

# Enhancing Energy and Environmental Performance at Seshasayee Paper and Boards Ltd

Paper Machine no. 5

Presented By  
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[www.spbltd.com](http://www.spbltd.com)

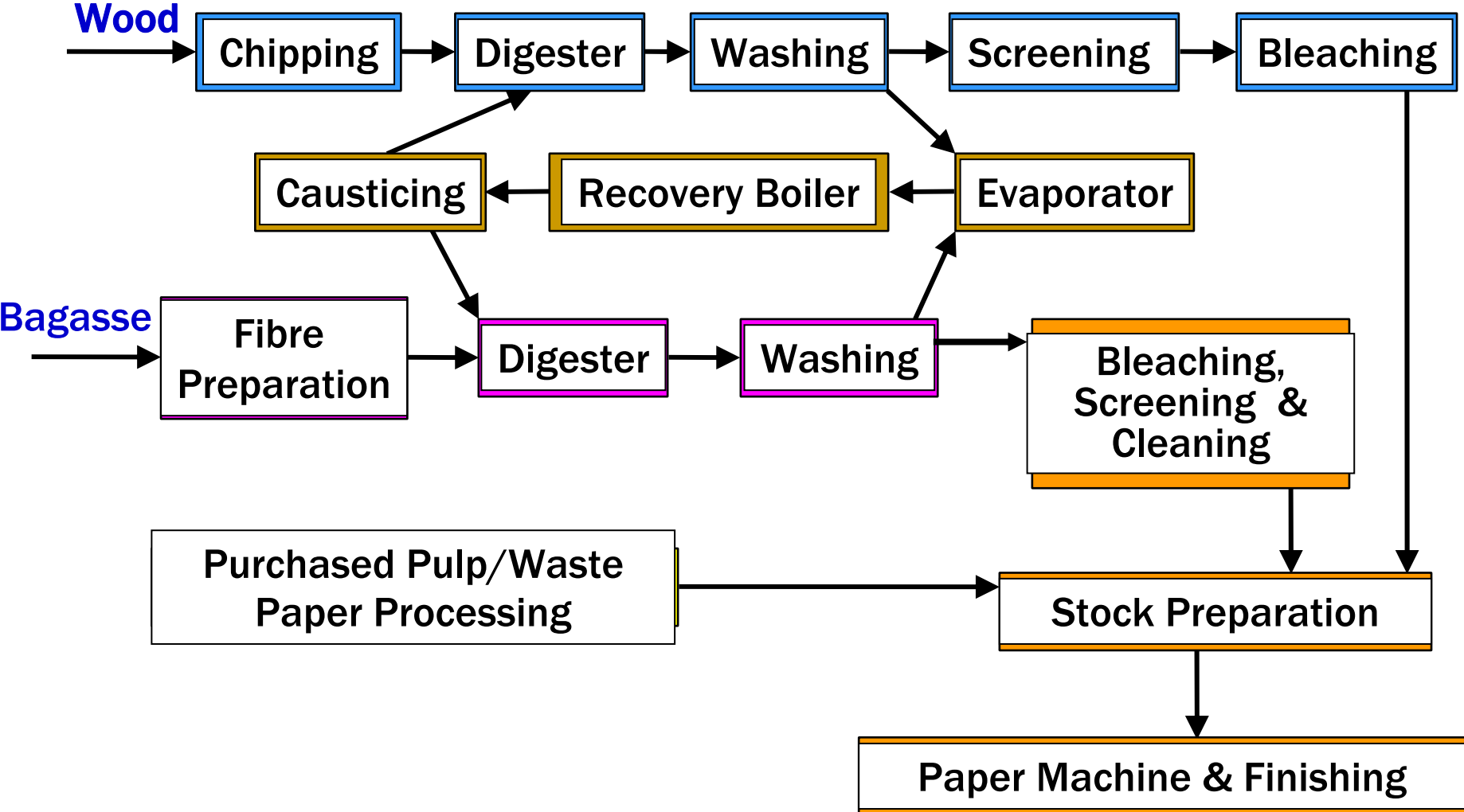
At the Life Long Learning (3L) Workshop in Pulp & Paper Sector  
held at M/s Seshasayee Paper, Erode 638007  
On August 30, 2007



# Contents

- General information
- New Paper Machine no. 5
- Captive Power Plant
- Energy Conservation Measures
- Mill Development Plan

