

 NATIONAL FERTILIZERS LIMITED, VIJAIPUR-I, GUNA (M.P.) NATIONAL ENERGY CONSERVATION AWARD-2007 (LARGE SCALE INDUSTRY – FERTILIZERS)	
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1. COMPANY PROFILE

National Fertilizers Limited, a Govt. of India Undertaking, was incorporated on 23rd August 1974. It is the second largest producer of nitrogenous fertilizer in the country and has four operating fertilizer units located at Nangal, Bhatinda, Panipat and Vijaipur with a total installed capacity of 32.083 lakh tones Urea.

The Vijaipur unit, which is a ISO 9001:2000 & 14001:2004 certified unit, comprises of two streams-Vijaipur-I and Vijaipur-II, which went into commercial production in July, 1988 and March, 1997 respectively. Both the streams are based on “*Steam reforming process*” of Haldor Topsoe (Denmark) for Ammonia plants with Natural gas feed in Vijaipur-I & NG/Naphtha feed in Vijaipur-II. The Urea plants are based on Snam Progetti (Italy) ‘s “*Ammonia stripping process*”

2. ENERGY CONSUMPTION

The details of various energy inputs and specific energy consumption during the last three years are highlighted in the table below. NFL Vijaipur has made a strategic tie up with M/s IOCL & M/s BPCL w.e.f. 01.04.2005 to get Regasified Liquefied Natural Gas (RLNG), which is cheaper than Naphtha. Furthermore, it is cleaner fuel as compared to Naphtha. This has resulted in considerable reduction in the energy cost of Urea as compared to last year. However, availability of RLNG is not sufficient to phase out the use of Naphtha. The % mix of NG, RLNG & Naphtha use depends on the availability of Natural Gas from M/s GAIL & RLNG availability from IOCL & BPCL. Though there has been significant reduction in specific energy consumption in the Year 2006-2007, the energy cost has not reduced proportionately since the Energy cost is dependent on the input ratio & the input raw material cost.

DESCRIPTION	UNIT	2004-05	2005-06	2006-07
Annual Urea Production	Lakh MT	9.264	9.16103	8.7461
Total Electric Energy consumption	Thousand MWH	1084.28	1095.88	1035.41
Total Thermal Energy consumption	GCal	1098178.64	1028612.08	996133.18
Total Energy consumption (Electrical+Thermal+Raw material)	GCal	5386089.6	5308816.9	5034255.16
Total Sp. Energy Cons. (Electrical+Thermal+Raw material)	Gcal/MT	5.807	5.795	5.756
Total Manufacturing Cost	Lakhs Rs.	46980.26	42438.28	42583.76
Total Energy Cost	Lakhs Rs.	38718.03	35315.00	37458.42
Total Energy Cost (Electricity + Thermal)	Lakhs Rs.	19358.27	9522.74	12619.1362
Total Energy cost as %age of Manufacturing Cost	%	82.41	83.21	87.96

3. ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP

NFL, Vijaipur is very much committed to Energy Management and for the same has a dedicated Energy management/ Conservation Cell, comprising of members from various Deptt. / Disciplines & headed by DGM (TS). Energy Manager, who is also a Certified Energy Auditor, is coordinator of the cell. Energy conservation Cell is associated with energy monitoring & recommends for energy improvement schemes & day-to-day trimming of plant to improve energy. Based on in-house study / energy audit, a number of energy saving schemes have been implemented / are being implemented / planned to be implemented. For all ENCON measures, the EC Cell is the principal functioning & Coordinating cell. The functioning of Energy Management is from the top. The head of the unit holds regular weekly meetings to discuss the status of energy consumption levels & action taken on ENCON options. The middle management, consisting of departmental in charges, reviews the ENCON options identified by the Energy Cell or the Audit Group for implementation. ENCON options / schemes, requiring higher investment are put up to the top management (Head of unit, CMD, Directors) for approval of budget & implementation. Further, suggestion scheme system for workers is in vogue in the unit. Energy saving suggestions are given utmost priority for implementation & are suitably rewarded. Energy saving modifications from plant are also given top priority for early implementation. Energy conservation awareness programme are held through out the year.

In addition to the monthly energy audit based on inputs, detailed plant wise energy audit is carried out by in-house energy cell or selected technical audit team. Energy audit was also conducted by M/s HTAS, Denmark for Ammonia-I Plant. It was decided to implement the recommendation of the audit team. Accordingly, Energy Saving Project was taken up. However, the project has presently been kept abeyance in view of escalation cost & non-conducive Government Policy.

4. ENERGY CONSERVATION ACHIEVEMENTS

The specific energy consumption for the last three years are highlighted below.

