



# **Workshop on Energy Management for Pulp & Paper Sector**

**18 Feb 2010**

**ITC Limited, PSPD, Unit - Kovai**

**Presenter: R Nandhakumaar**

# Energy Pause:

Don't let your electricity bill  
**weigh you down**



Always look for the BEE Endorsement Label on induction motors.

Bring home only BEE certified electrical appliances. Rated according to the amount of electricity consumed by them, your savings increase with the number of stars on the label.

To know more please log on to: [www.bee-india.nic.in](http://www.bee-india.nic.in)



**BUREAU OF ENERGY EFFICIENCY**  
MINISTRY OF POWER, GOVERNMENT OF INDIA  
4TH FLOOR, SEWA BHAWAN, R.K.PURAM, NEW DELHI - 110 066

Always look for this label



Save energy, save money!

How to read the label

- Please look at the BEE Endorsement Label while buying induction motors
- Know the efficiency level
- Look for BEE logo for the authenticity of the label




**Bachat Ke Sitare  
Dost Hamare.**

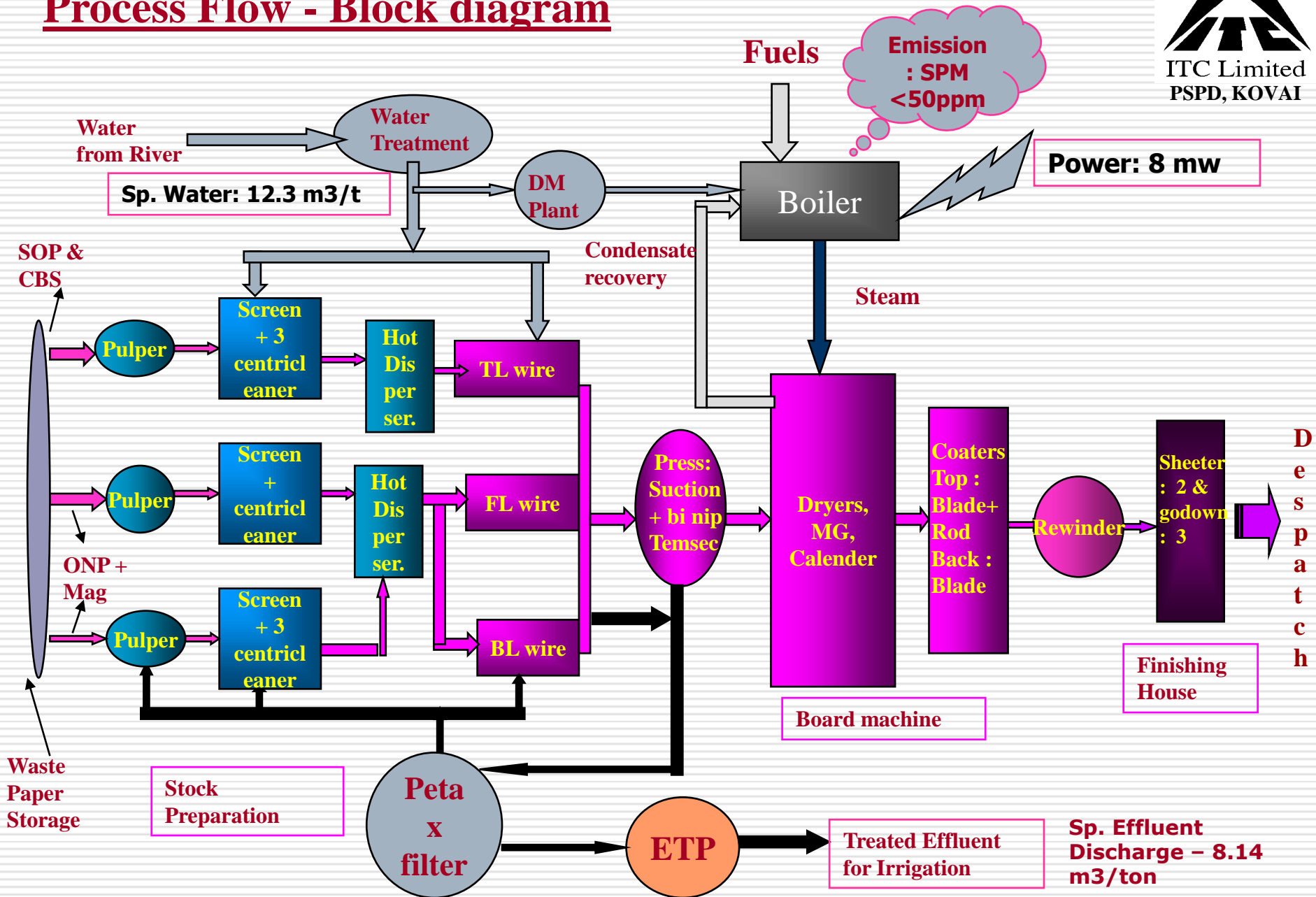


# Company Profile:

## ITC Limited , PSPD Unit:Kovai




- ITC Ltd is a multi business Corporate with Environmental Philosophy of Trusteeship related to social & environmental resources, aligned to the pursuit of economic objectives.
- Water Positive 7 years in a row
- Carbon Positive 4 years in a row
- Solid Waste Recycling Positive
- PSPD is the Paperboard & Specialty Papers Division, **2,000** crore business having 4 manufacturing Units
- Unit: Kovai is One of the units, located 42 km north of Coimbatore, Tamil Nadu.
  - Production capacity of **96,000** t/ year
  -  Manufacturing Duplex Board from **100 % recycled fiber**
  - Certified Integrated Management system ( ISO 9001, ISO 14001 & OSHAS 18001 )

