CII's National Award for Excellence in Energy Management 2024

BGPPL

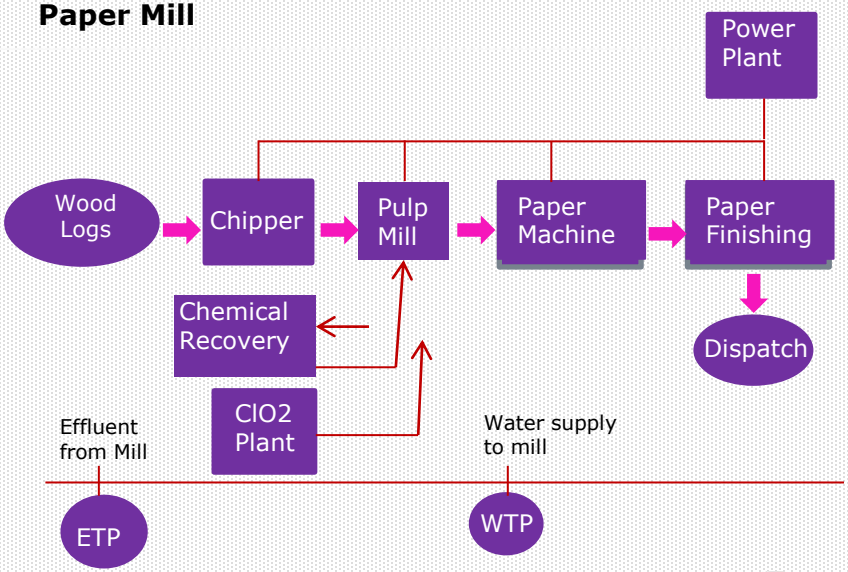
M/s BILT Graphic Paper Products Limited
Unit : Ballarpur

Presented by:
Ms. Samriti Pandey- Energy Manager

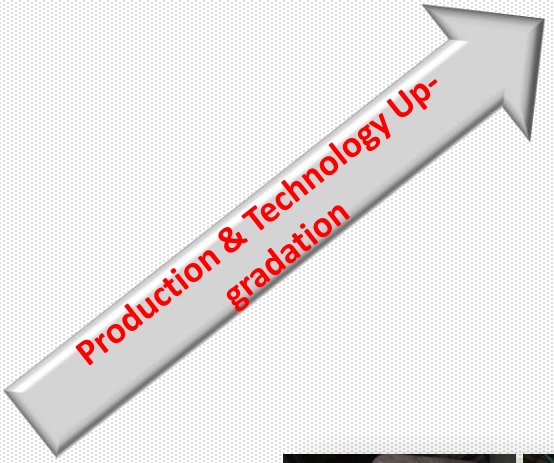
Mill Overview

- **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 and PEFC Chain of Custody Certificate**
- **Adopted Best available Environment Friendly Process Technology.**

