

**PRESENTATION
ON
NATIONAL AWARD FOR EXCELLENCE IN
WATER MANAGEMENT-2007**

**STERLITE INDUSTRIES (INDIA) LIMITED,
TUTICORIN**



Indian Operations

Company	Product	Capacity (Mt)
Sterlite Copper	Copper	400,000
Hindustan Zinc	Zinc	400,000
	Lead	85,000
BALCO	Aluminium	350,000
MALCO	Aluminium	40,000
IFL	Aluminium Foils	10,000
Vedanta Alumina	Alumina	1,400,000
	Aluminium	500,000
Sesa Goa	Iron Ore	15,000,000

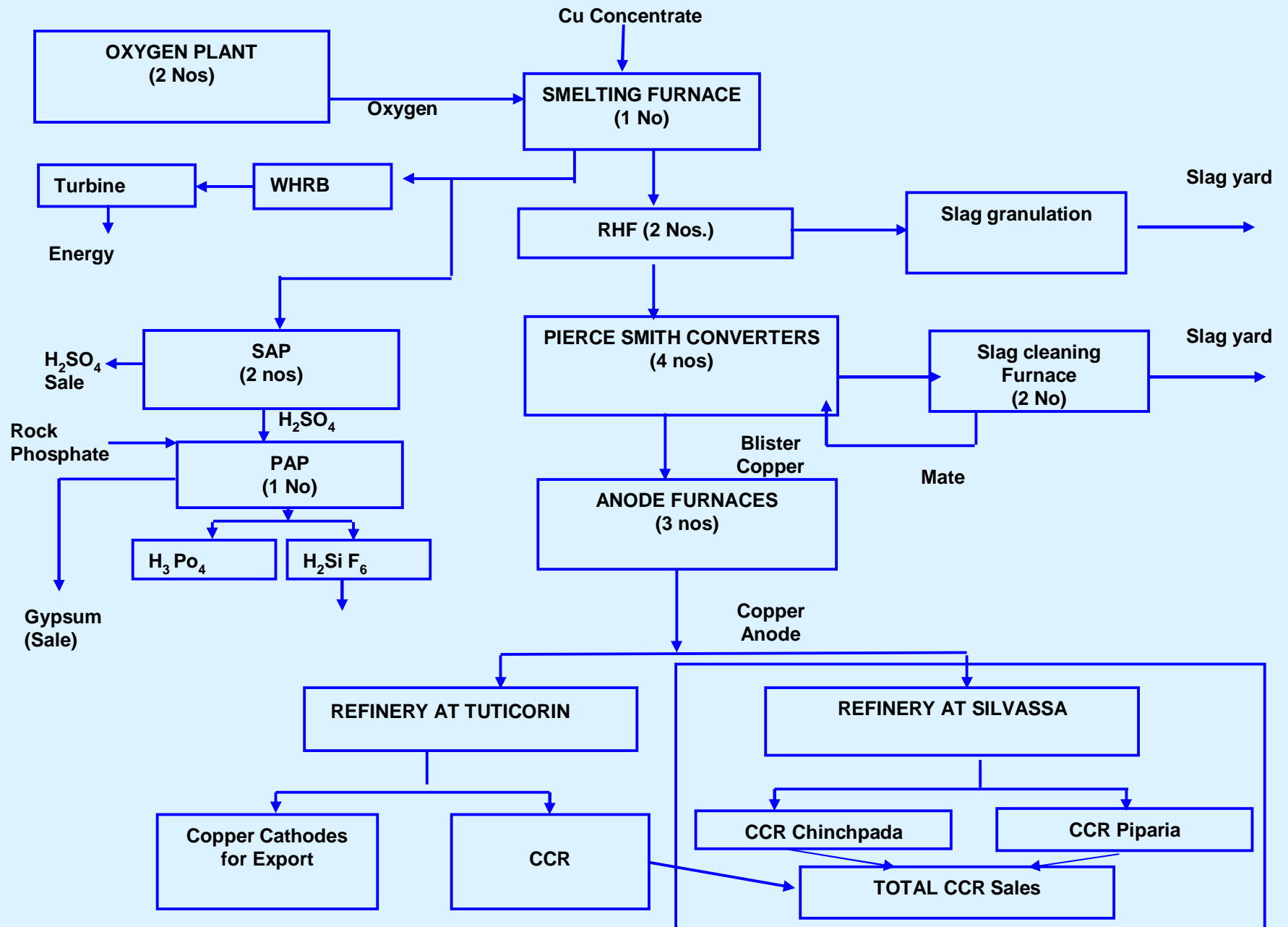
Main Products

§ Copper anodes	: 1100 TPD
§ Copper cathodes	: 600 TPD
§ Copper rods	: 260 TPD

By-Products

• Sulphuric acid	: 3500 TPD
• Phosphoric acid	: 600 TPD
• Hydro fluo silicic acid	: 25 TPD

