



NATIONAL AWARD
FOR

“EXCELLENCE IN WATER MANAGEMENT – 2007”

CII-GBC, Hyderabad

29th & 30th Nov 2007

N K Agarwal, Asst Vice President (Utilities & SHE)

Indo Rama Synthetics (I) Ltd.

Butibori, Nagpur

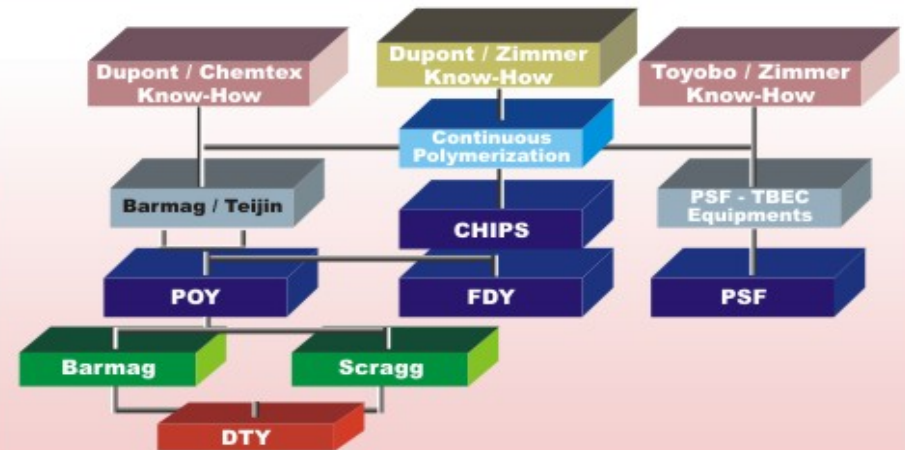
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INDO RAMA AT A GLANCE

Production Capacities (MT Per Annum)

Products	Plant-I [TPA]	Plant-II [TPA]	Total [TPA]
PSF (Polyester Staple Fiber)	1,55,000	1,45,000	3,00,000
POY (Partially Oriented Yarn)	1,12,000	1,30,000	2,42,000
FDY (Fully Drawn Yarn)	16,000	-	16,000
Polyester Chips	18,000	24,000	42,000
Total Production	3,01,000	2,99,000	6,00,000
DTY Production (Draw Texturised Yarn)	44,000	-	44,000

Technology Edge



Material Movement



1,50,000 Metric Tons / Month of material movement to and fro from Butibori Plant.

Highlights

- ▶ Second Largest Polyester Manufacturer in India
- ▶ Green Company – FICCI
- ▶ Most Efficient in Energy Conservation

System Oriented Company

- ▶ ISO-9001 [QMS]
- ▶ ISO-14001 [EMS]
- ▶ OHSAS - 18001

Vision

“A globally acclaimed company with a strong environmental commitment to improve the quality of life of employees & communities we serve and create sustained stake holder value across businesses.”

MISSION

By leveraging our national leadership position and strengths in

- State of art Technology
- Scale efficiency of operation
- Brand Image

We strive

ØTo **expand** our leadership position to attain global presence.

ØTo **continuously** create new opportunities for growth in our strategic businesses.

ØTo **maximise** creation of wealth, value and satisfaction for all the stake holders.

ØTo **cultivate** high standards of Business Ethics and Total Quality Management for a strong Corporate identity.

ØTo **achieve** International standard of Excellence in all spheres of operation by fostering a culture of participation and innovation by preserving ecological balance and heritage through a strong environment conscience.

List of Major Certifications and Awards



- #CII-National Water Management Award-2004
- #CII-National Water Management Award-2006
- #CII-Leadership & Excellence award in Safety, Health & Environment – 2004 & 2006
- #Best Exhibit Award-2004 by MPCB
- #MEDA-Energy Conservation Award & Certificate – 2004 & 2005, Short listed for 2006
- #ISO – 9001 (2000) Certification
- #ISO – 14001 (2004) Certification

Indo Rama selected as Green Company amongst few in India by FICCI

Other Recent Achievements

Ø Indo Rama participated in National level Convention on Quality Circles from 20th Dec - 23rd Dec 2006 at IIT, Kanpur.

Total 514 teams gave their presentations

- 1. Indorama team won Excellent Case Study Award in Kaizen.**
- 2. Indorama Quality Circle "Udaan" (CP Team) won Distinguish Award**
- 3. Operator - CP2/3 - Won Best Poster Award**

Ø In the field of export & import through ICD Nagpur for the year 2006, Indo Rama was awarded with following awards by CONCOR

- 1. " 2nd HIGHEST EXPORTER THROUGH ICD NAGPUR " Award**
- 2. " 3rd HIGHEST IMPORTER THROUGH ICD NAGPUR " Award**

COLLABORATOR / EQUIPMENT SUPPLIERS

© E.I.DuPONT, USA

© CHEMTEX INTL. INC., USA

© TOYOBO, JAPAN

© LVD, BELGIUM

© FOXBORO, SINGAPORE

© RIETER AUTOMATIK, GERMANY

© FUJI, JAPAN

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© LTG AMELIORAIR, FRANCE

© WARTSILA DIESEL, FINLAND

© BERTRAMS, SWITZERLAND

Alliance with Zimmer
AG for expansion

Panaromic view of Indorama.....





