

## 1.0 EXECUTIVE SUMMARY

IFFCO Phulpur unit is committed to use the energy in the most efficient way. "Energy Conservation" is a major objective for IFFCO as such, and more so, for Phulpur Unit. This has enabled to run the 1980 vintage Naphtha based Ammonia Plant of Phulpur-I with better performance level even after 35 years of operation. Ammonia plant of Phulpur-II, a new generation Naphtha based plant of late nineties, has been continuously improving its performance by implementing several modifications and by adopting best operating philosophy. IFFCO Phulpur Unit is continually striving to be the lowest energy consumer in the fertilizer industry. To achieve the goal several energy saving schemes have been adopted earlier like change-over of naphtha feed to natural gas in 2006. After 2006, a number of energy conservation schemes have been identified and planned to implement in stages under the Energy Saving Project (ESP). The present project of energy saving scheme is one of them.

## 1.1 PROJECT LOCATION

IFFCO Phulpur is located at Phulpur Tehsil in Allahabad District of Uttar Pradesh. The site is located at a distance of 30 km North East of Allahabad city on the UP state highway no. 7, connecting Allahabad to Jaunpur and Gorakhpur. Phulpur, which is a Tehsil, is about 6 km away from the site and is linked with Broad Gauge Rail link on the Varanasi-Allahabad route.

The project is limited to installation of energy saving scheme which includes installation of GT-HRSG Co-generation Plant having capacity of 23 MW and will be located near Urea-I. The project will be implemented on an area of 4800 m<sup>2</sup> (60mx80m) within Phulpur Fertilizer Complex, which is spread over an area of about 432.2 Ha of land.

## 1.2 SCOPE OF ENERGY SAVING PROJECT

The scope of Feasibility Study was aimed at to reduce the specific energy consumption of Urea by about 0.60 Gcal per MT at Phulpur Fertiliser Complex. To achieve the target, the following energy saving schemes has been considered at each Unit:

### 1.2.1 Schemes to be Implemented in Phulpur-I

Following schemes have been envisaged in ESP:

#### Ammonia-I

Sr.No.	Schemes under consideration
1.	Installation of New Air Compressor Turbine & New Refrigeration Turbine
2.	Installation of New back pressure Turbine
3.	Modification in CO2 Recovery Process
4.	Installation of Fuel gas Expander with inter and after pre-heaters and bypass arrangement
5.	Installation of VAM for Process Air Compressor Suction Chilling
6.	Ammonia Recovery from Synthesis Loop LP Purge Gases
7.	Installation of MP Stripper for Process Condensate Stripping
8.	Synthesis Gas Converter (105D) Revamp
9.	Saturated MP Steam Export from Synthesis Loop to Urea Plants
10	New Parrallel Methanator Effluent cooler (115-c) & BFW Header (145-C)
11	Installation of new Ammonia storage tank (double wall double integrity), Capacity: 10,000 MT

#### Urea-I

1.	Utilization of waste heat to Heat Feed Ammonia to Urea Converter
2.	Installation of VAM for Urea CO2 Compressor Suction Chilling
3.	New Urea Reactor Trays

#### Steam Generation Plant-I

1.	New GT-HRSG package
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### 1.2.2 Schemes to be implemented in Phulpur-II

#### Ammonia-II

S.No.	Schemes under consideration
1.	Revamping of Synthesis Gas Compressor
2.	Modification in CO2 Recovery Process
3.	Ammonia wash (syn gas drying) in synthesis compressor inter-stage and loop reversal

4.	Installation of Fuel gas Expander with inter and after pre-heaters and bypass arrangement
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### **Urea-II**

1.	Revamping of CO <sub>2</sub> Compressors
2.	Utilization of waste heat to Heat Feed Ammonia to Urea Converter (2 Nos.)
3.	New Urea Reactor Trays (2 Set)

### **1.2.2 Scope of Work of Engineering Consultant**

M/s CASALE would prepare basic engineering design package for the proposed project as under:

- (i) Design basis
- (ii) Mater balance, cooling tower and steam & condessate balance
- (iii) Process flow diagram for all section of the plants. The PFD shall be prepared for design condition
- (iv) Equipment list of new and modified equipments
- (v) Engineering Process Specifications and data sheet for new and modified equipments
- (vi) Details of Tie-in points for taking tapping in plant turn-around marled on PIDs
- (vii) Engineering specification for piping with reference to existing piping specifications
- (viii) Preliminary eaquipment arrangement for new and modified equipments
- (ix) Electrical motors specification with emergency power requirement for new and modified equipments
- (x) First edition of P&I diagrams for all new and modified sections of the plants  
The P&I diagrams shall show nominal diameters and medium symbols, walls and instrumentation, i.e., control loops and measuring points, control logic and analyzers, etc. Details of changes and modifications to the safety inter-lock trip systems for new and modified parts shall be shown in separate diagrams.
- (xi) Line list for new and modified piping based on existing pipings class specifications.
- (xii) Insulation requirement, if any.
- (xiii) Slope requirements of lines, if any.

- (xiv) Proposed modified plot plan showing the general layout for all new and modified section of the plant
- (xv) Marked up existing plot plan showing the available area for the new equipments
- (xvi) Layout of the equipments and space required.
- (xvii) Trip interlock logic diagram of new and modified sections showing trip set points, alarm annunciation and set points & delay time and manual reset.
- (xviii) Data sheet for new and modified control valves and new safety valves
- (xix) Typical Hook-up drawing for new and modified instruments loops
- (xx) Functional instrument diagrams and loop diagrams for documenting very complicated loops
- (xxi) HAZOP study for new installations and modifications
- (xxii) Operating Manual / guidelines for the new installations and their integration in existing plants, highlighting normal operations, start-up and shut-down operations were modified after revamping.

### 1.2.2 Estimated Cost of the project

The estimated cost of ESP project is as under:

#### Phulpur-I

S.No.	Schemes under consideration	Plant	Estimated Cost (Rs. Lakh)
1.	Modification in CO <sub>2</sub> Recovery Process – aMDEA Process in place of existing GV Process	Ammonia	13600
2.	New Efficient LO / SO Backpressure Turbines	Ammonia	500
3.	Installation of Fuel gas Expander with inter and after preheaters and bypass arrangement	Ammonia	3200
4.	Installation of VAM for Process Air Compressor Suction Chilling	Ammonia	950
5.	Ammonia Recovery from Synthesis Loop LP Purge Gases	Ammonia	800
6.	Saturated MP Steam Export from Synthesis Loop to Urea Plants	Ammonia	600
7.	Installation of MP Stripper for Process Condensate Stripping	Ammonia	1600
8.	New parallel Methanator Effluent Cooler (115-C) and BFW Heater (145-C)	Ammonia	800

9.	Synthesis Gas Converter (105D) Revamp	Ammonia	2500
10.	Installation of HP Ammonia Preheater	Urea	1100
11.	Installation of VAM for Urea CO2 Compressor Suction Chilling	Urea	800
12.	New Urea Reactor Trays	Urea	600
13.	New GT-HRSG package (GT + Electricals)	SGP	21000
14.	Replacement of Process Air Compressor Turbine (101-JT) & Refrigeration Turbine (105- JT)	SGP	6000
15.	Installation of new Ammonia storage tank (double wall double integrity), Capacity: 10,000 MT	Ammonia	4500
16.	<b>Sub Total</b>		<b>58550</b>
17.	<b>Contingency</b>		<b>1585</b>
18.	<b>Total</b>		<b>60135</b>

#### Phulpur-II

S.No.	Schemes under consideration	Plant	Estimated Cost (Rs. Lakh)
1.	Revamping of Synthesis Gas Compressor	Ammonia	4000
2.	Modification in CO2 Recovery Process - aMDEA Process in place of existing GV Process	Ammonia	13600
3.	Ammonia wash (syn gas drying) in synthesis compressor interstage <i>and</i> loop reversal	Ammonia	1200
4.	Installation of Fuel gas Expander with inter and after preheaters and bypass arrangement	Ammonia	3200
5.	Revamping of CO2 Compressors	Urea	8000
6.	Installation of HP Ammonia Preheater (2 Nos.)	Urea	950
7.	New Urea Reactor Trays (2 Set)	Urea	1000
8.	<b>Sub Total</b>		<b>31950</b>
9.	<b>Contingency</b>		<b>950</b>
10.	<b>Total</b>		<b>32900</b>

### 1.3 RAW MATERIAL AND UTILITIES

Basic purpose of implementation of energy saving schemes at each Unit is to conserve the raw materials i.e. natural gas, coal and water. There will be over all saving of natural gas, coal and water in Phulpur Unit. No additional raw materials will be required at all the Units.

