

## **GUJARAT STATE FERTILIZERS & CHEMICALS LIMITED**

**Vadodara (Gujarat)**

### **Unit Profile**

Gujarat State Fertilizers & Chemicals Ltd. (GSFC), a unit promoted by the Government of Gujarat is leading manufacturers of fertilizers & chemicals. GSFC is spread over 648 hectare with 220 (34%) hectare of green belt.

On February 15<sup>th</sup> 1962, GSFC was incorporated as Joint Sector Company with determination of the Government of Gujarat to offer quality products and services to the farmers. The first latency of GSFC's fertilizer rolled out of its production unit in 1967.

During the years 1974 to 1982 with serene policies of alteration, GSFC turned into manufacturing of Caprolactam, Nylon-6, Melamine and Argon. Subsequently, capacities were enhanced in Caprolactam and Melamine. Initially all the power was drawn from state grid. GSFC installed three nos. of Cogeneration plants in phase wise manner.



GSFC has been cornering glory by treading the five-fold path of Excellence, Ethics values, Dedication, Management excellence and Enhanced social responsibility.

The technologies for all the plants are provided by world’s leading technology providers such as M/S Chemico, M/S Toyo Engineering Corporation, M/S BASF, M/S Inventa, M/S Linde, M/S Agro Linz, M/S Chemie Linz, M/S Pole services, M/S TVA, M/S Tim J Browder, M/S Casale etc. All the plants are operated in safe, environmentally friendly and energy efficient manner.

GSFC has also put up plants for manufacture of Urea phosphate and Methyl Ethyl Ketone Oxime (MEKO). These plants are set up based on processed developed by R&D center with complete in-house engineering.

GSFC has also developed water soluble fertilizers and micro nutrients to enrich soil, tissue culture banana plants, highbrid and improved variety of Bajra, Tur, Veg. Tur, and cotton which provides disease free and high yielding plants.

The unit has Central library, Training institute for meeting the training needs of fresh employees as well as upgrading technical knowledge of employees, online farm advisory services, well-equipped static and mobile laboratory for soil and water testing facilities. The company also organizes farmer-training programs in consultation with Agriculture University. GSFC also shares its advance knowledge and resource in agri input through publication of bi-lingual agriculture magazine “KRISHI JIVAN”.

### **Manufacturing Facilities / Products Range:**

Installed capacity / Actual production / Capacity utilization for the last three years are presented below:

Product	Unit	Installed capacity	Actual production / (Capacity utilization %)		
			2006-07	2007-08	2008-09
Urea	MT	367200	302540 (82.39 %)	277008 (75.44%)	280500 (76.39%)
Ammonium sulphate (AS)	MT	196000	290600 (148.27%)	292935 (149.46%)	265710 (135.57%)
Diammonium sulphate (DAP)	MT	108000	14220	79300	43770
APS	MT		243000	120120	207500
Caprolactam	MT	70000	79666 (113.81%)	79716 (113.88%)	70913 (101.3%)
Melamine	MT	15000	15335 (102.23%)	14741 (98.27%)	13655 (91.03%)
Nylon-6	MT	8000	9145 (114.31%)	8638 (107.98%)	8751 (109.39%)
MEKO	MT	4450	3875 (87.07%)	4083 (91.75%)	3400 (76.4%)

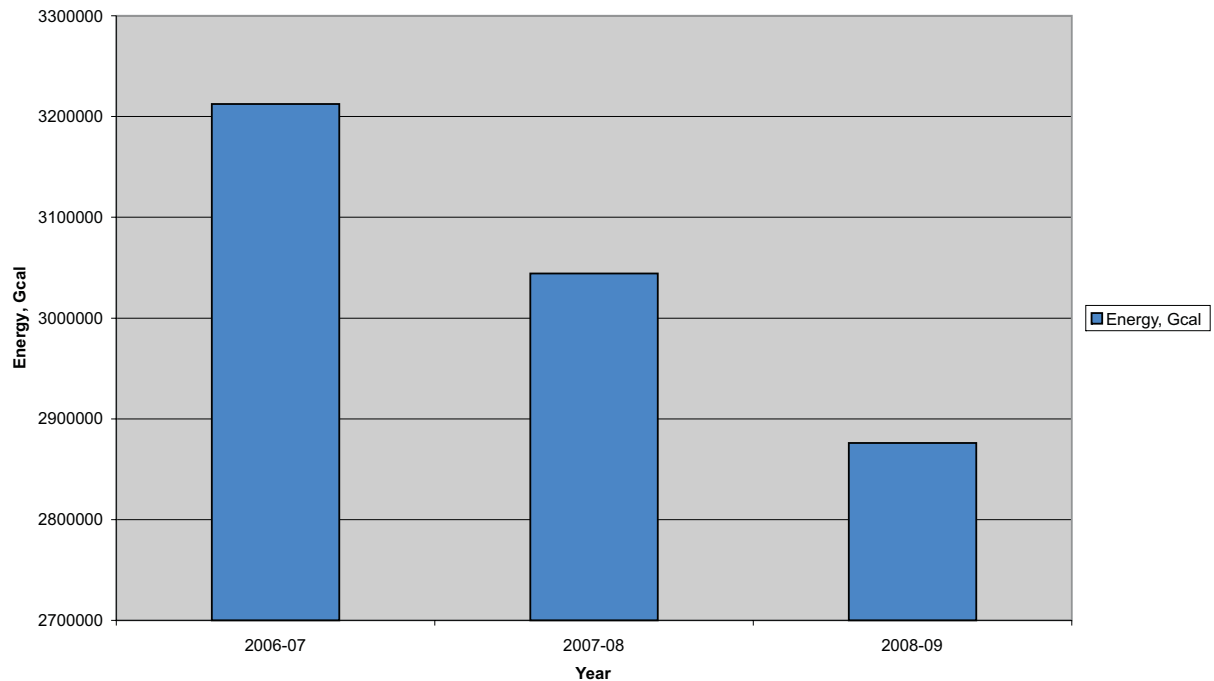
## Energy Consumption

Energy consumption at GSFC is monitored on regular basis during day to day production meeting, fortnightly Operation division meeting (ODC) and monthly Technical Monitoring Committee (TMC) meetings.

