



Seshasayee Paper and Boards Limited, Erode

Fine Papers - Lasting Impressions

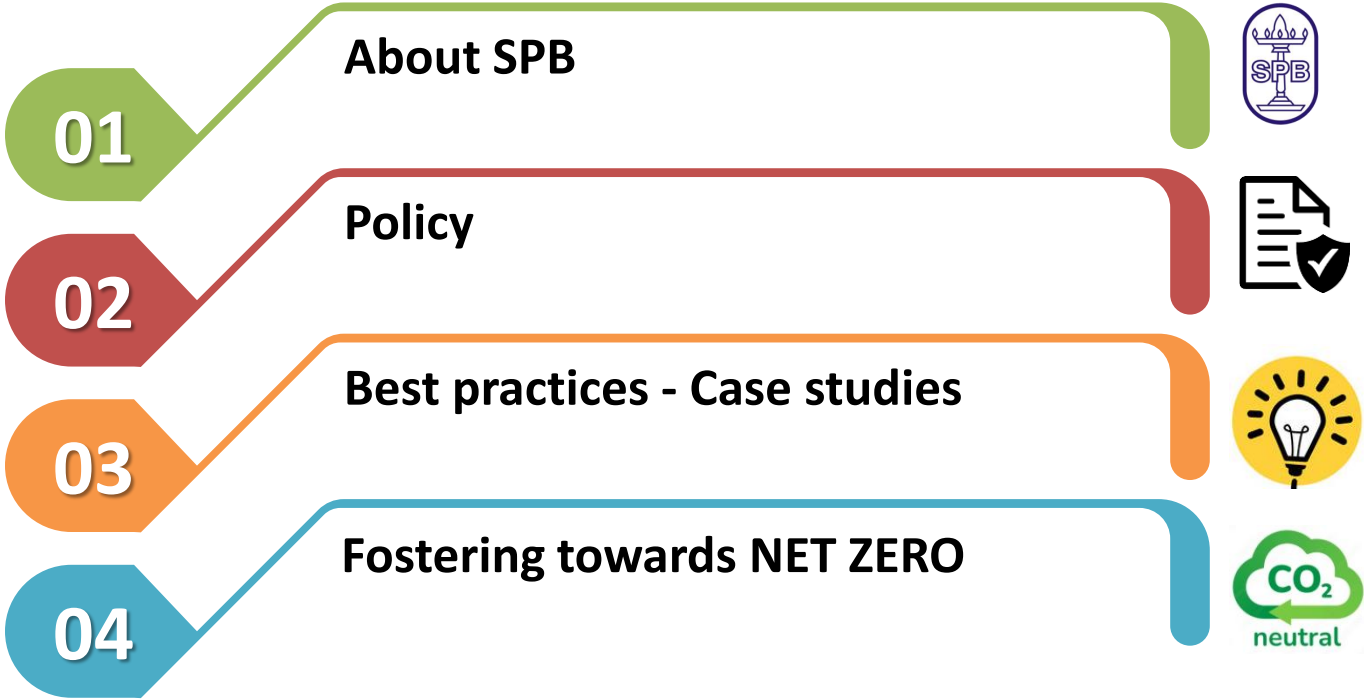


**FOSTERING THE FUTURE OF ENERGY AND ENVIRONMENT IN
PULP & PAPER INDUSTRY**

Presented by : D Radhakrishnan, CM (Pulp Mill Operations)

“Healthy Performance Based on Conservation & Sustainability Principles”

Presentation flow



SPB's Commitment for Excellence



RE share : + 60 %



All our products are 100% Recyclable & Biodegradable



Pioneer in Circular Economy



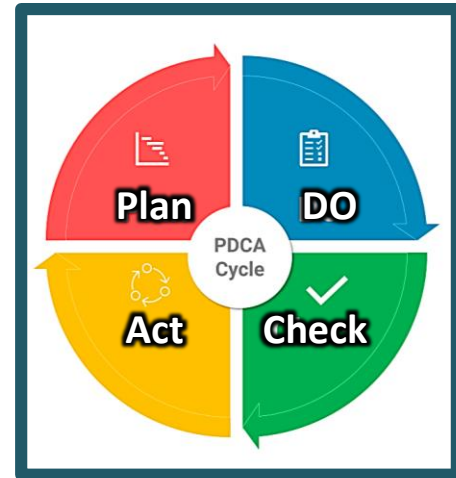
Plantations - 19.38 crores of seedlings in 22,500 acres of land



Carbon & wood positive



ECF Bleach process





Seshasayee Paper and Boards Limited

Erode - 638 007 - Tamilnadu - India

Q-E-E-G-H-S Policy



We, at SPB are committed to continually improve our Quality, Environment, Energy, Green Resources, Occupational Health and Safety Management Systems with a view to promote :

- ★ trust of customers and other stakeholders;
- ★ abatement of pollution;
- ★ efficient use of energy, water and other resources;
- ★ the availability of information and necessary resources to achieve QEEGHS objectives and targets;
- ★ larger use of Green resources and renewable energy;
- ★ well being of employees and safety of occupational work place by eliminating hazards and reducing OH&S risks;
- ★ competence and effective participation of all employees and service providers; and
- ★ compliance of all applicable legal and other requirements

01.03.2023

N. GOPALARATNAM
Chairman

Best Practices – Case studies

We always have a constant thirst to enhance the organization through efficient energy and environment handling methods and setting off the fossil fuel requirements.

