TATA CHEMICALS LIMITED (FERTILIZER SBU)
Budaun (Uttar Pradesh)

Unit Profile

Tata Chemicals limited (TATA CHEM) founded in 1939, is a part of TATA group of companies. TATACHEM comprises two divisions – Chemical division located at Mithapur (West Coast, in Gujarat State) and the fertilizer division located at Babrala, Western Uttar Pradesh. The chemical division at Mithapur owns and operates a uniquely inorganic chemical complex that produces 35 basic chemicals of which soda ash is the major product. TATACHEM holds a predominant position as a leader in the soda ash industry. The inorganic chemical complex of TATACHEM is the largest not only in India, but also in this part of the world and ranks among the most self-reliant, energy efficient and water efficient operations anywhere in the world.

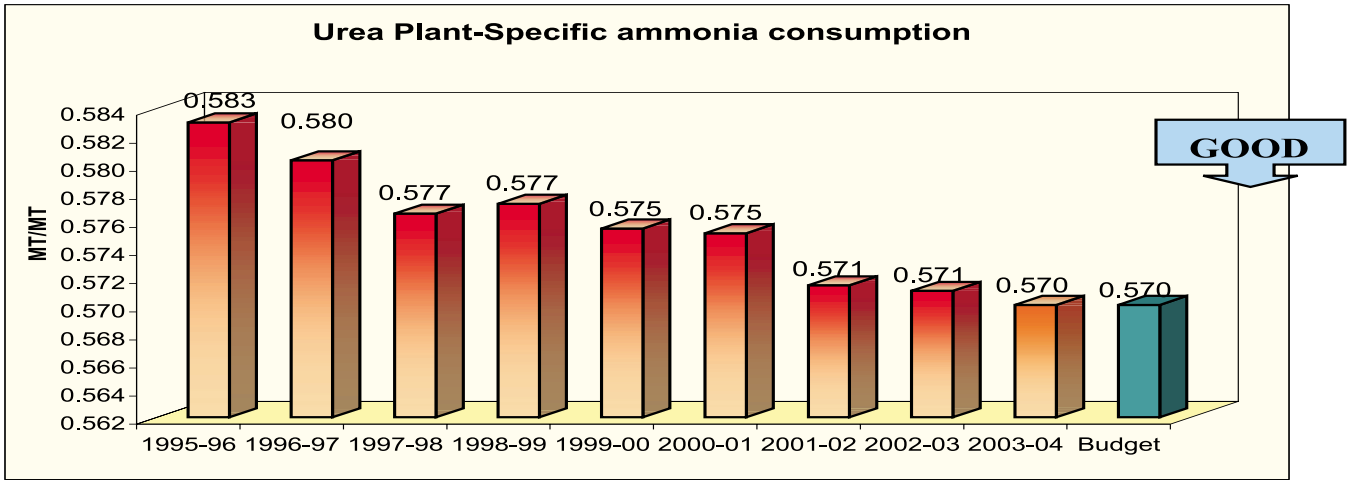
The fertilizer complex at Babrala comprises an Ammonia plant having an installed capacity of 1350 MTPD based on the "state of the art" low energy process of Haldor Topsoe A/S and two streams of Urea each having a capacity of 1310 TPD based on Snamprogetti spa technology incorporating several low energy features. The related facilities of offsites and utilities consist of a captive power and steam generation plant with two Gas turbines, two heat recovery units and one service boiler, cooling towers, ammonia storage, naphtha storage, inert gas plant, effluent treatment plant etc. . The design of utility plants was carried out in house. The control system at the complex is most advanced and is based on TDC3000 rel. 530 of Honeywell. An ERP system SAP 4.6 C has been installed to monitor and integrate all key business operations across the organisation for effective optimisation and control.

