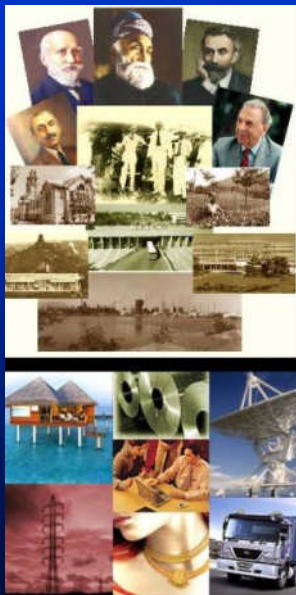


Presentation on
"Excellence in Water Management – 2008
16 & 17 December 2008: CII- Sohrabji Godrej Green Business
Centre, Hyderabad



The Glorious Tatas



TATA CHEMICALS LIMITED

- ✓ Group Turnover > \$62.5 Billion
- ✓ Group's 27 publicly listed companies have Market Capitalization \$ 60 Billion
- ✓ Operations in more than 40 countries across 6 continents
- ✓ Total Number of Employees : >350,000
- ✓ Conglomerate of 116 companies in 7

Business Sectors:

- Materials
- Energy
- **Chemicals**
- Services
- Consumer Products
- IT & Communications
- Engineering

Tata Chemicals



- ✓ Tata Chemicals Established in 1939 at Mithapur, Gujarat
- ✓ Urea complex at Babrala commissioned in Dec, 1994



Salt
Soda Ash



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Fertilizer Complex - Babrala



Single train Ammonia Plant
Capacity – 1520 MTPD
Haldor Topsoe Technology

Two trains Urea Plant
Capacity – 2620 MTPD
Snamprogetti Technology



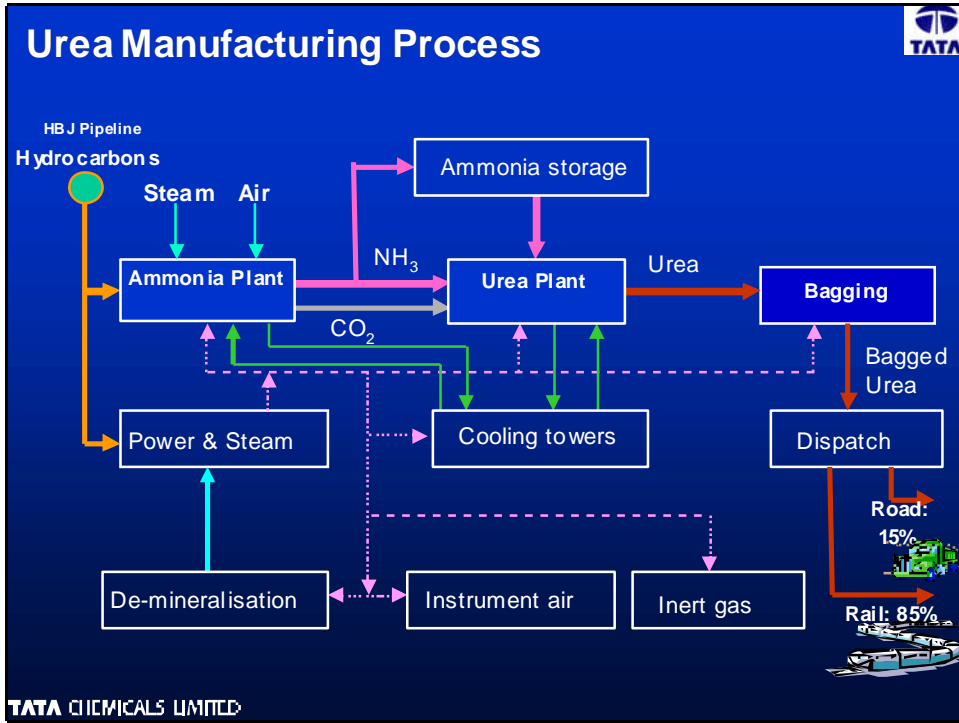
State-of-the-art Technology
Most Energy Efficient Plant
Most Environmentally Efficient
32% of entire area is under green cover



Zero Discharge of Effluents
Lowest Manpower Operated
DCS Control System
Single Control Room for Complex
SAP – R/3 ERP Package

TATA CHEMICALS LIMITED

Reference Plant for Technology Suppliers



Our APPROACH

Three pronged strategy for achieving excellence in water management

- ✓ Water Efficient Design
- ✓ Efficient Operations to conserve water
- ✓ Continuous identification of new opportunities and integrate them with the processes / operations through suitable modifications

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Water Efficient Design



Efficient Design: Selected **Unique** concepts at the design stage.