- Case study – 1: RDH Digestor modification
- Case study – 2: Firing of bio fuels in Boiler10
- Case study – 3: Biogas firing in Rotary Limekiln
- Case study – 4: Solar sludge dryer



Case study - 1

“An innovative approach to increase the Pulp Production”

Digester Modification

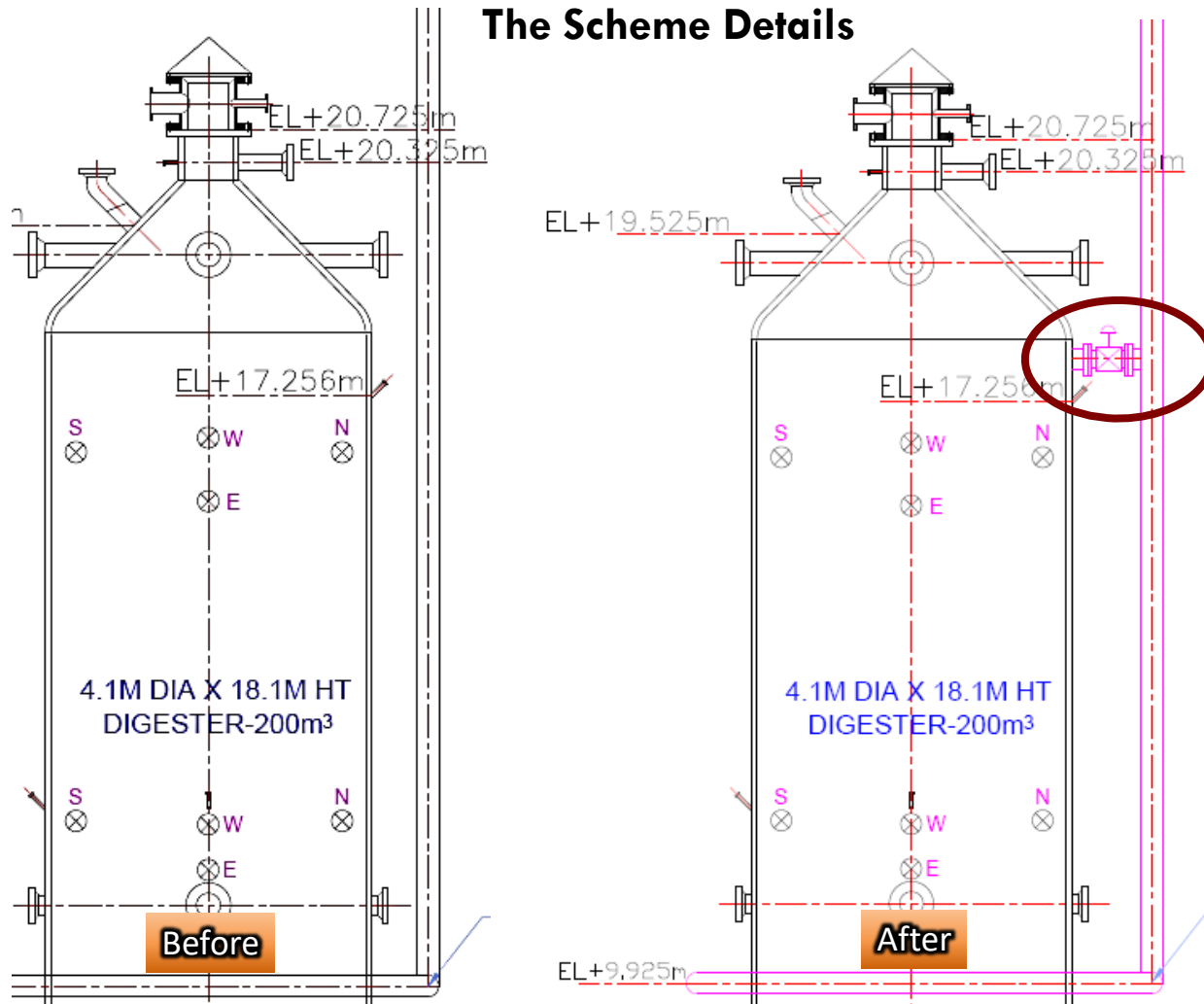
- ❑ Increased Pulp production from 380 to 430 tpd
- ❑ An unique approach where in design of digester was challenged
- ❑ An unique route with the help of in house team
- ❑ All the modifications were done in a period of 6 months time in phases with minimum investment
- ❑ Strengthening our sustainability practices



Trigger for the Project

- ❑ Need for enhancing Green Energy
- ❑ Substitution of imported pulp with own pulp
- ❑ Reduction in GHG

The Scheme Details



Modification – 1 (Chip fill Sequence)

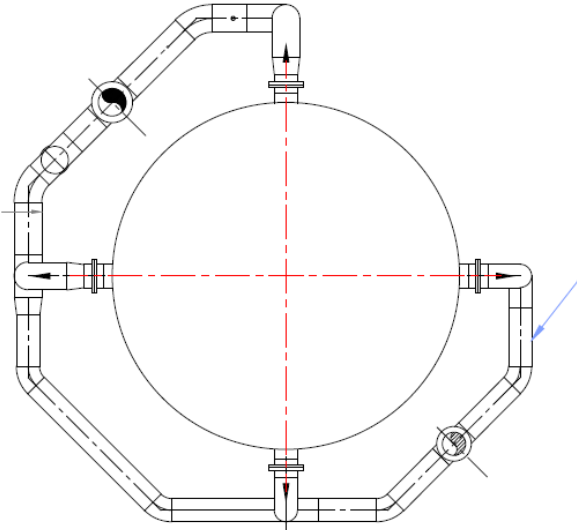
- To have top air evacuation in one digester with dual logic with the existing system (With middle and top valve openings)
- Investment – Rs. 24.51 Lacs

