# BILT GRAPHIC PAPER PRODUCTS LIMITED

## Unit Ballarpur, Distt. Chandrapur (Maharashtra)

### *Unit Profile*

BILT Graphics Paper Products Limited Unit-Ballarpur, India is one of largest manufacturer of uncoated wood free / Industrial grades of Paper & market Pulp.

Unit Ballarpur has versatile range of products in Note Book printing, Map Litho/ publication, Azure Laid, Industrial packaging & industrial tissue. It has paper machines in capacity ranging from 25 TPD to 520 TPD.

Plant started operation in the year 1953 with 25 TPD single machines. After commissioning of new PM-7 by Allimand, France with a capacity of 520 TPD in the year 2009, the installed capacity of the unit increased to 2,99,550 MT/annum. This unit is pioneer in the manufacture of wide range of high quality writing / printing & industrial grades of paper for the wide range of prestigious end users since last 63 years.

In the year 2013, new Pulp mill of 900 TPD was commissioned having latest technology like continuous digester, ODL process technology with ECF Bleaching to sustain and have an edge in the market in terms of environment, energy and quality. Simultaneously India's largest Soda Recovery Boiler with capacity of 1650 TPD solid firing was commissioned.

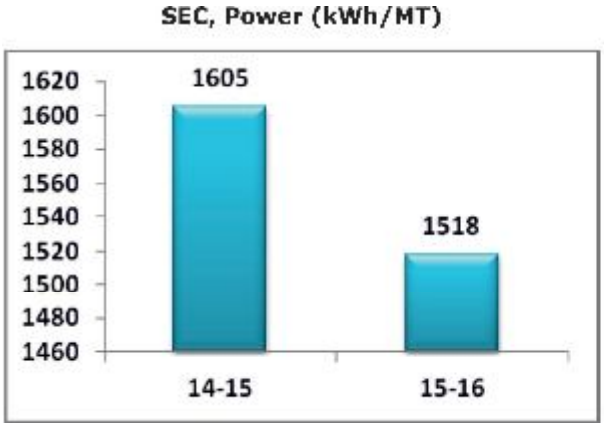
BILT, Ballarpur is the 1st integrated Pulp & Paper industry in India to have commissioned DAF and along with MBBR which are patented technology from Ovivo Finland to enhance environmental performance along with Pulp Mill modernization.

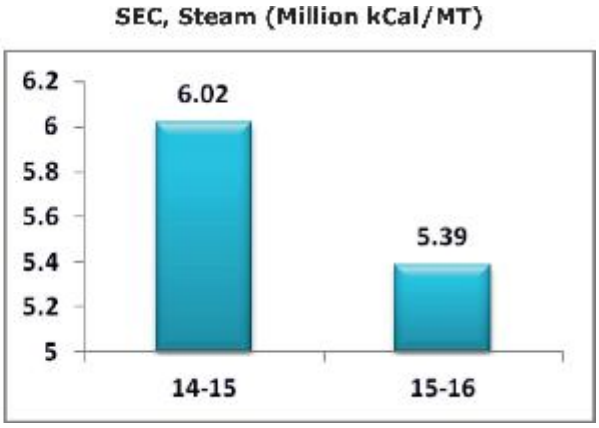
With expansion activities undertaken as above in last 5 years, Unit Ballarpur now is one of the largest integrated Pulp & Paper manufacturers with 7 Paper machine lines and captive Pulp production facility which also caters to Pulp requirement of sister concern at Ashti & Bhigwan.

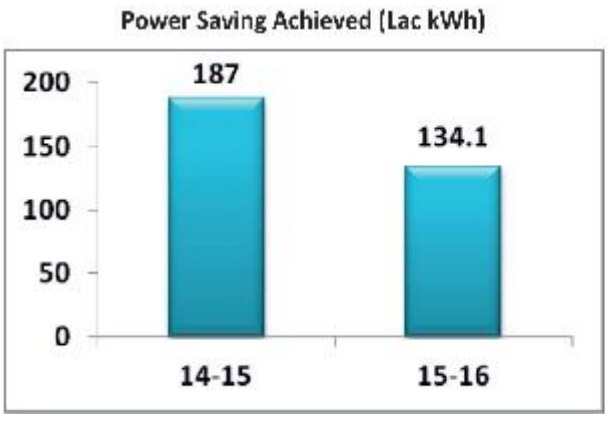
## *Specific Energy Consumption*

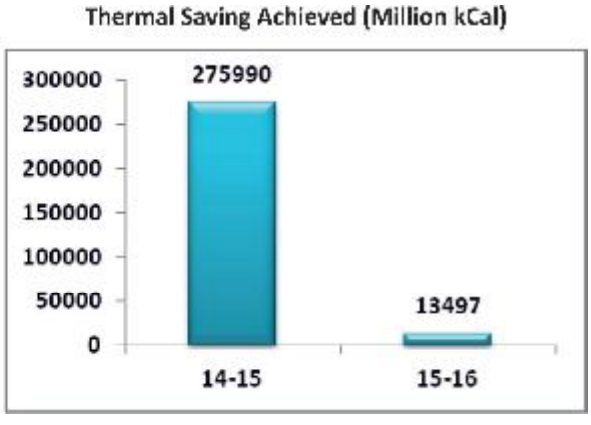
In last few years, there was continuous decline in Specific energy consumption due to regular improvement & implementation of energy conservation ideas in the unit carried out with active participation of employees under the umbrella of ISO 50001 Energy Management System. Despite addition of environmental compliant project like Limekiln , ODL Plant, MBBR & DAF , change in furnish , shift in production portfolio to lower GSM which is as low as 47 GSM , addition of Synchro sheeter, Wrapmatic machine for superior finished product quality , there has been drastic reduction in Specific Energy Consumption due to optimization of newly installed 520 TPD PM-7 & Pulp Mill.

