

CII's National Award for Excellence in Energy Management 2023



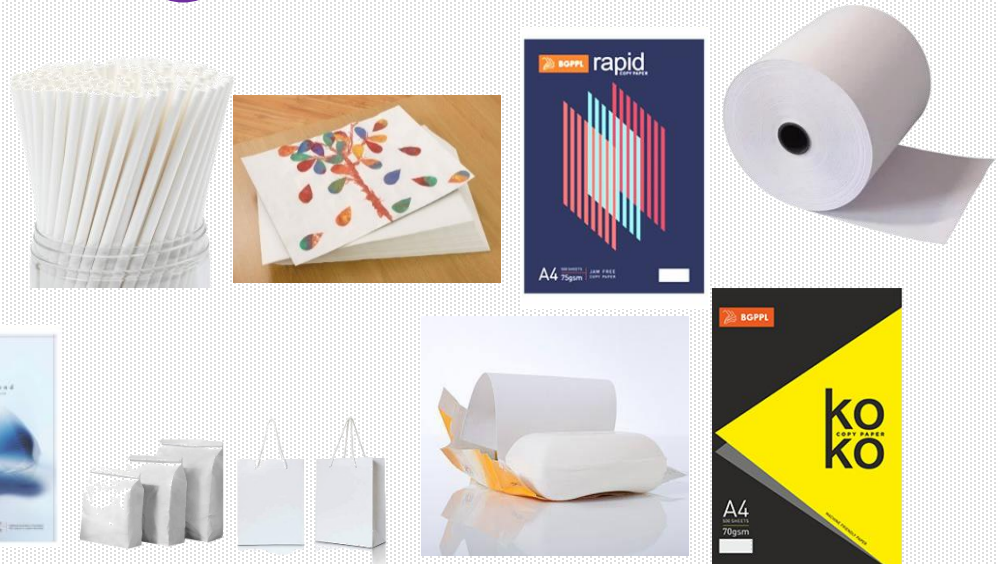
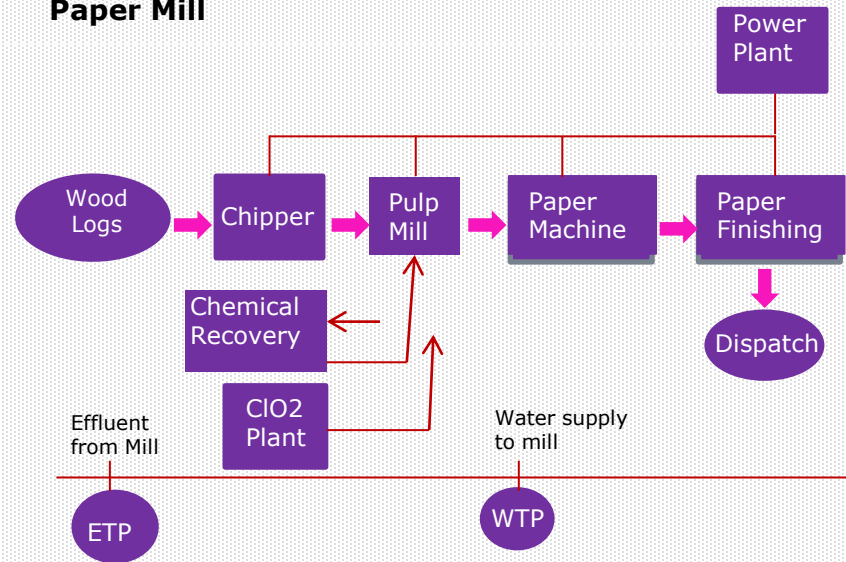
**M/s BILT Graphic Paper Products Limited
Unit : Ballarpur**