Benefits Achieved

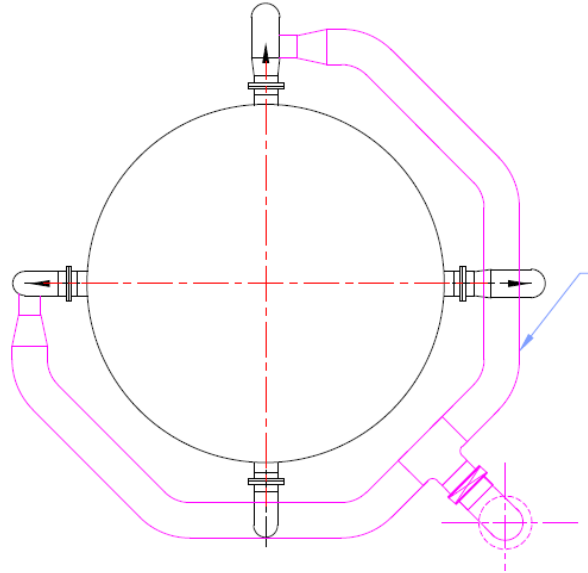
- Chip fill quantity in digester increased by **1.5 Tons / digester**
- Chip fill time reduction achieved is by **7 minutes minimum** (from 32 minutes to 25 minutes)

The Scheme Details

Before



After



Modification – 2 (TTT Sequence)

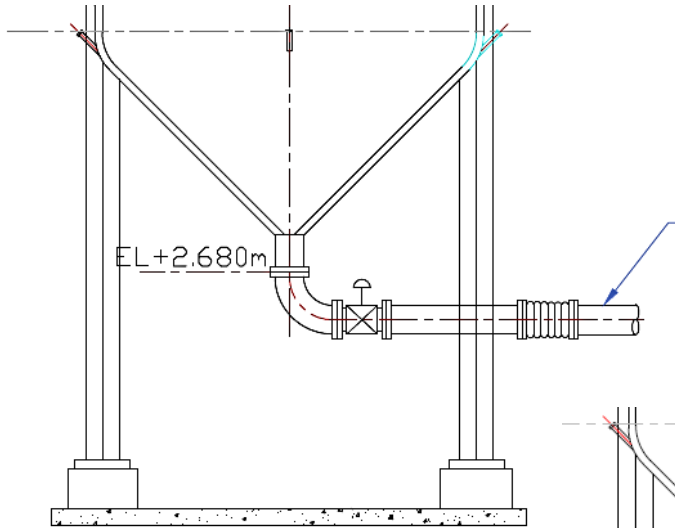
- Enlarging the middle header from 12" diameter to 16" diameter control valve in one digester with self draining.
- Investment – Rs. 34.07 Lacs

Benefits Achieved

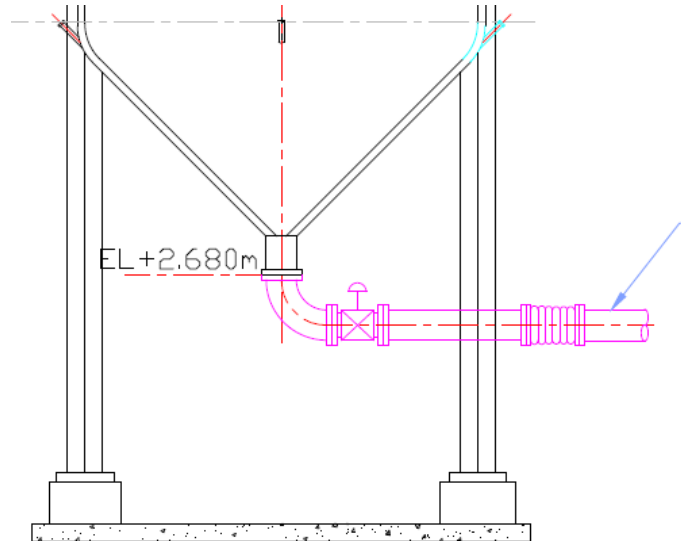
- Circulation volume increased from **130 LPS to 180 LPS**
- TTT time cycle reduced by **15 mins / cycle.**
- **Uniform Temperature profile achieved.**

Before

The Scheme Details



After



Modification – 3 (Pump out Sequence)

- Enlargement of discharge line nozzle size from 300mm diameter to 500mm diameter by replacing discharge valve.

- Investment – Rs. 101.52 Lacs

Benefits Achieved

- Clean pump out in **one stroke**
- Cycle time reduction from **310 minutes to 290 minutes** / pump out
- **Displacement liquor entry under low velocity.**

Case study – 1 (Contd...)

Outcome Achieved by the project

Description	UOM	Values
Increase in Pulp Production	TPD	380 to 430
Increase in Green Energy	%	6
Investment	Rs. Lacs	148
Savings	Rs. Crores	8.15



“Replication Potential – Yes can be horizontally applied”

Case study – 2

Firing of Biofuels in Coal Boiler

(Over & above the designed capacity of 10% through underfeeding)

- Originally CPP AFBC Boiler when commissioned in 2005 was designed to handle the fuel mix of **A) Imported coal (60% by underfeeding) B) Raw lignite (30% by under feeding) C) Bagasse pith (10% by overfeeding)**. **But, it is not incorporated in the system since commissioning.**
- More over, necessity of generating more green steam & power is the need of the hour.
- Firing of Biofuels in the Boiler was developed with the help of In-house team and utilising the existing facilities.
- **By this, we have reduced coal consumption by 79 TPD and increase in Green Energy by 7.46%.**



“An innovative approach to reduce the coal consumption”

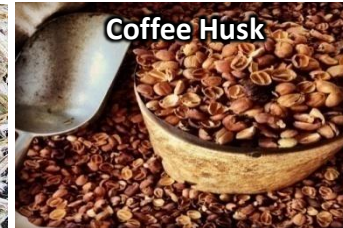
Case study – 2 (Contd...)

