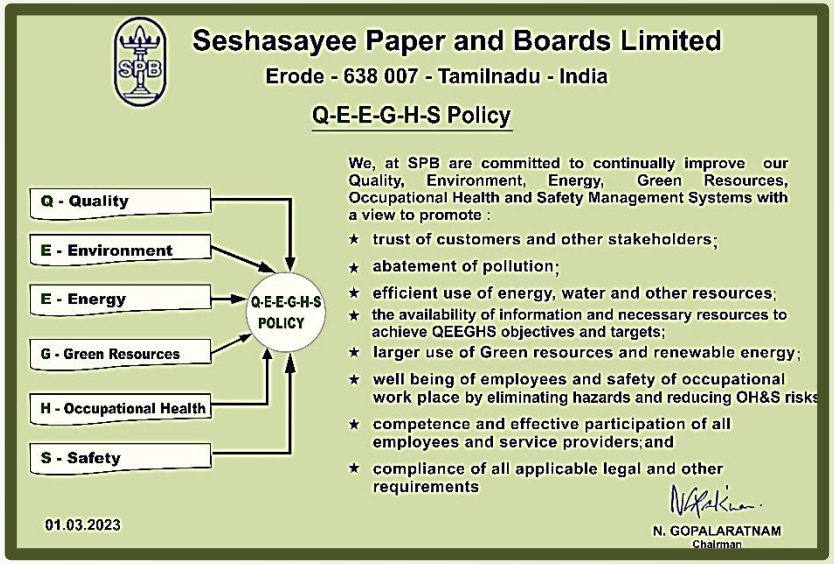
Our Energy Policy

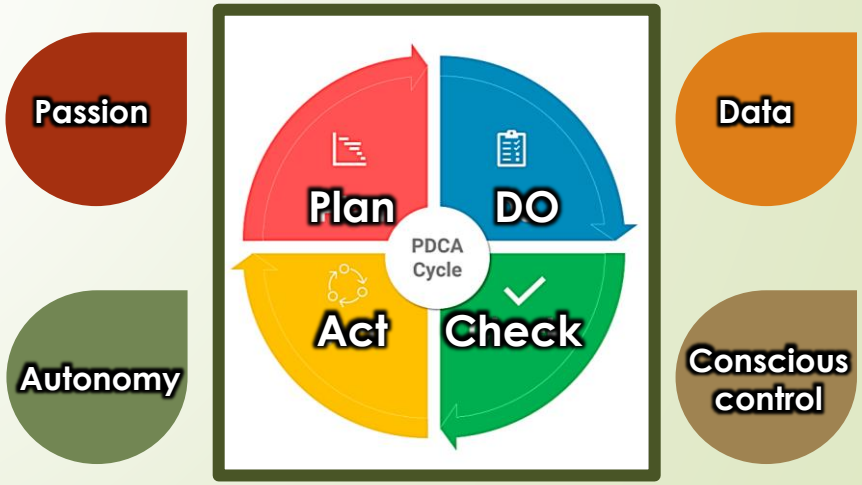
We, at SPB are committed to continually improve our Energy Efficiency by:

- Analysing the present status of energy generation and consumption in our mill
- Fixing energy consumption targets for each department
- Monitoring energy consumption on a daily basis
- Conducting periodic energy audits
- Fixing the yearly target for energy reduction and implementing the energy conservation schemes to achieve the target
- Involving and motivating all employees to reduce energy consumption