Basic Process Flow Diagram of Integrated Pulp & Paper Mill



History at a glance……



PM –7 : 165000 TPA
Total : 299500 TPA Pape
PP 4 : 67.5 MW

New Pulp Mill:
300000 TPA
ECF Bleaching

Bamboo
Subabul
MFW
Eucalyptus
Casurina

2013

PM – 3 Rebuild
New Pulp Mill – ClO2
Bleaching

2009

Bamboo
Subabul
MFW
Eucalyptus

1991

PM – 6

1983

Bamboo
MFW

PM – 4 & 5
Recovery Boilers

1964 , 1975

Bamboo
Subabul
MFW

PM – 2 & 3

1962

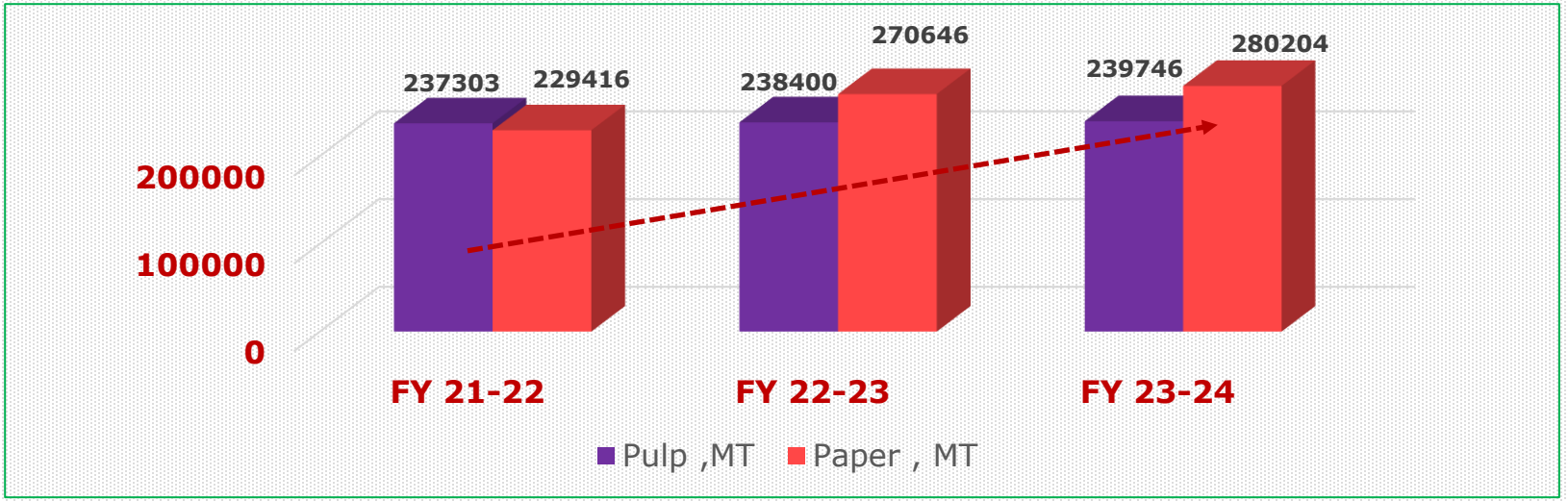
1952

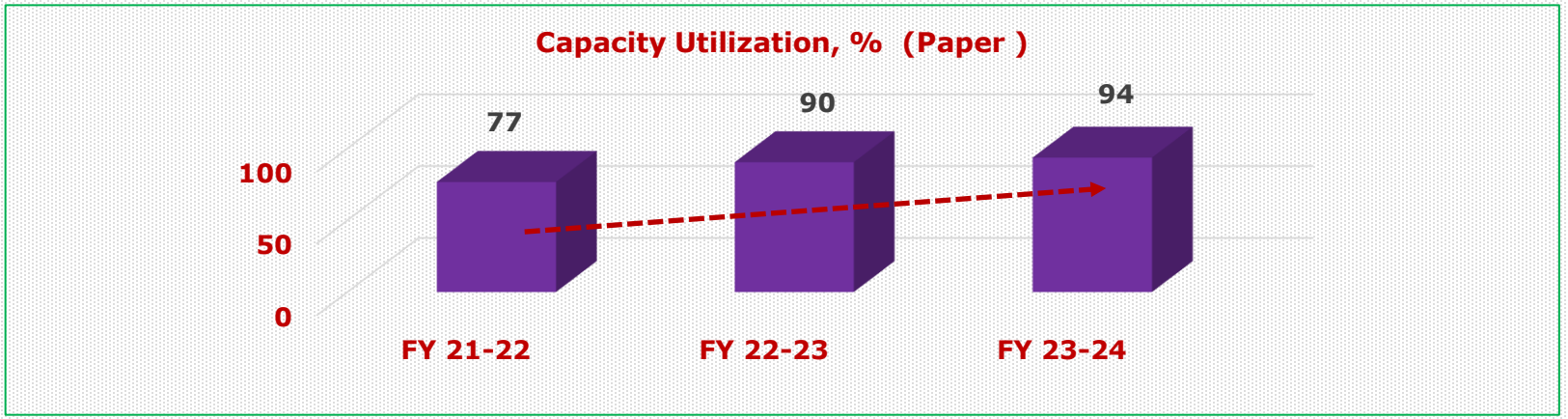
Bamboo

PM – 1
9000 TPA Paper

Raw Material Mix

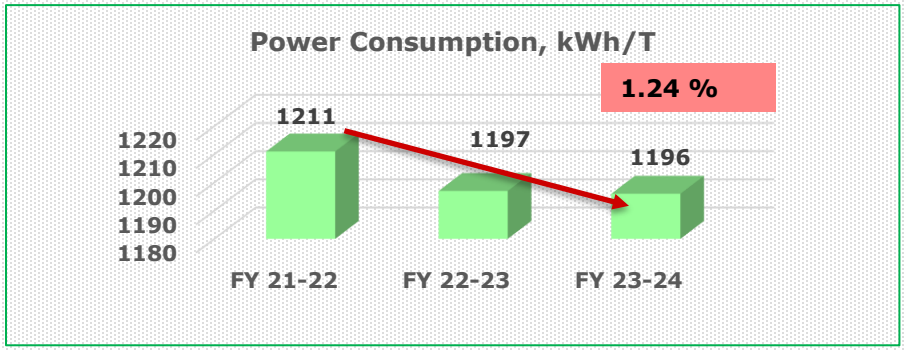
Production Data

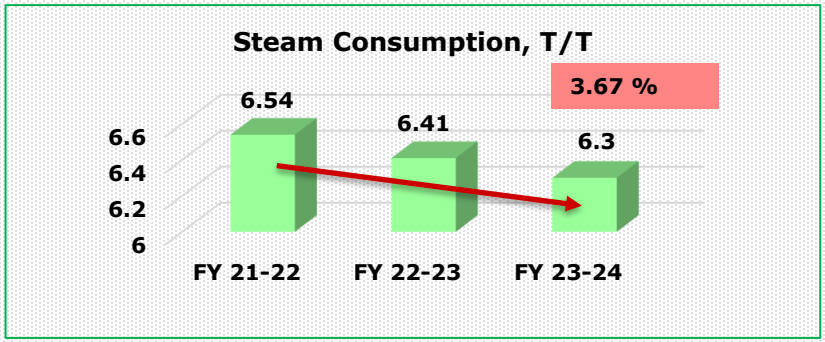




Type of Raw Material : 100 % wood based Paper Manufacturing Unit
Writing & Printing Grade : 95% Speciality Grade : 5 %

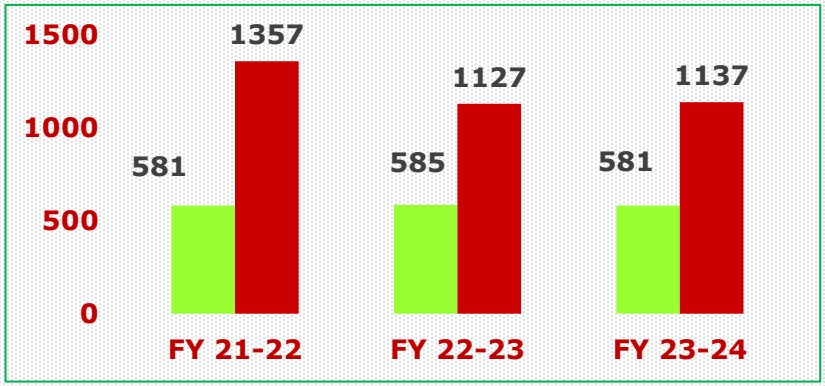
Specific Energy Consumption



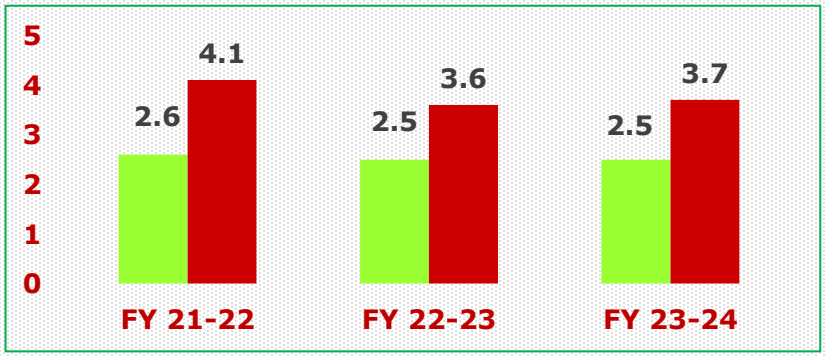


MTOE Status

	PAT-1	PAT-2	PAT-7
Cycle	2012-2015	2016-2019	2022-2025
Base Year	2007-2010	2014-2015	2018-2019
Assessment Year	2014-2015	2018-2019	2024-2025
Baseline MTOE	0.609	0.557	0.3971
Base Line Eq. Production	137090	247924	267916
Target MTOE	0.584	0.5335	Target 2.44% reduction=0.3874
Achieved MTOE	0.463	0.397	0.356
Ecerts Issued	16588	33842	