Trigger for the project

- To increase and sustain the Green Energy in the mill operation
- To explore alternative usage of green fuel, **thereby reducing the environmental impact.**
- Offsetting imported coal with Biofuels.
- Reduction in GHG.

Challenges Faced

1. **Coal screening** become bottleneck to handle more biofuels.
2. **Almost all the drag chain coal feeders** went to full RPM and we are unable to push more Biofuel.

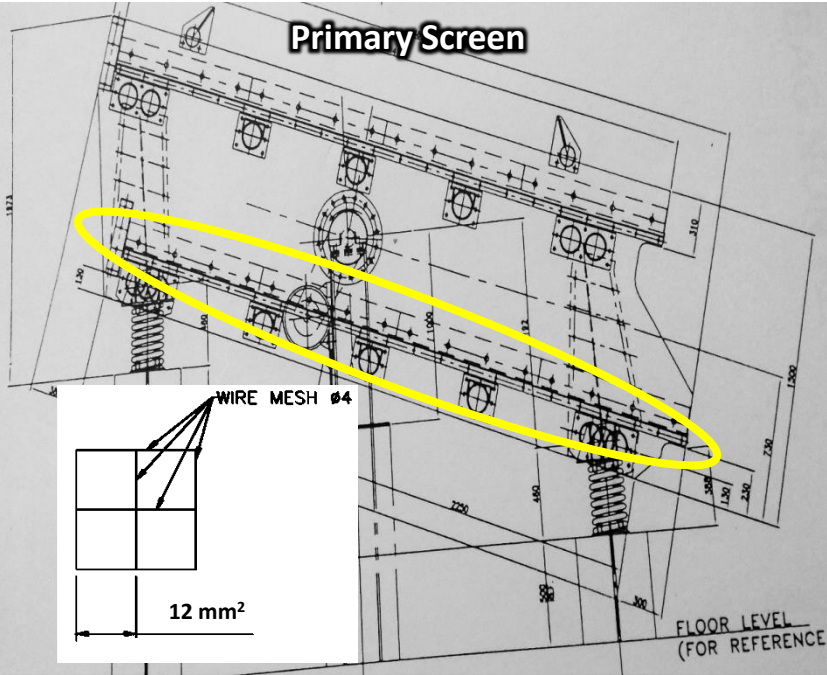


“An innovative approach to reduce the coal consumption”

Case study – 2 (Contd...)

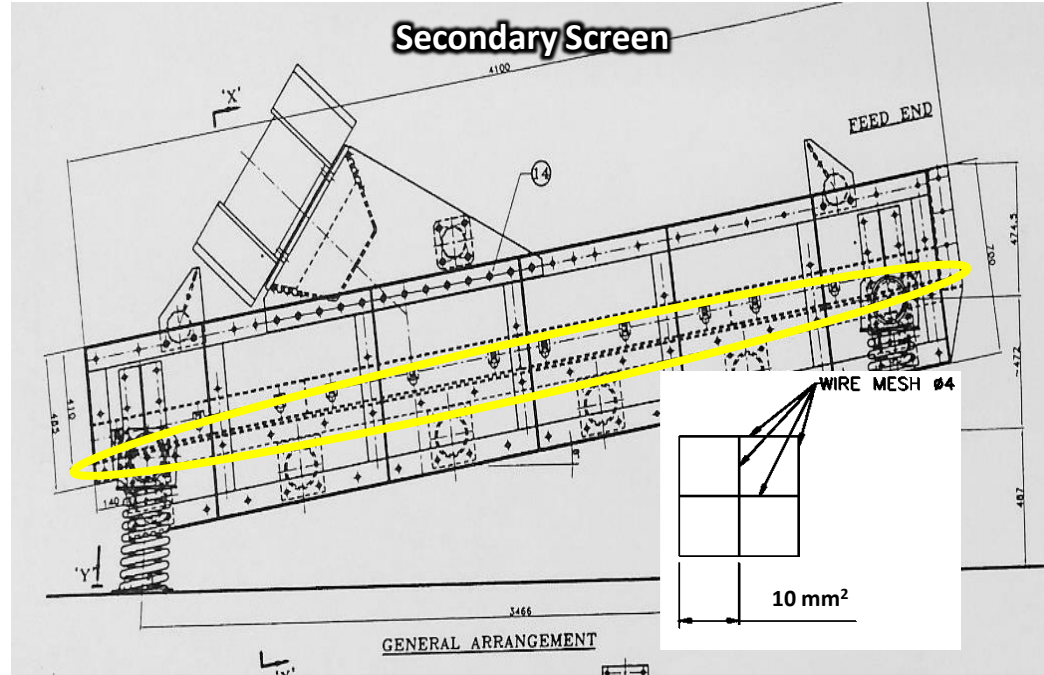
1. Modifications carried out in the existing system – Primary & Secondary Screen