### 1.4 PROJECT IMPLEMENTATION PLAN & TIME SCHEDULE

The ESP will be implemented in two Phases. Energy savings schemes which are having high energy savings potential and required relatively short lead time will be implemented in during 2016 turnaround and while the complete project will be completed in 2017 turnaround.

### 1.5 ESTIMATED PROJECT CAPITAL COST

The estimated capital cost of ESP is as under (Rs. Crore):

Sr No	Units	Equipment Cost (including 3% Contingency)	BEDP	DEDP	Total
1.	Phulpur-I	601.35	19	7	627.35
2.	Phulpur-II	329.00	16	4	349.00
3.	TOTAL	930.35	35	11	976.35

BEDP : Basic Engineering Design Package

DEDP : Detailed Engineering Design Package

### 1.6 FINANCIAL ANALYSIS OF PROJECT

The overall saving in Urea specific energy at each Unit and the financial analysis will be as under:

Particulars	UNIT	P-I	P-II	Total
Urea Plant Capacity	MTPD	2115	3030	5145
Energy Saving	Gcal/MT	0.947	0.386	0.467
Estimated Investment	Rs Crore	627.35	349	976.35
Monetary Savings	Rs Crore	151	97	248
Payback	Years	4.16	3.60	3.94

### 1.6 SAVINGS OF RAW MATERIAL OF PROJECT

Savings of raw material after ESP is as under:

Particulars	Phulpur Complex
Natural Gas	0.109 MMSCMD
Coal	525 MTPD
Water	2,760 m <sup>3</sup> /day

## 1.7 NEED & JUSTIFICATION

The need and justification of the proposed project is summarized as under:

- It will reduce overall energy consumption leading to a substantial reduction in pollution load.
- It will decrease the dependency of IFFCO, Phulpur unit over UPSEB grid during shortage of power generation
- ***It will reduce the consumption of natural resources viz. water, coal & NG which in turn will have positive impact on environment***
- It will impose positive impact on the consumption pattern of electricity in near-by area
- ***It will reduce the subsidy burden of Government of India (GOI).***
- It will maintain the profitability of IFFCO.
- It will maintain stability in indigenous / domestic market for Urea.
- It will check the import possibility of fertilizers to some extent and yield national savings
- There will be temporary employment generation during construction period.
- It will ease the availability of chemical fertilizers to farmers.
- Installation of new Ammonia Storage tank (double wall double integrity) is as a part of reliability improvement in storage technology as per one of the best available technology.
- The reduction of green house gas emissions from the stack will contribute to INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) under UNEPCCC.
- ESP is a complement to ***“India Low Carbon Strategy”*** to meet the target of carbon reduction equivalent to 20-25% of GDP by 2020 against the base of 2005.

## 1.8 Conclusion

As energy cost is increasing with passage of time, it is prudent to take the measures to save the energy at each location of IFFCO Plants. It is always the endeavour of IFFCO's top management to adopt the latest available and proven technology for improving the productivity of the Society. With the efforts taken by IFFCO management in the past, the IFFCO Plants are running at comparable energy consumption with global benchmarks. The proposed Energy Saving Project (ESP) will further reduce the energy consumption at all the Nitrogenous fertiliser Units. With implementation of Energy Saving Project (ESP), the overall urea specific energy will be reduced by about 0.60 Gcal per MT of Urea with payback of 3.94 Years. Thus, there will be reduction in the emission levels from each Plant with implementation of Energy saving project due to reduction in consumption of natural gas, coal, and imported power.

The ESP is simply a change-over scheme without any change in production rate. For this type of project, EIA Notification 2006 is also silent on preparation of EIA report and issuance of EC. ***Further, it would not be out of place to mention here that the area around IFFCO Phulpur has never been identified as "CRITICALLY POLLUTED AREA / ZONE" by CPCB.*** Further, the ESP fulfills the IFFCO policy related to protection & safe guard of environment and measures for energy conservation. It fulfills the aims & objective of EIA.

Considering the above facts, it requires a critical review with due diligence regarding exemption of Public Hearing and preparation of EIA report in generic form for grant of EC.



## 2.0 INTRODUCTION

### 2.1 Identification of the Project

IFFCO Phulpur unit is committed to use the energy in the most efficient way. “Energy Conservation “ is a major objective for IFFCO as such, and more so, for Phulpur Unit. This has enabled to run the 1980 vintage Naphtha based Ammonia Plant of Phulpur-I with better performance level even after 35 years of operation. Ammonia plant of Phulpur-II, a new generation Naphtha based plant of late nineties, has been continuously improving its performance by implementing several modifications and by adopting best operating philosophy. IFFCO Phulpur Unit is continually striving to be the lowest energy consumer in the fertilizer industry. In 2006, naphtha feed has been changed to natural gas to reduce the carbon load under strategic plan for carbon reduction. Since then, a number of energy conservation schemes have been identified and planned to implement in stages under the Energy Saving Project (ESP).

Production of Ammonia is an energy intensive process. IFFCO proposes the energy saving project to implement the latest available proven technological solution to meet the target of substantial reduction in energy consumption at its Phulpur Complex (P-I & P-II). M/s Casale, Switzerland is the Process Consultant for the Energy Saving Project (ESP).

The status of production before and after revamp at IFFCO Phulpur, will be same as follows:

**Table- 1.1**  
**Status of Production at IFFCO, Phulpur**

<b>Production before &amp; after ESP</b>	<b>Unit</b>	<b>Phulpur-I</b>	<b>Phulpur-II</b>	<b>Total</b>
Urea Production	MTPD	2115	3030	5145
Ammonia Production	MTPD	1215	1740	2955

Existing 12.5 MW Turbo Generator (TG-1) is in operation in Phulpur-I Power Plant for more than 34 years and is prone to frequent maintenance due to ageing. Keeping in view the technological advancements and the fact that Gas Turbine (GT) in co-generation cycle is more efficient than Turbo Generator (TG), Turbo generator (driven by steam turbine) will be replaced by Gas Turbine. IFFCO Phulpur Unit also intended to install GT-HRSG co-generation plant having capacity of 23 MW Power at 11 KV and 60 MT/hr HP Steam at 116 bar g pressure & 520+/-5 °C temperature.

## 2.2.2 Proposed Schemes

### 2.2.2.1 Schemes to be Implemented in Phulpur-I

Following schemes have been envisaged in ESP:

#### Ammonia-I

Sr.No.	Schemes under consideration
1.	Installation of New Air Compressor Turbine & New Refrigeration Turbine
2.	Installation of New back pressure Turbine
3.	Modification in CO2 Recovery Process
4.	Installation of Fuel gas Expander with inter and after pre-heaters and bypass arrangement
5.	Installation of VAM for Process Air Compressor Suction Chilling
6.	Ammonia Recovery from Synthesis Loop LP Purge Gases
7.	Installation of MP Stripper for Process Condensate Stripping
8.	Synthesis Gas Converter (105D) Revamp
9.	Saturated MP Steam Export from Synthesis Loop to Urea Plants
10.	New Parrallel Methanator Effluent cooler (115-c) & BFW Header (145-C)
11.	Installation of new Ammonia storage tank (double wall double integrity), Capacity: 10,000 MT

#### Urea-I

1.	Utilization of waste heat to Heat Feed Ammonia to Urea Converter
2.	Installation of VAM for Urea CO2 Compressor Suction Chilling
3.	New Urea Reactor Trays

#### Steam Generation Plant-I

1.	New GT-HRSG package
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## 2.2.2.2 Schemes to be implemented in Phulpur-II

### Ammonia-II

S.No.	Schemes under consideration
1.	Revamping of Synthesis Gas Compressor
2.	Modification in CO <sub>2</sub> Recovery Process
3.	Ammonia wash (syn gas drying) in synthesis compressor inter-stage and loop reversal
4.	Installation of Fuel gas Expander with inter and after pre-heaters and bypass arrangement

### Urea-II

1.	Revamping of CO <sub>2</sub> Compressors
2.	Utilization of waste heat to Heat Feed Ammonia to Urea Converter (2 Nos.)
3.	New Urea Reactor Trays (2 Set)

The process flow diagram of GT-HRSG has been presented in Plate-1.6.

## 2.1 Project Proponent

Indian Farmers Fertiliser Co-operative Limited (IFFCO) is a national level cooperative society engaged in the manufacture and marketing of various fertilizers. The Society, registered as a cooperative under the Multi State Cooperative Societies Act. IFFCO was established through Indian farming community's initiative along with the Government of India on 3rd November, 1967 for making available much-needed fertilizer at the farmer's doorstep from plants owned by them through their own distribution channels.

The Society has grown steadily in strength and stature from a modest membership of 57 cooperative societies and a seed equity capital of Rs.6 lakhs in 1967 to the present staggering membership of about 40,000 cooperatives with more than 55 million farmers as members, having a share capital of Rs.423.93 crores, which is now fully-owned by the member cooperative societies, having repatriated the entire equity contribution of the Government of India. Through its exemplary performance over the

years, IFFCO has today emerged as a unique cooperative of the farmers, for the farmers and by the farmers.

