



ITC Limited
Paperboards & Specialty Papers Division
TRIBENI: UNIT PROFIL

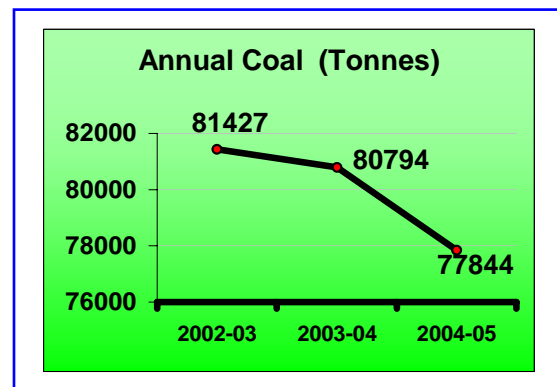
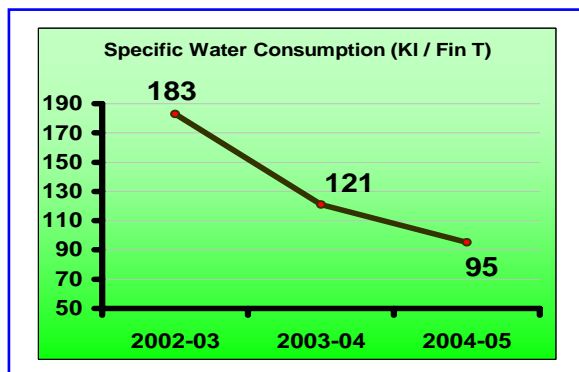
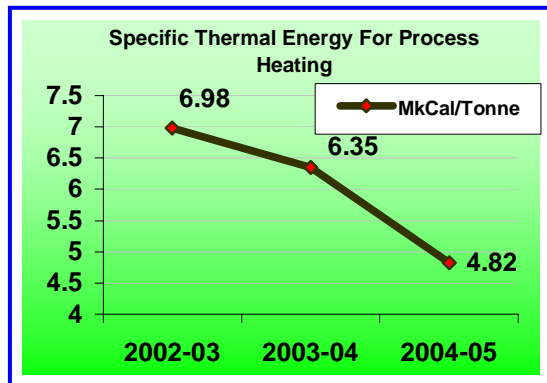
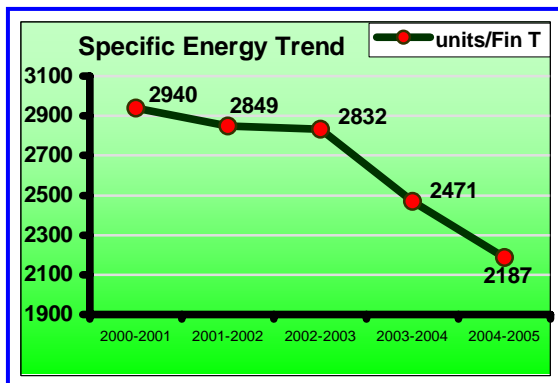


ITC Limited, Paperboard and Specialty Papers Division, Unit-Tribeni is a pioneer in the manufacture of a wide range of specialty papers in India. British American Tobacco founded it in 1949 to manufacture papers for the cigarette industry as Tribeni Tissues.

And the mill's capacity was enhanced to 30000 tonnes per annum. At present it has three paper machines, 1, 3 & 4 namely. It has developed significant capabilities in product development and other research covering specialty paper through one of the most comprehensive paper laboratories in the country. The major grades of specialty papers produce of Tribeni are cigarettes, décor, insulating, fine printing and other niche segments like matching tissue, faxing base etc.

Tribeni Unit is certified under the ISO 9001 program, since November'1999 and ISO 14001 programs, since Dec 2002 by the Lloyds Register of Quality Assurance, UK. It has achieved the highest level of certification for OHSAS 18001 with DNV. The business emerged runners-up in 2000 in the prestigious **Golden Peacock Environment Management Award**, instituted by the World Environment Foundation.

Our Continuous Green Endeavor...



