

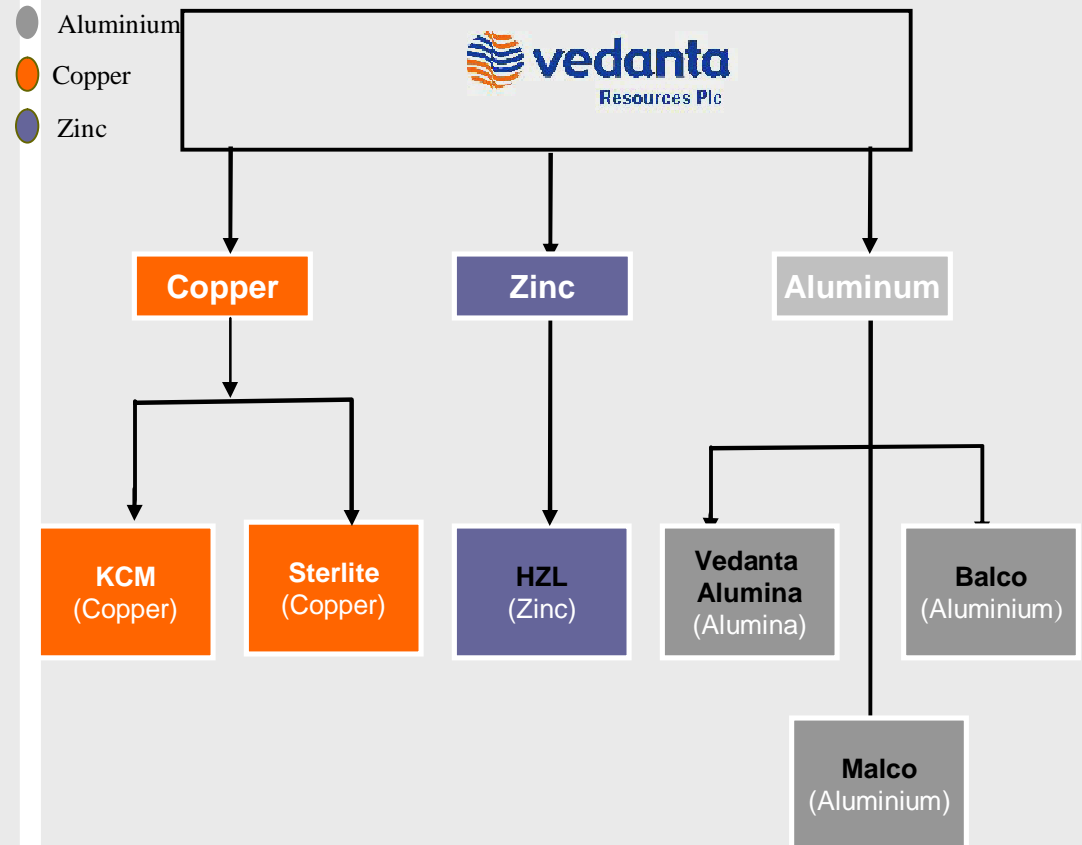
***National Award for Excellence in Water Management 2007:CII
Sterlite Industries India Ltd- Silvassa***



OVERVIEW

- p A leading producer of key commodities
- n Group turnover FY 06-07 \$ 6.7 bn
- p Listed on the London Stock Exchange
- p 25,000+ Employees
- p US\$ 2.2bn pipeline of brown – and greenfield projects

STRUCTURE





REFINERY



ANODE



ELETRO REFINING



CATHODE

CC ROD



CASTING



ROLLING



CC ROD COIL



PROJECTS WITH ZERO INVESTMENTS:

- q Modification in Thermoshypon cooling water arrangement.
Savings : 4380 m³ : **Rs. 1.4 Lacs.**
- q Condensate Recovery of RVD for Filter Press Backwashing.
Savings : 1284 m³ : **Rs. 0.41Lacs**
- q Process modification in Leaching section reduced steam consumption
Savings : 2160 m³ : **Rs. 0.69 Lacs**
- q Modification of Nozzles in ASWM Resulted in better drying & reduction in water consumption.
Savings : 770 m³ : **Rs. 0.23Lacs**
- q Reuse of collected condensate water generated by anode casting cooling water.
Savings : 655 m³ : **Rs. 0.21 Lacs**





PROJECTS WITH INVESTMENTS:

q Rain water harvesting.

Savings : <u>Year</u>	-	<u>Water Savings</u>	
2004	-	1577 m3	(Rs. 0.50 Lacs)
2005	-	4158 m3	(Rs. 1.25 Lacs)
2006	-	6225 m3	(Rs. 1.86 Lacs)
2007	-	9475 m3	(Rs. 2.84 Lacs)
Total	-	21435 m3	(Rs. 6.45 Lacs)
Investment	:	Rs. 10 Lacs	
Payback Period	:	72 months	





PROJECTS WITH INVESTMENTS:

q Conversion of Gland Packing Pumps into Mechanical Seal

Savings : 1728 m3 Water (**Rs. 0.55 Lacs**)

Investment : Rs. 3.0 Lacs

Payback Period : 65 months

q Provision of Electrolytic Cell covers in Refinery

Savings : 3703 m3 Water (**Rs. 1.18 Lacs**)

Investment : Rs. 1.0 Lacs

Payback Period : 14 months

q Lube Cooled Heat Exchanger for Compressors with recirculation

Savings : 1200 m3 Water (**Rs. 0.38 Lacs**)