Partnering for Synergy



Continuing the emphasis to deploy “the Best resources” across all its processes, Indo Rama has outsourced its non-core functions for enhancing the value and driving efficiencies by leveraging the partner’s core strengths & expertise –

Power Generation



Wartsila Diesel, Desein

I T



Accenture

F&A



Accenture

Stores



TCI

ENVIRONMENTAL POLICY

We, at Indo Rama Synthetics [I] Ltd. (IRSL) are committed to carry out the Production & associated activities of Polyester Yarns, Fiber & Chips in an environmentally conscious manner and protect Environment.

To accomplish this, we shall :

- Follow a systematic approach to achieve continual improvement in environmental performance.
- Comply with relevant environmental legislation, regulations & other requirements.
- Adopt resource conservation and / or recovery measures to prevent pollution.
- Ensure Zero discharge by recycling of wastewater after treatment.
- Ensure appropriate and safe operational practices.
- Promote awareness among employees and contractors / vendors for shared responsibility towards environmental protection.

C.V. Khandelwal
Chief of Operations

R.S. Singhvi
President

Vishal Lohia
Occupier

Water Conservation

List of Projects implemented during 2003-07

1.Reduction at source

- Minimise water spillage/wastage from desert coolers
- Minimise steam consumption in CP & PSF Plant
- Avoid wastage of water (Auto operation of tanks)
- Reduction of cooling tower blow down water (Improved chemical treatment)
- Reduction of Fire hydrant water loss (Cathodic Protection)
- Reduction of loss from urinals (Auto flush system)
- Reduction of consumption in canteen (Contractor made responsible)
- Reduction of steam consumption through cascade system (Zimmer technology based PSF Plant)
- Reduction of steam in CP (Zimmer technology based glyocol ejector)
- Reduction of drift loss in cooling towers (Replacement of eliminators)
- Reduction of water consumption in colonies

2.Reuse of water/steam/condensate

- Conversion of condensate to flash steam & its use in place of fresh steam
- Maximise reuse of condensate in boilers (Prioritisation before use of BFW)
- Reuse blow down water for gardening

3. Recycle

- Recycling of treated effluent in towers as makeup (Achieved zero effluent disposal target)
- Recycling of TEG boilout water
- Recycling of ACF backwash water in to process
- Recycling of water from dewatering system (During construction phase)
- Recycling of AHU's moisture (condensed from air)

4. Recovery

- Condensate from air moisture & steam traps
- Air vent water recovery
- Recovery of soak pit sewage effluent (Diversion of soak pit water to STP)
- Recovery of process generated water as process effluent into tower after treatment
- Recovery of rain water harvesting through underground sewage network
- Recovery of spin finish by its recycling in to PSF process

Summary

- Investment – Rs 93.61 lacs
- Annual Savings – Rs 87.25 lacs
- Payback – 12.9 months