IFFCO Phulpur-I (P-I) Unit was commissioned in the year 1981. Phulpur-I Unit consists of 1215 MTPD Ammonia plant based on M W Kellogg, USA Process Technology and 2115 MTPD Urea Plant based on Snamprogetti, Italy Process Technology. Subsequently, Phulpur-II (P-II) Unit was commissioned in the year 1997. Phulpur-II Unit consists of 1740 MTPD Ammonia plant based on Haldor Topsoe, Denmark Process Technology and 2x1515 MTPD Urea Plant based on Snamprogetti Process Technology. The Phulpur Complex have all the associated offsite and utilities facilities. The raw water demand is being met by own borewells and gas is available through HBJ pipeline of GAIL. Final prilled urea product is being transported through rail network and also by road to the final destination as per Government of India despatch plan. Therefore, the entire infrastructure is available at the present Phulpur plant site.

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 one of 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.

#### Energy Conservation Commitment and Policy

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

Major projects Implemented during recent past

1. Higher load operation, maximization of on-stream days and optimization of process parameters - Project has yield yearly saving of Rs. 3471.22 Lacs per year.
2. Monitoring and rectification of steam traps and leakages - Yields yearly saving of 193.86 Lacs per year
3. Absorber Temperature Improvement in CO<sub>2</sub> Plant - The project yields yearly saving of 13.29 Lacs

4. By-pass of Adiabatic Pre-Reformer – The project has yielded yearly saving of Rs 793.63 Lacs
5. Installation of Liquid Nitrogen Tank - The project has yielded an yearly saving of Rs 45.24 Lacs
6. CO2 Ejectors to prevent seal losses - The project has yielded an yearly saving of Rs 39.88 Lacs
7. Stoppage of Service Water Pump - The project has yielded yearly saving of Rs 117.56 Lacs

Due to stringent efforts, IFFCO Phulpur Unit has bagged a number of awards detailed below:

- a) IFFCO Phulpur Unit bags 15<sup>th</sup> Annual Greentech Environment Award 2014
- b) IFFCO Phulpur Unit bags "Indira Gandhi Paryavaran Puraskar 2011 which was conferred on 2<sup>nd</sup> February 2015.
- c) IFFCO Phulpur Unit bags Environment Protection Award for the year 2013-14 by FAI, New Delhi.
- d) IFFCO Phulpur Unit bags " 2015 IFA Green Leaf Award" by International Fertiliser Industry Association, Paris, France.
- e) Best Production Performance Award for Nitrogenous Fertiliser Plant - 2012" by FAI, New Delhi.
- f) 2nd Prize "National Energy Conservation Award - 2012", by BEE, Ministry of Power.
- g) Golden Peacock Environment Management Award- 2011 by Institute of Directors, New Delhi.
- h) IFFCO - Phulpur Unit, has received "National Award for Excellence in Energy Management -2012" ,by Confederation of Indian Industry (CII).
- i) IFFCO- Phulpur-I Unit has been awarded Runner-up trophy for "Best Production Performance Award for Nitrogenous Fertiliser Plant - 2010" by Fertiliser Association of India (FAI).

#### **ACCREDITATION AND CERTIFICATION:**

- a) Environment Management System (ISO 14001: 2004 Accreditation):
  - IFFCO Phulpur has established and implemented Environment Management System as per International Organization for Standardization. The system has been audited by Indian representative of M/s British Standards Institution, U.K.

and the unit has been accredited with ISO 14001:2004 Certification. IFFCO Phulpur has received ISO 14001: 2004 Certification for:

- Factory Premises.
- Residential Township, Ghiyanagar,
- IFFCO Hospital, Ghiyanagar
- Moti Lal Nehru Farmers Training Institute, Phulpur located nearby the factory.

b) IFFCO-Phulpur Unit is a OHSAS-18001, ISO 50001 (EnMS) & ISO 9001(QMS) Certified Unit.

c) A laboratories Accredited by UPPCB, Lucknow.

## 2.2 DESCRIPTION OF PROJECT

The project proposal includes installation of Gas Turbine (GT) in place of Steam Turbine (ST) as well as installation of Heat Recovery Steam Generation (HRSG). The project will reduce fuel (NG & Coal) consumption thereby resulting in reduction in generation of solid and liquid waste.

Overall energy savings for above schemes has been envisaged as 0.947 GCal/MT urea and 0.386 GCal/MT urea for Phulpur-I and Phulpur-II plants respectively.

### Raw Material Consumption at Present

**Table- 1.2**

#### **Status of Raw Material Consumption & Urea Production at IFFCO, Phulpur**

Particulars	Unit	Phulpur-I	Phulpur-II	Total
Urea Production	MTPD	2115	3030	5145
Feed NG	SM <sup>3</sup> /day	819450	1124816	1944266
Fuel NG	SM <sup>3</sup> /day	350062	655203	1005265
Coal	MT/day	784.6	-	784.6
Fuel to SG	SM <sup>3</sup> /day	36000	248650	284650
Ammonia Energy	Gcal/MT	8.692	7.197	7.811
Urea Energy	Gcal/MT	6.305	5.390	5.751

Savings of raw material after ESP is as under:

**Table- 1.3**  
**Savings of Raw Material Consumption**

Particulars	Phulpur Complex
Natural Gas	0.109 MMSCMD
Coal	525 MTPD
Water	2,760 m <sup>3</sup> /day

The water consumption after completion of the project, will be met by existing sources i.e. from deep bore well. The present requirement of fresh water is about 32,000-35500 m<sup>3</sup>/day. Fresh water consumption will be reduced by 2,760 m<sup>3</sup>/day after the project completion and operating the modified unit.

### 2.2.1 Estimated Project Capital Cost

Estimated capital cost of ESP is as under (Rs. Crore):

Sr No	Units	Equipment Cost (including 3% Contingency)	BEDP	DEDP	Total
1.	Phulpur-I	601.35	19	7	627.35
2.	Phulpur-II	329.00	16	4	349.00
3.	TOTAL	930.35	35	11	976.35

**BEDP** : Basic Engineering Design Package

**DEDP** : Detailed Engineering Design Package

### 2.3 NEED & JUSTIFICATION

The need and justification of the proposed project is summarized as under:

- It will reduce overall energy consumption leading to a substantial reduction in pollution load.
- It will decrease the dependency of IFFCO, Phulpur unit over UPSEB grid during shortage of power generation
- It will reduce the consumption of natural resources viz. water, coal & NG which in turn will have positive impact on environment
- It will impose positive impact on the consumption pattern of electricity in near-by area
- It will reduce the subsidy burden of GOI upto some extent.

- It will maintain the profitability of IFFCO.
- It will maintain stability in indigenous / domestic market for production of Urea.
- It will check the import possibility of fertilizers to some extent and yield national savings
- There will be temporary employment generation during construction period.
- Installation of new Ammonia Storage tank (double wall double integrity) is as a part of reliability improvement in storage technology as per one of the best available technology.
- The reduction of green house gas emissions from the stack will contribute to INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) under UNEPCCC.
- ESP is a complement to **“India Low Carbon Strategy”** to meet the target of carbon reduction equivalent to 20-25% of GDP by 2020 against the base of 2005.

## 2.4 DEMAND – SUPPLY GAP

All-India demand forecast of fertilizer nutrients and product urea during Eleventh Plan based on Multiple Regression method are shown below.

**Table-**

**Demand Estimates for Fertilizer Nutrients**

('000 tonnes)

Year	Urea Demand
2007-08	25360
2008-09	26275
2009-10	27135
2010-11	27945
2011-12	28755
2012-13	29733
2013-14	30744
2014-15	31789
2015-16	32870
2016-17	33987

To ensure uninterrupted supply in the eventuality of break down and unforeseen demand, buffer stock up to a limit of 5% of the seasonal requirement of the State is to be maintained. Also taking into consideration 10% of the supply in the pipeline, projected production capacity should be 15% above the projected demand of Urea as indicated in the above table.



## 2.4.1 Future Supply Estimates

### 2.4.1.1 Indigenous Supply

No new urea plant was commissioned during the Tenth Five Year Plan except for a small addition to the capacity of Namrup II unit of the Brahmaputra Valley Fertilizer Corporation after its revamp. The reassessed indigenous production capacity of urea in the Country as on 1-11-2007 was 207.93 lakh tones. While announcing the urea pricing policy for seventh and eighth pricing period, the government has revised various norms with regard to capacity, capacity utilization, vintage allowance, energy consumption norms, selling expenses and capital costs. The announcement of the new norms has significantly affected the viability of certain urea manufacturers. Consequently, units such as FCI Sindri, Neyveli Lignite Corporation (NLC), Duncan Industries Ltd. (DIL) and FACT became uneconomical and discontinued their production. The indigenous capacity for urea of the 28 functional units at present is around 20 million tonnes.