# PAPER MANUFACTURING PROCESS AT SPB

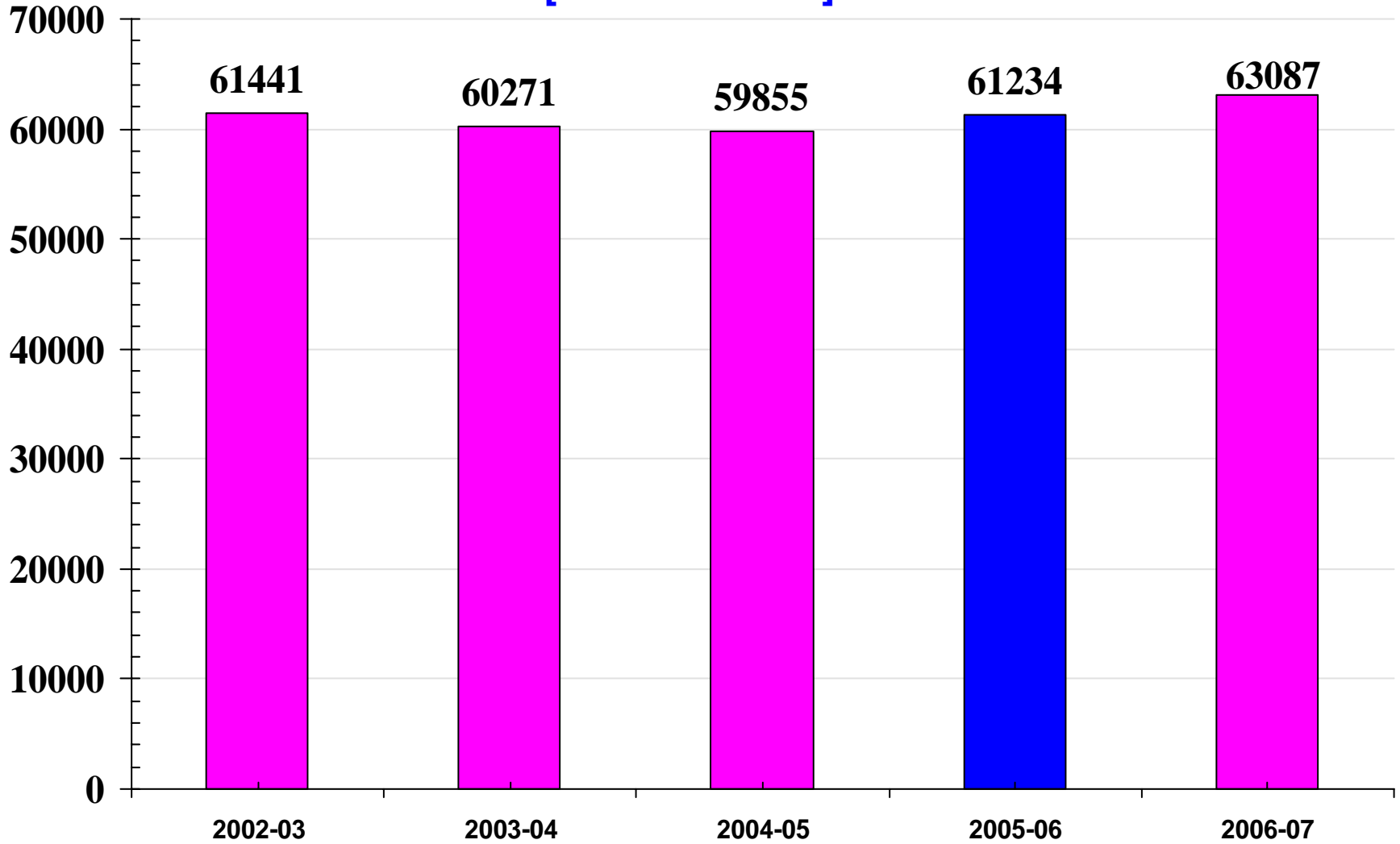


# PRODUCTION

- **Our paper production was around 60,000t /annum in the year 2000.**
- **A project to expand paper production from 60,000 to 115,000 t/annum was completed in the year 2000**