## *Energy & Fuel Reduction trends*



## *Energy Conservation Measures implemented for the year 2015-16*

*With implementation of following Energy Conservation initiatives implemented during 2015- 16 with total investment of Rs. 655 Lacs has yielded into annualized monetary benefits of Rs. 1541 Lacs.*

***Project No.1: Arresting Mill wide MP/LP steam leakages and resizing of MP steam lines.***

During opportunity of Mill shut, arrested mill wide MP/LP leakages through main headers and in distribution networks. Changed the valves, traps and flanges, removed the unwanted lines and totally isolated the old plants circuits which are non functional. Also, resizing of the MP line to cater the demand of the MP required in Paper Machine from 14" to 8". All these actions resulted in reduction in the steam inlet to TG by 5.57 T/Hr.

**Total Investment: Rs. 2.0 Lac & Thermal Saving = 277 Lac/Annum**

***Project No.2: Stoppage of 35 Bar Old Travelling Grate Boiler no.7 by***

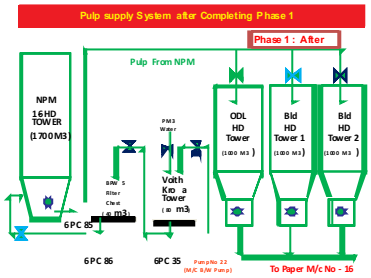
***i) Optimizing 65 Bar steam generation & ii) Minimizing steam flow through 75/13 Bar PRV by direct MP extraction supply to ODL.***

Previously there were 2 no's of travelling grate coal fired boilers in operation, 1 No. Soda Rec. Boiler @36 Bar steam & 1 no. of CFBC boiler @64 Bar steam. Optimization of the 65 Bar steam generation and minimizing 65/13Bar PRV operation by direct MP Extraction steam supply to ODL was undertaken. Thus steam requirement of mill can now be met completely through one travelling grate boiler, CFBC & New Recovery boiler. Shutting down 1 no. of travelling grate boiler led to saving in power of 209 kWh. 5260 Ton coal consumption reduced by above measures and efficiency improvement of other Boilers.

**Total Investment: 5.0 Lac & Power saving = 54 Lac/Annum & Thermal Saving = 142 Lac/Annum**



***Project No. 3 : Stoppage of Old Pulp Mill operation by Direct Pumping***




Earlier Bleached Pulp to PM 1to 6 was pumped from NPM HD Tower (4% Cy) to E2 Tower in Old Pulp Mills. After thickening of Bleached Pulp at BPW in old pulp mill to consistency of 5 to 9%, again 9% CyPulp was diluted to 4-4.5% CY.by ring dilution at bottom of Bleached HD Tower 1 &2 for further pumping to paper machines. Now Bleached Pulp from NPM 1-6 HD Tower (4% Cy) is directly pumped to Bleached HD Tower 1&2. Bleached Pulp storage capacity enhanced by converting ODL HD Tower to Bleached Pulp storage Tower. Stoppage of Bleach washer, 8 pumps & 2 agitators resulted in saving of 292 kWh.

**Total Investment = 2.0 Lac & Power Saving = Rs.75.4 Lac / Annum**

***Project No.4: Installation and commissioning of Steam & condensate system on PM-3.***


The specific steam consumption of PM-3 was on higher side i.e. 4.4 T/T and Condensate recovery was only 35-40% due to condensate evacuation problem & leakages. Higher DP was required in Rotary siphons to evacuate condensate from Dryers meaning high load on drive motors. Frequent breakdowns of rotary siphons was taking place & DP control system was not working properly. Installation & commissioning of steam & condensate

system on PM-3 was taken up with spoiler Bar, automated control and vapor heat recovery system. With this initiative, condensate recovery improved to 80-85% and specific steam consumption reduced by 1.6 T/T.

**Total Investment: Rs.170.0 Lac & Thermal Saving = 79.4 Lac/Annum**

***Project No.5 : Installation and commissioning of Black Liquor pre heater prior to Effect 1 in Evaporator Plant.***

The Evaporation plant of 360 TPH water evaporation capacity is a part of the New Recovery Boiler. The role of Evaporation plant in the Pulp mill is to concentrate the Weak black liquor of 15 % TS (generated during Pulping/ cooking process) to Strong black liquor of 70 % TS fired into the Recovery boiler as the Primary fuel to recover the chemicals and to generate Green steam. The Evaporator plant consists of Six effects, Three Finishers and Two nos. Black Liquor pre heaters. The role of a black liquor pre heater is to raise the temp. of black liquor entering to the particular effect to its boiling point for effective evaporation. After commissioning of the BL

heater, rise in the BL temperature entering in to effect 1 by 7 degree C, minimized the Delta T problem, starvation problem & realized improved steam Economy. Achieved Net steam saving of 0.54 T/Hr.

