INDIAN FARMERS FERTILIZER COOPERATIVE LIMITED
Phulpur Unit-I, Allahabad (Uttar Pradesh)

Unit Profile

During mid- 60's the Co-operative sector in India was responsible for distribution of 70 per cent of fertilisers consumed in the country. This Sector had adequate infrastructure to distribute fertilisers but had no production facilities of its own and hence dependent on public/private Sectors for supplies. To overcome this lacuna and to bridge the demand supply gap in the country, a new cooperative society was conceived to specifically cater to the requirements of farmers. It was an unique venture in which the farmers of the country through their own Co-operative Societies created this new institution to safeguard their interests. The number of co-operative societies associated with IFFCO have risen from 57 in 1967 to more than 36,000 now.

IFFCO commissioned the ammonia - urea complex at Kalol and the NPK/DAP plant at Kandla both in the state of Gujarat in 1975. Another ammonia - urea complex was set up at Phulpur in the state of Uttar Pradesh in 1981. The ammonia - urea unit at Aonla was commissioned in 1988. The annual installed capacity of all the plants was 1.62 million tonne of Urea and NPK/DAP equivalent to 309 thousand tonne of phosphates.

In 1993 IFFCO had drawn up a major expansion programme of all the four plants under overall aegis of IFFCO VISION 2000 . The expansion projects at Aonla, Kalol and Phulpur have been completed on schedule. The latest feather in the cap of IFFCO was completion of Kandla Phase-II on 5th August 1999 which has heralded realisation of all the objectives set forth under VISION - 2000. As per the tradition of IFFCO the project was completed more than two months ahead of schedule. As a result of these expansion projects IFFCO's annual capacity has been increased to 3.69 million tonne of Urea and NPK/DAP equivalent to 825 thousand tonne of phosphates.

The distribution of IFFCO's fertiliser is undertaken through over 36,000 co-operative societies. The entire activities of Distribution, Sales and Promotion are co-ordinated by Marketing Central Office (MKCO) at New Delhi assisted by the Marketing offices in the field. In addition, essential agro-inputs for crop production are made available to the farmers through a chain of 166 Farmers Service Centre (FSC). IFFCO obsessively nurtures its relations with farmers and undertakes a large number of agricultural extension activities for their benefit every year.

At IFFCO, the thirst for ever improving the services to farmers and member co-operatives is insatiable, commitment to quality is insurmountable and harnessing of mother earths' bounty to drive hunger away from India in an ecologically sustainable manner is the prime mission.

IFFCO, today, is a leading player in India's fertiliser industry and is making substantial contribution to the efforts of Indian Government to increase food grain production in the country.

Situated near Allahabad in Uttar Pradesh , IFFCO Phulpur complex has two production units – **Phulpur**

unit-I and **Phulpur unit-II** and is the world's largest fertilser complex based on naphtha as feed stock. **Phulpur unit- I** comprising of one 900 Te/day Ammonia Plant and a 1500 Te/day Urea Plant along with associated offsites facilities like Steam generation plant, Power generation plant, DM water plant, Inert gas plant etc. was commissioned way back in 1981.

Due to increasing demand-supply gap of Urea in the country, Govt. of India has given approval for expansion project at Phulpur site since basic infrastructure facilities were available at Phulpur. The unit **Phulpur-II** was commissioned in December 1997 and consists of 1350 MTPD Ammonia plant and 2200 MTPD Urea plant along with associated offsites facilities based on latest state of art technologies.

Energy Consumption

Ammonia & Urea manufacturing is highly energy intensive and it contributes more than 80% of the total cost of production Urea. Therefore, a slight change in energy consumptions affects the cost of production in a big way. Apart from cost of production reduction in energy saves the valuable fast depleting natural resources such as Naphtha & Coal. Therefore, the Energy conservation is a major corporate objective at IFFCO and it is a continuous process at its units.

IFFCO-Phulpur complex has become one of the lowest energy consuming units amongst Naphtha based fertilizer plants in India. It has substantially reduced its energy consumption during last three years. The details are highlighted below :

Plant	2001-02	2002-03	2004-05
Ammonia –I	9.648	9.621	9.466
Urea - I	7.689	7.636	7.489
Ammonia-II	8.094	7.989	7.944
Urea - II	6.111	6.001	6.024
Urea (I+II)	6.70	6.64	6.59

Note : All figures are in Mkcal/MT

Energy Conservation Commitment, Policy and Organizational Set up

As energy contributes more than 80% of cost of production and sharp rise in energy cost, energy conservation receives top priority at IFFCO Phulpur.

Energy Management Policy

On March 5, 2001, IFFCO Phulpur formulated its Energy Management Policy, which states : " IFFCO is committed to manufacture and supply of quality urea with minimum possible energy through:

- Adoption of latest developments and technologies.
- Better operation and maintenance practices.

- Minimise waste by recycling / reutilization and optimize resource consumption
- Creating awareness among each and every individual about energy conservation.
- Creating safe healthy working conditions and eco-friendly environment ".

Energy Conservation Cell :

The energy consumption is monitored on daily basis. Phulpur unit has constituted a task force, headed by Joint General Manager – Technical. The task force comprises of senior persons from various departments, viz. Production, Maintenance, Utilities, Technical Services, Finance & accounts etc. It meets periodically to discuss the various loss points either due to plant operating troubles or owing to design limitations or development of new technology. Besides this, for improving the energy efficiency within the existing facilities, studies are carried out and modifications are done in-house .

The Engineers and operators / technicians connected to each plant are regularly sent for in house / outside training programmes and Seminars on energy conservation to created their their interest in this area as well as make them aware of the various methods / developments in the field of energy conservation. Reputed professionals are invited as Faculty for the in - house programmes.