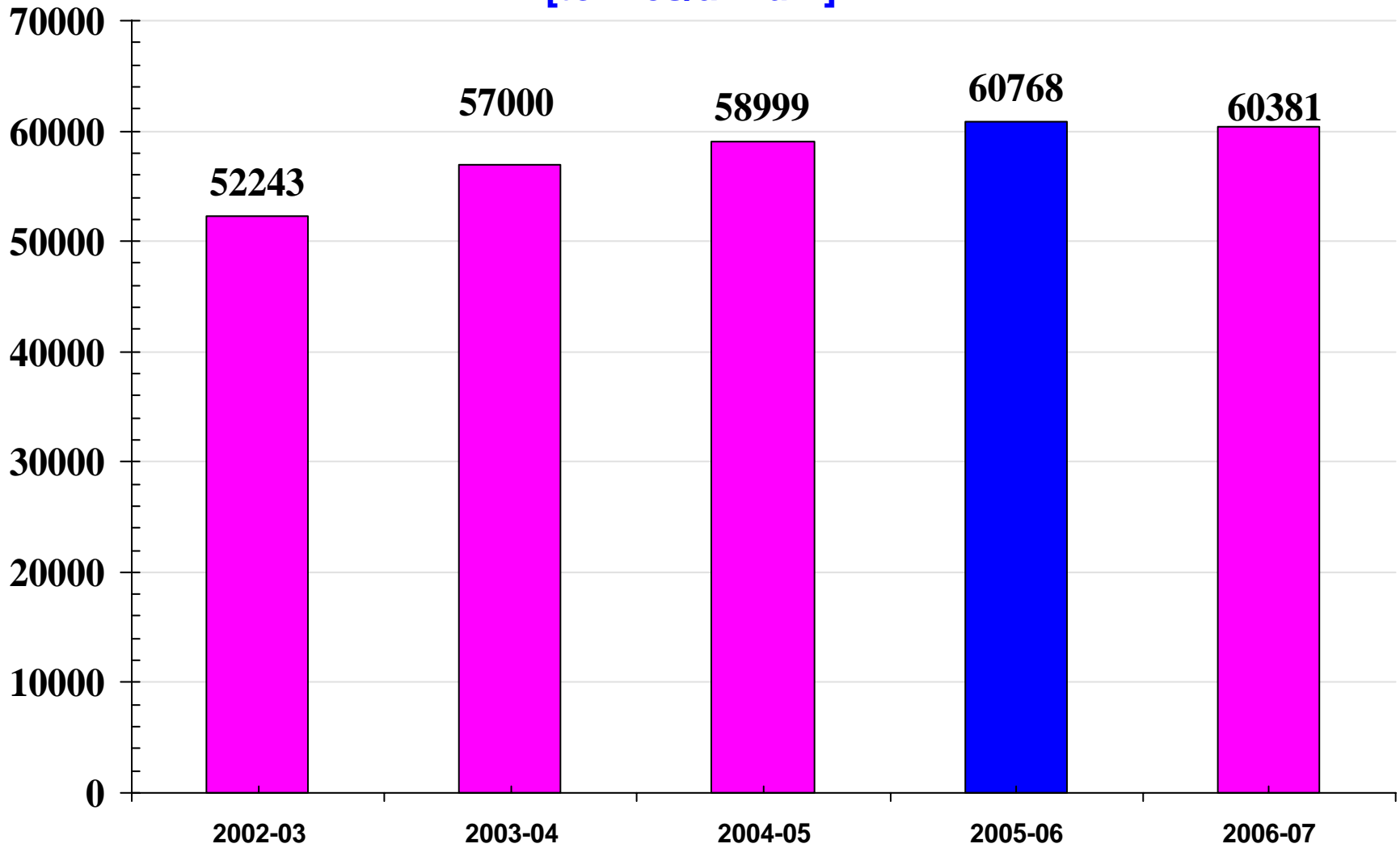
# PRODUCTION – PM#1-4

[tonnes/annum]



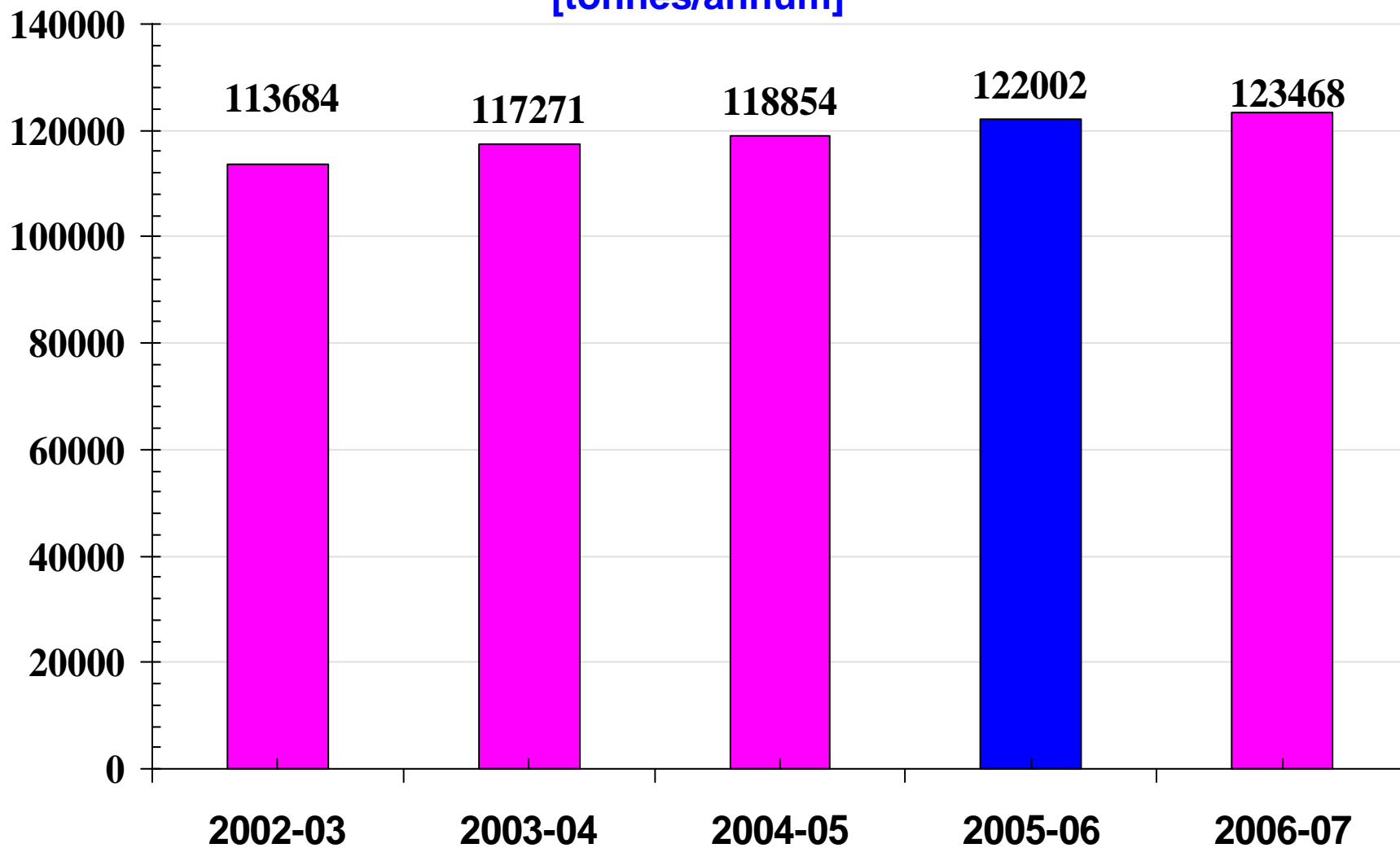
# PRODUCTION – PM#5[MF3]