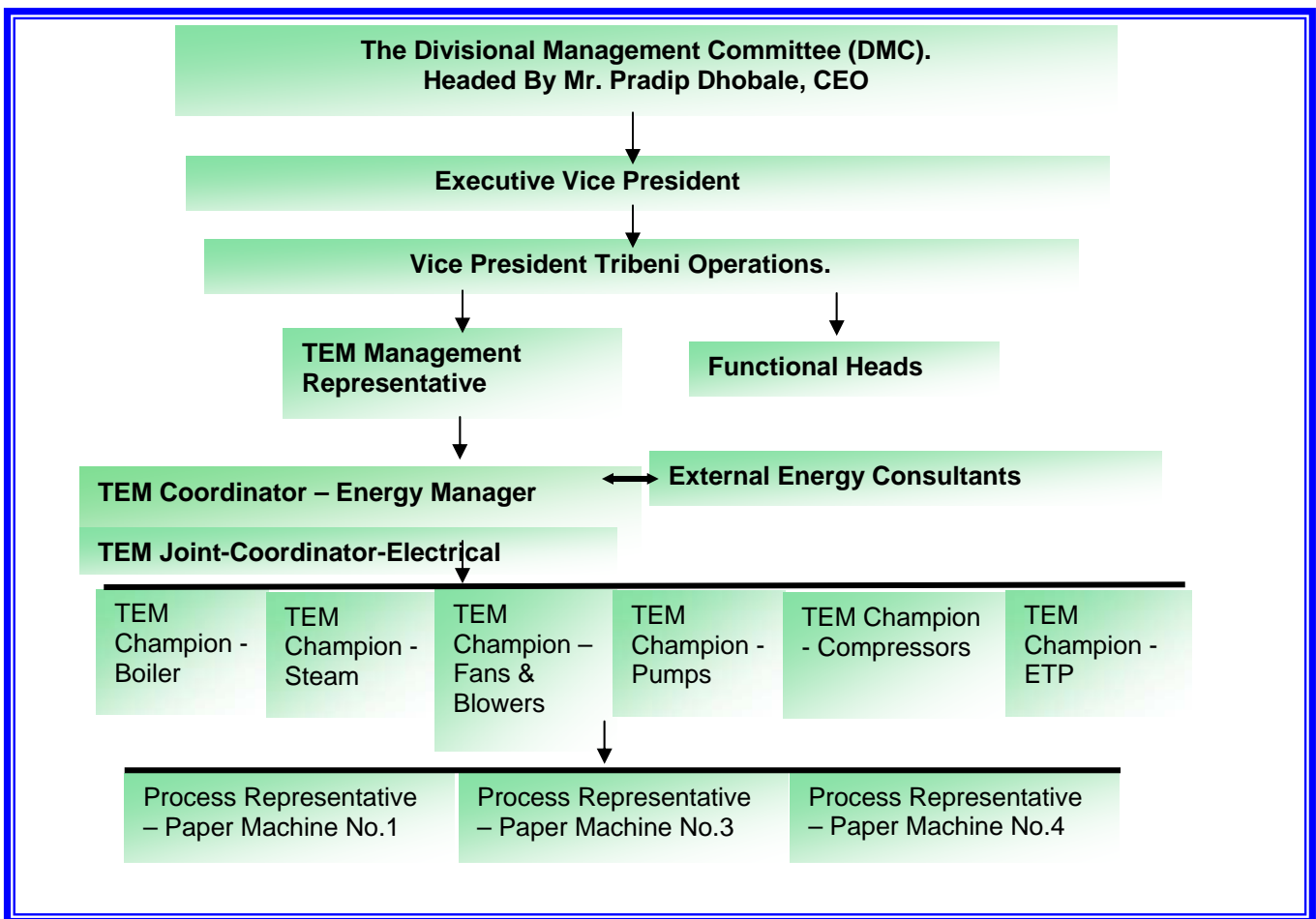
Description	Unit	2002-03	2003-04	2004-05
Annual Paper Production	tonnes	19786	21186	23667
Annual Electrical Energy Consumption	Lakhs kWh	560	524	517
Annual Thermal Energy Consumption	MkCal	138076	134594	114114
Total Energy Cost	Rs.Lakhs	1782	1735	1882
% of Energy Cost with Mfg cost		17	15	15
Specific Energy Consumption	KWh/ton	2832	2471	2187
Specific Thermal Energy Consumption	MkCal/ton	6.98	6.35	4.82

Salient features of Energy Conservation Cell.

As of now, EC Cell is constituted of Electrical, Energy and Process engineering functions which is called as Total Energy Management Committee (TEM) handled by the Group TEM Management Representative mentioned in above playing the role of a catalyst.

At ITC Tribeni, the vision of Energy Conservation were conceptualized in the late eighties. Successive Management thrusts on EC were translated into action plans and implemented with time-bound targets. Commitment of the Top Management trickled down to all levels. Project deptt had been acting as a Facilitator & Executor .

In the year, 2003, thrust to the Energy Conservation (EC) activity was given by the creation of an EC cell headed by a Sr. Manager exclusively qualified and certified for the job. The Process adopted energy conservation as a regular function. The commencement was moderate but within a short time the specific energy trend showed quantum improvement, with machine utilisation and productivity improvements following the fast track. There was an all round spurt in the systematic identification of EC potential in several areas of the Mill,



Brief description of projects implemented during the year 2004-05.

