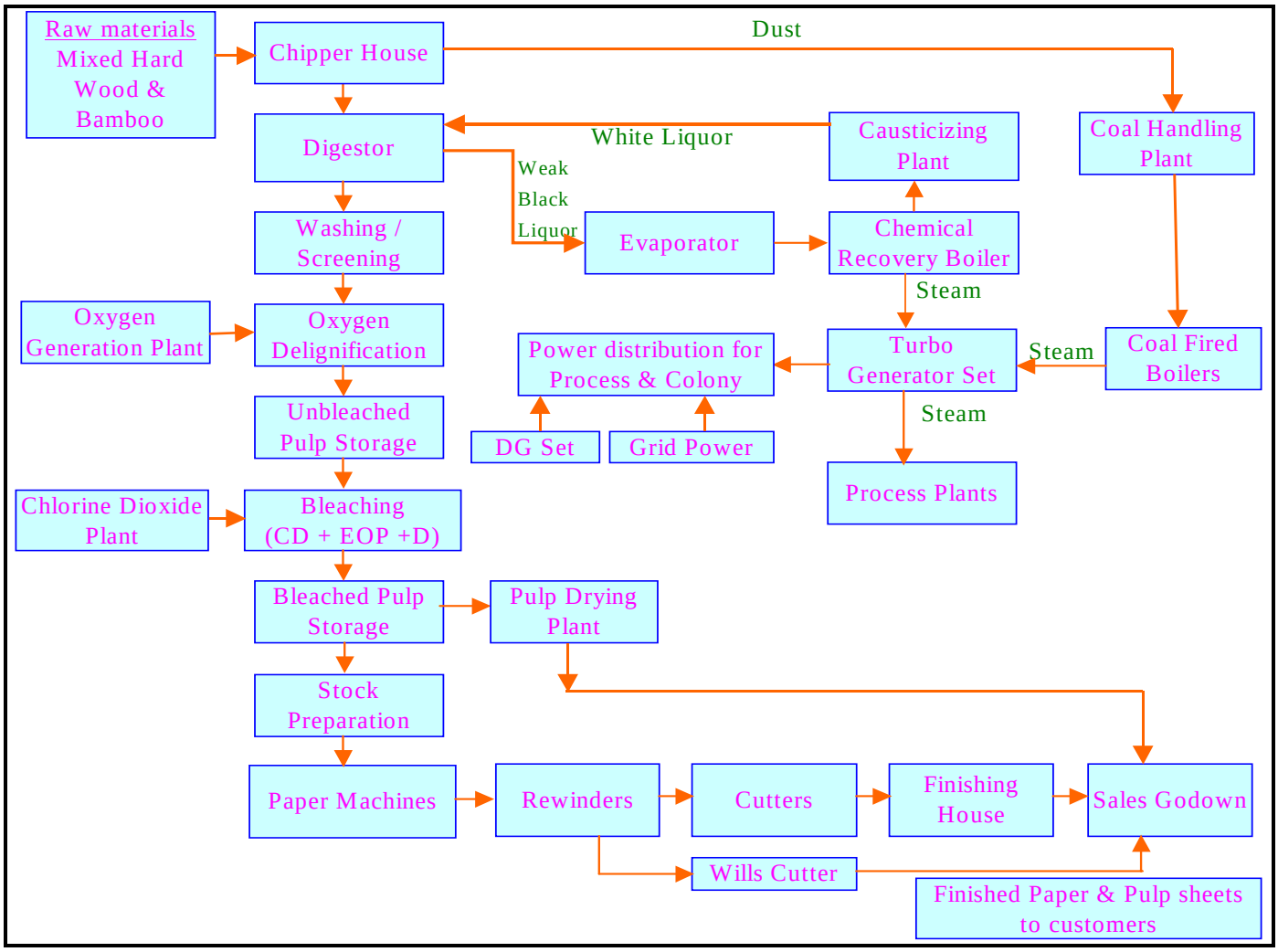
JK PAPERS MILLS
(A Unit of JK Paper Ltd.),
Jaykaypur, Rayagada **(Orissa)**

Unit Profile

JK Paper Mills (earlier Straw Products Ltd.), a unit of JK Paper Ltd. a flagship company of JK Organization, an integrated Pulp & Paper Mill with installed capacity of 18000 TPA, was set up in the year 1962 at Jaykaypur, Dist. Rayagada, Orissa. The mill manufactures machine finished, machine glazed and surface sized quality writing and printing paper and paper board, with a turn over of about Rs.666.57 crores / annum.

The mill has expanded in phases and at present it has 5 paper machines with production capacity of 121000 TPA finished paper, 110000 TPA BD (bone dry) bleached pulp and Coated Paper & Board 42700 TPA with modern pulp mill having Rapid Displacement Heating system, Oxygen Delignification system and CD-EOP-D Bleaching sequence, 2 nos. of 300 TPD BL solids firing capacity Recovery Boilers each, 5 nos. Coal Fired Boilers, 3 nos. Turbines with installed capacity of about 20 MW, 4 MW DG Set, Water Clarification & Treatment and Effluent Treatment Plant.