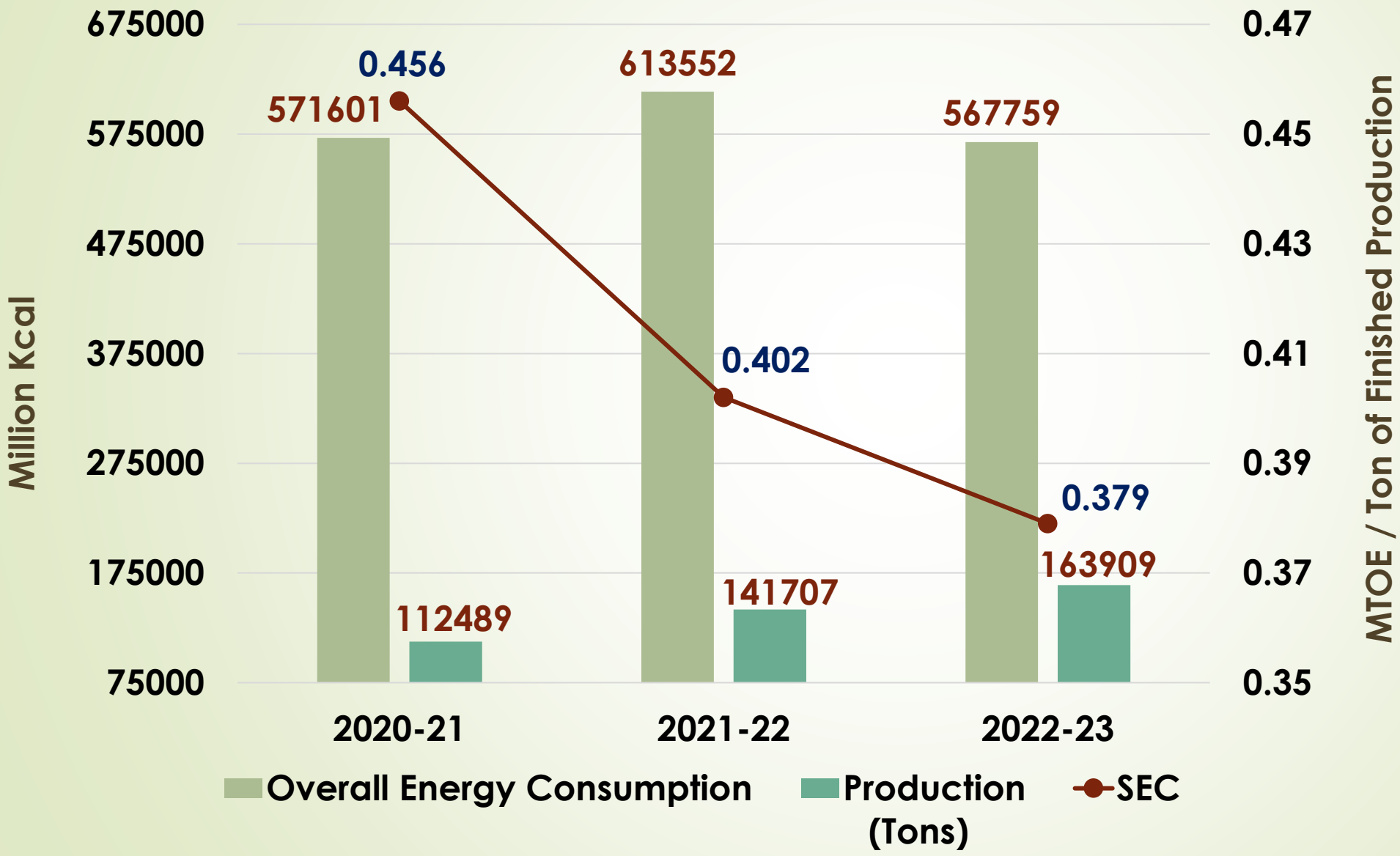
08.02.2016

K S Kasi Viswanathan
Managing Director





Overall Energy Consumption & SEC Trend



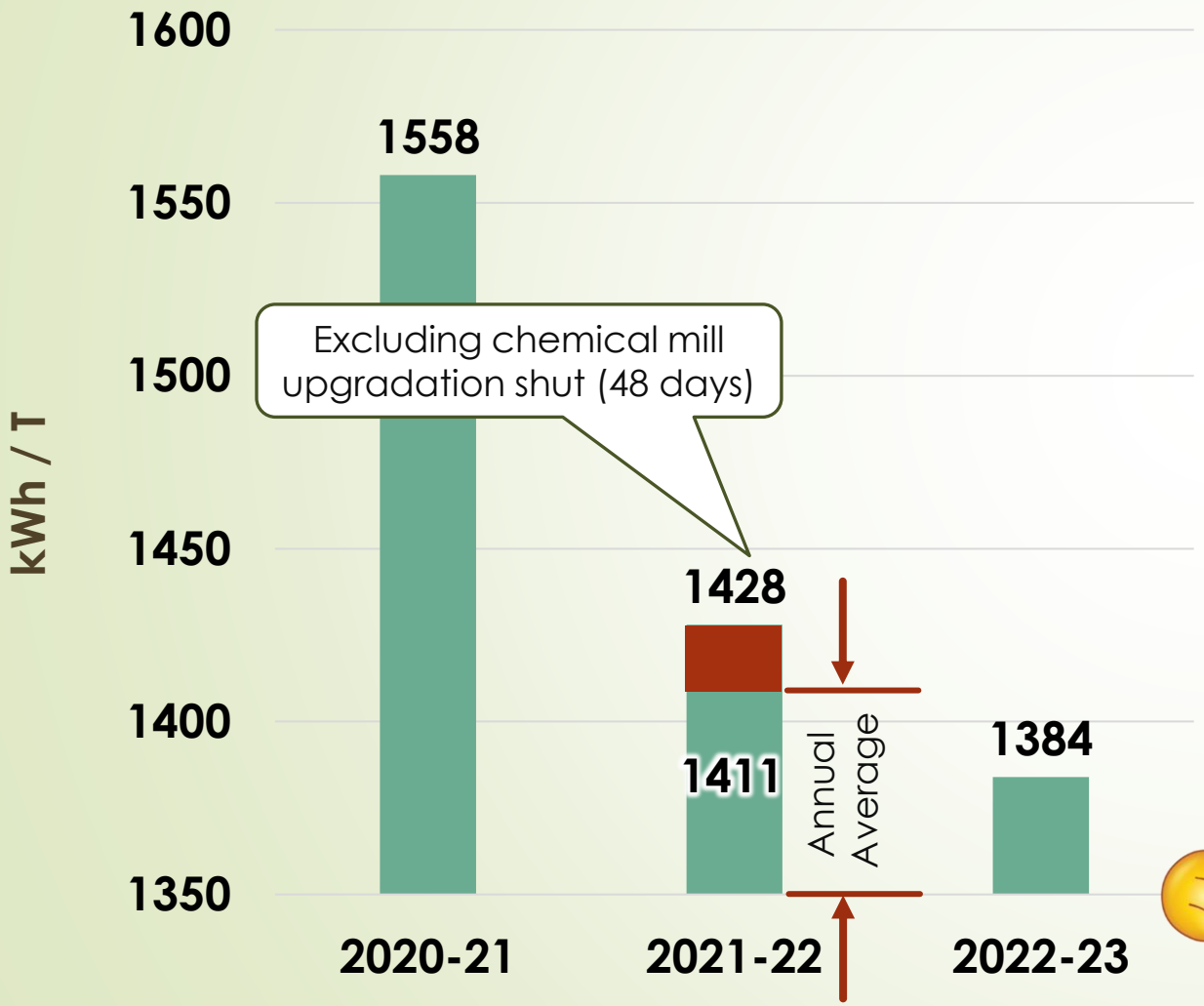
Paper Production – 46%

SEC – 17%

SPC & SSC Trend

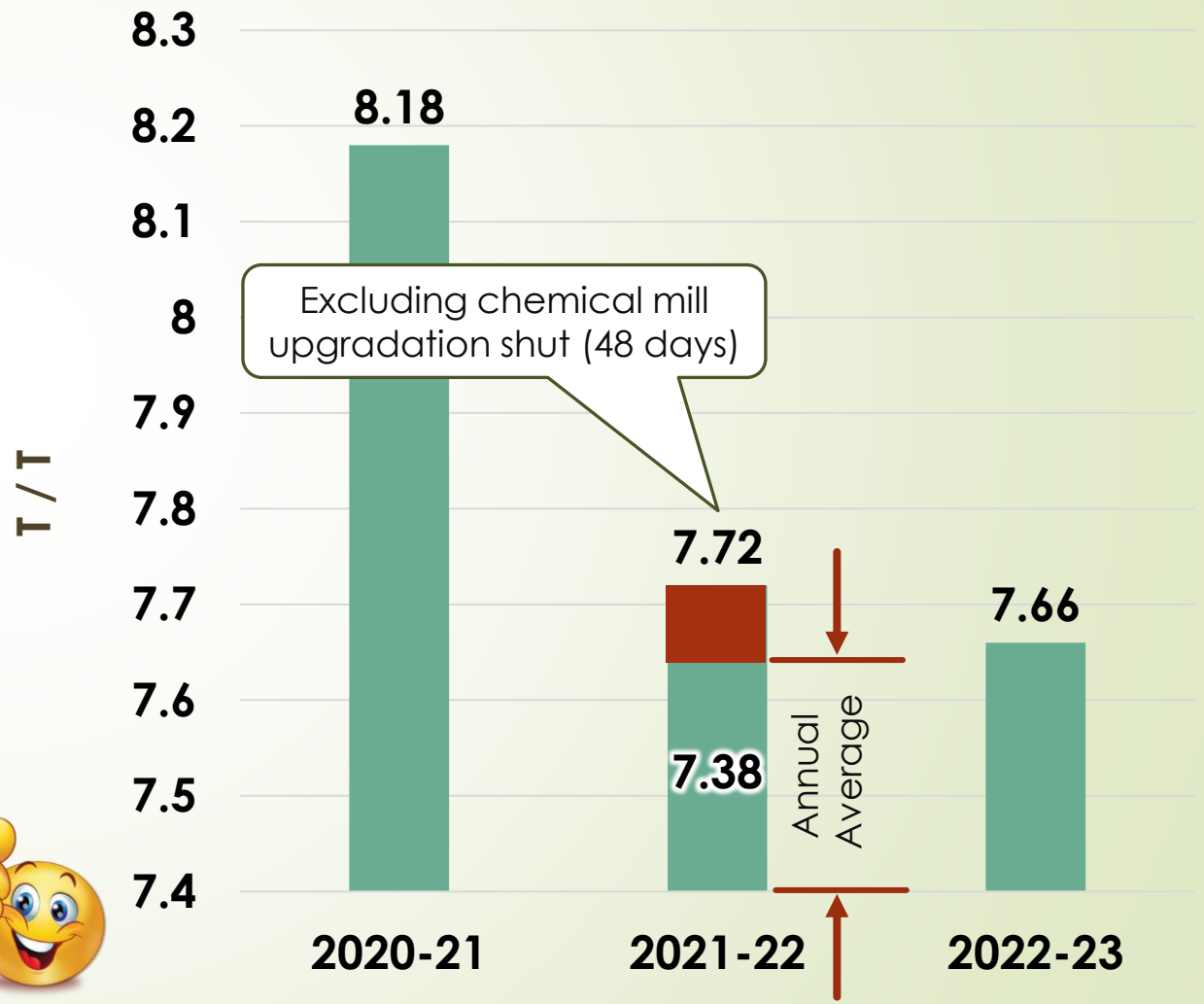
Specific Power Consumption

11.17%



