22nd National Award for Excellence in Energy Management - 2021

Presented By:
Indian Farmers Fertiliser Cooperative Ltd.
Phulpur-II Unit
24th – 26th August, 2021

Team Member:
S.K.Janghel (C.M.)
Lav Verma (Sr.Mgr.)
T.K.Singha (Sr.Mgr.)

IFFCO: At a Glance

IFFCO
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IFFCO was established as the farmers' own initiative in Cooperative Sector on 3rd Nov. 1967

- **Largest producer of fertilisers in the country.**
- **Nos. of Plant : Five (Kandla, Kalol, Phulpur, Aonla, Paradeep)**

Installed/Revamped Annual Capacity (Lakh MT)

Urea	: 42.4
NP/NPK/DAP	: 43.3
Total 'N'	: 26.3
Total 'P_2O_5'	: 17.2
WSFs	: 0.15
Zinc Sulphate Monohydrate	: 0.30

IFFCO Phulpur Unit-II : Profile

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Plant	Ammonia	Urea
Process Licenser	Haldor Topsoe, Denmark	Snamprogetti, Italy
Commissioned	December, 1997	
Daily Capacity (MTPD)	1740	3030
Annual Capacity (Lakhs MT)	5.7	10.0
Till Date Production (Lakhs MT)	129	223


Ammonia-II Plant

Urea-II Plant

IFFCO Phulpur Unit-II : Production Outline

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RLNG

GTG-HRSG

Utility Boiler

RLNG

Ammonia Plant

HP Steam

HP Steam

Power

CO2

Ammonia

HP Steam

RAIL

ROAD

Neem Urea

Bagging Plant

Urea Plant

Phulpur-II: Production Performance

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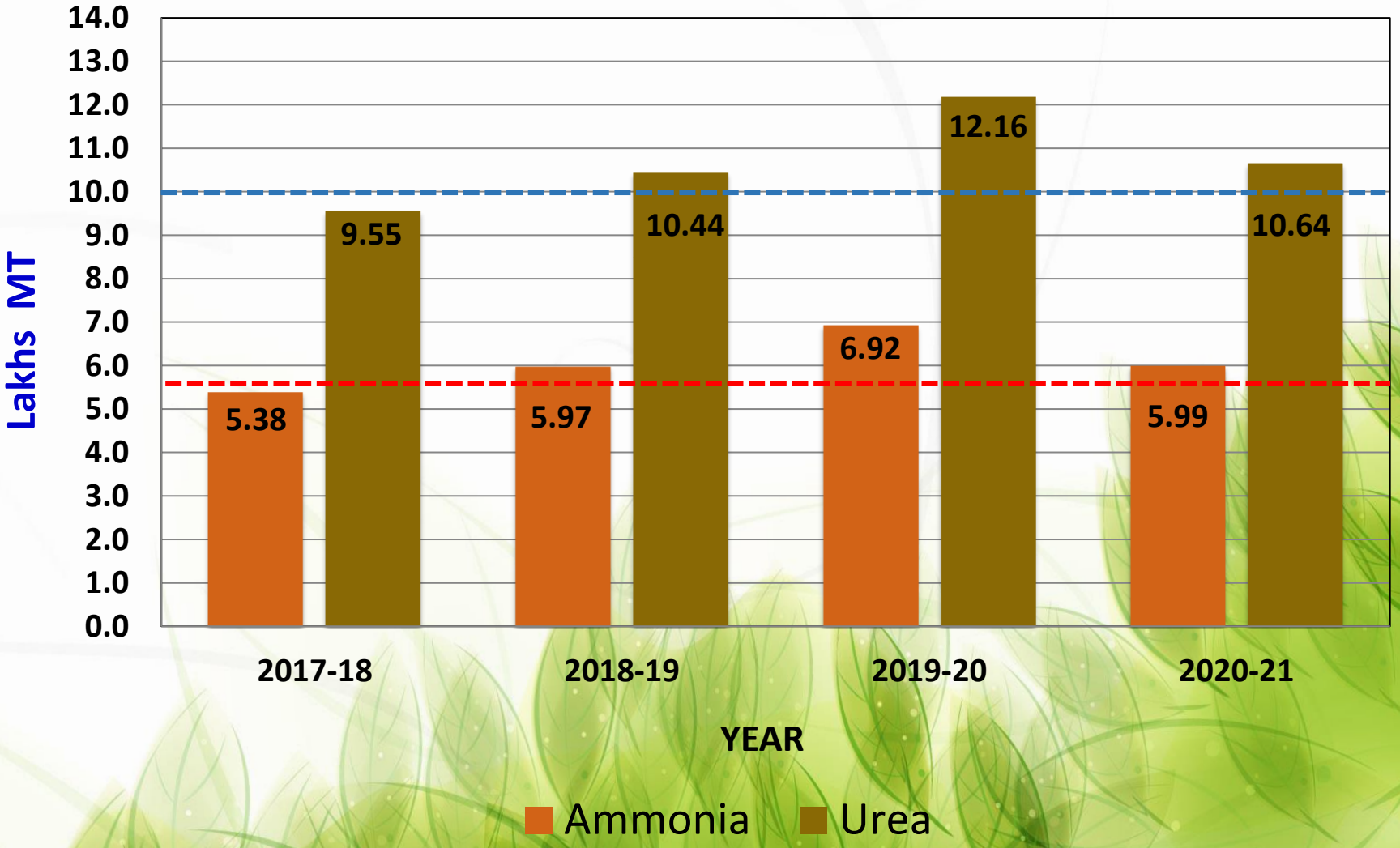

On-Stream Efficiency

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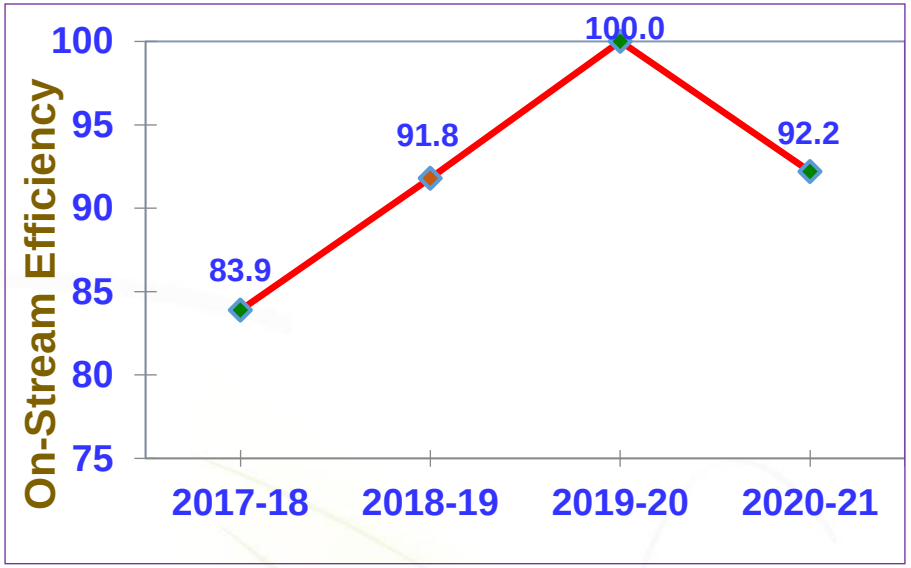
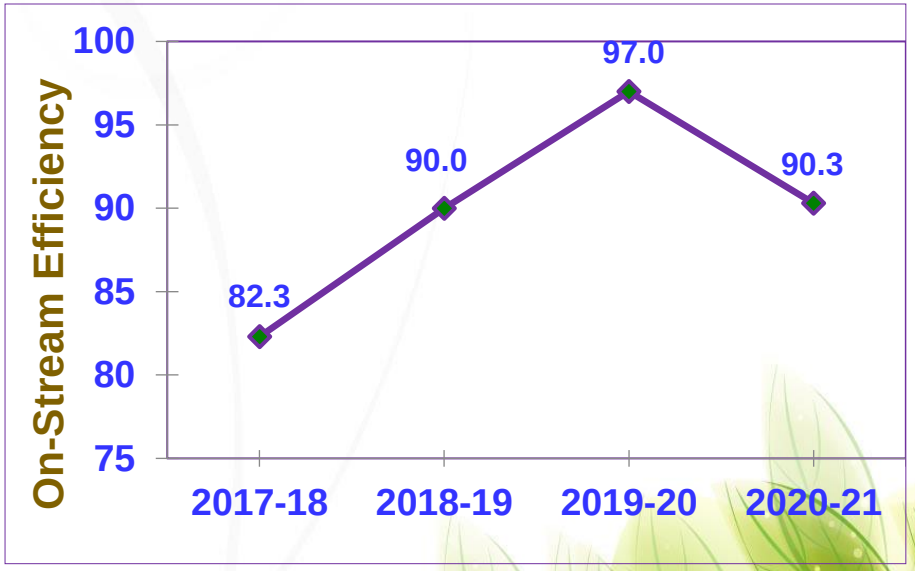
Ammonia Plant On-Stream Efficiency



