

BRIEF WRITE-UP ABOUT TATA CHEMICALS LTD. **(FERTILISER WORKS)**

(i) UNIT PROFILE

Tata Chemicals Limited (TATA CHEM) founded in 1939, is a part of TATA group of companies. TATACHEM comprises four SBUs. These are Chemicals-SBU, Fertilizer- SBU, Food Additives-SBU and Agri-business SBU. The Tata Chemical Limited operates the largest and integrated inorganic chemicals complex in India at Mithapur which 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 TATA CHEMICALS 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. A pioneer and market leader in the branded iodised salt which has a highest purity in the country. Our Phosphate plant located at Haldia is one of the efficient plants in India. Tata Chemicals has acquired three Soda ash plants of 'Bruner Mond' located around the globe and also General Chemicals Industrial Products Inc, a US based chemical company. As a result Tata Chemicals has risen as second largest Soda ash producer in the world.

The fertilizer complex at Babrala comprises an Ammonia plant having an installed capacity of 1520 MTPD based on the "state of the art" low energy process of Haldor Topsoe A/S and two streams of Urea each having an installed capacity of 1310 TPD based on Snamprogetti spa technology incorporating several low energy features. The related facilities of off-sites 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 ECC 6.0 has been installed to monitor and integrate all key business operations across the organisation for effective optimisation and control.

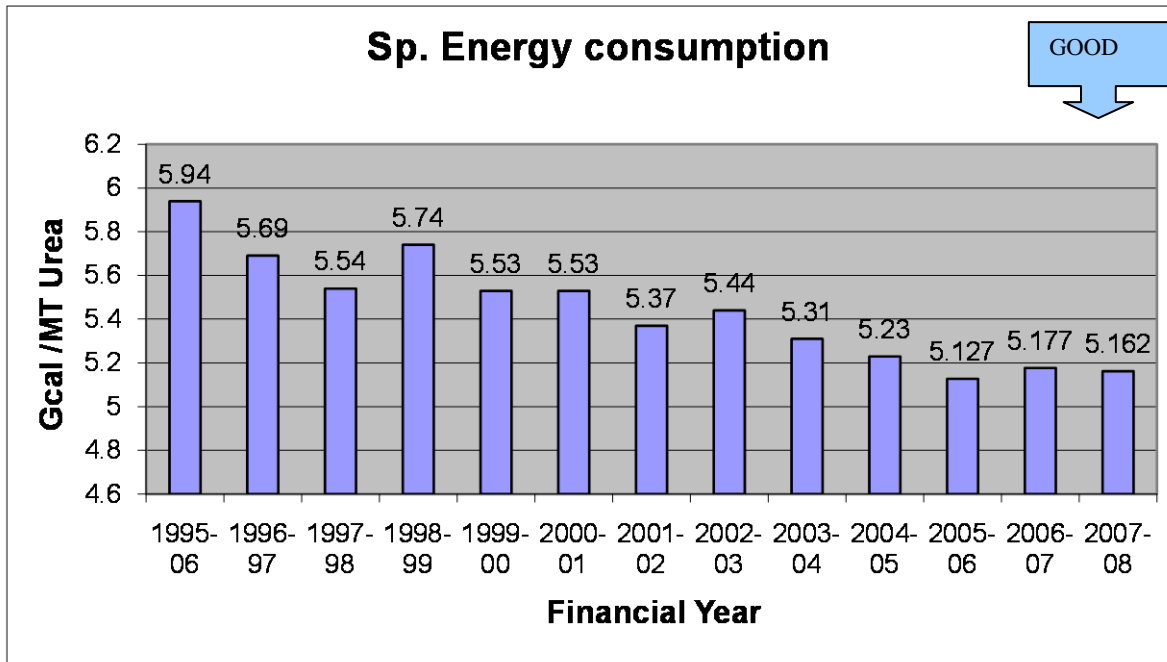
The fertilizer complex at Babrala is one of the six inland located fertilizer complexes based on cross country HBJ (Hazira- Bijaypur- Jagdishpur) natural gas pipeline. The pipeline transports associated gas from Bombay High and Natural Gas from South Basin to fertilizer and power plants located inland. Babrala happens to be at the tail end of the pipeline and experiences therefore frequent fluctuations in the gas supply pressure and quantity. As a consequence normally 70% of the total requirement of feedstock and fuel is being met with Natural Gas and the balance is met with Naphtha. Naphtha is drawn in rail tankers from a refinery in Mathura located at a distance of 150 Km by rail.

TATA CHEM Fertilizer complex is committed to bettering its already impressive quality norms and systems. It has been awarded ISO-9001-2000, ISO-14000, OHSAS-18000 and RC-14001 certifications. The company has also embraced the Tata Business Excellence Model (TBEM) in its quest to become more performance oriented and customer centric. Based on the Malcolm Baldrige National Quality Award, this model takes a holistic and comprehensive approach to improving business processes and strategic - decision making. The Fertilizer complex has been awarded Sword of Honor and EMS five star rating by British Safety Council, UK which shows the highest commitment to the safety standards. 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.

(II) 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 Pressure safety Valves was initiated to ensure that the ammonia and CO2 losses are minimized. Energy check lists (see Annexure 2, 3 &4) are used to monitor the plant operating parameters and losses.