# Process Flow - Block diagram



# Certifications & Awards: Unit - Kovai

## Certifications:

- ISO 9001 : 2000
- ISO 14001 : 2004
- OSHAS 18001 : 2007
- British Safety Council Award 2007 :  Rating
- British Safety Council Award 2008 :  Rating
- Forest Stewardship Council (FSC) 

## Awards:

- “Excellent Water Efficient Unit” – CII National award for Excellence in Water Management 2007, 2008 & 2009

# GFTN Membership & FSC Certification



## The Rainforest Alliance

ITC LIMITED - PSPD UNIT KOVAI  
Vivekanandapuram, Thekkampatty Village  
Mettupalayam Taluk, Coimbatore Dist, Pin: 641 113  
Tamilnadu  
INDIA

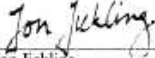
IS CERTIFIED FOR FOREST STEWARDSHIP COUNCIL  
CHAIN-OF-CUSTODY

Certificate Registration Code: SW-COC-004339

Valid from: September 16, 2009 to September 15, 2014

### CERTIFICATE SCOPE:

Single Chain-of-Custody certificate based on FSC-STD-40-004/  
FSC-STD-40-007. Additional details regarding the certificate  
scope, including products and species, are found at [fsc-info.org](http://fsc-info.org).

  
Jon Jickling  
Certification Quality and Systems Manager  
SmartWood Program of the Rainforest Alliance  
65 Millet Street, Suite 201, Richmond, Vermont USA 05477

SMARTWOOD IS A PROGRAM OF THE RAINFOREST  
ALLIANCE ACCREDITED BY THE FSC

This certificate is not evidence that a product is FSC certified; additional documentation is required from the certificate holder.

This certificate is the property of the SmartWood program of the Rainforest Alliance. Upon suspension or termination of your certification or renewal of your certificate, this certificate must be returned to SmartWood.

ACCREDITED  
FSC-ACC-004  
© 1996 Forest Stewardship Council A.C.



- **ITC – First Indian Company To Gain WWF’S GFTN Membership**
- The GFTN is WWF’S initiative to eliminate illegal logging while encouraging Improved and sustainable forest management practices to enable industries trading in or procuring forest goods to minimize their forest footprint

# Preservation of Environment:

## □ Concern on Conservation of Resources

## □ Water & Energy Conservation

- Invested **Rs 2.60 Crores** for Water Conservation in last three years.
- Invested **Rs 8.5 crores** for Energy conservation in last three years.
- Evaluation & improvements through regular audits

## □ Recycling of solid waste:

- **100%** of fly ash from boiler, ETP sludge and Deinking sludge are recycled.
- Plastics are sent to ACC for Recycling

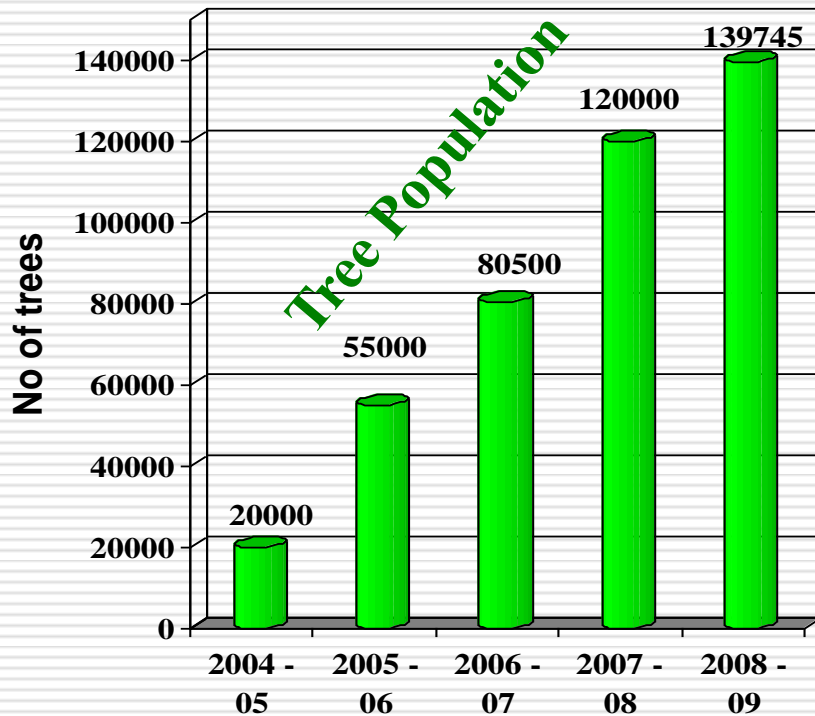
## □ Facilities & Processes are environment friendly:

- Online stack monitoring – SPM, SO<sub>x</sub>, NO<sub>x</sub> and continuous AAQS to improve environmental standards.
- FSC certified for using post consumer waste paper