Consumption of NG, power and LSHS for last three years is as given below:

Year	NG *1000 SM3	Power - own generation units *1000	Power - Purchased units *1000	LSHS MT	Total Energy Consumed Gcal
2006-07	175376	194015	402522	1488	3212416
2007-08	153265	169056	424786	4088	3044065
2008-09	145039	162029	392605	5412	2875911

### Total Energy consumption at GSFC



## ***Energy Conservation Commitment, Policy and Set Up***

GSFC has energy conservation as major corporate objective. General Manager (also designated Energy Manager) coordinated the activities of energy conservation and cost reduction. GSFC has dedicated energy cell comprising members from Operation, Electrical, Maintenance and Technical Services.

### **Mechanism of Energy Conservation**

Technical Department jointly with Plant operation group discusses the opportunities available for reducing energy consumption like minimizing or eliminating steam venting, impeller trimming / replacement of motors operating at low load, replacement of refrigeration compressors by VAHP by utilizing excess low pressure steam being vented, considering power generation through turbine in place of throttling across pressure reduction station (PRDS).

Regular energy audit (both thermal and electrical) is also carried out through M/S BEE approved energy auditors and the recommendations are discussed with energy auditors and then implemented. Audit of Compressed air system and Steam distribution network is also carried out through external agencies.

Employee's Suggestion Scheme is also used as a tool for inviting ideas from employees.

The specific energy consumption norms are also revised based on the actual improvement realized and same are discussed and actual consumption compare to norms is also discussed in Internal Management Committee meeting chaired by Managing Director.

Constant review of changes in technology is done to take the benefit like use of energy efficient lighting, energy efficient motors, variable speed drives, use of FRP fans etc. Considering the nos. of plants in operation, process integration is one of the major tool for energy saving like Use of vapour ammonia at DAP plant rather than compressing and condensing it at Ammonia plant, utilizing low pressure vent steam at one plant by diverting to other plants where LP steam is generated by pressure reduction of high pressure steam.

### ***Energy Conservation Achievements***

- At Ammonia plant, existing solid FRP blades of Cooling tower replaced by hollow FRP blades to reduce power consumption. It resulted in to annual power saving of 7.62 Lacs kWh.



- Looking to the margin available in terms of high pressure drop across level control valve in MP BFW supply loop at Ammonia plant, MP BFW pump impeller size reduced from 235 mm to 220 mm to reduce power consumption. It resulted in to annual power saving of 2.43 Lacs kWh.



- As per the original design wastewater generated from HAS section was diverted to storage tank from where it was pumped in controlled way to treatment plant. Minor modification carried out to transfer the waste from HAS sectioned directly to Waste water treatment plant. Avoidance of double pumping resulted in to stoppage of pump associated with Wastewater storage tank. It resulted in to annual power saving of 0.2 Lacs kWh.



- At Urea plant, interconnecting line between old and new plant crystallizes are flushed with steam. In absence of necessary isolation system this flush steam was remaining in line for all time. Necessary isolation system provided. This has resulted in to steam saving and ultimately in to annual NG fuel saving of 0.6 Lacs SM3.



- $H_2$  is purified in PSA section before use in HAS synthesis unit. Purification step generate purge stream that is vented. A system to recover and use this purge gas which is mainly Hydrogen as fuel at A-IV plant is implemented. It has resulted into annual NG fuel saving of 5.04 lacs SM3.



- At Ammonia plant, ISR outlet gas is cooled down in air cooler having 6 NOs. of fans. Existing solid FRP blades replaced by hollow FRP blades to reduce power consumption. It resulted in to annual power saving of 1.54 Lacs.



- **Energy saving by using Energy efficient lighting sources carried out as mentioned below.**

- 40 Nos. 400 W HPMV fittings replaced by 15 NOs. of 150 W Metal halide lighting fittings at Urea plant saving 1.205 Lacs units/yr.
- Installation of magnetic amplifier panel to reduce power consumption of lighting at SA-IV plant saving 0.372 Lacs units/ yr.
- 11850 Nos. 40 W tube lights with electromagnetic choke replaced by 28 W T5 fittings with electronic ballast saving 17.847 Lacs units/yr.



- Magnetic amplifier type lighting energy saver installed at 13 NOs. of various locations with guaranteed power saving of about 15% w.r. to existing gas discharge lamps. Anticipated annual saving on lighting energy is of 2.36 Lacs units/Yr.

Above mentioned measures resulted in to aggregate annual saving at a rate of 21.78 Lacs units.

### ***Energy Conservation Plans***

- **Installation of turbine in place of Pressure reduction station (PRDS) at CoGeneration plant:**

At present, pressure of 37 barg steam is throttled across PRDS to produce 14 barg. It is planned to replace PRDS by turbine to generate power (~1.2 MWH).

- **Installation of VAHP at Nylon-6 plant:**

It is proposed to replace existing Freon-22 based chilled water refrigeration system (200 TR) by VAHP by utilizing excess low pressure steam which is vented from the grid. Anticipated power saving is ~196 kWh.

- **MPS generation from HP condensate blow down at Ammonia plant:**

At present low pressure steam (5 barg) is generated from HP condensate (105-barg) blow down. Since, low-pressure steam is in excess and being vented, it is proposed to generate about 6400 MTPY Medium pressure steam (37 barg) which will reduce equivalent generation of steam in boiler.

- **Utilization of low pressure steam (3.5 barg) in Deaerator of CoGen-III plant:**

At present, low pressure steam requirement for Deaerator is met by reducing pressure of 14-barg-pressure steam. It is proposed to utilize excess low-pressure steam for the purpose. Anticipated steam saving is 24000 MTPY.

- **Installation of turbine in place of Pressure reduction station (PRDS) at Caprolactam-II plant:**

At present, pressure of 37-barg steam is throttled across PRDS to produce 20 & 14-barg steam at Caprolactam-II plant. It is planned to replace PRDS by turbine to generate power (~1.2 MWH).