**Presented by:
Ms. Samriti Pandey
Mr. Santosh M Patil**

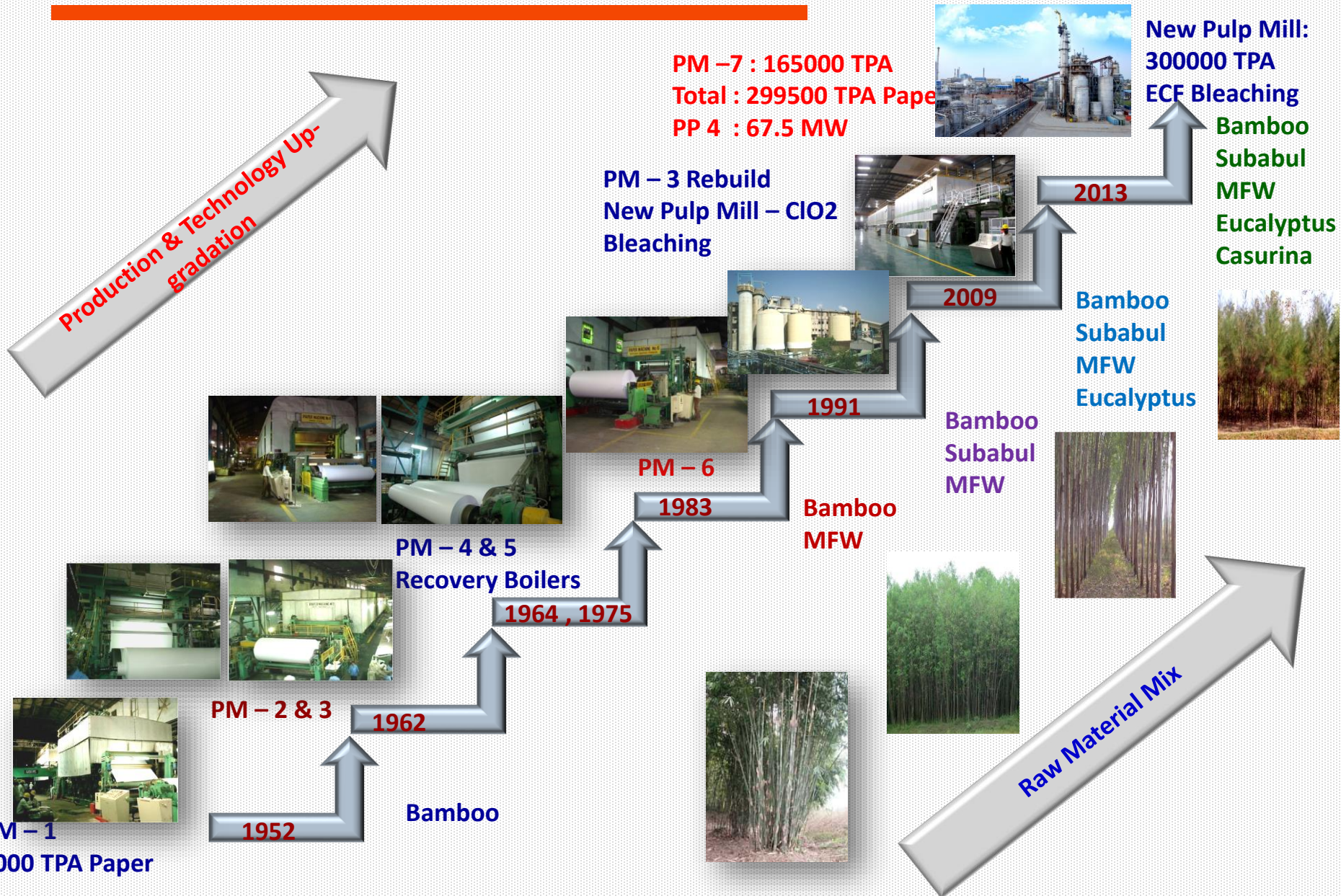
Mill Overview

- **Integrated Pulp & Paper manufacturing unit- Manufacturer of Uncoated Writing & Printing Grades of paper.**
- **Only “Wood/ Bamboo based Integrated Pulp & Paper Industry” in the State of Maharashtra.**
- **2,99,500 TPA Paper Production Capacity with Seven Paper Machines.**
- **67.5 MW Power Generation Facilities.**
- **Pulp Mill with Continuous digester, ODL & ECF Bleaching Process Technology.**
- **Certified Unit for ISO 9001, ISO 14001, ISO 45001 & ISO 50001.**
- **Adopted Best available Environment Friendly Process Technology.**

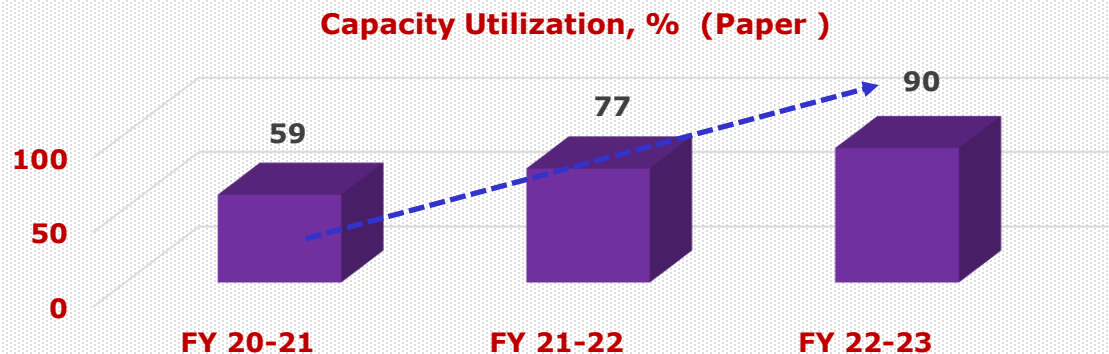
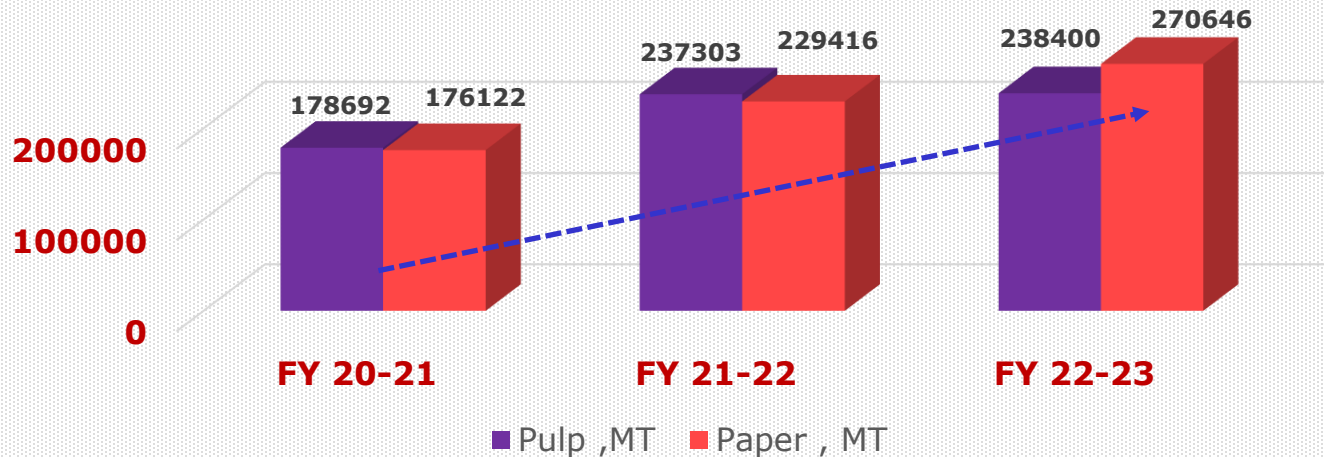
Basic Process Flow Diagram of Integrated Pulp & Paper Mill



History at a glance.....



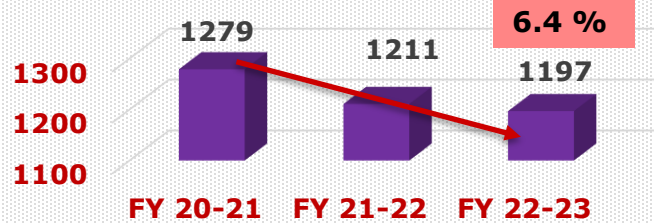
Production Data



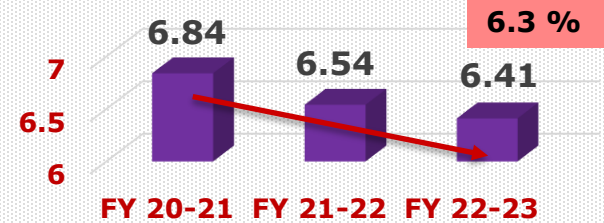
Type of Raw Material : 100 % wood based Paper Manufacturing Unit
Writing & Printing Grade : 95% Speciality Grade : 5 %

