Ballarpur Industries Ltd Yamuna Nagar

Unit Profile

Ballarpur Industries Limited is acknowledged as leaders in Pulp & Paper industry comprising of six Pulp / Paper mills and contributes 15% of country's overall paper production, with manufacturing 60% of country's value added and specialty paper. BILT- Unit Shree Gopal, Yamunanagar, was established in 1936 with 52 MT capacity is now producing 223 MT of speciality grade, high value added premium paper. The unit is ISO 9001 certified with state of art DCS controlled pulp mill commissioned in 1997 is first unit in India to go for medium consistency Chlorination and Eco friendly bleaching sequence of $C_D E_{OP} D D$.

The unit is having soda recovery and blow heat recovery systems already in place since inception with more value addition towards environment by Lime recovery kiln operating since January 2005 & up-gradation of Blow heat recovery in 2006-07.

Unit Entrance

Bird's Eye View

The production has been drastically boosted up at 145.8% capacity utilization during 2006-07 with highly effective TQM techniques adopted by the unit. Other plant features include ClO_2 plant based on R8 technology from Canada and latest technology Off Line Blade Coater to serve the market demand for premium grade paper. The Unit has a strong farmer support evident from the success of social forestry in surrounding region. New ideas and innovations viz. use of veneer waste (Plywood industry waste) as raw material to reduce environmental impact/ load, are always encouraged and used to derive the maximum benefit to unit and country. The unit is well aware of its responsibilities towards society and runs many CSR initiatives in this direction including Awareness Programme for AIDS and Computer Literacy Programme with a Mobile Van for Rural School Children.

The Unit's consistent efforts towards all round developments have been acknowledged by Government & Non Government bodies through various awards. A few of them, the copies of which are enclosed, are:

- Haryana State Safety & Welfare Award 2006 for Lowest Accident Frequency Rate
- Northwest QualTech award 2005 organised by PTU's Gian Jyoti School of TQM & Entrepreneurship, Chandigarh
- Northwest QualTech award 2006 organised by PTU's Gian Jyoti School of TQM & Entrepreneurship, Chandigarh
- IPPTA Award of Best Paper in Zonal Seminar at Chandigarh organized by Indian Pulp & Paper Technical Association

