

KRIBHCO SHYAM FERTILIZERS LIMITED

Distt. Shahjahanpur (Uttar Pradesh)

Unit Profile

Kribhco Shyam Fertilizers Limited (KSFL) is a gas based fertilizer plant located at a distance of 15 Km from Shahjahanpur on Shahjahanpur-Farukhabad state highway in Uttar Pradesh. The natural gas to the plant is supplied by HBJ pipeline.

This fertilizer plant has single stream of ammonia plant based on the "state of the art" low energy process of Haldor Topsoe A/S and two identical streams of urea plant based on Snamprogetti Spa technology incorporating several low energy features. The installed capacities of ammonia & urea plants are 1350 MTPD & 2200 MTPD respectively. Ammonia & urea plants capacities were reassessed to 1520 MTPD & 2620 MTPD respectively w.e.f. 1st April 2000. The commercial production of this plant was started in December'1995.



Feasibility study for revamp of ammonia & urea plants were carried out in 2006 by its process licensors M/S Haldor Topsoe & M/S Snamprogetti for increasing ammonia & urea production capacities to 1950 MTPD & 3130 MTPD respectively. Based on their recommendations and in-house study many attractive energy saving schemes had been incorporated mainly in ammonia plant. By these efforts Kribhco is now able to produce close to 1800 MTPD ammonia & 3000 MTPD urea on consistence basis.

Upcoming Projects

- (1) Power required for plant is supplied by one gas turbine and second gas turbine used as a standby. This gas turbine is running in off grid operation but plant is shortly going for export of surplus power by running stand by gas turbine.
- (2) Feasibility study M/S HTAS is under progress for increasing ammonia production to 2000 MTPD and producing CO2 equivalent to 3500 MTPD urea by incorporating all feasible energy saving schemes.
- (3) One additional cooling tower cell for ammonia plant.

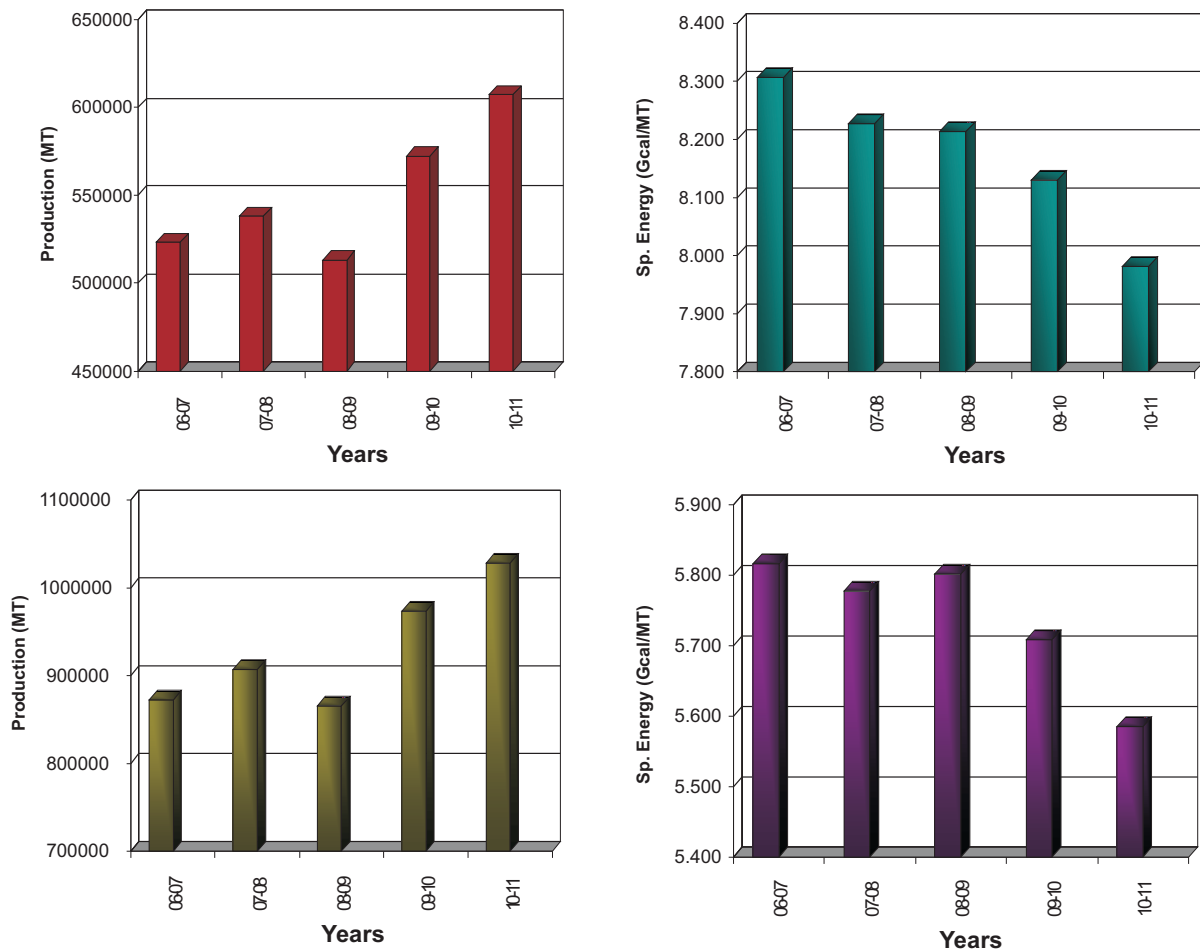
Energy Consumption

KSFL is one of best energy Managed Industry in fertilizer Sector. Various energy efficiency measure have been taken up by the industry time to time and uses designed amount of energy input for per unit production of the Urea. The Energy input level is in the close range of design data which is supposed to be best possible levels keeping in mind with age and operating condition of the plant.