- ✓ **Though the river Ganges is near by we selected bore-well water as fresh water supply source.**
- ✓ **Earlier borewell water was coming to the plant after getting accumulated in a pond. Now it is coming to the plant directly through pipeline.**
- ✓ **Effluent treatment at the source to conserve water and ammonia**
- ✓ **Boiler blow down is used as make up to cooling tower.**
- ✓ **All innocuous treated effluents are used for green belt development and maintenance within the premises. TCL, Babrala is a 'ZERO' effluent discharge unit.**

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Water Efficient Operation



Efficient Operation: Our strategy is continuous monitoring and optimization of operation

- ✓ **Continuous vigilance and monitoring at the source (i.e at the tube well discharge)**
- ✓ **Maximum possible recycling of process/steam condensate**
- ✓ **Cooling water treatment optimization to operate with high cycle of concentration.**
- ✓ **Boiler water treatment optimization to minimize blow down quantity.**
- ✓ **Controlled use and monitoring at all consumption points**

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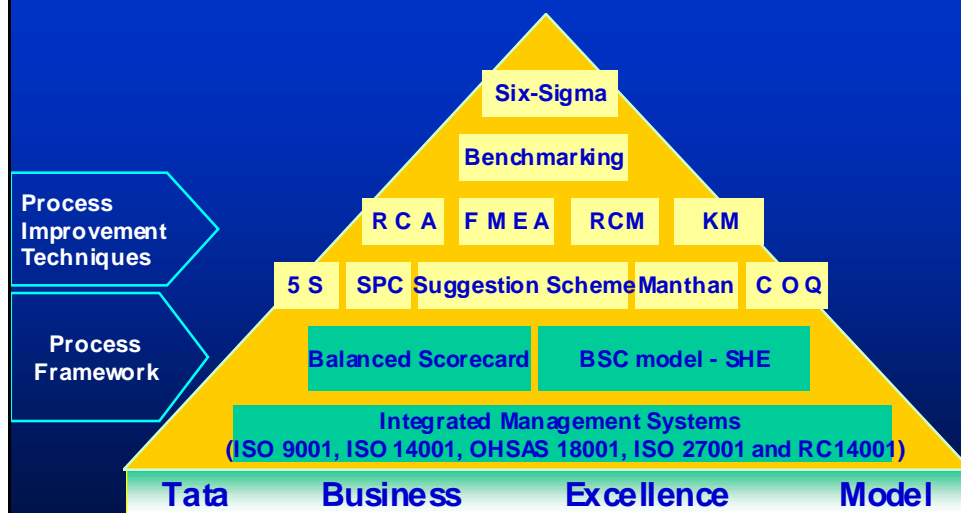
Find new opportunities and integrate



Efficient Modification: Our strategy is to involve maximum people and continuously search for new opportunities and optimization of operation

- ✓ All employees and township residents are made aware of water conservation
- ✓ People find new opportunities and suggest
- ✓ Suggestions are evaluated by concerned department followed by process engineering dept for benefits and suitability
- ✓ Scheme made and detail design done
- ✓ Scheme implemented and evaluated for actual benefits
- ✓ Suggestor is rewarded

Driving Excellence through People Involvement Teamwork and efficient methodologies



MONITORING.....Measure , Analyze & Improve



Measuring

Flow meters are provided at the discharge of tube wells to measure at source

Major consumption points have separate flow meters

Sum of production and sum of consumptions are balanced on daily basis. Variation (<2.0 %) ensures accuracy of measurement.