Urea Plant On-Stream Efficiency



One of the important factor which effects the Productivity / Energy of the fertiliser plant is the Downtime of the plant. Due to COVID 19, our schedule for Annual Turnaround was postponed in-spite of having different problem in the plant and we had to run the plant at reduced load. We have achieved our actual production of Urea of 10.64 Lakhs MT against our targeted production of 11 Lakhs MT and actual overall energy of 5.36 Gcal/MT of Urea as against our targeted energy of 5.18 Gcal/MT of Urea during the year 2020-21.

- **Poor Reliability of Plant & Equipment leads to:**

↑ ***Duration of Downtime days*** ↑ ***No. of Downtimes***

↓ ***Productivity*** ↓***Productivity / Energy Efficiency***

Phulpur-II : Sp. Energy Consumption

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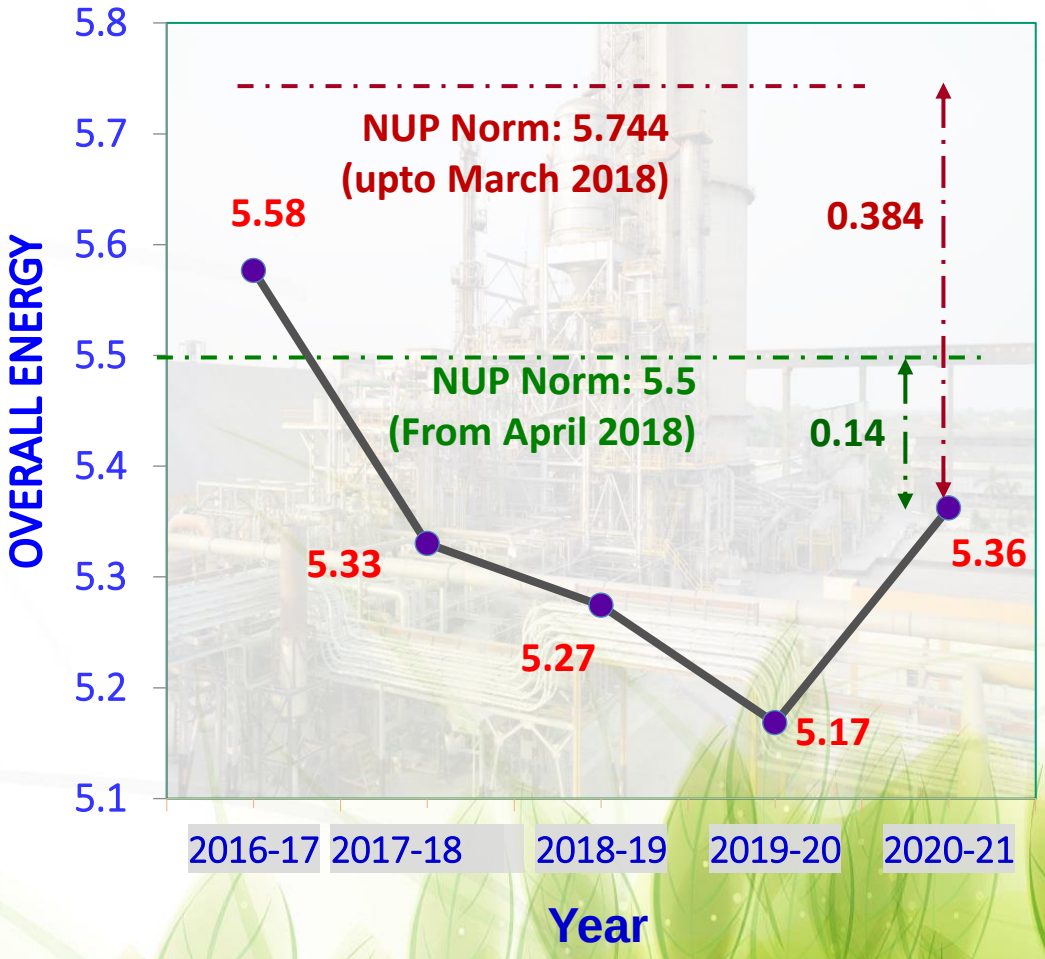
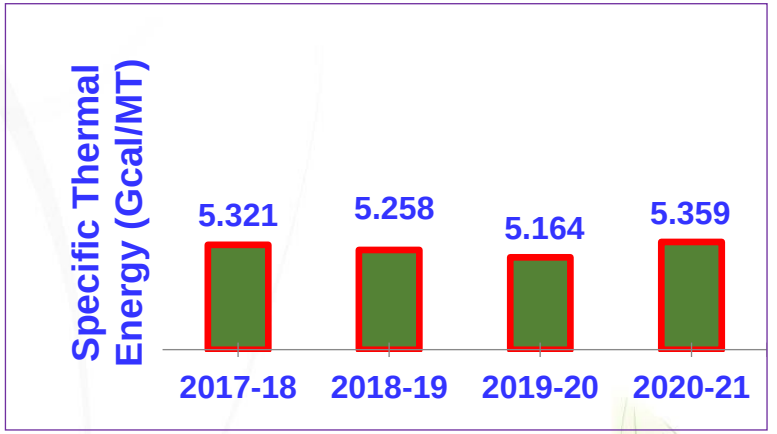
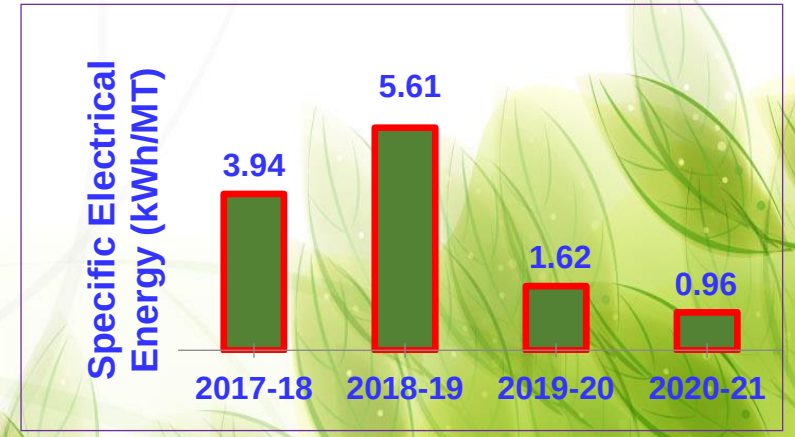
Energy in Gcal/MT of Urea







List of Major Encon Projects Planned in 2021-22

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S.No	Energy Conservation Measures	Expected Yearly Energy Saving (Gcal)	Investment (Rs. Lakh)
1	Replacement of Air Preheater (APH) of existing cast iron integral fin type with plate type APH in Ammonia-II plant.	15700.0	1922.0
2	Replacement of DM water Pump (P-4511 B) from Back Pressure Turbine Drive with 110 kW Motor drive in Ammonia-II Plant.	14359.8	5.8
3	Installation of 14” LP Steam Export Line from Phulpur-I Yard Header to CDR Plant.	35982.1	41.0