[tonnes/annum]



# PRODUCTION - TOTAL

[tonnes/annum]

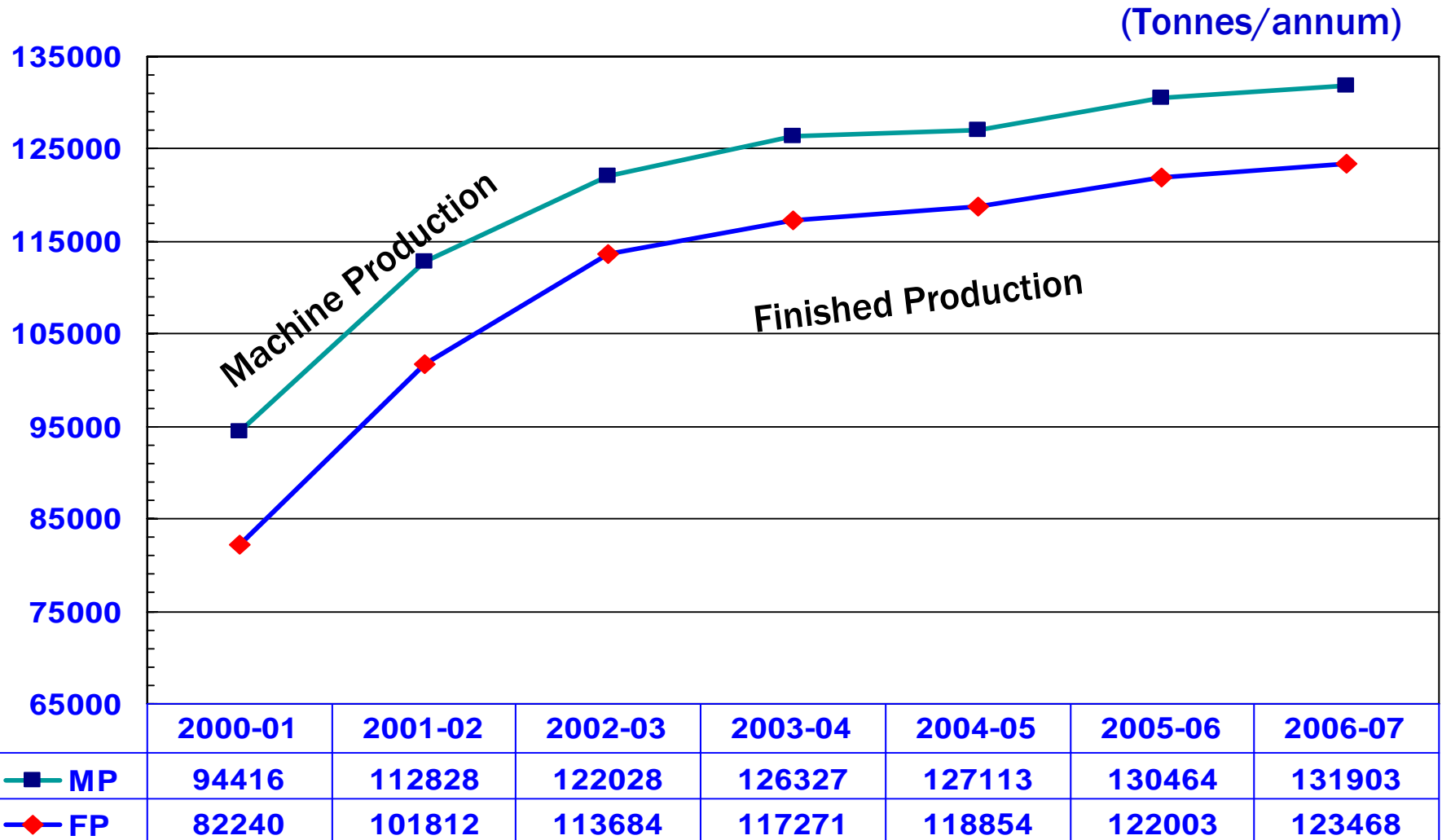


**NEW PAPER MACHINE – PM 5**

# SPB PAPER MACHINES

<b>Machine No. →</b>	<b>1-(MF1)</b>	<b>2-(MG)</b>	<b>3-(YANKEE)</b>	<b>4-(MF2)</b>	<b>5-(MF3)</b>
<b>Make</b>	<b>Black Clawson USA</b>	<b>Black Clawson USA</b>	<b>KMW SWEDEN</b>	<b>INDO BEROLINO INDIA</b>	<b>VOITH GERMANY</b>
<b>Deckle, cm</b>	<b>300/305</b>	<b>300/305</b>	<b>230/234</b>	<b>300/305</b>	<b>280 (Max)</b>
<b>Speed, mpm</b>	<b>100-270</b>	<b>50-240</b>	<b>50-250</b>	<b>100-350</b>	<b>370-1000</b>
<b>Capacity Tons/day</b>	<b>40</b>	<b>55</b>	<b>18</b>	<b>55</b>	<b>165</b>
<b>Machine Configuration</b>	<b>Fourdiriner &amp; Cylinder</b>	<b>Fourdiriner, MG Dryer &amp; Cylinder</b>	<b>Fourdiriner Single MG Dryer</b>	<b>Fourdiriner &amp; Cylinder</b>	<b>Duoformer &amp; Cylinder</b>

# MACHINE PRODUCTION & FINISHED PRODUCTION



# Paper Machine no. 5 - General

- Make : Voith - Second hand Machine (Imported From Miesbach, Germany)
- Grade : Uncoated Woodfree Paper
- Pigment Coated Paper
- Super Calendered Paper
- Grammage : 45 - 120 gsm
- Machine Speed : 370 - 1000 mpm
- Trim at Pope Reel : 2.81 m
- Machine Production at 100% Efficiency : 180 tpd

# Paper Machine no. 5 – Features

- Hydraulic head box with DuoFormer F wire,
- Trinip press,
- Predryer, Post dryer with PV,Closed Hood System and auto humidity controls
- Cascade Steam and Condensate System with good heat recovery system for flash steam and condensate
- Metering size press,
- Two roll calender system
- Distributed Control System,
- Quality Control System
- Drive controls

# STOCK PREPARATION: PM 5

- Refiners 6 Nos. 250 kW Sund's Conflo design for wood & Purchased Pulp (12 kwh/t/SR)
- Energy control in refiners
- Trim Refiner 650 kW Conflo, Sunds (stopped now)
- Deflaker for broke processing
- Three Stage High consistency Thick (cascade)  
Stock Screening supplied by Ahlstrom
- Energy Efficient Ahlstrom agitators

# Approach Flow System – PM5

- Approach Flow System, (Ahlstrom)
- 5 Stage Centrifugation (Primary 57, Secondary 13, Tertiary 4 connected to deculator, fourth & fifth stage 2 each.)
- 2 Stage Screening – (Primary – Hole Secondary-Slot)

# Head Box & Wire

- Head Box:

Hydraulic W Type with top lip, Anti deflection control and Adjustment for jet control.

- Twin Wire: Duoformer Type F

# Tri-nip Press

- Average dryness after III Press 46% - 48%.
- Duocentri II with suction pick up, suction Press, Poly urethane covered crown controlled Rolls in I and III nip position.
- Nip Load (Kgf/cm)
  - I 70
  - II 80
  - III 90

# Dryer – PM 5

- **Dryer Dia** :
- **Cyl. 1 to 11** 1500 mm
- **Cyl. 31** 1200 mm
- **Rest 12-30, 32-45** 1800 mm
  
- **Web Stabilizer** : 7 Nos. supplied by Metso
- for Unirun 1 & II
  
- **Steam pressure** : 3.3 bar
  
- **Steam & condensate system** : Cascade
  
- **Hood and Ventilation supplied** : Closed with PV system  
By Lario Energy – Italy.  
with exhaust heat recovery