Note: Specific consumptions given in above chart include non-plant energy consumptions also

Tata chemicals have consistently achieved lower energy levels than the design value of 5.79 M kcal per tonne of urea. The Company had achieved an energy consumption figure of **5.11 M kcal / 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.**

The plant has facility of dual fuel use (NG and Naphtha) at any mix at all consumption points. To reduce the cost of production, contract has been signed with IOCL for supply of RLNG. In 2005-06 approx 37% of total Natural gas used was RLNG. Our effort to reduce cost of production is a continuous process. We are looking for spot price RLNG continuously. As and when it is available, it is being used for production of fertiliser grade urea.

(III) 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 create the position as "Lowest Energy / Cost Consuming Urea Producer in the World".

There is well defined **Energy Policy (Annexure-6)**, modification and project management system for implementing any process changes in the plant regarding energy conservation, safety and environment. 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 14 waves of operation respectively for Ammonia, Urea, Offsites , ENCON and 2 waves for marketting, logistics and fixed costs, technology up- gradation, data management etc.

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 and GM-Operations in the AQC (Apex Quality Council) and elaborate his action plan for deviations. VP-Manufacturing sends Monthly and Quarterly performance reports to Chief Operating Officer-Fertiliser SBU and MD.

(IV) ENERGY CONSERVATION ACHIEVEMENTS

Energy conservation and safety are given top most priority in plant operation. Ideas are generated through Brainstorming within employees, discussion with experienced vendors, ex-employees and technology supplies and from literature survey. All ideas are analysed for techno-commercial feasibility by a Manthan and technical cell of the plant. The ideas are implemented after critical evaluation, HAZOP study, if found suitable. In this process Tata Chemicals implemented following energy conserving projects during the year 2007-08. The summary of the schemes are given in tabular form.

<i>Sr. No.</i>	<i>Detail</i>	<i>Saving of fuel in Gcal/yr</i>	<i>Saving of fuel in Rs. Lacs/yr</i>	<i>Investment in Rs.Lacs</i>	<i>Simple payback period (Years)</i>
1	Installation of Booster Pump in the Cooling Water line of final syn gas Cooler (E-312):	800	7.04	9.5	1.35
2	Stopping of HSD pump at naphtha day tank to reduce power consumption	500	4.4	1.05	0.24
3	Recovery of waste Heat from continuous boiler blow down of ammonia plant	1800	15.84	5.0	0.32
4	Stage blinding of Ammonia plant boiler feed pump (P-601B)	630	5.544	3.5	0.63
5	Diversion of GV condensate to ammonia plant De-aerator	1820	16.02	1	0.06
6	Coro-coating of 3 nos Ammonia cooling water pumps	500	4.4	17	3.86
	Total	6050	53.244	37.05	

(V) ENERGY CONSERVATION PLANS AND TARGETS

The company is committed to improve upon its energy performance further. The excellence in Energy consumption is not a destination but a continuous journey for the unit as a whole. Due to heavy shortage of urea in the country and exorbitantly high international price of the commodity Tata Chemicals, in consultation with Department of Fertilisers, took decision to step up production through plant debottlenecking route with minimum implementation time and cost. During the current year debottlenecking project will be commissioned and more than 34 days shut down has been planned. Additional no of days of shut down and additional equipments like fired heater required in the debott project are expected to contribute more specific energy during the year 2008-09, therefore target of higher sp energy consumption (5.24 MKCal/MT) is taken for this year. However, we have planned a few energy saving projects accordingly to be commissioned by next year to reduce energy level to 5.1 MKCal/MT and our efforts will continue for coming years to bring it to 5.0 MKCal/MT level.

The following are some of the energy saving immediate initiatives in the pipeline for 2008:-

- Installation of new heat exchanger for pre-heating fuel natural gas to CPP by using urea steam condensate.
- Installation of make up gas chiller in synthesis compressor by LiBr chilling technology.

(VI) ENVIRONMENT AND SAFETY

Tata Chemicals has a SHE management system conforming to **ISO-14001, OHSAS-18001 and RC-14001**. 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. High standard of safety guided by OHSAS-18801 and British safety council are experienced through out the works. Recently on 13th Sept-2008 the unit has completed 5 million accident free man hours. The Fertiliser plant at Babrala was awarded Sword of Honour by the British Safety Council consecutively for 04 years from the year 2003-04 to 2006-07 and also 05-star rating for Environment Sustainability by British Safety Council consecutively from the year 2004-05 to 2006-07. Based on consistent environmental performance, British Safety Council has honoured Tata Chemicals (Fertiliser Plant) by presenting special award "Nakheel Business Sustainability Award" in 2008.

The organization has many commendable awards In Year 2007-08. A few of them are listed below.

Quality:

- International Asia Pacific Quality Award (IAPQA from Asian Pacific Quality Organization.
- JRD QV award for TBEM 600+ score to TATA Chemicals Ltd.

Energy and Water Management: -

- CII-National Energy Management Excellence Award – 2007
- CII-National Award for Efficient Water Management – 2007
- Five star rating in Environment sustainability

SHE (Safety Health and Environment) :-

- Aditya Birla award for the best Responsible Care company" and "Corporate Social responsibility award" 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.
- Sword of honour from British safety council consecutively four times in a row.

Innovation :-

- The best Technical Innovation Award (2006-07) from Fertilizer Association of India (FAI)