**Total Investment:1 Lac & Thermal Saving = 27.0 Lac/Annum**

## *Energy Policy*

Unit Ballarpur is committed for reducing the energy consumptions through effective utilization and continuous improvement. Unit has independent Energy Conservation Cell, headed by a full time Energy Manager, along with Process & Engineering members. The Energy Policy of the unit as given below:

# Energy Policy

**BILT Graphic Paper Products Limited, Ballarpur**

**BGPPL, Ballarpur is committed to sustainable development in all its activities, products and processes. To accomplish this, we will make continuous efforts to improve our energy performance.**

**Our endeavor towards this goal will be;**

- **Comply with all statutory laws, rules and regulations.**
- **Reduce specific energy consumption by identifying and implementing energy conservation measures in the processes and incorporating energy efficient technologies & equipments.**
- **Carryout regular energy reviews to set objectives and targets for energy conservation.**
- **Monitor, control, report and carry out internal benchmarking studies regularly to achieve higher performance.**
- **Create awareness in energy conservation by imparting training through workshops & seminars to all employees & their families, contractors and all service providers.**

**18.08.2011**

**S S Arora**
**Unit Head**

# JK PAPER LIMITED
# UNIT:JKPM
## Rayagada (Odisha)

### *Unit Profile*

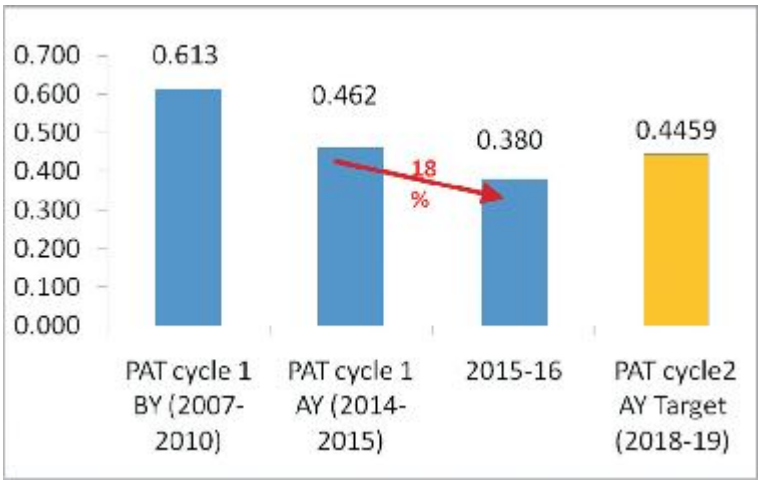
**J K Paper Limited, Unit:** JK Paper Mills - is located at Jaykaypur, Dist: Rayagada, Odisha which is approachable by Air / train from Vizag / Bhubaneswar to Rayagada. JK Paper Mills is the flagship company of JK Organization was established in 1938 and JK Paper Mills, an integrated Pulp & Paper Mills was setup in the year 1962 with initial capacity of 18000 TPA at Jaykaypur in the District of Rayagada (Odisha).

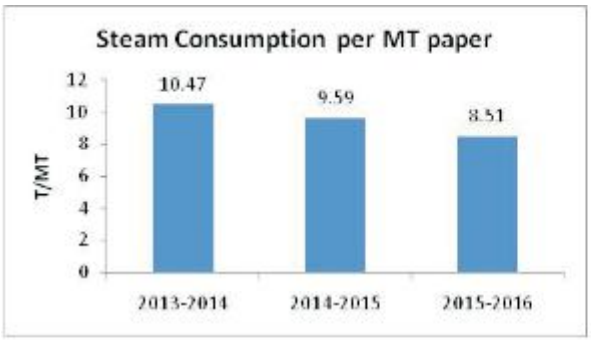
JK Paper Mills is a manufacturer of Pulp, uncoated and coated quality writing and printing papers. It is the First Pulp & Paper Industry in the country to certify with ISO-9001 Quality Management System and ISO-14001 Environment Management Systems by M/s. DNV, Netherlands and also certified with OHSAS-18001. The Mill has now adopted an integrated Quality, Environment, and Occupational Health & Safety Management System. And also J.K. Paper Mills has adopted TPM concept from JIPM, Japan as a management tool for continual improvements in all the systems. JKPM has achieved Excellence TPM Award in category 'A' in 2006 and Excellence in Consistent TPM Commitment Award in 2009.

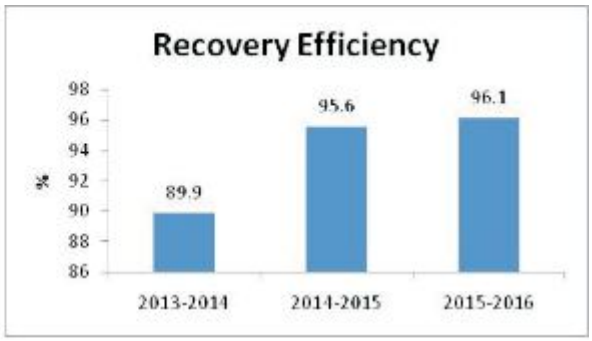
It was expanded in stages and present capacity is 2,95,000TPA of coated and uncoated paper with addition of paper machine - 6 of capacity 1,65,000 TPA.