Installation of multi-step Capacity controller for compressor by replacing Unload/Full-load control.

Air fluctuation was in the range of 6.1 – 7 kg/cm²g i.e, over all pressure fluctuation was around 0.9 kg/cm²g which was high, leading to energy losses. Most of the instrument applications required only around 5.5 kg/cm²g pressure.

Operating pressure band reduced to 5.5 -5.8-kg/cm²g by installing multi-step controller in Two stage KGK make 500 CFM compressor. This consists of a Pressure transmitter with microprocessor and set of solenoid valves. The actual operating pressure can be set with minimum differential pressure. Reduced operating pressure band to 5.5 -5.8-kg/cm²g.



Recurring Annual Savings : 92000 kWh
≈ Rs. 2.07 lacs
Total Investment : Rs. 40,000.

Segregation of Operating pressure (HP & LP) in compressed air lines - replacing single-pressure operation.

Separate High pressure & low pressure air line Existing two mains for lub & non-lub air used with minor modifications. Reduced operating pressure for service air requirements to the lowest possible (<4.0 Kg/cm²).

Removed unwanted piping from the circuit. Removed single stage oil-free compressors Operating two-stage compressor for instrument air requirements.



Recurring Annual Savings : 510000 kWh
≈ Rs. 11.5 lacs
Total Investment : Rs 3.50 lacs.

Retrofit of Induced draught fan of IJT boiler with Efficient design Casing & Rotor.

The 96,000 m³/h @ 286 mm wc ID of IJT boiler was running with Variable frequency drive since 1995. The type of the impeller was Radial inclined. The ID fan is installed with IJT boiler. The outlet duct was designed in such a way that the resistance of the system was increased.

Retrofitted the existing fan with energy efficient Impeller & Scroll design. Modified the delivery duct of the fan to reduce the resistance of the system

ACTUAL POWER SAVED = 21 KW
ANNUAL ENERGY SAVED = 190735 KWH



Recurring Annual Savings : 191000 kWh
≈ Rs. 4.30 lacs
Total Investment : Rs. 4.0 lacs.

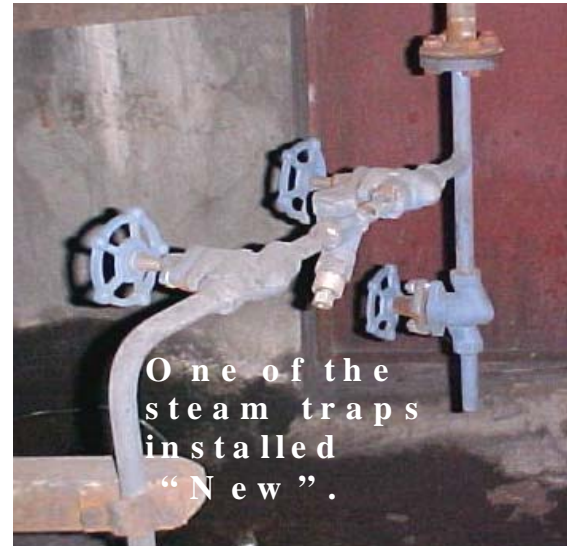
Improvement through hardware replacements in Steam Line Insulation and steam traps.

In this Phase of study on steam system: 12 Nos. steam traps identified with wrong orientation/layout. 10 New trap positions located. 19 stem traps were damaged. 1600 Sq.ft of steam & condensate lines had been identified for improved lagging.

Replaced 31 steam traps. Introduced 10 new traps at identified locations and steam line lagging done during 2004-05.

Recurring Annual Savings : **757 tonnes of coal equivalent.**
≈ 3179.4 Mk.Cal
≈ Rs. 15.4 lacs

Total Investment : **Rs 16.2 lacs.**



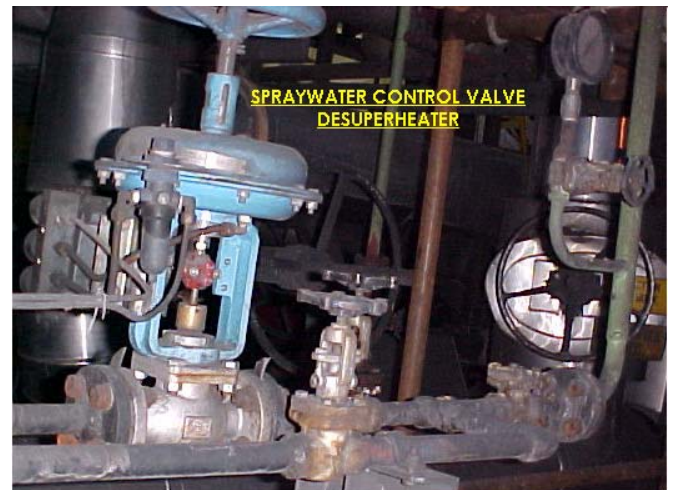
Install De-super heater for Process Steam.