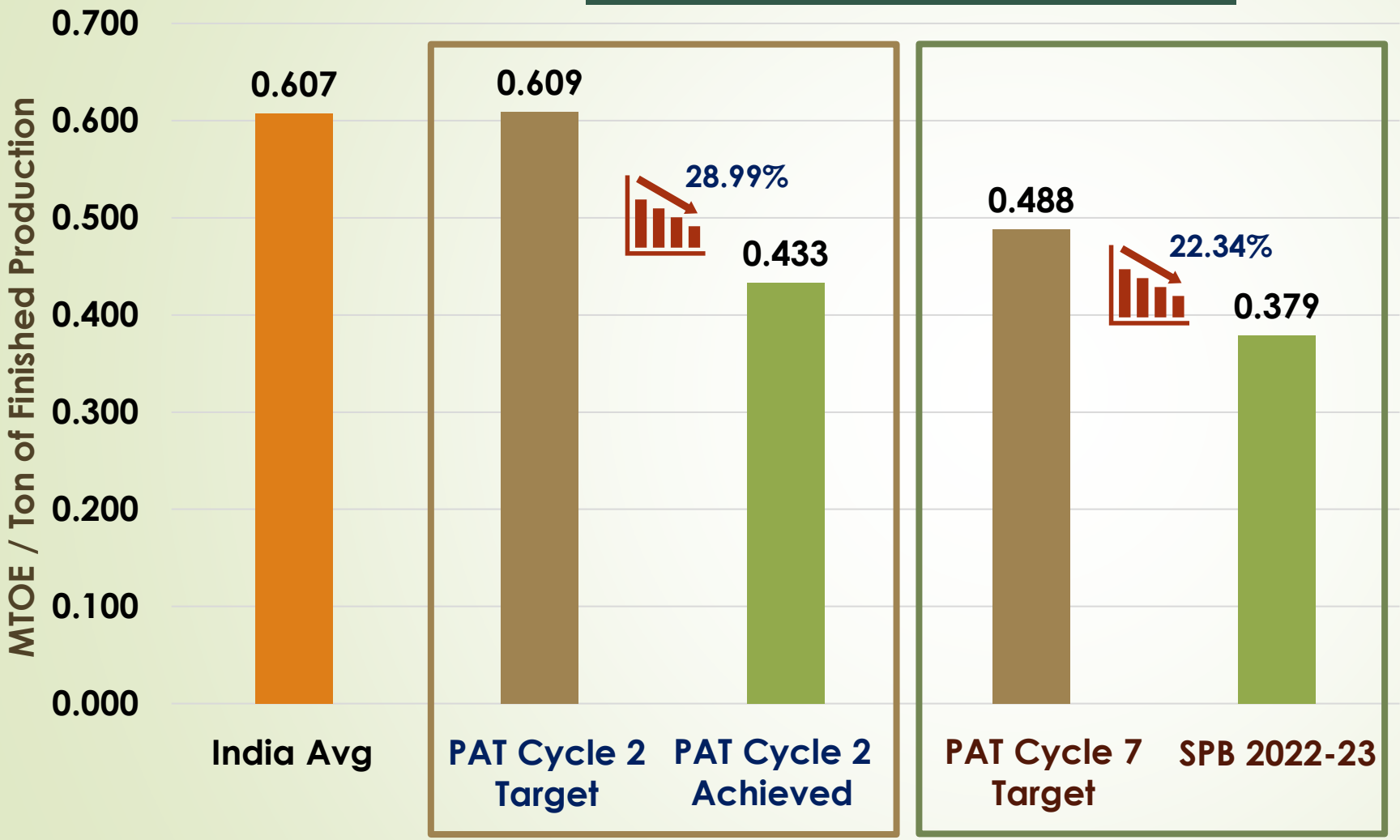
Specific Steam Consumption

6.36%



Benchmarking & Road Map

Specific Energy Consumption



(Source: Gazette Notification Dt: 31.03.2016 & 26.10.2021)

Live Projects – FY: 2023-24	
In Pipe line	11
Annual Savings	962 MKcal
Reduction in SEC	6%
Investment	188 Lacs

