# NATIONAL FERTILIZERS LIMITED, VIJAIPUR-II, GUNA (M.P.)

## 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 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.

| DESCRIPTION | UNIT | 2002-03 | 2003-04 | 2004-2005 |
|---|---|---|---|---|
| Annual Urea Production | Lakh MT | 8.66919 | 8.64788 | 9.44500 |
| Total Electric Energy consumption | Thousand MWH | 85.978 | 86.512 | 101.83 |
| Total Thermal Energy consumption | GCal | 939468.63 | 880089.9 | 919386.94 |
| Total Energy consumption (Electrical+Thermal+Raw material) | GCal | 4972647.38 | 4867026.86 | 5162637 |
| Total Sp. Energy Cons. (Electrical+Thermal+Raw material) | Gcal/MT | 5.736 | 5.628 | 5.464 |
| Total Manufacturing Cost | Lakhs Rs. | 42615.1 | 51524.85 | 56355.58 |
| Total Energy Cost | Lakhs Rs. | 34288.88 | 37968.89 | 46589.13 |
| Total Energy Cost (Electricity + Thermal) | Lakhs Rs. | 10107.75 | 11074.69 | 12804.13 |
| Total Energy cost as %age of Manufacturing Cost | % | 80.46 | 73.69 | 82.66 |

- Total Energy cost is more in 2004-05 due to use of more costly fuel, Naphtha, on account of limitations in Natural gas availability from M/s. GAIL.Further the Cost of Naphtha has also increased leading to increase in energy cost.

## 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 cell with headed by the Energy Manager. For all ENCON measures, the ECC is the principal functioning & Co-ordinating 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.

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. Feasibility study for capacity enhancement along with associated Energy savings is being carried out by M/s HTAS & M/s Snamprogetti

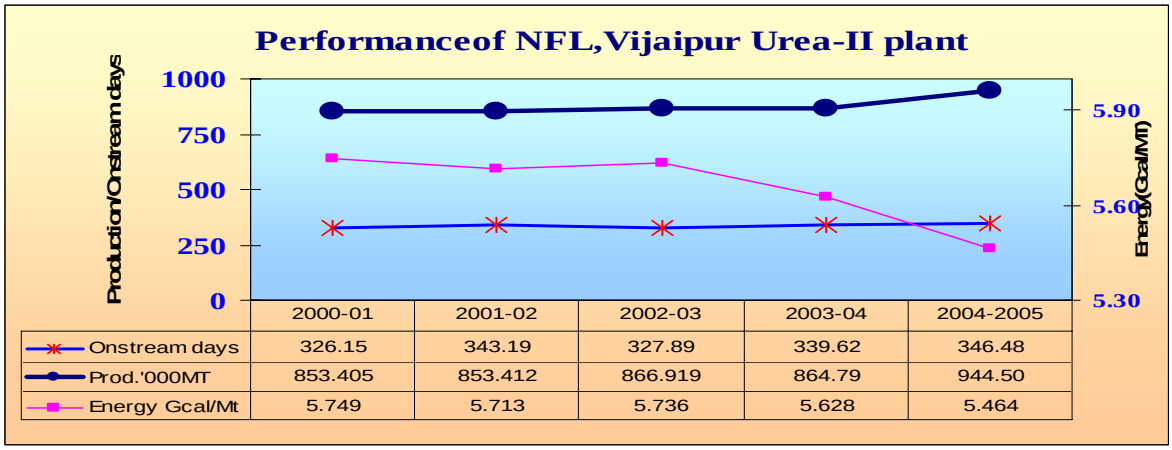
## 4. ENERGY CONSERVATION ACHIEVEMENTS

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

| Ear | Overall specific energy consumption (Gcal/MT of Urea) | % reduction in energy consumption (base year 2002-2003) | Monetary saving effected (base year 2002-2003) in Rs. Lakhs |
|---|---|---|---|
| 2002-2003 | 5.736 | - | - |
| 2003-2004 | 5.628 | 1.88 % | 266 |
| 2004-2005 | 5.464 | 4.74% | 814 |

## PERFORMANCE OF VIJAIPUR-II PLANTS AT A GLANCE

| ITEM | UNIT | 2002-03 | 2003-04 | 2004-2005 |
|---|---|---|---|---|
| AMMONIA | | | | |
| AMMONIA PRODUCTION | MT | 503119 | 495613 | 546490 |
| CAPACITY UTILIZATION | % | 100.30 | 98.81 | 108.95 |
| ON STREAM DAYS | DAYS | 348.44 | 333.48 | 354.19 |
| ONSTREAM EFFICIENCY | % | 95.46 | 95.46 | 95.46 |
| AVG. PLANT LOAD | MTPD | 1444 | 1486 | 1575 |
| NO. OF INTERRUPTIONS | NOS. | 6 | 6 | 2 |
| SPECIFIC ENERGY CONS. | Gcal/MT | 7.848 | 7.777 | 7.627 |
| UREA | | | | |
| UREA PRODUCTION | MT | 866919 | 864788 | 944500 |
| CAPACITY UTILIZATION | % | 100.27 | 100.02 | 109.24 |
| ONSTREAM DAYS | DAYS | 338.46 | 328.95 | 352.39 |
| ONSTREAM EFFICIENCY | % | 92.73 | 89.88 | 96.57 |
| AVG. PLANT LOAD | MTPD | 2561 | 2629 | 2680 |
| SPECIFIC ENERGY CONS. | Gcal/MT | 5.736 | 5.628 | 5.464 |




**THE VARIOUS ENERGY SAVING SCHEMES IMPLEMENTED DURING 2004-2005 ARE HIGHLIGHTED BELOW.**

In it's 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. The specific energy consumption for running condensing turbine is much higher than energy required in motor for running the same pump as energy of power generation is much lower in Vijaipur due to operation in cogeneration mode power plant . To save on energy cost, condensing turbines are being replaced with motor or standby motors are taken in line.

**Incremental energy for producing power and steam from cogeneration is listed below:**

105 ata steam = 0.758 Gcal/MT steam
40 ata steam = 0.705 Gcal/MT steam
3.5 ata steam = 0.600 Gcal/MT steam
Power = 1020 kcal/kWh
= 1.020 Gcal/MWh

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

**1. REPLACEMENT CONDENSING TURBINE OF COOLING WATER PUMPS IN UREA-II PLANT TO MOTOR.**

- The energy cost for running condensing turbine to pump cooling water is much higher than energy required in motor for running the same cooling water pump as cost of power generation is much lower in Vijaipur due to cogeneration mode power plant.
- The scheme has been implemented & motor is in line since 01.10.2004. Actual energy saving is to the tune of around 0.026 GCal / MT Urea
- PAYBACK: Annual savings : Rs. 480.00 lakhs
  Investment : Rs. 60 lakh
  Payback : Around 2month


**5. <u>ENERGY CONSERVATION PLANS AND TARGETS</u>**

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. | Capacity enhancement of Ammonia & Urea plants of Vijaipur II is being carried out by M/s HTAS & M/s Snamprogetti respectively. There shall also be added benefit of Energy saving with better capacity utilisation . | Feasibility study is under progress.. | - | - |