## □ VCS Project:

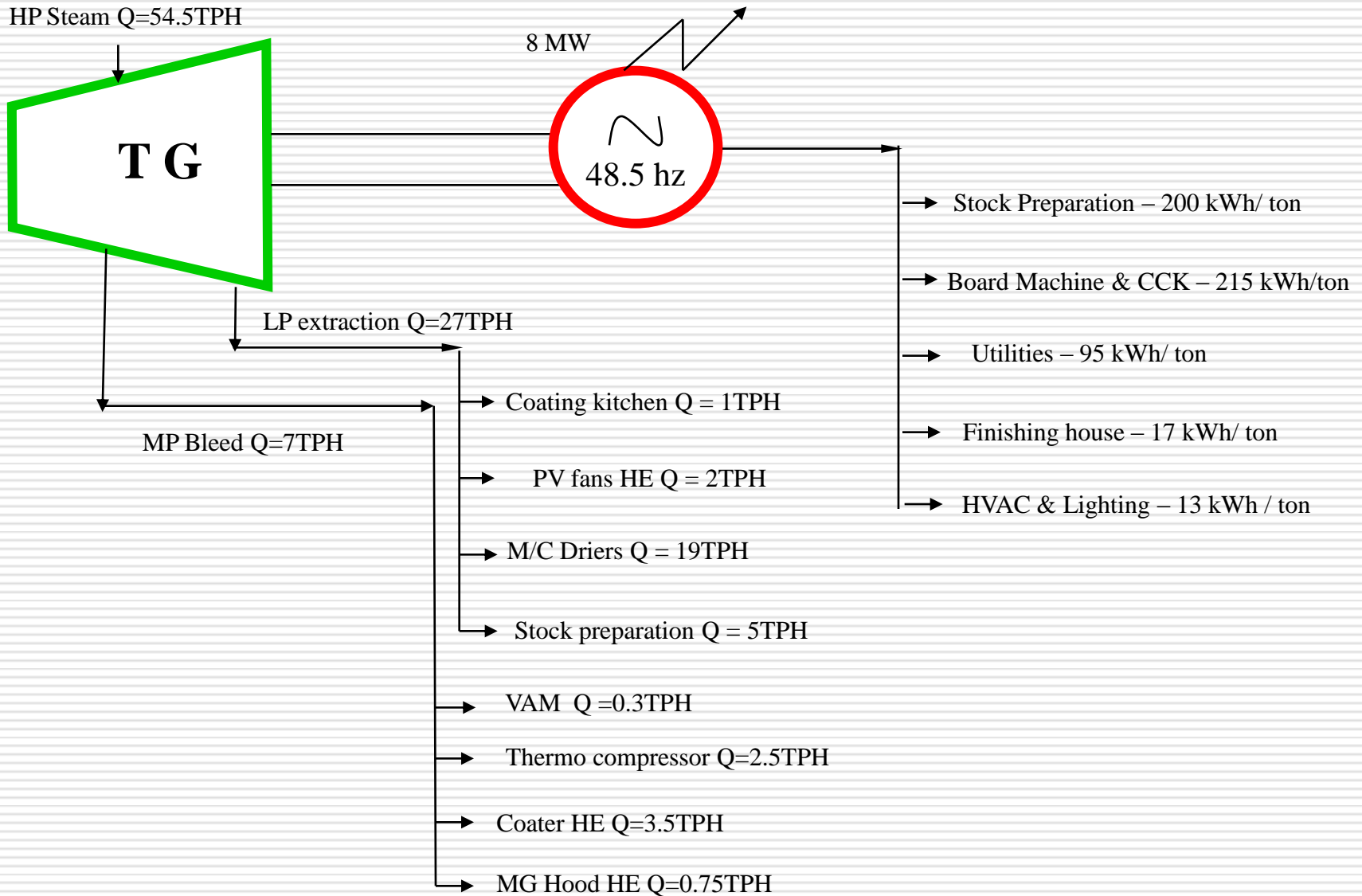
- Predominantly using waste biomass in boiler as fuel, **69,000 tons** of CO<sub>2</sub> reduction per annum

# Environment preservation & Green Belt Development



- 270 acre under cultivation using treated effluent.
- 1,39,475 trees of various species
- Long term tie up with Tamilnadu Agricultural University to monitor and study the impact of treated effluent on soil & ground water.