Specific Energy Consumption

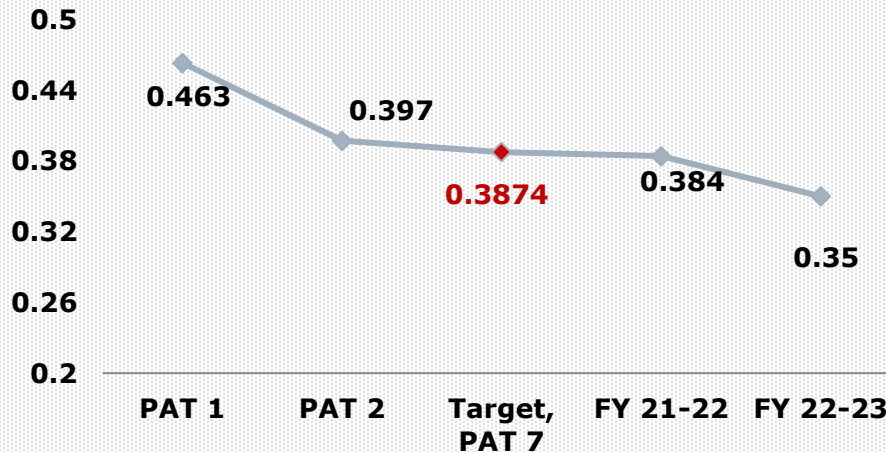
Power Consumption, kWh/T



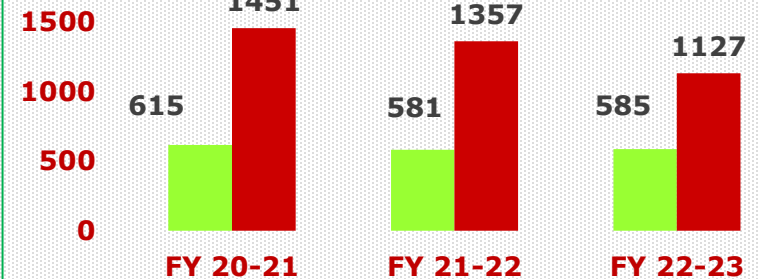
Steam Consumption, T/T



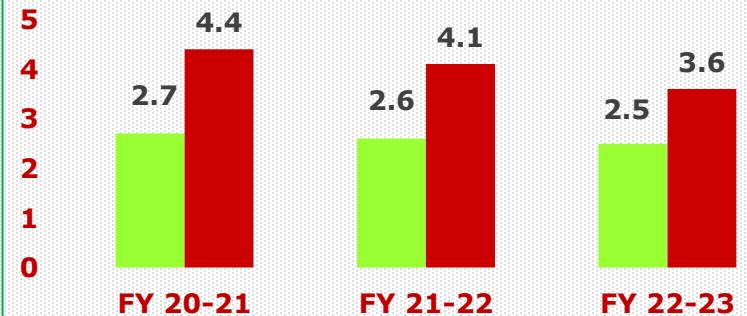
MTOE Status



2000



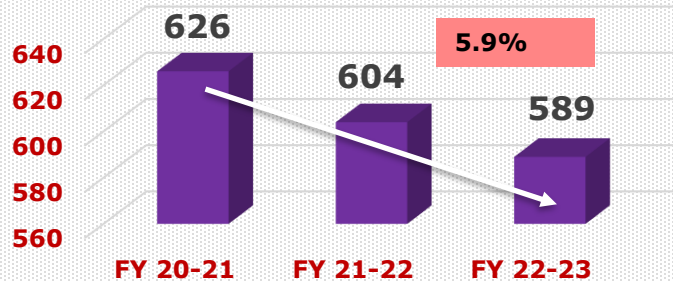
Grade wise Power Consumption of WP & Speciality Grade, kWh/T



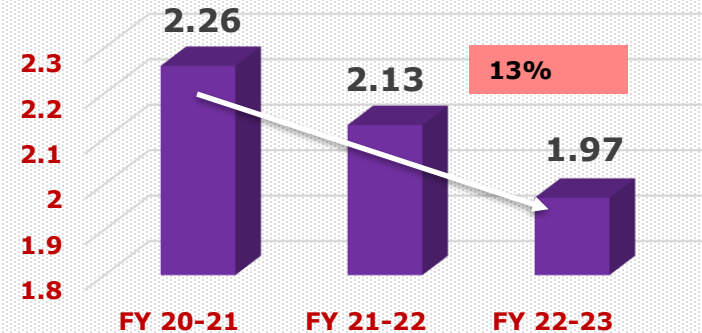
Grade wise Steam Consumption of WP & Speciality Grade, T/T

Section wise Energy Consumption

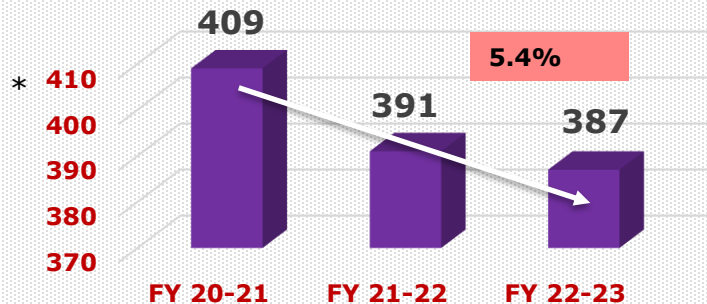
Power Consumption PM7 , kWh/T



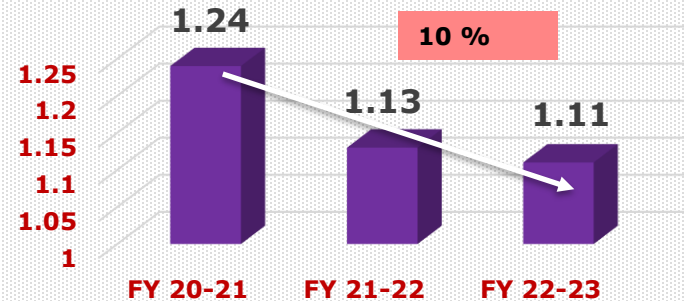
Steam Consumption PM7, T/T



Power Consumption Fiberline , kWh/T

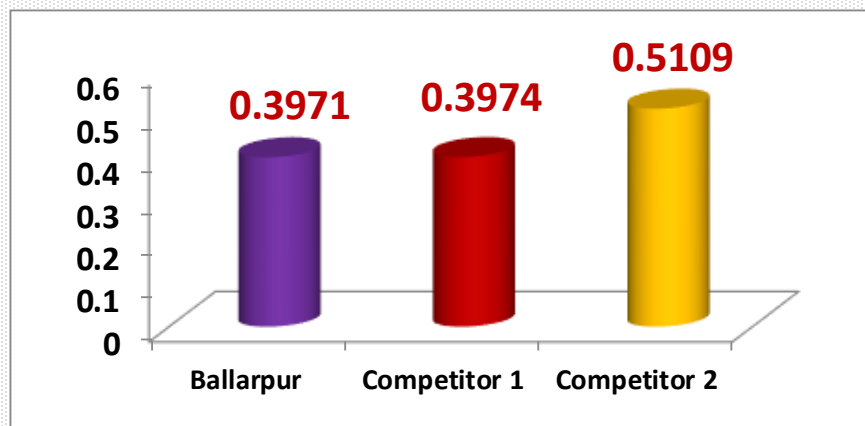


Steam Consumption Fiberline, T/T



Global Norms/ Benchmark Data

Bench Marking	Power kWh/T	Steam T/T	Remarks
Indian Pulp & Paper Mills	1400	12	CPPRI Study*
International Mills	900 - 950	6.5 – 7.0	High Volume Single m/c & Pulp Mill
BPU Mill	1197	6.41	Integrated Pulp & Paper Industry with 7 Paper Machines .