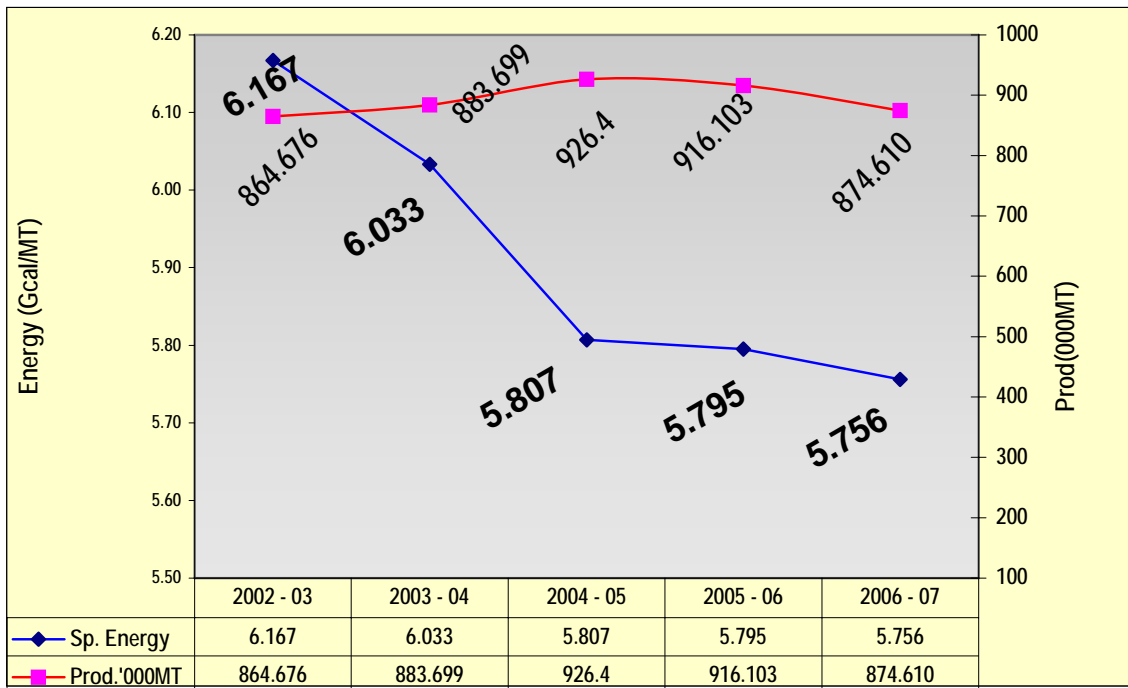
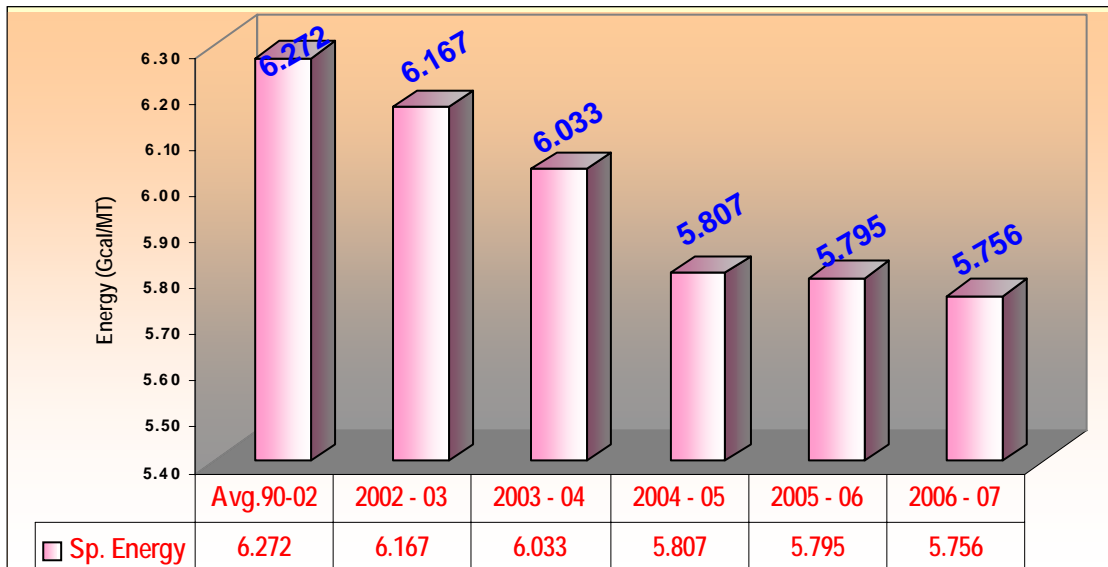
Year	Overall specific energy consumption (Gcal/MT of Urea)	% reduction in energy consumption (base year 2004-2005)	Monetary saving effected (base year 2004-2005) in Rs. Lakhs
2004-2005	5.807	-	-
2005-2006	5.795	0.21%	257.79
2006-2007	5.756	0.88%	1256.97

- All the savings have been shown in terms of Naphtha.