A schematic block diagram showing process flow (Fig-1)

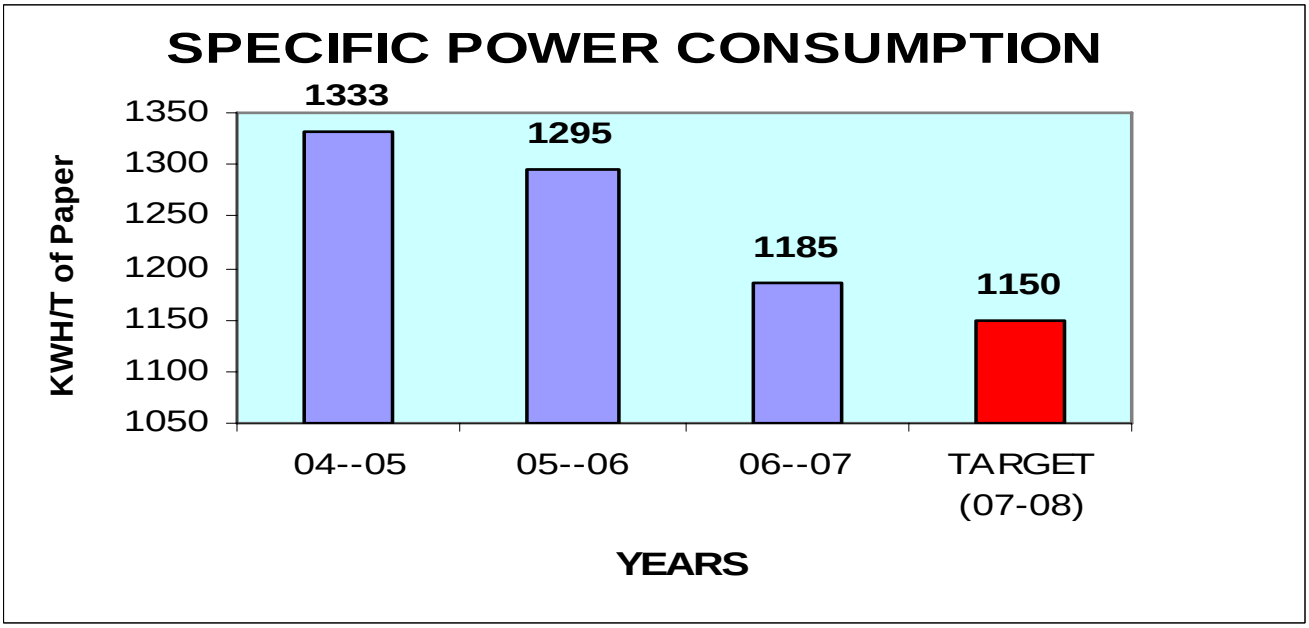


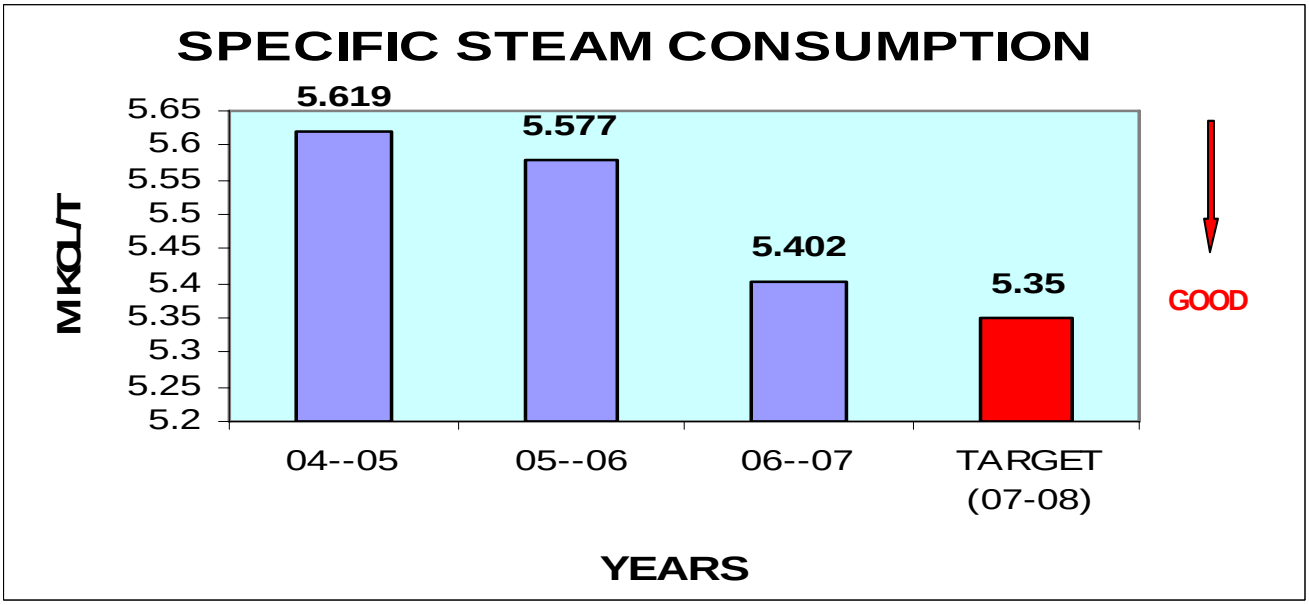
Energy Consumption

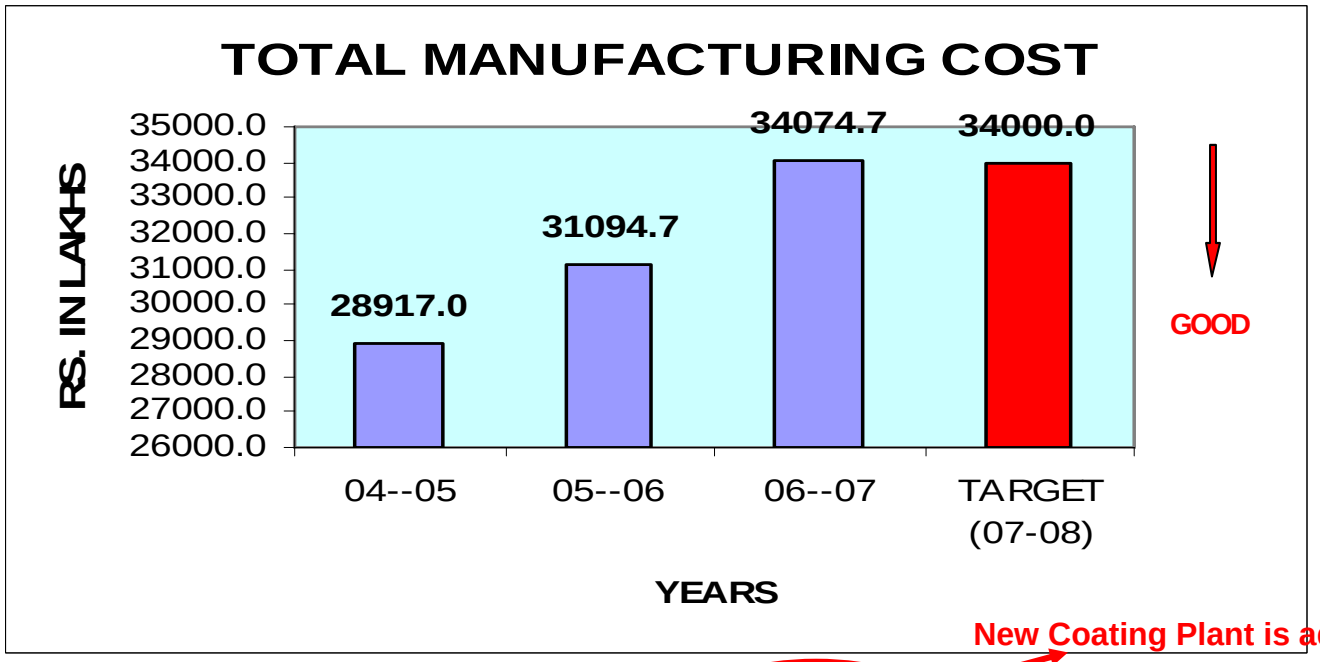
Expansion / Modernization / Renovation is a way of life at JK Paper Mills. To be self sufficient in power demand w.r.t. expansion, the company has been putting up additional power generation plants without overburdening the grid demand and have been modernizing / discarding the old boilers and discarded old Pulp Mills (2 nos. of 80 TPD BD Bleached Pulp Production Capacity).