The company's board recently started its own marketing arrangement with effect from 1st April 2003 to bring more customer orientation and competitive edge to its business, earlier Rallis India Ltd was the strategic partner for the marketing of the Urea product. The cost optimisation effort by the company is highlighted by the fact that Tata Chemicals has institutionalised the concept of "MANTHAN" (Total Operative Performance) Accelerated Performance Improvement, the project aims at saving Energy/costs in various units of operation. Manthan has completed Seven Waves leading to a total saving of Rs 36.79 Crores and is currently into the eighth wave " Technology Upgradation"

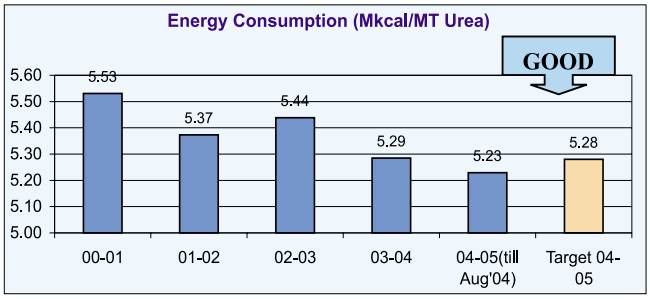
Energy Consumption

About 80% of the energy required for urea production is drawn from Ammonia. Reduction and prevention of ammonia losses in the plant helps in reduction of energy consumption. The total loss of ammonia is reflected in the form of ammonia and urea emanating as gaseous and liquid effluent continuously or intermittently from MP, LP, vacuum sections and prilling tower besides spillage and leakage. Regular monitoring of the process vents including PSV's was initiated to ensure that the ammonia and CO2 losses are minimized. Energy check lists are used to monitor the plant operating parameters and losses. Trend of specific consumption of ammonia is depicted in Table

Tata chemicals have consistently achieved lower energy levels than the design parameter of 5.79 Mkcal per tonne of urea as shown in Fig.1. The Company had achieved an energy consumption figure of **5.285**



Mkcal per tonne of Urea which is the lowest recorded energy consumption value on a national level. Currently Tata Chemicals is considered the **Benchmark for energy efficiency in the Indian Fertiliser Industry.(Source: FAI)**.



Costs in Rs. Crores	2001-2002	2002-2003	2003-2004**
Manufacturing Cost	420.15	471.03	457.88
TOTAL ENERGY COST	225.31	249.02	241.89
Energy cost as % of Manufacturing cost	53.63%	52.87%	52.83%

* The % of Naphtha used in Feed & Fuel had gone up from **0.7% in 2001-02 to 5.2% in 2002-03 to 20.9% in 2003-04** owing to a severe restriction in NG allocation by MOPNG. Also the cost of Naphtha had gone up by **Rs.1154/KL in 2003-04 over 2002-03.** If we consider the same fuel composition as 2002-03 and negate the effect of price increase, then we get an energy cost for the **actual total energy consumption of 2003-04 at Rs 241.89 crore/yr which is Rs 700 lakh less than 2002-03 figures.** Considering this energy cost the new **Energy Cost as a % of manufacturing cost now becomes 52.83% (as mentioned in the table above).** However if we take into account the actual cost of naphtha & the naphtha consumption of 20.8% the Manufacturing cost becomes 534.7 and the Energy cost becomes 59.76% of manufacturing cost

Energy Conservation Commitment, Policy and Set up

Energy conservation is continuous and on going process. Energy Balancing/Monitoring and tracking at Tata Chemicals is done by Process Engg. Deptt on a daily basis. The energy consumption is monitored on daily basis in each plant and appropriate and immediate measures are taken to minimise consumption on a continuous basis by cross functional team comprising of Operation & Maintenance, and Technical Services. The company's strategy is to sustain the position as " Lowest Energy / Cost Consuming Urea Producer in the World".

Tata Chemicals has institutionalized the concept of "MANTHAN" (Total Operative Performance) Accelerated

Performance Improvement, the project aims at saving Energy/costs in various units of operation.

The MANTHAN is a structured, time bound and team based with top management support and bottom up approach which uses the creativity and energy of employees and all the partners and suppliers to impact the company's bottom line with minimal investment in the shortest possible time. It is a performance focused, people driven, and Comprehensive bottom up program that channels the experience and knowledge of employee to generate and implement ideas that significantly improve operations and bring breakthrough improvements.

The Manthan has completed 5 waves of operation respectively for Ammonia, Urea, Offsites , ENCON and 2 waves for marketting, logistics and fixed costs. Presently its 8th wave is in operation on "Technology Upgradation".

Syndicated Savings for different waves

Wave - I	Ammonia	8.21 Croes
Wave - II	Urea	2.51 Crores
Wave - III	Offsites and Utilities	5.66 Crores
Wave – IV	ENCON	1.68 Crores
Wave-V	Replacement ideas	3.29 Crores

The total syndicated savings of all waves till date, taken together is Rs 36.29 Crores.