Tools used for Water Conservation Activities

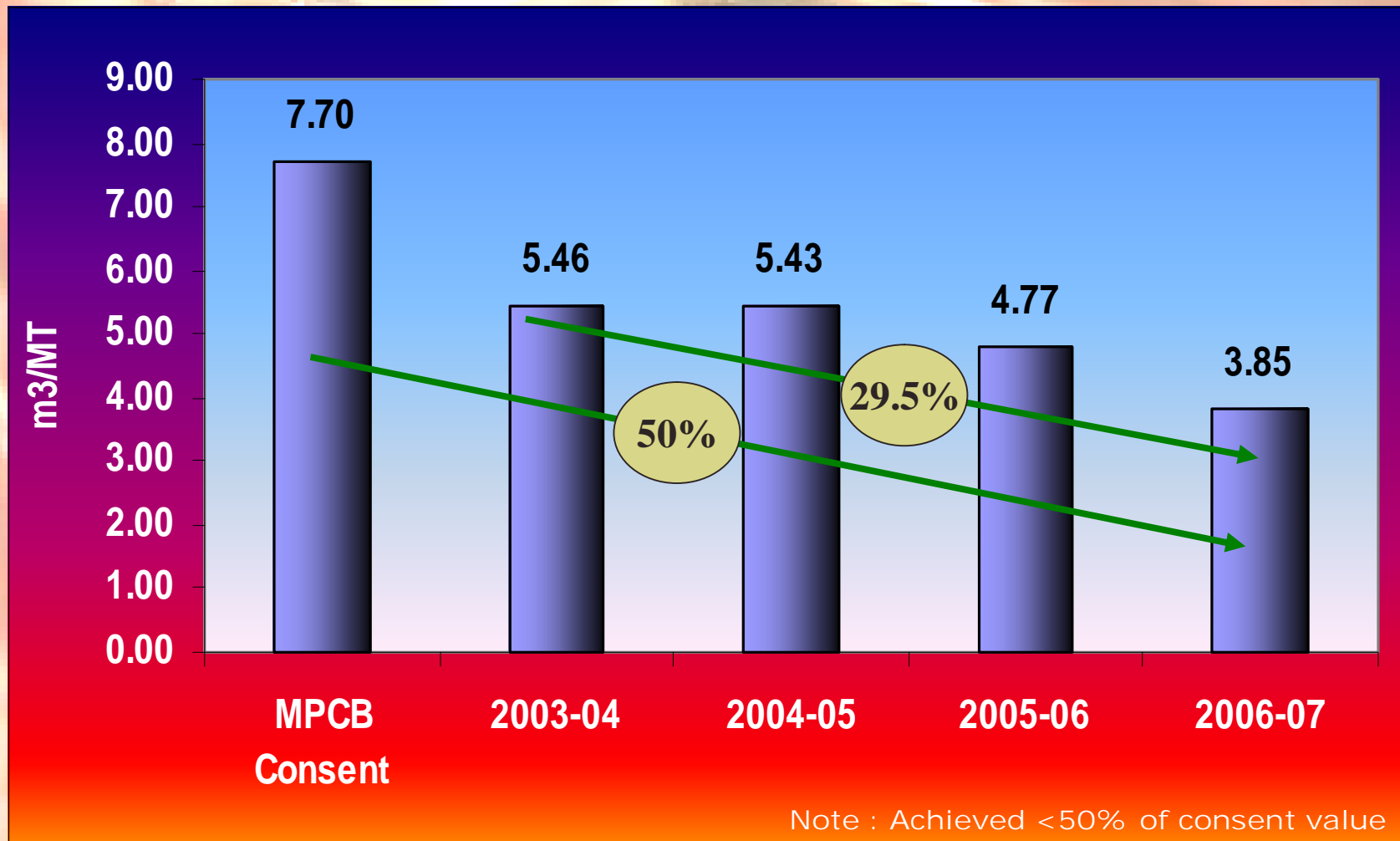
- Pie chart for distribution of water consumption
- Why-Why analysis for root cause analysis
- 4W-1H format for water conservation action plans
- Daily water balance reporting
- Regular audit of drinking / filter water points
- Storm drain audit on regular basis
- Outside boundary wall checking (zero effluent concept)
- Trend graphs for consumption monitoring
- Recycling of about 600 m³/day rain water harvested through underground network of sewage collection
- Review in every business review meeting at CMD level

√ In spite of very low contribution of water cost to sales turnover (<0.1%), its availability in plenty in Butibori & low cost as compared to major towns, Indo Rama has given due importance to water conservation efforts since beginning.

√ Achieved through focus on 4 R's – Reduction at source, Reuse, Recycle & Recovery. As a conscious effort, we have added 5th R – Rethink à Open mind towards efforts for resource conservation

Reduction in Water Consumption (SBU Poly)

(Industrial + Plant Domestic)



Waste Water Generation & Discharge Details (Industrial)

Year (April- March)	Quantity generated (m ³)	Quantity recycled (m ³)		Quantity discharged (m ³)		Waste Water Discharge/ Ton of Product
		(m ³)	%	(m ³)	%	
2003 – 04	274467	192483	70.13	81984	29.87	0.30
2004 – 05	250818	173803	69.29	77015	30.71	0.29
2005 – 06	235877	170773	72.40	65104	27.60	0.28
2006 – 07	283009	191260	67.58	91749	32.42	0.27


Waste Water Generation & Discharge Details (Domestic)

Year (April- March)	Quantity generated (m ³)	Quantity recycled (m ³)		Quantity discharged (m ³)		Waste Water Discharge/Ton of Product
		(m ³)	%	(m ³)	%	
2003 – 04	494587	494587	100	0	0	0
2004 – 05	559544	559544	100	0	0	0
2005 – 06	565103	565103	100	0	0	0
2006 – 07 *	565260	431612	76	133648	24	0.39

* Recycled quantity is less than generated quantity as major quantity was used in construction activities for expansion project & left out for gardening.

Thermosetting process in new PSF Plant

Background

- Polyester staple fibre (PSF) is manufactured in both our old and new plants. Both the plants are of different technology. Old plant is based on Toyobo, Japan and new plant on Zimmer, German technology. 
- During the manufacture of PSF, fibre has to pass through thermosetting unit. In this unit fibre tow is heated under tension and defined conditions of relaxation (heat-setting or thermosetting). The heat-setting changes the fibre morphology and allows the properties of the fibre tow to be adapted to end-use requirements.
- In the thermosetting unit the tow is fully dried and consequently thermoset on rollers which are uniformly heated by steam as a heating media. The heat-setting temperature is between 150 and 220 deg C, depending on the shrinkage desired.