# Web Stabilizer

- Elimination of edge fluttering
- Improved runnability
- Speed increase

# Steam and Condensate System

- Cascade System (3 groups in pre-dryer & 2 groups in after dryer)
- Utilization of flash steam, hot condensate for heating the incoming Hood supply air
- Automatic steam pressure control for sheet moisture control

# ABB QCS – PM5

Finishing loss less than 7%,  
about 2% less than Industry  
Standard

- **Model** : Advant - station 500 series operating
- **Station. SW \* 1.8 - 3**
- **Accuray 1190 version. - ABB**
- **Features** : There are two frames for QCS.
- **Frame No.2 before Speed sizer and**
- **Frame No.1 before the reeler.**
- **Frame No.1** : (SP 1200) is having scan based MD/CD
- **caliper, basis weight, moisture**
- **Measurement and profile display.**
- **Frame No.2** : (SP700) is having scan based MD/CD
- **measurement and control of Base paper**
- **weight, moisture and ash and profile**
- **display.**

# PM 5 – size press, calender, reeler

- Speed sizer : Line force 40 Kg/cm
- Max coat weight 10 gsm/side  
(Dryness 76% after coat against 65% in inclined size press)
- Calender : Single stack with single nip
- Swimming roll (soft/steel)
- And top chilled iron roll.
- Reeler : grooved drum with primary
- and secondary arms.

# Conversion in PM 5

- Two winders – 1  
Globe and 1  
Jagenberg winder
- Sheeting facility with  
1 Duplex Sheeter  
and 2 Simplex  
sheeters
- One A-4 Cut pack  
line
- Automatic Reel  
wrapping machine
- Shrink Wrap  
Machine for bundle
- Stretch Wrap for  
reels