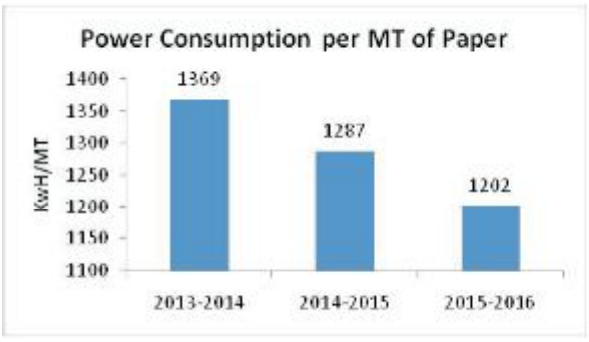
### *Energy consumption details.*

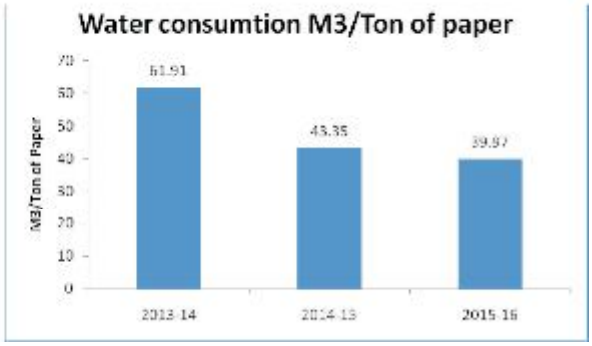
Total specific energy consumption, TOE/T of Eq. Product (GtG)






## *Brief Description of Major Energy Conservation Projects*

**Project 1: Replacement of Old Inefficient Vacuum pp & slip-ring motors** with new energy efficient Vacuum pp & efficient induction type motor.

PM 1 -vacuum pump (10K5), PM 3 - vacuum pump 2 no's (Pump 7 & 8),PM 5- vacuum pump no 4 replaced with new efficient vacuum pumps & Motors.

Electrical Energy Savings: 14.8 Lakh kWh.

Annual Savings: 4.44 Million Rs.

**Project 2: By providing additional steam condensate removal traps and modifying the existing lines have resulted in steam reduction in LFB air heater**

Air heater is used to preheat the air entering in to the combustion zone. The higher the TPH of steam implies the less efficiency of heat transfer. The following actions were taken to reduce the steam consumption.

- Faulty traps were replaced.
- Additional traps were provided to remove the condensate.
- Steam lines were modified.
- Steam leakages were arrested.

The above initiatives have resulted in reduction of TPH from 14.16 to 9.52. This has saved 21.52 Million rupees per annum.

**Project 3: Rise in feed water temperature of recovery boiler before de-aerator by taking 25 MW return condensate.**

The input temperature of the return condensate plays a major role in steam consumption at De-aerator. The TPH of de-aerator is inversely proportional to the input temperature of return condensate. By adapting the following innovative approach, made it possible to increase the return condensate temperature and could reduce the steam consumption.

- Since the return condensate quality is meeting the specifications of feed water, the 25 MW turbine return condensate is being directly fed in to the de-aerator by providing a separate line. This helped in reducing the heat losses happening at condensate polishing unit.

The above modification has helped in reducing the steam consumption from 18.99 TPH to 15.89 TPH. This project has saved 13.95 million Rupees only.

***List of Energy Conservation projects implemented in 2015-16:***

| Sl. No. | Title of Project | Annual Savings (Lakh kWh) | Annual Savings (Coal Tonnes) | Annual Saving (Rs million) |
|---|---|---|---|---|
| 1 | Replaced existing Screw & Reciprocating Compressors with Centralized Centrifugal Compressor System. | 13.36 | | 4.01 |
| 2 | BS feed & ODL flow controlled with VFD by keeping control valve full open to minimize flow variation. | 0.23 | | 0.07 |
| 3 | EOP feed MC pump running with frequency control with 100% valve opening. | 0.81 | | 0.24 |
| 4 | Bleached HD MC pump running with frequency control with 100% valve opening. | 1.98 | | 0.6 |
| 5 | Energy saving by the Replacement of the 70 watt MH lamp with 23 watt CFL Lamp at Recovery & lime kiln area. | 0.15 | | 0.05 |