For the last three years specific energy consumption shown below, which indicates the continual reduction in energy consumption due to our sustained efforts to conserve energy with the implementation of various energy conservation projects & ideas for increasing the efficiency of the equipments/ plant.

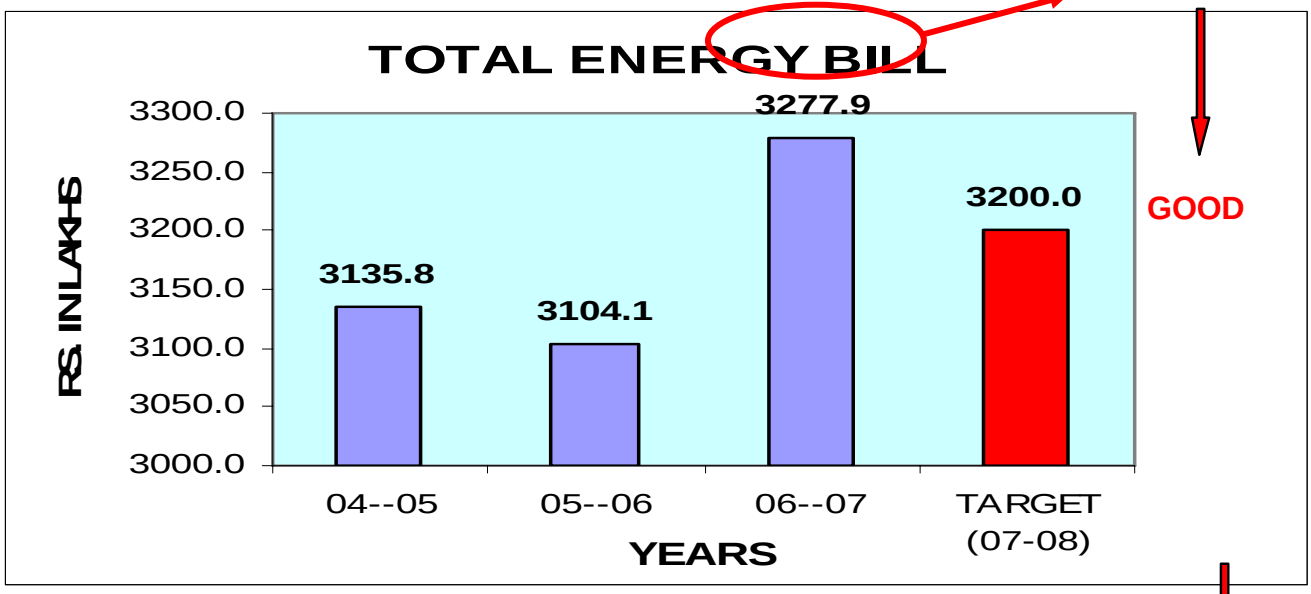
DESCRIPTION	UNIT	2004-05	2005-06	2006-07
Electrical Energy	kWh/T	1333	1295	1185
Thermal Energy	M Kcal / T	5.619	5.577	5.402
Total Manufacturing Cost	Rs. lakhs	28917.04	31094.67	34074.66
Total Energy Bill	Rs. lakhs	3135.78	3104.11	3277.89
Energy Cost as %age of Manufacturing Cost	%	10.84	9.98	9.62