## Environment and Safety

GSFC gives highest priority to environment and safety. GSFC is proud recipient of certification of Integrated Management System i.e. ISO-9001 for quality, ISO-14001 for environment and OHSAS 18001 for Occupational Health and Safety. Efforts are made to arise safety standards by educating the contract workers before they start the job. On the environment front thrust is given for plantation of trees and development of gardens in vacant areas and around the plants / buildings.

  
**ENERGY POLICY**

**We at GSFC are committed to Energy Conservation by :**

- Monitoring & reducing specific energy consumption for all products.
- Upgrading energy efficient and eco-friendly technology.
- Adopt abundant & eco-friendly renewable resources of energy.
- Maximizing use of Waste Heat.
- Creating awareness for energy conservation among employees /nearby residents.

 **GROWING GREEN**  
VADODARA

  
**H. V. PATEL, IAS**  
MANAGING DIRECTOR

**GUJARAT STATE FERTILIZERS & CHEMICALS LIMITED**  
*An ISO Certified Company* *Promoted by Govt. of Gujarat*  
P.O. Fertilizernagar - 391 750, Dist. Vadodara, Gujarat.

## **RASHTRIYA CHEMICALS & FERTILIZERS LIMITED**

**Thal Unit  
Distt. Raigarh (Maharashtra)**

### **Unit Profile**

The performance in the year 2008-2009 was magnificent. All the previous production records have now become insignificant history. The dream figures of highest ever **production, capacity utilisation and stream days were achieved. For Ammonia it was** 1096850 MT, 110.79 % and 355.95 days and the same for **Urea was** 1933000 MT, 113.24 % and 349.08 days respectively. The lowest ever **specific energy consumption** of 6.472 M kcal per MT of Urea was also achieved during this year.

This is the 25<sup>th</sup> year of continuous operation of THAL UNIT. Production targets have been regularly met or exceeded. In the year 2008-09 new standards of production and efficiencies were set and record production figures were achieved. The performance record of Ammonia, Urea, PHP, SGTG and Chemical group of plants to date, together with efficiencies, reliability and length of continuous runs achieved, illustrates RCF's firm commitment to operational excellence since inception. Since commencing operations in 1985, RCF Thal has achieved a cumulative production of Ammonia of 20.8 Million MT and production of Urea to a total of 35.1 Million MT.

These achievements, comparable to best in the country, have been accomplished without compromising safety or environmental standards.

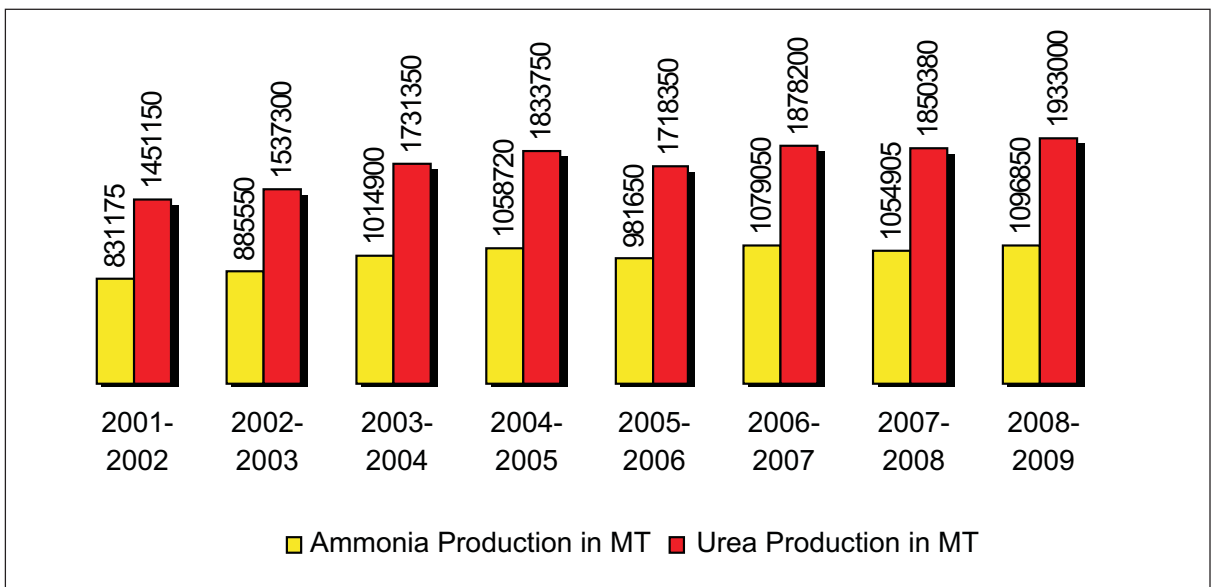
The production performance during the year has been summarised below :

<b>S.NO</b>	<b>PRODUCT</b>	<b>ACHIEVEMENTS FOR THE YEAR (2008-2009)</b>	<b>PREVIOUS ACHIEVEMENTS</b>
1 .	AMMONIA	10,96,850 MT	10,79,050 MT (06-07)
2 .	STREAM DAYS	355.95 Days	353.8 Days (04-05)
3 .	UREA	19,33,000 MT	18,78,200 MT (06-07)
4 .	STREAM DAYS	349.08 Days	345.53 Days (06-07)
5 .	Sp. ENERGY CONS. OF UREA	6.472 M kcal/MT	6.477 M kcal/MT (04-05)
6 .	UREA DESPATCH	19,43,643 MT	18,76,657 MT (06-07)