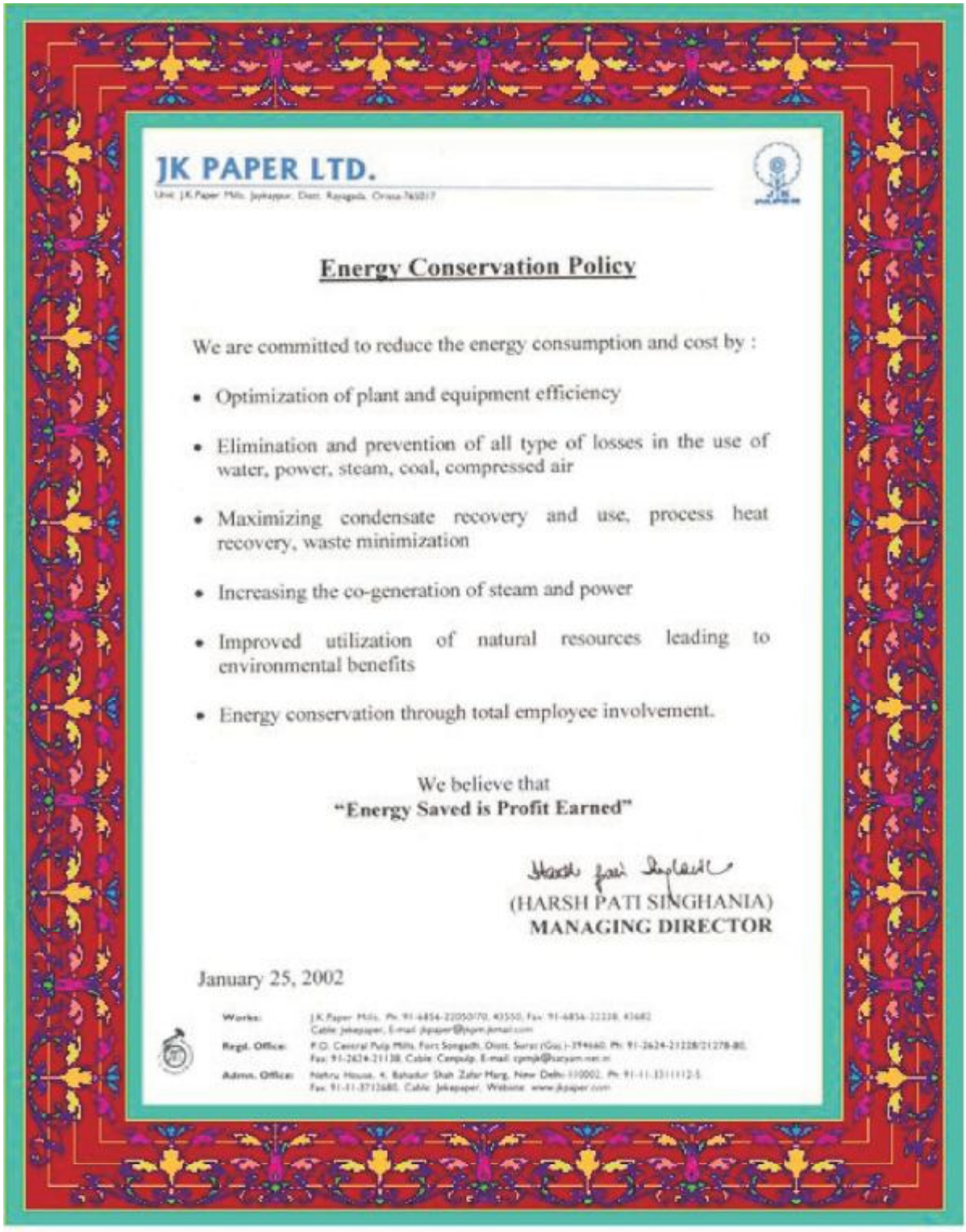
| Sl. No. | Title of Project | Annual Savings (Lakh kWh) | Annual Savings (Coal Tonnes) | Annual Saving (Rs million) |
|---|---|---|---|---|
| 6 | Energy savings (20KW/Hr) achieved by changing Primary centri cleaner pump impeller in PM-6. | 1.68 | | 0.5 |
| 7 | Power savings in CFB 6 Drag chain feeders by reducing seal air pressure. | 4.58 | | 1.37 |
| *8 | Reduction in cooling tower fan power consumption by Decrease in blade angle from 17 ° to 13.5 °. | 4.34 | | 1.3 |
| *9 | Utilization of evaporator foul condensate water instead of DM water in the CD filter vacuum pump condensate pump as it was draining earlier. | 12.6 | | 3.78 |
| 10 | Use of Fine Bar Refiner discs in place of conventional discs. | 2.17 | | 0.65 |
| 11 | PM 1 One inefficient vacuum pump (10K5) replaced with new vacuum pump. | 4.4 | | 1.32 |
| 12 | PM 3 energy inefficient vacuum pump 2 no's (Pump 7 & 8) replaced with new vacuum pump. | 6 | | 1.8 |
| 13 | PM 5 energy inefficient vacuum pump no 4 replaced with new vacuum pump. | 4.4 | | 1.32 |
| 14 | Energy savings by reducing fresh water consumption by 3240 m3/day | 2.06 | | 0.62 |
| 15 | Reduction in specific power consumption of PM-6 from 446 KWH/T to 417 KWH/T by Optimization of PM-6 after implementation of debottle neck plan | 49.66 | | 14.9 |
| 16 | Street Light fittings replaced with LED Street light fittings in both Colony & Plant . | 0.14 | | 0.04 |
| 17 | Street Light fittings replaced with LED Street light fittings in Pm/c - 1 to 5 , Pd Plant & Finishing house area. | 0.09 | | 0.03 |