Thermosetting process in new PSF Plant

Edge over Technology

- In the old PSF plant, steam is supplied to rollers at 24 bar for heat transfer to fiber tow & taken from other end at same pressure as a condensate. The condensate after flash vessel is pumped back to Boiler while flash generated low pressure steam is used for jacketing purpose.
- In new PSF plant, the thermosetting consist of three zones having six rolls each. The steam is supplied to third zone at 24 bar through pressure control valve. The condensate of third zone is flashed & flash steam is supplied for II zone, again the condensate of II zone is flashed & flash steam is supplied for I zone. The flash steam from the condensate of I zone is used for various low pressure steam purpose. Finally the condensate after flash tank of I zone where the pressure is around 3.0 bar sent back to the boiler. This steam cascading system ensures maximum utilization of steam heat energy.
- Due to right selection of new technology, fibre of good quality is manufactured with less steam consumption, ultimately resulting in saving of water.

Thermosetting process in new PSF Plant

Analysis

-Old Toyobo Technology

Specific Steam Consumption – 1 MT of steam/MT of PSF production

Average PSF production – 400 MT/Day

Hence, steam consumption – 400 MT/Day -----(A)

-New Zimmer Technology

Specific Steam Consumption– 0.68 MT of steam/MT of PSF production

Average PSF production – 400 MT/Day

Hence, steam consumption – 272 MT/Day -----(B)