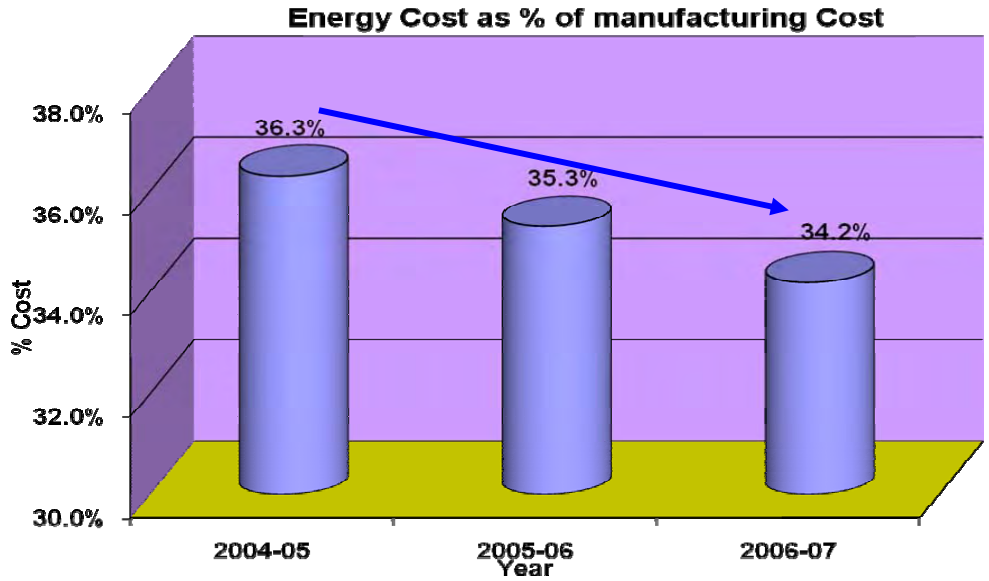
(i) Energy Consumption

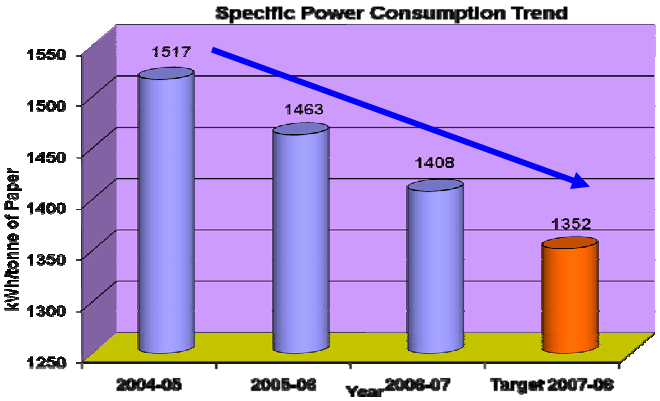
The Specific Energy Consumption has shown continuous downward trend with the consistent efforts of the unit in that direction. Even though the fuel prices have shown a increasing trend over the last few years energy cost as percentage of manufacturing cost has decreased from 36.3% to 34.2%.

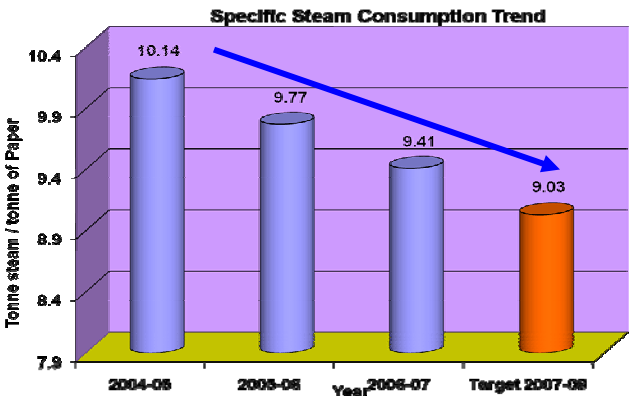
Pulp Mill

Paper Machine

DESCRIPTION	UNIT	2004-05	2005-06	2006-07
Annual Production	Tonnes	77595	79908	81439
Total Coal Consumption	Tonnes	148781.43	154536.78	150343.51
Total Electrical Energy Consumption	Lakhs kWh	1314.86	1316.35	1283.34
Specific Energy Consumption Electrical	kWh / tonne	1517	1463	1408
Total Thermal Energy Consumption	Million kCal	822217.3	849061.3	850364.6
Specific Energy Consumption Thermal	Tonne of steam/ tonne of paper	10.14	9.77	9.41
Total Energy Cost	Rs. Lakhs	6117.86	6907.55	6810.58
Energy Cost as % of manufacturing Cost	%	36.3%	35.3%	34.2%







(ii) Energy Conservation Commitment, Policy and Organizational Set Up (Please include a photo copy of unit's Energy Conservation Policy, if decided)