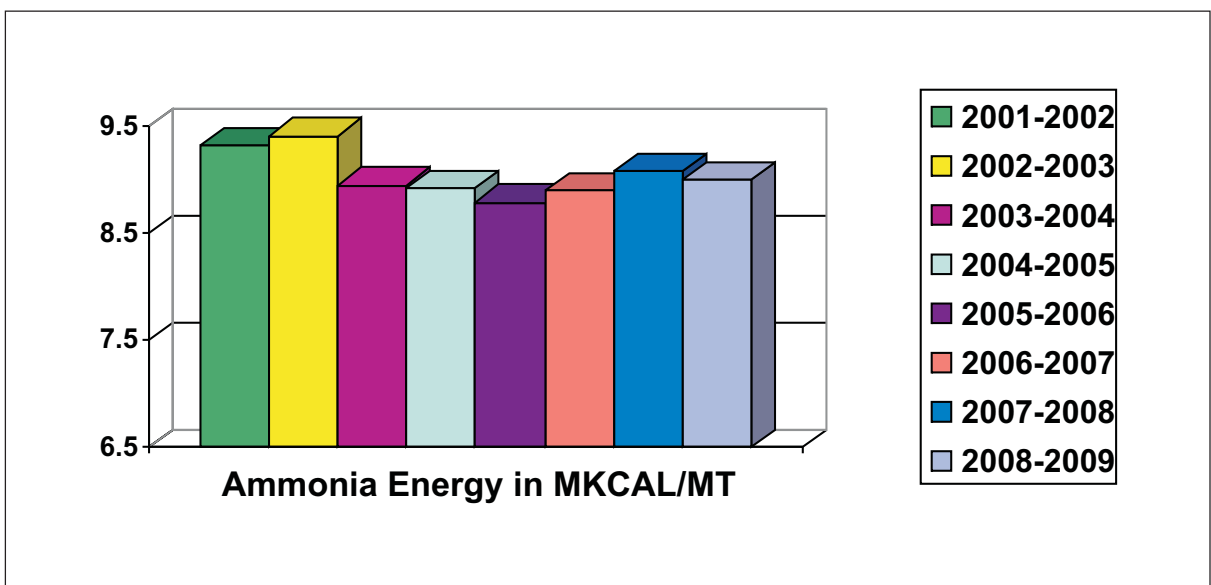
## Energy Consumption

The performance record of Ammonia and Urea can be judged by the sustained level of energy consumption with respect to previous years best energy consumption together with efficiencies. Reliability and length of continuous runs illustrates RCF's firm commitment to operational excellence since inception. This has been accomplished without compromising safety or environmental standards.

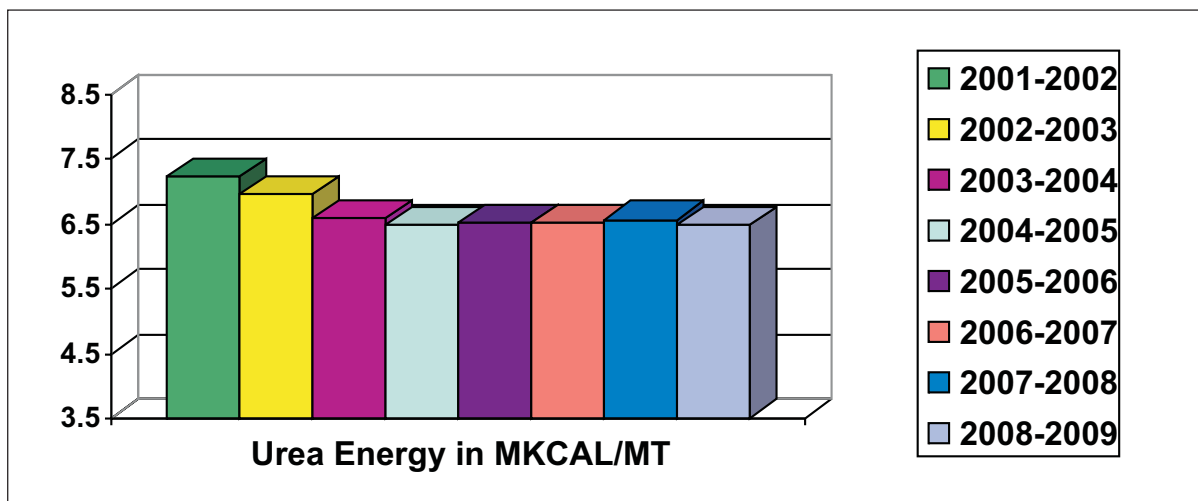
### Ammonia & Urea Production in MT



### Ammonia Energy in Mkal/MT



## Urea Energy in Mkal/MT

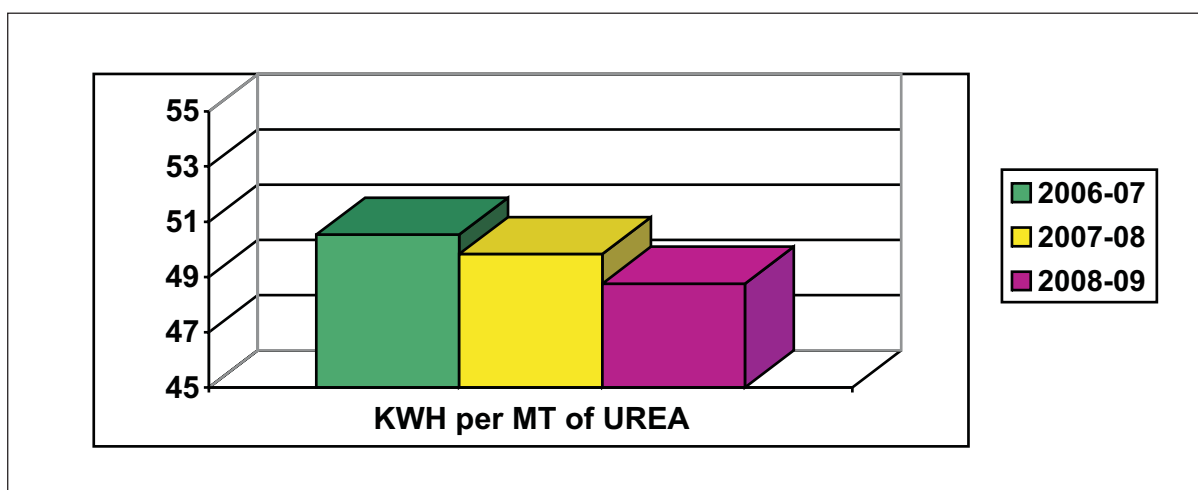


Sustained operations of all the plants i.e process and utilities with minimum downtime resulted into :