-Cost benefit analysis

Saving in steam consumption (A) – (B) => 128 MT/Day

Hence, saving in DM water consumption => 128 M³/Day

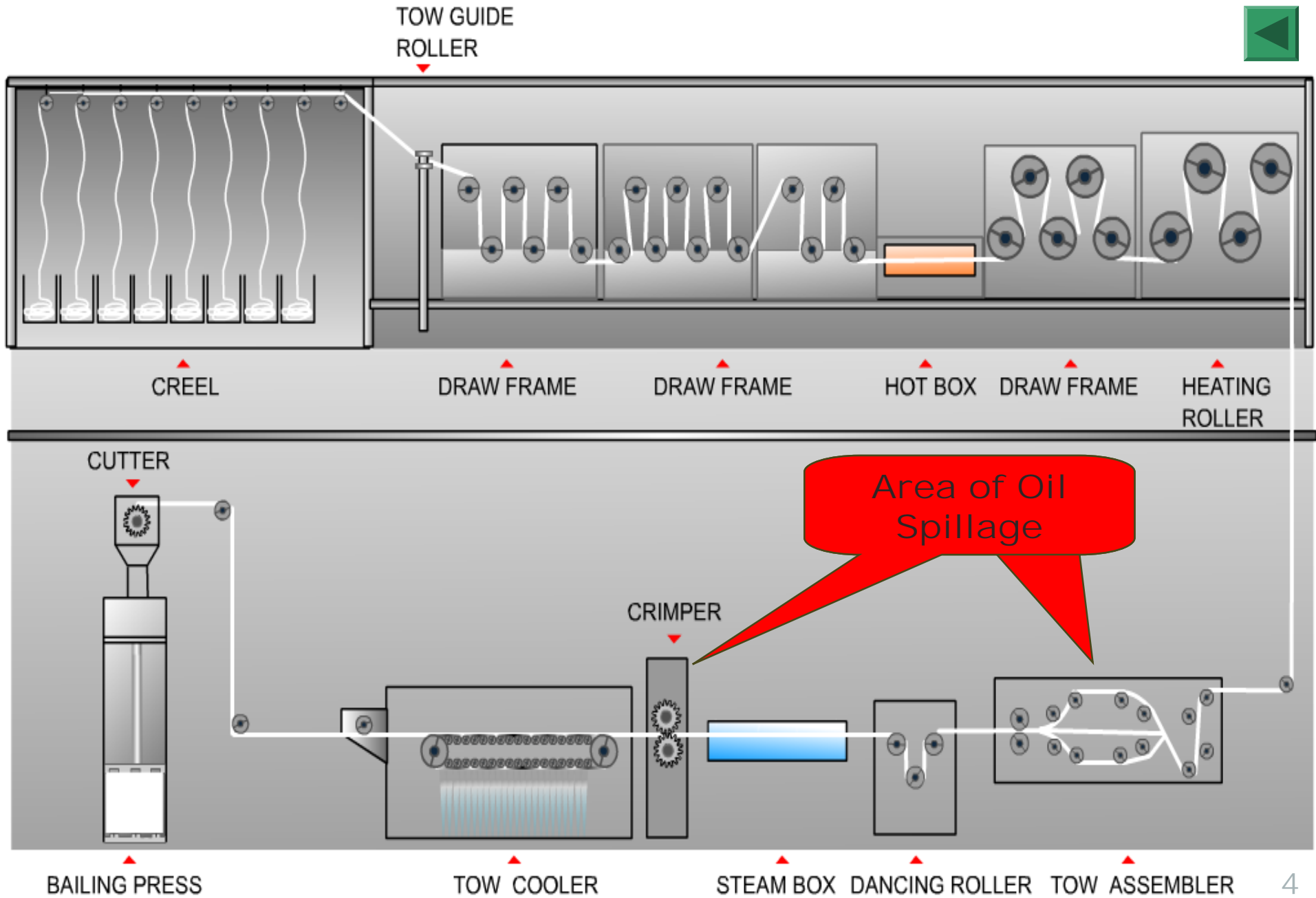
Cost of DM Water => 20 Rs/M³

Hence annual DM water saving => 46,720 m³ or Rs 9.34 lacs

Other benefits

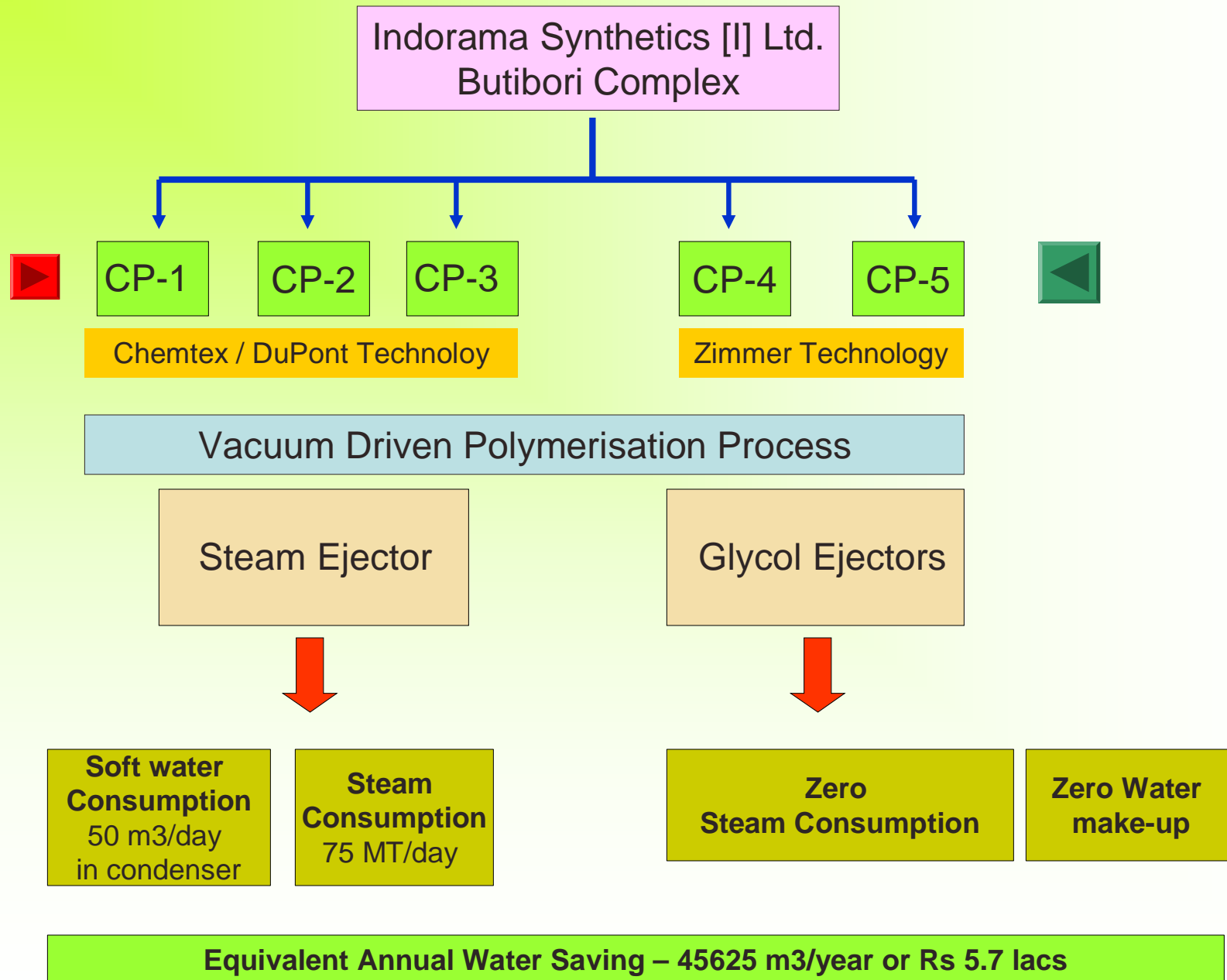
1. Annual coal saving => 8800 MT or Rs 185 lacs