Primary Screen



Mesh size changed from 8 mm² to 12 mm² opening

Secondary Screen

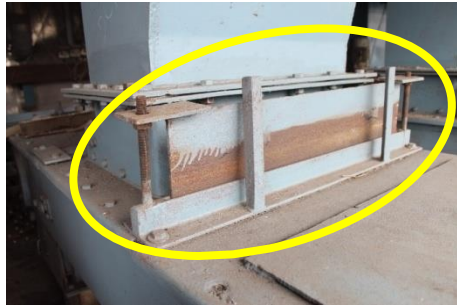
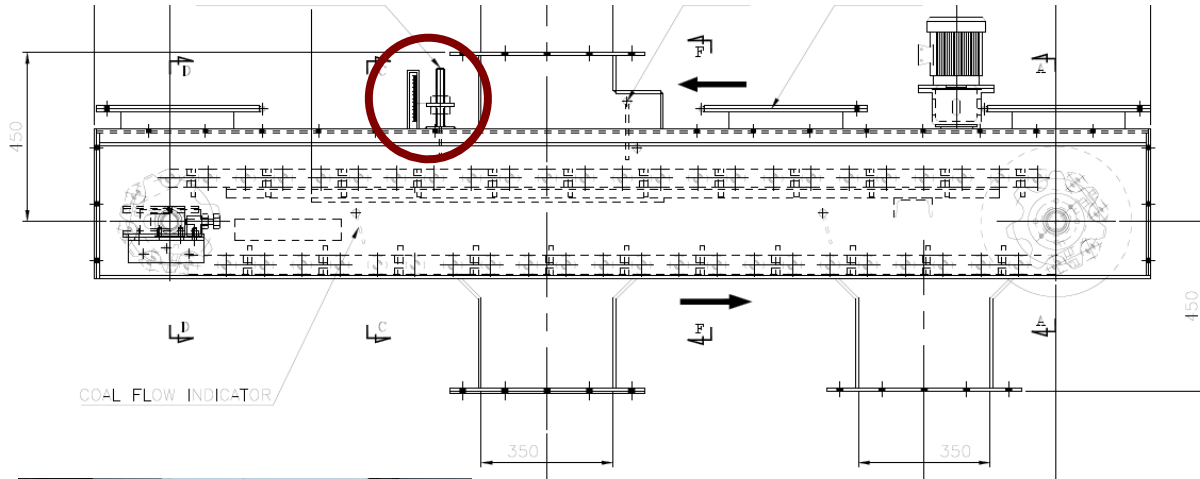


Mesh size changed from 8 mm² to 10 mm² opening

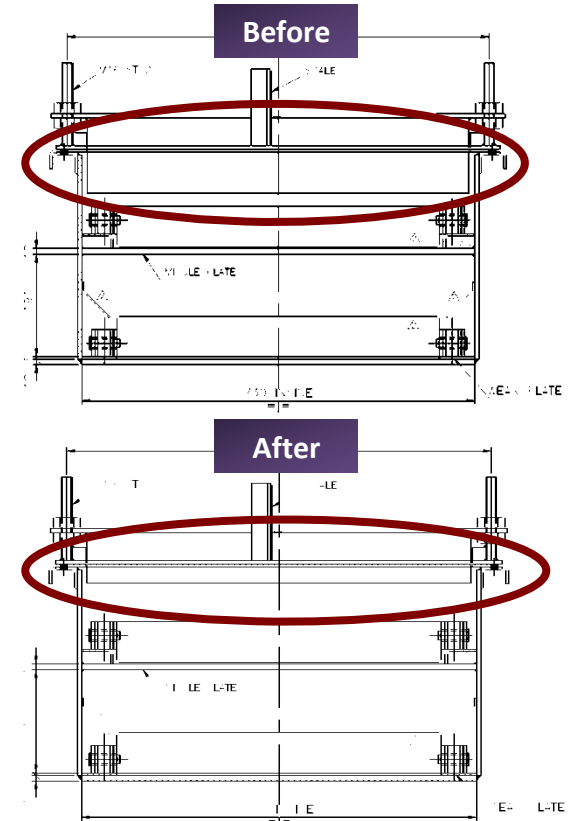
“An innovative approach to reduce the coal consumption”

Case study – 2 (Contd...)

2. Modifications carried out in the existing system – Drag Chain Coal Feeders



All the flow adjusting gates were lifted to maximum and now fuel feeding was achieved.