All the plant data related to energy and production gets automatically downloaded each day at 10:00 AM via a DCS to SAP interface module Energy Balancing via SAP-PP module is done by Technical Services by 11:00 AM. The departments are immediately informed to take corrective and preventive actions The HOD's can confirm the production figures in SAP only after the GO AHEAD clearance form Technical Services.

Each department has a Balanced Score Card (BSC) and Annual Quality Improvement Plan (AQUIP) and is daily monitored via a SAP linked Dashboard which contains the yearly targets and the asking rate to achieve the targets

Each HOD has to present his departmental project target Vs Actual before the VP-Manufacturing andGM-Operations in the AQC (Apex Quality Circle)and elaborate his action plan for deviations. VP-Manufacturing sends Monthly and Quarterly performance reports to Chief Operating Officer -Fertiliser SBU and MD.

Energy Conservation Achievements

As the company did not take the Annual Shut down of the plant, so some of the energy conserving projects could not be implemented however Tata Chemicals implemented the following energy conserving projects during the year 2003-04 :-

- To stop P-22 by interconnecting the header of P-22 and P-06. **Expected Savings Rs. 0.86 lakhs/year**
- P-13 and P-10 discharge interconnection and stopping of P-10. **Expected Savings Rs.0.48 Lakhs/ year**
- Installation of 5 extra High efficiency trays in Urea reactor of both units. **Expected Savings Rs 204.19 Lakhs/year**
- Installation of Additional plates in E-18 to improve its efficiency. **Expected Savings Rs.26.42 Lakhs/ year**

- Recovery of Ammonia from V-05 vent by connecting it to Vacuum Section. **Expected Savings Rs.26.42 Lakhs/year**
- C-03 off gases utilisation in Primary Reformer as fuel. **Expected Savings Rs.92.23 Lakhs/year**
- To connect the prevacuum vent to the blow down header. **Expected Savings Rs.0.86 Lakhs/year**
- To provide arrangements for backflushing of E-19A/B. **Expected Savings Rs.35.41 Lakhs/year**
- To connect 11-R-02 (Hydrolyser) off gas to C-02, just above 36th tray and 46th tray. **Expected Savings Rs.66.35 Lakhs/year**
- Recycle of P-7 solution to C-03 top and provision of sparger in the C-03 inlet vapour line. **Expected Savings Rs.36.44 Lakhs/year**
- To install air sealing system in MCL. **Expected Savings Rs.247.19 Lakhs/year**
- To throttle LS I/V's of prevacuum and vacuum section ejectors. **Expected Savings Rs.12.52 Lakhs/year**
- To reduce the running hours of P-11A/B (H.P. flushing pump) . **Expected Savings Rs.0.10 Lakhs/year**
- Substation 2 and 3 the lighting can be switched on/off as per requirement by installing ON/OFF switch outside the substation. **Expected Savings Rs.0.70 Lakhs/year**
- Auto speed control of BFW turbine by differential pressure between BFW and steam drum. **Expected Savings Rs.24.17 Lakhs/year**
- 02FV-32 (FV-740) bypass to be provided during start up. **Expected Savings Rs.0.46 Lakhs/year**
- Trim change of valve FV33 (excess syn gas to reformer) . **Expected Savings Rs.43.89 Lakhs/year**
- Excess syn gas tapping from the upstream of E-312. **Expected Savings Rs.9.27 Lakhs/year**
- Generator Frequency reduction. **Expected Savings Rs.12.68 Lakhs/year**
- Reduction of consumption of Service air at Service Boiler for burner cooling. **Expected Savings Rs.25.14 Lakhs/year**
- To stop 55-P-02A/B. **Expected Savings Rs.0.20 Lakhs/year**
- Stopping of UB4 raw water pump and connecting the header with the horticulture. **Expected Savings Rs.0.10 Lakhs/year**
- Hot DM water from Ammonia plant. **Expected Savings Rs.45.02 Lakhs/year**
- Blinding of service air tappings (8 nos) at both HRU to save KS consumption in process air compressor at ammonia plant. **Expected Savings Rs.43.09 Lakhs/year**
- LS isolation valve provided near Ammonia Plant battery limit. **Expected Savings Rs.12.34 Lakhs/year**

Energy Conservation Plans and Targets

The company is committed to further improve upon its energy performance.

