



National Award for Excellence in Water Management-2008
16 & 17 December 2008;
CII – Sohrabji Godrej Green Business centre, Hyderabad



A. Padmanabhan, General Manager (Projects)
M/s ITC Limited – Paperboards & Specialty Papers Division,
Unit Bhadrachalam



PSPD
BHADRACHALAM

Company profile



- n PSPD, a Division of ITC Ltd, formed in Apr 2002, by merging group businesses in Paperboards & Specialty Papers.
- n PSPD consist of Unit Bhadrachalam, Unit Kovai, Unit Tribeni, Unit Bollaram, with turnover of Rs.2364 Crores during 2007-08. Bhadrachalam turnover more than is Rs.1200 Cr
- n Unit Bhadrachalam is India's largest single location integrated paperboard company of capacity 4.0 lac TPA.
- n 98% self sufficiency in power requirement through co-generation.
- n ISO 9001:2000, ISO 14001-2004 and OSHAS18001 certification for Unit Bhadrachalam are a proof of Quality, Environment, Health and Safety Systems.



PSPD
BHADRACHALAM

Water Conservation Measures implemented

2007-08



S.N	Title of Water Saving project implemented	Year	Annual Water Savings		Invest Rs. Lakhs	Payback Period (Months)
			m ³	Rs. Lakhs		
1	Reduction by installation of push type buttons at toilets to reduce 300m ³ /d of domestic water consumption.	2007-08	109500	2.74	0.50	2.2
2	Reuse of Causticizing CD filter, compressor and pump sealing water for log washing to save 900m ³ /d	2007-08	264000	6.60	11.30	20.5
3	Reusing of PM-5 lean tank excess back water for tower dilution at bleached tower suction to save 250m ³ /d	2007-08	82500	2.06	11.30	65.7
4	Installed Disc filter for PM-5 top layer to recycle the back water to save 1100m ³ /d.	2007-08	36300	9.08	105.00	138.80
5	Reuse of SRB-3 HBL tank pumps sealing water as Evaporator-3 cooling tower make up to save 100m ³ /d.	2007-08	33000	0.83	1.60	23.3



PSPD
BHADRACHALAM

Water Conservation Measures implemented

2007-08



6	Reuse of Effluent secondary clarifier outlet water for floor cleaning of Evaporator 3 & Causticizing plant to save 200m ³ /d	2007-08	66000	1.65	2.45	17.8
7	Reuse of Pulp sheeting machine backwater for pulper slushing at St-A&B to save 150m ³ /d	2007-08	49500	1.24	1.85	17.9
8	Reuse of sand filter blow down water from TG 5, as make up for TG5 Cooling tower to save 100m ³ /d	2007-08	33000	0.83	0.65	9.5
9	Rectification of 20 numbers of leakages through on-line water leaks arresting method in the mill to save 250m ³ /d	2007-08	82500	2.06	0.87	5.1
10	Reuse of Evapara tor-4 Pumps sealing water as make up for cooling tower to save 450m ³ /d.	2007-08	148500	3.71	3.50	11.3



PSPD

BHADRACHALAM

Water Conservation Measures implemented

2007-08



11	Reuse of PM-1,2 & 3 hydraulic stations , & vacuum condenser cooling water for PM-2 & 3 high pressure showers to save 200m3/d of fresh water	2007-08	66000	1.65	3.78	27.5
12	Recycling of LimeKiln-2 vaccum pump sealing water through cooling tower to save 450m3/d	2007-08	148500	3.71	4.50	14.5
13	Recycling of SRB4 spout cooling water, SWAS panel cooling water to raw water clarifies to save 250m3/d	2007-08	82500	2.06	2.50	14.5
14	Reuse of cooling tower blowdown water for Evap- 3 & 4 vaccum pp sealing water purpose to 500m3/d	2007-08	165000	4.13	5.00	14.5
15	Reuse of excess pulp sheeting machine backwater for D1 dilution screw at NFL-1 to save 700m3/d for 7 days in a month	2007-08	58800	1.47	4.50	36.7
TOTAL			1752300	43.81	159.3	43.60