# Mill Overall Energy Balance:





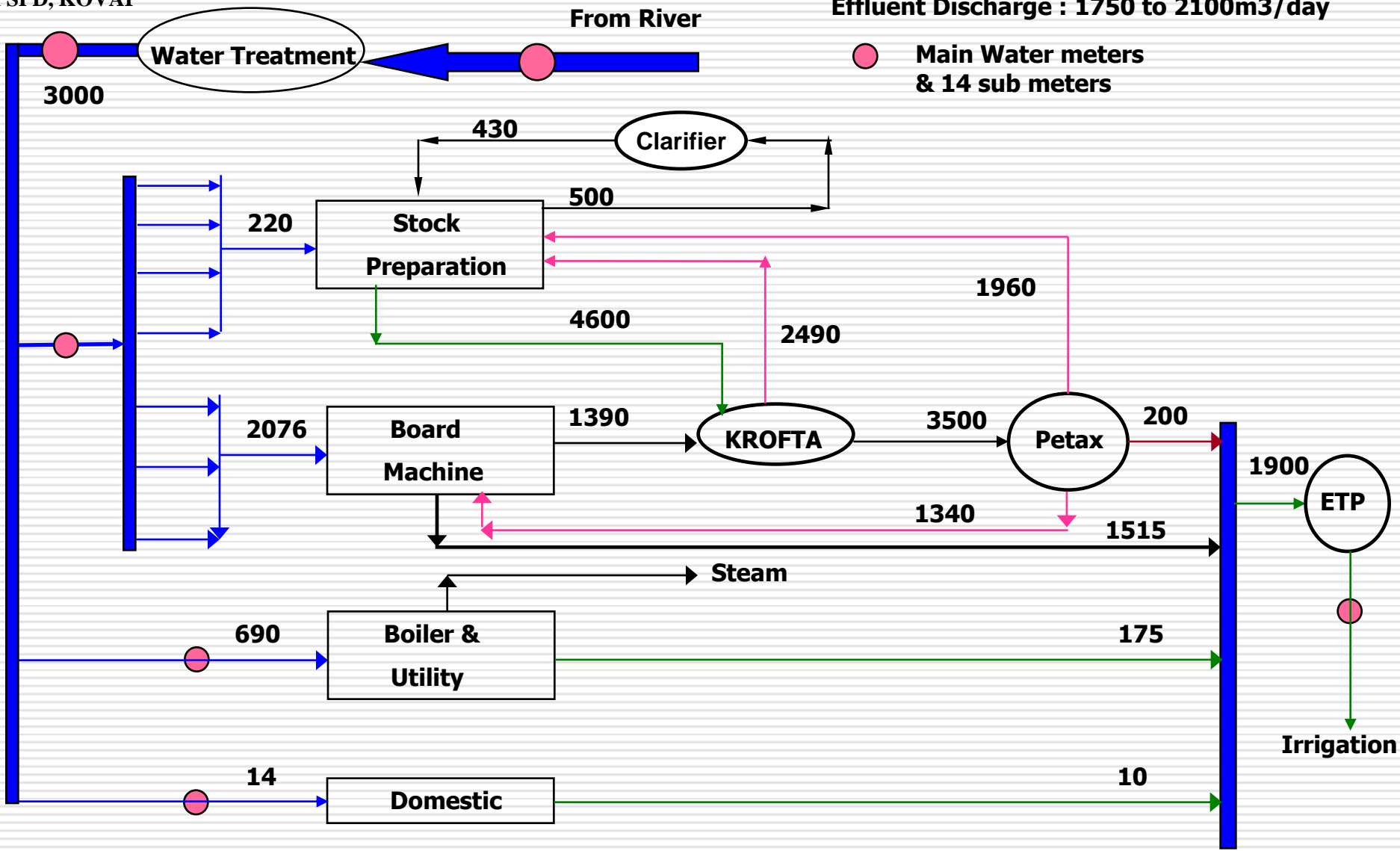
ITC Limited  
PSPD, KOVAI

# Mill water Balance:

Intake from river : 2800 to 3200m<sup>3</sup>/day

Effluent Discharge : 1750 to 2100m<sup>3</sup>/day

● Main Water meters & 14 sub meters





# Energy Management Cell

## KPOV's 09- 10

### 1) **Energy consumption reduction**

- Power reduction : 5000 units / day - 3.4 %
- Steam reduction : 1.2 TPH - 4 %
- Water reduction : 500 KL/day - 16.67 %
- Compressed Air : 200 Cfm - 15 %

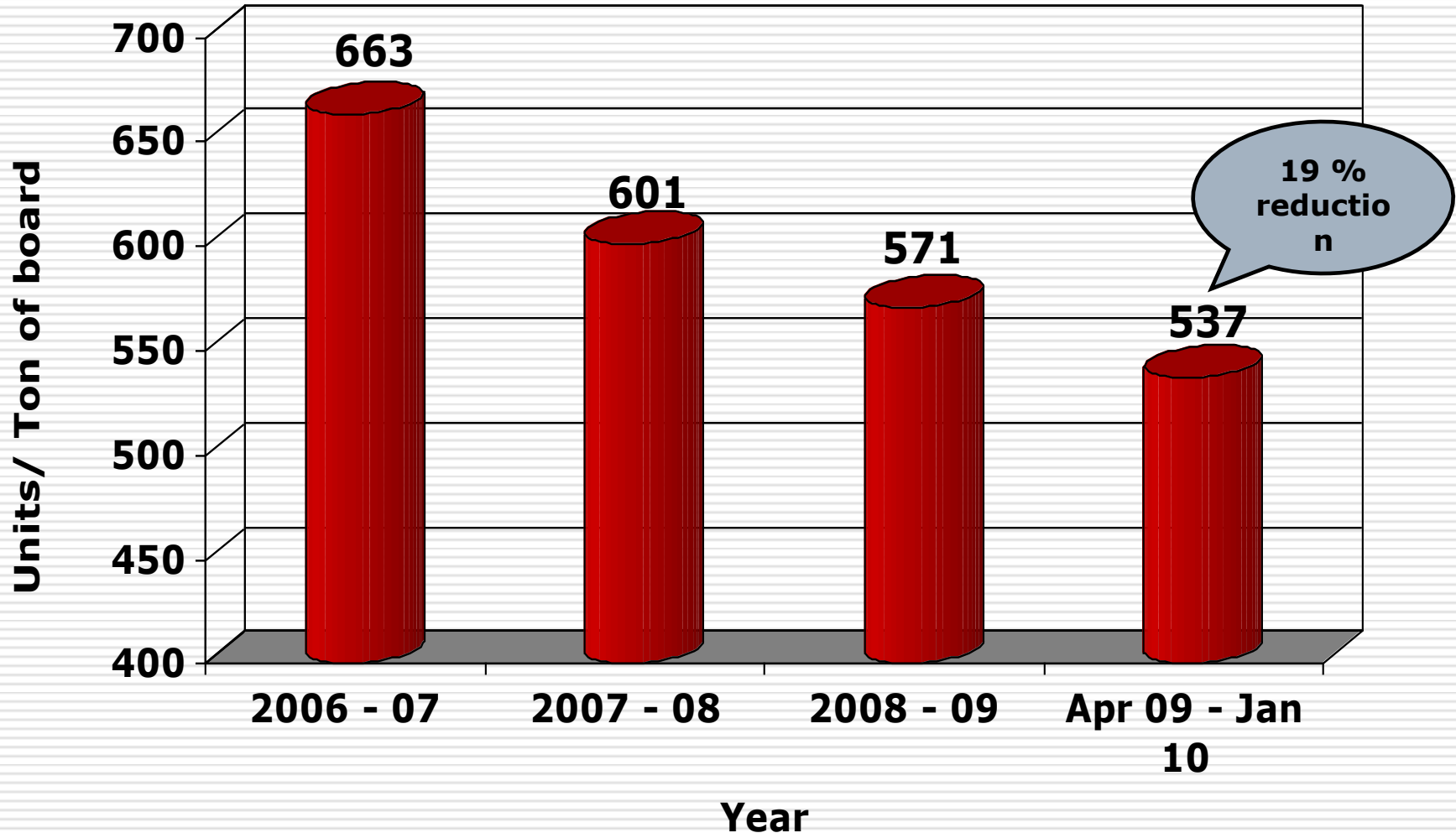
### 2) **Energy Audits planned for 09 - 10:**