The following energy saving initiatives are planned for the year **2004-2005**:-

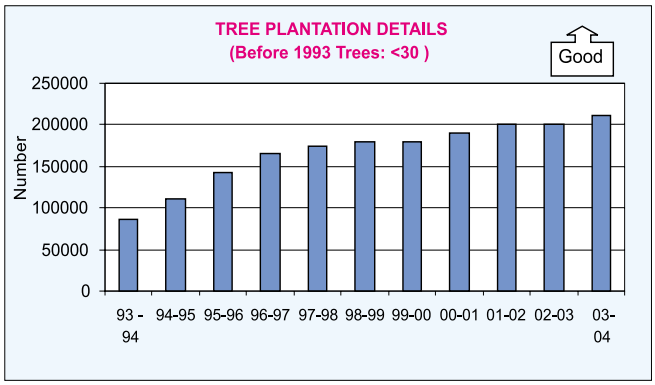
- Scheme for lowering of flue gas temperature exit of combustion air preheater located at the waste heat recovery section of the primary reformer. **Expected Savings Rs.56.9 Lakhs/year**

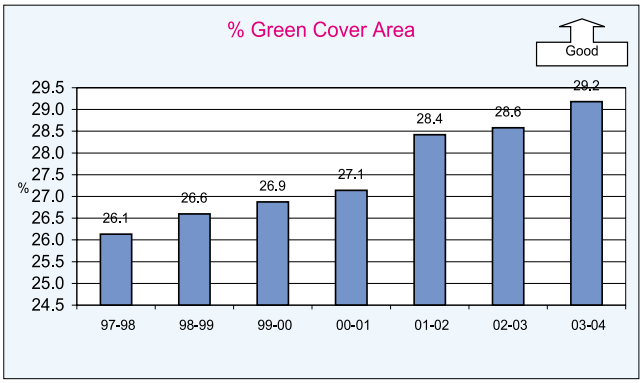
- MP Process condensate stripping system instead of LP system in Ammonia Plant. **Expected Savings Rs.336.71 Lakhs/year**
- Optimisation of Process parameters by installation of Advanced Control System. **Expected Savings Rs.332.71 Lakhs/year**
- To provide arrangements for preheating NG in E-204B instead of heating in E-219. **Expected Savings Rs.52.58 Lakhs/year**
- Change of KS line insulation. Expected Savings Rs.43.09 Lakhs/year. **Expected Savings Rs.55 Lakhs/year**
- Use of ejector for transfer of water from GP-2 to GP-1. **Expected Savings Rs.0.17 Lakhs/year**
- Fuel NG going to Reformer to be heated in E-204. **Expected Savings Rs.51.81 Lakhs/year**
- To provide urea melt recirculation system in MV-06 & MV-07. **Expected Savings Rs.1.17 Lakhs/year**
- To provide control valve in the C-02 off gas line. **Expected Savings Rs.18.45 Lakhs/year**
- Blinding one stage of Boiler Feed Pumps in Ammonia Plant. **Expected Savings Rs.2.58 Lakhs/year**
- Condensate of steam traps of CO2 compressor area to be diverted to LC header. **Expected Savings Rs.1.06 Lakhs/year**
- Steam Inlet in PC Stripper to be controlled by TIC as well as FIC. **Expected Savings Rs.2.53 Lakhs/year**
- Steam saving by providing the close loop to all the traps' outlet at CPP area. **Expected Savings Rs.3.05 Lakhs/year**
- E-602 replacement with old one as the existing is having lower capacity than design. **Expected Savings Rs.86.15 Lakhs/year**

Environment and Safety

Tata Chemicals has a safety management system conforming to **ISO14001 & OHSAS18001**. The company has built an Effluent Treatment Plant and developed 13 km long green belt to ensure the concept of **Zero liquid effluent discharge**. At Tata Chemicals (Fertiliser plant) the quality of effluents and air emissions always conform to the standards stipulated by UP Pollution Control Board and the Ministry of Environment and Forest.

The company has a strong commitment towards safety. The total man-hours lost during 2003-04 was zero although there were 3.3168 number of direct million man-hours engaged(including contract labours)in the





entire nitrogenous fertiliser production facility during 2003-04