- Ø **ISO-9001 : 2000.**
- Ø **ISO-14001 : 2004.**
- Ø **OHSAS-18001 : 1999.**
- Ø **Integrated system certification obtained on 2003.**
- Ø **ISO-17025 : 2005 certified in 2006.**
- Ø **GreenTech Gold award for Environmental Excellence for consecutive two years (2006 & 2007)**
- Ø **CII National award for Excellence in Energy Management for the consecutive 7 years.**
- Ø **British safety council five star award for the year 2002,2003 & 2004.**





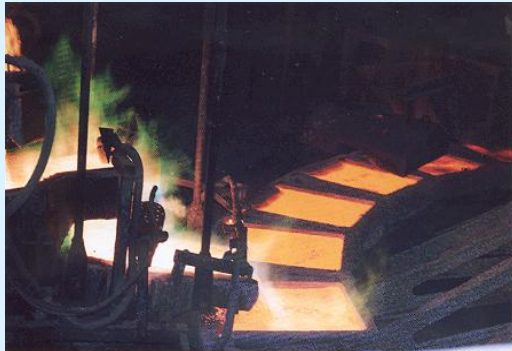
CONCENTRATE LOADING IN HOPPER



ISASMELT COMPLEX



RHF MATTE POURING



ANODE CASTING



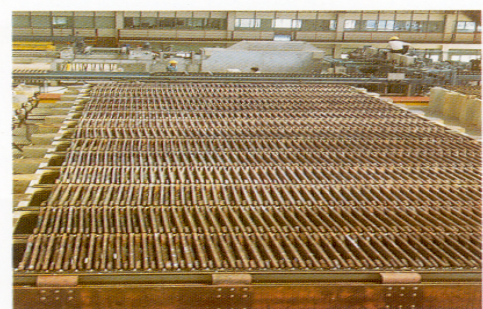
CONVERTER SKIMMIG



RHF SLAG GRANULATION



ANODE DESPATCH



REFINERY - BANKS



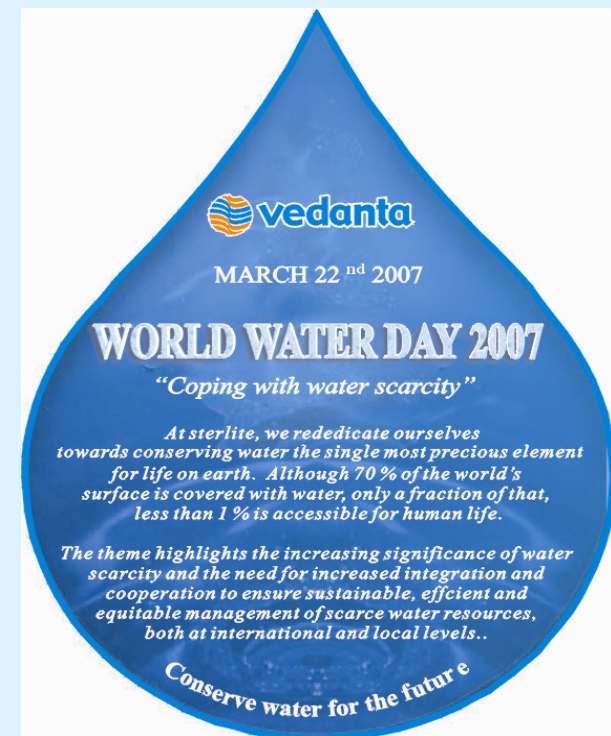
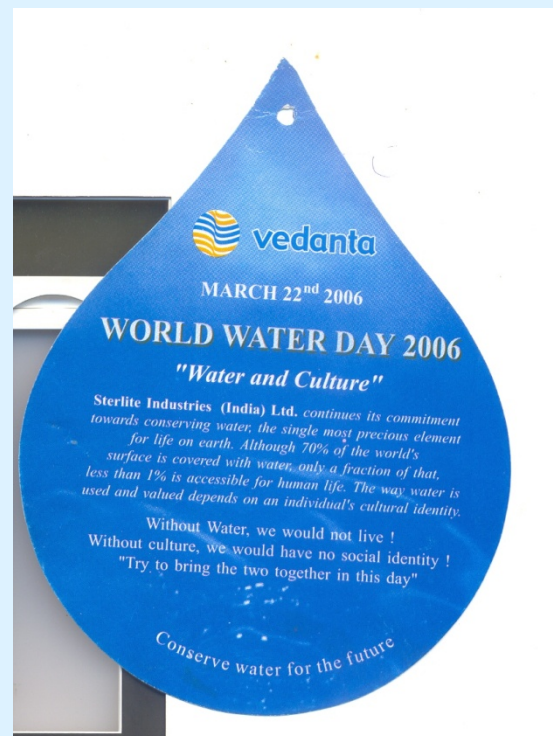
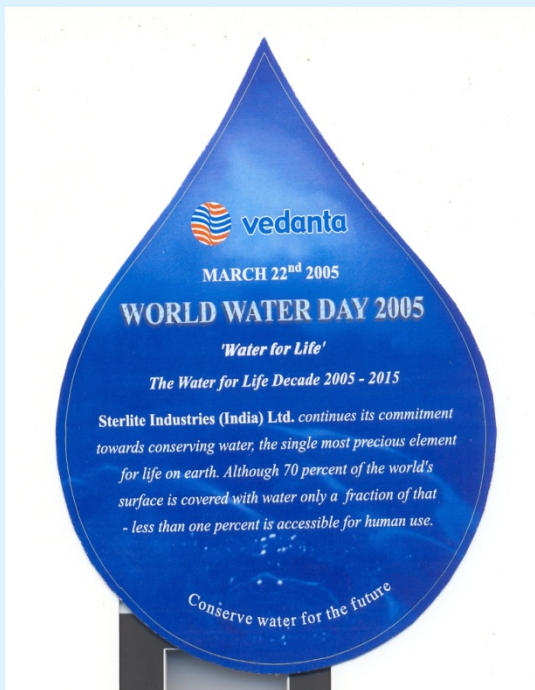
CCR - AT STOCK YARD

Products	Specific water (m ³ /MT)	Avg. production per day (MT)	Total water requirement (m ³ /Day)
Copper Anode	2.3	1100	2530
Sulphuric acid	0.95	3500	3325
Phosphoric acid	3.6	600	2160
Copper Cathode	0.6	600	360
Copper Rod	0.6	260	156
Total			8531

Storage facility	Capacity (M3)
Water Reservoir - A	8000
Water Reservoir - B	8000
Water Reservoir - C	40000
Total storage	56000

- Storage availability for plant operation : 6.5 Days.
- Cost of water : Rs.22.5 / M3

- World Water Day - Being celebrated by us every year on Mar 22nd with flag hoisting and oath taking by all the employees.
- Pamphlets with the theme of the year - Being issued to all company / contract employees to create awareness.
-





Mr. Karmegam, Retired Director for Water Resources, Tamil Nadu Govt. has given awareness sessions for all employees.



Rain water harvesting facility created at Sterlite housing complex.



Awareness sessions / competitions conducted for school children towards water conservation.



Rain water harvesting facility created for near by 3 villages.

- Dedicated Water Manager with full fledged water management team.
- Daily MIS on water consumption being circulated to all HODs.
- Product / By-products wise monthly water consumption report generated & circulated to all HODs.
- Flow meters fixed at all consumption points and monitored on daily basis.
- Water report covers all details regarding water levels in dams, water reservoirs and area wise consumption.
- Area wise budget allocated for water consumption & variance / deviations discussed in daily production meeting.
- Area wise water consumption reviewed by top management team in the monthly Operation Review meetings.