### 2.4.1.2 Additional Capacity

Around 2.560 million tonnes of additional capacities through de-bottlenecking or revamp, which are under implementation or proposals by urea manufacturers, are under consideration with the Government of India.

## 2.4.2 Projected Demand-Supply Gap

The following Table-2.18 gives scenario of the demand-supply gaps that are likely to emerge by the end of 2016-17.

**Table-2.18**  
**Projected Demand Supply Gap for Urea**

('000 tonnes of material)

tem	2011-12	2012-13	2014-15	2015-16	2016-17
<b>Demand Estimates (FAI)</b>	28755	29733	31789	32870	33987
<b>Supply Estimates</b>					
• Plants under Operation	20000	20000	20000	20000	20000
• OMIFCO	1652	1652	1652	1652	1652
• Revamp/ Debottlenecking	2560	2560	2560	2560	2560
<b>Total Supply</b>	<b>24212</b>	<b>24212</b>	<b>24212</b>	<b>24212</b>	<b>24212</b>

There is almost 3-4 lakh tones of urea demand per annum for manufacturing of complex fertilizers and for exports to neighbouring countries like Nepal, Myanmar etc. This will increase the projected deficit level of urea further.

The projected deficit level of about 46 lakh tonnes of urea by 2011-12 is based on certain assumptions on the demand as well as supply side. On the supply side, a critical assumption is that the existing installed capacity is not only retained in good working condition but is also able to maintain the high capacity utilization levels. As much as 35 lakh tonnes of urea capacity is from plants based on costlier feedstock such as naphtha/ fuel oil. It would call for change over of feedstock, if the Country were to continue to have this much capacity available for production. Even the gas based plants commissioned in 1980's and thereafter would call for timely revamping and retrofitting to ensure that they are able to maintain present operating rates and low energy consumption.

#### **2.4.3 Import of Urea**

The quantity of urea available for international trade is limited. The analysis of past 15 years data reveal that increase and decrease in the world export supply or import demand by 10 million tonnes has led to violent fluctuations in the prices from US\$ 70 to US\$ 600 per tonne of urea. This variation in prices is basically due to changes in the output by either 'low cost exporters' or 'swing producers' who account for about 6 million tonnes of world trade. Low cost producers are export oriented facilities based on low cost gas. Swing producers are primarily domestic suppliers who either (i) enter the export market when prices are high even ignoring domestic supplies, or (ii) stop even domestic supplies when prices are low. Manufacturers in free markets like USA fall under this category.

When the demand is strong, it is the demand-supply balance which would determine the price level that the market can sustain at that particular point of time. It has no relation to manufacturing costs.

When market is weak, it is the cost profiles of the producers and more specifically their cash costs which would determine the price levels. Low cost exporters do not normally reduce their export volumes and prefer to maximize sales volumes even when prices are dropping so long as they recover their cash costs. Generally, the swing producers have higher manufacturing costs and they would start exiting the market as prices

drop, thereby reducing exports to balance the reduction in import demand and maintain prices.

From the above discussions, it is apparent that urea is a strategic commodity and capacity of international market is rather limited to meet significant increases in demand. An additional demand of even 1-2 million tonnes would cause serious imbalance and prices would shoot up. Higher levels of demand could result in a situation when urea would not be available in spot markets at any price.

Therefore, it would not be prudent to depend on imports for more than 5-6 lakh tones of urea. This in other words means that Country shall be required to have in place additional domestic capacity of urea for indigenous consumption and to make the Country export hub for urea. To reduce the demand-supply balance during eleventh and subsequent Plan periods, a number of new and expansion projects are under consideration.

#### **2.4.4 Export Possibility / Domestic & Export Market**

The project ESP proposal includes installation of Gas Turbine (GT) in place of Steam Turbine (ST) as well as installation of Heat Recovery Steam Generation (HRSG). The project will reduce raw material (NG, Coal & Water) consumption.

There would not be any significant increase in the production capacity of finished products. Hence, the possibility of export of urea and impact on domestic and export market can be ruled out.

#### **2.4.5 Employment Generation (Direct & Indirect)**

The proposed project is an Energy Saving Project (ESP). It would not enhance the production capacity of IFFCO Phulpur Unit. The existing manpower is sufficient to take care of the establishment of proposed ESP. However, employment generation (direct and indirect) is not envisaged due to project implementation.

### **3.0 PROJECT DESCRIPTION**

#### **3.1 TYPE OF PROJECT**

The proposed project is a modernization project without any change in production rate with an aim to reduce the energy consumption per tone of production by adopting the modern proven, fail-safe technology through replacement of steam turbines to gas turbines. The project fulfills the aims and objective of environment by reduction in energy and natural resources like NG & water.

- 3.1.1** The proposed project is an independent project and not interlinked with any other project. The project will be implemented in existing units of Phulpur-I and Phulpur-II. The project will yield energy saving of 0.947 Gcal/MT of urea at Phulpur-I and 0.386 Gcal/MT of urea at Phulpur-II. A total of 0.467 Gcal/MT of Urea has been estimated. The natural resources savings equivalent to 0.109 MMSCMD of NG, 525 MTPD of Coal and 2,760 m<sup>3</sup>/day of water has been estimated after implementation of the project with a pay-back period of 3.94 years.

#### **3.2 LOCATION OF THE PROJECT**

The ESP project includes installation of GT-HRSG Co-generation Plant having capacity of 23 MW and will be located near Urea-I. The project will be implemented on an area of 4800 m<sup>2</sup> (60mx80m) within Phulpur Fertilizer Complex, which is spread over an area of about 432.2 Ha of land. The location of the IFFCO, Phulpur Complex in Google Map has been presented in Plate - 1.1. The location of the IFFCO, Phulpur Complex in Geographical Map has been presented in Plate - 1.2.

##### **3.2.1 Co-ordinates of the project**

Geographically Phulpur fertilizer complex is located at latitude 25°32'21.49" North and longitude 82°02'49.31" East at an elevation of about 97m above Mean Sea Level (MSL).

#### **3.3 DETAILS OF SITE**

The choice for selection of alternate site is limited as the proposed ESP project including GT-HRSG scheme shall be located near existing Urea-I of Phulpur fertilizer complex. The project is located within the battery limit of the fertilizer complex. As regards consideration of environmental protection, it is envisaged that there would be

a reduction of pollution load due to reduction in energy consumption, NG, Coal and water consumption.

### 3.3 SIZE & MAGNITUDE

The project includes installation of various schemes as a part of energy saving project which also includes GT-HRSG co-generation plant having capacity of 23 MW Power at 11 KV and 60 MT/hr HP Steam at 116 bar g pressure & 520+/-5 °C temperature.

### 3.4 PROJECT DETAILS

The energy saving that involves schemes related to replacement / revamping of the existing compressors & turbines and modification of CO<sub>2</sub> removal section are targeted. With regard to execution of the project, energy saving scheme, license and basic engineering package is required. M/s CASALE, SA Switzerland has provided the scope of work as mentioned below:

#### 3.4.1 Preparation of Basic Engineering Design Package (BEDP)

M/s CASALE would prepare basic engineering design package for the proposed project as under:

- (i) Design basis
- (ii) Mater balance, cooling tower and steam & condessate balance
- (iii) Process flow diagram for all section of the plants. The PFD shall be prepared for design condition
- (iv) Equipment list of new and modified equipments
- (v) Engineering Process Specifications and data sheet for new and modified equipments
- (vi) Details of Tie-in points for taking tapping in plant turn-around marled on PIDs
- (vii) Engineering specification for piping with reference to existing piping specifications
- (viii) Preliminary eaquipment arrangement for new and modified equipments
- (ix) Electrical motors specification with emergency power requirement for new and modified equipments
- (x) First edition of P&I diagrams for all new and modified sections of the plants

The P&I diagrams shall show nominal diameters and medium symbols, walls and instrumentation, i.e., control loops and measuring points, control logic and analyzers, etc. Details of changes and modifications to the safety inter-lock trip systems for new and modified parts shall be shown in separate diagrams.

- (xi) Line list for new and modified piping based on existing pipings class specifications.
- (xii) Insulation requirement, if any.
- (xiii) Slope requirements of lines, if any.
- (xiv) Proposed modified plot plan showing the general layout for all new and modified section of the plant
- (xv) Marked up existing plot plan showing the available area for the new equipments
- (xvi) Layout of the equipments and space required.
- (xvii) Trip interlock logic diagram of new and modified sections showing trip set points, alarm annunciation and set points & delay time and manual reset.
- (xviii) Data sheet for new and modified control valves and new safety valves
- (xix) Typical Hook-up drawing for new and modified instruments loops
- (xx) Functional instrument diagrams and loop diagrams for documenting very complicated loops
- (xxi) HAZOP study for new installations and modifications
- (xxii) Operating Manual / guidelines for the new installations and their integration in existing plants, highlighting normal operations, start-up and shut-down operations were modified after revamping.