Daily Reporting

Daily water consumption information is sent to Senior Management

Daily Environment performance is reviewed by senior management

Every year reduction of specific water consumption target is taken and the same is mentioned in MD's Green Goal sheet

Environment incident Reporting System

Monitoring consumption of domestic water



To monitor and reduce per capita consumption

- ✓ Flow meters installed in the domestic supply lines to township
- ✓ Treated effluent is being used in place of fresh water for township green-field maintenance
- ✓ Awareness sessions on natural resource conservation and Quiz contest are conducted regularly for township (ISO-14001 certified) residents, school students and nearby community
- ✓ Township sewage water is treated and used for horticulture purpose
- ✓ Regular Preventive Maintenance of water taps/network at public places by using checklists

Water Conservation Projects 2004-2008			
Sr No	Year of Implementation	Description	Investment (Rs Lacs)
1	2004-05	Use of partially de-cationed water as ammonia cooling tower make-up (annual water saving: 284,000 m ³)	5.50
2	2004-05	To provide tapping points (5-6) at cooling tower Blow down header for horticulture purpose.	0.35
3	2004-05	2" bypass line provided with I/V from ring header to fountain water pump discharge line	0.00
4	2005-06	Recycling of DM plant analyser effluents to FWST (annual water saving: 10000 m ³)	0.85
5	2005-06	To provide flow metres in tubewells at drinking water o/l line going to township	3.00
6	2005-06	To provide water cooler in recycle line of HSD pump to control HSD temp in the day tank and thus eliminating use of water spray on the tank during summer (annual water saving: 5000 m ³)	1.00
7	2006-07	Recycling of CPS GP steam condensate to DM Plant (Annual water saving: 25000 m ³)	4.00
8	2006-07	Recycling of inter-stage condensate from compressors to cooling water return header (annual water saving: 25000 m ³)	4.50
9	2006-07	Installation of additional pH meter at the inlet lines to Guard pond-1	2.00
10	2006-07	To provide horticulture water tapping near Fire and safety lawn and GGP area	1.00
11	2006-07	To prime the floor washing pumps using effluent water and eliminate the consumption of utility water.	0.30
12	2007-08	To provide tappings at the 55-P-05A/B/C recirculation line for irrigation near NBS security guard cabin	0.25

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Water Conservation Project - 1

Installation of a water cooler for to control HSD tank temperature

- ✓ **HSD pump runs continuously as a ready available stand by fuel for Gas turbine and Boiler to avoid unwanted trips**
- ✓ **We used to spray water on tank surface to cool down the HSD tank in day time of hot summer**
- ✓ **A water cooler was installed to cool the recycled HSD at pump discharge so that temp remain below flash point of HSD**

Benefits

Annual water saving : 5000 M³

Investment : Rs 1.5 lacs

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Water Conservation Project-2



Rain Water Harvesting system in residential complex for water conservation

✓ Water harvesting Pond -1

- ✓ Capacity : 100X30X0.5 m³
- ✓ Water collected and recharged during rainy season: 4500 m³
- ✓ Cost of project: Rs 10,000

✓ Water Harvesting Pond – 2

- ✓ Capacity: 20X30X1 m³
- ✓ Water collected and recharged during rainy season: 900 m³
- ✓ Cost of project: Rs 25,000

Benefits

Annual water charged : 4500 M³

Investment : Rs 35,000

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Water Conservation Projects - 3



Rain Water Recycling project in residential complex for water conservation

- ✓ A pit of 10 M³ capacity constructed
- ✓ Auto start pump with capacity of 50m³/hr
- ✓ Recycle to raw water body