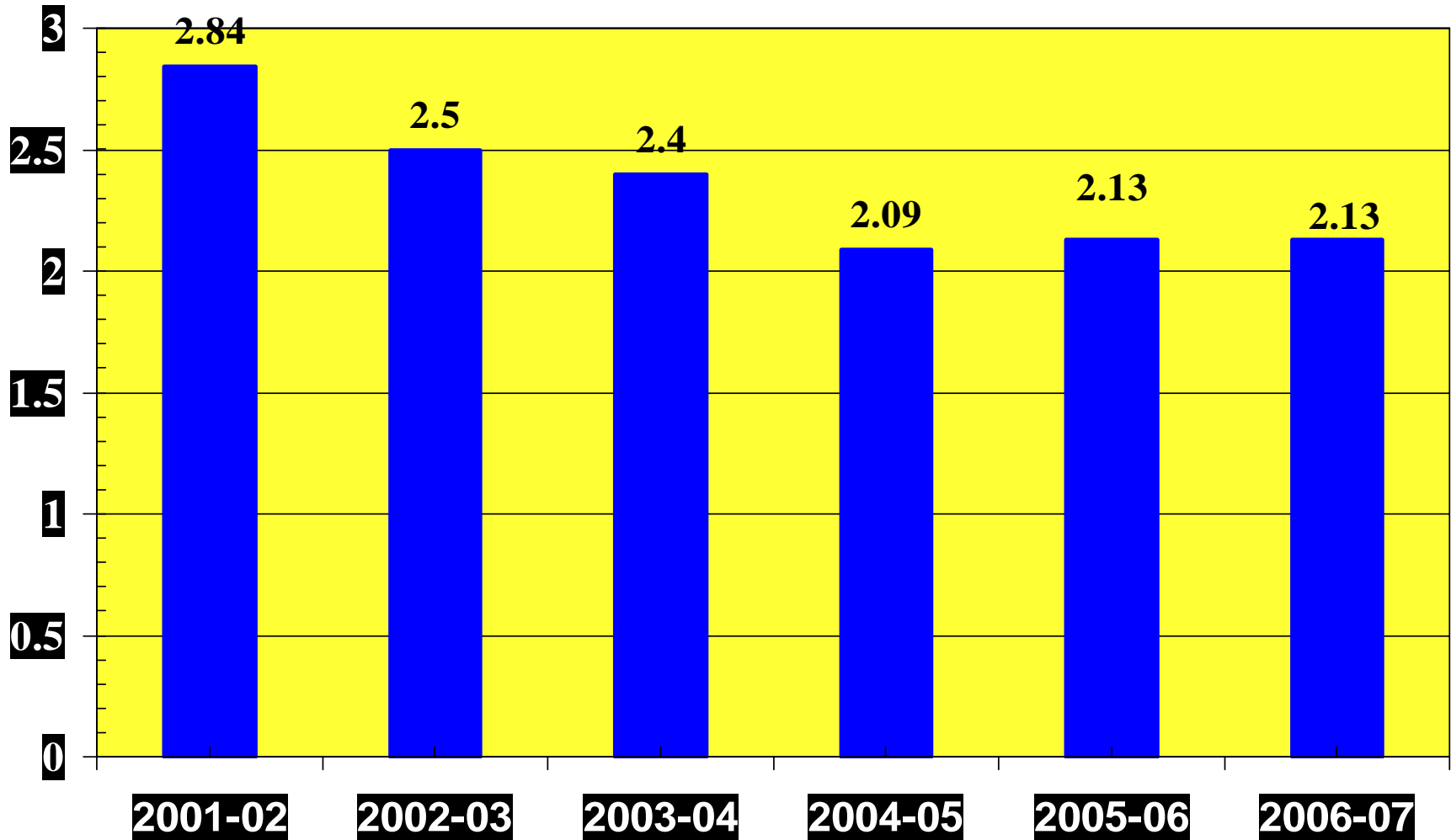
# Energy Conservation Measures

- Energy Efficient agitators
- Automatic Energy Control in Refiners
- Variable frequency Drive for pumps
- Demand Controller for compressed air supply
- Change over to LP steam from MP steam in chilling plant
- Conversion of DC drive to AC drive for Secondary fan pump