Water				
Water level in Dams	FL (Feet)	Norms (Feet)	Actual (Feet)	Discharge (cusecs)
Papanasam	143	30	118	350
Manimuthar	118	30	66	0
Srivaikundam	8.8	5	6.5	500
Opening stock (M3)		53726	78857	
Water Receipts (M3)	Norms	On date	MTD	YTD
1.7 MGD	4500	0	1980	20540
5 MGD	11250	9300	238900	1624200
Tanker	0	0	0	49144
Total receipts (M3)	15750	9300	240880	1693884
Raw Water- Consumption(M3)		5365	172826	1218143
Smelter cons.(M3)				
Feed area	10	18	357	2383
DM plant cons	50	134	3425	7958
Launder built up cooling	0	0	0	0
ISA HVS	20	20	620	4160
Spray pond	0	0	0	950
Conv. Gas cooler	35	2	49	3626
Scrubber	150	150	6950	50470
SCF	5	0	0	0
Anode Furnace	150	250	7750	50026
CT-3	50	0	0	535
Anode Furnace-HVS	0	0	0	0
Fire water	10	0	50	160
WTP	250	300	9750	59900
Evaporation loss	100	100	2850	21125
Gardening	90	29	1567	15088
PR	10	0	0	37
Total	930	1003	33368	216418
SAPcons(M3)				
SAP	3191	1602	57980	434775
ETP	400	320	8510	69510
Evaporation loss	140	140	3990	29575
Gardening	120	29	1567	15088
Total	3851	2091	72047	548948
PAP cons(M3)				
PAP	1900	1836	54611	347568
Evaporation loss	195	80	2280	16900
Gardening	50	12	653	6287
Total	2145	1928	57544	370755

Soft water- consumption(M3)		1747	56493	384439
Smelter	1160	1129	33032	226882
SAP	250	86	4336	28187
PAP	0	0	3219	22155
CPP	400	342	10266	71479
Refinery	100	95	2820	17868
CCR	100	95	2820	17868
Potable water- consumption(M3)		200	7289	45720
Smelter	100	79	2878	18071
SAP		49	1799	11294
PAP		49	1799	11294
CPP		3	93	543
Refinery		20	720	4518
CCR		0	0	0
Water level in reservoirs		Quantity(M3)	Level in cm	
Reservoir -A	7000	7580	220	
Reservoir -B	7000	6835	200	
Reservoir -C	30000	40428	300	
Water correction Buffer stock		-28000	0	
Closing stock - Water	44000	54843	80843	
Water stock available for	4.25	5.61	Days	
Totals (RW+SW+PW)(M3)	Norms	On date	MTD	YTD
Total Smelter water cons.	2190	2211	69278	474928
Total SAP water cons.	4135	2226	78182	588430
Total PAP water cons.	2396	1977	62562	404204
Total CPP water cons.	636	431	13768	101022
Total Refinery water cons.	337	334	8726	65530
Total CCR water cons.	100	132	4092	27555
Project	0	2	409	3176
Total	9795	7314	237017	1664844
Blow down details				
CT-1 Blow down	50	0	356	4809
CT-2 Blow down	50	0	380	4169
CT-O2-1 Blow down	70	0	610	8421
CT-O2-2 Blow down	70	0	265	7089
Total Garden cons.	300	121	6512	62838
STP availability	4	4		

- CII conducted Water and Energy audit and 70 % of the recommendations are implemented.
- Periodical internal water audits being conducted by water management team.
- TQM teams were formed five times to have continuous focus on water conservation.

- Technology supplier : MIM, Australia
- Water consumption : 10 m³/MT of Copper anode.
- Water recycling status : MIM, discharging water into river / mines.
- SIIIL water consumption : 2.3 m³/ MT of Copper anode.
- SIIIL recycling status : Zero discharge.

Norms

- CPCB norms for copper smelter : 100 m³/MT of Copper anode.
- SIIIL status : 2.3 m³/MT of Copper anode.

SI No	Title of Water Saving project implemented	Year of Implementation	Annual Water Savings		Investment Made	Payback Period (Years)
			m ³	Rs. Lakhs	Rs. Lakhs	
1	Air cooling system for sulphuric acid cooling.	2003	726000	163.35	500	3.1
2	Smelter Granulation complete conversion into Treated water from ETP.	2003	132000	29.7	10	0.3
3	Air cooling system for Captive Power Plant -1	2003	165000	37.12	150	4.0
4	Primary Smelter- Waste Heat Recovery Boiler instead of Gas Cooler.	2004	99000	22.275	2200	----
5	Recycling of Oxygen Plants' Cooling Tower blow down water.	2004	66000	14.85	3	0.2
6	Air Cooled Condenser for Steam Turbine Generator.	2004	231000	51.97	300	5.8
7	Air cooling system for Captive power plant-2.	2005	198000	44.55	200	4.5
8	Secondary Smelter – Air Cooled Condenser to reduce the gas volume.	2005	33000	7.425	40	5.38
9	Conversion of conventional Gland Seal to Mechanical Seal of water pumps.	2006	33000	7.425	20	2.69
10	Up gradation of rain water collection system from 5000 m3 to 60000 m3	2006	55000	12.37	100.00	Rain water harvesting