2. This project is under registration as CDM project



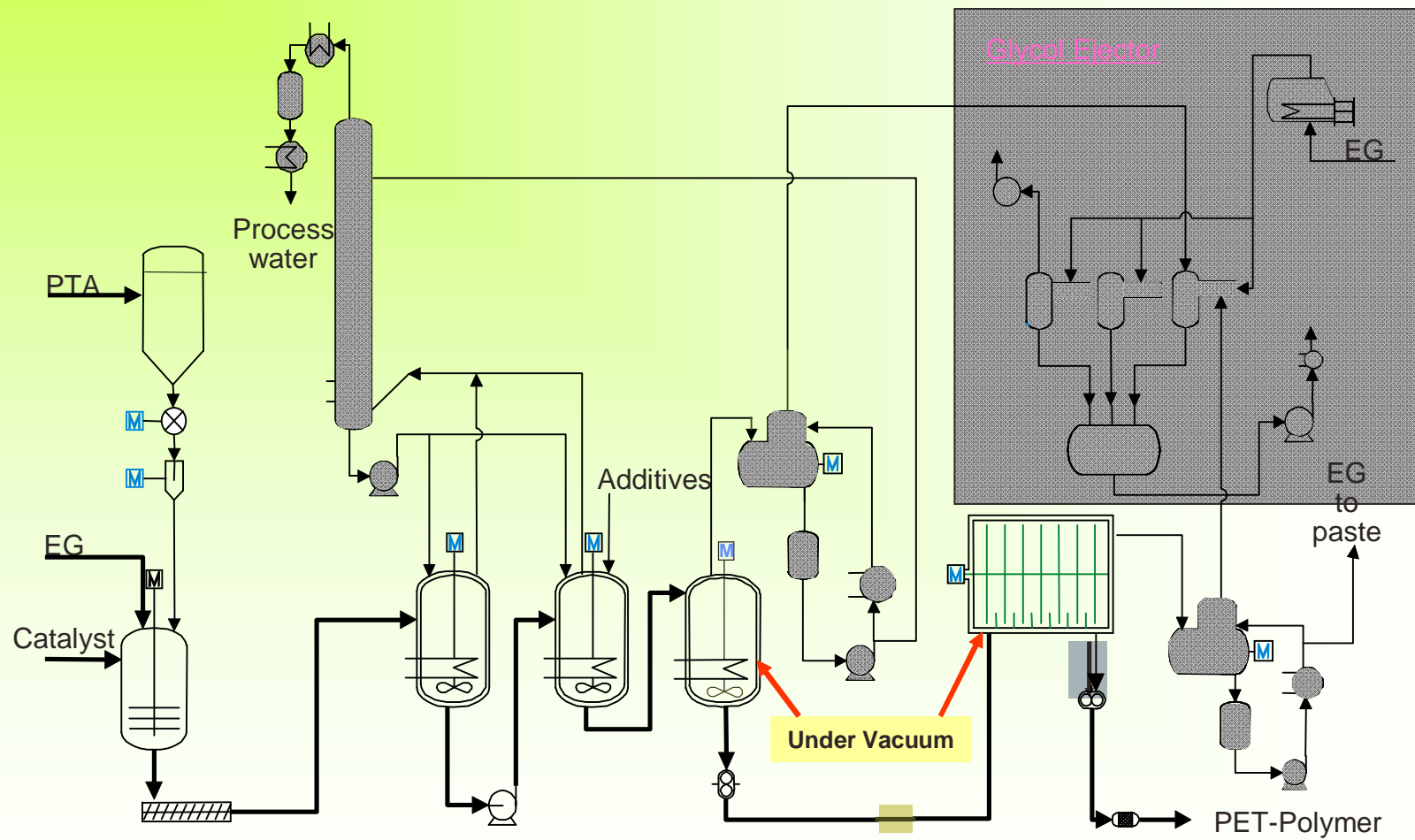
Water saving due to selection of right technology