### 3.5 RAW MATERIAL

Existing consumption of raw materials for production of 5145 MTPD of urea are briefed as under:

Particulars	Unit	Raw Material Consumption		
		Existing	Proposed	Saving
Total NG	SM3/day	3234181	3125181	109000
Coal	MT/day	784.6	259.6	525
Water	m <sup>3</sup> /day	32,000	29,240	2760

Savings of raw material after ESP is as under:

Particulars	Phulpur Complex
Natural Gas	0.109 MMSCMD
Coal	525 MTPD
Water	2,760 m <sup>3</sup> /day

Natural Gas is being purchased from GAIL as per Gas Sale agreement between GAIL & IFFCO dated 25.8.2004. Coal is being procured from nearby colliery of CIL. Source of water is ground water from deep tube wells. Existing tube wells shall be utilized. However, water consumption shall reduce after implementation of proposed project.

The project does not require any facility for transportation of raw material and finished products. The production profile of Phulpur Unit shall remain same.

### **3.5.1 RESOURCE RECYCLING/ RESUSE**

The proposed project does not envisage resource recycling and reuse. However, there will be reduction in consumption of natural resources like NG, Coal and Water.

### **3.5.2 AVAILABILITY OF WATER, ENERGY & POWER**

The project proposal does not envisage any additional requirement of water. The present source of water is ground water of about 32,000-35500 m<sup>3</sup>/day which will reduce from 32,000 m<sup>3</sup>/day by 2760 m<sup>3</sup>/day.

Similary, there will reduction in requirement of energy. Energy consumption will reduce by 0.467 Gcal/MT of Urea (5145 MTPD).

### **3.5.3 QUANTITY OF WASTE (SOLID & LIQUID)**

The project proposal is limited only to energy saving project which includes installation of Gas Turbine (GT) in place of Steam Turbine (ST) as well as installation of Heat Recovery Steam Generation (HRSG). The project will reduce fuel (NG & Coal) consumption thereby resulting in reduction in generation of solid and liquid waste.

Due to replacement of steam driven turbine by Gas Turbine, a reduction of coal consumption of about 525 MTPD has been envisaged corresponding to reduction in ash generation from 274 MT to about 91 MT.

Due to reduction in water consumption, there will be substantial reduction of about 900 m<sup>3</sup>/day of wastewater.

#### 4.0 SITE ANALYSIS

IFFCO Phulpur has been commissioned in the year 1981 and running successfully since then. Several modernization schemes have been implemented successfully in the past. The prime factor with respect to connectivity plays an important role in successful implementation of the project as per schedule.

IFFCO Phulpur is located at Phulpur Tehsil in Allahabad District of Uttar Pradesh. The site is located at a distance of 30 km North East of Allahabad city on the UP state highway no. 7, connecting Allahabad to Jaunpur and Gorakhpur. Phulpur, which is a Tehsil, is about 6 km away from the site and is linked with Broad Gauge Rail link on the Varanasi-Allahabad route.

Phulpur fertilizer complex is spread over an area of about 432.2 Ha of land. The ownership of the land is with Indian Farmers Fertiliser Co-operative Limited (IFFCO), a national level cooperative society engaged in the manufacture and marketing of various fertilizers. The proposed project shall be established within plant premises of existing complex near Urea-I Plant.

Since the project shall be implemented within existing plant premises, there would no change in existing land use pattern.

#### 4.1 Eco-sensitive Areas

The proposed ESP project includes various schemes including installation of GT & HRSG without any change in production profile. There will be reduction in natural resource and energy per capital of finished production.

It is envisaged that there is no Wild Life Sanctuary, National Park, Reserved Forest within 10 km radius of the project area.

#### 4.2 Topography

Phulpur Fertilizer Complex is located in Phulpur tehsil of Allahabad district. The project area falls under the central Ganga alluvial plain. Ganga and Yamuna are the most important rivers of the district. Other rivers which flow in the district and at the end meet with Ganga or Yamuna are Tons and Belan, The holy Ganga and Yamuna confluence in the middle of the district at Allahabad town and flow in the shape of 'Y' alphabet which divide the district in three physiographic tracts namely Trans-Ganga region, Doab region



and Trans-Yamuna region. The northern part of Allahabad district, popularly known as Gangapar, is endowed with good fertile soil for cultivation of food grains, pulses, oil seeds and vegetables. The southern part of Allahabad, known as Yamuna par is partly hilly and agriculturally backward. (Source: District Industrial Profile of Allahabad.).

#### 4.3 Existing Facilities

Indian Farmers Fertiliser Co-operative Limited (IFFCO) is a national level cooperative society engaged in the manufacture and marketing of various fertilizers. The Society, registered as an autonomous cooperative under the Multi State Cooperative Societies Act, 2002, was established through the Indian farming community's initiative along with the Government of India on 3rd November, 1967 for making available much-needed fertilizer at the farmer's doorstep from plants owned by them through their own distribution channels.

IFFCO Phulpur Unit is a well established fertilizer complex spread over an area of 432.2 Ha of land. In addition to industrial activities, there exists residential area for providing accommodation to its employees. The residential accommodations are well furnished and well connected with metallic road with water supply and electricity. Water is being supplied to the residential colony through underground pipelines. Source of power is own power generation plant. All the other infrastructural facilities like school, play grounds etc are well maintained. In addition to above facilities, IFFCO has established Diary, Fishery and Agro Farms to provide training to the farmers and best uses of fertilizers. The colony has a good sewerage system and the township sewage are treated in a dedicated Sewage Treatment Plant. The treated sewage is used as irrigational water.

#### 4.4 Soil Classification

Phulpur area falls in northern part of Allahabad district, popularly known as Ganga par and is endowed with good fertile soil for cultivation of food grains, pulses, oil seeds and vegetables. The soil texture is predominantly clayey in nature and of light grey colour. The pH of soil is slightly alkaline having pH around 8.0 to 8.5. The porosity varies from 46 to 50%. The cation exchange capacity varies from 12.2 to 19.0 meq/100g of soil. Nitrogen & Phosphorous ratio has been found around 1:10.

#### 4.5 Climate of Phulpur

Phulpur tehsil falls under humid subtropical climate that is common to cities in north-central India. Phulpur experiences three seasons: hot dry summer, cool dry winter and warm humid monsoon. The summer season lasts from April to June with the maximum temperatures ranging from 40 °C (104 °F) to 48 °C (118 °F). Monsoon begins in early July and lasts till September. The winter season lasts from December to February.

The temperature of the area has been found to vary between 0.5 to 48°C. The Humidity has been found to vary 13 to 97%. Annual rainfall of the area is about 1000mm with an average rainy day of 48 days. The wind speed of the area varies from 1.8 to 13 Kmph. The dominant wind direction is West & South-west.

#### 4.6 Social Infrastructure

- 4.6.1** The residential colony of IFFCO Phulpur falls in Sarai Abdulmalik Panchayat of Phulpur tehsil. Sarai Abdulmalik is a Census Town city in district of Allahabad, Uttar Pradesh. The Sarai Abdulmalik Census Town has population of 4,815 of which 2,509 are males while 2,306 are females as per report released by Census India 2011.

Population of Children with age of 0-6 is 496 which is 10.30 % of total population of Sarai Abdulmalik (CT). In Sarai Abdulmalik Census Town, Female Sex Ratio is of 919 against state average of 912. Moreover Child Sex Ratio in Sarai Abdulmalik is around 765 compared to Uttar Pradesh state average of 902. Literacy rate of Sarai Abdulmalik city is 80.62 % higher than state average of 67.68 %. In Sarai Abdulmalik, Male literacy is around 89.72 % while female literacy rate is 70.92 %.

Sarai Abdulmalik Census Town has total administration over 930 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Census Town limits and impose taxes on properties coming under its jurisdiction.

##### Caste Factor

Schedule Caste (SC) constitutes 7.46 % of total population in Sarai Abdulmalik (CT). The (CT) Sarai Abdulmalik currently doesn't have any Schedule Tribe (ST) population.

##### Work Profile

Out of total population, 1,242 were engaged in work or business activity. Of this 1,087 were males while 155 were females. In census survey, worker is defined as person who

does business, job, service, and cultivator and labour activity. Of total 1242 working population, 77.21 % were engaged in Main Work while 22.79 % of total workers were engaged in Marginal Work.