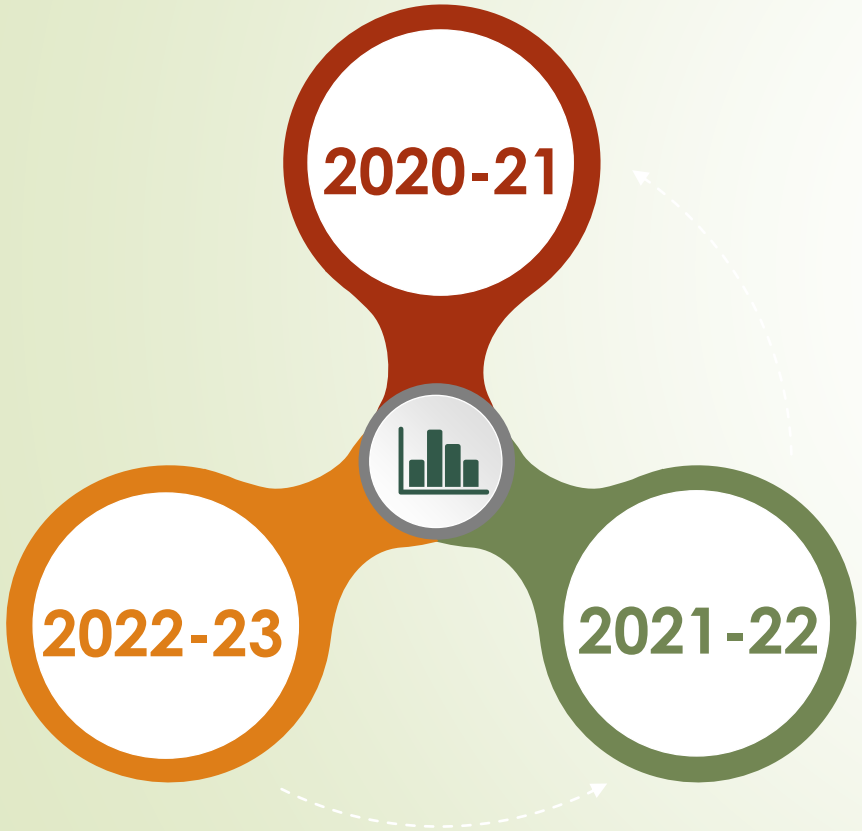
Projects Planned – FY 23-24

Notable Project: Utilization of Flue Gas heat recovery

Both the units of the company have achieved the targets under the PAT Cycle and accordingly are eligible for Escerts

Project Summary: 2020-21 to 2022-23

Emission reduction
31690 tCO2e



Key Project

Optimization of process steam temperature
Investment – Nil
Steam saved – 24 TPD
Cost saved – Rs. 69 Lacs
Pay back – Immediate

01

- ECS Implemented – 29 Nos
- Investment – Rs. 172 Lacs
- Steam Saved – 14043 Tons
- Power Saved – 16 Lakh kWh
- **Cost Saved – 178 Lacs**
- Pay back – 11.6 Months

Key Project

TG frequency reduction
Investment – Nil
Power saved – 19200 kWh / day
Cost saved – Rs. 410 Lacs
Pay back – Immediate

02

- ECS Implemented – 24
- Investment – Rs. 89 Lacs
- Steam Saved – 50077 Tons
- Power Saved – 69 Lakh kWh
- **Cost Saved – 1106 Lacs**
- Pay back – 1 Month

Key Project

Firing of Biofuels through overfeeding
Investment – Rs. 36 Lacs
Coal saved – 9 TPD
Cost saved – Rs. 291 Lacs
Pay back – 1.50 Months

03

- ECS Implemented – 17 Nos.
- Investment – Rs. 211 Lacs
- Steam Saved – 3805 Tons
- Power Saved – 2.31 Lakh kWh
- F.Oil saved – 274 KL
- **Cost Saved – Rs. 621 Lacs**
- Pay back – 4 Months

Total Steam saved – 67925 Tons

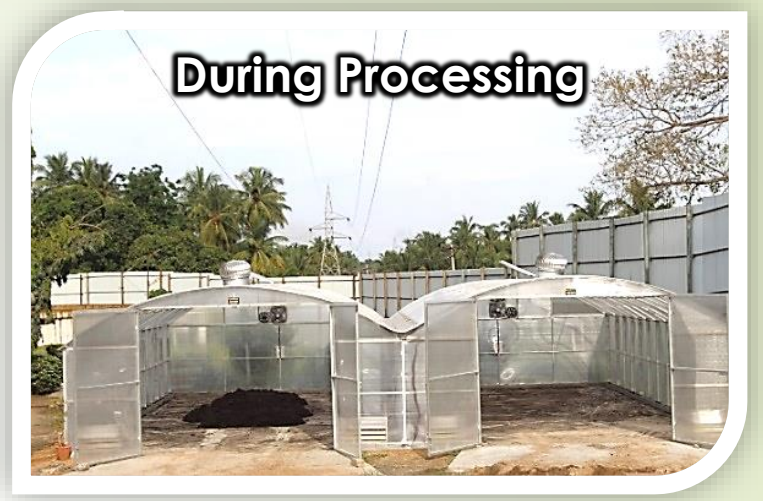
Total Power saved – 88 Lakh kWh

Total Furnace oil saved – 274 KL

Innovative Project

"Solar Sludge Dryer"

Novel Approach in handling of MLSS



Mixed liquor suspended solids (MLSS)

- The concentration of suspended solids, in an aeration tank during the activated sludge process, which occurs during the treatment of waste water.
- MLSS consists mostly of microorganisms and non-biodegradable suspended matter.

Trigger for the project

- Constant look for offsetting the fossil fuel requirement.
- The high Calorific value 3260 to 3460 kJ/kg value fuel to be utilised in a better way
- Earlier used as Fertiliser
- Post implementation of this project, the dried MLSS is being used in power boiler as biomass

"Change is inevitable, Changes call for innovation, and innovation leads to progress"

Innovative Project (Contd...)

How MLSS is handled?

- Sludge-drying beds (Direct sunlight)
- The rotary drum vacuum filter
- The centrifuge
- The belt filter press

SPB adopted the unique Green energy concept of harnessing the natural resources.

- In-house trail was taken with 200 kg of MLSS material on Dt: 12/04/2022.
- Based on the input, on 12/08/2022, a solar sludge drying system of 2000 square feet was installed.

"An innovative approach to offset fossil fuel consumption"

Innovative Project (Contd...)

SPB adopted the unique Green energy concept of harnessing the natural resources.

- The present system can handle 20% of the requirement.
- 6 tonnes of such MLSS are being dried per batch in a cycle of six days (dried from 15% to 70%).
- Solar dryer operation temperature is 34° C (min) and 50 ° C (Max) during the summer section.