### 1. Electrical Energy Consumption Reduction in Urea Plant

Year	KWH/MT of Urea
2006-2007	50.53
2007-2008	49.83
2008-2009	48.76

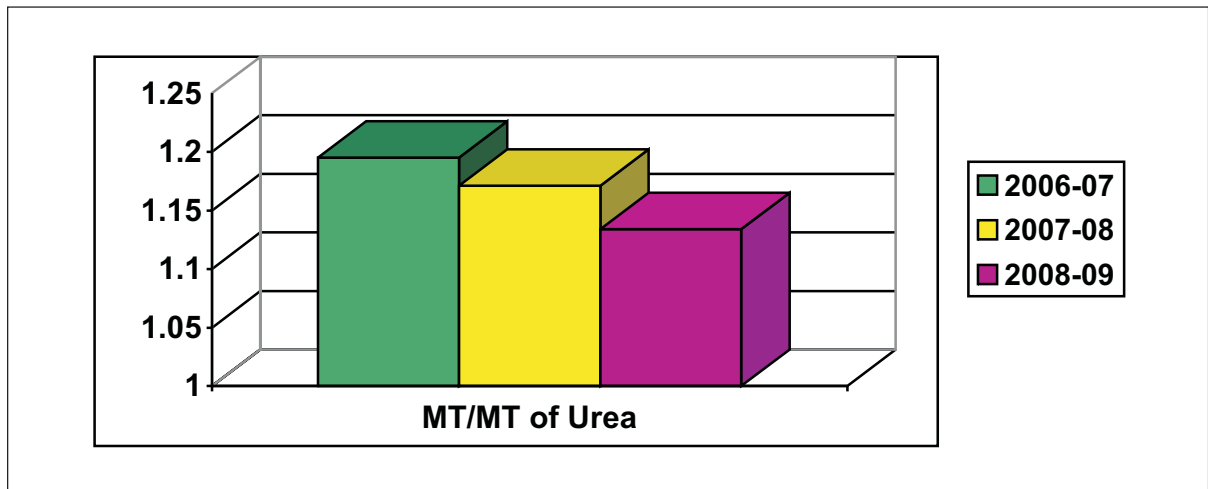
### Specific Electrical Energy Consumption



## 2. Steam Consumption Reduction in Urea Plant

Year	MTof steam/MT of Urea
2006-2007	1.195
2007-2008	1.171
2008-2009	1.134

### Specific Steam Consumption



### *Energy Conservation Commitment, Policy and Organizational Set Up*

In spite of feedstock crisis, plants at Thal have performed well largely due to the proactive and painstaking efforts taken in the field of energy conservation and capacity enhancement through technical foresight. The energy level maintained by 24 years old RCF, Thal plants itself shows our commitment & outlook towards Energy conservation.

Company has an exclusive **Energy Conservation Cell**. The cell is headed by Executive Director of the Unit. As per the EC Act-2001 plant unit has designated 'Energy Managers'. These two Energy Managers are reporting to Executive Director. Plant also has qualified **Certified Energy Auditors** and **Certified Energy Managers**.

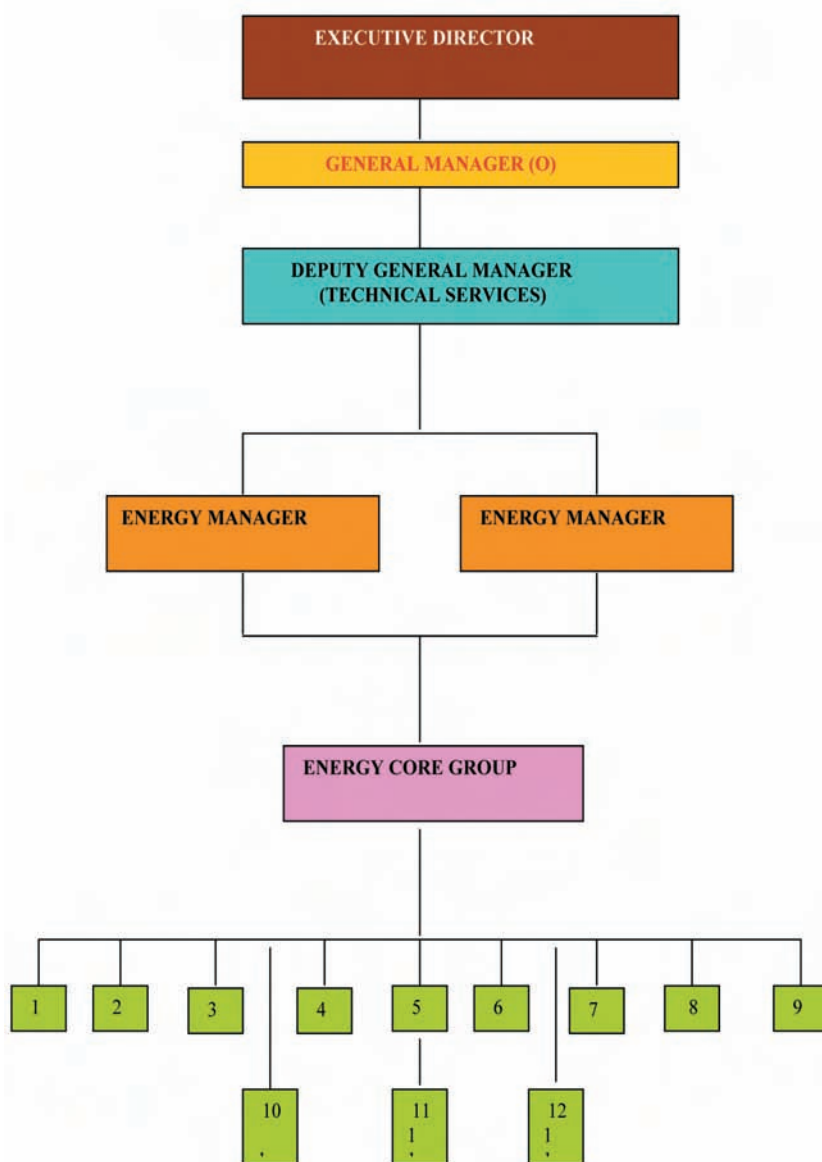
Energy cell conducts a monthly review meeting. In this meeting core group members present the various energy saving potential in their working areas. After brainstorming sessions and cost benefit analysis, the schemes are finalised for implementation after proper approval. The projects already undertaken are reviewed in the monthly meeting.