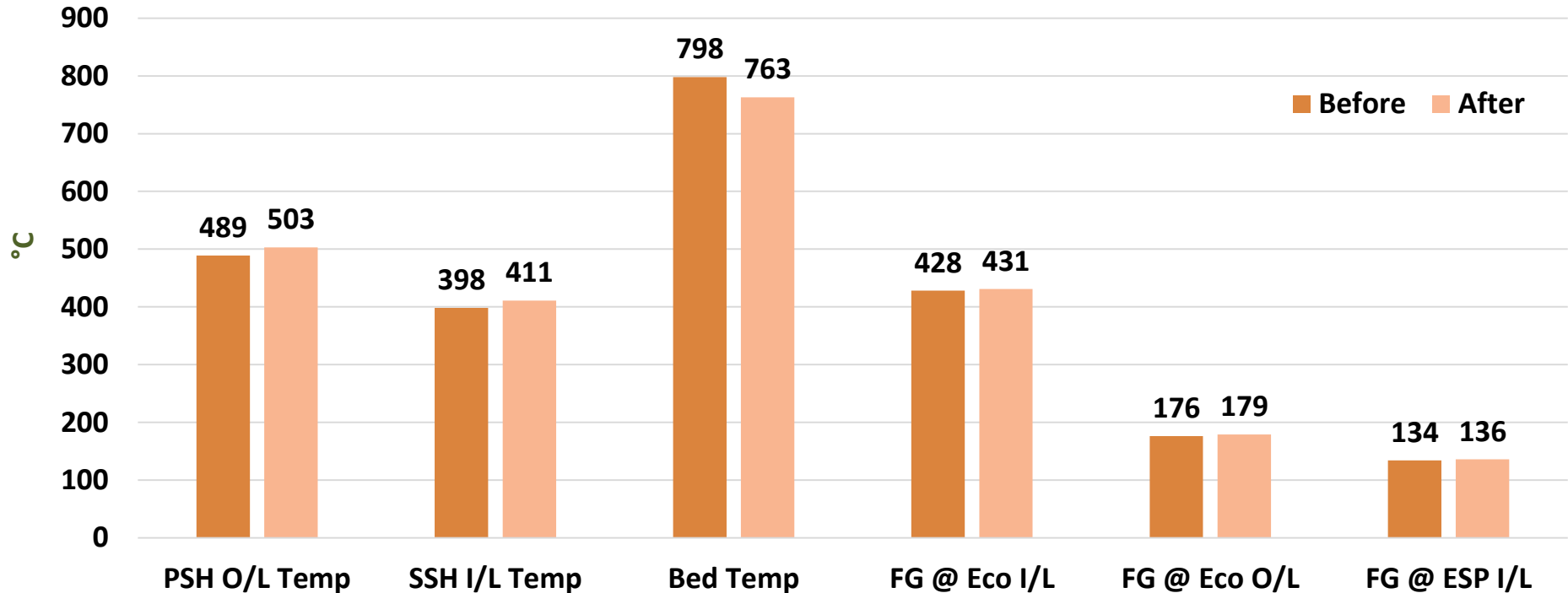


“An innovative approach to reduce the coal consumption”

Case study – 2 (Contd...)

Operational & Control Parameters

For Boiler steam: Flow, Pressure & Temperature – 76 TPH / 103 KSC / 507 °C



“An innovative approach to reduce the coal consumption”

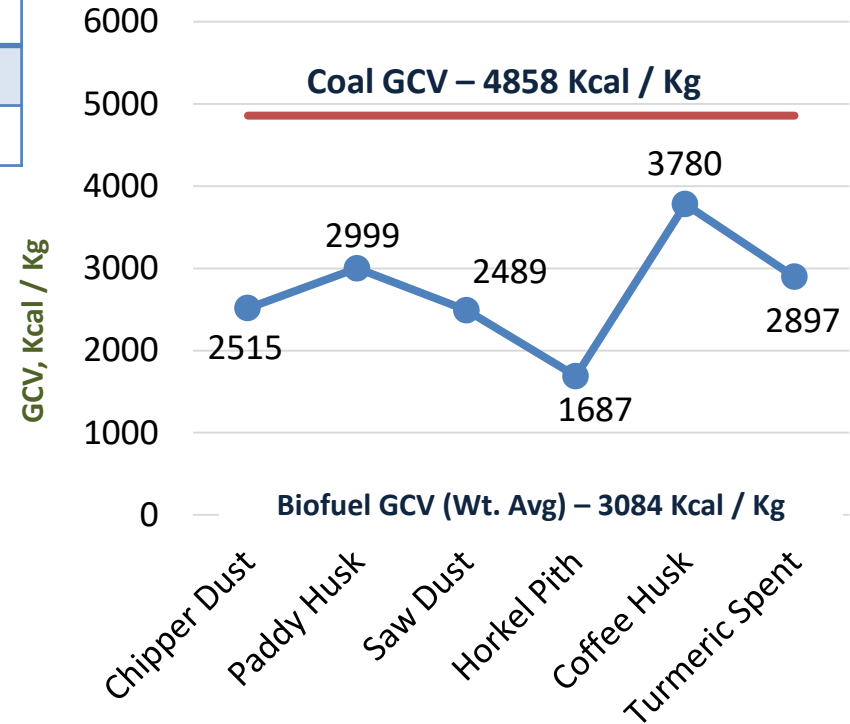
Case study – 2 (Contd...)

Consumption of Biofuels and Coal

Description	UOM	Base Line	Present Level	Gap
Bio fuels	TPD	0	153	+153
Imported Coal	TPD	325	246	-79

Break up of Bio fuel consumption

S. No	Description	UOM	Consumption
1	Chipper dust	TPD	40
2	Paddy husk	TPD	66
3	Saw dust	TPD	4
4	Horkel pith	TPD	5
5	Coffee husk	TPD	36
6	Turmeric spent	TPD	2
Total		TPD	153



“An innovative approach to reduce the coal consumption”

Case study – 2 (Contd...)

Outcome achieved by the project

S. No	Description	UOM	Value
1	Coal savings	TPA	27650
2	Increase in Green Energy	%	7.46
3	Annualized cost savings	Rs. in Lacs	1123



“Replication Potential – Yes can be horizontally applied based on Boiler design”

“An innovative approach to reduce the coal consumption”

Case study – 3

Bio gas firing in Rotary Limekiln

“An Unconventional Solution to Conventional Problem”

- ❑ An anaerobic lagoon was installed early in 1984 to treat the High BOD effluent from Bagasse plant.
- ❑ The biogas generated was let to the atmosphere without any collection device.
- ❑ In 2013, a suitable supplier was identified to make a balloon cover above the anaerobic lagoon to collect the bio gas and was pumped by a blower to the power boilers to a tune of 2000 Nm³/day
- ❑ Our **“Unique way of handling foul condensate”** and fire as partial fuel replacement in Lime kiln.
- ❑ Developed with the help of In-house team and utilising the existing facilities with lower investment
- ❑ Care being taken for mitigating H₂S by addition of Ferric chloride

“An innovative approach to reduce fossil fuel consumption”

Case study – 3 (Contd...)