| Sl. No. | Title of Project | Annual Savings (Lakh kWh) | Annual Savings (Coal Tonnes) | Annual Saving (Rs million) |
|---|---|---|---|---|
| 18 | PM-5 Defleker System stopped completely, without deviating from Quality of Pulp. | 2.48 | | 0.74 |
| 19 | Replacement old Inefficient Vacuum pp at PM/c-3 & 5 | 14.86 | | 4.46 |
| 20 | Optimization of running hours of 2 Nos. Cooling Blowers motor (of Rear & Front Drum Motor ), by providing interlock with Machine start & Stop operation, at Globe rewinder of Accura Sheeter area. | 0.32 | | 0.1 |
| 21 | PM-6, VFD provided at Pulp Mill tower feed pp, to optimize running Load as per process requirement. | 1.42 | | 0.42 |
| 22 | Installation of VFD at NFL, to optimize process requirement New VFD installed for D1 feed M/C pump 424-P-0012-M , Screen dilution pump 423-P-0017-M , Secondary Screen feed pump 423-P-0013-M , Tertiary screen feed pump 423-P-0014-M ,The screening feed pump motor 423-P-0011-M ,Screw motor ( provided with a 105amps acs850 drive as for process requirement. It is not running continuously it runs only when problem in reclaimer screw) | 19.67 | | 5.9 |
| 23 | BY providing additional steam condensate removal traps and modifying the existing lines have resulted in steam reduction in LFB air heater. | | 7396 | 21.05 |
| 24 | Rise in feed water temperature of recovery boiler before de-areator by taking 25 MW return condensate. | | 4900 | 13.95 |

| Sl. No. | Title of Project | Annual Savings (Lakh kWh) | Annual Savings (Coal Tonnes) | Annual Saving (Rs million) |
|---|---|---|---|---|
| 25 | Water from continuous blow down taken in to the hot water tank/ dilution tank. There by reducing steam requirement for heating the water. | | 4700 | 13.38 |
| 26 | By changing the raw material mix which suits the performance of X filter has lead to stoppage of old Causticizing plant. | | 3100 | 8.82 |
| 27 | Partial Replacement of furnace oil with PET coke in Lime kiln has resulted in steam reduction | | 3325 | 9.46 |
| 28 | Improved black liquor solid % from 72 to 75 has resulted higher steam production from recovery boiler. This has saved equal amount of CFB steam. | | 6600 | 18.79 |
| 29 | Reduction in specific steam consumption of PM-6 by Optimization of PM-6 speed from 1050 mpm to 1100-1150 mpm after implementation of Debottle neck plan | | 839.67 | 2.39 |

**Annual Savings:** 147.40 Lakh kWh
30800 MT of equivalent Coal
132.06 Rs Million

## *Energy Conservation Policy*



**JK PAPER LTD.**

Unit: J.K.Paper Mills, Jaykaypur, Dist. Rayagada, Orissa-764017

### Energy Conservation Policy

We are committed to reduce the energy consumption and cost by :

- Optimization of plant and equipment efficiency
- Elimination and prevention of all type of losses in the use of water, power, steam, coal, compressed air
- Maximizing condensate recovery and use, process heat recovery, waste minimization
- Increasing the co-generation of steam and power
- Improved utilization of natural resources leading to environmental benefits
- Energy conservation through total employee involvement.

We believe that
**"Energy Saved is Profit Earned"**

(HARSH PATI SINGHANIA)
**MANAGING DIRECTOR**

January 25, 2002

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Cable: Jekapaper, E-mail: jkpaper@sify.com

Regd. Office: P.O. Central Pulp Mills, Fort Songadh, Distt. Surat (Guj.)-394660, Ph: 91-2624-21228/21278-80, Fax: 91-2624-21138, Cable: Compulp, E-mail: cpmjk@satyam.net.in

Admn. Office: Nehru House, 4, Bahadur Shah Zafar Marg, New Delhi-110002, Ph: 91-11-3311112-5, Fax: 91-11-3712680, Cable: Jekapaper, Website: www.jkpaper.com

# SESHASAYEE PAPER AND BOARDS LIMITED

**ERODE (Tamil Nadu)**

## *Unit Profile*

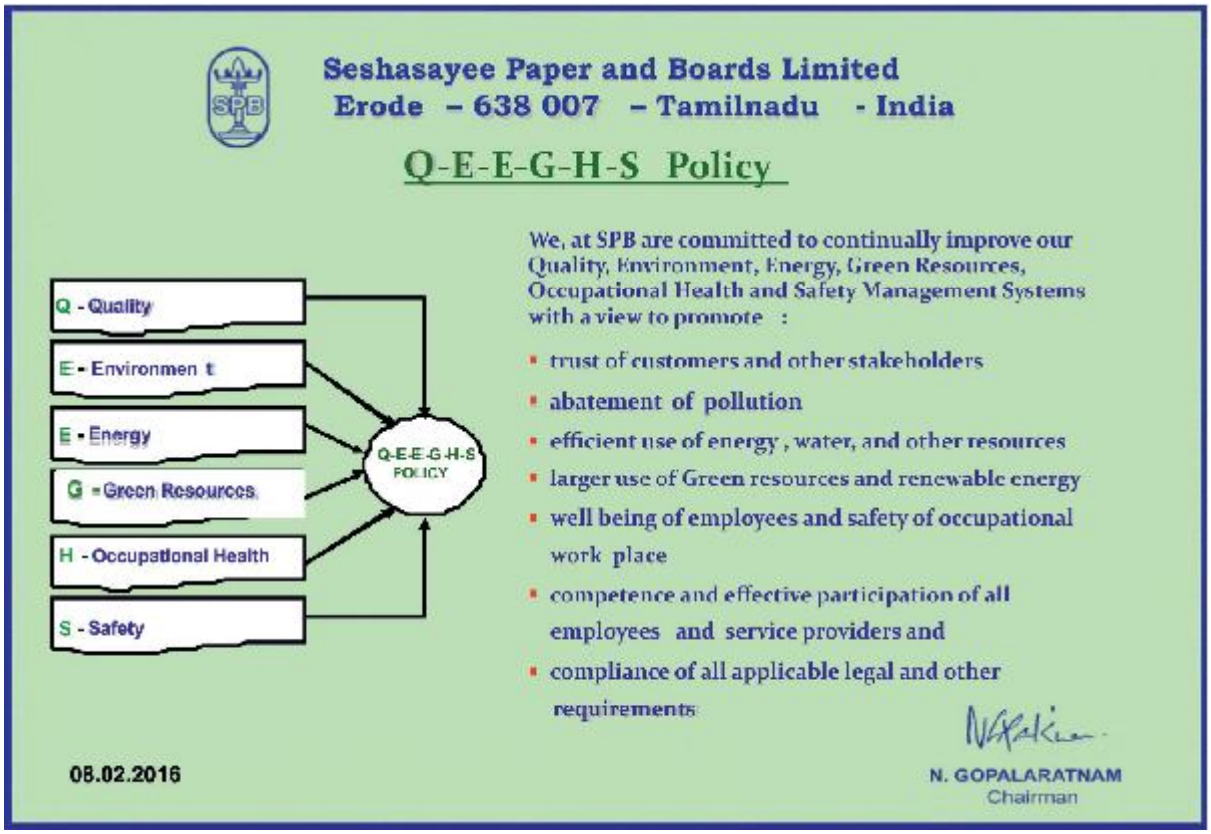
Seshasayee Paper and Boards Limited ( SPB), the flagship company belonging to 'SPB-ESVIN GROUP', operates an integrated pulp and paper mill at Pallipalayam, Erode-638007, District Namakkal, Tamilnadu, India.