PSPD

BHADRACHALAM

Summary of Water Conservation

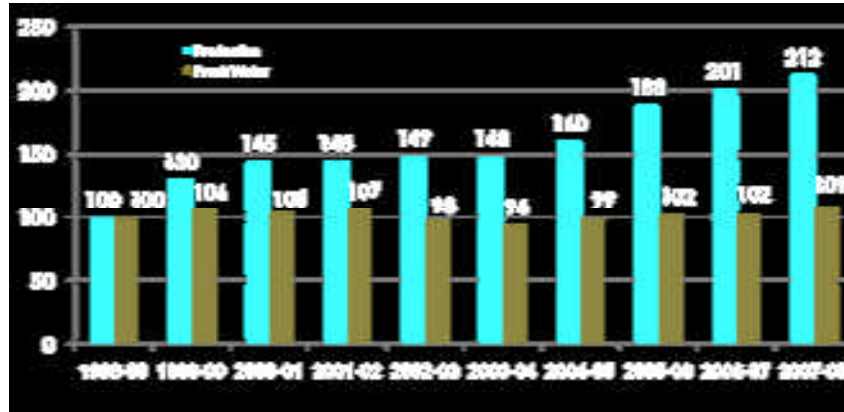


Year	Water savings (m3)	Savings (Rs. Lakhs)	Investment (Rs. Lakhs)	Payback (Months)
2004-05	579150	5	5	12
2005-06	2175690	49	237	58
2006-07	1136800	49	52.2	13
2007-08	1752300	44	159.3	43.6



PSPD
BHADRACHALAM

Production Vs Fresh water intake

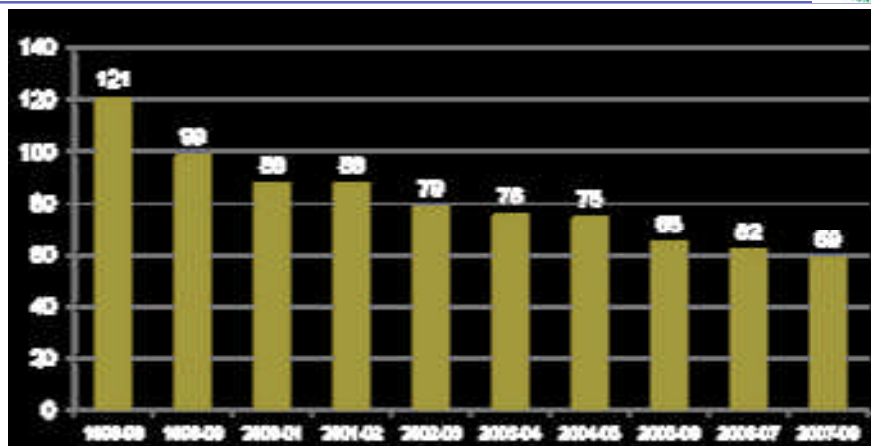


Even when production has more than doubled since last 10 years, fresh water intake has increased by only 9%. Achieved majorly by reduction, reuse and recycling approach through in-house efforts and technology route.



PSPD
BHADRACHALAM

Specific water consumption

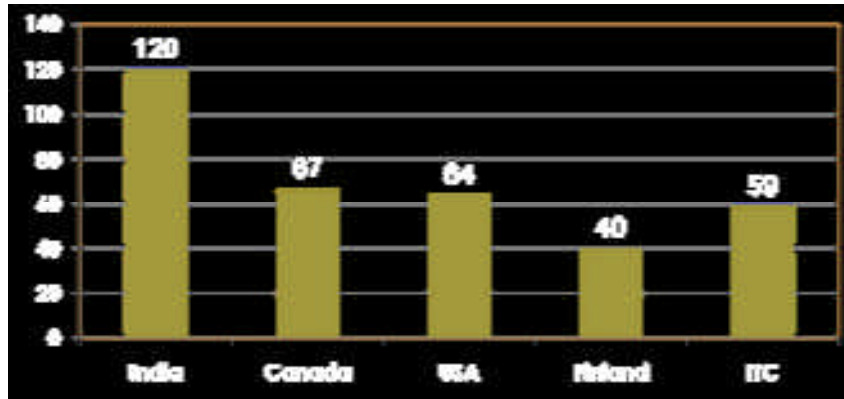


Consistent efforts for water conservation over a decade through 3R has resulted in 51.2% reduction in specific water consumption for decade and 21.33% reduction in last four years.