Major Energy Conservation Measures in Phulpur-II Unit in the year 2018-19

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S. No	Energy Saving Schemes	Yearly Energy Saving (Gcal)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
1	Replacement of New Rotor in place of old inefficient Rotor in Synthesis Gas Turbine of Ammonia –II Plant.	18175.6	259.6	940.5	45.1
2	Installation of additional aMDEA Solution-Solution Plate Type Heat Exchanger (PHE) and DM water preheater in aMDEA Section of Ammonia-II Plant.	31695.0	1097.9	250.0	2.8
3	In-house modification of Condensate Pump drive changed from Back Pressure Turbine to Motor (old spare available) in Ammonia-II Plant.	5048.2	175.0	0.0	0.0
4	In-house modification of Bulk Absorber Inlet Separator condensate Pump drive changed from Back Pressure Turbine to old spare Motor in Ammonia-II Plant.	9129.8	316.0	0.0	0.0
	Total (Thermal Energy)	**64048.6**	**1848.5**	**1190.5**	
	Specific Thermal Energy (Gcal/MT Urea)		**0.061**		

Major Energy Conservation Measures in Phulpur-II Unit in the year 2018-19

S. No	Energy Saving Schemes	Yearly Energy Saving (kWh)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
5	Replacement of 100 Nos 90 W LED Street Light Fixture at Plant premises in place of 150 W High Pressure Sodium Fixture.	30739.0	3.4	2.8	9.9
6	Replacement of 40 Nos 250 W LED Flood Light fixture in road side of Power Plant, Ammonia Plant & Ammonia Storage Tank area in place of 400 W High Pressure Mercury Vapour (HPMV).	33103.0	3.6	3.4	11.3
7	Replacement of 70 Nos 120 W LED Flood Light fixture in Badminton Hall and its premises of Township in place of 25 Nos. of 1000 W Halogen light & 40 Nos. of 40 W Tube light.	32467.0	3.6	3.0	10.0
8	Replacement of 385 Nos 45 W LED Well Glass Fixture in Ammonia & Urea Plant in place of 125 W High Pressure Mercury Vapour (HPMV) Light.	118344.0	13.0	7.5	6.9
9	Replacement of 30 Nos 120 W LED Baylight Fixture in Ammonia-II Compressor house in place of 400 W High Pressure Mercury Vapour (HPMV) Light.	57816.0	6.4	2.0	3.8
	Total (Electrical Energy)	**272469**	**30.0**	**18.7**	
	Specific Electrical Saving (Gcal/MT of Urea)	**0.0007**			

Major Energy Conservation Measures in Phulpur-II Unit in the year 2019-20

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S.No	Energy Conservation Measures	Yearly Energy Saving (Gcal)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
1	Optimum Load Operation, Maximization of on-stream days & optimization of Process Parameters.	118881.7	3257.2	0.0	0.0
2	Revamping of Power Plant Cooling Tower-II in Phulpur-II Plant.	2875.0	77.5	166.0	25.5
	Total (Thermal Energy)	121756.7	3334.7	166.0	
	Specific Thermal Energy Saving (Gcal/MT of Urea)	**0.10**			

Major Energy Conservation Measures in Phulpur-II Unit in the year 2019-20

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S.No	Energy Saving Schemes	Yearly Energy Saving (kWh)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
3	Online replacement of drift eliminator in Ammonia-II Cooling tower.	222501.0	22.2	59.5	32.2
4	Replacement of 385 Nos of 80 Watt HPMV Well Glass Fixtures with 45 Watt LED Well Glass Fixtures in Urea-II Plant.	73237.0	10.7	9.3	10.2
5	Replacement of 150 Nos of 125 Watt HPMV Well Glass Fixtures with 45 Watt LED Well Glass Fixtures in Ammonia-II Cooling Tower.	105408.0	15.4	5.8	4.5
6	Replacement of 550 Nos of 80 Watt HPMV Well Glass Fixtures with 45 Watt LED Well Glass Fixtures in Ammonia-II (33 and 35 area) and Urea-II Plant.	104625.0	15.3	13.3	10.4
7	Replacement of 30 Nos of 400 Watt HPMV Bay Light Fixtures with 120 Watt LED Bay Light Fixtures at below the Ammonia-II Compressor House.	73786.0	10.8	1.2	1.3

Major Energy Conservation Measures in Phulpur-II Unit in the year 2019-20

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S.No	Energy Saving Schemes	Yearly Energy Saving (kWh)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
8	Replacement of 110 Nos. of 72 Watt Recess Mounting Luminaire Fluorescent lamp with 38 Watt 90 Nos. Recess Mounting Luminaire LED Lamp at Power Plant Control room in Phulpur-II Plant.	24458.0	3.6	1.1	3.7
9	Replacement of 120 Nos. of 22 Watt Recess Mounting Luminaire of compact Fluorescent lamp with 38 Watt 60 Nos. Recess Mounting Luminaire LED Lamp at Purchase Section of Phulpur-II Plant.	1957.0	0.3	0.8	32.0
10	Replacement of 385 Nos of 35L Storage Type Old Geysers with 35L Storage Type 5 Star Geysers in Ghiyanagar Township.	24322.0	3.6	8.5	28.3
	Total (Electrical Energy)	630294.0	81.9	99.5	
	Specific Electrical Saving (Gcal/MT of Urea)	**0.0015**			

Major Energy Conservation Measures in Phulpur-II Unit in the year 2020-21

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S.No	Energy Conservation Measures	Yearly Energy Saving (Gcal)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
1	Installation of Higher capacity Ammonia Condenser (E-3522) in place of existing Ammonia Condenser to reduce the Ammonia content at the outlet from Off Gas Absorber in Ammonia-II Plant.	119.4	3.2	20.0	75.0

Major Energy Conservation Measures in Phulpur-II Unit in the year 2020-21

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S.No	Energy Saving Schemes	Yearly Energy Saving (kWh)	Monetary Saving (Rs. Lakh)	Investment (Rs. Lakh)	Pay Back (Month)
2	Replacement of 150 Nos of 400 W HPMV / Metal Halide Bay Light Fixtures from Township Street light with 200 Nos. 70 W Crompton make LED Street light fixtures.	111048.0	19.1	2.9	1.8
3	Replacement of 30 Nos of 400 W HPMV / Metal Halide Bay Light Fixtures from Utsav Griha and A type quarters in Township with 250 W Crompton make LED Flood light fixtures.	10863.0	1.9	1.5	9.5
4	Replacement of 100 Nos 150 W old High Pressure Sodium Fixure from Township with 70 W Crompton make LED Street light fixtures.	19313.0	3.3	1.8	6.6
5	Replacement of 10 Nos 80 W Fluorescent tube Lamp from Administration Building with 40 W Recess / Suspended LED Fitting.	1053.0	0.18	0.13	8.7
6	Replacement of 47 Nos 80 W Fluorescent tube Lamp from Central Canteen Building with 40 W Philips make Recess Mounting LED Luminaire.	9902.0	1.7	0.6	4.2
	Total (Electrical Energy)	152179.0	26.18	6.93	
	Specific Electrical Saving (Gcal/MT of Urea)	**0.0004**			

1. Installation of Higher capacity Ammonia Condenser (E-3522) in place of existing Ammonia Condenser to reduce the Ammonia content at the outlet from Off Gas Absorber:

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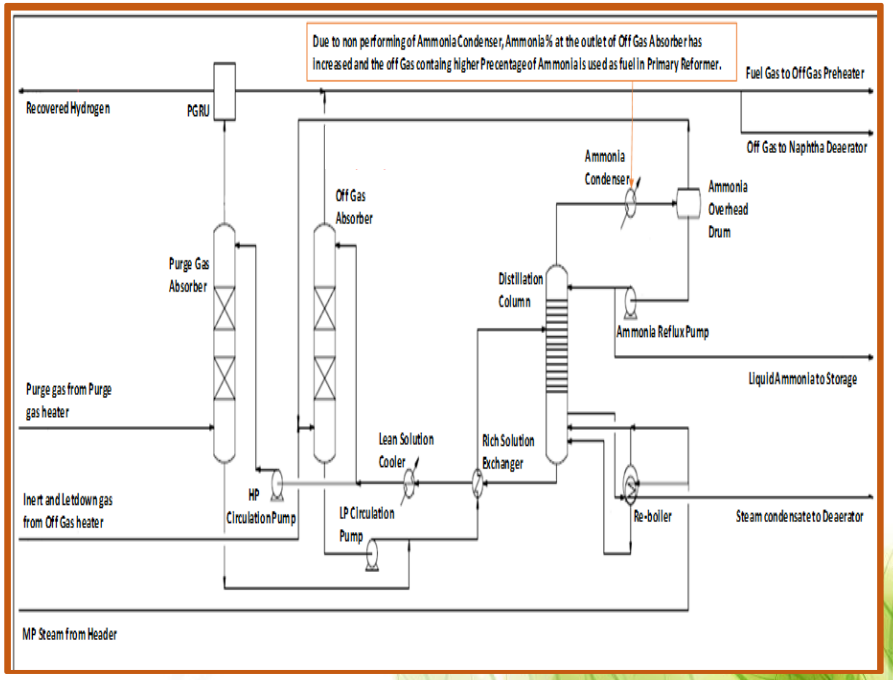
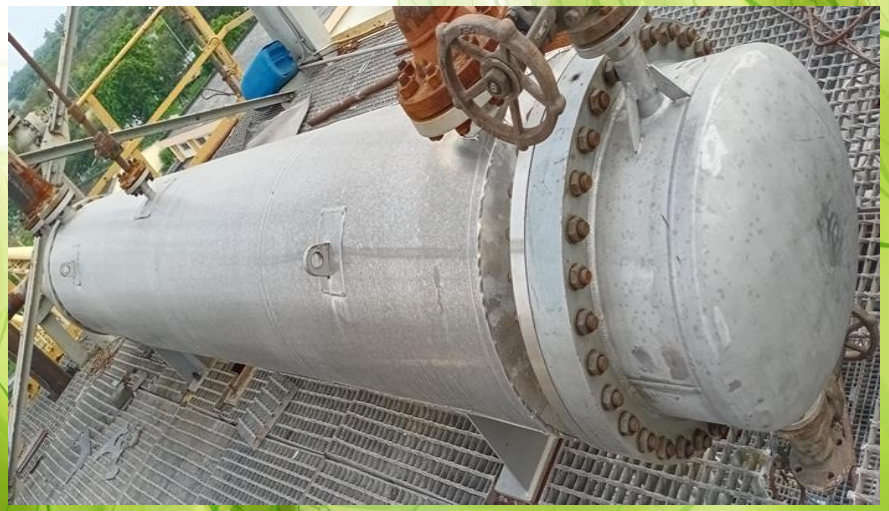
- Earlier, the existing Ammonia Condenser at the upstream of Ammonia OH Drum was not performing. The design heat duty of the exchanger was 0.25 Gcal/Hr corresponding to 25 m3/hr of CW flow.
- But, due to increased plant load after CEP & ESP-III, the heat load of the Condenser increased to more than 1.2 Gcal/Hr which corresponds to 120 m3/hr of CW.
- Earlier, it was tried to increase the CW flow by increasing CW supply line from 3" to 4" but performance of Condenser was not satisfactory.
- The ammonia percentage in the off-gases to the primary reformer burners was around 2.0 %.
- By replacing the condenser with higher capacity, the NH3 % is reduced in off gas and saving of ammonia in off gas which has been used as fuel in Primary Reformer.
- Yearly saving achieved from this scheme is 119.4 Gcal with investment cost of 20 Lakhs and saving of 3.2 lakhs as the on-stream days after implementing the scheme is around 2.5 months.





2. Innovative way for on-line replacement of drift eliminator in Ammonia-II Cooling tower in Phulpur-II Plant:

- In every cooling tower, drift is the undesirable loss of liquid water to the environment via small droplets that become entrained in the leaving air stream.
- The drift loss through the cooling Tower was on higher side resulting the water droplets carry with them chemicals and minerals which impacting the surrounding environment.
- Thus, the old and inefficient drift eliminator replaced with latest designed efficient drift eliminators.
- The Project was implemented successfully in running plant without tripping of Ammonia –II Plant.
- Thereby reducing the drift losses in cooling tower and power consumption in motor of Bore-well Pumps.
- The chemicals Consumption and make up water is reduced.
- The yearly Power saving was 222501 kWh and in terms of Rs. 22.2 Lakhs.

3. In-house modification of LTS out Separator Condensate Pump drive changed from Back Pressure Turbine to old spare Motor in Ammonia-II Plant:

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- Previously LTS outlet separator condensate Pump was driven by back pressure Turbine.
- But the Turbine was very old and inefficient. Steam consumption by the Turbine was on higher side.
- There was frequent steam leakage from the Steam inlet valve & Gland etc..
- To reduce the energy consumption old back pressure Turbine was changed to old spare Motor drive during last Annual Turn-around of Phulpur-II.
- In this in-house Modification no investment was required because the Motor was old and kept as spare.
- Yearly energy saving was 5048.2 Gcal. The cost saving is 175 Lakhs.

Motor Driven LTS out separator condensate Pump (MP-3323B)

4. In-house modification of Bulk Absorber Inlet Separator condensate Pump drive changed from Back Pressure Turbine to old spare Motor in Ammonia-II Plant:

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- Previously Bulk Absorber inlet separator condensate Pump was driven by back pressure Turbine.
- But the Turbine was very old and inefficient. Steam consumption by the Turbine was on higher side.
- There was frequent steam leakage from the Steam inlet valve & Gland etc..
- To reduce the energy consumption old back pressure Turbine was changed to old spare Motor drive during last Annual Turn-around of Phulpur-II.
- In this in-house Modification no investment was required because the Motor was old and kept as spare.
- The yearly energy saving was 9129.8 Gcal. The cost saving is 316 Lakhs.

Motor Driven Bulk Absorber Inlet Separator condensate Pump (MP-3323B)

Electrical Energy saving during 2020-21

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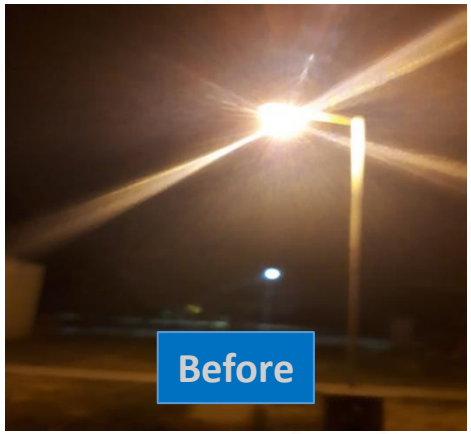
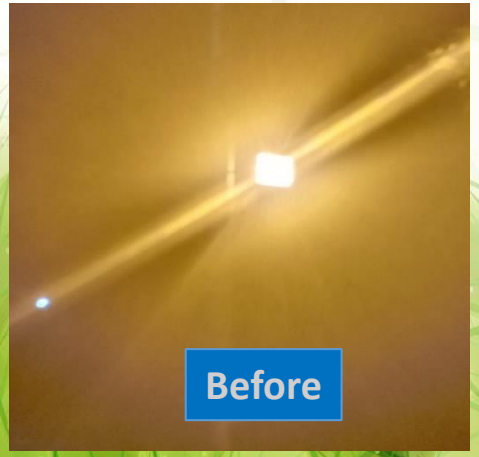
1. Replacement of 150 Nos of 400 W HPMV / Metal Halide Bay Light Fixtures from Township Street light with 200 Nos. 70 W Crompton make LED Street light fixtures:

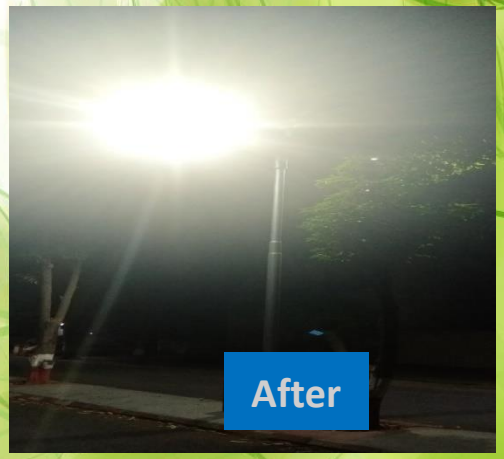
To reduce the energy consumption, 150 Nos. of 400 W HPMV / Metal Halide Bay Light Fixtures from Township Street light with 200 Nos. 70 W Crompton make LED Street light fixture with 10kV SPD, in IP66 Enclosure. Annual saving comes 111048 kWh.



2. Replacement of 30 Nos of 400 W HPMV / Metal Halide Bay Light Fixtures from Utsav Griha and A type quarters in Township with 250 W Crompton make LED Flood light fixtures:

To reduce the energy consumption, 30 Nos. of 400 W HPMV / Metal Halide Bay Light Fixtures from Utsav Griha and A type quarters in Township with 250 W Crompton make LED Street light fixture with 10kV SPD, in IP66 Enclosure. Annual saving comes 10863 kWh.





Electrical Energy saving during 2020-21

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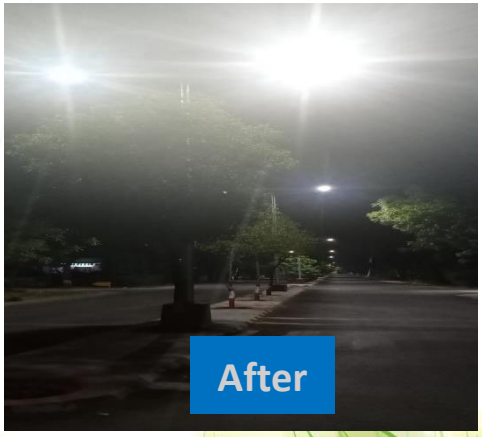
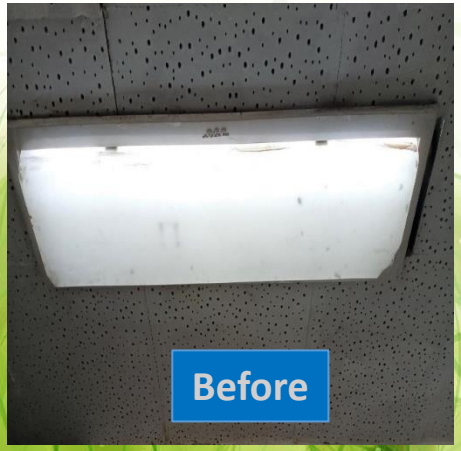
3. Replacement of 100 Nos 150 W old High Pressure Sodium Fixtures from Township with 70 W Crompton make LED Street light fixtures:

To reduce the energy consumption, 100 Nos. 150 W old High Pressure Sodium Fixtures from Township with 70 W Crompton make LED Street light fixtures equivalent to CG Cat No-LST-70-CDL. Annual saving comes 19313 kWh.



4. Replacement of 10 Nos 80 W Fluorescent tube Lamp from Administration Building with 40 W Recess / Suspended LED Fitting:

To reduce the energy consumption, 10 Nos. 2X40 W Fluorescent tube Lamp from Administration Building replaced with 40 W Recess / Suspended LED Fitting complete with driver. Annual saving comes 1053 kWh.



Electrical Energy saving during 2020-21

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5. Replacement of 47 Nos 80 W Fluorescent tube Lamp from Central Canteen Building with 40 W Philips make Recess Mounting LED Luminaire:

To reduce the energy consumption, 47 Nos 80 W Fluorescent tube Lamp from Central Canteen Building replaced with 40 W Philips make Recess Mounting LED Luminaire. Annual saving comes 9902 kWh.

Before

After

UTILISATIONS OF RENEWABLE ENERGY RESOURCES

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Raw water Pump House


Bagging Top Floor


Roof of Central Canteen


Roof of Control Room


Solar Unit at Plant

Solar Power Pack:

- 800 KWp Solar power pack installed in plants and is connected to the LT Grid.
- The Solar Power Units are in continuous operation generating Electric Power there by reduction of CO2 emission.
- Solar light installed at different locations inside the plant and as well as also township.

Year	Technology (Electrical)	Type of Energy	Onsite / Offsite	Installed Capacity (MW)	Generation (Million kWh)
FY-2018-19	Solar PV System	Electrical	Onsite	0.8	0.905
FY-2019-20	Solar PV System	Electrical	Onsite	0.8	0.967
FY-2020-21	Solar PV System	Electrical	Onsite	0.8	1.014

Solar Water Heaters

6 Nos. of Solar Water Heater installed in Guest House.

Bio-Methanation Plant

Carbon Foot Print

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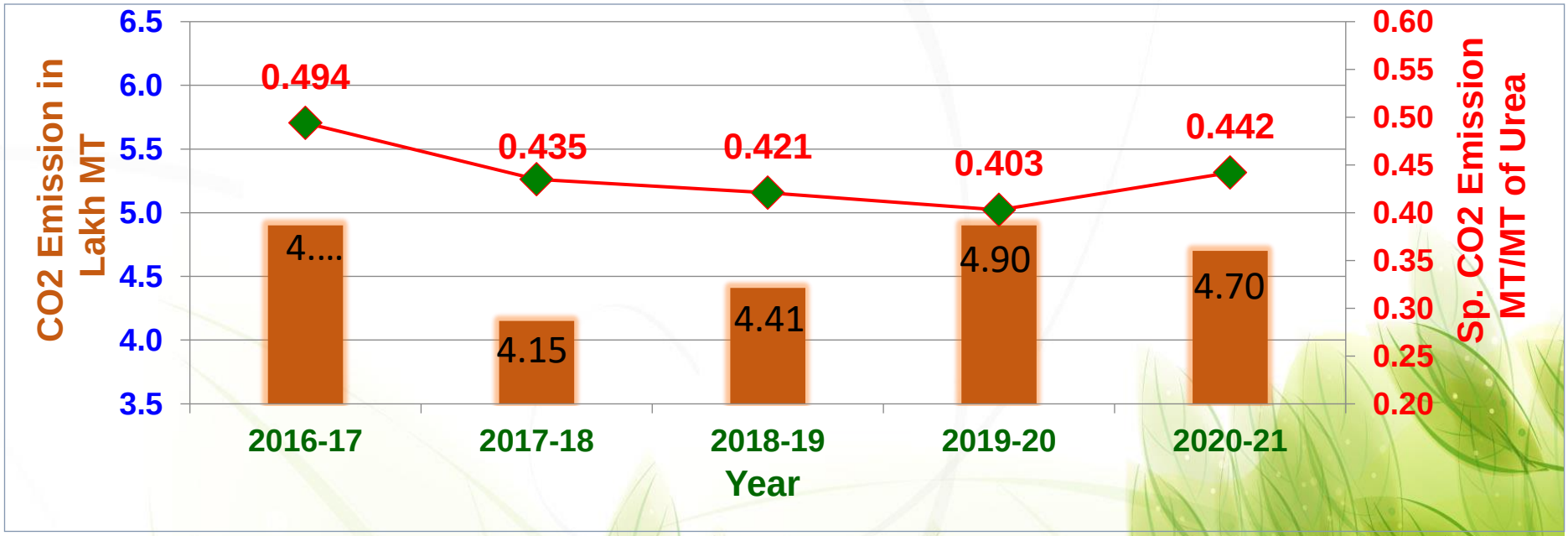
Our endeavours for every year is to reduce specific energy consumption, which will also result in lesser CO2 emissions. We have also installed solar power plants which also reduce CO2 emission.