SPB was incorporated in the year 1960 in collaboration with M/s Parsons and Whittemore, South-East Asia Inc., USA. SPB commenced commercial production in December 1962 , with a capacity of 20,000 tpa printing, writing and poster grades. SPB expanded in stages and today it has a capacity to produce around 125,000 tpa of different grades of paper.

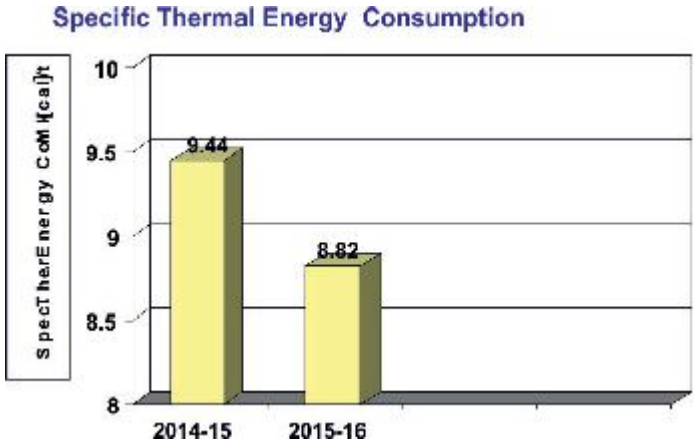
SPB uses hardwood and sugarcane bagasse as the primary raw materials. SPB is an integrated pulp and paper mill having its own pulping (wood & bagasse) units and 5 Paper Machines to produce paper and market pulp. Power and steam for the mill's total energy requirements are obtained from the Energy Efficient Coal fired Captive HP Cogeneration Power Plant with State of the art technology and an energy efficient HP Chemical Recovery Cogeneration plants.

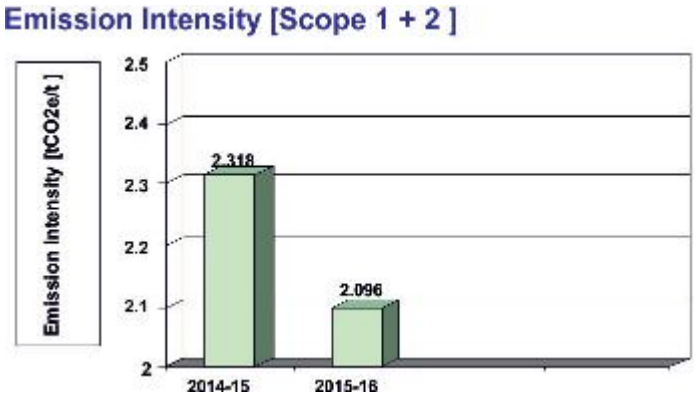
## *Energy Management*

SPB attaches utmost importance to Energy & Water Conservation, Environment Protection & Emission reduction. Implementation of energy efficiency schemes year round had reaped quantum gains show cased through Specific Energy & Emission Intensity reduction on a continuous basis. The projected energy gains realized are being discussed by General Manager (Energy / CCD)without fail in TRM & HOD meetings being held on a monthly basis. Energy efficiency Initiatives integrated to Emission reduction carried out by SPB have been selected by NPC as well as UNIDO through select pilot plant study programmes.