Commitment

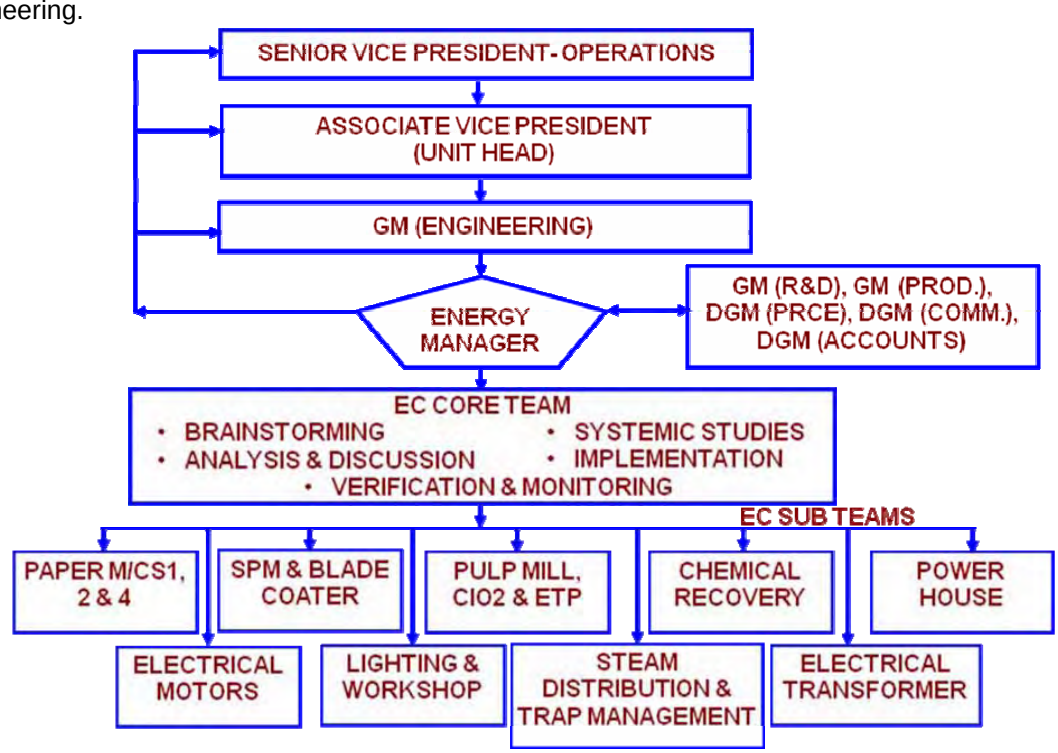
The management is committed for optimum use of resources with a thrust on energy conservation. This is evident from the existence of EC cell since 1985 involving dedicated personnel. The overall objective is to operate all the systems & equipments at best possible efficiency and strive to achieve competitiveness with better than design performances. In its constant endeavour to this commitment, productivity enhancement & Waste reduction has been taken up through TQM techniques, which are contributing directly / indirectly to conservation of energy & precious resources.

Policy (As attached)

Organizational Set Up

Top management of the unit is the driving force behind the Energy Conservation activities of the Unit. The Energy Conservation Cell is headed by General Manager (Engineering). The EC cell reports Energy Consumption & Conservation Status in the form of Energy Report every month to Unit Head (AVP). In addition, there are 9 nos. of cross-functional Departmental EC teams. Two members of core team are Certified Energy Managers & one Certified Energy Auditor as per EC Act 2001.

The departmental EC teams are headed by Energy Champions of respective area (heads of the process and utility sections) and supported by management staff and senior workmen of Electrical & Mechanical engineering.



BILT, YAMUNA NAGAR
ENERGY POLICY

At BILT, YNR., we pledge to reduce the consumption of energy in form of electricity, steam, water, fiber and compressed air consistently without impairing productivity and commit to develop, implement and sustain ENCON (Energy Conservation) as a movement through participation from grass root level by :

- Continuous improvement of process, instrumentation and utilities to optimize the energy cost.
- Continuously review the Specific energy consumption (SEC) norms and benchmark with the best in pulp and paper industry.
- Regular monitoring of implemented energy saving proposals and check frequency of energy reporting system.
- Review new projects with respect to energy use.
- Impart regular training to create awareness to the employees on efficient use of energy.
- Top management commitment to improve our industrial and national energy scenario.
- Undertake social responsibility to educate, share and promote energy and environment aspects with other industrial in its vicinity.

–Chief General Manager

Energy is Life - Conserve it.

(iv) Energy Conservation Achievements

Project 1: Optimization of hot air flow through blowers at Laminating machine by installing VFDs

2 nos. hot air supply fans were operated at laminating machine with manual damper operation for air flow control. Both the fans were operated at full speed of 1500 rpm. And the power consumption was around 54 kW & 45 kW respectively.

To eliminate the damper throttling, it was decided to install VFD on both the fans. Trials were conducted for speed requirement at different operating conditions after installing VFDs on both the blowers. The speed reduced to 1200-1300 rpm at desired production rate. A better control over the airflow was achieved with improved quality of product. The power consumption reduced by total 33 kW. Higher power savings could be achieved during small deckle of paper.

Annual energy saving	: 2.77 Lakhs kWh
Annual monetary saving	: 6.32 Rs. Lakhs
Investment made	: 4.0 Rs. Lakhs

Project 2: Installation of 4 Nos. Improved Design Energy Efficient Surface Aerators in ETP

The Effluent treatment plant was having conventional design surface aerators. It was proposed to install new aerators with improved design along with to reduce power consumption. A study was carried out for the same & 4 Nos. Aerators were replaced. Power consumption for those aerators reduced from 24 kW to 15 kW per aerator.