- Phulpur-II Unit has already installed a Carbon Di Oxide Recovery (CDR) Plant of 450 MTPD capacity in the year 2006-07, to recover CO2 from flue gases of Ammonia-II Plant primary reformer furnace.
- We have also installed solar power plants at different locations inside the Plants such as at the roof of Bagging Plant, Raw water storage tank, roof of central canteen and roof of plant control rooms to reduce CO2 emission.

Environment & Sustainability

Liquid Effluent Treatment

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Rejection water of Reverse Osmosis Plant used in Coal yard in Phulpur Unit:

We are using cooling tower blowdown for RO Feed. The recovered RO product is being used in softening plant as make-up water and the reject water is being used in coal yard to supress the coal dust. The Plant Capacity is 3000 M3 /day (Recovery 85 %).

Sewage Treatment cum Recycle Plant:

The sewage generated in Plant Township is treated in Sewage Treatment Plant and is being used for irrigation purpose at Farm Land. The Plant Capacity is 125 M3 / hr.

Waste Disposal:

Bio degradable wastes from kitchen and horticulture are converted into very good manure by vermi composting System. The manure is used in horticulture, green belt area & 150 Acres farm land at Cordet

Rain water Harvesting System:

Total 5 Nos. Rain Water Harvesting systems are installed in township. IFFCO is also planning to install more Rain water harvesting systems at different locations.

Study by Consultant is in progress.

Installation of Online Environment Monitoring System

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Liquid Effluent Monitoring:

IFFCO Phulpur Unit continuously monitored the pH, Ammonical Nitrogen at guard pond area and Flow in pipe line of liquid effluent generated in the complex. After treatment, the liquid effluent reused effluent in horticulture & irrigation of farmland within IFFCO's premises.

Flow Instrument & local display

Local display for pH & TAN

Installation of Ammonia Sensor at strategic locations of Plants:

To monitor ammonia leakage, ammonia sensor is installed at strategic locations of Ammonia-I, Urea-I and Ammonia Storage Tank area of IFFCO Phulpur Unit. In case of any leakages in the plants, the Panel operator shall identify the location of Ammonia Leakage and take action accordingly to arrest the leakage. Water curtain has been provided at the periphery of the control room as well as ammonia feed pumps for safety of the Plant personnel.

Procurement Process

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IFFCO Phulpur has taken care of Energy optimization right from Procurement process among Vendors / Suppliers / Contractors

- The Evaluation of a Bid is done on the basis of Operating Cost
- Loading is being done to take care of the Performance and Productivity of equipment offered.
- In case the consumption of utilities is different for different Bidders. Extra operating cost over the minimum one shall be calculated as below for loading.

Operating cost = Difference in utilities consumption x Unit cost of Utility x 8760 x 0.9 x 5.5860 x N

Where:

- 8760 is number of available hours in a year
- 0.9 is availability factor
- 5.5860 is discount factor at an interest rate of 10% per annum for
- one year erection/commissioning and ten years operational period.
- N is the number of operating equipment items.

Teamwork, Employee Involvement & Monitoring

IFFCO
पूर्णतः सहकारी स्वामित्व
Wholly owned by Cooperatives

- Energy is monitored daily in presence of Unit Head, to facilitate this various reports are prepared and corrective actions are taken immediately to rectify the problem area.
- Various types of Reports are generated on daily/weekly/monthly/ quarterly and yearly basis for Reporting & Monitoring the Energy Consumption:

Employee Engagement:

- IFFCO Phulpur Unit encourages its employees through Suggestion Scheme to give ideas of energy conservation.
- In our Unit, the have a suggestion scheme for all Employees. All Employees (Workman & Supervisor Level) participated the Suggestion Scheme Awards.

Phulpur Unit-II EM-PRO-F-01

Performance Report for :27.10.2020

Overall Input Norms per MT of Urea

Inputs	Unit	Day	ACTUAL Month	Year	
RLNG	000 SM3	0.6311	0.6341	0.6325	
POWER PURCHASED	KWH	0.0566	0.0874	0.0830	
HSD	MT	0.0000	0.0000	0.0000	
COAL	MT	0.0209	0.0232	0.0199	
PURCHASED AMMONIA	MT	0.0000	0.0000	0.0000	
BAGS	NO	22.2228	22.2228	22.2228	
ENERGY	GCAL	5.2175	5.2583	5.2670	
	Inputs	Unit	Day	Month	Year
AMMONIA	Feed RLNG	000SM3/MT	0.6650	0.6646	0.6589
	Fuel RLNG	000SM3/MT	0.3846	0.3871	0.3881
	Total R-LNG	000SM3/MT	1.0496	1.0517	1.0470
	HP STEAM IMP	MT/MT	0.0000	0.0000	0.0000
	HP STEAM EXP	MT/MT	1.5582	1.5582	1.5367
	MP STEAM EXPORT	MT/MT	0.0974	0.1007	0.1049
	LP STEAM EXPORT	MT/MT	0.0296	0.0289	0.0329
	ENERGY (B.L)	GCAL/MT	7.1886	7.2172	7.2471
	ENERGY (OVERALL)	GCAL/MT	7.4274	7.4628	7.4750
UREA-1	AMMONIA	MT/MT	0.5700	0.5700	0.5701	
	HP STEAM (WITHOUT CDR)	MT/MT	0.8491	0.8637	0.8650	
	HP STEAM (WITH CDR)	MT/MT	0.9633	0.9785	0.9836	
	LP Steam Export	MT/MT	0.0000	0.0000	0.0000	
	ENERGY B.L	GCAL/MT	4.9504	4.9641	4.9691	
	ENERGY (OVERALL)	GCAL/MT	5.2175	5.2583	5.2670	Avg. B.L. 4.9500
UREA-II	AMMONIA	MT/MT	0.5700	0.5700	0.5701	4.9640
	HP STEAM (WITHOUT CDR)	MT/MT	0.8480	0.8636	0.8634	4.9675
	HP STEAM (WITH CDR)	MT/MT	0.9622	0.9784	0.9772	
	LP Steam Export	MT/MT	0.0000	0.0000	0.0000	
	ENERGY B.L	GCAL/MT	4.9496	4.9639	4.9659	
	ENERGY (OVERALL)	GCAL/MT	5.2175	5.2583	5.2670	
STEAM GENERATION						
	RLNG	000SM3/MT	0.0000	0.0000	0.0898	
	HP Steam internal	MT/MT	0.0000	0.0000	0.0000	
	LP STEAM IMPORT	MT/MT	0.0000	0.0000	0.2640	
	ENERGY (B.L)	GCAL/MT	0.0000	0.0000	0.9106	

GM (Tech)

Distribution: MSD/SGM(P)/GM(Prod)/JGM(Utl)/DGM(U)/DGM(P)/DGM(PH)/DGM(Pro)/DGM(E)/DGM(O)