## *Specific Energy consumption*






| Parameter | Units | 2014-15 | 2015-16 | % Reduction over 2014-15 |
|---|---|---|---|---|
| **SPC** | kWh/t | 1652 | 1588 | **3.9 %** |
| **STEC** | Mkcal/t | 9.44 | 8.82 | **6.6%** |
| **Emission Intensity** | tCO2e/t | 2.318 | 2.096 | **9.6%** |

## *Achievements of Energy Savings from Implementation of Energy Efficiency Projects*

| Parameter | Units | Value |
|---|---|---|
| Electricity saving | Lakh kWh | 366 |
| Coal saving | MT | 2570 |
| Investment | Rs Lakhs | 1116 |
| First year Energy cost saving | Rs Lakhs | 1363 |

## *List of ENCON Projects implemented*

**Energy Efficiency Improvement Projects commissioned & in operation during 2015-16**

| Project Description | Date of Implementation |
|---|---|
| Boiler# 10 conversion from Fluidized Bubbling to Spouted bed (with additional Bed & SH heating area) using high grade imported coal, resulting in increased net steam and power generation from CPP-21MW Steam turbo-generator. Boilers 6 & 7 ran intermittently at low loads. | Apr'15 |
| Boiler# 10 PA fan stoppage | Jun'15 |
| Low DP Control Valve integrated to energy efficient boiler feed pump-Boiler#10 | Apr`15 |
| Bagasse pulping – Resource Conservation | Jan'16 |

| | |
|---|---|
| Yankee machine upgradation | Jan'16 |
| PM 1-4 stock preparation- 5.5 KW, Refiner water booster pump stopped. | Feb'16 |
| PM 1-4 stock preparation- 11 KW, Fresh water booster pump stopped. | Feb'16 |
| PM 5- White water pump Speed reduction from 1450 RPM with DOL starter to 1200 RPM with VFD | Mar'16 |
| PM 5 - HT Refiners tackle pattern modified to welded bar resulting in increase in refiner load. 1 of 4 refiners was stopped. Specific energy for refined pulp had reduced. | July'15 |
| PM 5 - 1 of 2 Hood exhaust fans (F-918& F-919) was stopped, by increasing inlet air temperature, reducing volume of air supply and maintaining hood exhaust air temperature. | Nov'15 |
| PM 5 - Condensate separator pumps (P581 A & 581 C) were stopped, by cascading steam and condensate system through control valve, pumping is avoided and by gravity condensate is transferred. | Dec'15 |
| Water Treatment plant- 2 intake well high efficiency pumps (#3 &#4) are running continuously & Pump#1 pump was stopped | Dec'15 |
| Water Treatment plant- Drinking water supply pump with 60 HP motor stopped for 18 hours/day with bypass line provided from colony drinking water supply line. | Jan'16 |
| CPP –Boiler#10- De-superheater pump is running in DOL with high variation in LP & MP steam temperatures. DOL starter was replaced with VFD with reduction in steam temperature variation. | Sep'15 |
| CPP –Boiler#10- ELGI Air Compressors loading/unloading pressure setting 6.1Kg/cm2 / 6.6Kg/cm2 had been reduced to 4.8 kg/cm2/ 5.3kg/cm2 resp. | Mar'16 |
| Boilers 10 & #11 PHEs heating surface augmentation for enhanced heat recovery from process condensate | June'15 |
| Fibre line- Previously #47 pump (75 KW) was running for 2nd washer spray and #48 pump (75KW) and #48A pump (93KW) were running for 2nd washer vat dilution. #48 pump motor capacity was increased to 132 KW and other two pumps (#47 and #48A) were stopped. | July'15 |
| Leakage Class IV replacement with Class V Vent Control valve for arresting steam passing in Recovery Boiler | Aug'15 |
| Steam reduction through hot water generation from li1<br>Slaker scrubber in Recausticizing Centre | Oct'15 |

## *Description of Key Energy Conservation Projects Implemented*

Select Major Projects are described as under:

**Project 1:**

**Conversion of Bubbling bed to Spouted bed Combustor with increased heating surface-Coal fired HP Boiler –CPP :**

Bubbling fluidized bed was converted to Spouted bed combustor design in order to accommodate increased bed coil heating surface, thereby achieving the objective of enhanced high pressure (106ksc) steam generation in High efficiency coal fired Boiler (#10) . Additional superheater section was installed alongside, to ensure rated steam temperature of 510°C.

PA fan had been stopped , thereby additional power saving was ensured.
Benefits through increased Performance efficacy realized are stated as under :

- Increase in HP steam generation from Power Boiler from 85 to 105 TPH.
- The inefficient MP Boilers were operated sparingly and that too at lower loads.
- Power generation from 21 MW STG of CPP was enhanced from 13/14 to 18/19 MW, aiding in excess power [2.5 to 3 MW] for export .
- Total Station Power consumption of the Coal fired Block was reduced by 15 %.
- Grid Power drawl had been reduced by over 100 lakh units till end 2015-16.
- GHG Emission reduction to the tune of over 35000 tCO2e could be achieved due to the above scheme.

**Project 2:**

**CPP – Coal fired Boiler-Station Power consumption reduction by integrating Boiler Feed Pump (KSB) with Low DP Control Valve (IL Palghat**)

In order to mitigate high pressure drop across the Control valve of Boiler feed pump, a newly designed control valve with lower differential pressure was installed, thereby retaining the energy efficient feed pump in place.
Gains accrued are as under :

- Station Power consumption reduction : 5000 units/day
- Net Power available for export : 0.21 MW
- Emission reduction realized for the first year: ~2000 tCO2e.
- The concept had been successfully replicated in Recovery Boiler in operation.