- SEC is below the Avg. Consumption of the global SEC
- Highest Ecert Achiever in PAT-2 cycle
- Geared up to crack the next PAT Cycle

**Actual of the Competitors (Integrated Pulp & Paper) with reference to unit Ballarpur in FY 18-19
(Ref.: Notification of PAT-7 Cycle)**



Pulp and Paper- Best performers of PAT-II

Top 5 DCs having best specific energy consumption (SEC)

Name of DC	SEC (toe/tonnes)
BILT Ballarpur Unit, Maharashtra	0.3970 (Integrated Paper Mill)
JK Papers, Rayagada, Odisha	0.3974 (Integrated Paper Mill)
Kuantum Papers, Punjab	0.3714 (Agro Based Paper Mill)
Ruchira Paper Mill, Himachal Pradesh	0.4914 (Agro Based Paper Mill)
ITC-PSPD Kovai Unit, Tamil Nadu	0.2234 (RCF Based Paper Mill)

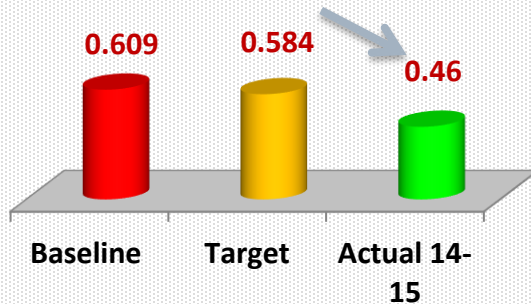
Top 5 DCs having best maximum number of ESCerts

Name of DC	Number
BILT Ballarpur Unit, Maharashtra	33,842
Century Pulp & Paper, Lalkua, Uttarakhand	29,649
Tamil Nadu Newsprint Ltd, Karur, Tamil Nadu (under State Govt.)	26,352
Seshasayee Paper And Boards, Erode, Tamil Nadu	21,057
West Coast Paper Mill, Dandeli, Karnataka	18,780

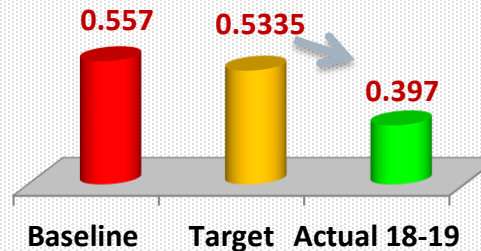
Number of DCs (+ ESCerts)	Number of DCs (- ESCerts)	Number of Positive ESCerts	Number of Negative ESCerts
19	05	2,00,005	-5,600*

Target SEC in short term/ Long Term

PAT Cycle- 1



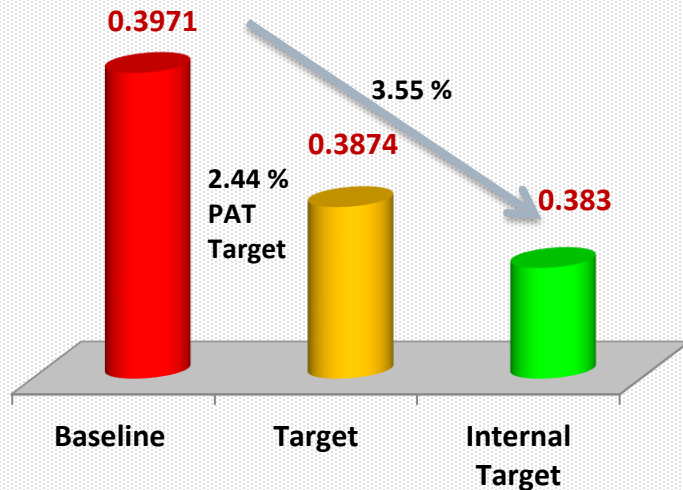
PAT Cycle- 2



**PAT 1 Compliant –
16587 Ecerts received**

**PAT 2 Compliant -
Highest 33842 Ecerts
received**

PAT Cycle- 7



**PAT 7 Received
Target of 2.44 %
reduction over 0.3971
(achieved SEC of FY
18-19)**

**Additional , 1.11 %
reduction target**

**Concreate Action
plan formulated**

Road Map- Achieve Target

- **Set Structured Objective and Target**
- **Devised Strong Review mechanism**
- **Employee involvement and Awareness**
- **Brainstorming in Ground level to come up with optimization projects**
- **Regular Internal as well as External Audits for further reduction potential**
- **ISO 50001: 2018 system adherence & system strengthening**

Action Taken:

- **Interdepartmental EC team taking rounds**
- **Suggestion scheme for shop floor workmen and operators**
- **Regular trainings for Energy intensive workmen**
- **Initiated projects:**
 - **Targeting high energy using equipment's to save 1 MW**
 - **Efficiency calculation of Compressors, Refiners and Vacuum Pumps**
 - **Saving 2 TPD of Steam**
 - **Improvement in condensate recovery**

Major Encon Projects planned 2023-24

S. No.	Description of energy efficiency improvement measure	Investment (Rs. In Million)
1	Installation of 6 new energy efficient Triton aerator in Effluent Treatment Plant. Expected reduction in power consumption by 110 KW.	2.6
2	PM-7 fresh water pump replacement with energy efficient pump, expected saving of 65 KW.	0.2
3	Installation of TDR system at PM-2 . Expected power saving of 30 KW.	2.4
4	Installation of steam and condensate system at PM-1, expected steam saving of 0.3 MT/T of paper.	15
5	To replace existing Lobe blower with New Energy Efficient Screw Blower at MBBR system in Effluent Treatment Plant. Expected saving of 21 KW.	6
6	Implementation of SEC system at PM-4 & PM-6 refiner to improve paper quality vis a vis reduction in power consumption to the tune of 18-24 KW	2.4
7	Replacement of existing identified conventional lighting lamps with energy efficient LED lamps .Expected reduction in power consumption to the tune of 100 kwh/Day	1
8	Installation of 6 no.s of VFD at identified locations in Recovery Boiler & Evaporator plant. Expected reduction in power consumption to the tune of 70 KW	5.5
10	To replace energy in efficient MC Pump of ` P Stage' in pulp mill with new energy efficient MC pumps. Expected reduction in power consumption to the tune of 221 KW	12.5

Energy Saving Projects Summary

Year	No. of Projects Implemented	Investment Made (INR Million)	Elect Energy Savings (Million kWh)	Thermal Energy Saving Million kcal	Total Savings (INR Million)	Payback Period (in months)
FY 2020-21	9	35.7	7.2	26545	42.7	10
FY 2021-22	6	11.0	3.7	19184	47.7	3
FY 2022-23	12	52.45	2.56	13041	47.15	13

Major EC Projects Implemented -3 Years

Year	Name of the Energy Saving projects	Invest. (INR Million)	Electrical Savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
2022-23	Online washing system for Evaporator Effect 1&2. Resulted Water boiling frequency reduced to 2 times in a month from the earlier 4 times in a month, increase in WBL processing rate, improvement in steam economy by 0.15 and LP steam savings of 50TPD.	27.7		17500	34	10
2022-23	New Chiller for new ClO2 plant resulting steam saving of 4 TPD (0.5 T/ T ClO2) in addition with improved plant runnability.	8.1		1400	2.72	36
2022-23	Installation of New Energy efficient centrifugal mill water Pump of 75 KW in place of old 200 KW pump. Resulted Energy saving of 66 KW/Hr.	0.25	0.55		2.25	1.3
2022-23	Installation of New Energy Efficient HT feed Pump at Recovery Boiler-3. Resulted power saving of 40 KW/Hr.	8	0.336		1.36	71
2022-23	Energy saving through upgradating DC drive to AC drive at PM-3. Resulted Power saving of 10 KW/Hr in addition with quality improvement, reduction in breaks and less rejection.	6	.084		0.34	-
2022-23	Installation of New VFD on ODL Blow Tank MC pump. Resulted power saving of 70 KW/Hr.	0.9	0.589		2.09	5