Innovative Project-2



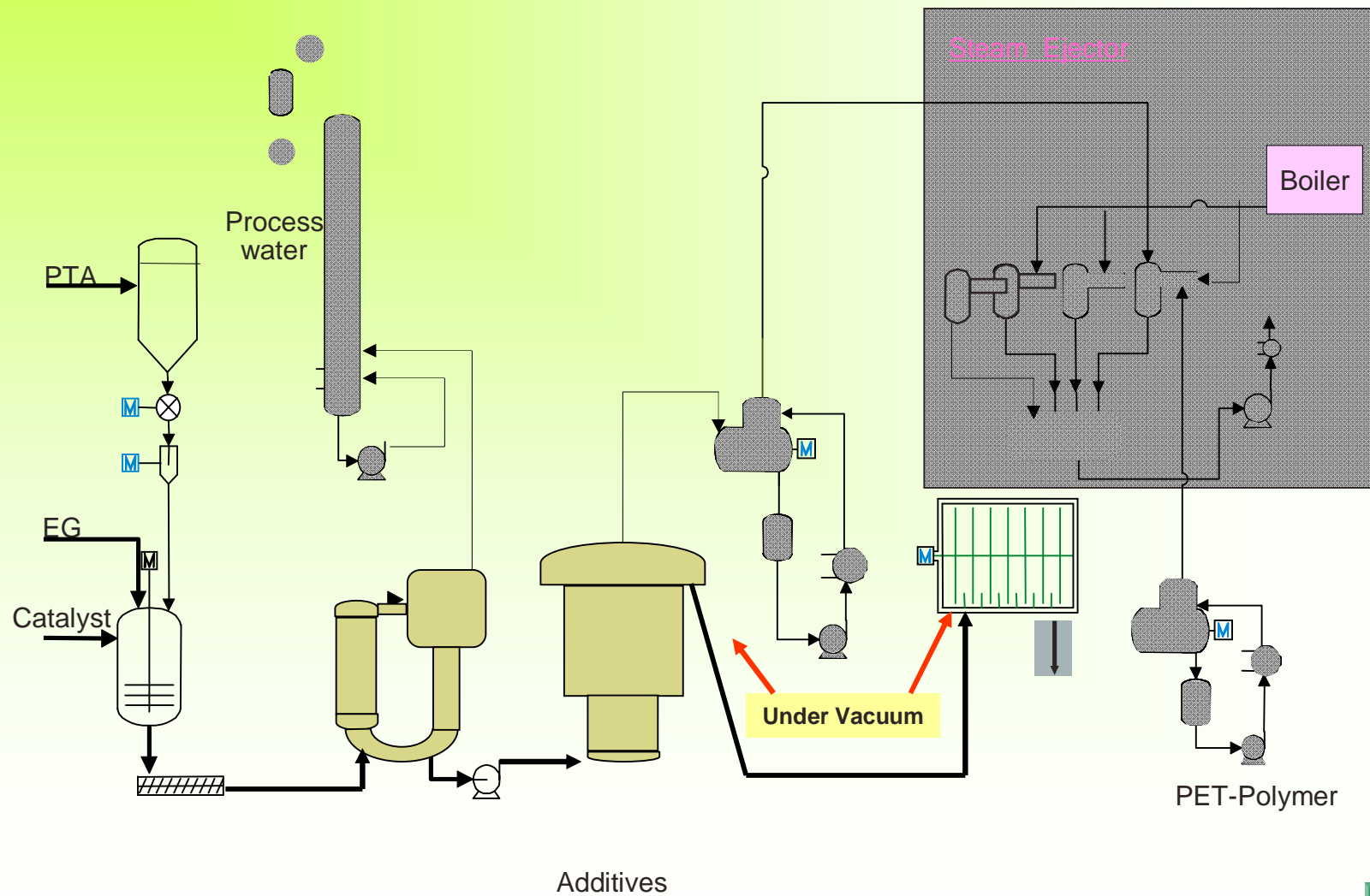
Innovative Project-2

Zimmer's 4 Reactor Continuous Polycondensation Process



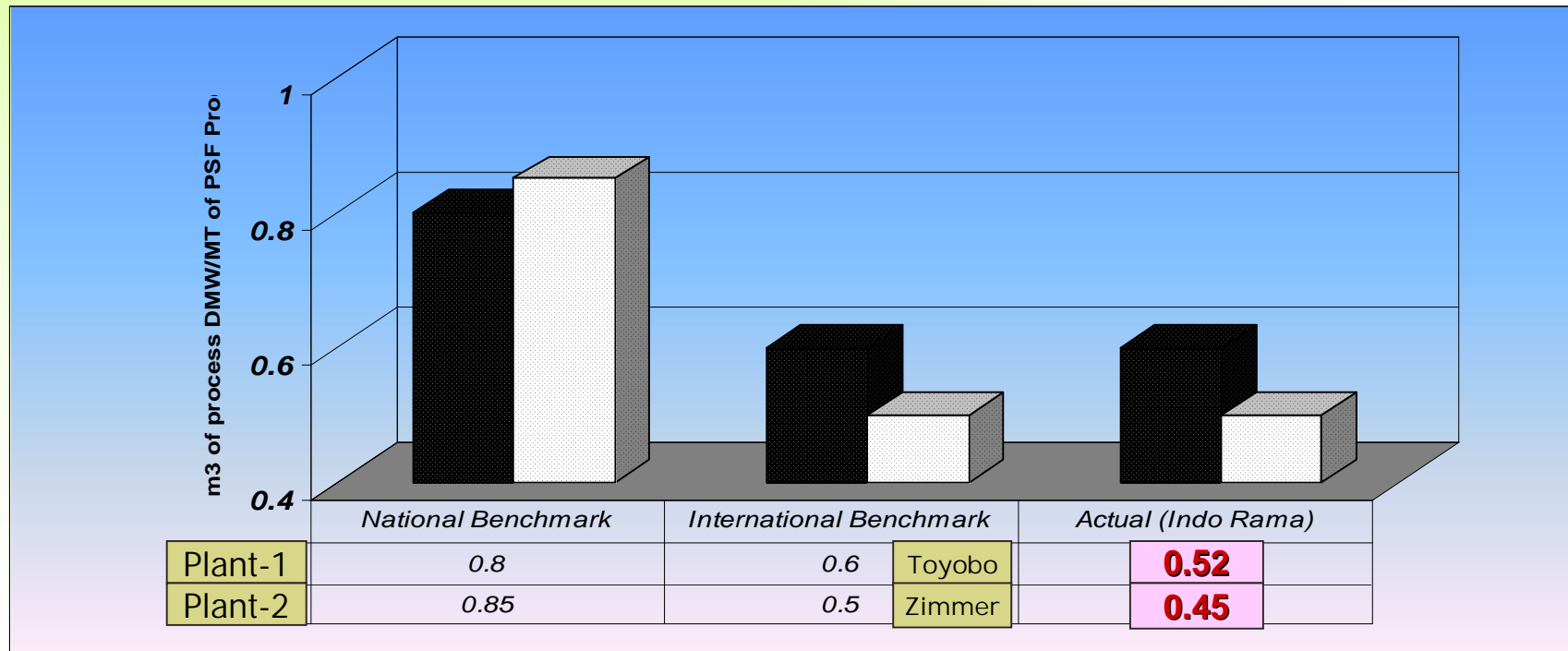
Innovative Project-2

Chemtex / DuPont's 3 Reactor Continuous Polycondensation Process



DM Water saving in PSF plant

- In old PSF plant, due to in-house modifications in system such as spin finish recycling, stoppage of overflows etc, specific DM Water consumption is improved to 0.52 against international technology supplier - Toyobo, Japan norm of 0.6
- Specific DM Water consumption in new Zimmer, Germany technology based PSF plant is 0.5. Due to good operational practices, recycling of spin finish back in to process and avoidance of overflow, we have achieved 0.45



Monitoring & Reporting system followed at Indo Rama

- Utility dept monitors the water consumption on daily basis. Daily water mass balance report is prepared. Water consumption figures are also highlighted in Daily Utility Performance report. Both these reports are circulated to concerned depts.
- Chief of Operation reviews the water consumption alongwith other Utility figures in Plant review meeting on alternate day. Any deviation is discussed/studied in details. Also, the water conservation issues are reviewed in this meeting. Accordingly, corrective actions are decided on regular basis.
- Total Water System audit is done by Workers / Staff team once a fortnight and problems attended immediately.
- Outside boundary wall checking once a fortnight and inside drains once a month is done to ensure strict compliance to zero effluent discharge concept. It further ensures min consumption of water by maximization of treated effluent recycling.
- Water monitoring cell receives suggestions / attends all complaints / issues related to water consumption / effluent recycling on regular basis.
- Environment committee meeting under the chairmanship of M.R (ISO 14001) is held once every two months to review all aspects of environment, EMP issues as well as water saving issues. The members are drawn from workers & staff from all plants / areas.
- The monthly / quarterly figures are reviewed in Business Review Meeting held at corporate office under the chairmanship of CMD.

List of activities carried out for awareness on water conservation in Plant, Residential Colony, Local Community etc.