Investment : Rs. 1.5 Lacs

Payback Period : 46 months





WATER CONSERVATION PROJECTS - SUMMARY:

Total no of projects implemented	=	9
ü Projects implemented without investments	=	5
ü Projects implemented with investments	=	4

Savings : 37315 m³ Water

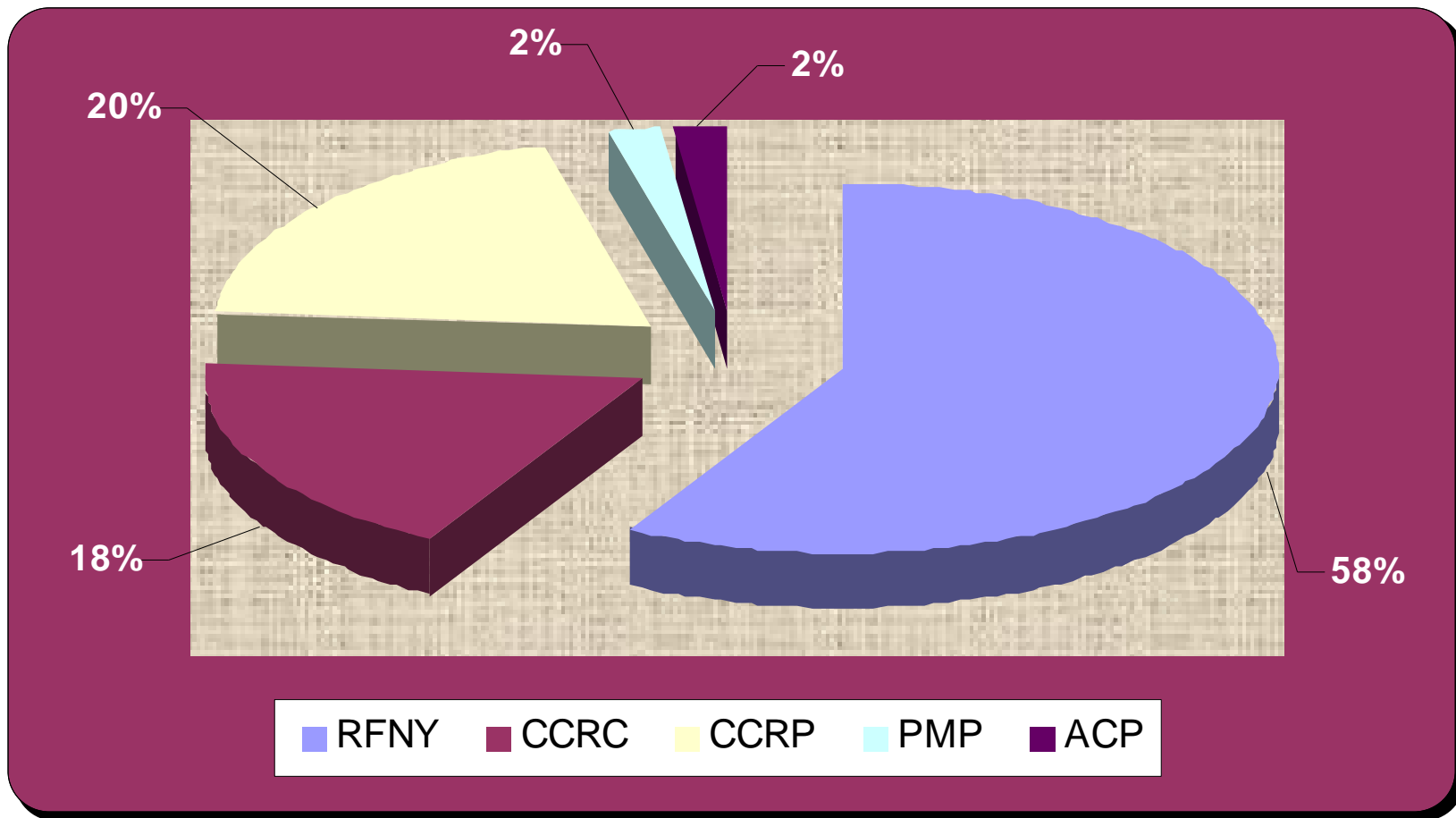
Total Investments made : Rs 15.5 Lacs

Total Savings Achieved : Rs 11.5 Lacs



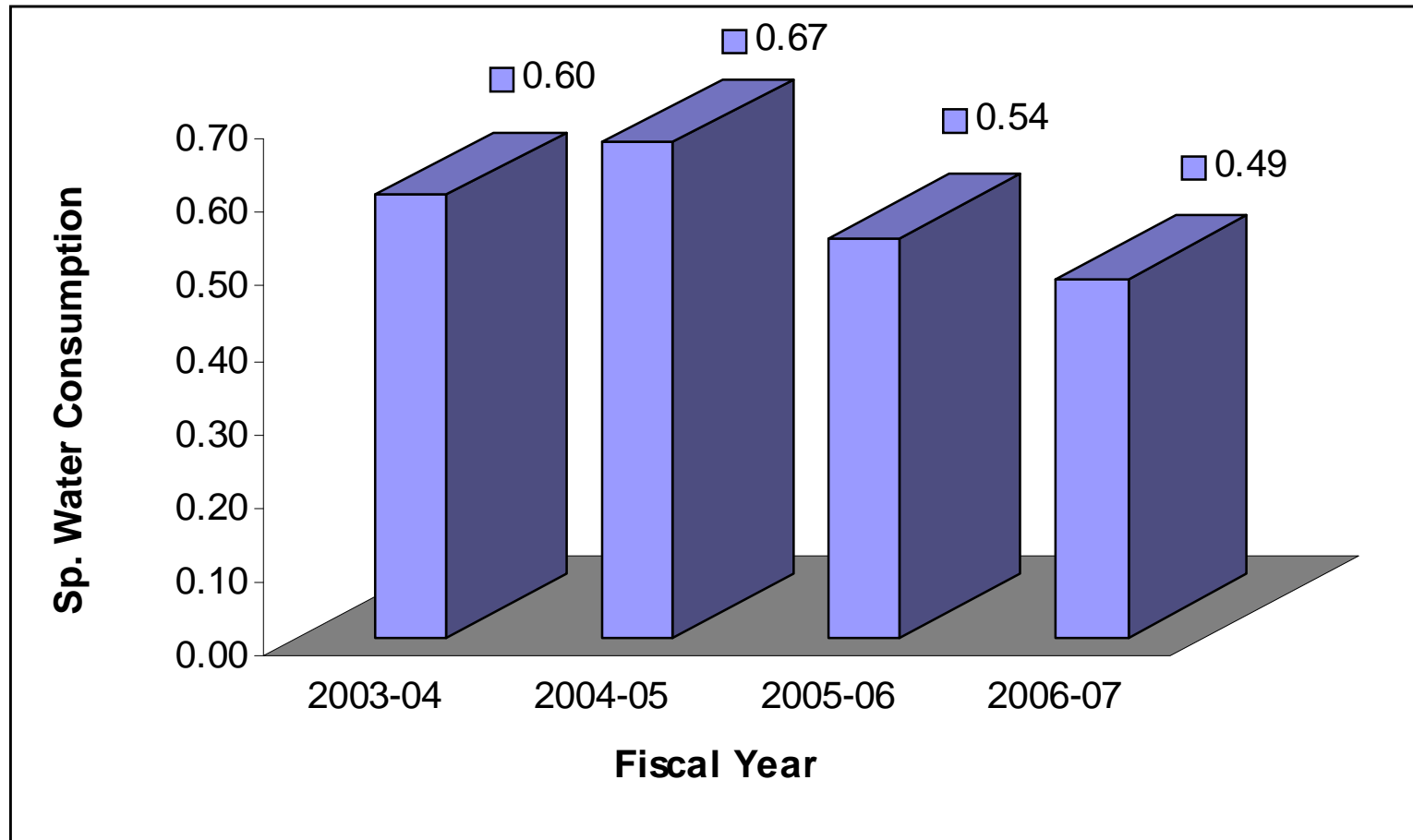


WATER SHARE - SILVASSA





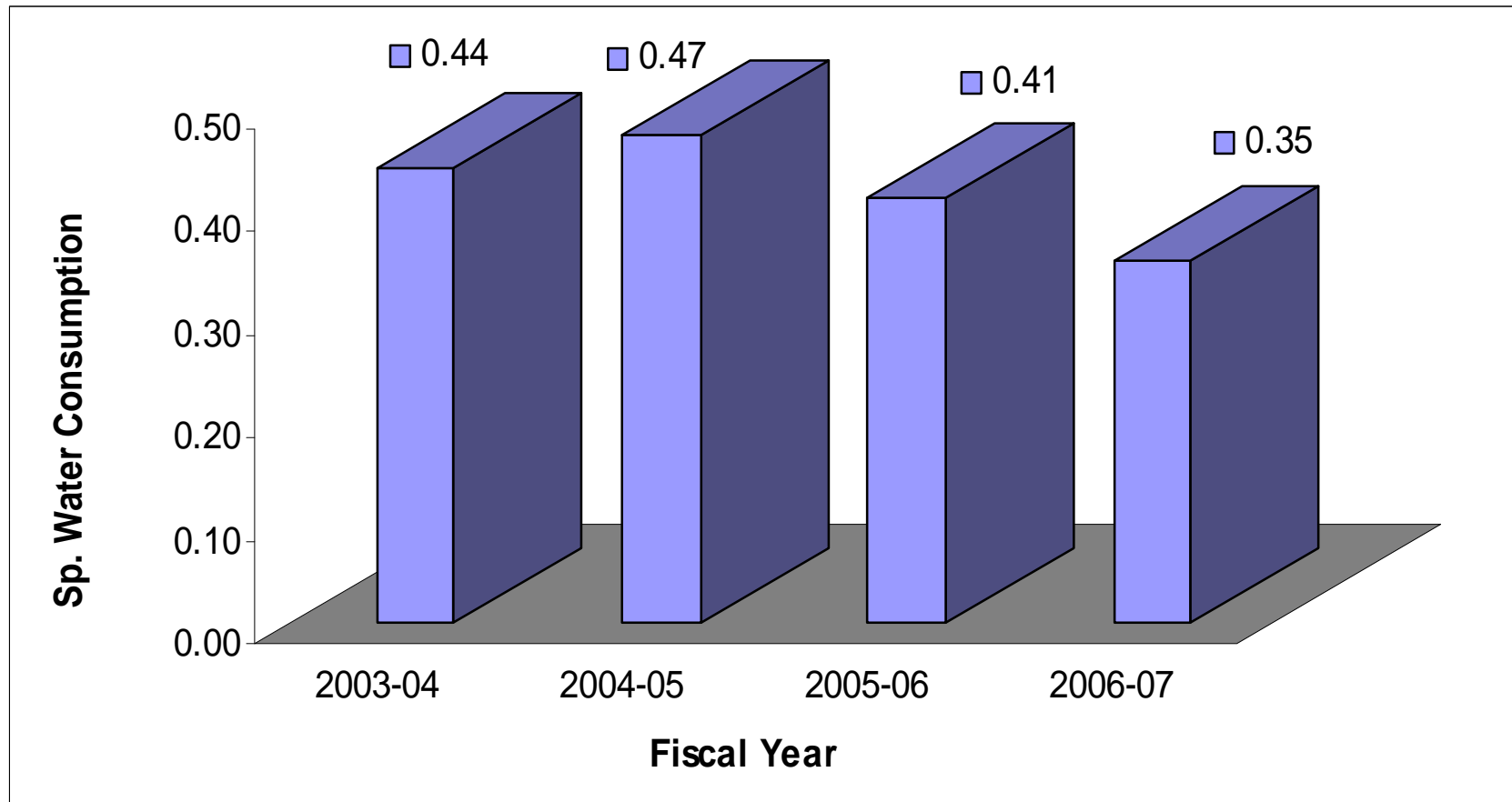
WATER CATHODE (M3/MT)