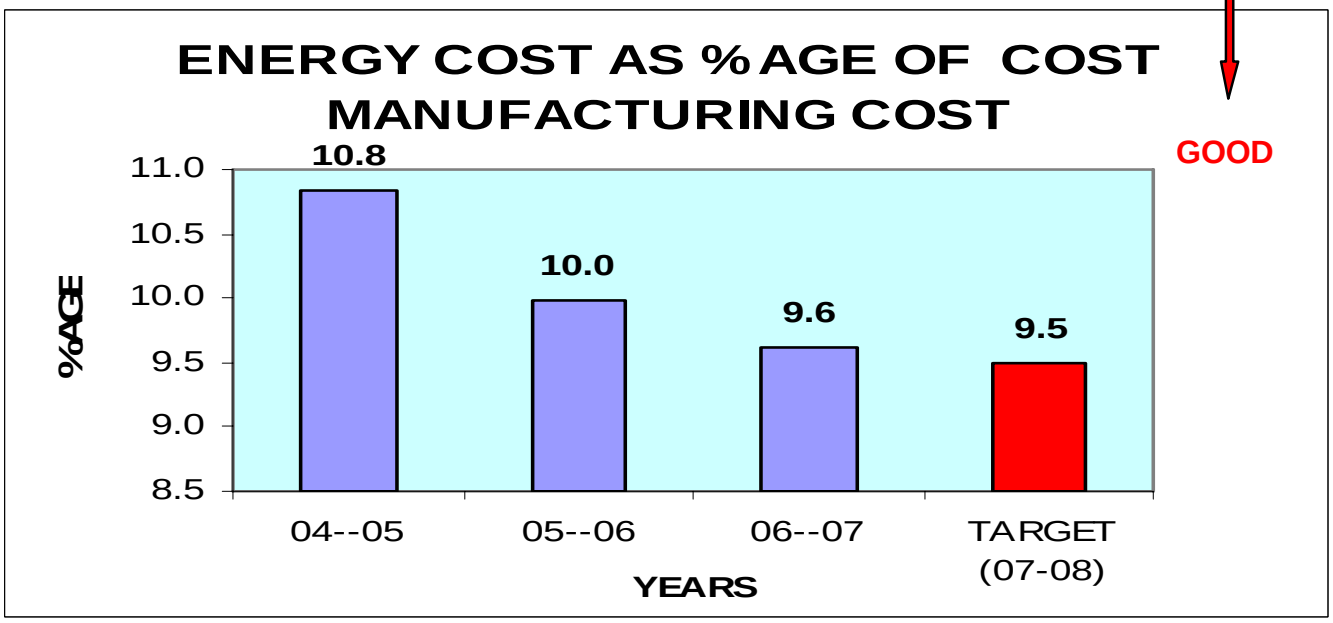


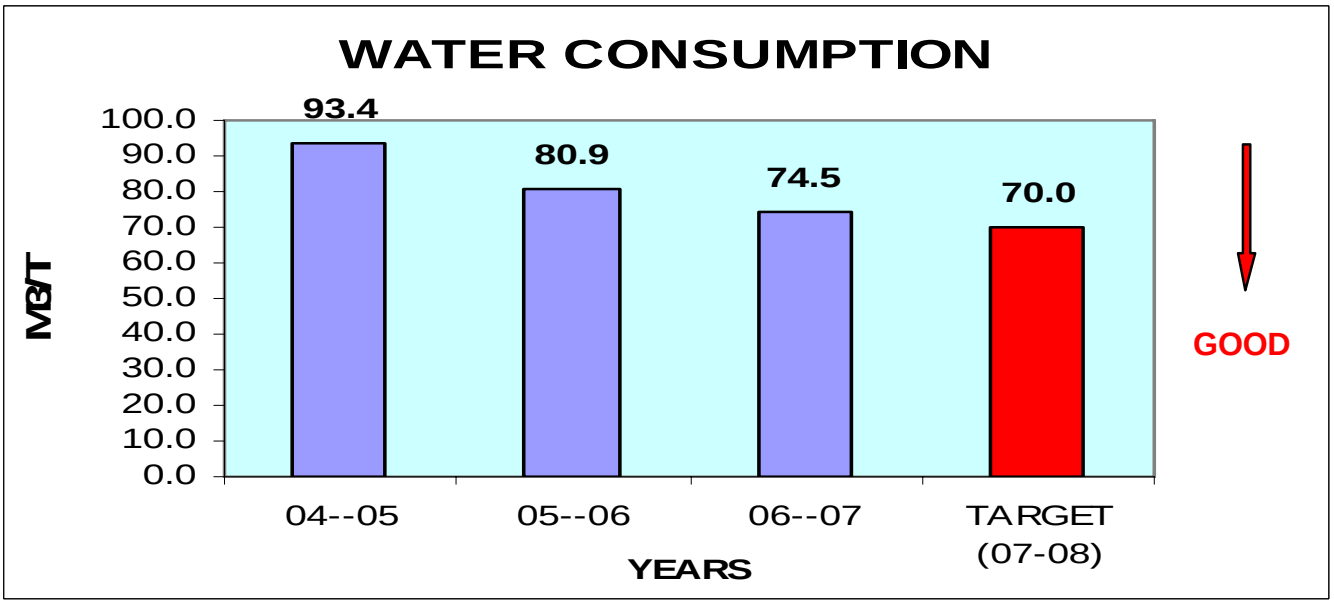


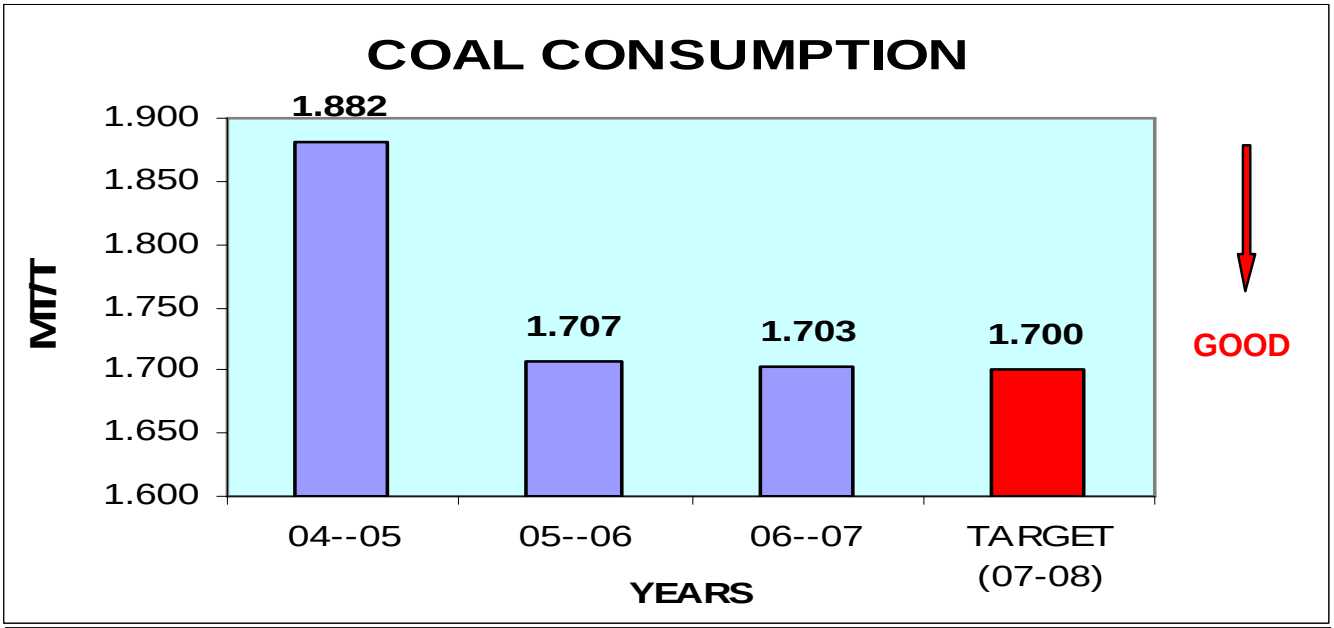


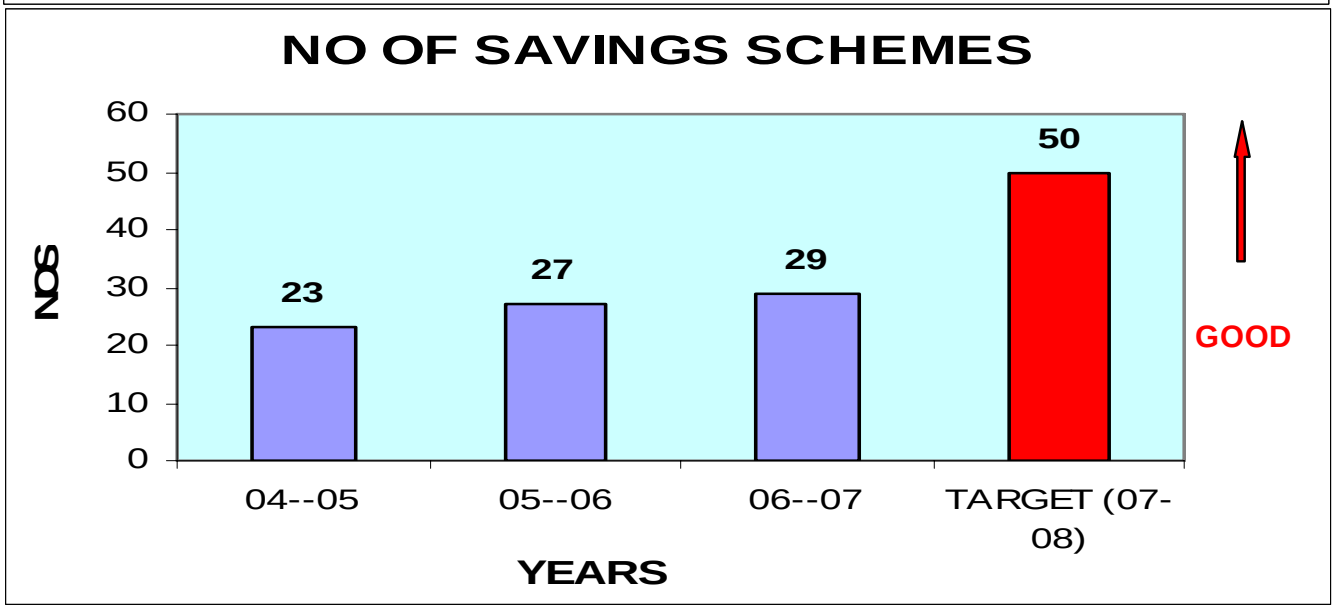
New Coating Plant is added

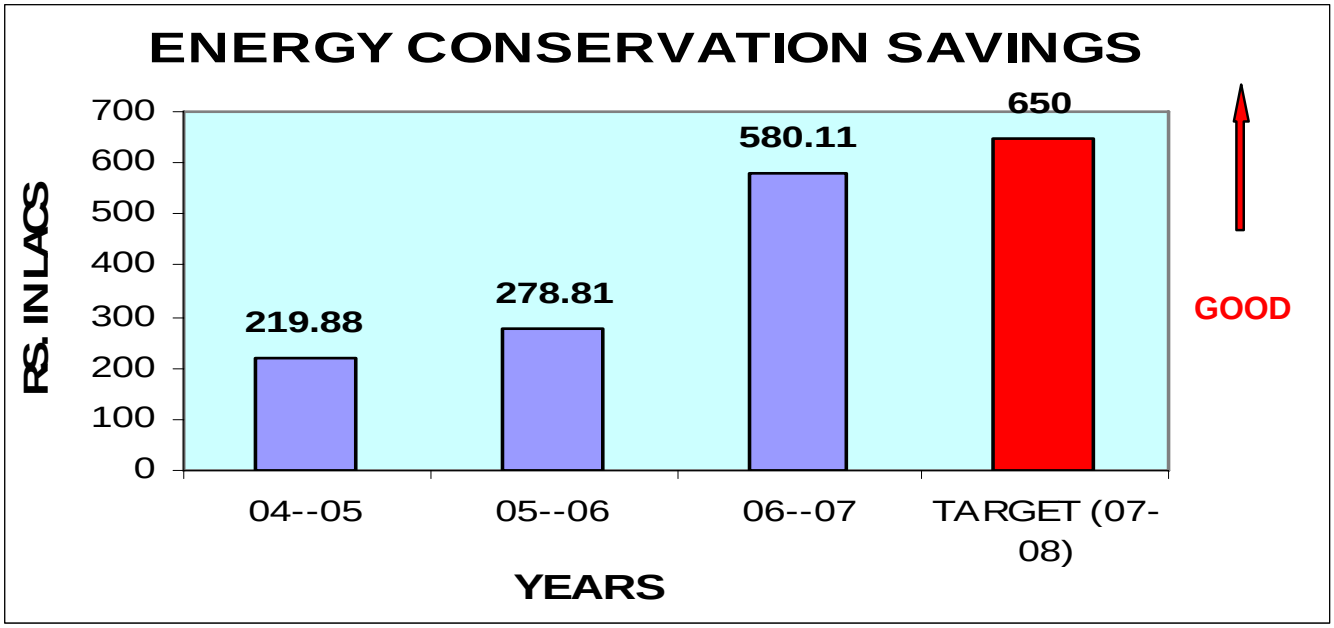





WATER CONSUMPTION
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
93.4
80.9
74.5
70.0
04--05
05--06
06--07
TARGET (07-08)
YEARS
GOOD


COAL CONSUMPTION
1.900
1.850
1.800
1.750
1.700
1.650
1.600
1.882
1.707
1.703
1.700
04--05
05--06
06--07
TARGET (07-08)
YEARS
GOOD


NO OF SAVINGS SCHEMES
60
50
40
30
20
10
0
23
27
29
50
04--05
05--06
06--07
TARGET (07-08)
YEARS
GOOD



Energy Conservation Commitment, Policy & Set-Up