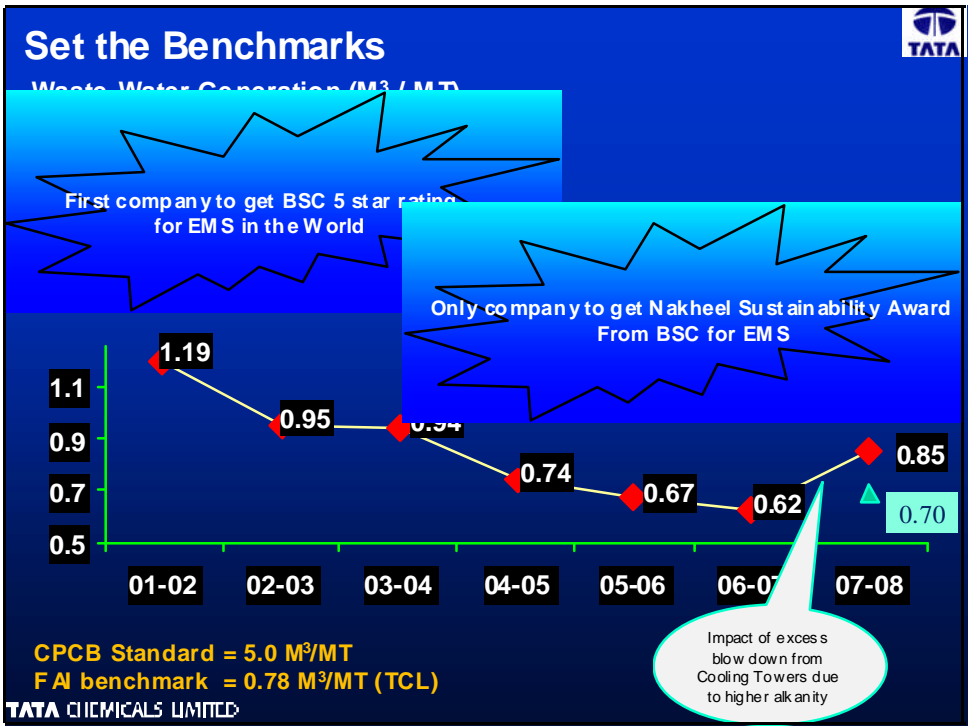
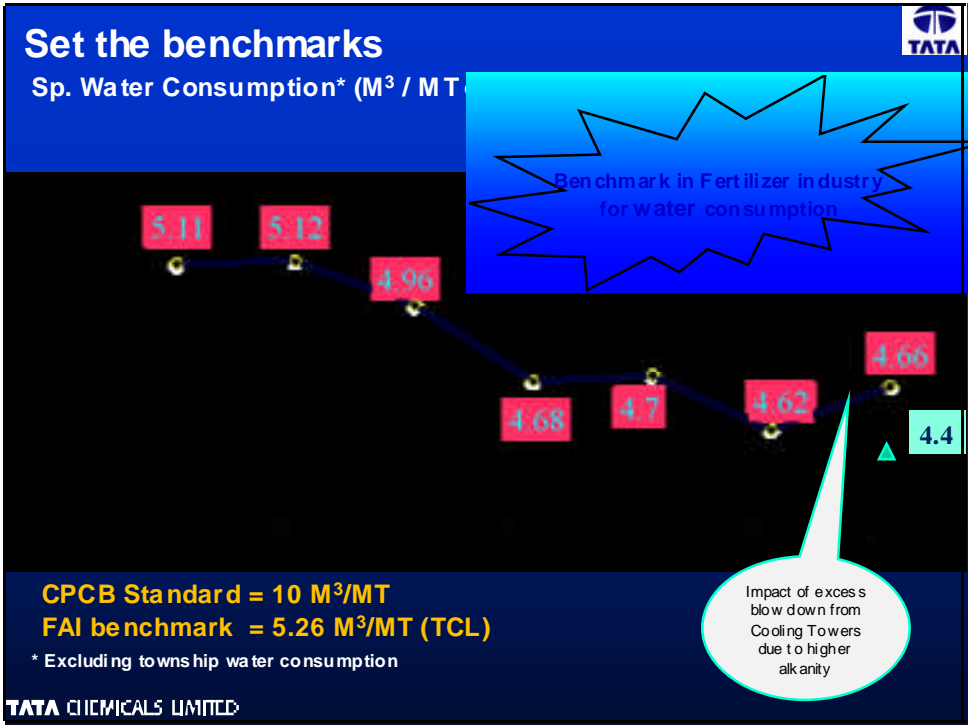


Benefits

Annual water saving : 50000 M³

Investment : Rs 100,000

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India's Best – Sp. water consumption (M³/MT)



	<u>TCL</u>	<u>Indo Gulf</u>	<u>CFCL</u>	<u>ECPL</u>	<u>KSF</u>
03-04	4.96	–	–	6.55	–
04-05	4.68	5.23	–	5.97	6.62
05-06	4.70	–	5.12	6.26	–
06-07	4.50	5.2	5.4	6.15	-
07-08	4.66 [#]	5.75	-	-	-

figure is 4.40 excluding impact of alkaline water blow down

CPCB Standard = 10 M³/MT

FAI benchmark = 5.26 M³/MT (TCL)

International Benchmark is not available for similar plant in similar geographical conditions. Also, Benchmarking report in the area of water conservation is not published by any agency.