Reduction in Specific Water Consumption = 18.97 %



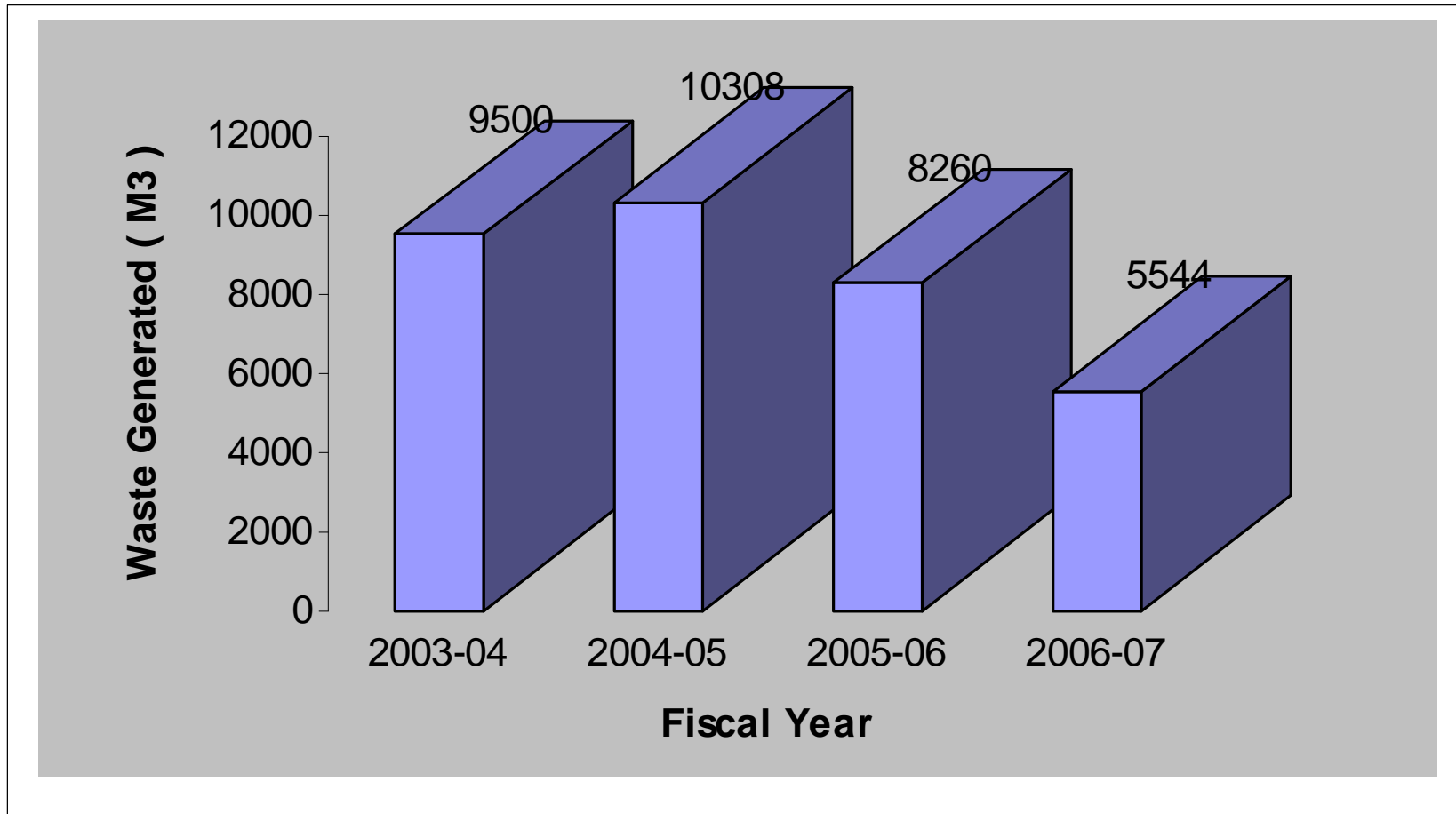
WATER CC ROD (M3/MT)