To create awareness among employees, Energy conservation week is celebrated every year from 14<sup>th</sup> December to 21<sup>st</sup> December. All the plants including chemical

group & utilities are invited to present their achievements towards energy conservation alongwith the future plan and targets. The plant making best efforts and realising the set targets is awarded. Also slogan competition, poster competition & Quiz competition is held which is open to all.

A special programme is arranged with any external faculty from renowned field to share the views and ideas on energy conservation.

### **Energy Conservation Cell Structure**



### ***Environmental Management and Pollution Control***

In view of excellent environment performance of the Thal Unit, Maharashtra Pollution Control Board have granted Consent to Operate for five years for third successive time which is a rare distinction for large scale industrial unit.

The unit has co-ordinated all monitoring follow up & return submission to meet requirements of Air Act, Water Act, HWM Act & Cess Act for the period from April 2008 - March 2009 without any deviation from compliance for a single day.

Based on track record on environment compliance by RCF Thal Unit, Ministry of environment & Forest Dept., Gov. of India have granted Terms of Reference (TOR) for the Thal III expansion project and Debottlenecking for Ammonia plant.

## **INDIAN FARMERS FERTILIZERS COOPERATIVE LIMITED**

**Paradeep Unit  
Distt-Jagatsinghpur (Orissa)**

### **About IFFCO**

Indian Farmers Fertiliser Co-operative Limited (IFFCO) was registered on November 3, 1967 as a Multi-unit Co-operative Society. The Society is primarily engaged in production and distribution of fertilizers and IFFCO is the largest producer of fertilizer in the country. IFFCO has five production units at Kalol, Kandla, Phulpur, Aonla and Paradeep.

### **Unit Profile**

It is the largest grass-root Di-ammonium phosphate (DAP) complex, with an installed capacity of 1.92 million tonnes of fertilizer a year. The complex has the world largest Phosphoric Acid plant of 2650 tons per day, two streams of Sulphuric acid plant, each having a capacity of 3500 Tonnes per day and utilities & offsites facilities as required for a fertiliser complex. In terms of



nutrients, the production capacity amounts to 0.8 million tonnes of 'P2O5' and 0.325 million tonnes of 'N' per annum. IFFCO Paradeep unit is situated on Bhubaneswar - Paradeep National Highway No. 5-A, about 110 KM away from the State capital Bhubaneswar. IFFCO Paradeep unit is situated on Bhubaneswar - Paradeep National Highway No. 5-A, about 110 KM away from the State capital Bhubaneswar.

The existing facilities at IFFCO Paradeep fertilizer complex are as under:

Sl. No.	Name of the Plant	Capacity
01.	Sulphuric Acid Plant	2 x 3500 MTPD
02.	Phosphoric Acid Plant	1 x 2650 MTPD
03.	DAP (18:46:00)	3 x 2090 MTPD
04.	Boiler (AFBC)	2 x 110 TPH
05.	Water Treatment Plant	2300 m <sup>3</sup> /hr
06.	Captive Power Plant	2 x 55 MW

Indian Farmers Fertiliser Cooperative Limited (IFFCO) took over OCFL's Phosphatic Fertiliser Complex at Paradeep in October 2005. The physical condition of the entire fertilizer complex was very poor at the time of take over. The plant was forced to shutdown by Orissa State Pollution Control Board due to non-compliance of environmental norms by the previous owner. The most urgent requirement was to convince the State Pollution Control Board that their environmental concerns would be complied completely. The Pollution Board was convinced with the measures proposed to be carried out by IFFCO on a time bound schedule and permission for resuming production was granted to IFFCO on 7<sup>th</sup> October, 2005.

Since the task of putting the plant back into production was a tough assignment, IFFCO prioritized the jobs giving first preference to restoration of pollution control norms. Housekeeping and plant layout were also to be restored as per Industry standards.

The plant consists of two streams of Sulphuric Acid Plant, one stream of Phosphoric Acid plant and three streams of Complex fertilizer plant. In addition to these various offsite and utilities facilities are also present inside the complex to fulfill various requirements

Despite various constraints, IFFCO decided to take a trial run production of the various plants in the fertilizer complex beginning from 17<sup>th</sup> November, 2005 till the 5<sup>th</sup> of January, 2006 to identify bottlenecks in various equipments. During the trial run, the equipment constraints for achieving full production capacity were studied, the behavior of critical machineries were checked and plans were drawn for carrying out major repair work / rehabilitation.

After resumption of production, focus shifted to conservation of resources like improving raw material consumption efficiency, energy conservation, water conservation and infrastructure building.