- > By controlled supply of water in both colonies of Indo Rama & plants, all concerned (Gents, Ladies, Children, Labours, Local community) are already made aware about water conservation.
- > Every year Environment Day is celebrated at site. Environment Day celebration includes various competitions like Poster, Slogan, Quiz, Drama, Group song, Essay, Cross word Puzzle etc. Main emphasis is given on water conservation / management. It covers all employees.
- > Lectures are arranged periodically on Water Management to the company employees as part of ongoing skill/knowledge enhancement programme (conducted by Training Dept.).
- > Through Ladies club, various competitions on different aspects of water are held among children & ladies.
- > Related topics are covered through Video coverage relayed to all houses in Indo Rama colonies through Main Club.
- > Slogans on "Water Conservation" are displayed throughout factory. "Water Conservation" stickers & posters are provided near water use points/wash basins / toilets etc.

Initiatives taken to improve Environment (Contribution to Society)

- © ***Implemented ISO-14001 (EMS) in 2003-04***
- © ***OSHAS-18001 is under execution***
- © ***Already spent about Rs 141.3 million on installation of various pollution control measures. In addition, recurring O & M expenses of about Rs 147 lacs being met every year***
- © ***Adopted Nagpur Airport for plantation development***
- © ***Provided dust bins in Nagpur city***
- © ***Role model in the field of Environment Management in whole Vidarbha region***
 - © ***NEERI sponsoring visits of scientists from UNESCO, Srilanka, Bangladesh etc to our complex***
 - © ***Unique / Innovative project on Rain water Harvesting (Through sewage system)***
- © ***Aesthetically developed garden at a cost of Rs 85 lacs inside colony - Place of attraction for tourists from far away places***
- © ***Already covered more than 74.5% free area under plantation***
- © ***Generation of gas (Feeding to employees canteen) from Kitchen waste***
- © ***Provided Solar hot water system for central canteen***
- © ***Upgradation of coal dedusting, flyash handling system to reduce fugitive emission towards zero target***

Thank You !

Our Products are White
But
Our Vision is Green



Our Fibre forms the fabric of Your life...



INDO RAMA



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