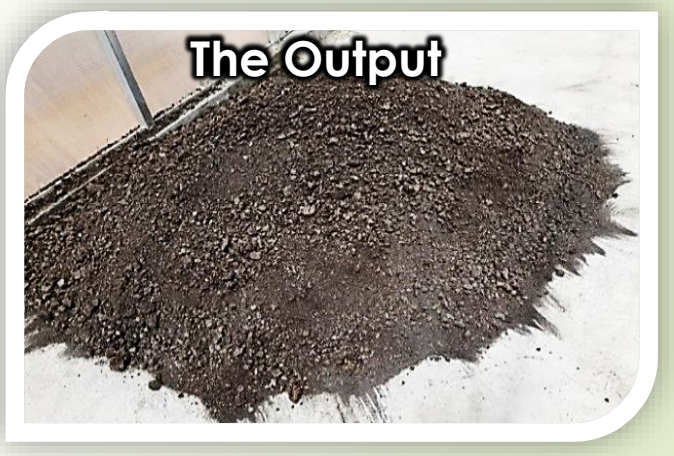
"An innovative approach to offset fossil fuel consumption"

Innovative Project (Contd…)

- Installation cost – Rs. 17.5 lakhs
- Space required – 2000 Sq. feet
- With low moisture content, it can be fed along with other fuels in power boilers

Outcome achieved by the project

S. No	Description	UOM	Value
1	Coal savings	TPA	**30**
2	Annualized cost savings	Rs. in Lacs	**4.10**



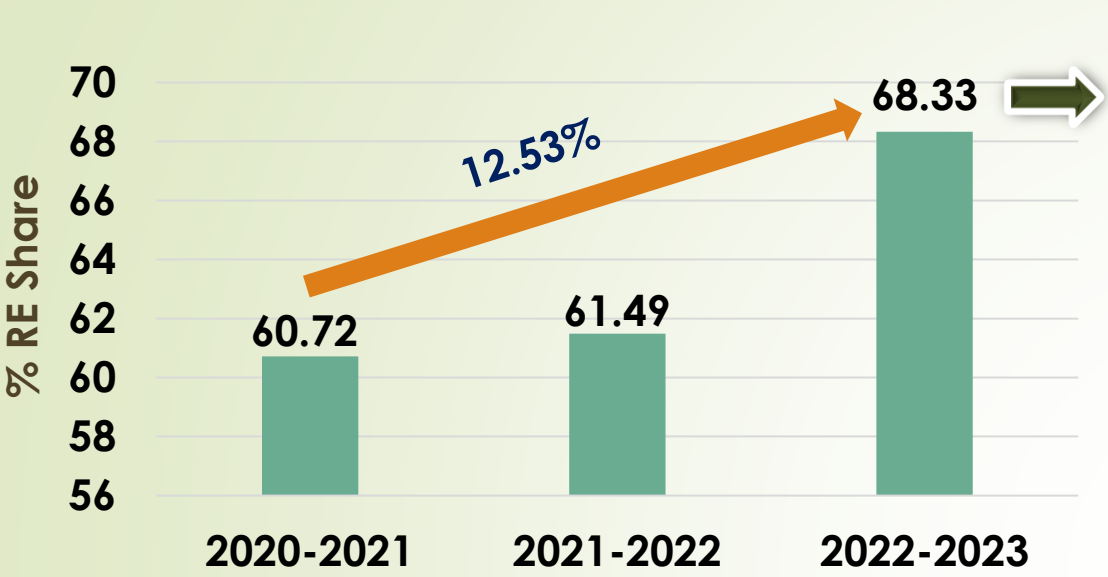
First time implementation on National Level

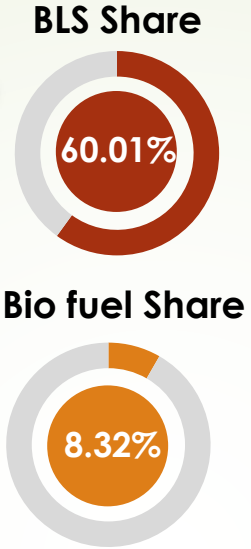
Feasible, Sustainable, Self driven and beyond OEM

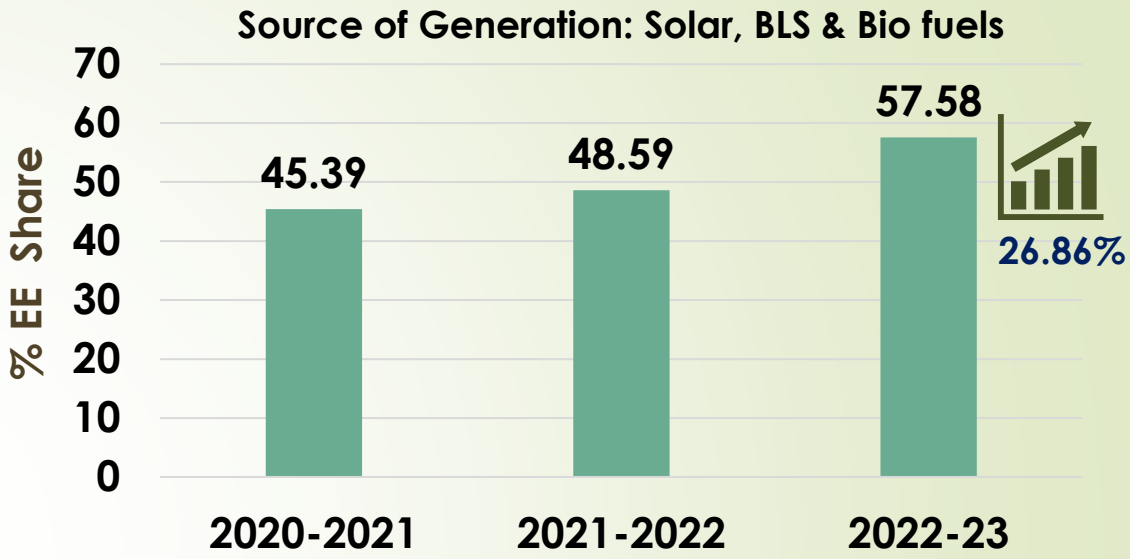
"Replication Potential – Yes we can horizontally apply in other mills"

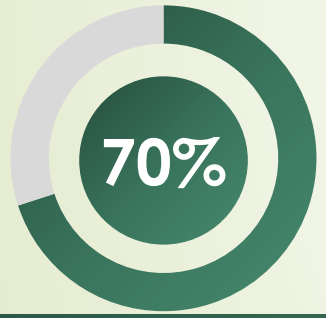
"An innovative approach to offset fossil fuel consumption"

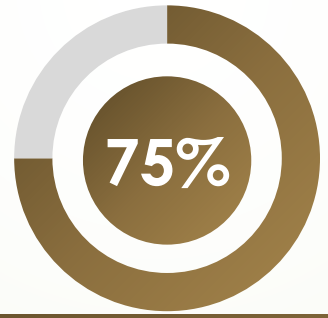
Utilization of Renewable Energy Sources & Road Map

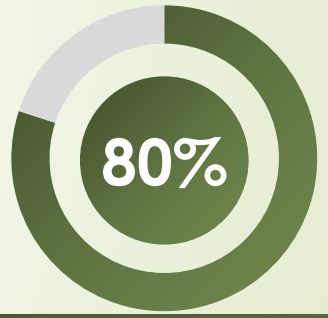












2020-2024

- After MDP 3, with upgradation in pulp mill and recovery complex – Increase in RE share **1.64%** - Investment Rs. 20 Crores
- Bio fuel consumption in coal fired Boiler to be increased by **3.90%** by improving fuel handling system and increasing feeding points