Reduction in Specific Water Consumption = 20.45 %

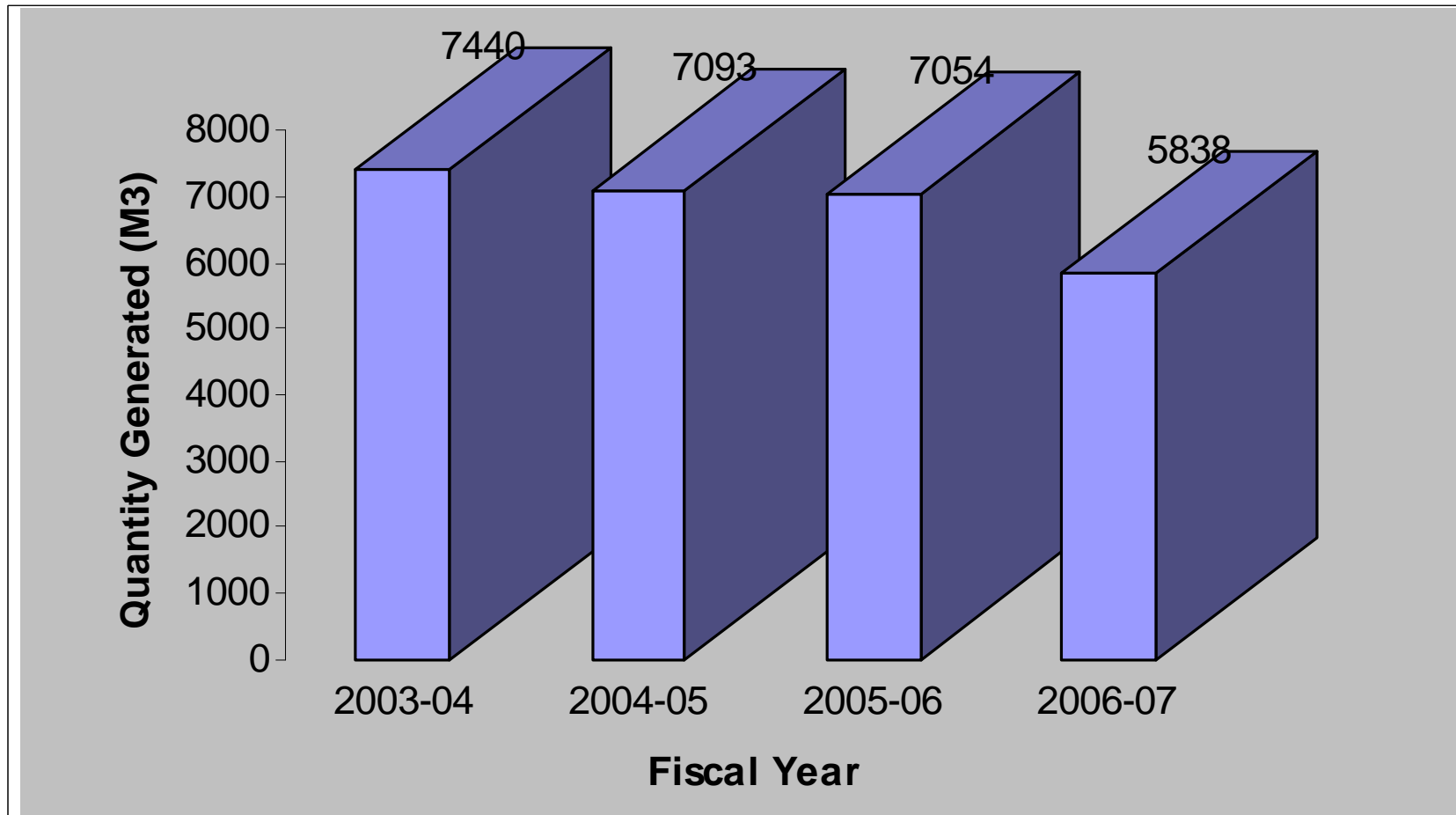


Waste Water Details : Industrial





Waste Water Details : Domestic





BENCHMARKING

- q Our ultimate objective of our plant is to be 0.4 m³/MT of copper cathode.
- q CII water audit and implementing the same for further improvement.
- q To sustain as a ZERO discharge plant in copper industry.

ROAD MAP FOR THE FUTURE

- q Regular Water Audits & Identification of new projects.
- q SPC techniques in Water Monitoring.
- q Utilization of waste condensate water.
- q Conversion of all gland seal pumps into mechanical seals.
- q Exploring the possibility of Air Cooled heat exchangers in place of normal cooling towers.





TQM PROJECT 1: WATER CONSUMPTION REDUCTION

Problem Statement :

Consumption of water is on higher side @ 1,10,400 m³ per year which is costing around Rs. 35.3 Lacs per year.