Conventional – Steam Stripping

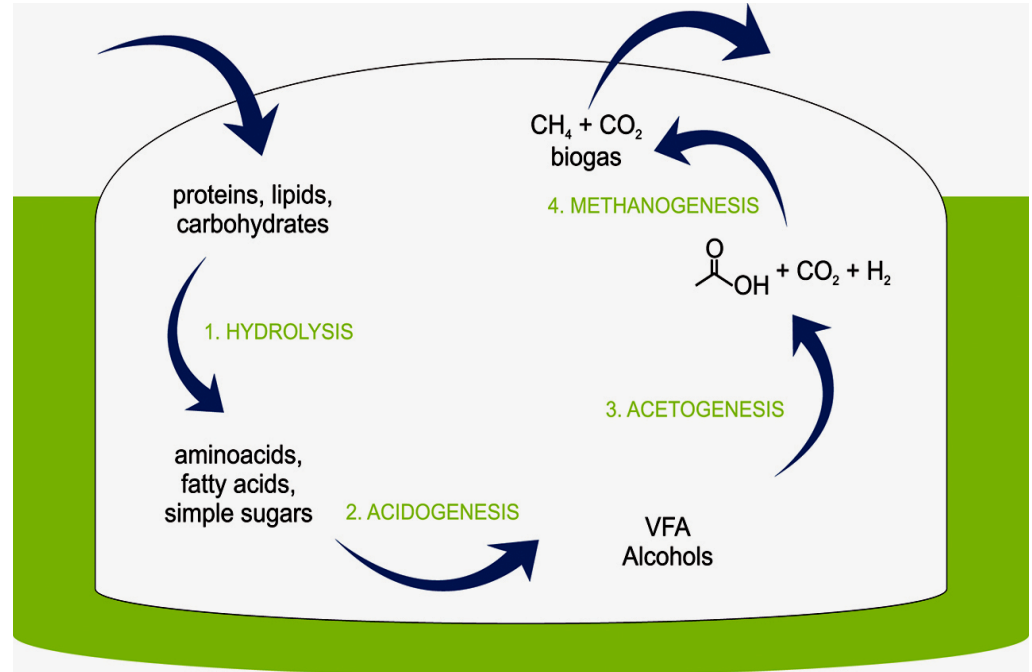


Uniqueness – Treatment in Anaerobic Lagoon



Foul Condensate + Bagasse
Pith Filtrate

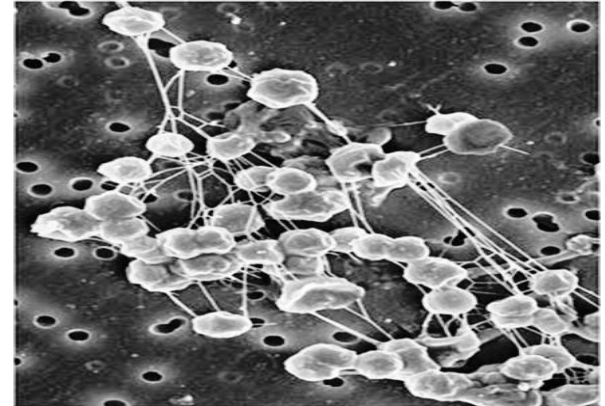
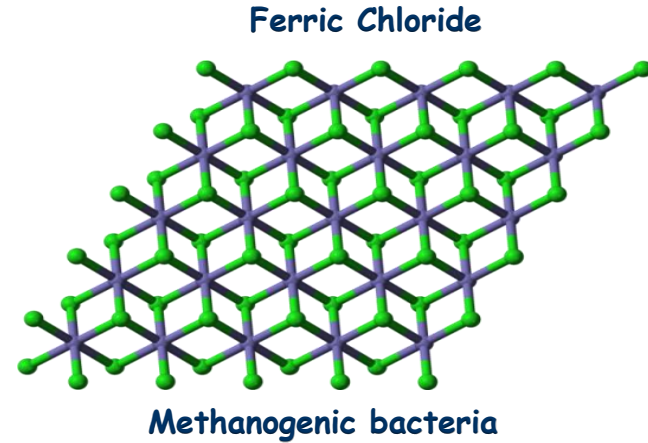
To Rotary
Lime Kiln



Case study – 3 (Contd...)