2025-2030

- After MDP 4, with new recovery boiler firing at 550 tpd and Recovery Boiler firing at 959 tpd – Increase in RE share **2.71%**
- Bio fuel consumption in coal fired Boiler to be increased by **2.38%**

2031-2035

- Coal fired Boiler to be retrofit for conversion from coal to 100% Bio fuel - Increase in RE share **3.50%**
- Furnace oil consumption to be reduced by 30% - Increase in RE share **1.70%**

Waste Utilization and Management System – Last 3 Years

Bagasse Pith (In-house & Sold outside)

Quantity – 10466 Tons
Fuel GCV – 2119 Kcal / Kg
Waste of total fuel – 15.99%

Wooden Bark (Sold outside)

Quantity – 7548 Tons
Fuel GCV – 1795 Kcal / Kg
Waste of total fuel – 11.53%

Chipper Dust (In-house)

Quantity – 36907 Tons
Fuel GCV – 2561 Kcal / Kg
Waste of total fuel – 56.40%

Screen Rejects (Sold outside)

Quantity – 10519 Tons
Fuel GCV – 3832 Kcal / Kg
Waste of total fuel – 16.07%

Board Manufacturing

Filter cake – 95447 Tons
Wet pith – 7119 Tons

Cement Manufacturing

Lime sludge – 72972 Tons
Lime grits – 12737 Tons
Fly ash – 41211 Tons

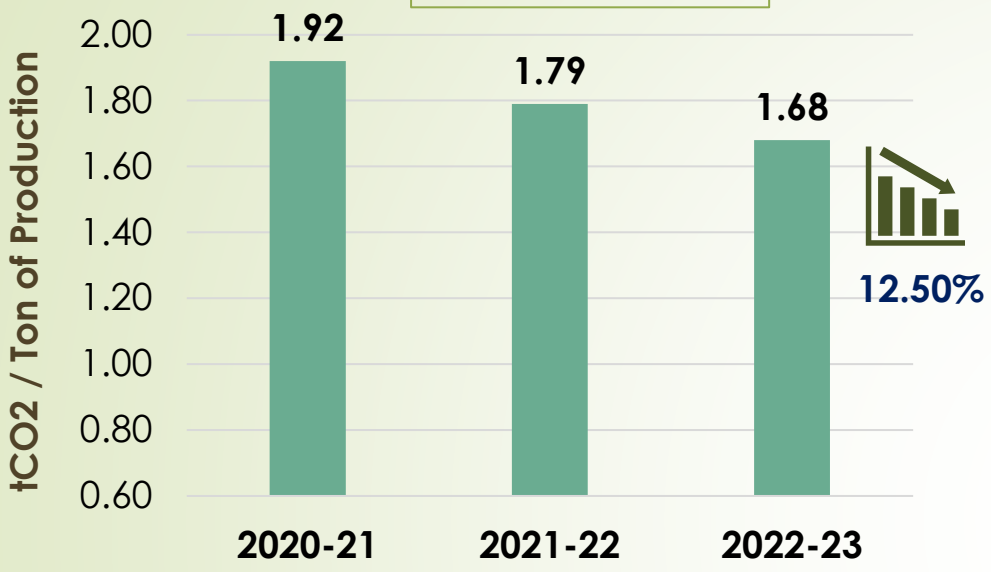
Soap Manufacturing

Sodium sulphate – 3896 Tons

Waste Component	Quantity in Tons	Usage Point
Methane gas	1494	Rotary Lime Kiln
MLSS	6 tons of as such MLSS are being dried (from 15%to 70%) in a cycle of six days.	Dried material is being used in power boiler having a calorific value of 3400 Kcal / Kg.
Food waste	Converted in to Biogas in anaerobic digester and used as cooking fuel	

GHG Inventorization

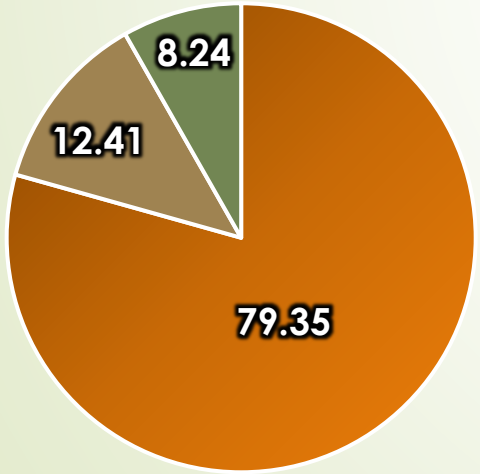
Emission Intensity



Short term & Long term Plan

- Key DCs implementation of projects under **"DEEP" as per BEE**
- Increase in RE share – **75% to 80%**
- Purchase Policy – buying products based on Energy labelling to increase loadability and **to reduce the transportation distance**
- We have separate Green Procurement Policy which focus on reduction in energy and **procuring green products.**
- Work on group captive solar model, to increase the renewable energy share and **bring down dependency on grid Power**
- Work on increasing the % RE share through step up in pulp production, which in turn will **reduce dependency on imported pulp** for the Unit 2 & 3

% Emissions



- **Scope 1** (Coal, Bio fuels, Furnace oil and Lime stone)
- **Scope 2** (Grid import and purchased pulp)
- **Scope 3** (Raw material transport, Fuels transport, Chemicals transport, Employee commute & Despatch to depots)

The Company has drafted the Business Responsibility and Sustainability Report for FY 2022-23, in line with the format prescribed by SEBI, which is given in Annexure - III in the Directors' Report

Green Supply Chain Management

Buying from **ISO certified vendors**

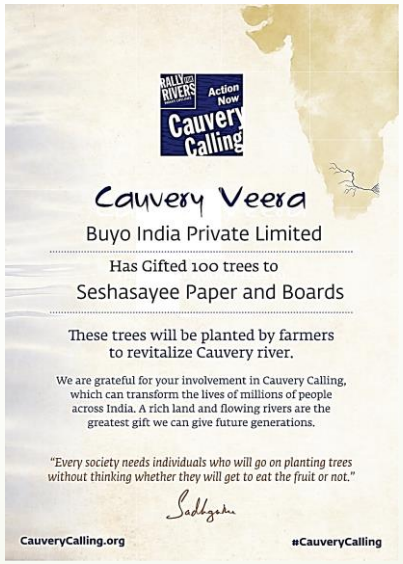
Evaluation of Supplier Performance data

Awareness creation and efficiency improvement programs

Use of more **indigenous** raw material

Efforts on **purchasing the batteries** with the buyback options.

Purchase of **BEE star rated electrical items**, usage of LED & energy efficient motors.



Currently they made plantation of **150+ trees** on behalf of SPB.