- 4.6.2** The plant area of Phulpur fertilizer complex falls in Tisaura village. Tisaura is small village located in Phulpur Tehsil of Allahabad district, Uttar Pradesh with total 285 families residing. The Tisaura village has population of 1952 of which 1033 are males while 919 are females as per Population Census 2011.

In Tisaura village population of children with age 0-6 is 291 which makes up 14.91 % of total population of village. Average Sex Ratio of Tisaura village is 890 which is lower than Uttar Pradesh state average of 912. Child Sex Ratio for the Tisaura as per census is 753, lower than Uttar Pradesh average of 902.

Tisaura village has higher literacy rate compared to Uttar Pradesh. In 2011, literacy rate of Tisaura village was 75.20 % compared to 67.68 % of Uttar Pradesh. In Tisaura Male literacy stands at 89.50 % while female literacy rate was 59.57 %.

As per constitution of India and Panchyati Raaj Act, Tisaura village is administrated by Sarpanch (Head of Village) who is elected representative of village.

#### Caste Factor

Schedule Caste (SC) constitutes 17.16 % of total population in Tisaura village. The village Tisaura currently doesn't have any Schedule Tribe (ST) population.

#### Worke Profile

In Tisaura village, out of total population, 602 were engaged in work activities. 85.38 % of workers describe their work as Main Worker (Employment or Earning more than 6 Months) while 14.62 % were involved in Marginal activity providing livelihood for less than 6 months. Of 602 workers engaged in Main Work, 190 were cultivators (owner or co-owner) while 125 were Agricultural labourers..

## **5.0 PLANNING BRIEF**

### **5.1 Planning Concept**

IFFCO Phulpur Unit is continually striving to be the lowest energy consumer in the fertilizer industry. To achieve the goal several energy saving schemes have been adopted earlier like change-over of naphtha feed to natural gas in 2006. After 2006, a number of energy conservation schemes have been identified and planned to implement in stages under the Energy Saving Project (ESP). Planning to meet any unforeseen requirement for the proposed project is under consideration.

The concept of present ESP has been conceived by IFFCO management in search of best available technology for reduction of energy and natural resources like NG, Coal & water.

The consultant has been searched on global basis in consultation with Projects & Development India Ltd (PDIL). Globally renowned consultant related to energy schemes has been identified. IFFCO will make responsible M/s Casale for preparation of basic and detailed engineering package for ESP project and identification of necessary modifications for optimization of ESP project as stated above.

IFFCO has appointed PDIL for preparation of feasibility report, filling & online submission of Form-I and necessary formalities related to environmental clearance. After EC the job allotted to M/s Casale will be executed under schedule fixed by Casale and IFFCO. Necessary equipments shall be procured after review of basic & detailed engineering package, which will include replace of old machineries & equipment for optimization of energy consumption. The scheduled completion of project shall be within 36 months after award of EC.

### **5.2 Population Projection**

There would be minor influx of population during construction. However, it is envisaged that local workers of adjoining villages shall be engaged during construction to check the influx of population in the area. The visit of super specialists during construction period cannot be ruled out. They will be accommodated in IFFCO Guest House /near-by facilities.

There will be no influx of population and new appointments and hence no population projection has been envisaged in the proposed project.

### 5.3 Land Use Planning

IFFCO fertilizer complex is spread over an area of 432.2 Ha of land. Total available is being used as under:

#### LAND USE DETAILS (IFFCO PHULPUR UNIT)

DESCRIPTION	AREA (HA)	Percentage of Total Land
Plants and Storage	130	30.08
Township	74.5	17.24
Green Belt Development (Plant)	26.4	6.11
Roads/Guard Pond /Township Green Belt	50.2	11.61
Ash Pond	74.8	17.31
Demonstration Form of (CORDET)	76.3	17.65
<b>Total Land</b>	<b>432.2</b>	<b>100.00</b>

Total green belt area within IFFCO Phulpur premises (Plant, Township, Cordet, Ash Pond): 123 Ha

As the project proposal is limited to installation of Gas Turbine (GT) in place of Steam Turbine (ST) as well as installation of Heat Recovery Steam Generation (HRSG) as energy saving only. Hence, additional land use planning is not envisaged.

#### 5.3.1 Green Belt Development :

The land provided for the factory and township was originally “USAR” land and was lying unutilized from long time. IFFCO had taken a challenge to reclaim this usar land and it has been converted into a green land. 50 to 200 m wide green belt has been developed around the complex. Today, the entire area is full of trees and vegetation.

About 3.0 Lakh trees of wide variety of about 30 species including some of medicinal species imparts scenic beauty besides providing suitable habitat for birds and other flora

and fauna. The greenery and the scenic beauty of Sanjivani Vatika, Buddha Vihar, Nandan Udyan, Saras Kunj, etc. are remarkable and imparts healthy environment. The species of plants planted are Peepal, Neem Shesham, Pakad, Jamun, Guava, Arjun, Amla, Bel, Kanji, Ashok, Casurina, Gulmohar, Amaltas, Harre, Bahera, Karenj, Bottlebrush etc.

### 5.3.2 Environment and Safety

IFFCO Phulpur Unit is totally committed for maintaining an eco-friendly environment. For controlling air pollution, plants have been provided with 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.

There is a full fledge Environment & Safety Department which runs under dedicated experienced specialist of the field.

The Safety Department runs as per OHSAS: 18001 guidelines and maintains the safety norms and MSDS guidelines precaution of chemicals and materials used & procured. It provided all the safety items to the workers and provides necessary training related to safety and prevention of accidents. The instances of accidents and risk are identified and reported to the higher authorities. Fire Fighting system is under the control of safety department.

IFFCO has a well established Environment Department which runs under experienced specialist of the field. The department works as per guidelines of IS 14001, 9001. The departmental head is responsible for implementation of guidelines related to environment issued by CPCB, SPCB, MoEF&CC. The department is responsible for making compliance against the condition and enquiry made by statutory and non-statutory bodies.

#### **5.4 Assessment of Infrastructure Demand**

The existing infrastructural facilities available at IFFCO Phulpur are having all the basic requirements and are updated from time to time. Hence, there shall be no demand of infrastructure during establishment of proposed project.

#### **5.5 Amenities/ Facilities**

IFFCO Phulpur is having all the required amenities and facilities. Safety, healthy, environmental, social, cultural requirements are periodically assessed and updated as per requirements.

#### **6.0 Proposed Infrastructure**

The existing infrastructure of IFFCO Phulpur with respect to residential colony, green belt, Social infrastructure, road and rail facilities, supply of water, sewerage facilities, power requirement etc. are readily available and are working efficiently. In view of the size and magnitude of proposed project, no additional infrastructure is envisaged.

#### **7.0 Rehabilitation & Resettlement Plan**

The schemes under proposed project shall be implemented within plant premises of existing Phulpur Fertilizer Complex. Hence, any planning with rehabilitation & resettlement is not applicable.

#### **8.0 Project Schedule & Cost Estimates**

##### **8.1 Project Schedule**

Energy Saving Project will be implemented in two phases. First phase will be 2016 turnaround and other will be 2017 turnaround. The likely date of start of construction shall commence after getting Environmental Clearance (EC) from MoEF. The project is scheduled to be completed within 24 months after issuance of EC.

## 8.2 Project Schedule

THE ESTIMATED CAPITAL COST OF PROPOSED ENERGY SAVING PROJECT IS AS UNDER (RS./CRORES):

Sr No	Units	Equipment Cost (including 3% Contingency)	BEDP	DEDP	Total
1.	Phulpur-I	601.35	19	7	627.35
2.	Phulpur-II	329	16	4	349
3.	TOTAL	930.35	35	11	976.35

**BEDP** : Basic Engineering Design Package

**DEDP** : Detailed Engineering Design Package

### 8.2.1 Financial Analysis

The financial analysis of project will be as under:

The overall saving in Urea specific energy at each Unit and the financial analysis is as under:

ESP	UNIT	Phulpur-I	Phulpur-II	Total
Urea Plant Capacity	MTPD	2115	3030	5145
Energy Saving	Gcal/MT	0.947	0.386	0.467
Estimated Investment	Rs. Crore	627.35	349	976.35
Monetary Savings /Year	Rs Crore	151	97	248
<b>Payback</b>	<b>Years</b>	<b>4.16</b>	<b>3.60</b>	<b>3.94</b>

## 9.0 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

IFFCO, Phulpur has embarked on energy saving of Ammonia-Urea Plants in a big way. It is prudent on part of fertiliser manufacture to lower the energy consumption as the energy cost is continuously increasing with the passage of time.

As energy cost is increasing with passage of time, it is prudent to take the measures to save the energy at IFFCO Phulpur. It is always the endeavour of IFFCO's top management to adopt the latest available and proven technology for improving the productivity of the Society. With the efforts taken by IFFCO management in the past, the IFFCO Phulpur plants are running at comparable energy consumption with global benchmarks. The proposed Energy Saving Project (ESP) will further reduce the energy consumption at IFFCO Phulpur. With implementation of Energy Saving Project (ESP) at



IFFCO Phulpur, the over-all urea specific energy will be reduced by about 0.467 Gcal per MT of Urea with payback of 3.94 Years.