- Power distribution & Power quality audit - Done
- Boiler energy audit - Done
- Overall energy Audit
- Vacuum Pump Audit

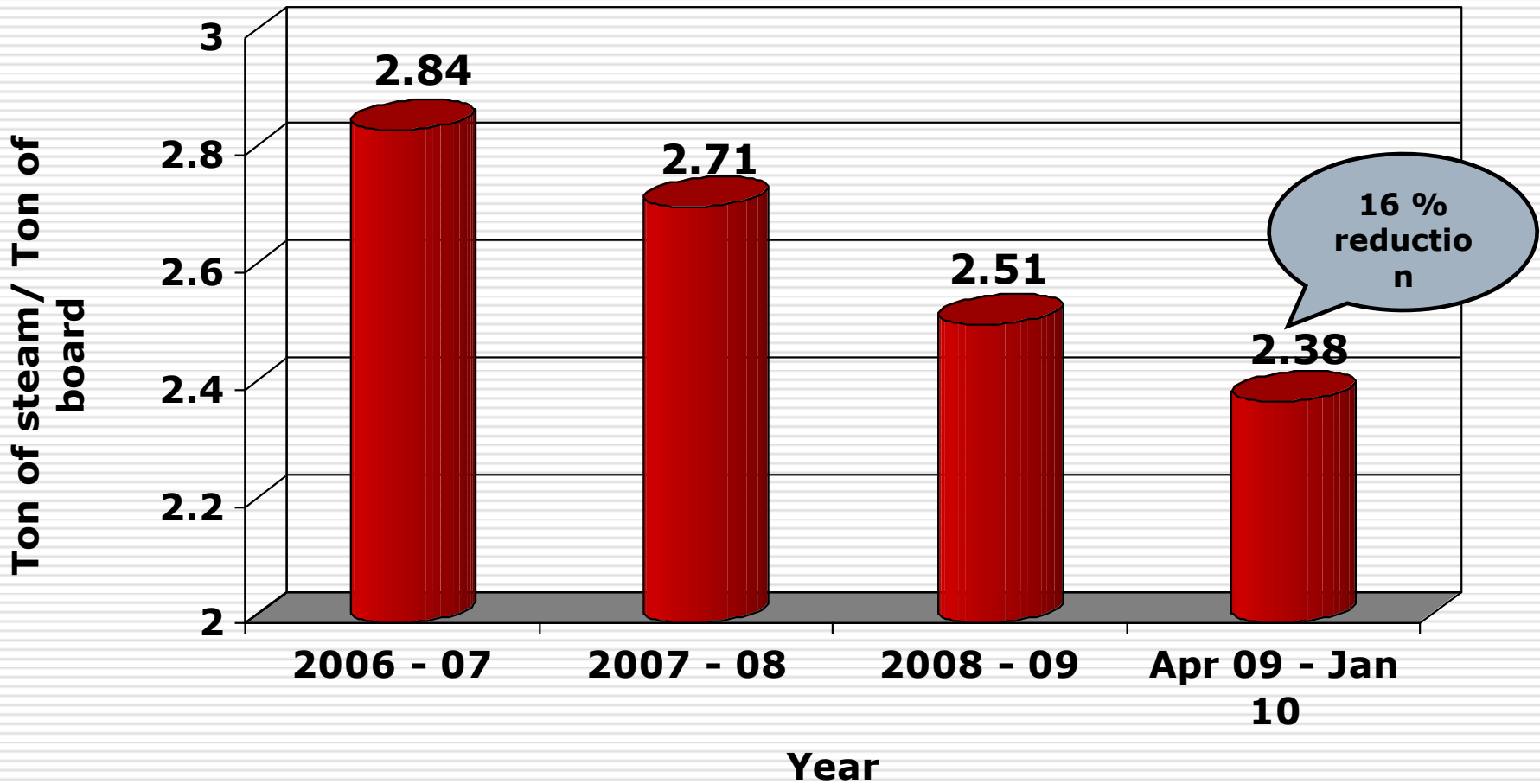
### 3) **Identification of two Encon Projects per month and co-ordination for implementation.**