Choosing material from suppliers with **lesser plastic/polymer content**

As per the notification UPC-II-PWM(SUP)/2022 dt 12/08/2021, Ministry of Environment, Forest & Climate change notified the Plastic Waste Management amendment rules, which **bans the usage of one-time plastic** lesser than 75 microns with effect from 30th Sep, 2021 & lesser than 120 microns with effect from 31st Dec, 2022.

Key Project

EPR initiative - Identified new service provider "M/s Sakthi Plastics" for the **collection & disposal of plastic items from SPB.**

Logistics cost reduction in wood procurement

Distance (KMS)	UOM	2020-21	2021-22	2022-23
1-100	%	2.92	3.00	2.87
101-200	%	30.21	33.58	44.31 ↑
201-350	%	66.87	63.42	52.81 ↓

Teamwork & Employee Involvement

Approach for Energy Conservation Initiatives

- Rewards 05
- Brain Storming to Explore ECS 04
- Daily Monitoring 01
- CAPA for Deviation 03
- Energy Review 02

Energy Management Structure

- **Chairman**
- **MD**

  Project Approvers
- **Director (Opn)** → Project Evaluator & Risk Management
- **Sr. GM (Electrical)** → Project Progress Reviewer
- **HOD's, Energy Auditors & Energy Managers** → Ideas Generators & Project Implementers

Functioning Focus Area

- Restoring basic condition of equipments
- Process / Energy Optimization
- Innovation & Technological Upgradation
- Awareness / Knowledge Management
- Audits – Internal & External

Honesty | Dedication | Trust | Passion | Success

Teamwork & Employee Involvement (Contd...)

From the Desk of DGM (CS)

Equipment wise - Energy measuring and monitoring :

KW indication facilities have been provided in DCS for monitoring the Higher capacity Equipment's. So the Operator can able to monitor the normal Power requirement of the plant. If any deviation is observed they can act to correct the same.

Air generation for the operation of instrument used for industrial automation will consume more energy. So our focus should be on reduction of Instrument air consumption. We optimized the Instrument air Consumption by carrying out various projects and which resulted in substantial reduction in Electrical Energy usage.

Reduction in usage of Compressed air for instrument operation and reduction in energy utilization for running the compressors.

- Instrument Air pressure Optimized with 4.7KG/CM2 previously we kept 5.2 KG/CM2. So air compressor loading time reduced and Energy saved.
- MF2 rewinder and Reel Wrapping machine requires 6KG/CM2 air pressure. To meet this requirement we provided separate air Boosters instead of increasing air pressure in common Instrument line.
- Old type Auto Guides consumed more air so we replaced with in built proportional control type Auto guides and Palm sensors .It helps to reduce the Air consumption and also reduction in compressor running time.

Specific Power & Steam for Ton of equivalent finished paper production and increasing trend in condensate recovery.

		2019-20	2020-21	2021-22
Sp. power cons KWH/Tons of Eq finished prod	:	1588	1548	1411
Sp. Steam cons T/T of Eq finished prod	:	8.19	8.18	7.38
Condensate recovery %	:	84.73	84.08	84.80

Targets for the year 2022-23

Power: 1378 Kwh / ton of Eq.Finished Production

Steam: 7.24 tons /ton of Eq.Finished Production

Where ever possible we can introduce small automations system in our manufacturing process which will help to save thermal and electrical energy. So the employees are requested to submit their valuable suggestions to achieve the target of the year 2022-23.

Sincerely Yours,

(B.V. Sivakumar)


"Employee Recognition – The Successful Relationship"


Awareness


Training on Team Work


Employee Involvement

Energy Monitoring System

Shift Meeting

When – Shift wise
Headed by – SIC & HOD

Production Meeting

When – Daily
Headed by – Director (Opn)

Energy Cell Meeting

When – Weekly
Headed by – Sr. GM (Elec)

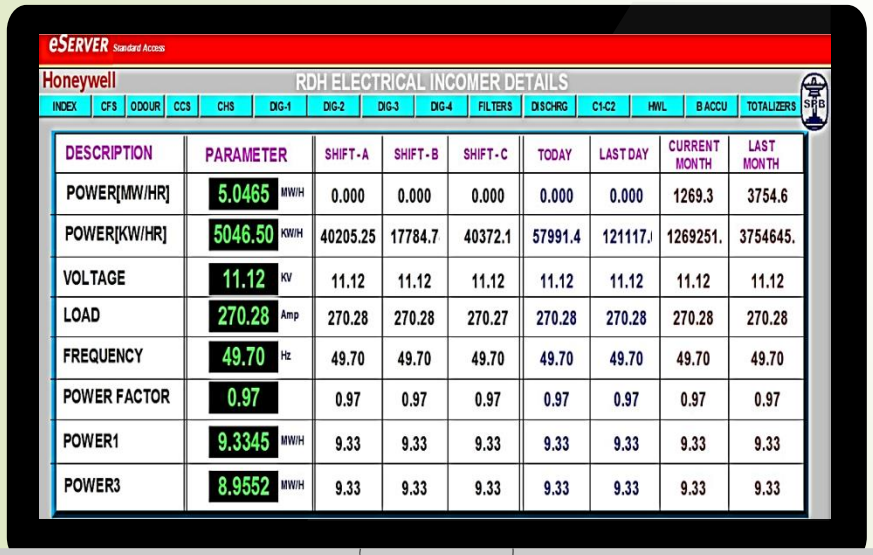
Energy Review Meeting

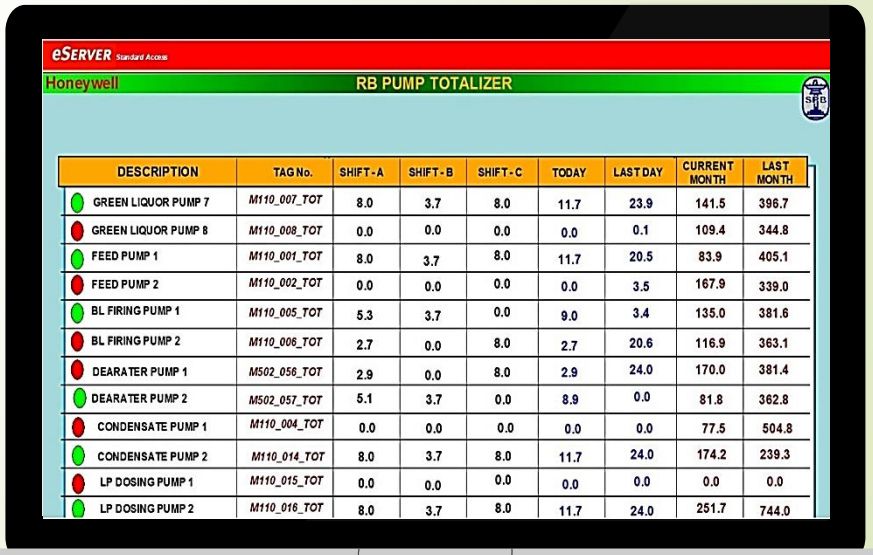
When – Fortnightly
Headed by – Chairman & MD