In the present scenario of increasing cost of energy JK Paper's well established Energy Management System is continuously working on energy conservation. The company has been forming various committees from time to time namely, Energy Conservation Cell, Cost Compression Cell, Continuous Improvement Cell etc. with new energetic committee head and team members to achieve maximum benefit in conserving resources and reduce cost of production to meet market challenges.

The function of the cell is to minimize losses and wastages, use technique to substitute high cost energy by low cost energy, optimize consumption, and maximize utilization of plant and machinery capacity etc. by following tools:

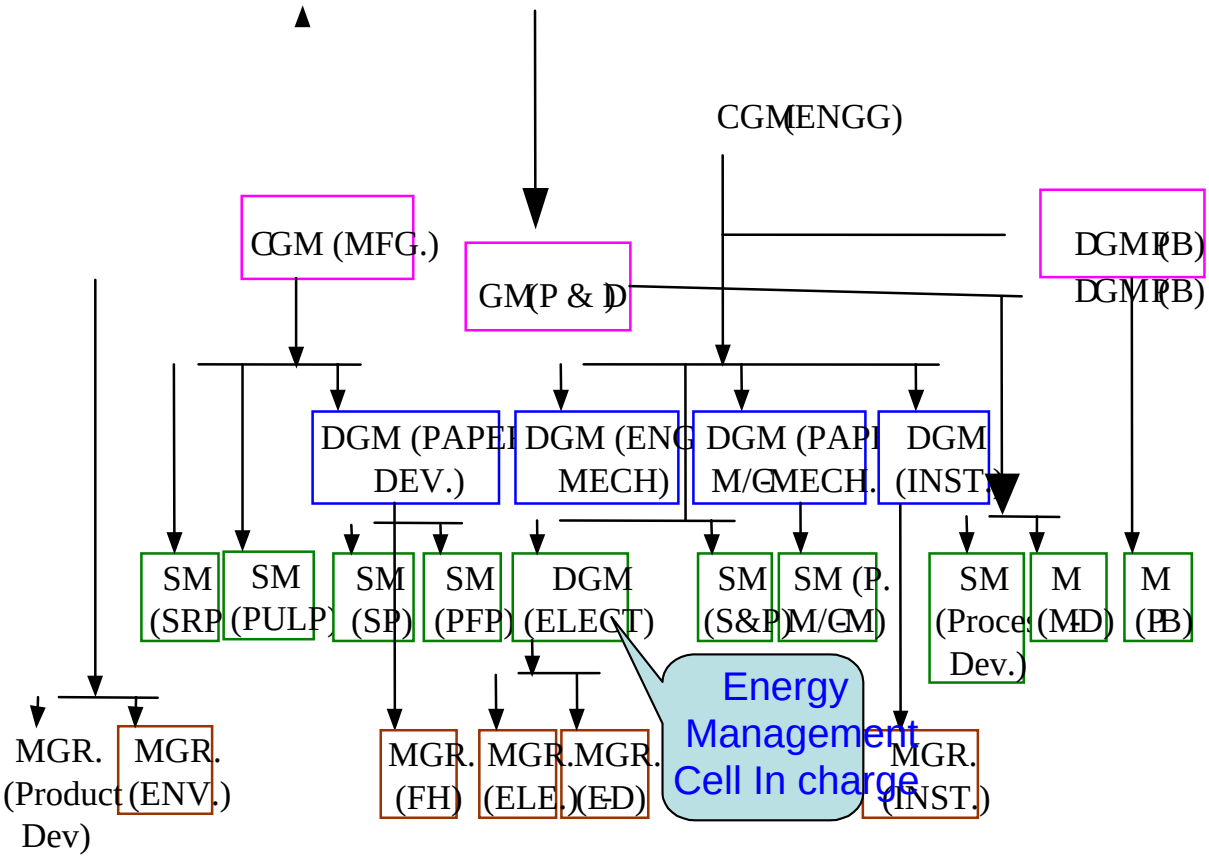
1. To Study specific energy consumption trend in terms of Power, Steam, Water in various sections of the mill and monitor.
2. To follow up with various departments to arrest steam leakages, condensate leakages, water leakages and provide adequate insulation as required to minimum heat losses thereby save energy.
3. To prepare energy conservation projects / proposal and ensure their financial approval and timely implementation.
4. To assist quality circle, evaluate ideas generated by suggestion schemes and to implement useful energy conservation schemes.
5. To implement suggestions given by internal auditors (ISO & TPM) from time to time.