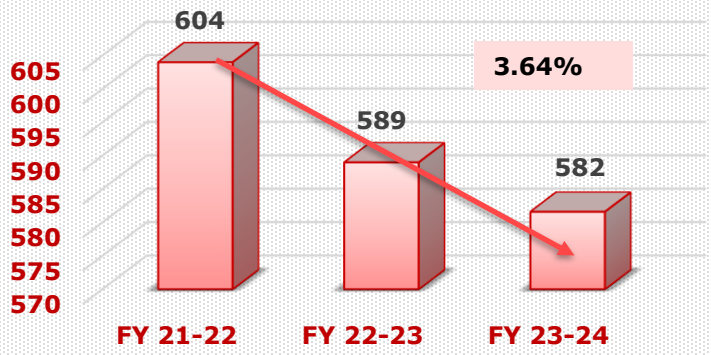
Grade wise Power Consumption of WP & Speciality Grade, kwh/T



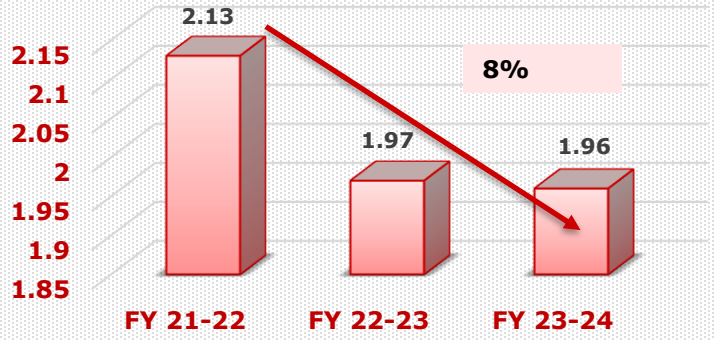
Grade wise Steam Consumption of WP & Speciality Grade, T/T

Section wise Energy Consumption

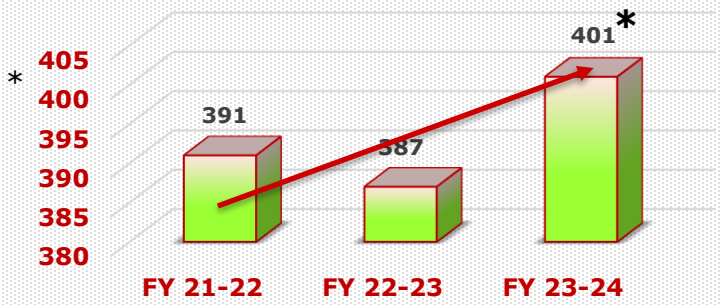
Power Consumption PM7 , kWh/T



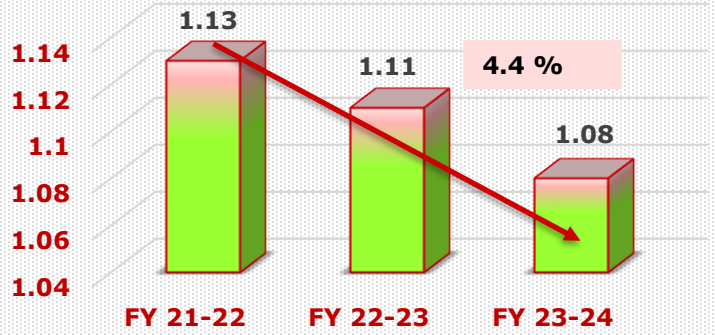
Steam Consumption PM7, T/T



Power Consumption Fiberline , kWh/T



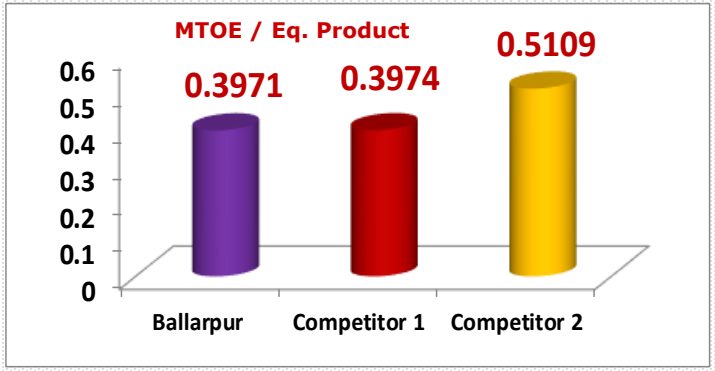
Steam Consumption Fiberline, T/T



* Addition of New Equipment's for Environment Concern

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	**1196**	**6.30**	**Integrated Pulp & Paper Industry with 7 Paper Machines .**



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

- **SEC is below the Avg. Consumption of the global SEC**
- **Highest Ecert Achiever in PAT-2 cycle**

MINISTRY OF POWER
GOVERNMENT OF INDIA

PAT SCHEME

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*

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:**

  Audit Conducted on PM-3 for Steam and Condensate system by M/s Kadant and project is under progress.

  - Targeting high energy using equipment's to save 1 MW

  - Efficiency calculation of Compressors, Refiners and Vacuum Pumps

  - Improvement in condensate recovery system

Major Encon Projects planned 2024-25

Description	Investment Rs Lac
To replace energy in-efficient MC pump in pulp mill with new energy efficient MC pumps. Expected reduction in power consumption to the tune of 160 kW.	125
New steam and condensate system at PM-3 , expected steam saving of 96TPD	400
Installation of 4 nos. of VFDs at identified locations in pulp mill and Evaporator plants. Expected reduction in power consumption to the tune of 208 kW.	50
Replacement of existing identified conventional lighting fixtures with energy efficient LED lamps Expected reduction in power consumption to the tune of 75 kwh/day.	20
Implementation of SEC system at PM-4 & 6 refiners to improve paper quality vis a vis reduction in power consumption to the tune of 18-24 kW.	25
Energy efficient vacuum pump at Caustizing plant , expected power saving of 40 Kw	45
Use of indirect heat in series with direct heater at SBL process flow , expected steam saving of 76 TPD	25
New 3 stage centrifugal compressor , expected power saving of 412 Kwh	
Evaporator plant effect #2 modification , expected steam saving of 12TPD.	2.5
New Hood for PM5 MG Cylinder	92
New Press filter for dregs removal in Causticizing	155
Installation of MCW pump at PP4 Cooling tower	45

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 2021-22	6	11.0	3.7	19184	50.3	3
FY 2022-23	12	52.45	2.56	13041	29.4	13
FY 2023-24	15	55.3	3.089	9177	26.73	25