PERFORMANCE OF VIJAIPUR-I AT A GLANCE

ITEM	UNIT	2004-05	2005-06	2006-07
AMMONIA				
AMMONIA PRODUCTION	MT	529164	529272	502263
CAPACITY UTILIZATION	%	105.5	105.52	100.13
ON STREAM DAYS	DAYS	349.13	348.18	329.06
ONSTREAM EFFICIENCY	%	95.65	95.39	90.15
AVG. PLANT LOAD	MTPD	1516	1520	1526
NO. OF INTERRUPTIONS	NOS.	6	2	3*
SPECIFIC ENERGY CONS.	Gcal/MT	7.861	7.863	7.788

UREA	UNIT	2004-05	2005-06	2006-07
UREA PRODUCTION	MT	926400	916103	874610
CAPACITY UTILIZATION	%	107.15	105.96	101.16
ONSTREAM DAYS	DAYS	346.48	340.45	320.23
AVERAGE PLANT LOAD	MTPD	2674	2691	2731
ONSTREAM EFFICIENCY	%	94.93	93.27	87.73
SPECIFIC ENERGY CONS.	Gcal/MT	5.807	5.795	5.756



MAJOR ENERGY SAVING SCHEMES IMPLEMENTED DURING 2006-2007 ARE HIGHLIGHTED BELOW.

In its constant endeavour to optimise and improve upon the present systems, besides optimization of process parameters & maintenance practices, energy saving schemes were implemented recently after thorough & extensive study in the related fields.

A) INSTALLATION OF PRE-CONCENTRATOR IN 11-STREAM OF UREA PLANT:

In Urea Plant the vapour from MP Decomposer was earlier cooled from 120°C to 75°C & condensed in MP condenser before recycling back to the reactor. In the process the useful heat of condensation of 9.396 Gcal/h was being lost in Cooling Water.

By installation of Pre-concentrator, it has been possible to recover 60% of the useful heat. The vacuum concentrator, as per CASALE design, has been installed in 21 stream of Urea Plant. Pre-concentrator is an additional vacuum stage utilizing heat of condensation of Carbamate vapours coming from Medium Pressure. In this scheme, the first vacuum concentrator has been replaced with modified Heat Exchanger in which, in the upper part, heat of condensation of Carbamate vapour coming from the MP decomposer is used for heating Urea solution & in the lower part, Low Pressure steam is being used. LP steam saving to the tune of 210 kg/MT steam, against guaranteed saving of 195 kg/MT Urea, has been achieved. Moreover, Prill quality of urea has also improved.



In view of NG limitation from M/s GAIL, we had been forced to use Naphtha. Hence, all Energy savings has directly resulted in saving in terms of naphtha.

- **PAYBACK:**
- Annual savings :Rs. 1480.0Lakhs
- Investment : Rs. 450.0 lakh
- Payback Around < 4 month

Besides, we have also replaced the damaged / defective insulations, steam traps, steam leakages through valves / joints which has resulted in significance energy & financial savings.

➤ **Replacement of defective steam traps / valves & attending other steam leakages:**

- **PAYBACK:**
- Annual savings :Rs. 16.96 Lakhs
- Investment : Rs. 1.00 lakh
- Payback Around < 1 month

➤ **Replacement of damaged Insulations:**

- **PAYBACK:**
- Annual savings :Rs. 44.9 Lakhs
- Investment : Rs. 3.37 lakh
- Payback Around < 1 month

5.ENERGY CONSERVATION PLANS AND TARGETS

On the basis of Internal Energy Audit and the detailed Energy Audit of Ammonia- carried out by M/s HTAS, the unit has the following future action plan in the pipeline for conservation of energy.

Sl. No.	Plan	Implementation (Year)	Annual Savings	
			Energy, GCal	Lakh, Rs.
1	Installation of Pre-concentrator in one streams of Line-I Plant	2007-08	51876	1450
2.	Implementation of Schemes proposed by M/s HTAS under the Energy Audit conducted in Ammonia plant of Vijaipur-I- with the Installation of S-50, Retrofit of Benfield to GV, Installation of CA pre-heater and other modifications	The project has been kept abeyance in view of escalated cost & non-conducive Government Policy towards energy saving scheme.	199550	5587 (By taking cost of Naphtha)