6. To engage external agency i.e. auditors / consultants to assess the heath of the organization w.r.t. energy consumption and optimize investment for additional power generation station.
7. To arrange essay / poster / slogan competition (with attractive prizes) to enhance consciousness among employees (about scarcity of energy, its depleting production and increasing cost from time to time), inculcate habit of conserving and effective use of energy, emphasizing on environmental impact to have a continuous improvement in reduction in cost of production.
8. To impart training to improve the skill of personal to evaluate the opportunity by material balance, heat balance, energy balance etc.
9. To celebrate the 14th Dec. as the Energy Conservation Day involving employees, their family members (including school children), employees of nearby small scale industries to motivate them to achieve the goal of conservation of energy for future generation.

Energy Conservation Achievements

Some of the energy conservation projects implemented are as under:

Flash steam recovery system installed for Pulp Mill.



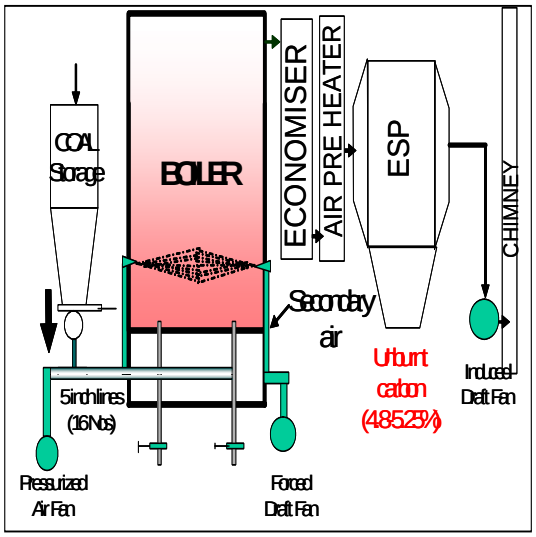
Flash steam recovery system installed for pulp mill black liquor indirect heater.

Investment :- Rs. 16.80Lakhs
Savings Per Annum :- Rs. 76.68Lakhs

Reduction in Unburnt carbon in Flyash

VFD installed to Primary air fan and pressure optimized to 1050 mmWC thus lower carryover
Furnace pressure tapping changed and balance draft maintained
Secondary air supply header from both the sides thus better curtain effect.
Present Unburnt carbon in flyash is 4.8 – 5.2 %

Kw Saving :-
Investment :- Rs. 15.00Lakhs
Savings Per Annum :- Rs. 24.60Lakhs



By providing ON/OFF switch at entrance of all the Substations.

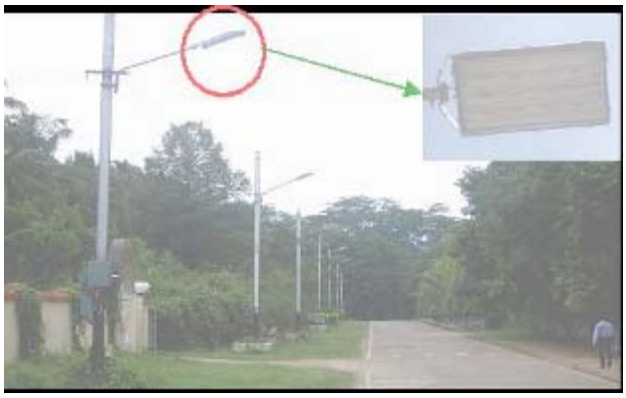
ON/OFF switches are installed at the entrance of all PCC, MCC & Transformers room to avoid unnecessary lighting whenever not required.

Investment :- Rs. 0.26Lakhs
Savings Per Annum :- Rs. 1.69Lakhs

Installation of Energy Efficient light fittings-T5

Energy efficient T-5 light fittings are installed by replacing conventional light fittings.

Investment :- Rs. 1.89Lakhs
Savings Per Annum :- Rs. 3.75Lakhs



Replacement of old air conditioners with energy efficient air conditioners in plant & colony.

Energy efficient Air conditioners are installed in place of conventional Air conditioners inside plant & Colony.

Investment :- Rs. 4.20Lakhs
Savings Per Annum :- Rs. 9.24Lakhs

OTHER MAJOR INITIATIVES TAKEN FOR ENERGY CONSERVATION DURING THE YEAR 2006-07:-

Sl No	Improvement Schemes	Saving in (Rs. Lakh/Year)	Investment in (Rs. Lakhs)
1	Improvement of own Generation by improving power factor from 0.80 to 0.93	140.16	27.50
2	CFB-1&2 optimizing the flue gas losses by installing O_2 meter inside control room for combustion monitoring .	4.18	0.50
3	CFB-5 optimizing the flue gas and radiation losses by improving boiler skin insulation.	11.88	8.50
4	Use of LP steam in stead of MP steam in LFB-5 FW heater	7.18	2.50
5	Improvement of condenser vacuum thereby reducing heat rate in 12 MW & 5.4 MW turbine.	11.05	5.00
6	Providing insulation over noninsulated pipe lines and valves.	1.55	0.25
7	Arresting the steam leakage by on line sealing.	0.21	0.02
8	Replace steam ejector in Evaporator plant -01 with suitable size vacuum pump.	9.70	4.00
9	Insulation of noninsulated surfaces of white liquor storage tank in caustisizer plant.	3.90	2.00
10	Downsizing of over rated motors with proper size motors	1.68	Nil
11	Downsizing the recirculation pumps in the evaporator section.	1.30	3.00

Sl No	Improvement Schemes	Saving in (Rs. Lakh/Year)	Investment in (Rs. Lakhs)
12	Replacement of 40W tube light with 36 w tube light resulted power saving of 16.0 KW	5.61	Nil
13	Replacement of Electronic chokes in place of conventional chokes.	1.50	3.25
14	Replacement of old Air conditioners with energy efficient air conditioners in plant and colony resulted power saving of 55 Kw.	9.24	4.20