# Energy Conservation Measures

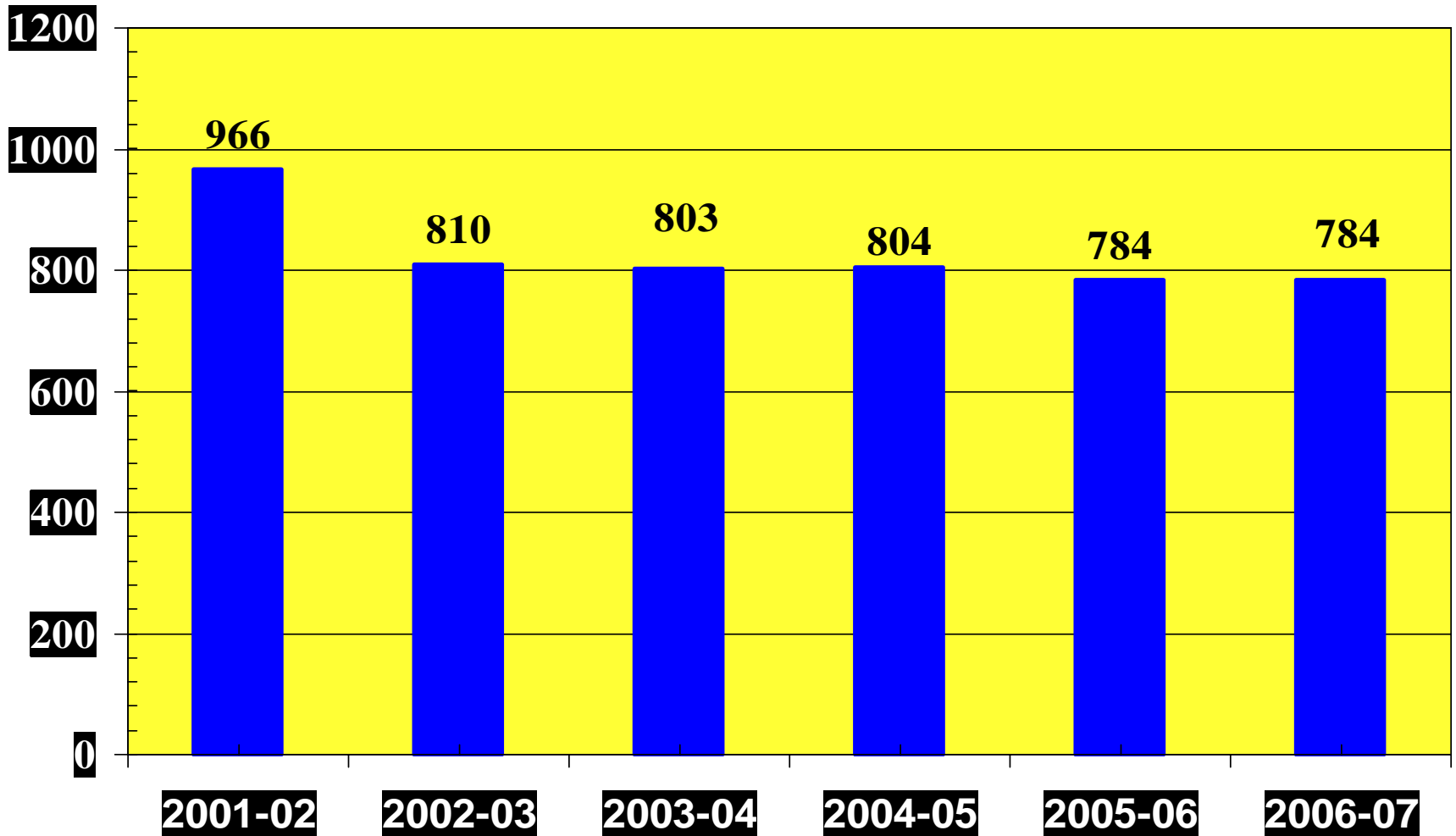
- Exhaust steam from condensate tank is used to heat white water resulting in lower viscosity and therefore better drainage on wire
- Johnson Rotary Joints
- Automatic Humidity control in Closed Hood system
- Plate heat exchanger for COL cooling system avoiding chilled water usage
- capacity Utilization