Annual energy saving	: 2.69 Lakhs kWh
Annual monetary saving	: 6.13 Rs. Lakhs
Investment made	: 8.0 Rs. Lakhs

Project 3: Installation of Electromagnetic Ballast, Installation of Energy Efficient lamps & modification in lighting switching arrangement

As a part of Continuous improvement in all areas, a study was conducted to find the potential for energy conservation in lighting. As a result it was decided to replace old GLS lamps (60W/ 100W) with CFLs (20 W) & Old electromagnetic ballast with latest technology low loss Electronic Ballast. Also, switching arrangements for some areas were modified so as to avoid the wasteful practices. The measures resulted in huge power saving & better control of lighting. Also, it helped to improve the working conditions in the plant.

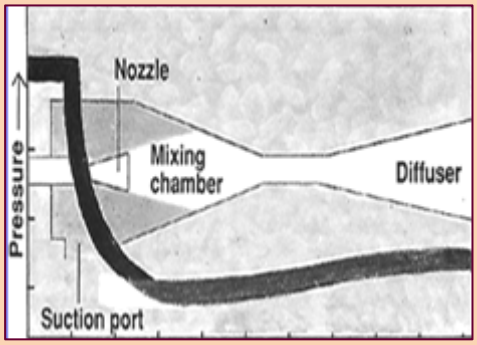
Annual energy saving	: 2.39 Lakhs kWh
Annual monetary saving	: 5.46 Rs. Lakhs
Investment made	: 2.25 Rs. Lakhs

Project 4: Compressed air system efficiency enhancement by installation of screw compressor

Machine house 1 was supplied with compressed air generated from 2 nos. reciprocating air compressors. As, the specific power consumption for screw compressors is low as compared to reciprocating compressors, it was decided to install new screw compressors. The power consumption for the system reduced by 40 kW with the new screw compressors & minor modification in piping, while keeping one reciprocating compressor off.

Annual energy saving	: 3.36 Lakhs kWh
Annual monetary saving	: 7.66 Rs. Lakhs
Investment made	: 12.00 Rs. Lakhs

Project 5: Installation of Thermo compressor based steam & condensate recovery system to reduce steam consumption at PM-5



Paper Machine 5 steam & condensate system was modified to take maximum advantage of the cascading effect at paper machine and to reduce steam consumption by boosting steam pressure with thermo compressor. Earlier a study was carried out by M/s. Forbes Marshall for the system optimization & modifications were done according to the outputs of the study. It resulted in reduction in steam consumption by 0.6 tonne / tonne of paper & better process control with a saving of 886 tonne of coal annually..

Annual energy saving	: 4436 MkCal
Annual monetary saving	: 30.0 Rs. Lakhs
Investment made	: 80.0 Rs. Lakhs

Project 6: Installation of VFD at couch pit & Seal pit pumps at PM-4

Couch pit & seal pit pumps are operated continuously irrespective of the level in the pit. It is observed that the liquid levels varies according to paper breaks & running condition of the paper machine. To optimize the running of these pumps it was decided to install VFDs with a feedback from level sensor in the pit. A considerable saving of 13 kW (9 kW for couch pit pump & 4 kW for seal pit pump) was achieved.

Annual energy saving	: 1.09 Lakhs kWh
Annual monetary saving	: 2.50 Rs. Lakhs
Investment made	: 4.50 Rs. Lakhs

Project 7: Interlocking of broke chest agitator & pump at PM-4

Agitators are continuously operated to ensure that there is no settling of pulp in the chest. However, the pumps for those chests are operated on the basis of requirement to transfer the pulp to another chest. It was observed that for half of the time in a day, we can stop running of the agitator when there is no transfer of pulp. For this, an interlocking arrangement was provided, so that the agitator will start up before 5 minutes of the pump, every time whenever required. As a result, the agitator running hours were reduced form 24 hrs. a day to 12 hrs. a day.

Annual energy saving : 0.29 Lakhs kWh
Annual monetary saving : 0.67 Rs. Lakhs
Investment made : 0.20 Rs. Lakhs

Project 8: Replacement of old motors with new energy efficient motors

In a continuous trend to improve upon the performance, motors which are rewound several times & those with deteriorated efficiency are replaced with latest technology Higher Energy Efficient Motors on priority every year. A significant saving of 29 kW was achieved during the year with such motor replacements. In addition, this replacement reduces maintenance cost & downtime with increase in plant availability.