A Desuperheater for Process steam has been installed in the Turbine Extraction Steam main which is supplying Heating Steam for the Paper Machines and process. The Temperature of Extraction Steam coming out of the Co-generation plant varies depending of the Electrical Load on the Turbo-Alternator no 2. It is found that the Temperature more often ranges between 180 Deg C to 200 Deg C. The process steam requirement at the Paper Machine end is at 4.00 Kg/Cm²g at which the saturation steam temperature is 151 DegC. Keeping a margin to prevent generation of wetness in steam and possible line heat losses the desired Temperature at sending end (at Boiler) was fixed at 165 Deg C

Desuperheater System was supplied by M/s. Forbes Marshall ,Pune. Spray water is drawn from the Deaerated Feed water line (Delivery of Boiler Feed Pump). The Energy Saving accrued from the Reduction in Overall Surface Temperature of Steam Piping from Boiler to Process as well as from better functioning of the Thermo-compressor Heating System of the Paper Machines (by way of lower dumping of Steam to Condenser).

Recurring Annual Savings : **543 tonnes of coal equivalent.**
≈ 2280.60 Mk.Cal
≈ Rs. 9.50 lacs

Total Investment : **Rs 3.04 lacs.**



Natural (wind Driven) ventilators to replace Power driven Exhaust Fans.

As a means to Trap Renewable Wind Energy Natural Roof Ventilators have been installed to extract the Venting Vapour from Turbine Hall and paper Machine Operating Floors of PM3&4. This has replaced the Power driven exhaust Fans which were running since inception of the power plant.

The Natural Ventilators run with an air velocity which is rather low for wind turbine installation. The Speed and Exhaust air quantity varies on outside air velocity . The number of Ventilators is liberally kept on a higher side to cater for ambient variations.

A total 12 nos installed in TG Hall and 52 Nos in PM3&4.

Recurring Annual Savings : 86000 Kwh
Total Investment : Rs 5.2 lacs.

ITC=PSPD= UNIT TRIBENI



NATURAL VENTILLATORS
VIEW FROM ROOF

Other Projects Implemented during 2004-05.

1. Incorporation of water separators in vacuum pumps.
2. Timer operated external lighting.
3. Replacement of belt transmission system with energy efficient system. (Special Wedge Belts instead of old jacketed belts along with dual duty pulleys)

Energy Conservation plans to be completed during 2005-06.

Energy Conservation Measures (Planned)	Anticipated savings		Approx. investment (Rs.lakhs)	Project Commencement & Completion year
	Energy Value kWH	Rs. Lakhs		
Replacement of Mechanical Aeration System in Effluent Plant with Diffused Aeration.	430000	10.32	148.4	commenced in April'2005 - to be completed in March'2006.
Replacement of Paper Machine 1 and 3 Dryer's Pocket Ventillation system fans with energy efficient fans .	120000	2.88		
Replacement - Paper machine 1 Pump from Sump to water recycling plant(Dynasand).	32000	0.768		
Replacement - Paper machine 3 Pump from Sump to water recycling plant(Dynasand).	30000	0.72		
Replacement of De-aerator feed pumps in two boilers (IJT and IBIL) with energy efficient pumps.	55000	1.32		
Cooling water system modifications in Turbo-Generator no 2 with pump replacements.	450000	10.8		
Cooling water system modifications in Turbo-Generator no 3 with pump replacements.	450000	10.8		
Installation of Natural Ventilation devices in Paper Machine buildings and finishing house.	75000	1.8		
Load-based operation of Cooling Tower Fan in Power Plant with Variable speed drive.	60000	1.44		
Heat recovery from Paper Machine Dryer exhaust in Paper Machine 3.	540000	12.96		

Installation of combustion Air Preheater using exhaust flue gas heat.	410000	9.84		
Enhanced temperature/pressure operation of Boiler Deaerators with system modifications	240000	5.76		
Process re-designing at Paper Machine no 4 approach flow system with replacement/retrofit of Fan Pump and Centricleaners.	250000	6		
Recycling of used cooling water from compressor system .	40000	0.96		
Heat recovery from Turbine Gland Vent condenser in Turbo Generator no 3.	120000	2.88		
Replacement of inefficient screw compressors with two stage reciprocating compressor.	80000	1.92		
TOTAL	3382000	81.168	148.4	