15	Replacement of conventional light fittings with Energy efficient T-5 light fittings resulted power saving of 5.4 KW	1.89	3.75
16	Avoiding day light by providing translucent sheet in paper go downs.	1.23	2.35
17	Replacement of faulty Capacitors which consumes active power resulted power saving of 6.5 KW	2.28	0.58
18	Energy saving by providing On- Off switch at the entrance of each sub station.	1.69	0.26
19	Replacement of incandescent indication lamp by LED	0.84	0.46
20	Optimization of chilled water temperature in coating plant	1.54	Nil
21	Replacement of 400w sodium vapour light fittings with 250W metal halide light fittings resulted power saving of 3.5KW	0.61	0.65
22	Providing timer to switch off street light in colony and plant resulted power saving of 5.5 Kw	0.97	0.15
23	Running of 12 MW TG set on 49 HZ frequency	122.64	60.00
24	Preventing idle running of equipments	35.04	0.25
25	Divering hot condensate from NFL (hot water heater) to Condensate Tank.	10.56	1.00
26	Use of LP steam in stead of MP steam at pulp mill hot water heater	57.51	12.00
27	Flash steam recovery system for pulp mill	76.68	16.80
28	Flash condensing system at General condensate tank installed at DM Plant.	38.34	0.37
29	Providing desuperheating for New Fibre Line to LP steam for better heat transfer	19.17	3.00
	Sub Total	580.11	162.34

Energy Conservation Plans and Targets

Sl No	Improvement Schemes	Saving in (Rs. Lakh/Year)	Investment in (Rs. Lakhs)
1	Installation of V/F drive for clear water pump motor	19.49	25
2	Installation of V/F drive for pulp supply pumps motor in Bleaching	3.11	11.5
3	Improvement in power factor from 0.93 to 0.95	28.15	27.5
4	Installation of V/F drive for CFB 1 & 2 P.A.fan motor	5.94	10

5	Replacement of Dynodrive system for coal feeders in CFB 1 & 2 by frequency drive system	4.65	8.3
6	Replacement of Conventional light fittings by Energy efficient light fittings	17.33	21.83
7	Frequency drive for LFB -IV ID fan motor	31.63	39
8	Providing VVVF drive in LFB-4 FD fan	3.15	8
9	Providing VVVF drive in LFB-5 PA fan	2.1	3.5
10	Installation of Flash steam recovery system at Pulp Mill and use the flash steam into hot water heater	17.04	5.00
11	Paper Machine no. 1 flash (condensate tank) to be connected to hot water heater at Pulp Mill	25.56	10.00
12	Shifting desuperheating station for RDH from supplier point (Turbine House) to customer point (Pulp Mill) to reduce line losses	10.22	4.00
13	Installation of thermocompressor for Evaporator - 3 and increase the LP pressure from 2.6 to 3.2 Kg/cm², thereby reduction in steam consumption	17.04	7.50
14	Increase the return condenstate from CS Plant, Clorine di oxide, Clorine gassifier there by increasing feed water temperature	8.25	4.00
	Sub Total	193.66	246.13

Environmental, Occupational Health & Safety (EHS) Policy

The unit is committed to preserve its Environmental, Occupational Health & safety of its employees. This Policy shows employees commitment and involvement of top management for safeguarding the Environmental, Occupational Health & safety for future generations & conserve resources.

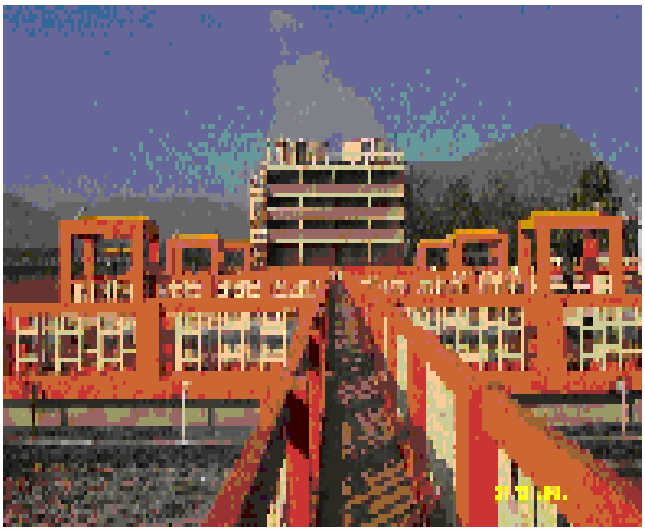
Following major improvements have been made :

WATER TREATMENT

Augmentation of Effluent Treatment Plant by installation of Activated Sludge Process with Cooling Towers:-

JKPM up graded the existing Effluent Treatment Plant by incorporating most advanced Activated Sludge System with Cooling Tower *for* further improvement in the quality of effluent. The most important feature of the up gradation is the *Cooling Tower* in the Effluent Treatment Plant to maintain the temperature profile of the effluent before it goes to the Aeration Basin. The Optimum temperature would enhance the growth of micro-organisms, which eat up much of the pollutants.

This kind of *Aeration Basin with Cooling Tower* in ETP is the first of its kind in Indian Pulp and Paper Industry.



A VIEW OF NEW ET PLANT

PADDY CROP IRRIGATED WITH TEW AT JKPM

Treated effluent water use for cultivation:-

Land application is a nature's own treatment process and is Eco-friendly, which includes renovation of wastewater through physico-bio-chemical reactions, re-use of wastewater and nutrients for biomass production, replenishment of natural resources and recharge of ground water. JK Paper Mills in the course of manufacturing 1,22,000 tonnes of paper per annum generates 25,000–27,000 m^3/day Treated Effluent Water. Demonstration plots of various crops have been raised through treated effluent water at JKPM Agro Economic Research Centre, Jaykaypur. Demonstration plots of TEW (Treated Effluent Water) irrigation is being taken up to convince farming community to take up cultivation of agricultural crops with TEW and which can bring up liftment of rural economy. The mill is planning for irrigating 1000 Acres of land by taking help of Local farmers.