Major EC Projects Implemented -3 Years

Year	Name of the Energy Saving projects	Invest. (INR Million)	Electrical Savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
2021-22	Automation of Combustion Air System in Recovery Boiler by providing auto control for combustion Air and Fuel based on optimized calculation and proper distribution through Primary, Secondary and Tertiary Air Fans at various firing rates. Resulted increased Specific Steam Generation from 3.13 to 3.17 per month. Improvement in steam credit.	0		16380	2.6	
2021-22	Up gradation of PM-2 DC drive system with new AC drive system with automation. Resulting energy saving of around 40KW in addition with improved machine uptime, increased machine speed (up to 170 MPM) and Easy Fault diagnostic.	7.5	.336		1.17	
2021-22	DCS Logic incorporated in Effect-1 Finishers of Evaporator plant to control steam Flow with reference to Calandria Pressure in Cascade mode, resulting steam saving of 4310MT/annum.	0		2995.5	4.3	
2021-22	Installation of VFD on Secondary Condensate Pump in New Evaporator plant has resulted in reduction in power consumption of about 16 KW/hr.	0.7	0.134		0.4	

Major EC Projects Implemented -3 Years

Year	Name of the Energy Saving projects	Invest. (INR Million)	Electrical Savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
2020-21	Saving by Tuning , HP Governing Valve Opening of PP#4 TG.	0		26545	23.19	
2020-21	Installation of New Centric leaners at PM2, PM4 & PM5 Resulting quality and machine run ability, improvements and power saving of 18KW	9	0.151		0.41	
2020-21	Installation & Commissioning of Caliper Profile Control System at PM-3. Resulting Quality improvement in addition to power saving of 18 KW.	25	0.151		0.41	
2020-21	Fully Auto-Operation of CFBC Boiler by developing DCS logic with support of Thermax.	.2	0.42		1.13	

Innovative Project:

Name of the project:

Evaporator plant effect 1 & 2 modification via black liquor spray nozzle addition, header modification, addition of vapour relief lines & on line washing arrangement

why innovative:

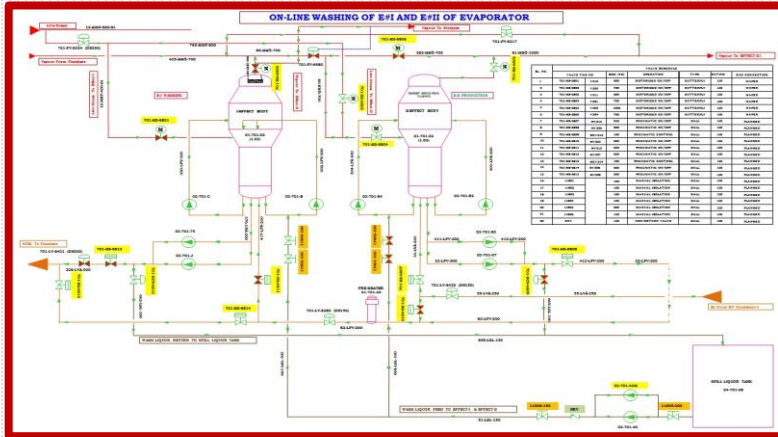
This Project can be considered as “ Innovative “ due to modification in existing system which has resulted in Energy savings.

- Water boiling frequency got reduced to 2 per month from the earlier 04 per month. This has resulted saving in steam @10 TPD
- A Loss in SBL production of 10 hr. per month due to increased water boiling could be avoided resulting in constant BL firing in boiler.
- Cleaning of heating surfaces of E1 and E2 regularly has improved, the role of heat transfer resulted in a steam saving of 40 TPD.

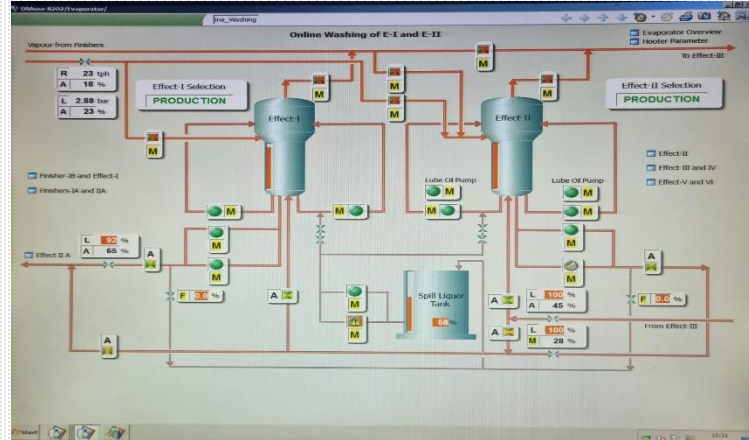
Trigger for implementing the project:

- The availability of the plant was a major concern especially at higher production rate.
- Due to the nature of the input that handled in the plant, there used to be a demand for water boiling of the entire plant primarily to clean the heating surface of E1 & E2.
- This led to loss in production and increased energy cost.

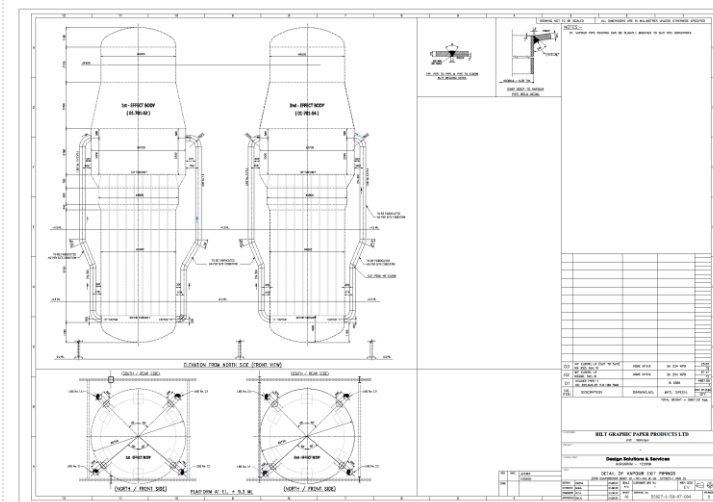
On line washing DCS display & vapour relief lines of E1 & E2



Schematic of On Line Washing System



DCS Page with Modification



Vapour Relief Arrangement



Nozzle Arrangement

Innovative Project:

Replicability :

Yes, This project can be replicated in evaporator plant

Impact on SEC:

Saving in LP steam consumption up to 50 TPD

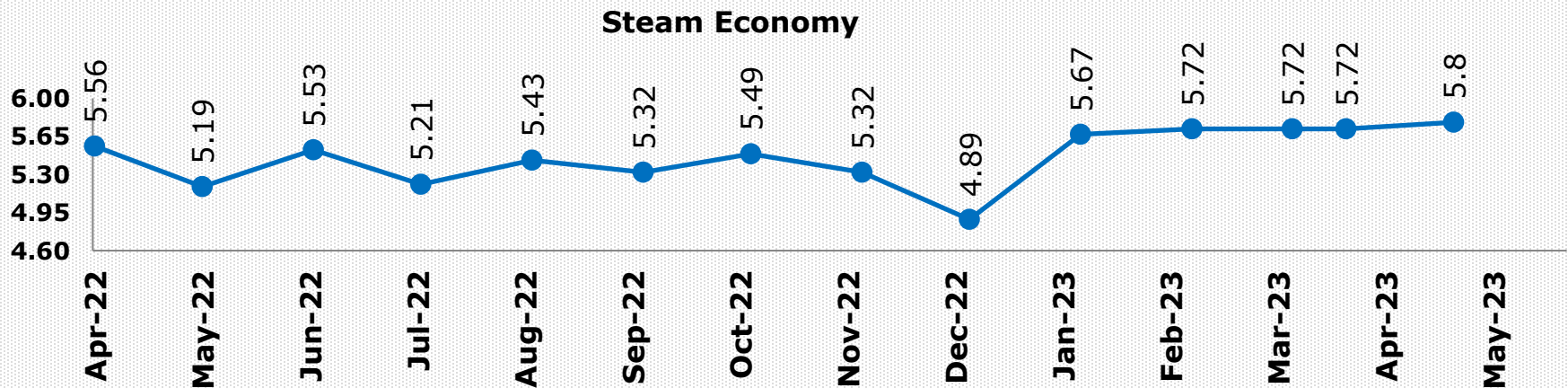
Year of Installation: Nov.,22

Annual Saving : Rs 235 Lacs

Investment: Rs.277 Lacs

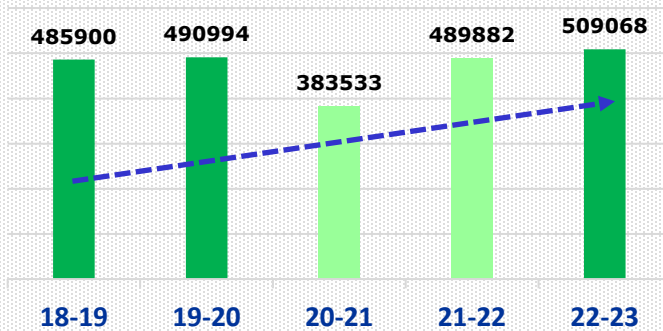
Benefits:

- Water boiling frequency reduced to 2 times in a month from the earlier 4 times in month
- Increase in WBL processing rate @ 5-10 m³/hr
- Improvement in steam economy by 0.15

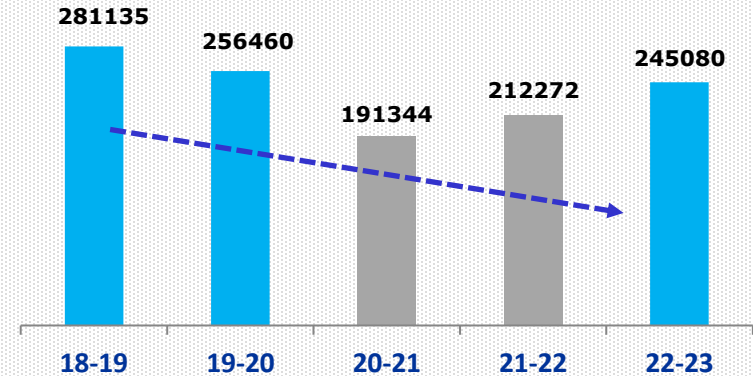


Renewable Energy Resources

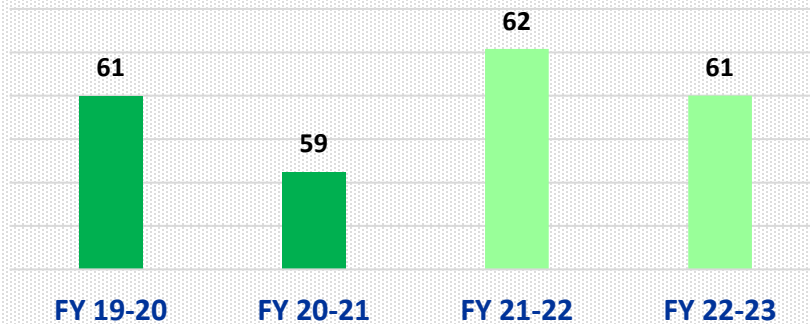
Black Liquor Solids, MT



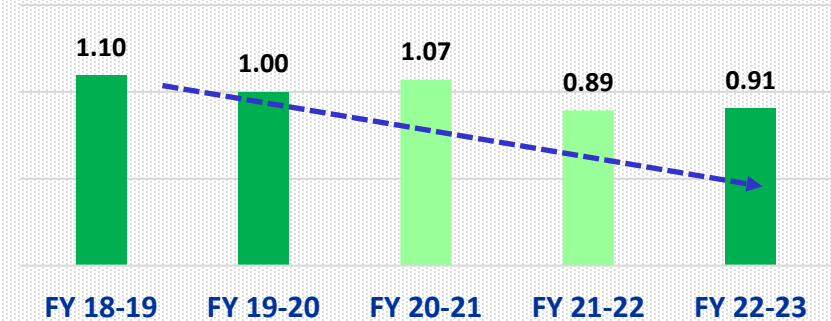
Coal Consumption for Boilers, MT



% Share of Renewable Energy



Coal Consumption, MT/MT of Paper



2020-21 and 2021-22 was Covid Period. Mill was running intermittently in few months. Hence Specific energy consumption is not comparable

Renewable Energy Resources

During FY 12-13, we were getting 20% of Renewable Energy from black liquor through Recovery Boiler



Presently we are getting 61% of Renewable Energy from black liquor through Recovery Boiler



RPO : Composite (Solar + Non Solar) RPO Target of 9 % is applicable to our industry.

	Technology (Solar,/Wind/Biomass/ Black Liquor)	OnSite			
		Installed ,MW	Generation in Million kWh	Consumption by Million Kwh	Share,% (Generation)
2020-2021	Black Liquor	28	281.5	166.78	59
2021-2022	Black Liquor	28	340.7	211.493	62
2022-2023	Black Liquor	28	360.8	218.762	61

For Renewable Energy , We have Recovery Boiler of 1650 TPD Black Liquor Solids Firing. We consume 100% Power which we generate through Recovery Steam . The Share of Biomass generation in total own power generation is 61-62%.

Off Site :

We are not having any contract demand or setup for OffSite Renewable Energy.

Solid Waste....

Wood-Bamboo Dust

Sold to outside parties as bio-fuel.

Firing Bamboo Dust in our CFBC boiler to replace coal

Year	Quantity , MT	GCV, (kCal/kg)	Heat Value(Mkcal/Yr)
20-21	11813	2560	30241
21-22	18426	2486	45807
22-23	17295	2503	43289



Wood Dust-
Biomass

ETP Sludge - 14000 MT/annum

Utilized by outside parties for board manufacture.