The Energy Saving Project of IFFCO Phulpur is limited to modernization without any change in production profile. However, the production capacity may increase by about 10% due to ESP. The ESP project fulfils the requirement of Corporate Environmental Policy and it will reduce the subsidy burden of Government of India under Fertilizer Control Policy. The proposed project will also check the price rise of chemical fertilizer and the product cost of urea will be compatible with imported fertilizer.

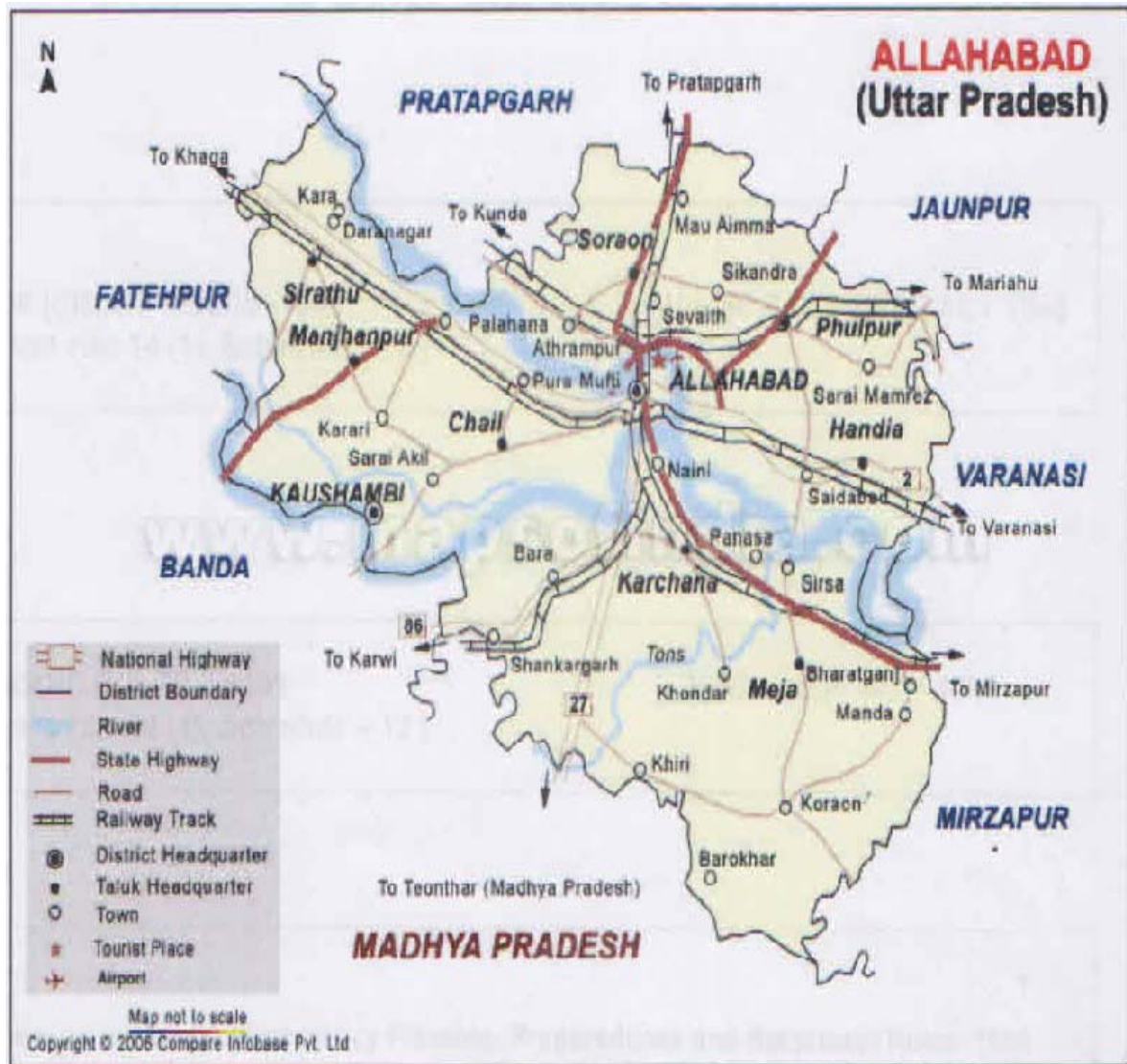
It is concluded that the over-all energy consumption of 5.751 Gcal/MT shall come down to 5.284 after implementation of proposed ESP with a pay-back of 3.94 years. Thus, there will be reduction in the emission levels from each plant with implementation of Energy Saving Project due to reduction in consumption of natural gas (0.109 MMSCMD), coal (525 MTPD), Water (2,760 m<sup>3</sup>/day).

The ESP is simply a change-over scheme without any change in production rate. For this type of project, EIA Notification 2006 is also silent on preparation of EIA report and issuance of EC. ***Further, it would not be out of place to mention that the area around IFFCO Phulpur has never been identified as “CRITICALLY POLLUTED AREA/ ZONE” by CPCB.*** Further, the ESP fulfills the IFFCO policy related to protection & safe guard of environment and measures for energy conservation. It fulfills the aims & objective of EIA.

Considering the above facts, it requires a critical review with due diligence regarding exemption of Public Hearing and preparation of EIA report in generic form for grant of EC.



**Plate-1.1**  
**Location of IFFCO, Phulpur Complex on Google Map**



**Plate-1.2**

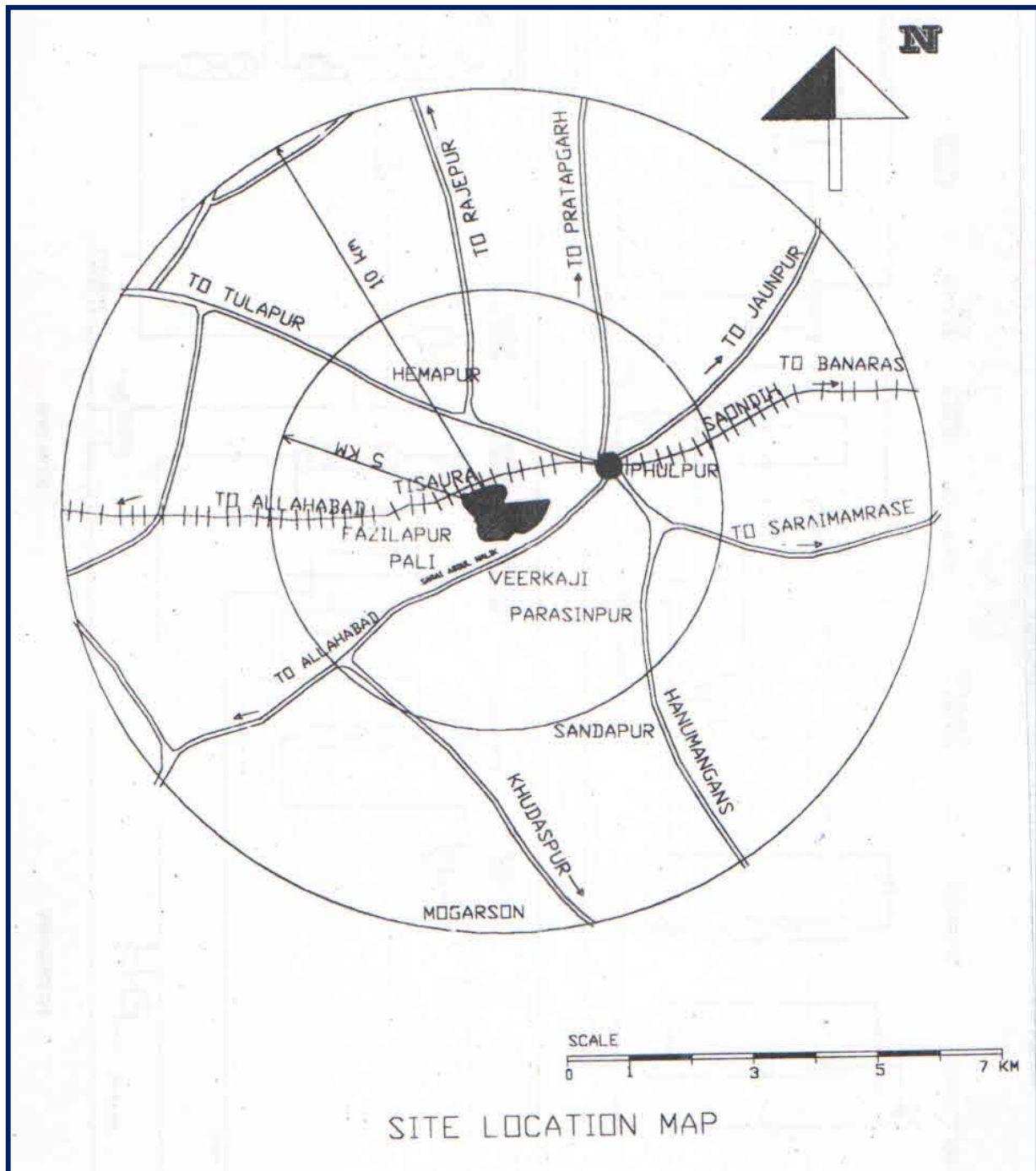
**Location of IFFCO, Phulpur Complex on Geographical Map**