Energy consumption data for the last five years are summarized in the table below:-

Plant	2006-07	2007-08	2008-09	2009-10	2010-11	Reduction in FY2010-11 w.r.t. FY 2006-07
Ammonia	8.3060	8.2260	8.2127	8.1297	7.9811	3.91 %
Urea	5.8164	5.7772	5.8014	5.7088	5.5842	3.99 %

All figures are in GCal/MT



Energy Conservation Measures

Ammonia & Urea manufacturing plants are highly energy intensive. Energy cost has tremendously gone up in last 5 years and is increasing day by day. Energy cost contributes more than 80% of total cost of urea production therefore slight change in energy consumption has considerable impact on the production cost of urea.

Energy conservation is continuous & ongoing process and focused activity of the KSFL. Energy balance, monitoring and tracking at KSFL is done by Technical Service Department on daily basis. The energy consumption is monitored on daily basis in each plant and appropriate and immediate measures are taken to minimize 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 modification and project management system for implementing any process changes in the plant regarding energy conservation, safety and environment. A task team is constituted in each department who takes care of

day to day monitoring of plant equipment and if any variation or abnormality observed it was brought in the notice of technical service department and this problem was addressed with the consultation of concerned department.

Based on above, KSFL had identified and incorporated some of the attractive energy saving schemes mainly in ammonia plant. This has resulted highest ever ammonia & urea production with lowest ever specific energy consumption in FY 2010-11. KSFL had implemented many schemes/modifications to achieve sustainable energy conservation and CO₂ emission reduction. Major schemes implemented in the last three years are as under:-

S.N.	Plant	Name of Scheme	Year of Implementation	Resulted Saving (Rs Lacs/annum)	Investment Done (Rs Lacs)
1	Ammonia Plant	Isolation valve provision in 14" CD vapor line from process condensate stripper (F 1321 to E-1322 air cooler	FY2008-09	16.77	1.20
2		Installation of Ammonia Product Heater in the ammonia line going to urea plant	FY2009-10	48.31	13.03
3		PAC Discharge line size increased from 10" to 12" for reduce pressure drop and increasing air flow rate.	FY2009-10	107.36	17.92
4		FD/ID Fan duct modification by using CFD Analysis	FY2009-10	41.17	140.33
5		Provision of Primary Reformer Fuel NG preheating	FY2009-10	4.75	20.90
6		Installation of New Plate type heat exchanger in synthesis loop.	FY2010-11	26.84	12.00

Major Energy Conservation Measure implemented in FY 2010-11

a) Installation of an additional Exchanger

One additional plate type heat exchange was installed in the synthesis loop (as shown in the schematics). This resulted reduction in gas temperature at the exit of E-1505 heat exchanger. Reduction in temperature of gas resulted reduction in ammonia vapor formation from chillers. This has reduced load on ammonia refrigeration compressor thus saving of steam.

Investment incurred on the project	: Rs. 12 Lacs
Total savings per annum	: Rs. 32 Lacs
Payback Period	: 4.5 Months
Yearly Saving	: 269 MTOE

b) Modifications in ammonia plant synthesis gas turbine condensate transfer system

Existing condensate header was overloaded and due to high pressure drop in network Plant was forced to run two nos. condensate transfer pump in synthesis gas turbine. After study it was concluded that installation of a dedicated separate line of 8" size (to shortest possible route) will be the economical solution. The scheme was implemented by using existing unused pipeline. Investment cost was very less. After implementation of the scheme, Plant is able to handle the condensate by running only one pump.

Investment incurred on the project	: Rs. 1.00 Lacs
Total savings per annum	: Rs. 1.26 Lacs
Payback Period	: 10 Months
Yearly Saving	: 10 MTOE

c) Modifications in urea plant's inert washing tower (C-3/E-11) to minimize ammonia loss

Inlet gas pipe to E-11 bottom was extended and sparger arrangement was made for better distribution of gas in the solution. Level gauge upper tapping height was increased thus unit was able to maintain high liquid level in E-11 bottom. This has resulted saving of approximately 1.0 MTPD of ammonia which was otherwise going to atmosphere.

Investment incurred on the project	: Rs. 0.72 Lacs
Total savings per annum	: Rs. 32.00 Lacs
Payback Period	: 9 Days
Yearly Saving	: 256 MTOE

Other ENCON activities

- (a) Optimization of process parameters, higher plant load operation & maximizing on-stream days.
- (b) Performance monitoring of critical energy intensive rotating equipments, cooling towers.
- (c) Monitoring of energy consumption and rectifying the inefficiencies.
- (d) Regular monitoring and rectification of losses from steam traps, leakages, passing from vents.
- (e) Monitoring & Rectification of losses from stack and due to improper insulation.

Environment & Safety

KSFL Shahjahanpur Fertilizer complex has certification for QMS, EMS & OHSM thus maintaining an eco-friendly environment. Company is getting regular permits, consents and authorization for hazardous wastes from statutory bodies. Regular monitoring of emission from plant sources and ambient air are being carried out for controlling air pollution. A huge green belt has been developed all around the factory and township. Plant has been operating on ZERO effluent discharge by utilizing effluent in plant as well as township for horticulture purposes. Sewage water after treatment in sewage water treatment plant is used inside the plant premise.

Company is maintaining a very good safety record and providing training on Fire & Safety regularly to all employees and contract workers. Regular hazop study of the plant is being carried out by the external agencies.