PSPD
BHADRACHALAM

Global Benchmark



Source: National Productivity Council, New Delhi
Final report on water conservation in pulp and paper sector.
Table 14: Region/Country specific average water consumption in large scale wood based pulp and paper mills, (Page 48/115)



PSPD
BHADRACHALAM

Roadmap towards Global benchmark

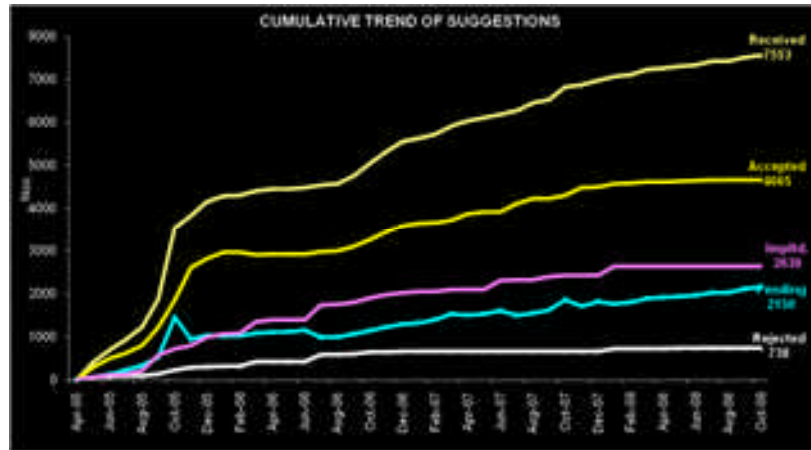


- (A) Capacity utilization
 - to reduce specific water consumption
 - to reduce water usage for non productive purpose
- (B) Technology up gradation
 - to reduce fresh water consumption, waste water generation & improve quality of waste water
 - to built-in water reuse and recycling facilities
- (C) Employee participation and water audits
 - water & process mapping to identify opportunities
 - to reduce wastage and losses
 - to create awareness & update with latest water conservation techniques and products



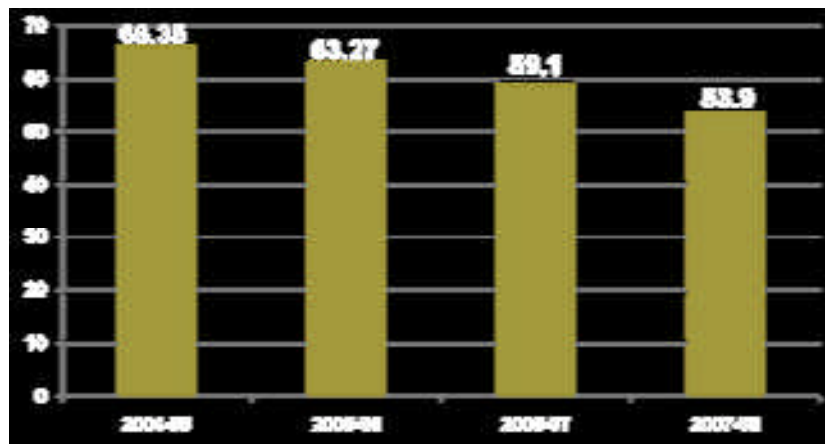
PSPD
BHADRACHALAM

Employee involvement through TPM



PSPD
BHADRACHALAM

Waste water discharge (Kiloliter per tonne)



As per CREP (Corporate Responsibility for Environmental Protection) proposed by MoEF and CPCB maximum limit is 100 kiloliter per tonne



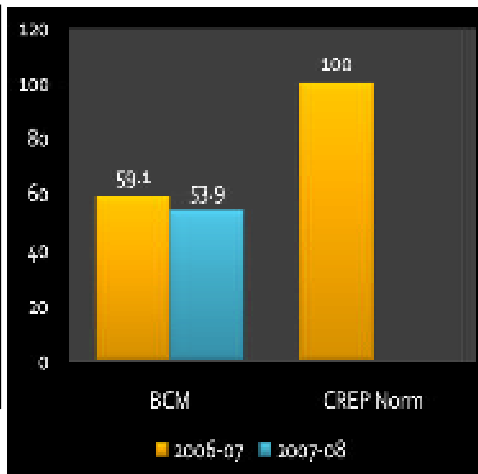
PSPD

BHADRACHALAM

Specific Waste Water Discharge - Standards



Standard	Discharge (KL/MT)
CREP	100
Benchmark *	50
Best Achievable *	53
Relaxed Standard *	63
Bhadrachalam	53.9



CREP: Corporate Responsibility for Environment Protection (CREP) by MoEF,

* National Productivity Council, New Delhi



PSPD

BHADRACHALAM

Quality of Waste Water



Adsorbable Organic Halides (AOX) in the treated waste water have been reduced to 0.011 Kg/ton of production during 2007-08