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)
2023-24	Saving achieved by trimming the impeller of the MC pump for feeding to P stage tower .	0.5	0.3528		1.354752	4
2023-24	Saving achieved by replacing old aerators with energy efficient triton aerators	26	0.4116		1.580544	197
2023-24	Saving achieved by replacing the fresh water pump of PM-7 with lower capacity pump as the recirculation valve remain opened to meet requirement.	0.3	0.252		0.96768	3
2023-24	Power Saving through Installation of VFD to 02-651-71 High solid pit Pump	0.4	0.0924		0.354816	13
2023-24	Installation of New TDR for PM#2	2.5	0.2688		1.032192	29
2023-24	New Energy efficient pump at ETP cooling tower , achieved power saving of 82 Kwh by installation of lower capacity pump and motor for cooling tower feed in view of separation of Machine backwater via new thickener.	0.75	0.6888		2.644992	3
2023-24	Installation steam and condensate system at PM-1 , achieved steam saving of 19 TPD.	15		4589	6.65	27
2023-24	Provision of ON-Off valve and vapor vent valve at Finisher body at Evaporator plant resulting steam saving of 19 TPD.	0.3		4589	6.65	0.55

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)
2023-24	Replace existing inefficient Lobe blower with a New Energy efficient Screw Blower at MBBR in Effluent Treatment Plant. Achieved power saving t the tune of 21 kW.	**7.5**	**0.18**		**0.68**	**132**
2023-24	Energy Saving by changing the Drain Pipe in CSCP Plant Drainage System and shutting down of Transfer pump.	**0.94**	**0.18**		**0.68**	**16**
2023-24	Installation of VFD on 02-200-07 pump, Black Liqour pump to evaporator	**0.4**	**0.33**		**1.26**	**3**
2023-24	Avoided double pumping by Diversion of PG & PM-3 Condensate directly to Recovery Plant resulted power saving of 10 kw .	**0.2**	**0.08**		**0.32**	**7**
2023-24	VFD at steaming vessel 01-201-04	**0.4**	**0.10**		**0.39**	**12**
2023-24	PM-4 machine chest pump No.1 has been replaced with new pump under Energy Conservation. Achieved Saving of about 6 kW.	**0.12**	**0.05**		**0.19**	**7**

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 to170 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 Calendria 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	

Innovative Project:

Name of the project:

Provision of ON-Off and vent valves in Finishers vapor outlet line at Evaporator plant resulting steam saving of 19 TPD.

Why innovative:

This Project can be considered as " Innovative " due to modification in existing system which has resulted in Energy savings and Environment compliance.

- We have three Finishers in Evaporator plant. Out of these three Finishers , one Finisher remains always under wash mode
- The vapor outlet lines of all these Finishers are common and outlet vapor goes to second effect.
- During Finisher washing, we cut steam and SBL entry to that Finisher and do washing with hot condensate at 85-95 deg. C
- The water washing activity were being carried out at a higher temp. than required due to non availability of Valves in Finishers vapor outlet lines and some vapors are going back to the finisher under wash mode.
- Instrument on/off valves provided in Finishers vapor outlet line and short circuiting of vapor eliminated.
- Instrument On/Off vent valves also provided in vapour line before outlet valve for safety.
- Vapor carry over along with wash liquor from Finisher to Spill liquor tank and then to atmosphere, which is resulting in odor issue minimized after provision of these valves.
- This Project resulted in clean atmosphere and energy saving.

Trigger for implementing the project:

- Higher Steam consumption/ Steam Loss and environmental non compliance

Provision of ON-Off valve and vapor vent valve at Finisher body at Evaporator plant

Replicability :

Yes, This project can be replicated in evaporator plant

Impact on SEC:

Saving in LP steam consumption up to 19 TPD

Year of Installation: March,24

Annual Saving : Rs 66.5 Lacs

Investment: Rs. 3 Lacs

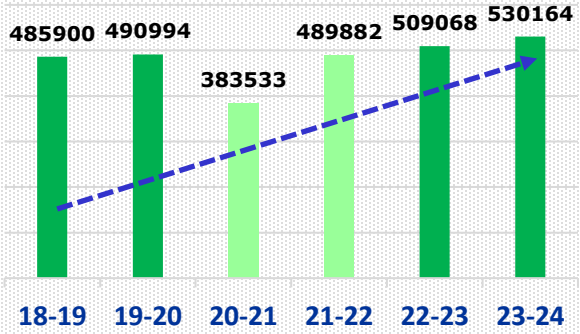
Benefits: Steam Saving and Environmental Compliance

Renewable Energy Resources

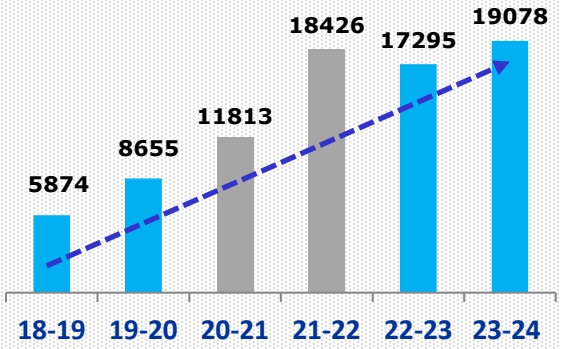
To reduce dependence on captive coal consumption : Use of Biomass Fuel

- Increase the steam generation with the help of Biomass (Black liquor generated in pulp mill) fuel in Recovery Boiler.
- Use of chipper wood dust in Coal boiler CFBC-9 as an alternate fuel