Sl. No	Title of Water Saving project implemented	Year of Implementation	Annual Water Savings		Investment Made	Payback Period (Years)
			m3	Rs. Lakhs	Rs. Lakhs	
11	Recycling of ETP vacuum pump seal water to SAP Cooling tower consumption.	2007	49500	11.13	3	0.3
12	Recycling of ISA furnace cooling tower blow down water to SAP cooling tower consumption.	2007	33000	7.42	2	0.3
13	Recycling of DMF back wash water to green belt consumption.	2007	33000	7.42	1	0.1



Radiator type air cooler for sulphuric acid cooling.

Savings : 2200 m³/day



Radiator type air cooler for captive power plant diesel engine cooling

Savings : 1100 m³/day



2 numbers of rain water catchment ponds to collect rain water from all over the plant

Capacity : 60,000 m³ (total)



Air cooled condenser for steam turbine generator exhaust system

Savings : 700 m³/day



4 numbers of Effluent treatment plants.

Capacity : 1400 m³/day



2 numbers of surge ponds to hold the treated water during plant upsets.

Capacity : 7000 m³



Radiator type air cooled system for secondary smelter flue gas handling system.

Savings : 100 m³/day



Recycling of ETP pumps seal water to SAP cooling tower.

Savings : 150 m³/day



Recycling of utility cooling tower blow down water to SAP cooling tower.

Savings : 100 m³/day



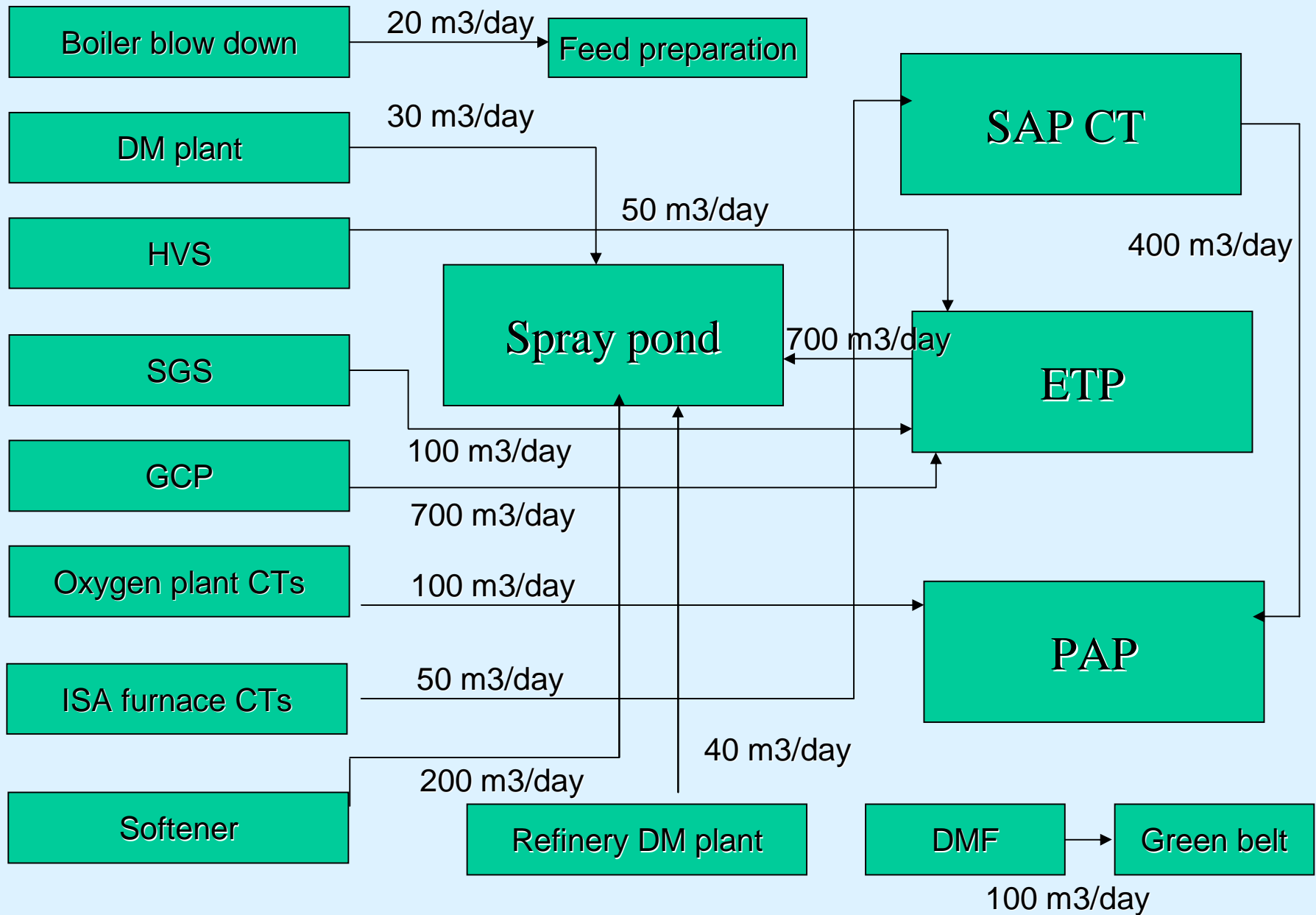
Conversion of gland seal into mechanical seal for water pumps.