AOX (Kg/Tonne)	
Bhadrachalam Mill	0.011
Indian Paper/Paperboards Mills*	0.46-0.8
European Paper Industries#	0.03
World Bank Standard**	0.2

*Average as per Comprehensive Industry Document for Large Scale Paper Mills, study conducted by Central Pulp & Paper Research Institute, 2007

CEPI (Confederation of European Paper Industries), Sustainability Report 2007

**World Bank Guideline for New Paper Mills.

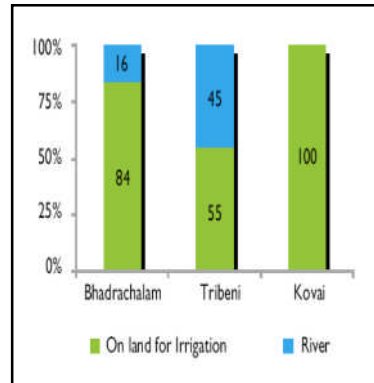


PSPD
BHADRACHALAM

Utilization of waste water



Utilization of treated effluent water for irrigation



Source: ITC Sustainability Report 2008



PSPD
BHADRACHALAM

Innovative project – 1 Ozone bleaching for Fiberline



Trigger:

- Water consumption per ton of bleached pulp is 25m³/t (cooking & fiberline only) is high compared to international standards.
- Color in pulp mill effluent
- Maximize utilization of effluent water for irrigation

Analysis:

- Ozone bleaching is effective at high(35% - 40%) consistency presses

Action:

First installation in India with O₂ generation plant,

Benefits:

- Guaranteed water consumption is 15m³/t
- Reduction in color of pulp mill effluent by 50%.
- Reduction in AOX to 0.1 to 0.01kg/ton.
- ClO₂ consumption reduced by 50%



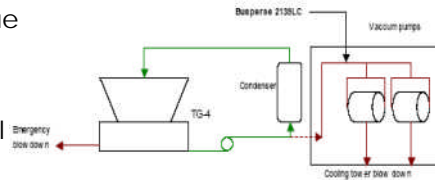
PSPD
BHADRACHALAM

Innovative project – 2 Reuse of cooling tower blowdown



Trigger:

- Once through sealing water for evaporator vacuum pumps due to fouling of sealing water
- Evaporator cooling tower blow down is drained to control COC



Analysis:

Blow down water is not fit for reuse in vacuum pumps sealing purpose due to high TDS. Need for chemical treatment for blow down water to pass through vacuum pumps for sealing purpose

Benefit:

- Chemical treatment of blow down water at inlet of vacuum pumps and draining after usage
- Reduction of 500m³/d of fresh water consumption for sealing.



PSPD
BHADRACHALAM

Innovative project – 3 Recycling through CD Filter for PM5



Trigger:

- Sp water consumption is high for paper machine due to variation in product mix
- Backwater not fit for reuse due to high fiber and filler content

Analysis:

- ClariDisc filter found suitable for recycling of back water for reuse in machine .
- Filter produces super clear, clear and cloudy filtrate to be used for specific application.



Benefit:

- Recycling of 1000m³/d of back water (capacity is 3000m³/d)
- Recovery of fiber by using cloudy filtrate at tower dilution purpose



PSPD

BHADRACHALAM

Sustainability through Monitoring & Reporting



Monitoring & Reporting:

- 4 Entire plant is DCS operated for control and consistent operation.
- 4 Monitoring of water and energy consumption on real time basis.
- 4 Norms for water consumption; plant wise and process wise.
- 4 EC Cell to monitor consumption daily basis against norm and report back any deviation seeking reasons from HOD.
- 4 Metering facility over entire plant integrated with DCS.
- 4 Total employee participation through mill wide TPM initiative to promote water conservation.
- 4 Water conservation as KRA for managers in their annual appraisals.
- 4 Capital scheme for water conservation with 5-7 year payback is implemented.



PSPD

BHADRACHALAM

Sustainability through Monitoring & Reporting



Monitoring & Reporting:

- 4 Monitoring on shift basis, process plant drains leading to ETP to monitor discharge of effluent water and characteristics.
- 4 Water audits are carried out annually through experts.
- 4 Water balance carried out on monthly basis, department wise.
- 4 Capital and revenue budget to for audits and implementation of proposals.
- 4 Water flow meters at water intake and discharge are regularly calibrated as per ISO schedule
- 4 IMIS reports for daily and monthly consumption and discharge.
- 4 Monthly review against the norms for improvement



PSPD
BHADRACHALAM



Thank You