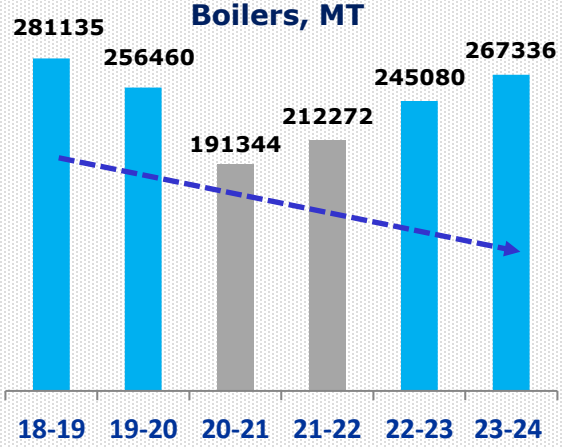
Black Liquor Solids, MT



Chipper wood dust for Boilers, MT



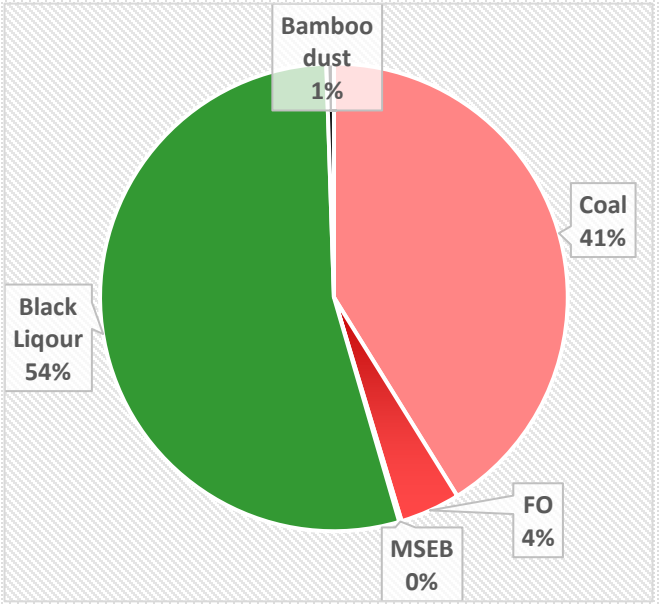
Coal Consumption for Boilers, MT



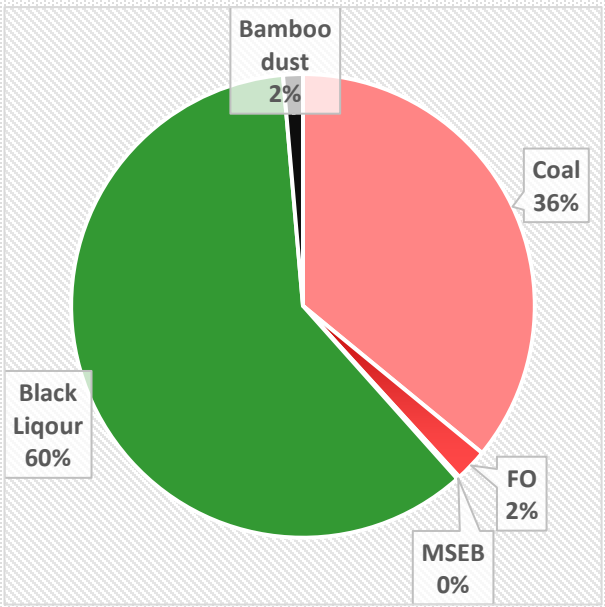
2020-21 and 2021-22 was Covid Period. Mill was running intermittently in few months. Hence Specific energy consumption is not comparable

Renewable Energy Resources

FY 2014-15



FY 2023-24



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

Renewable Energy Resources

	OnSite				
	Technology (Solar,/Wind/Biomass/ Black Liqour)	**Installed ,MW**	**Generation in Million kWh**	**Consumption by Million Kwh**	**Share,% (Generation)**
2021-2022	Black Liqour	28	340.7	211.493	62
2022-2023	Black Liqour	28	360.8	218.762	61
2023-2024	Black Liqour	28	392.4	232.1	60
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)
21-22	18426	2486	45807
22-23	17295	2503	43289
23-24	19078	2485	47416

Wood Dust- Biomass

Lime Sludge- For Cement Manufacturing

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.

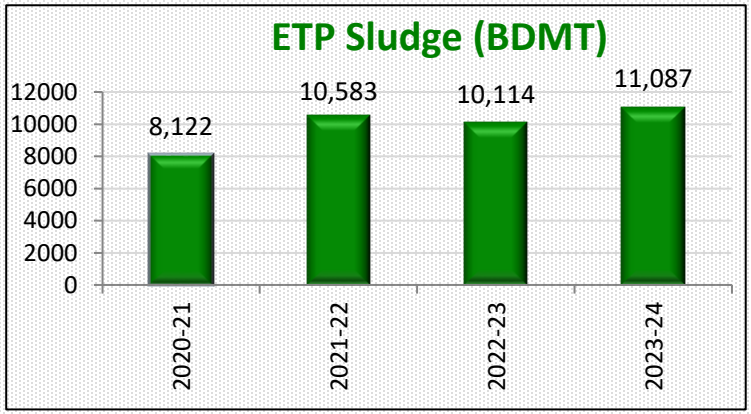
Lime Sludge - 30000 MT/annum

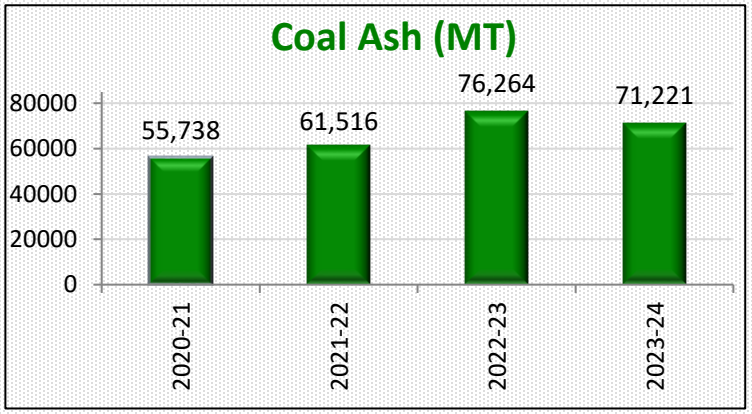
Recycled by reburning in Rotary Limekiln
Excess purged out sludge sent to M/s Ultratech Cements, Awarpur, M/s Dalmia Cement

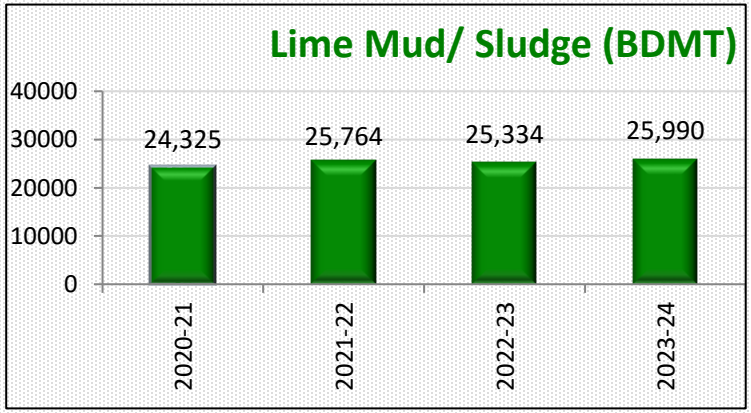
Hazardous Wastes:

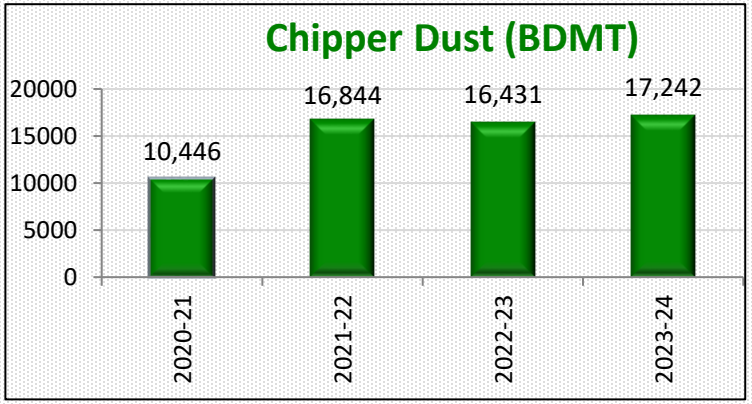
Used oil given to registered recycler- 24000 kg/annum
Asbestos containing gland packing waste- Member of CHWTSDF, Nagpur, hazardous waste given to CHWTSDF, Nagpur.