Sample Performance Reports

DAILY STEAM BALANCE REPORT FOR PERIOD FROM 01-OCT-20 TO 31-OCT-20

IFFCO

DATE	PRODUCTION (MTPD) AMM 1	AMM 2	TOTAL	UREA 1	UREA 2	TOTAL	GENERATION (MT/Hr) BOILER 123	GT	SUB TOTAL	BLR 4	AM HRU	SUB TOTAL	GRAND TOTAL	CONSUMPTION (MT/Hr) AMM 1	AMM 2	UREA 1	UREA 2	TG 1	TG 2	INT 1	INT 2	CDR	TOTAL	LP STEAM (MT/Hr) LPS AMM 1	LPS AMM 2	LPS UREA 1	LPS UREA 2	LPS TOTAL	STEAM NORM
01	1266.0	1835.6	3101.4	2230.9	3242.6	5473.5	135	61	196	0	106	106	301	60	-12	84	117	0	24	0	0	28	301	20	2	10	0	33	1.32
02	1266.0	1834.0	3099.9	2165	3289.0	5454.0	132	61	192	0	106	106	298	60	-13	79	121	0	23	0	0	29	298	19	2	9	0	30	1.31
03	1264.0	1830.6	3094.9	2219.3	3243.4	5462.7	133	61	195	0	106	106	300	61	-13	82	119	0	24	0	0	28	300	18	2	9	0	29	1.32
04	1261.0	1829.7	3091.1	2216.1	3225.3	5441.4	137	61	198	0	105	105	303	61	-12	83	118	0	24	0	0	28	303	24	2	9	0	35	1.34
05	1257.0	1827.3	3084.5	2214.7	3220.8	5435.5	138	61	199	0	105	105	304	61	-11	84	117	0	25	0	0	28	304	24	2	9	0	34	1.34
06	1256.0	1827.9	3083.7	2211.3	3234.4	5445.7	137	61	198	0	106	106	304	61	-12	82	119	0	26	0	0	28	304	24	2	9	0	35	1.34
07	1259.0	1825.0	3083.9	2224	3251.4	5475.4	137	60	197	0	106	106	303	61	-12	83	119	0	25	0	0	28	303	24	2	10	0	36	1.33
08	1264.0	1828.9	3093.2	2228.2	3223.1	5451.3	132	60	192	0	103	103	295	59	-13	84	114	0	23	0	0	28	295	24	2	10	0	36	1.30
09	1262.0	1827.8	3089.3	2240.2	3232.3	5472.5	130	61	191	0	105	105	296	59	-14	83	115	0	24	0	0	28	296	24	2	10	0	36	1.30
10	1262.0	1826.2	3088.0	2213.4	3245.2	5458.6	127	61	188	0	105	105	293	58	-15	82	117	0	22	0	0	29	294	24	2	10	0	36	1.29
11	1263.0	1828.8	3092.0	2214.4	3247.9	5462.3	128	60	188	0	105	105	293	59	-15	82	117	0	22	0	0	29	293	24	2	10	0	36	1.29
12	1263.0	1827.9	3090.8	2219	3250.1	5469.1	132	60	193	0	104	104	297	60	-15	82	118	0	23	0	0	29	297	24	2	8	0	34	1.30
13	1258.0	1827.9	3085.5	2207.9	3281.8	5489.7	142	61	203	0	105	105	307	63	-11	82	119	0	26	0	0	28	307	24	2	9	0	35	1.34
14	1258.0	1822.4	3080.6	2206.8	3264.6	5471.4	141	61	202	0	105	105	306	63	-12	81	120	0	25	0	0	28	306	24	2	10	0	36	1.34
15	1260.0	1824.8	3084.7	2192.9	3302.2	5495.1	136	61	198	0	106	106	303	62	-12	81	120	0	25	0	0	28	303	24	2	10	0	36	1.33
16	1266.0	1825.0	3090.6	2205.6	3256.7	5462.3	137	61	199	0	106	106	305	62	-12	83	119	0	25	0	0	28	305	24	2	9	0	36	1.34
17	1263.0	1830.3	3093.0	2210	3253.0	5463.0	132	61	193	0	106	106	298	60	-12	83	116	0	24	0	0	28	298	24	2	10	0	37	1.31
18	1265.0	1833.1	3098.0	2220.4	3232.7	5453.1	126	61	188	0	104	104	292	59	-15	83	116	0	23	0	0	28	292	24	2	10	0	36	1.29
19	1265.0	1833.8	3099.1	2213.4	3280.8	5494.2	128	61	189	0	104	104	293	60	-16	81	117	0	23	0	0	28	293	24	2	10	0	36	1.28
20	1264.0	1839.0	3103.2	2219.1	3256.1	5475.2	127	60	188	0	103	103	291	59	-17	81	116	0	23	0	0	29	291	24	2	10	0	36	1.28
21	1264.0	1839.0	3103.4	2223.4	3274.9	5498.3	127	61	188	0	102	102	291	59	-18	82	116	0	23	0	0	29	291	25	2	10	0	37	1.27
22	1263.0	1834.1	3097.4	2227	3248.4	5475.4	131	61	192	0	103	103	295	60	-15	82	116	0	23	0	0	28	295	24	2	11	0	37	1.29
23	1264.0	1835.7	3099.4	2213	3251.6	5464.6	128	61	189	0	102	102	291	59	-16	81	116	0	23	0	0	28	291	24	2	11	0	37	1.28
24	1263.0	1842.7	3105.3	2207.5	3298.1	5505.6	124	61	185	0	102	102	287	57	-18	80	117	0	22	0	0	29	287	24	2	11	0	37	1.25
25	1263.0	1846.7	3109.4	2233.2	3276.3	5509.5	122	61	184	0	102	102	286	57	-18	81	115	0	22	0	0	29	286	24	2	10	0	37	1.25
26	1264.0	1852.8	3116.5	2218.9	3306.6	5525.5	124	62	185	0	102	102	287	57	-20	79	118	0	24	0	0	29	287	24	2	11	0	37	1.25
27	1271.0	1857.9	3129.0	2203.6	3326.9	5530.5	124	61	186	0	102	102	287	58	-19	80	118	0	23	0	0	29	287	24	2	10	0	36	1.25
28	1272.0	1860.2	3132.2	2231.5	3315.8	5547.3	124	61	185	0	101	101	286	57	-20	81	116	0	23	0	0	29	286	24	2	10	0	36	1.24
29	1270.0	1861.7	3132.0	2237.4	3271.2	5508.6	123	61	184	0	101	101	285	56	-21	81	115	0	24	0	0	29	285	23	2	10	0	35	1.24
30	1259.0	1861.8	3121.0	2254.5	3359.8	5614.3	126	61	188	0	103	103	290	57	-20	79	122	0	23	0	0	29	290	23	2	10	0	35	1.24
31	1266.0	1862.6	3128.5	2229.6	3286.0	5515.6	124	61	186	0	102	102	288	58	-19	81	117	0	22	0	0	29	288	23	2	10	0	35	1.25

Sample Steam Balance Reports

IFFCO - PHULPUR UNIT

WEEKLY PRODUCTION AND ENERGY

Weekly Data (23rd - 31st Oct. 2020)