7 board mills are operated around the mills area.

Coal Ash - 85000 MT/annum

Fly utilized by Cement Industries.

Bed ash for Bricks manufacturing.



Lime Sludge- For
Cement
Manufacturing

Lime Sludge - 30000 MT/annum

Recycled by reburning in Rotary Limekiln

Excess purged out sludge sent to M/s Ultratech Cements, Awarpur,
M/s Dalmia Cement

Hazardous Wastes:

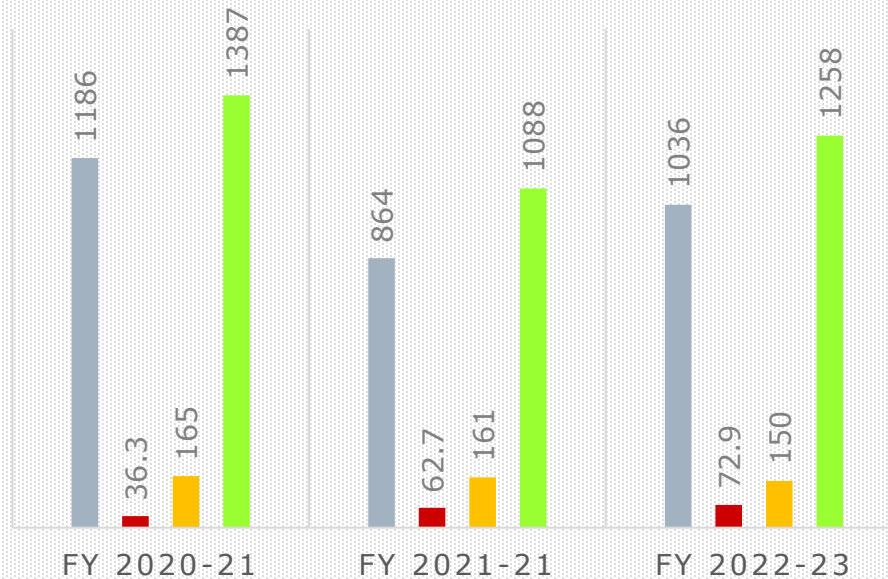
Used oil given to registered recycler- 24000 kg/annum

Asbestos containing gland packing waste- Member of CHWTSDF,
Nagpur, hazardous waste given to CHWTSDF, Nagpur.

GHG Emission Data

KG OF CO2/MT OF PRODUCT

■ Scope1 ■ Scope 2 ■ Scope 3 ■ Total



Short Term Target:

Reduction by 1% Every Year

Action Plan:

- Improvement in Recovery Boiler efficiency to decrease dependency on fossil fuel
- Installation of Biomass Boiler to consume the debark generated in chipper by debarker
- Adoption of energy efficient technologies
- Energy Efficient Energy Pump
- Triton Aerator
- VFDs

Note: All Figures are excluding biomass and after CO2 Sequestering by plantation

Wood: Plantation Details

- **Farm Forestry-**
Promoting plantation of pulpwood species in the farmers field.
- **Developing plantation nearer to the industry.**
- **Catchment area for plantation-** within 500 KM.

(Akola, Amravati, Buldhana, Chandrapur, Gadchiroli, Nagpur, Wardha, Washim, Yavatmal)

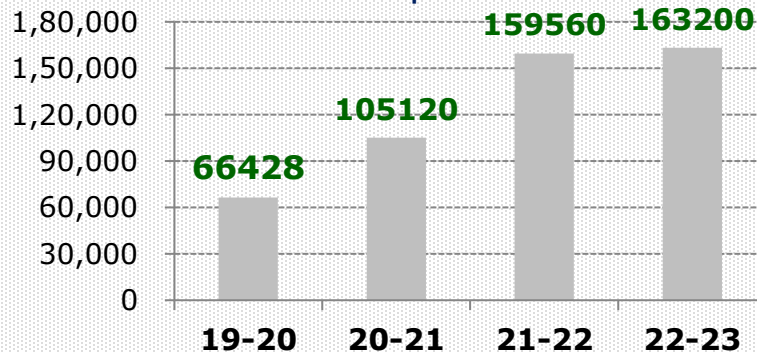
Reducing Scope -3 Green House Gas emission.

Plantation- CO2 sequestering during life cycle.