Solid Waste Generation

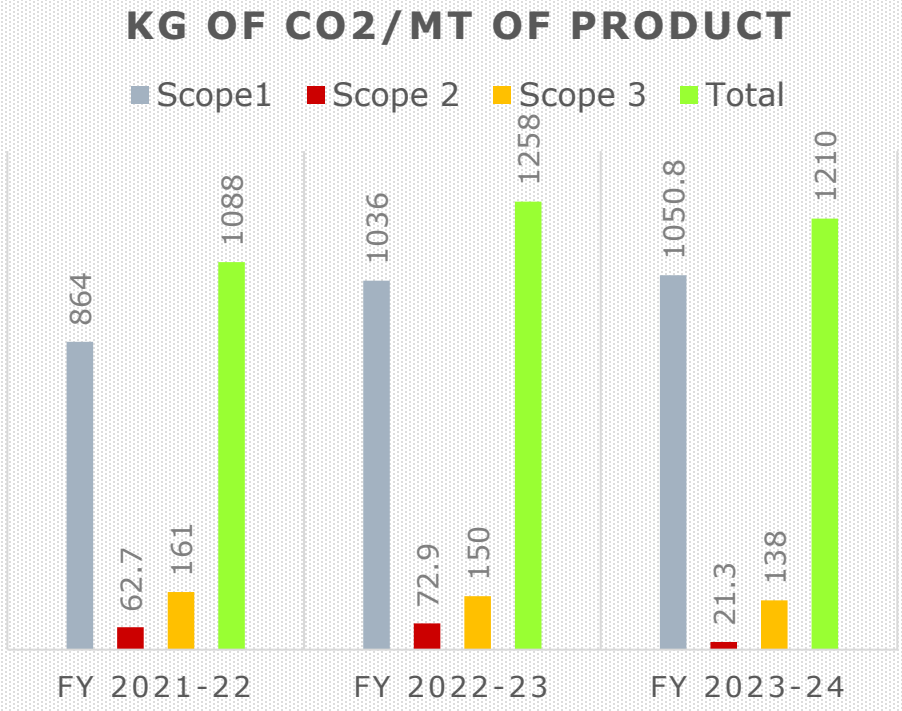








GHG Emission Data



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 Pump

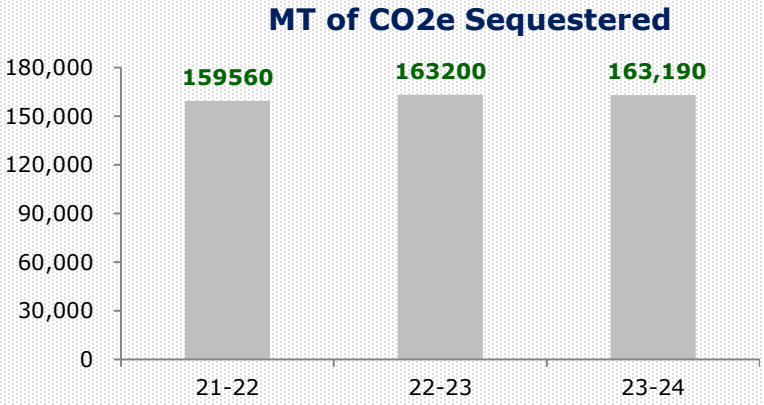
Note: All Figures are excluding biomass and after CO2 Sequestering by plantation

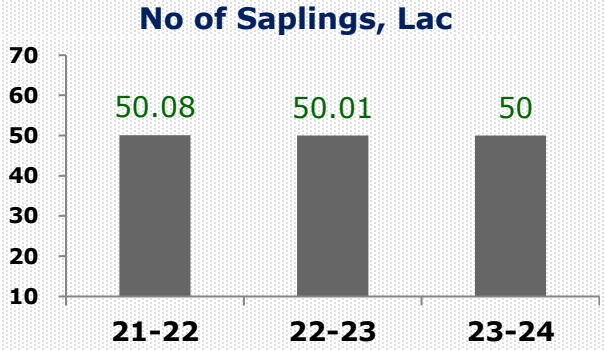
Wood: Plantation Details

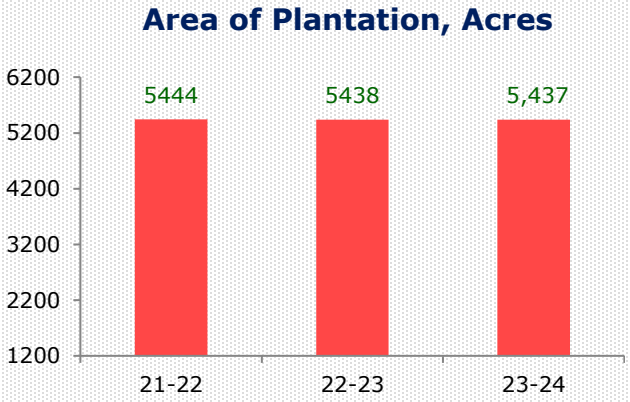
- Farm Forestry-Promoting plantation of pulpwood species in the farmers field.
- Developing plantation nearer to the industry.
- Catchment area for plantation- within 500 KM.

(Akola, Amravati, Buldhana, Chandrapur, Gadchiroli, Nagpur, Wardha, Washim, Yavatmal)
Reducing Scope -3 Green House Gas emission.

Plantation at mill owned land – 100 Acres - CO2 sequestering during life cycle.