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India's Best – Sp. Effluent generation (M³/MT)



	<u>TCL</u>	<u>Indo Gulf</u>	<u>CFCL</u>	<u>KSF</u>
03-04	0.94	–	–	–
04-05	0.74	–	–	0.82
05-06	0.67	0.80	–	–
06-07	0.62	0.71	1.0	–
07-08	0.85 [#]	0.73	-	–

figure is 0.70 excluding impact of alkaline water blow down

CPCB Standard = 5.0 M³/MT

FAI benchmark = 0.78 M³/MT (TCL)

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Way Forward.....never rest on your laurels



Deep recharge Rain water harvesting

Use of treated domestic effluents for toilet flushing in township

All new building to be constructed as Green buildings concept

Assessment of carbon Foot Prints of Tata Chemicals

Life Cycle assessment of Urea Business

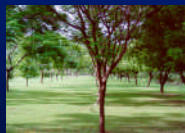
To establish model Eco-friendly villages in near by community

TATA CHEMICALS LIMITED

Certifications / Memberships



- ISO 9001, ISO 14001, OHSAS 18001, RC14001 and ISO 27001
- ISO 14001 and OHSAS 18001 certification for Township
- Signatory to Responsible Care – A public Commitment
- Member of CoRE – Corporate Round Table on Environment



TATA CHEMICALS LIMITED

AWARDS & ACCOLADES



- ✓ 5 Star rating for Environmental Sustainability from BSC, UK : 2004, 2005, 2006
- ✓ Sword of Honour from British safety council consecutively four times in a row. :2007-08
- ✓ ICMA, SHE Excellence Award : 2005
- ✓ Aditya Birla best Responsible Care Award : 2004
- ✓ Greentech Environment Excellence Platinum Award for year : 2003-04, 2004-05.
- ✓ Golden Peacock Environment Management Award for the year : 2005
- ✓ Award for “Excellence in Natural Gas Conservation” First Prize in Fertiliser Sector, instituted by GAIL : 2004, 2005.

TATA CHEMICALS LIMITED

AWARDS & ACCOLADES



- ✓ Environment protection award from Fertiliser Association of India : 2005-06
- ✓ Aditya Birla award for the best Responsible Care company” and “Corporate Social Responsibility award” : 2005-06, 2007-08
- ✓ Aditya Birla award for “Corporate Social Responsibility” for the year : 2005-06
- ✓ The Sarva Shreshtha Suraksha Puraskar (Golden Trophy and Certificate) from National Safety Council of India (NSCI) for year 2006-07.
- ✓ The best Technical Innovation Award (2006-07) from Fertilizer Association of India (FAI)
- ✓ Nakheel Sustainability award (Special Award) by British safety council in year 2007-08

TATA CHEMICALS LIMITED



At Babrala We are Proud of....



- Our State of Art Plant with many Novel Features** (Green piece)
- Our Benchmark SHE Standards : BSC Swords of Honor consecutively 4 times in a row** (Purple piece)
- Being Best in the World for our Technology Suppliers** (Orange piece)
- Being India's Best in SHE performance** (Pink piece)
- Our Highest Employee Productivity in Fertilizer Industry** (Yellow piece)
- Our High CSR standards** (Cyan piece)
- Our Environment Standards >> First plant in World to get BSC 5 star** (Light Purple piece)
- Our Greenest & Best Landscaped Industrial Facility** (Light Green piece)
- Being India's Most Energy & Water Efficient fertilizer complex** (Dark Blue piece)

TATA CHEMICALS LIMITED





BEING WORLD CLASS

THANK YOU

TATA CHEMICALS LIMITED