# PROCESS STEAM PER TONNE (t/t) - PM 5

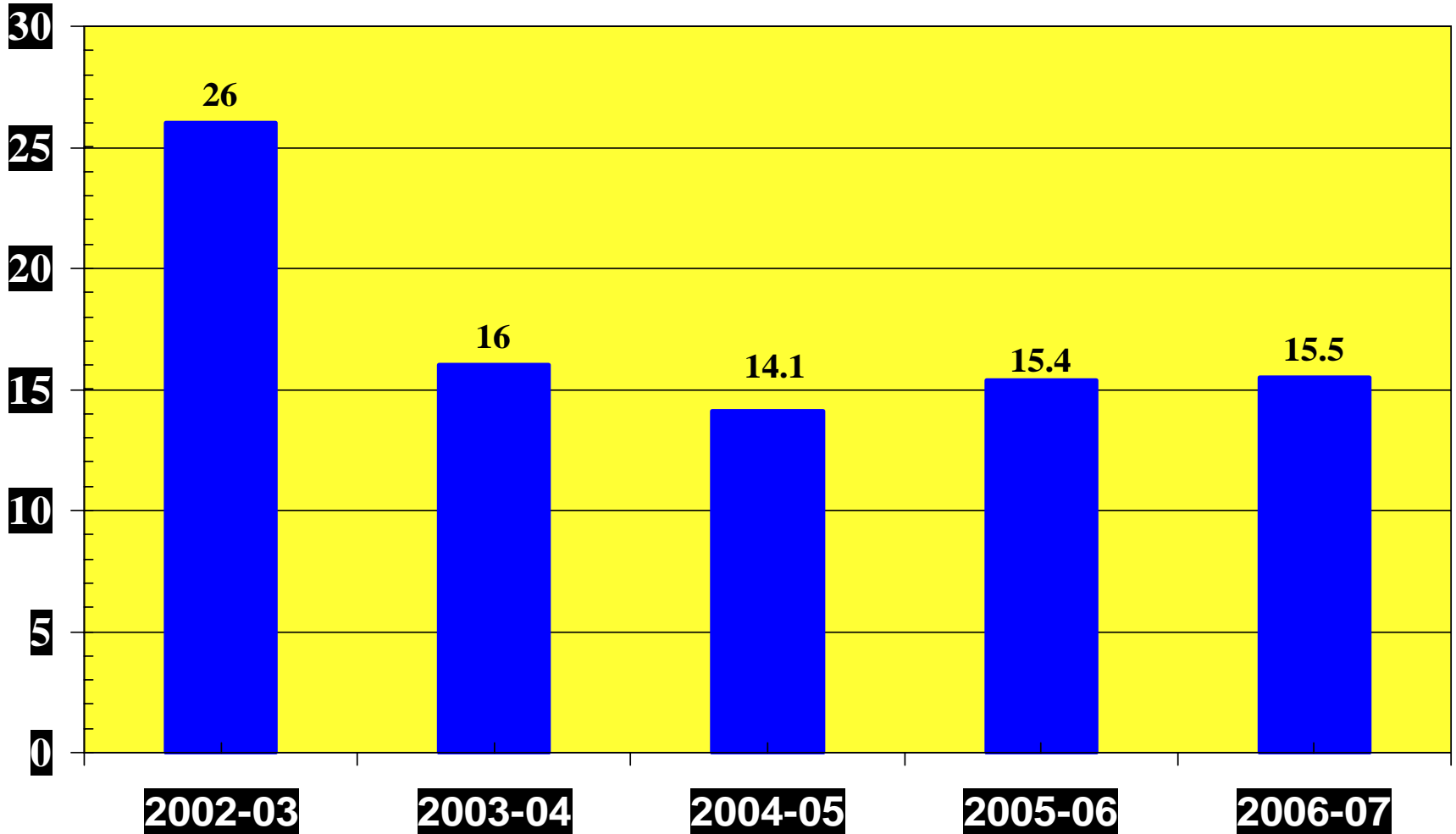


# POWER CONSUMPTION PER TONNE OF PAPER

## KWh/t - PM5



# WATER CONSUMPTION PER TONNE OF PAPER CUBIC METERS - PM5



# Water Conservation Measures

- Recycling the Vacuum pump and compressor cooling water after cooling
- Recycling the white water for slushing of imported pulp
- Reuse of clear filtrate from Poly Disc saveall for consistency control & shower

# Conclusion – Paper Machine no. 5

- Paper Machine 5 is one of the high speed Paper Machines in India.
- Power & Steam consumptions are optimum
- PM5 has built in energy efficiency features and many schemes were implemented to fine tune the energy consumption