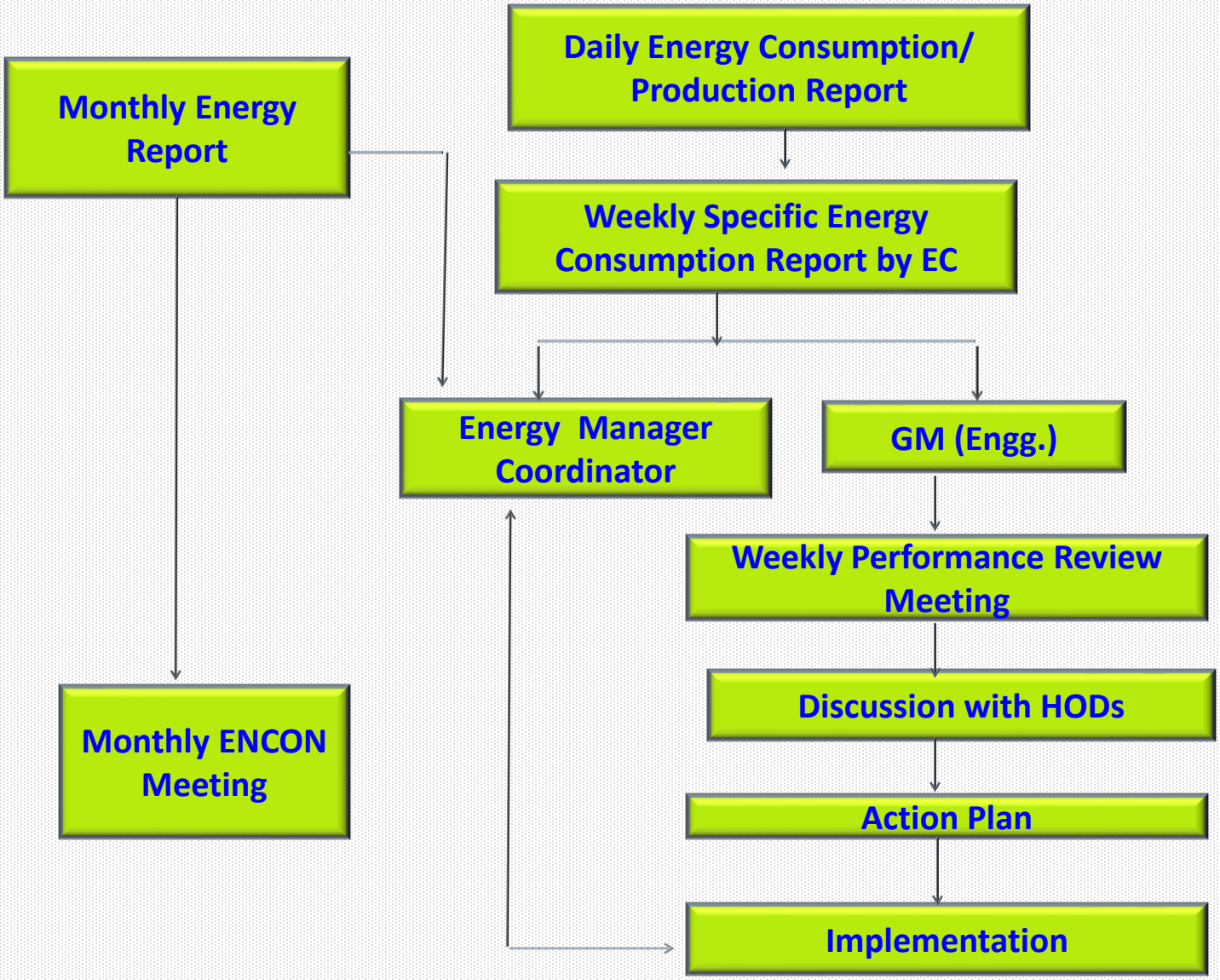




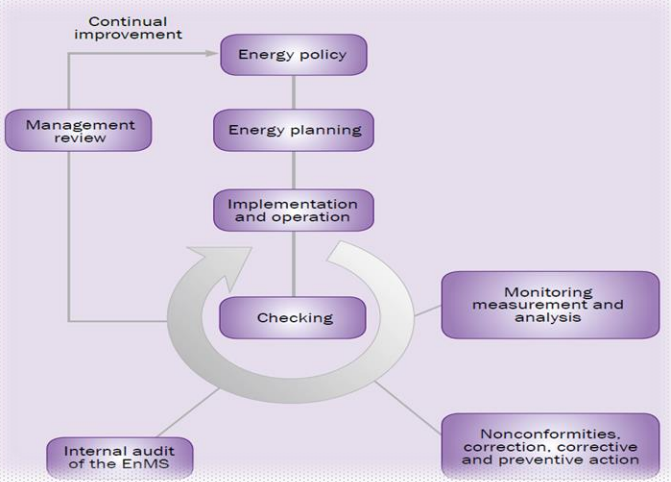


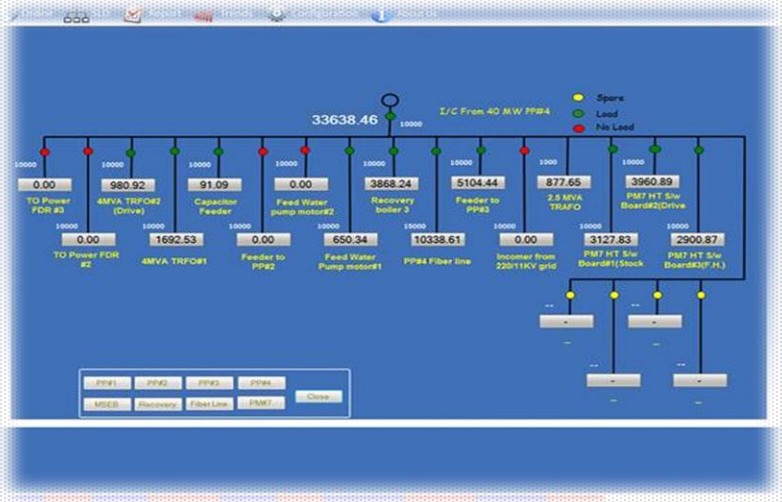
(Considering 3 years Rotation / 10 CER (10MT) per year per acre basis on Eucalyptus Plantations)

Management of Energy Conservation Program



Team Work, Employee Involvement & Monitoring





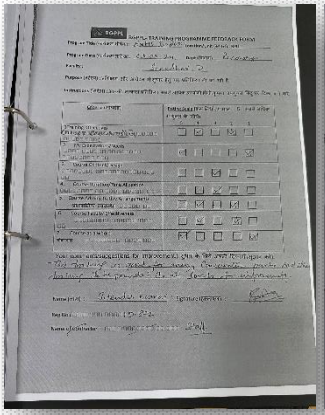
- ✓ Daily monitoring of utilities
- ✓ Daily meetings chaired by Departmental Heads in Departments
- ✓ Daily meeting chaired by Unit Head with all HODs
- ✓ Monthly VC with COO
- ✓ Separate capex approvals for EC activities
- ✓ No constraint of funds for energy conservation projects with faster payback
- ✓ 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