Savings : 100 m³/day.

- CII conducted extensive water audit at Sterlite in two phases in April-2007.
- CII proposed an annual water saving potential of 3,11,850 m³ (945 m³/day). It is equivalent to the annual water saving potential of Rs.82.12 lakhs.
- An extensive water balance was prepared by CII with the actual flow measurement in all the consumption points.

S. No.	Project	Investment (Rs Lacs)	Pay back period (Months)	Water	Annual
				saving (m3/d)	cost savings (Rs Lacs)
1	Optimization of SAP boiler blow down.	1.5	14	13.56	1.25
2	Replacing raw water with boiler blow down water at Cu.conc. storage bin area in smelter.	2	12	30	2.20
3	Reuse of blow down water at CPP.	2	7	50	3.70
4	Effective usage of treated STP water for beneficial applications.	10	16	100	7.42
5	Reducing raw water consumption in gardening, by diluting the TDS in the water collected in F-reservoir.	5	8	100	7.42
6	Avoiding use of raw water in the areas like secondary gas scrubber, floor cleaning in ETP and road washing near SLF.	5	8	100	7.42
	Total	25.5		394	29

S. No.	Project	Investment (Rs Lacs)	Pay back period (Months)	Water	Annual
				saving (m3/d)	cost savings (Rs Lacs)
1	Recycle vacuum pump seal water in PAP by installing dedicated cooling tower.	10	5	200	26.73
2	Recycle DMF & softener backwash water in WTP.	15	12	200	14.85
	Total	25		400	42