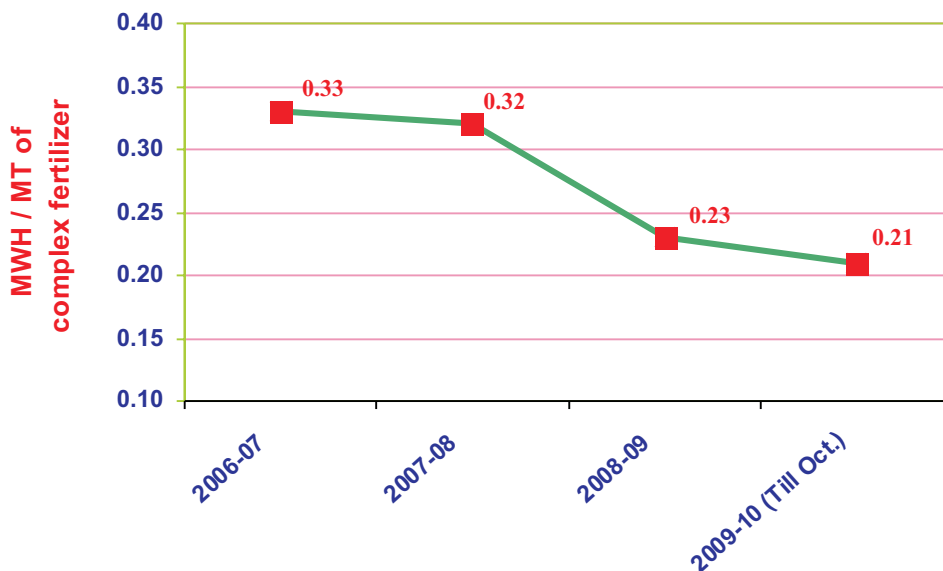
## Production Performance

During the financial year 2008-09, IFFCO Paradeep unit have produced 13.06 lakhs metric tonnes (MT) of DAP (18:46:00)/NP (20:20:00:13) Fertilisers, 12.68 lakhs MT of Sulphuric Acid and 3.91 lakh MT of Phosphoric Acid (as 100% P<sub>2</sub>O<sub>5</sub>).

Presently both the streams of the sulphuric acid plant are operating as per the Phosphoric acid/NPK plant requirement and last year it has achieved highest daily total sulphuric acid production of 6600 MT which is 95% of the design plant

load. The phosphoric acid plant is continuously operating at about 70 to 75 % of design plant load and has achieved highest daily production of 2650 MTPD, which is the design capacity. DAP plants are running on an average production rate of about 5000 MTPD. Ever highest daily total production of Complex Fertiliser (DAP/ NP) has been achieved by producing 6,900 MTPD (122 % of design capacity) and monthly highest production of 1,52,000 MT of complex fertiliser has been achieved in Nov 2008.

## Energy Consumption



## Energy Conservation Achievements

List of energy saving schemes implemented are as follows:

1. During Sulphuric Acid Plant shutdown, system was purged with diesel firing. This has been stopped which will save 40 KL diesel every shutdown and now purging will be done by heating air with HP steam.

2. Reduction in impeller stage of ammonia pump to reduce energy consumption.
3. Use of pump of lower capacity at the canal to pump water to reduce energy consumption.
4. Vent steam discharged from condensate receiver has been routed to utilize in the De-aerator of Sulphuric Acid Plant.
5. Vent steam from Continuous Blow Down tank of Waste Heat Boiler in Sulphuric Acid Plant is being utilized in the de-aerator of Sulphuric Acid Plant.
6. Back pressure steam from steam driven Boiler Feed Water Pump in Sulphuric Acid Plant has been routed to evaporators in Phosphoric Acid Plant.
7. Removal of unwanted High Pressure steam lines to reduce line losses.
8. Provision of direct steam injection in Tail Gas scrubber of Di-Ammonium Phosphate Plant has been done to reduce the steam consumption during startup of DAP Plant.
9. Condensate pot for jacketed steam commissioned and taken in line resulted in zero venting in melting area of Sulphuric Acid Plant.

## **Modification – 1**

Scheme to reduce catalyst preheating time during cold start of Sulphuric Acid Plant & simultaneously reduce diesel consumption.

### **Brief Description:**

In Sulphuric Acid process,  $\text{SO}_2$  generated by combustion of Sulphur is converted to  $\text{SO}_3$  in catalytic converter. The converter is provided with four nos of vanadium pent oxide catalyst beds. The catalytic reaction for  $\text{SO}_2$  to  $\text{SO}_3$  conversion in presence of vanadium pent oxide takes place only above activation temperature of catalyst i.e. about 400 deg C. During cold start, to bring the catalyst temperature to the desired operating level, diesel is fired through two burners to heat the converter catalyst. In 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> catalyst beds the temperature of 400 °C is achieved within 24 hrs after startup of diesel firing. However to achieve desired temperature of 400 deg C in 4<sup>th</sup> bed, it takes further 12 hrs. Hence it takes approximately 36 hrs to achieve the required temperature of all catalyst beds and consumes 100 KL of diesel for every cold start.

In house study was conducted to reduce the time taken for heating the catalyst bed temperature to desired operating level and also to reduce diesel consumption.

Based on this study a scheme has been implemented to preheat the catalyst by utilizing HP steam from coal fired boilers in the waste heat boiler of Sulphuric Acid Plant and also providing interconnection between 1<sup>st</sup> bed outlet duct to 4<sup>th</sup> bed inlet duct in order to achieve 4<sup>th</sup> bed temperature early, during the cold startup.

After implementation of above scheme, diesel consumption has been reduced from 100 KL to 60 KL thus saving 40 KL per startup per stream and cold startup time has been reduced from 36 hrs to 24 hrs thus saving 12 hrs.