### 4) **Knowledge sharing on energy conservation – Minimum two per month**

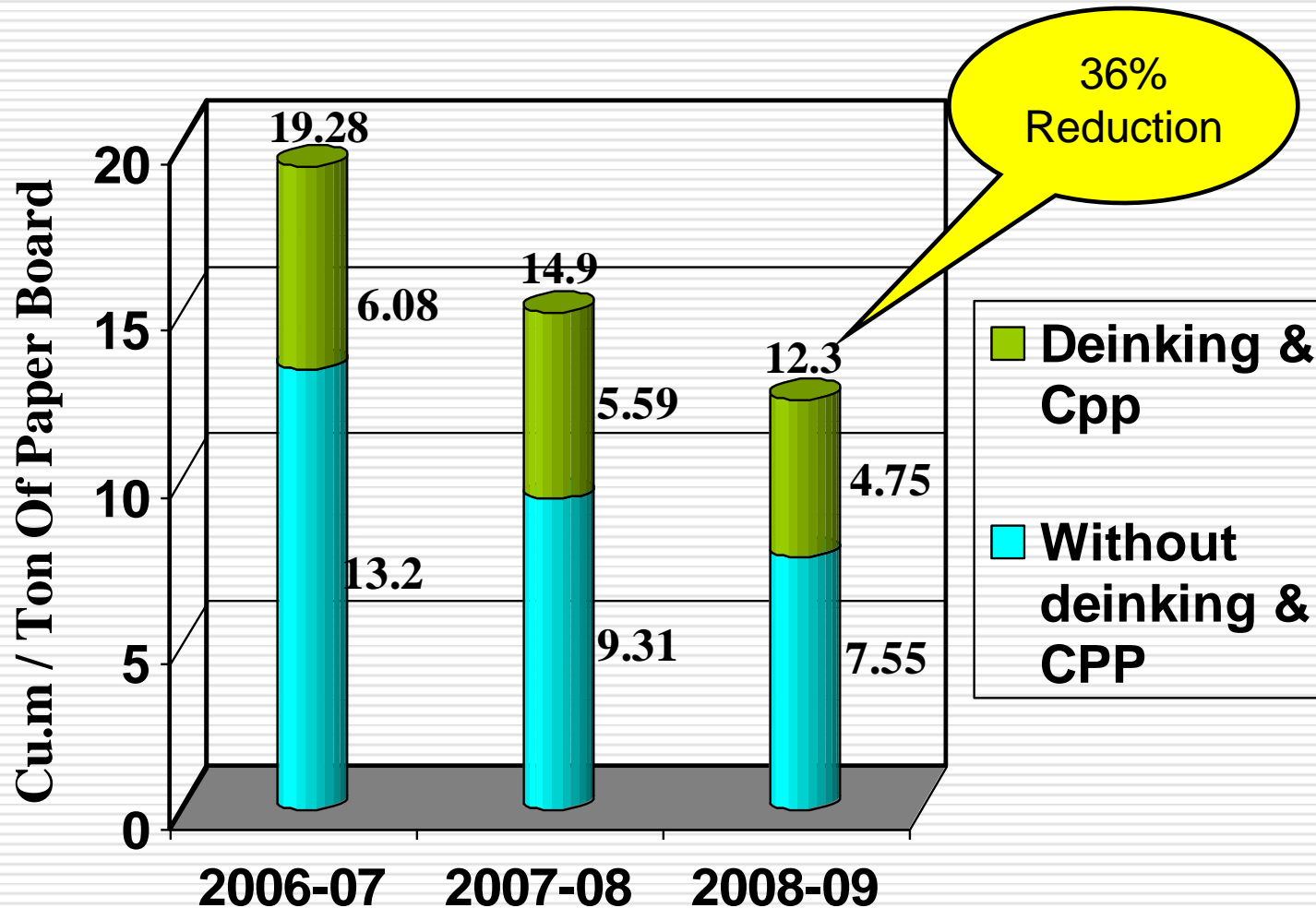
# Specific Power Consumption:



# Specific Steam Consumption:



# Specific Water Consumption



# Energy Audits:

- ❑ Conducted water audit through M/s.CII and implemented water saving measures to save 400 m<sup>3</sup> of water per day.
- ❑ Conducted energy audit through M/s. TERI and M/s. M.K.Raju consultants and implemented energy conservation measures with the cost above 1 crore.
- ❑ Conducted steam audit through M/s.Forbes Marshall and implemented energy saving measures recommended by them.
- ❑ Conducted steam audit through M/s.Kadant Johnson and implemented energy saving measures recommended by them. Savings Achieved 3 TPH of steam
- ❑ Conducted Energy saving audit through M/s SKF Ltd and Energy savings through equipment alignment . Savings envisaged 440 Units / day
- ❑ Conducted Compressed Air Audit with M/s.Dilzer consultants and saved Around 250 Cfm compressed Air.