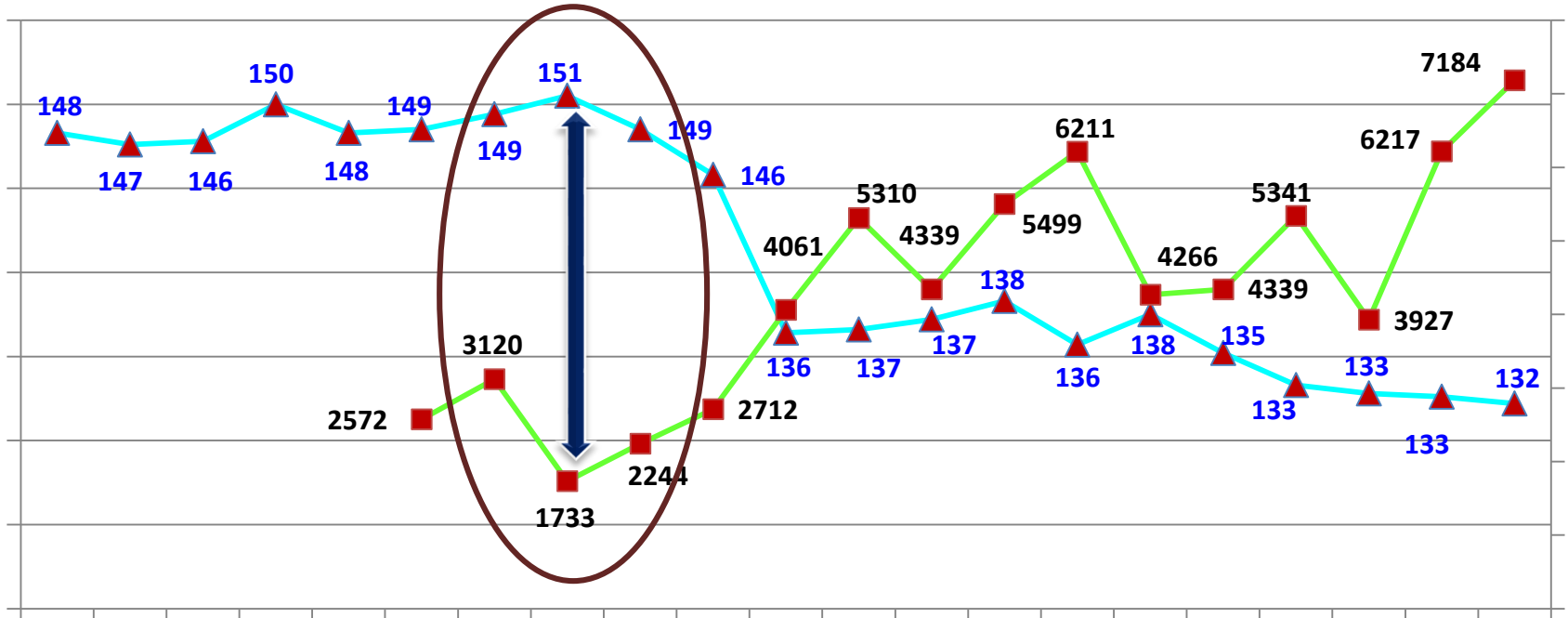
Operational & Control Parameters

- Adequate care was taken to avoid the impact of sulphide in the anaerobic digestion by regular addition of Ferric chloride.
- Regular supplementation of nitrogen and phosphate is done for biological activity in addition to addition of micronutrients for enhancing the methanogenic activity.
- Regular testing of the performance of the anaerobic system is monitored by Laboratory for the % reduction in BOD,COD and VFA ratio



Best practices – 3 (Contd...)

Kiln Fuel reduction analysis – Day wise Energy consumption monitoring



▲ Oil per Ton of Lime Kg

■ Methane Gas flow

Best practices – 3 (Contd...)

Outcome achieved by Project Implementation

Description	UOM	QTY
Furnace oil reduction	KL / day	3 – 3.5
Savings	Rs in Crores / Annum	3.6
GHG Emission avoidance	tCO2e	42439
COD load to ETP reduction	%	20

★ Elimination of odor nuisance

★ Reduced energy and nutrient consumption in the aeration system

“ Replication Potential – Can be replicated by all Integrated Pulp & Paper Mill ”

Case study – 4

“Solar Sludge Dryer”

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”

Case study – 4 (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 trial 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.
- 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 season.

“An innovative approach to offset fossil fuel consumption”

Case study – 4 (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

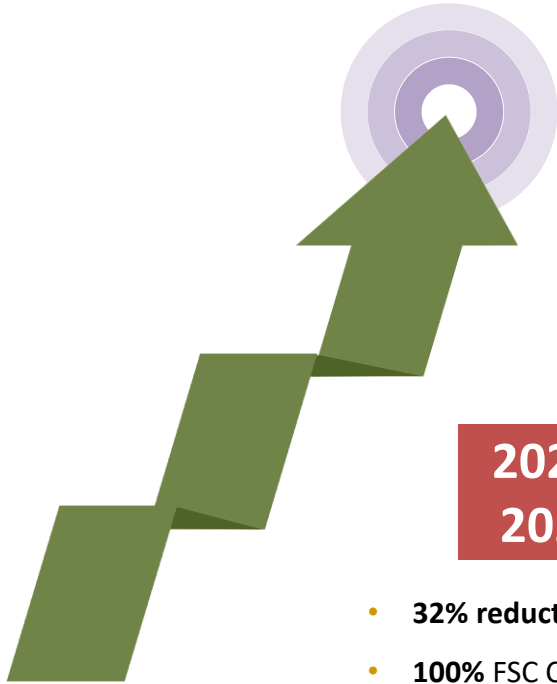
Feasible, Sustainable, Self driven and beyond OEM

“Replication Potential – Yes we can horizontally apply in other mills”

“An innovative approach to offset fossil fuel consumption”



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



Fostering towards NET ZERO Commitment

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 **72% to 75%**

2023-
2027

- Procurement of more Indigenous material
- **ISO 50001 EnMS** Certification by 2023
- Increase Renewable Energy Source to **72%**
- **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)



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



**Proud to be a Responsible Paper
Maker & Energy Leader**

Thank You