Annual energy saving : 2.44 Lakhs kWh
Annual monetary saving : 5.55 Rs. Lakhs
Investment made : 12.0 Rs. Lakhs

Other Energy Conservation measures implemented in 2006-07 are as follows:

Sr. No.	Project description	Energy savings per year basis			Investment incurred on the project (Rs. Lakhs)
		Electricity (Lakhs kWh)	Coal (tonnes)	Total Savings (Rs. Lakhs)	
1	Installation of energy efficient pump at Mixing chest no. 1 of PM 4	0.59	--	1.34	2.0
2	Installation of energy efficient pump at HP wire shower pump at PM-4	0.50	--	1.15	2.0
3	Installation of VFD on TG Cooling Tower Fan	0.76	--	1.72	3.0
4	Installation of VFD on HP sealing water pump at Pulp Mill	0.50	--	1.15	2.0
5	Interlocking of Agitator of mixing chest with pump at PM-5	0.80	--	1.82	0.5
6	Modification in rotating element of Feed Water Pump at power house	1.51	--	3.45	0.5
7	Increase back water temp to 40 deg.C to increase drainage from wire & reduction in steam consumption	--	388	13.43	0.0
8	Installation of VFD on clarified water pump at PM-5	0.46	--	1.05	2.0

9	Optimisation of hood air flow by installing VFDs at PM-1 hood fans	1.13	--	2.59	4.0
10	Installation of VFD on High Pressure Pump of PM 4	1.18	--	2.68	2.0
11	Modification in old multistage pump at Tube well no.1	0.50	--	1.15	0.0
12	Installation of VFD on High pressure pump of PM-5	0.92	--	2.11	3.0
13	Timer control for rag chest agitator at PM-5	0.67	--	1.53	0.5
14	Installation of VFD on bleach transfer pump at Pulp mill	0.84	--	1.92	3.0
	Total	**10.37**	**388**	**37.08**	**24.5**

(v) Energy Conservation Plans & Targets

The Unit have moderate energy conservation plans and have taken up 18 Energy Conservation initiatives (major projects tabulated below) for the year 2007-08 which would bring a saving of Rs. 328.8 Lakhs with an investment of Rs. 428.0 Lakhs. A major cost reduction project for fuel shift from FO to Producer Gas for Lime Kiln is under progress, which will result in annual saving of Rs. 212 Lakhs.

S. N.	Energy Conservation Measures Planned	Anticipated savings in			Approx. investment (Rs. Lakhs)	Project commencement & Completion year
		Lakh kWh	Steam (tonne)	Rs. Lakhs		
1	Installation of Coal based Producer Gas plant to replace Furnace Oil used for Rotary Lime Kiln	--	Fuel Shift	212.0	310.0	2007-08
2	Installation of 6 nos. Energy Efficient Aerators in ETP	4.03	--	9.4	12.0	2007-08
3	Energy Efficient high pressure pumps at PM4 (02 nos)	0.36	--	0.8	4.0	2007-08
4	Energy Efficient Pump For Stock Chest at PM4 (02 nos)	0.23	--	0.5	2.5	2007-08
5	Energy Efficient Pump for Buffer Chest at PM4(03 Nos)	3.00	--	7.0	10.0	2007-08
6	Installation of Energy Efficient street lights	0.29	--	0.7	6.5	2007-08
7	Electronic chokes for tube-lights in the Mill	2.52	--	5.9	5.0	2007-08
8	Installation of energy efficient motors at various places (14 Nos.)	3.78	--	8.8	6.5	2007-08
9	PM 7 vacuum pump replacement & system optimization	8.30	--	19.3	25.0	2007-08
10	Installation of VFD at Cutter of PM 7 (30 KW)	0.22	--	0.5	1.0	2007-08
11	Installation of VFD at High Pressure Pump of PM 7 (75 kW)	0.59	--	1.4	2.5	2007-08
12	Installation of VFD at PM 4 mixing Chest pump	0.58	--	1.3	2.0	2007-08
13	Installation of VFD at High pressure pump of PM 5	0.42	--	1.0	2.0	2007-08
14	Installation of VFD at E O stock pump at Pulp mill	0.46	--	1.1	1.5	2007-08
15	Installation of VFD at E O vat dilution pump at Pulp mill	0.38	--	0.9	1.5	2007-08