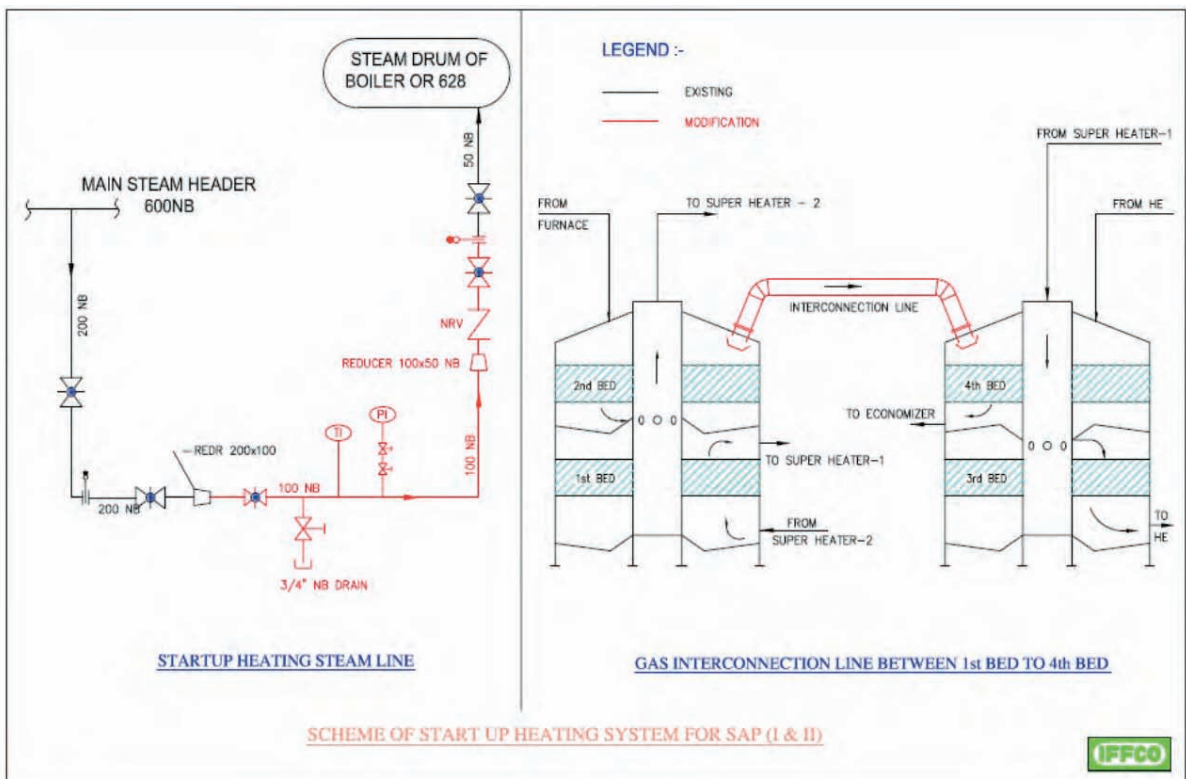
This modification is unique and not existing in any other plant in the world as far as we know.

**Investment:** Rs.1, 00,000 /-

**Savings :** a) considering savings in Diesel consumption in the Year  
b) Rs.98,72,511 (for financial year 2008-09) @ Rs. 33000/- Per KL of Diesel

**Other benefits:** Savings in 12 hrs production loss per start up which is a direct benefit.

### Schematic diagram



## Modification – 2

Reduction in power consumption of ammonia transfer pump.

### Description:

Liquid ammonia from the Ammonia storage tanks is pumped to the DAP plant through Ammonia transfer pumps. Ammonia transfer pump is provided with an auto recirculation valve to ensure that the pump does not operate below its minimum flow capacity. When operating at low capacity in the minimum flow valve re-circulates a part of the pumped liquid back to the tank thus meeting the minimum flow requirement of the pump. Thus pump was drawing same power in all conditions.

A scheme was implemented to reduce the discharge head and power consumption of Ammonia transfer pump by reducing impeller from four stage to three stage.

After implementation of above scheme, power consumption has been reduced from 71 kWh to 59 kWh by saving 12 kWh power consumption.

**Investment: Rs. 0 /-**

**Savings :** a) 12 kWh power consumption  
b) Rs. 2,75,616 /- (per year) @ Rs. 2.90 /- (Per kWh)

## Modification – 3

Use of pump of lower capacity to pump water from canal to save power.

### Description:

Earlier there were two pumps of 3000 m<sup>3</sup>/hr were there to pump the water from canal to the plant. As water requirement for plant decreased due to various steps taken for water conservation, at canal water pump house for pumping raw water from canal, one additional lower capacity pump (1600 m<sup>3</sup>/hr, 160 kW) has been installed in place of old pump (3000 m<sup>3</sup>/hr, 450 kW). This modification has reduced the need of running the second higher capacity pump which consumes more power. This will result in substantial amount of energy savings.

**Investment: Rs. 1,500,000 /-**

**Savings :** a) 290 Kwh power consumption  
b) Rs. 6,660,720 /- (per year) @ Rs. 2.90 /- (Per kWh)

## Energy Policy



Indian Farmers Fertiliser Cooperative Limited  
Paradeep Unit



### ENERGY POLICY

IFFCO Paradeep is committed to sustainable development in all its activities, products and processes. To accomplish this, the unit will make continuous efforts to improve its energy performance.

Our endeavour towards this goal will be as follows:

- ▶ Comply with all statutory laws, rules and regulations
- ▶ Reduce overall energy consumption per unit of output by identifying and implementing energy conservation schemes in the processes, innovation and incorporating new energy efficient technologies and equipment
- ▶ Implement renewable energy technologies wherever possible
- ▶ Reduce green house gas emissions
- ▶ Conduct regular energy audit
- ▶ Monitor, control, report and carry out benchmarking studies regularly to endeavor higher performance
- ▶ Create awareness in energy conservation techniques by imparting training, workshops and seminars to all employees and their families, contractors, suppliers and service providers and surrounding local population
- ▶ Carry out plantation of trees within and outside plant
- ▶ Procure energy efficient and eco marked items only wherever possible.

Date : 1<sup>st</sup> January 2008

  
M.R. Patel  
Executive Director  
IFFCO Paradeep

## Safety, Health and Environmental Policy



### ENVIRONMENT, HEALTH AND SAFETY POLICY ISO 14001:2004 & OHSAS 18001:2007

IFFCO Paradeep Unit, having the world's largest phosphoric acid plant and manufacturing phosphatic fertilizers, accepts its duty to exercise care for Environment, Health and Safety for the employees and the interested parties.

IFFCO Paradeep unit is committed for continual improvement in Occupational Health & Safety (OH&S) and Environment performance by setting and reviewing objectives & targets periodically through Environment, Health & Safety (EHS) Management System which focuses on

- ❖ Compliance of legal & other requirements on OH&S and Environment.
- ❖ Improving OH&S performance by risk minimisation & its effective identification and control.
- ❖ Strive for pollution prevention by effluent and waste minimization, through recycle and reuse.
- ❖ Conservation of natural resources and drive for afforestation.
- ❖ Communicating individual EHS obligations to employees, contractor's staff and interested parties.
- ❖ Availability of this policy to the general public.

Date : 1<sup>st</sup> April 2008

  
 (M. R. Patel)  
 Executive Director