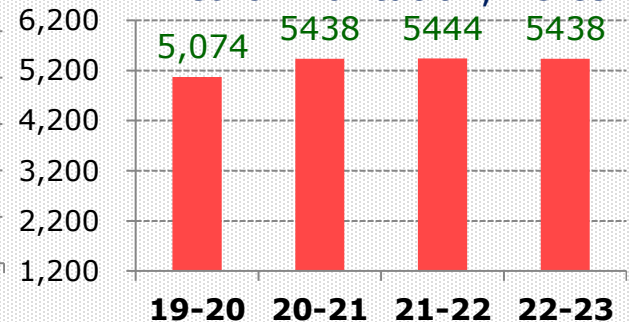
No of Saplings, Lac



MT of CO2e Sequestered

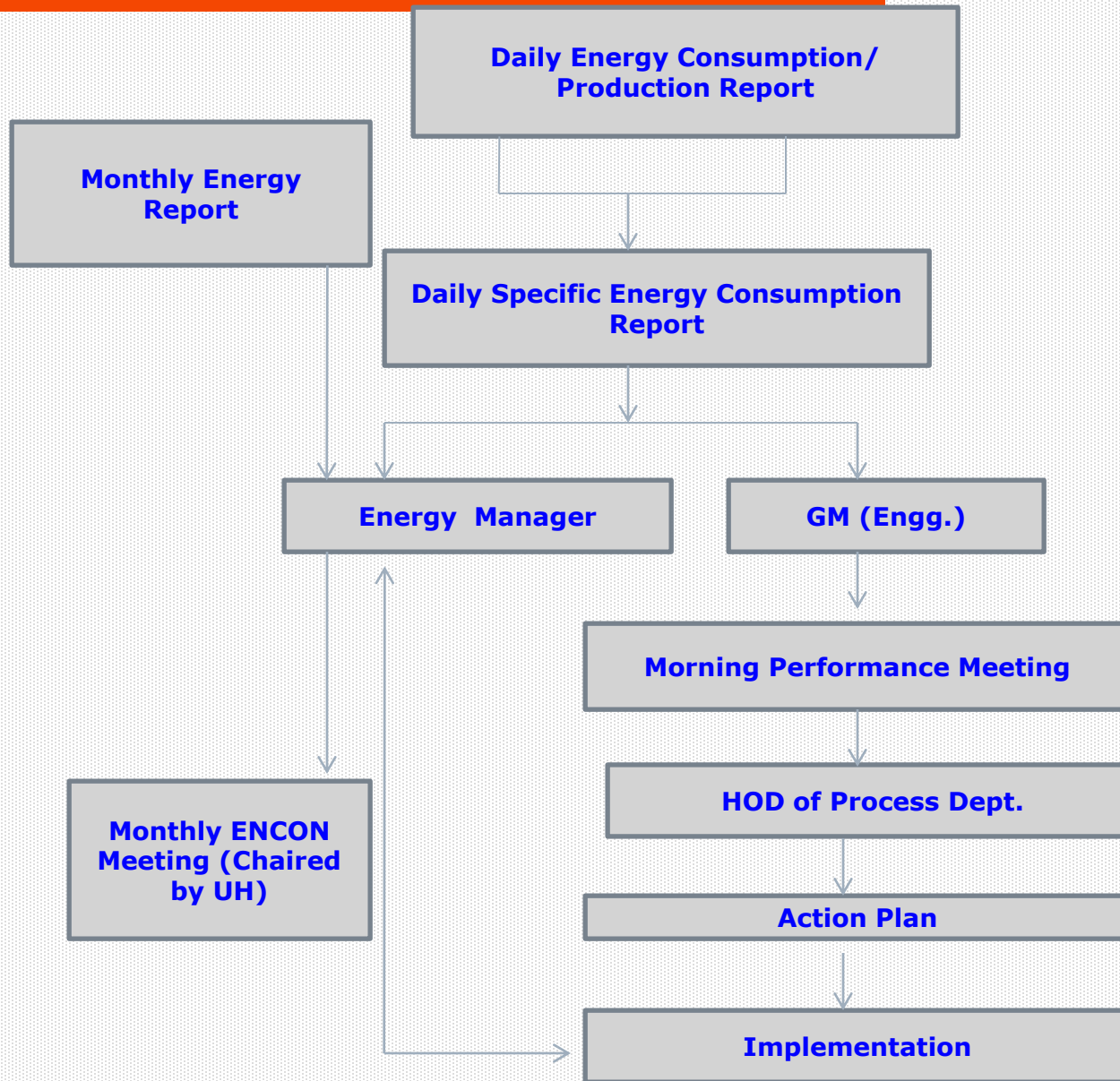


Area of Plantation, Acres

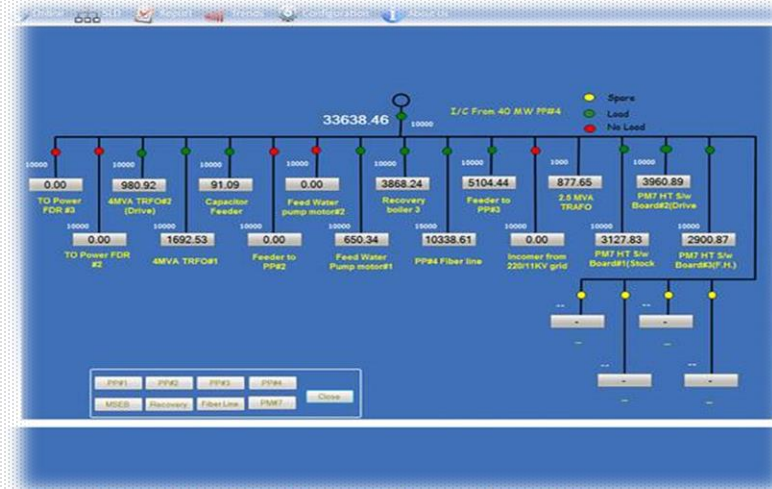
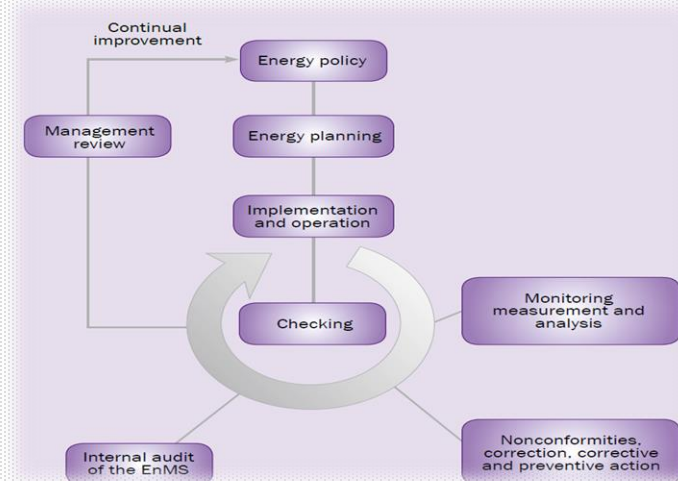


(Considering 3 years Rotation / 10 CER (10MT) per year per acre basis on Eucalyptus Plantations)

Management of Energy Conservation Program



Team Work, Employee Involvement & Monitoring



- ✓ Daily monitoring of utilities
- ✓ Daily meetings chaired by departmental heads
- ✓ Monthly meeting chaired by Unit Head
- ✓ Monthly VC with COO
- ✓ Separate capex approvals for EC activities
- ✓ No constraint of funds for energy conservation projects with faster payback
- ✓ More than budget allocation, focus is on in-house ideas for optimization of energy usage, TQMs, Implementation of best practices, Awareness of workmen, Management Programs and EnMS-50001-2018

Implementation of ISO 50001:2018

- 1st Integrated Pulp & Paper sector who achieved ISO 50001:2011 certification in 2012
- Achieved the certification without any consultant
- Upgraded to ISO 50001: 2018 in Oct., 2020
- Yearly external audit & Quarterly internal audits
- Well established & mature system in place

Benefits:

- Enhanced awareness
- Strong review mechanism
- Implementation of Energy conservation projects, process optimization , capturing low hanging fruits



Net Zero commitment

Target for Net Zero by 2030

Action Plan:

- **Reduction in Energy Consumption – Fossil fuel**
- **Pulpable Wood Plantation**
- **Roof Top Solar Panel**
- **Recovery Boiler Efficiency Improvement**

Energy Conservation Awareness Drive



Gate Meeting



Oath Ceremony

Quiz Competition



Painting Competition

EC Team



Painting Competition in School



Plantation

Top Management Involvement in result of competitions



Badge Distribution



Awareness Session

BPU Awards & Recognitions FY 22-23



CII
Energy Efficient
Unit

IPMA
Environment
Award

BEE
Top Performer
PAT Cycle II

Nagpur
Customs
Top Exporter

SEEM
Energy Efficiency
Platinum Award

Director Steam
Boiler
Best Boiler User



Thank You

National & State Level Achievements

1st Prize award in 16th State Level Energy Conservation Award for FY2021 by MEDA

"Certificate of Excellence" award in 15th State Level Energy Conservation Award for FY2020 by MEDA



Platinum Award in National Energy Management Award by SEEM-2019



1st Prize in 14th State Level Energy Conservation Award 2019 by MEDA



Platinum Award in National Energy Management Award by SEEM-2017



1st Prize in National Energy conservation Award-2016



Platinum Award in National Energy Management Award by SEEM-2016



Energy Efficient Mill Award-2016 by CII



1st Prize in State level Energy Conservation Award by MEDA-2016

Platinum Award in National Energy Management Award by SEEM-2019

1st Prize in 13th State Level Energy Conservation Award 2018 by MEDA

Certificate of Merit in National Level Energy Conservation Award -2018 by BEE