# Energy Audits:

S No	Agency	Subject	Year
1	M.K.Raju Consultants Pvt. Ltd.,	Overall Energy Audit	June_2004
2	The Energy and Resources Institute	Overall Energy Audit	April _ 2006
3	Forbes Marshall	Steam trap system audit	March_2007
4	Confederation of Indian Industry	Water Audit	June _ 2007
5	POET consultants	Lightning survey	JuLY _ 2007
6	Kadant Johnson, UK	Steam & condensate System energy Audit	June _ 2008
7	Loyal agencies ( GE electric )	Lighting survey	JuLY _ 2008
8	Conzerv	Power quality audit	Sept _ 2008
9	SKF Limited,	Electrical Energy audit by Equipment alignment correction	Dec _ 2008
10	Dilzer Consultancy	compressed Air system audit	Jan _ 2009
11	Godrej & Boyce Mfg. Co. Ltd.	compressed Air system audit	June_ 2009
12	Venus energy audit system	Boiler Energy audit	Sep_2009

# Case Study1 : IFC CONTROL

- IFC Controls the Air flow and pressure being delivered thereby reducing artificial demand in the plant. It is designed specifically to operate at the Intermediate point of the compressed air system i.e, on the downside stream of the dryer / receiver and upstream side of the main piping distribution system

# Case study 1 – Intelligent Flow control

## Past Scenario:

- ❑ Compressor output send through a receiver /dryer and connected to a common header.
- ❑ Compressor load and unload set pressure was 5.5 bar and 6.3bar respectively to meet the process requirement.
- ❑ Power consumption per hour was 149.05kwh



Compressor



Receiver



Air Dryer

Process Header

# Case study 1 – Intelligent Flow control

## Present Scenario:

- ❑ Compressor output sent through a receiver /dryer and connected to a Intelligent flow control
- ❑ Intelligent flow control set pressure is 4.5 bar to meet the process requirement.
- ❑ At present compressor load and unload set pressure is 4.5bar and 5 bar respectively which meet the process requirement.
- ❑ Present power consumption per hour is 140.95kwh
- ❑ Per hour power saving is 8kwh.



Compressor



Receiver



Air Dryer



IFC  
(Godrej )

Process Header

# Case study 1 – Intelligent Flow control

## Project Summary:

### Past Scenario:

Power consumption per hour: 149.05kwh

### Present Scenario:

Power consumption per hour: <140.95kwh

Savings Per hour : 8 KWH

Annual savings : Rs.1.6 Lakhs

Investment : Rs.3.2 Lakhs

Pay back : 2 years

## Case study 2 – STOCK HD Pulper VFD

### **Past Scenario:**

- HD pulper was running with fixed speed through out the batch process.
- In the time of feeding and discharge the fixed speed is not required
- Power consumption (kwh) per ton – 24.688
- Total cycle operation - 26 mins, Range of current consumption – 120-340 amps

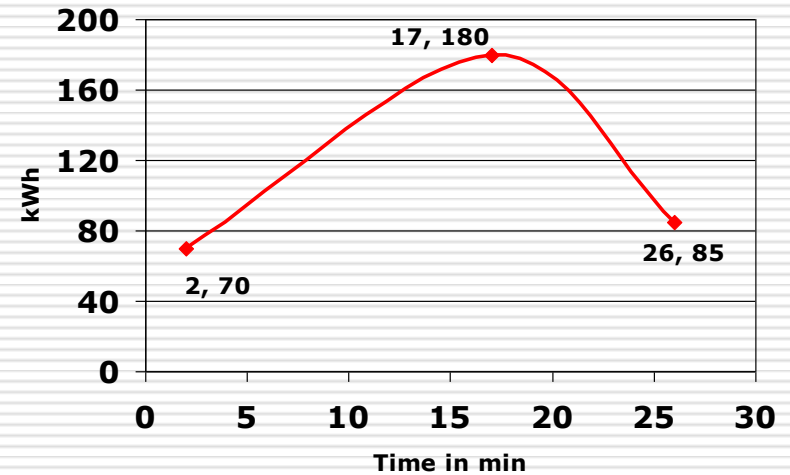
# Case study 2 – STOCK HD Pulper VFD

## Present Scenario:

- HD pulper installed with 200KW VFD, speed during feeding and discharging is reduced.
- Pulper rotor speed varied based on raw material.
- Power consumption (kwh) per ton – 11.577
- Total cycle operation - 26 minutes, Range of current consumption – 100-275 amps



Pulper Load Trend



0-2 min – Feeding

2-17 min – Pulping

17-26 min - Discharge

## Case study 2 – STOCK HD Pulper VFD

### **Project Summary:**

Power consumption per ton without VFD	– 24.688 kWh
Power consumption per ton with VFD	– 11.577 kWh
Savings per ton	– 13.1 kwh
Savings per day	– 1179 kwh
Savings per annum	- 3,94,965 KWH
Savings per annum	- Rs.9,87,413
Investment	- 13.0 Lakhs
Payback Period	- 16 months

## Case study 3 – Stock chest Agitator

### Past Scenario:

- ❑ Chest no.8,10,12,13 and fibre recovery chests agitator was running with 1550 mm diameter.
- ❑ Agitator motor was 22kw running with 1000 rpm.
- ❑ Current consumption – 47Amps - 31.5kWh