Date	Phulpur-I Ammonia Production, MT	Ammonia Energy (B.L.), Gcal/MT	Ammonia Energy (Overall), Gcal/MT	Urea Production, MT	Urea Energy (B.L.), Gcal/MT	Urea Energy (Overall), Gcal/MT	Phulpur-II Ammonia Production, MT	Ammonia Energy (B.L.), Gcal/MT	Ammonia Energy (Overall), Gcal/MT	Urea Production, MT	Urea Energy (B.L.), Gcal/MT	Urea Energy (Overall), Gcal/MT	Overall (Phulpur-I + II) Total Urea production (MT)	Complex Energy (Gcal/MT)	Remarks	Shutdown Details / Reason for High Energy	Goal loss
Theoetical Minimum Energy		4.47			2.53			4.47			2.53						
ESP Revamp Case	1215		7.77	2130		5.750	1850		7.17	3250		5.17	5380.00	5.40			
23 October 2020	1263.7	7.760	7.845	2213.0	5.460	5.748	1835.7	7.207	7.448	3251.6	4.954	5.239	5464.6	5.445			
24 October 2020	1262.6	7.745	7.838	2207.5	5.441	5.733	1842.7	7.177	7.417	3298.1	4.953	5.217	5505.6	5.424			
25 October 2020	1262.7	7.743	7.838	2233.2	5.443	5.728	1846.7	7.175	7.413	3276.3	4.943	5.206	5509.5	5.418			
26 October 2020	1263.7	7.767	7.862	2218.9	5.429	5.729	1852.8	7.175	7.417	3306.6	4.956	5.222	5525.5	5.425			
27 October 2020	1271.1	7.741	7.834	2203.6	5.445	5.726	1857.9	7.189	7.427	3326.9	4.950	5.218	5530.5	5.420			
28 October 2020	1272.0	7.728	7.820	2231.5	5.448	5.724	1860.2	7.171	7.410	3315.8	4.942	5.199	5547.3	5.410			
29 October 2020	1270.3	7.725	7.832	2237.4	5.455	5.732	1861.7	7.172	7.413	3271.2	4.949	5.217	5508.6	5.426			
30 October 2020	1259.2	7.791	7.893	2254.5	5.426	5.755	1861.8	7.139	7.387	3359.8	4.966	5.222	5614.3	5.436			
31 October 2020	1265.9	7.760	7.855	2229.6	5.451	5.735	1862.6	7.190	7.428	3286.0	4.957	5.228	5515.6	5.433			
Weekly Data (23rd - 31st Oct. 2020)	11391.2	7.750	7.846	20029.2	5.444	5.734	16682.1	7.177	7.418	29692.3	4.952	5.219	49721.5	5.426			
Monthly Data (Oct., 2020)	39160.3	7.777	7.876	68752.2	5.459	5.755	56941.2	7.211	7.456	101249.0	4.963	5.253	170001.2	5.456			
Yearly Data (Apr.,2020 to March.,2021)	266496.7	7.761	7.864	468848.0	5.490	5.794	383596.2	7.246	7.474	670125.2	4.967	5.266	1138973.2	5.483			

Sample Weekly Energy Reports

INTERNATIONAL CERTIFICATIONS

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Certificate of Registration

ENERGY MANAGEMENT SYSTEM - ISO 50001:2018

This is to certify that: Indian Farmers Fertilizers Co-Operative Ltd.
Phulpur Unit:
Ghiya Nagar
Allahabad 212 404
Uttar Pradesh
India

Holds Certificate No: **ENMS 567240**

and operates an Energy Management System which complies with the requirements of ISO 50001:2018 for the following scope:

The Manufacture of Urea and Ammonia, Generation of Compressed Air, Generation of Steam through Coal Fired, Natural Gas Boilers and HRSG, Generation of Power through Steam Turbine and Gas Turbine.

For and on behalf of BSI:
Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2010-10-25
Latest Revision Date: 2020-12-18
Effective Date: 2020-12-18
Expiry Date: 2023-12-17

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bsi.

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that: Indian Farmers Fertilizers Co-Operative Ltd.
Phulpur Unit:
Ghiya Nagar
Allahabad 212 404
Uttar Pradesh
India

Holds Certificate No: **EMS 534419**

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

The Manufacture of Fertiliser Grade Urea (including activities at Moti Lal Nehru Farmers Training Institute, Ghiyanagar Residential Township and Township Hospital.

For and on behalf of BSI:
Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2008-07-15
Latest Revision Date: 2020-12-14
Effective Date: 2020-05-16
Expiry Date: 2023-05-15

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SGS

Certificate IN19/818843406

This is to certify that

Indian Farmers Fertiliser Cooperative Limited

IFFCO Sadan, C-1 District Centre, Saket, New Delhi, 110017, India

meets the minimum requirements as defined under the

IFA Protect & Sustain Product Stewardship Programme

To achieve the level of IFA Product Steward Excellence

Production of Urea, Neem Coated Urea Fertilizers/ Production of DAP, NPK Fertilizers

Detailed information is available on request at the offices of SGS United Kingdom Ltd

This certificate is valid from 11 December 2018 until 11 December 2021
Issue 1. Certified since 11 December 2018

This is a multi-site certification.
Additional site details are listed on the subsequent page.

Authorised by

SGS United Kingdom Ltd Certification and Business Enhancement
Rosemore Business Park Ellesmere Port Cheshire CH65 3EN UK
t +44 (0)151 350 6666 f +44 (0)151 350 6600 www.sgs.com

SGS IFA 01 0118 M2

Page 1 of 2

bsi.

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that: Indian Farmers Fertilizers Co-Operative Ltd.
Phulpur Unit:
Ghiya Nagar
Allahabad 212 404
Uttar Pradesh
India

Holds Certificate No: **FM 534418**

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The Manufacture and Supply of Fertiliser Grade Urea.

For and on behalf of BSI:
Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2008-07-15
Latest Revision Date: 2020-12-14
Effective Date: 2020-05-16
Expiry Date: 2023-05-15

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Certificate of Registration

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM - ISO 45001:2018

This is to certify that: Indian Farmers Fertilizers Co-Operative Ltd.
Phulpur Unit:
Ghiya Nagar
Allahabad 212 404
Uttar Pradesh
India

Holds Certificate No: **OHS 582315**

and operates an Occupational Health and Safety Management System which complies with the requirements of ISO 45001:2018 for the following scope:

The Manufacture of Urea.

For and on behalf of BSI:
Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2017-12-22
Latest Revision Date: 2020-12-14
Effective Date: 2020-12-22
Expiry Date: 2023-12-21

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SGS

Certificate IN19/818843406, continued

Indian Farmers Fertiliser Cooperative Limited

IFA Protect & Sustain Product Stewardship Programme

To achieve the level of IFA Product Steward Excellence

Issue 1

Additional facilities

Site 1:
Indian Farmers Fertiliser Cooperative Limited, Phulpur, P.O. Ghiyanagar, Prayagraj, Pin -212404 (Uttar Pradesh), India
Production of Urea/ Neem Coated Urea Fertilizers

Site 2:
Indian Farmers Fertiliser Cooperative Limited, Aonla, Paul Pothen Nagar, P.O. IFFCO Township, Bareilly, Pin -243403, (Uttar Pradesh), India
Production of Urea/ Neem Coated Urea Fertilizers

Site 3:
Indian Farmers Fertiliser Cooperative Limited, Kalol, Kasturi Nagar, Gandhi Nagar, Pin -382423 (Gujarat), India
Production of Urea/ Neem Coated Urea Fertilizers

Site 4:
Indian Farmers Fertiliser Cooperative Limited, Kandla, Post Box No.12, Gandhidham, Kandla (Kuchchh), Gujarat, 370201, India
Production of DAP, NPK Fertilizers

Site 5:
Indian Farmers Fertiliser Cooperative Limited, Paradeep – Village Musadia, PO Paradeep, Dist. Jagatsinghpur, Pin -754142 (Odisha), India
Production of DAP, NPK Fertilizers

Page 2 of 2

ENCON PROJECT BUDGET ALLOCATION

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Details	2016-17	2017-18	2018-19	2019-20	2020-21
Total turn over of company/plant (Rs. Million)	17754.6	17996.2	25431.8	27003.0	21140.6
Amount Invested in ENCON Projects (Rs. Million)	727.4	2282.7	120.92	26.55	2.693
Investment %	4.1	12.68	0.48	0.10	0.01

Learning from CII Energy Award 2020 or any other award program:

- **The objective of the awards is to recognise and Award "Excellence" in Energy Management in Industries and to facilitate sharing of information by excellent energy efficient companies.**
- **It is a sense of competition to motivate other plants to achieve excellence and establish futurity by pinpointing Carbon Emission Reduction initiatives focused on energy conservation.**
- **The Awards evaluate all kinds of new processes, products, services, technologies, and other types of innovations in a common platform. They also assess new ideas and approaches along with tangible results.**

Awards & Recognition 2020

IFFCO
पूर्णतः सहकारी स्वामित्व
Wholly owned by Cooperatives

21st National Award for Excellence in Energy Management in 2020 by CII .

"National Energy Conservation Awards-2020"

FAI Best Production Performance Award-2020

20th Annual Greentech Environment Award - 2020

Team Member:
S.K.Janghel (9410499505)
Lav Verma (9415670592)
T.K.Singha (6307243733)