Mission Statement :

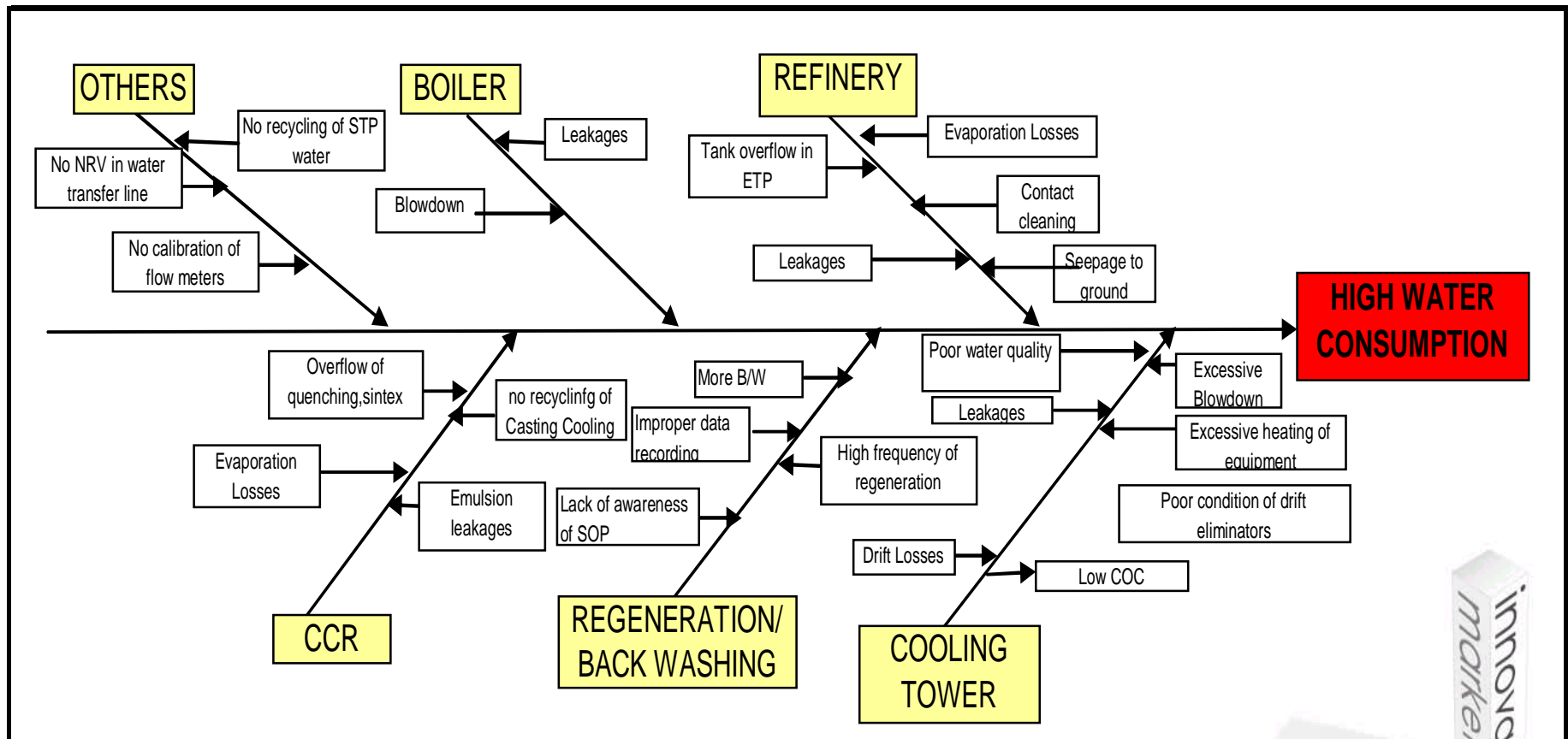
Reduce the Water consumption from 1,10,400 m³ per year to 92,000 m³ per year thereby leading to conservation of natural resource & a saving of approx Rs 6.0 Lacs per year.





TQM PROJECT 1: WATER CONSUMPTION REDUCTION

Cause And Effect Diagram based on Brain Storming :