Energy Projects Meeting

When – Fortnightly
Headed by – Director (Opn)

Review Mechanisms





The cultural change and the Impact that it has made, has earned us our "Gold Rating"

Energy Efficiency

SEC reduction – 17%
ECS implemented – 70 Nos

Green Supply Chain

Initiatives taken to minimize GHG impacts in supply chain

Water Conservation

SWC reduction – 23%
Rain Water Harvesting

Material Conservation

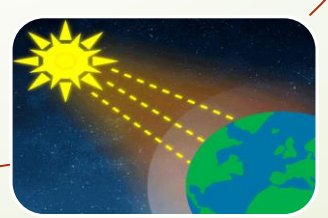
100% Sustainable sourcing of Bagasse through WOW concept
83% replacement of Limestone

Renewable Energy

Substitution – 68.33%
Usage of Biofuels to reduce coal consumption

Waste Management

Our treated waste water is used for irrigation –
Pioneer in Circular Economy



GHG Emission

Emission Reduction – 12.50%
Usage of Bio-methanation gas to replace F. Oil

ISO 50001 – Implementation Road Map

Oct '22

Mile stone – 1

Gap analysis & reporting in line with the requirements

Dec '22

Mile stone – 2

Detailed presentation of ISO 50001:2018 requirements to the core team members.

Feb '23

Mile stone – 3

Preparation of Technical & Allied Documents (TAD) - Business Process Manuals / Procedures / Process Flow charts / OCP.

Internal Auditor Training on ISO 50001:2018 requirements to a total of 15-20 members from various departments / functions

May '23

Aug – Sep '23

Mile stone – 4

Preparation towards Certification audit.

Mile stone – 5

Stage 1 Audit by the Certification Body

Stage 2 Audit by the Certification Body

Final Certification Oct '23

Energy
- Modern trends and latest updates on Steam Turbo Generator
- Use of solid waste from recycled paper mills to develop biofuels
- Awareness about future energy sources / trends, available technologies

Environment
- Exploring alternate Fuels
- New age evaporator system for Zero Liquid Discharge

Sharing of knowledge
- Sustainable pulp production
- Advancement in automation for Pulp & Paper mills
- Exposure to experts in different fields

Best Practices
- Resource Efficiency
- Optimization of minimal usage of energy, water and fiber

Overall: Enhanced our responsibility be trend setters in Energy Management

Frequency of Detailed Energy Audit & Status

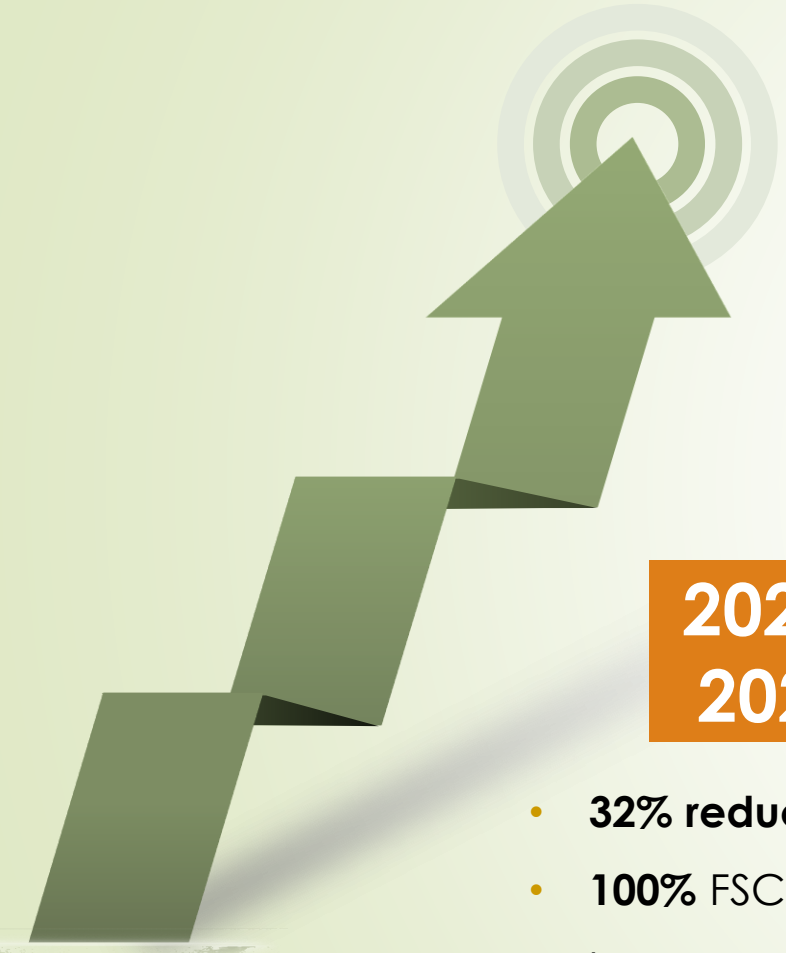
2020-21
- Conducted by – CII
- ECS proposed – 16 Nos

2022-23
- Conducted by – AEEE
- ECS proposed – 4 Nos

2023-24
- Conducted by – CII
- ECS proposed – 13 Nos

Fostering towards NET ZERO Commitment

Moving towards Net Zero Emissions including scientific based targets for scope 1, 2 & 3 emissions



2027-2030

- **Hybrid Energy** (Solar) & Process heating by Solar thermal
- Supplier Emission Reduction by **40%**
- Scale up Renewable Thermal Energy Innovations
- Scaling up Pulp Production for Self Sufficiency & increasing Renewable Energy to the level of **75% to 80%**

2023-2027

- Procurement of more Indigenous material
- **ISO 50001 EnMS** Certification by 2023
- Increase Renewable Energy Source to **75%**
- **Elimination of Plastics** in our product
- **Biomass heating** with flue gas

2015 - 2023

- **32% reduction** in Emissions (FY 15-16: 2.46 tCO2; FY 22-23: 1.68 tCO2)
- **100%** FSC Certified Wood Procurement – **Achieved**
- Increased Renewable Energy Source to **68%** (From 51.65% to 68% in last 8 years)
- **Installation of PCC plant** by Dec 2022 – 8050 TPA of CO2 reduction
- Carbon positive through Farm Forestry Management: **12 tCo2** (Last 3 years)

Excelling Efforts

Recognize

Empower

Repeat

Our Efforts & Journey Continues in the Pursuit of "Manufacturing Excellence in Energy Performance"

Proud to be a Responsible Paper Maker & Energy Leader

Thank You