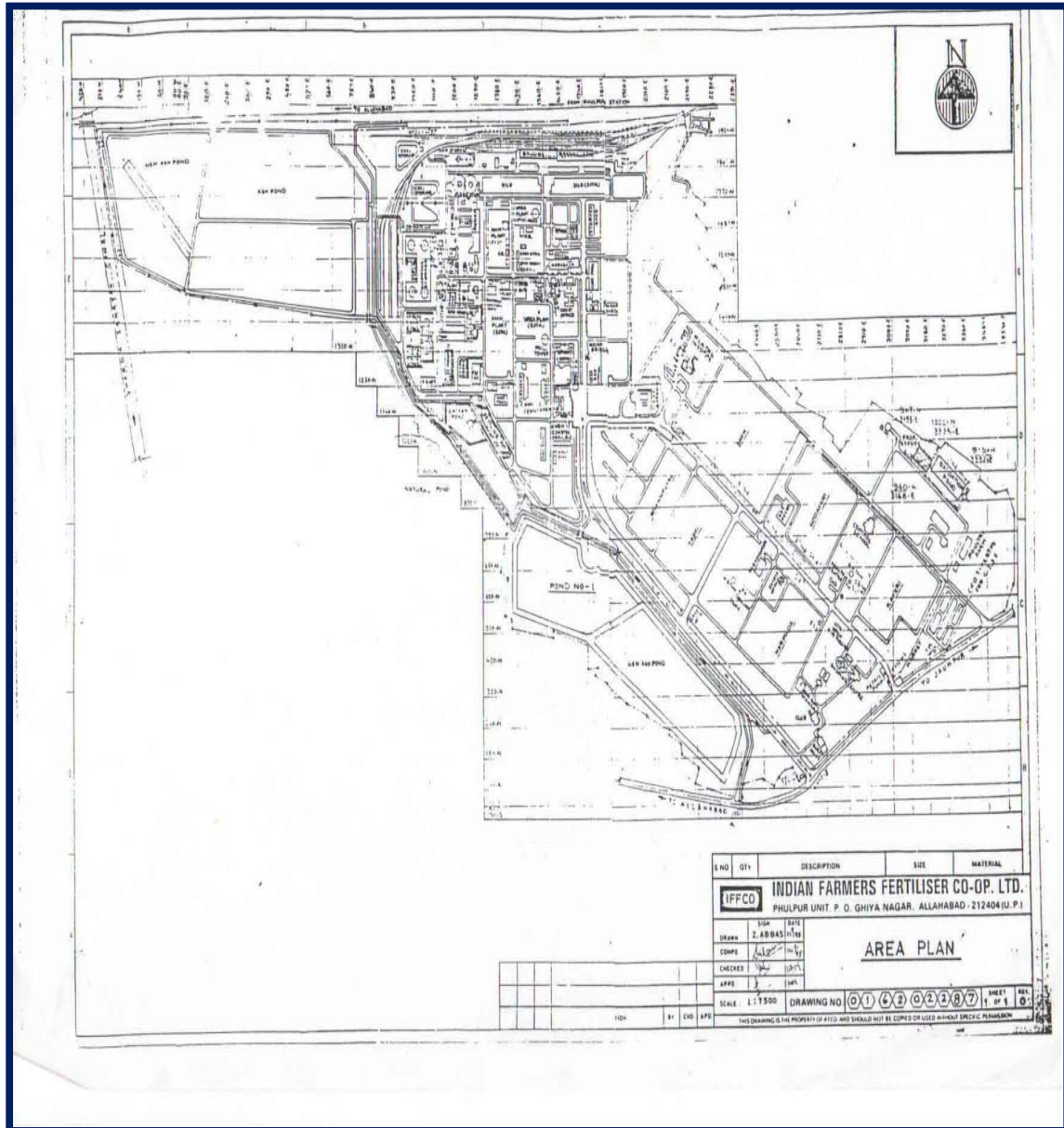
PLATE-1.3

TOPOGRAPHICAL MAP OF PHULPUR AREA



**PLATE-1.4**

**SITE LOCATION MAP**



**PLATE-1.5**

**Area Plan of IFFCO Phulpur Unit**

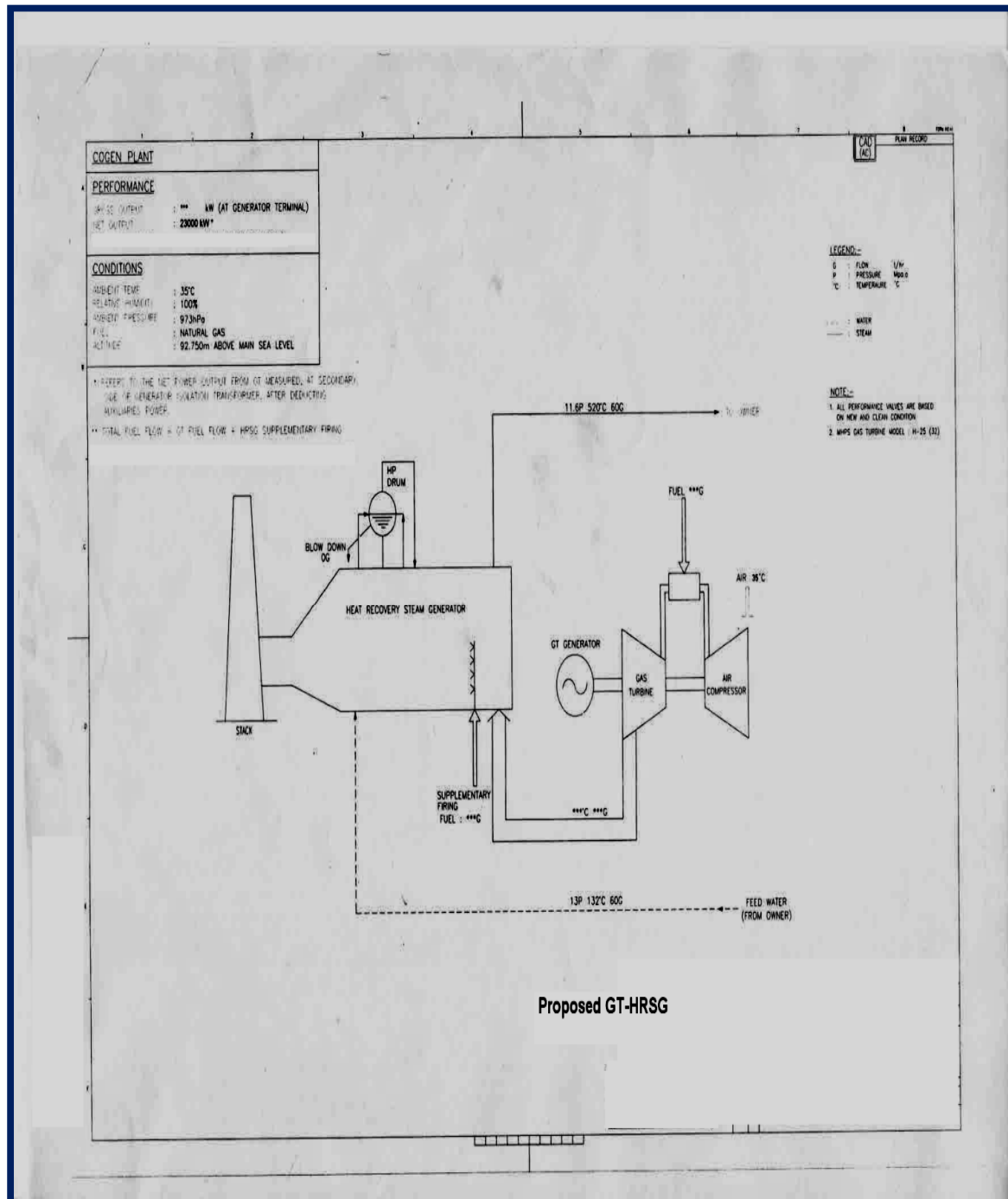


PLATE-1.6

PFD of GT-HRSG