16	Installation of modified conical tank (300 cu.m.) for thick black liquor storage without any agitator	1.57	--	3.7	12.0	2007-08
17	Additional Bodies with B3, B4 & B5 effect at Soda Recovery Evaporators.	1.73	--	4.0	12.0	2007-08
18	Replacement of air lift pumps with Centrifugal pumps and VFD for Clarifiers & Mud Washers.(8 nos.)	2.35	--	5.5	12.0	2007-08
	Total	**30.8**	**---**	**283.8**	**428.0**	

(vi) Environment & Safety

Environment

BILT, Yamuna Nagar is an environmentally conscious Unit and is committed towards continuous improvement of environmental performance by reducing air emission, process effluents and solid wastes. Unit has also started exercise for achieving ISO 14001 certification & various measures are being taken up in the process.

a) Water Effluent

BILT-SGU is having an Effluent Treatment Plant of capacity 2200 m^3/hr. During the period 2004-2007, measures have been taken with an Investment of Rs. 70.0 Lakhs to reduce water consumption from 152 m^3/tonne in 2004-05 to 130 m^3/tonne in 2006-07 per Ton of Paper and effluent discharge from 136.7 m^3 to 103.3 m^3 per tonne of paper.

The treated effluent is used for gardening in the mills and colony resulting reduction in fresh water consumption to the extent of 25000 m^3/annum. It is also used in for gland cooling of pumps & refiners, jet condenser of chemical house evaporator, cooler ejector of soda recovery evaporator, ash quenching & raw material wetting etc. Paddy & Sugar Cane crops have been irrigated with treated effluent.

Paddy crop

Mill Gardening

b) Air

Our all the four nos. of Coal fired Boilers and two nos. of soda recovery boilers have ESP in operation since 1997-98. During the year 2004-05, two nos. of new ESP's supplied by Thermax, Pune were installed. One ESP for rotary Lime Kiln in January 2005 with design emission of 80 mg/ Nm^3. Second ESP was installed in June 2005 on ABL recovery Boiler with design emission of 80 mg/ Nm^3. Also, ESP of JMW Recovery boiler has been upgraded. The air emission has come down to 80 mg / Nm^3 against 150 mg / Nm^3 limits set by State Pollution Board.

The recovery efficiency has also gone up to achieve 96.14% for the year 2006-07 giving additional gain by way of recovered Sulphate.

c) Solid Waste

Rotary lime Kiln has been installed during 2004-05 to recycle the sludge & is in continuous operation since Jan-05. The quantity of solids generated and disposed has come down from 100 TPD to 6 TPD on dry basis.

Safety

Unit has a full-fledged Safety department with qualified & experienced Chief Safety Officer to look after safety of Men, Material and Machines. For better control & effective implementation of safety, the Mill is divided into 7 Safety Zones with Sectional / Zonal Safety Committees. Each Sectional Safety Committee has equal no. of Management & Workmen Staff headed by Safety Champion. These 7 Sectional Safety Committees report to Central Safety Committee and Safety Champions who are also members of the Central Safety Committee attend meeting every month.

Following are the major initiatives taken up in Safety

- Safety Training to all employees (360 employees undergone training in 30 sessions during 2006-07)
- Celebration of Safety week in the month of March every year
- Essay, Slogan, Painting & Quiz competitions on Safety
- Safety audit by internal safety team every year apart from once in two years by External Agency.
- Health check up camp twice in a year for the employees working in hazardous area.
- Mock drills to check preparedness for gas leakage/ fire

Unit has well defined on site emergency plan and work permit system. SOPs (Safe Operating Procedures) are made & displayed at appropriate locations (machines, Cutting & welding area) for gas cutting/ welding, 2 wheel/ 4 wheel trolleys & other operations of machines for accident prevention.

Year 2006-07 was marked by lowest no. of accidents with reduction by 51% as compared to previous year. The achievement was honoured with an Award for First in achieving Lowest Accident Frequency Rate among Large Scale Paper Factories by Directorate of Industrial Safety & Health, Haryana.