6.0 ENVIRONMENTS AND SAFETY

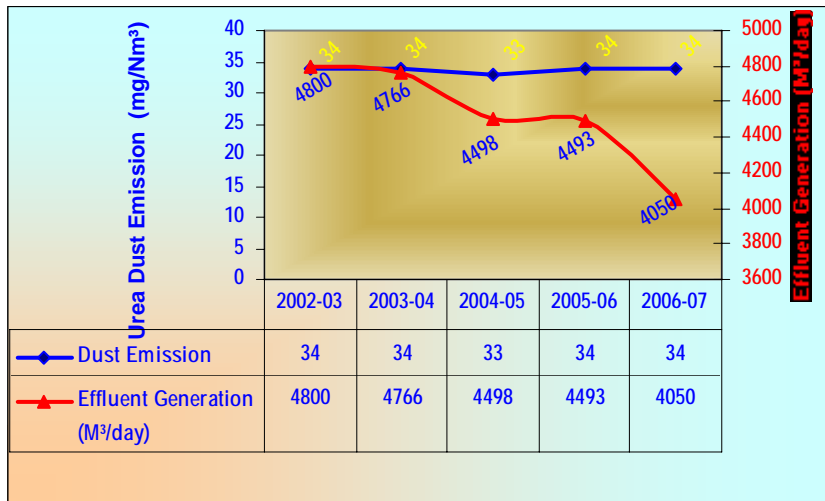
6.1.ENVIRONMENT

National Fertilizers Limited has its own corporate Environment Management Policy, which gives utmost importance to 'Environment Protection' in and around the complex. N.F.L., Vijaipur is an ISO-14001: 2004 unit, which is a testimony of it's commitment towards Environment consciousness.. The unit has been consistently upgrading the concept of conservation, recycle & reuse for optimum utilization of inputs. This has also helped in reducing waste discharges thus preventing pollution. The unit has bagged many prestigious awards for efficient environment control.

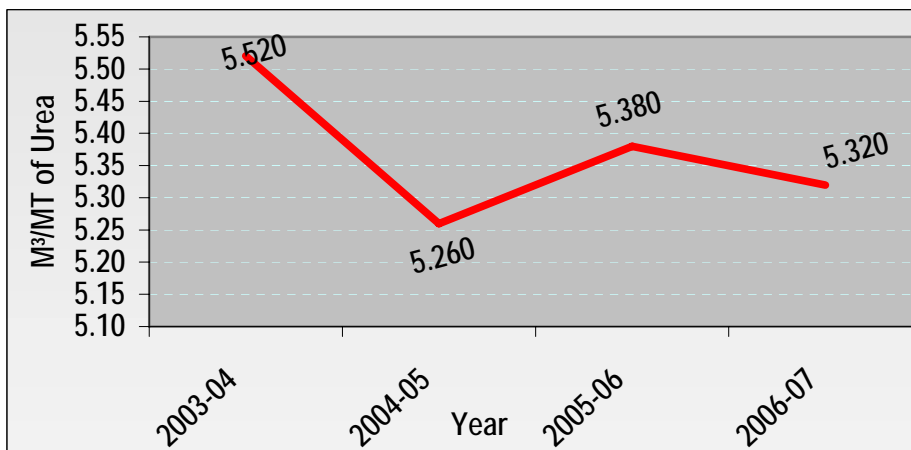
A separate Effluent Monitoring Cell (EMC) has been established to keep round the clock vigilance on effluent quality so that the discharges are much lower than Minimal National Standards. In order to inoculate Environment awareness amongst masses, World Environment Day, Earth Day, Ozone Day are observed.

In addition to the Water Pollution Control Measures incorporated since Design, NFL Vijaipur in it's enbeavour to improve upon the systems has indigeneously developed A Pilot plant for treatment of Urea Bearing Effluent by BIO-HYDROLYSIS

EFFLUENT GENERATION & PRILLING TOWER DUST EMISSION (VP-I & II)



PROCESS WATER CONSUMPTION (VIJAIPUR I & II)



6.2 SAFETY

National Fertilizers Limited, Vijaipur has its own Safety policy. It aims at creating safe working conditions & habits in order to eliminate Industrial Accidents. National Fertilizers Limited, Vijaipur has adopted several measures to achieve this goal.

- Integration of safety with various departments, familiarization of the employees with the general and special safety practices like Safe Work Permit and enforcing them in their work place,
- Safety audit is conducted every year by external agencies.

- Plant level & Central Safety Committees are set up who suggest safe practices for implementation.
- Combined Risk Analysis report of Hazardous Plant i.e. M/s GAIL, IOCL and NFL at Vijaipur was carried out by M/s PDIL Sindri. Onsite Emergency plan (Rev.03) and safety report revised accordingly. Based on combined Risk analysis report Offsite emergency plan is being revised by M/s NFL Vijaipur on behalf of Collector Guna, Madhya Pradesh.
- Mutual Aid Agreement with M/s GAIL, Vijaipur.
- Accident free period: 49,000,00 Hrs (2006-07)