## Case study 3 – Stock chest Agitator

### **Past Scenario:**

- ❑ Chest no.8,10,12,13 and fibre recovery chest agitator diameter reduced to 1000mm.
- ❑ Agitator motor changed to 22kw running with 750 rpm.
- ❑ Current consumption – 39Amps, 27 kWh

## Case study 3 – Stock chest Agitator

### **Project Summary:**

#### Savings for one chest:

Power savings	– 4.5kwh
Power savings per day	– 108 kwh
Power savings per annum units)	– 36180 kwh ( for 5 no's = 1.81 Lakh
Savings per annum	- Rs.90,450
Investment for motor	- Rs.93,000
Payback Period	- 12 months

## Case study 4 – VFD Applications – CT pump

### □ Past Scenario:

- TG condenser steam load varies 8-14 TPH
- Cooling water flow 1700 cu.m / hr.
- Cooling Water Delta T :2 - 4°C
- Condenser design Delta T :8°C
- condenser Cooling water requirement 1200 cu.m / hr
- Motor power : 160 Kw, 960 rpm



## Case study 4 – VFD Applications – CT pump

### □ Present Scenario:

- TG condenser steam load varies 8-14 TPH
- Cooling water flow < 1200 cu.m / hr.
- Cooling Water Delta T :5-6°C
- Temp set : 36°C for O/I water
- Motor Speed : 600 rpm (Avg.)

### Savings :

Power saving : 850 KWH / day

Cost savings : 7.5 Lakhs / annum

Investment : 14 Lakhs

Pay back : 22 months



## Case study 5 – Antifriction coating of Pump

- ❑ Past scenario:
- ❑ Pump Q=330 (350) cu.m/hr
- ❑ Pump head=130 (135) M
- ❑ Motor power = 250 KW
- ❑ Vibration = 7 -9 mm/s
- ❑ Power drawn = 240 KWH



## Case study 5 – Antifriction coating of Pump

### Present scenario:

- Antifriction coating provided for Pump casing inner side by Belzona
- Pump flow = 350 cu.m/hr
- Pump head = 140 M
- Motor power = 250 KW
- Vibration = 1.5 -2.0 mm/s
- Power drawn = 212 KWH

### Savings:

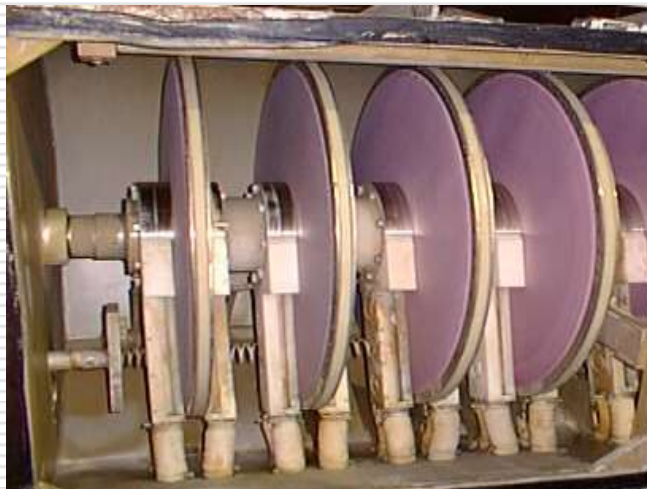
- Power = 28 KWH
- = 280 units / day
- = Rs.1,000 / day
- Investment = Rs.75,000
- Pay back = 75 days

## Case study 6 – Petax filter

### Usage of back water in HP showers

- ❑ Back water is normally not used in HP Showers
- ❑ Normal filters get jammed very fast
- ❑ “PETAX” Filter from Kadant France was first installation in India
  - Filtered water TSS is < 20 ppm irrespective of the inlet water clarity.
  - Clear water from Krofta having TSS around 200 is filtered through Petax Filter
  - The technology prevents the closely woven filter media from jamming.
- ❑ Accept water is used in
  - All high pressure showers in wire and press part
  - Lubricating showers in wire and press part
  - Pumps sealing water
- ❑ Cost of the project – 2 crore

# Case study 6 – Petax filter





## Case study 6 – Petax filter

### Usage of back water in HP showers

Water savings Achieved	: 3,000 Cu.m / day
Power Savings Achieved	: 2120 units /day
Savings per day	: Rs.21,000
Savings per annum	: Rs.70 Lakhs
Pay back	: 3 years

# Awareness To Local Community On Energy Conservation & Global Warming



Involving local Community



Competition for workmen

# Awareness To Local Community On Energy Conservation & Global Warming



**Distribution of free CFL lamps  
to 265 + 425 households**



# Community Development:



- Training on Efficient use of LPG in the unit for local community



- Creating awareness on use of renewable energy to local community



- Creating awareness on Energy conservation on Domestic Appliances for local community

# Wealth Out Of Waste: WOW

Collection of Waste:

Areas Covered

Hyderabad

Chennai

Bangalore

Coimbatore

Vishakapatnam

Thirupathi

Current Collection : **2000 MT/month**, Much more in future

*Recycling of 1 ton of waste paper saves 17 trees and 32,000 litres of water*

## Wealth Out Of Waste: WOW



## International Recognition For ITC's WOW Project

ITC's Wealth Out Of Waste (WOW) Project  
Received The Prestigious **Papyrus Award**  
Presented By the **Bureau Of  
International Recycling (BIR)**





# Wealth Out Of Waste: WOW

ITC's





ITC Limited  
PSPD, KOVAI

**THANK YOU**