ETP

700 m³/day



Spray pond

100 m³/day



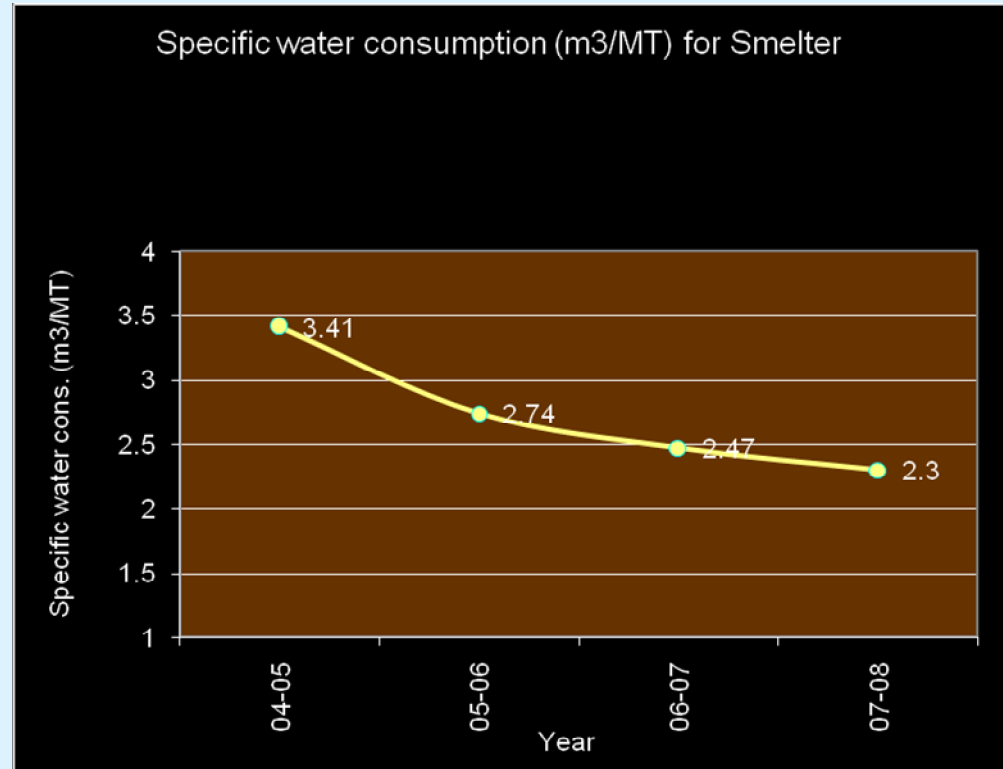
SGS



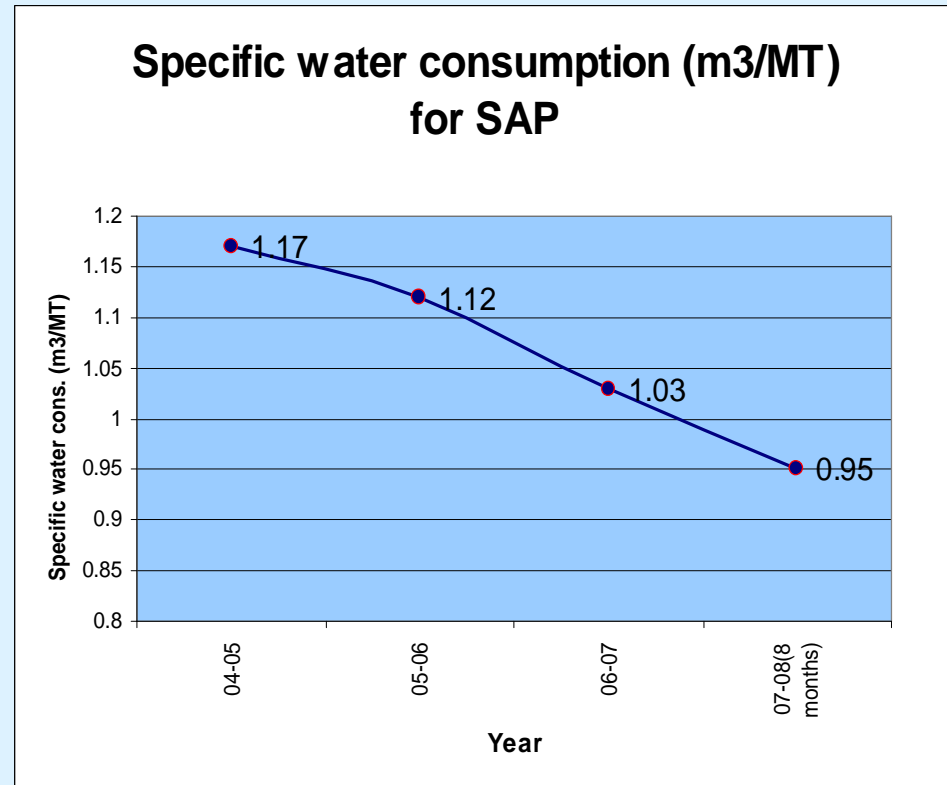
Slag granulation

9 11:49 AM

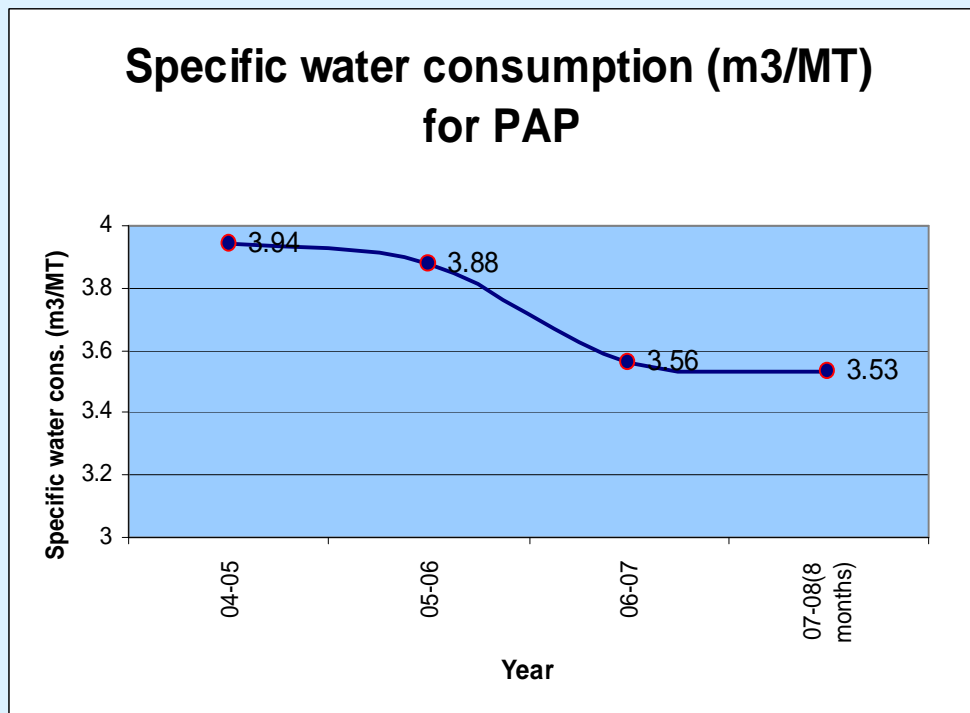
Year	Specific water consumption (m ³ /MT)
04-05	3.41
05-06	2.74
06-07	2.47
07-08(8 months)	2.30



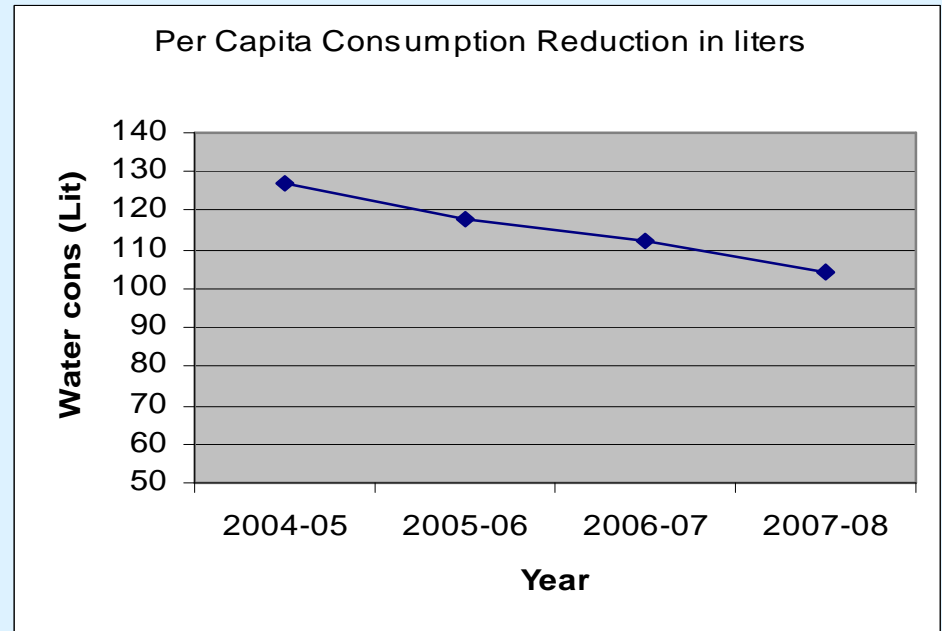
Year	Specific water consumption (m ³ /MT)
04-05	1.17
05-06	1.12
06-07	1.03
07-08(8 months)	0.95



Year	Specific water consumption (m ³ /MT)
04-05	3.94
05-06	3.88
06-07	3.56
07-08(8 months)	3.53



YEAR	Per Capita Consumption Reduction in liters
2004-05	127
2005-06	118
2006-07	112
2007-08	104



Sterlite , Tuticorin
Sterlite , Tuticorin

Thanks you all
Thanks you all