TQM PROJECT 1: WATER CONSUMPTION REDUCTION

Formulation of Theories

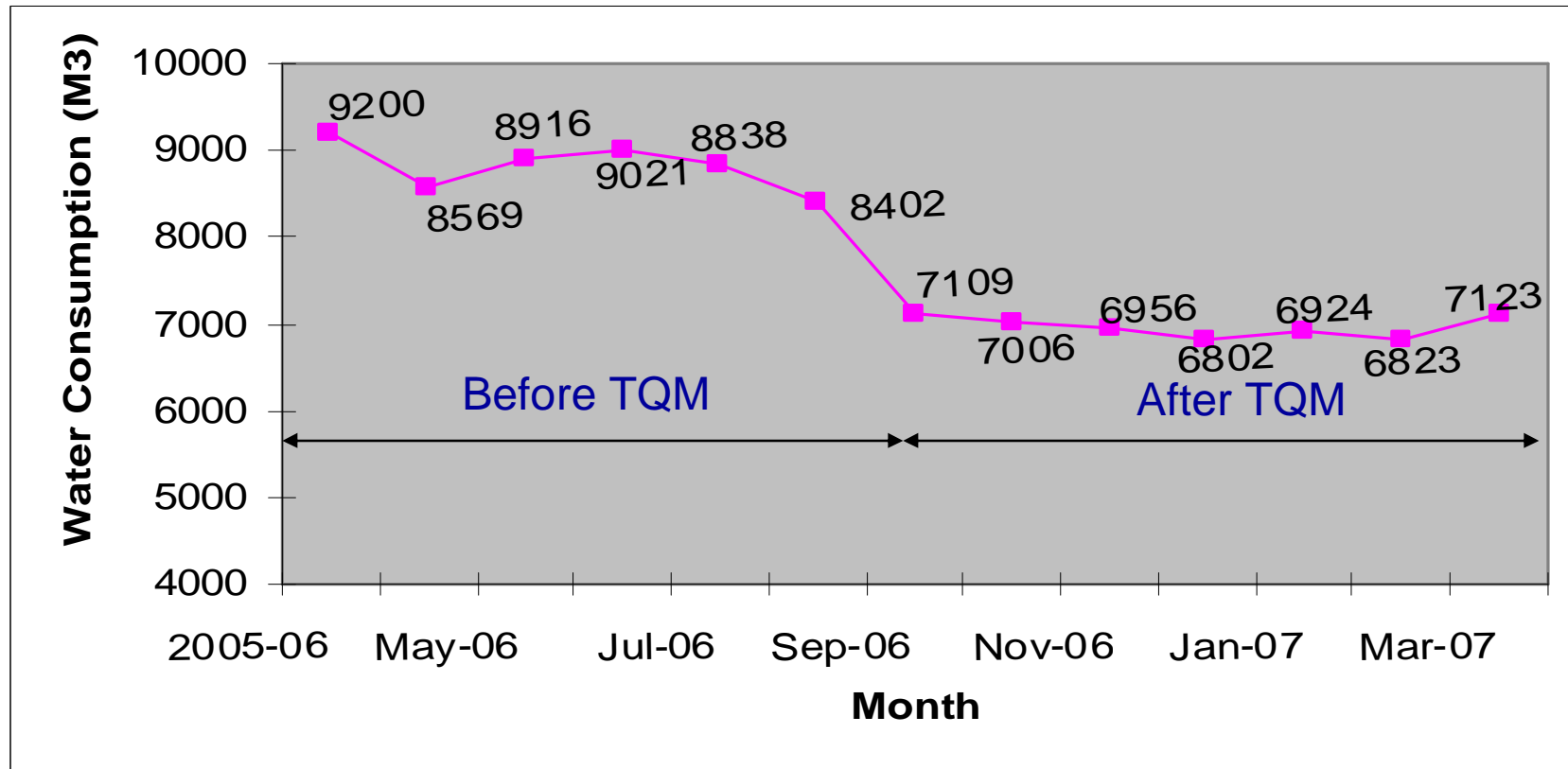
- q Recycling of water
- q Overflow and leakages
- q Evaporation losses in cell house
- q Excessive regeneration and backwashing
- q Efficiency of cooling tower [the cycle of concentration to 5-7 (COC)]
- q Alternate source to raw water.





TQM PROJECT 1: WATER CONSUMPTION REDUCTION

Results & Benefits

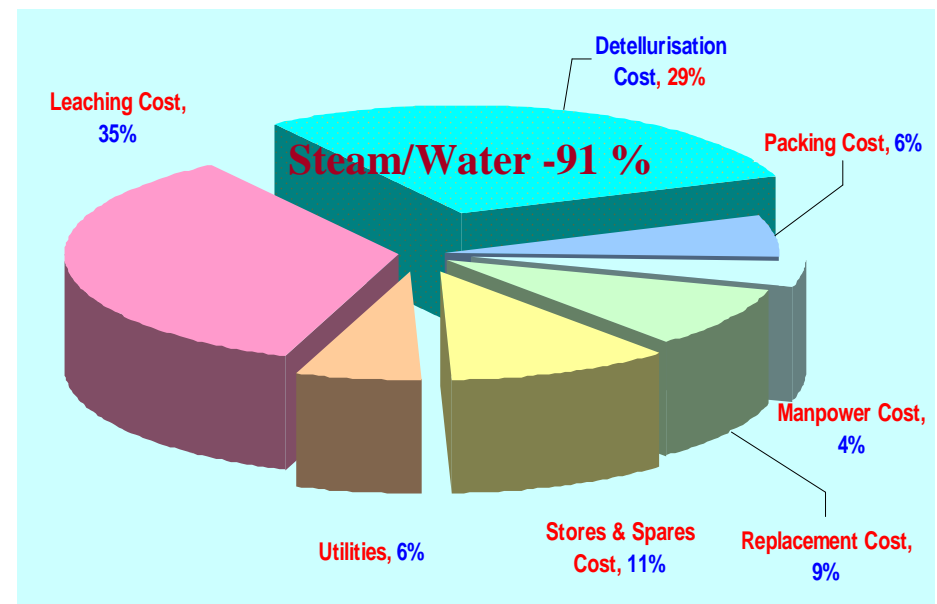


Reduction in Water Consumption : 16.2 % (Rs. 5.73 Lacs)



TQM PROJECT 2: WATER CONSUMPTION REDUCTION IN PMP

- De-Te Cost is 29 % of the Total Slime Plant Cost
 - Steam / Water - 91 %
- We targeted reduction in steam consumption which in turn resulted in water consumption reduction.
- We increased the no. of baskets, increased the basket cleaning frequency & provided additional steam lines.
- After completion of the project water consumption reduced by 70 %.