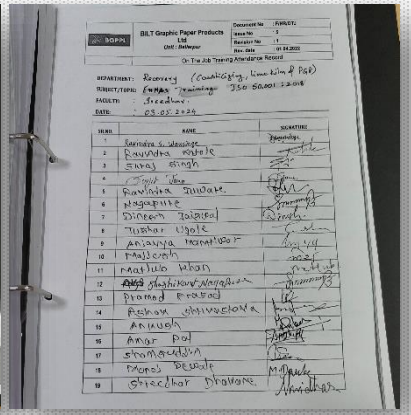
Implementation of ISO 50001:2018

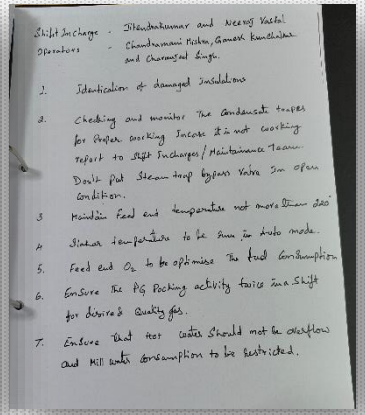
- 1st Integrated Pulp & Paper sector who achieved ISO 50001:2011 certification in 2012
- Achieved the certification without any consultant
- Upgraded to ISO 50001: 2018 in Oct., 2020
- Yearly external audit & Quarterly internal audits
- Well established & mature system in place
- Successfully completed the Rcertification Audit in May,24. Certificate attached and valid till July,2027

Benefits:

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







DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 10000410247-MSC-RvA-IND | Initial certification date: 26 July 2018 | Valid: 26 July 2024 – 25 July 2027

This is to certify that the management system of

BILT Graphic Paper Products Limited

(Unit - Ballarpur) Post Office: Ballarpur Paper Mills, Ballarpur, District: Chandrapur - 442901, Maharashtra, India

has been found to conform to the Energy Management System standard:

ISO 50001:2018

This certificate is valid for the following scope:

Manufacture of Writing, Printing, Copier and Industrial Grade of Paper

Place and date: Barendrecht, 11 July 2024

For the issuing office: DNV - Business Assurance, Zwolseweg 1, 2994 LB Barendrecht, Netherlands

Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV Business Assurance B. V., Zwolseweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0)10-292 [illegible] www.dnv.com/assurance

BGPPL: Net Zero Commitment

Net Zero
Path Forward

1) Roof Top Solar Panel – Offer Received
2)Green Fuel Switchover to replace Fossil Fuel- Recovery Boiler efficiency improvement

Carbon Neutrality
Path Forward

1) Pulpable wood plantation- Mill owned land (100 Acres)
2) Energy From Carbon Neutral Fuel
3) 3R concept- Reuse ,Reduce, recycle
4) Energy Efficiency Improvement Projects

Certificates

ISO45001:2018 **ISO 50001 : 2018** **ISO 9001:2015,** **ISO 14001:2015**

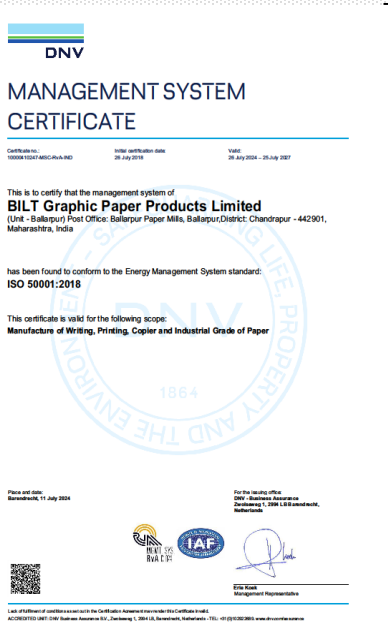
MANAGEMENT SYSTEM CERTIFICATE

BILT Graphic Paper Products Limited

(Unit - Ballarpur) Post Office: Ballarpur Paper Mills, Ballarpur , District: Chandrapur - 442901, Maharashtra, India

has been found to conform to the Occupational Health and Safety Management System standard:
ISO 45001:2018

This certificate is valid for the following scope:
Manufacture of writing, printing, copier and industrial grades of paper



DNV

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of
BILT Graphic Paper Products Limited
(Unit - Ballarpur) Post Office: Ballarpur Paper Mills, Ballarpur,District: Chandrapur - 442901, Maharashtra, India

has been found to conform to the Energy Management System standard:
ISO 50001:2018

This certificate is valid for the following scope:
Manufacture of Writing, Printing, Copier and Industrial Grade of Paper

MANAGEMENT SYSTEM CERTIFICATE

BILT Graphic Paper Products Limited

(Unit - Ballarpur) Post Office: Ballarpur Paper Mills, Ballarpur, District: Chandrapur - 442 901, Maharashtra, India

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:
Manufacture of writing, printing, copier and industrial grades of paper

MANAGEMENT SYSTEM CERTIFICATE

BILT Graphic Paper Products Limited

(Unit - Ballarpur) Post Office: Ballarpur Paper Mills, Ballarpur, District: Chandrapur - 442 901, Maharashtra, India

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:
Manufacture of writing, printing, copier and industrial grades of paper

SCS Global Services does hereby certify that an independent audit has been completed and conformity to the applicable standard(s) has been confirmed for:

BILT Graphic Paper Products Limited, Unit Ballarpur

P .O. Ballarpur Paper Mills Ballarpur, 442901 Ballarpur, Maharashtra, India

This single site certificate covers the production of Bleached Pulp, Writing & Printing uncoated paper, Copier Paper and MG Poster Paper using the physical separation method, percentage-based method and volume credit method. It also covers a due diligence system for the control of wood sourced from West Bengal, Jharkhand, Madhya Pradesh, Chattisgarh, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Maharashtra, Telangana, Karnataka, Orissa and Assam; the sale of PEFC Controlled Sources.

The facilities and products listed above have been certified as

PEFC Chain of Custody Certified

This certificate cannot be presented as evidence that certified wood products have been supplied. In all cases, such evidence must be conveyed on the corresponding sales documentation.
Certified against PEFC ST 2002-2020 (Chain of Custody), PEFC ST 2001-2020 (Trademark Use)

SCS Certification Registration Number: SCS-PEFC-COC-002678

Valid from: 12 April 2024 Expiry date: 11 April 2029

SCSglobal SERVICES

Maggie Schwartz, Managing Director, Forestry
SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA

Printed: 12 April, 2024

PEFC Chain of Custody Certified

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

BGPPL

BPU Awards & Recognitions FY 22-23

CII
Excellent Energy Efficient Unit Award

IPMA
Environment Award

BEE
Top Performer
PAT Cycle II

Nagpur
Customs
Top Exporter

SEEM
Energy Efficiency
Platinum Award

Director Steam
Boiler
Best Boiler User

samriti.pandey@bgppl.com

Thank You