Energy Conservation Achievements

Phulpur unit has always been a leader in adopting new developments in the field of fertilizer production and number of modifications / revamp have been carried out over the years which have resulted in substantial improvement in energy consumption. Major modifications carried out in Phulpur-I are listed as below :

PHULPUR-I

1. Purge Gas recovery unit in Ammonia-I plant
   Net Improvement in energy saving : 0.1108 Gcal/Mt of Ammonia
2. Synthesis Converter Retrofit
   Net Improvement in energy saving : 0.117 Gcal/Mt of Ammonia
3. Lo - Heat benfield retrofit in CO2 removal system
   Net Improvement in energy saving : 0.096 Gcal/Mt of Ammonia
4. Modified CO2 Compressor Turbine in Urea plant
   Net Improvement in energy saving : 0.16 MT Steam / MTof Urea
5. **Installation of Pre- Concentrator in Urea plant (In Year 2001-02)**
   Net Improvement in energy saving : 0.08 Gcal/Mt of Urea

Similarly in **Phulpur-II** some of the energy saving features which have been incorporated in the new plant since design stage are as follows :

PHULPUR-II

- Gas turbine drive, with Naphtha as fuel, for process air compressor.
- Heat recovery unit connected to the gas turbine for generating high pressure steams to meet the

requirement of Ammonia and Urea Plant.

- Medium pressure process condensate stripper.
- GV - Low energy CO2 removal system.

Purge Gas recovery unit based on Membrane Separation Technique has been installed in Dec. 2001 which has resulted in energy saving by 0.11 Gcal/MT of ammonia.

There has been a steady decline in specific electrical and thermal energy consumption. Energy consumption in Phulpur-I has been brought down from the level of **12.5 Gcal/MT** in initial years to the current level of **7.5 Gcal/MT** i.e. a reduction of about **40%.** Similarly in Phulpur – II the energy consumption is improving day by day and it is at a level of **6.0 Gcal/MT** of urea which is lowest among the contemporary naphtha based plants in the country. Following table shows the energy consumption pattern & savings achieved in energy during last three years which shows a remarkable reduction.

Plant	2000-01	2001-02	2002-03	2003-04	%reduction over 2001
Ammonia -I	10.105	9.648	9.621	9.466	**6.32**
Urea -I	8.115	7.689	7.636	7.489	**7.71**
Ammonia –II	8.334	8.094	7.989	7.944	**4.68**
Urea - II	7.072	6.111	6.001	6.024	**14.82**

Note : All figures are in Mkcal/MT

Recently, IFFCO-Phulpur unit - II has bagged Prestigious " **National Energy Conservation Award 2003"** from Govt. of India, Ministry of Power.

Energy Conservation Plans and Targets

Energy conservation is an ongoing process at IFFCO . Phulput unit has launched its major Energy Saving Project (ESP) worth Rs. 150 crores for its existing Ammonia & Urea plants. This project is scheduled to be implemented in 3 phases by the year 2006. Following major proposals are in hand at Phulpur unit as a part of its future plans for energy conservation

ITEM DESCRIPTION	Saving in GCal/MT	Investment in Rs. Crores	Pay back Years
AMMONIA-I			
LTS Guard & BFW Preheater	-	-	-
Switch over to GV 2 -Stage CO_2 Removal System	-	-	-
S-50 Converter & MP Boiler	-	-	-
Ammonia Wash Unit	-	-	-
Retrofit of syngs compressor	-	-	-
New make-up gas chiller			
Integrated Energy Savings for Ammonia - I schemes	**0.716**	**87.10**	**3.26**
AMMONIA-II			
LTS Guard Bed	-	-	-
S-50 Converter	-	-	-
Final gas chiller	-	-	-
Integrated Energy Savings for Ammonia -II schemes	**0.157**	**33.57**	**3.15**
UREA-I			
Installation of MP Pre-decomposer	-	-	-
Revamp of Existing CO_2 Compressor	-	-	-
Variable frequency drive for hydrolyser pump	-	-	-
Integrated Energy Savings for Urea -I	**0.081**	**19.87**	**3.0**

Environment and Safety

IFFCO Phulpur Unit is totally committed for maintaining an eco-friendly environment. For controlling air pollution, plants have been provided with Bag Filters, Electro Static Precipitators, Dust Extraction Systems, etc. A lush green belt with about 3 lakh trees has been developed all around the factory premises which is a natural means of air purification. To overcome the problem of fly ash disposal, generated in the Captive Power plant, a dense phase dry fly ash disposal plant has been installed which directly fills the fly ash in closed tankers for transportation of the ash to the cement plants manufacturing Portland pozzolana cement.

Phulpur Unit has always put its best efforts for conserving water. The effluent generated in the plant is recycled back after purification in Reverse Osmosis Plant. Even the sewage water generated in the township is reused in the plant after treatment in sewage treatment plant. The plant is running on zero effluent discharge and total recycle basis. The present specific water consumption is the lowest among the fertiliser industry in the country. Plant and its township have ISO 14001 certification which speaks volumes about its environmental commitment.

The complex has won number of awards for its environment improvement efforts. In 2002, it had won the 1st Environment Excellence award from Indo-German Greentech foundation and TERI award on Environment Excellence for industries with turnover of Rs. 500 crore and above.

Similarly safety of employees is the prime concern of management at IFFCO Phulpur and all measures are taken so that no untoward incidence took place. The safety committee headed by chief of the Fire & Safety department meets regularly and discuss the safety related problems with plant personnels and remedial actions are taken accordingly. No. of training programmes are organised including practical demonstration of safety related equipments at site to create awareness at every level. IFFCO Phulpur has won number of safety awards from various agencies such as, FAI, Ministry of Labour, etc.