Employee & Community Involvement

APPROACH

TOP DOWN APPROACH



Policy Deployment
Continuous Improvement
Daily Management

BOTTOM UP APPROACH

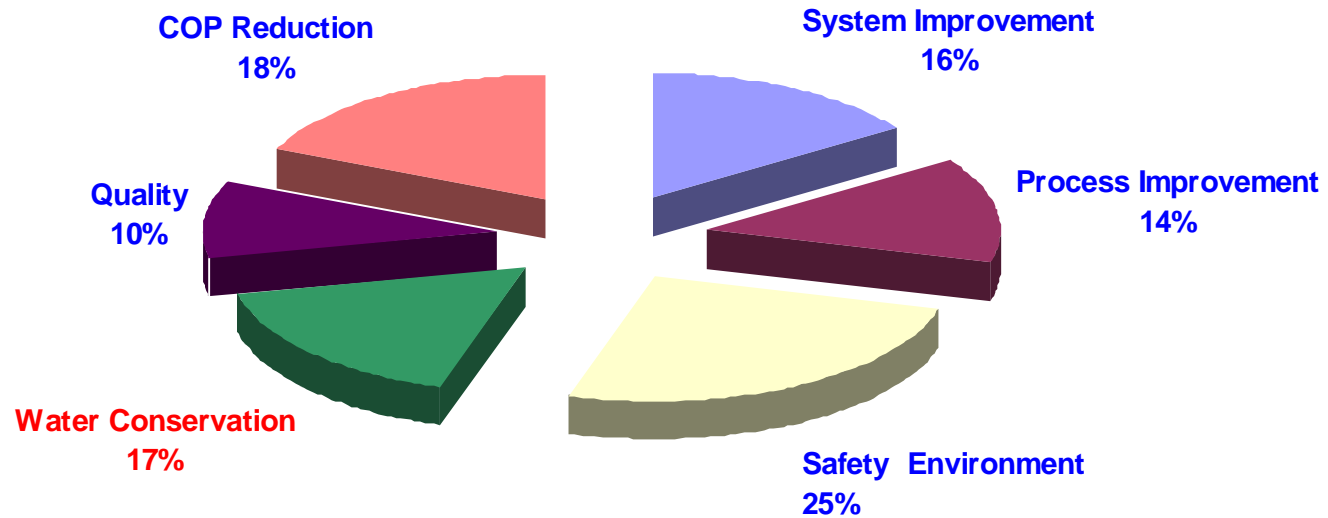


PEP Mechanism
Water Month





SUGGESTION CATEGORY





Water Month Celebration

- q Celebrated Water Month on March 2007.
- q Celebrated World Water Day on March 22nd 2007.
- q Each year carries a particular theme on WWD like...

2007 : coping with water scarcity
challenge of the twenty-first century

2006 : Water and Culture

2005 : Water for Life

2004 : Water and Disasters

2003 : Water for the future etc....

- q Organized various events related to water awareness.



Excellence in Water
Management 2007



WATER MONITORING & REPORTING SYSTEMS:

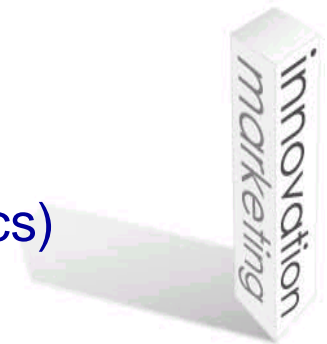
- q Whole Plant is divided into 5 areas and Water Consumption for each plant is monitored.
- q Water norms are fixed for all the equipments & any variation is alerted by DCS.
- q Water audits being done internally by water champions and remedial actions immediately taken.
- q Water report is getting prepared by the Water Manager and is getting reviewed by the Head Operations in presence of Sectional Heads.
- q The Water report consists of Water Share, Specific Consumption, Trend analysis, Internal & External Benchmarking, Concerns and Action plan for the next month.





LIST OF MAJOR ENVIRONMENT IMPROVEMENTS

- q Rain water harvesting in the plant. (10 Lacs)
- q Zero Discharge Plant.
- q Reduction in air pollution by introducing scrubbers. (3.5 Lacs)
- q Installed Sewage Water Treatment facility. Treated water is being used for gardening purpose. (2.5 Lacs)
- q Installed air pre heater in the boiler to reduce fuel consumption. (5.5 Lacs)
- q Installed Acetylene Soot Collection System installed in CCR to improve working Environment. (5.6 Lacs)
- q Soil Correction Carried out in Refinery. (2.62 Lacs)
- q Installation of Air Ventilators in Refinery & CCR. (3.23 Lacs)





AWARDS & CERTIFICATION

- q ISO 9001,14001 and 18001 (OHSAS) Certification by DNV
- q “Sterlite” brand Copper cathode registered in LME in Dec-'01
- q Awarded Commendation certificate RBNQA of IMC in March 2007
- q Sterlite bagged IMEA - Silver corporate award of M/s Frost and Sullivan in Nov 2006
- q Won First Prize at “Qualtech 2005” in Improvement – Manufacturing Category.
- q Won finalist award at ASQ team competition-2006 held in Milwaukee, USA.
- q NABL accreditation on chemical, electrical & mechanical testing in Aug-2003.
- q Central lab recognized as R&D centre by Govt., of India





AWARDS & CERTIFICATION

- q Won 3rd Prize for Unique Employee Involvement by INSSAN – May 2007
- q Appreciation letter from Gujarat safety council for excellent safety practices
- q Won INSSAN Meritorious award Feb-2007
- q Bagged consecutive prizes for best suggestor in INSSAN at Visakaptnam in July 2007
- q Corporate award for Creative workplace
- q Safety Innovation award by Institute of Engineers – Sept 2007
- q Short listed for Platinum Band in IMEA NABL
- q Awarded by CII as Excellent Energy Efficient Unit in Sept'07
- q Won First Prize at “Qualtech 2007” in Innovation – Manufacturing Category.

