23rd National Award for Excellence in Energy Management - 2022

Team Member:
T.K.Singha (Sr. Mgr)
Santosh Prajapati (Dy.Mgr)
N. Khushwaha (Asst. Mgr)

Presented By:

Indian Farmers Fertiliser Cooperative Ltd.

Phulpur- I Unit

23rd – 25th August, 2022

IFFCO: At a Glance

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-I : Profile

Plant	Ammonia	Urea
Process Licenser	MW Kellogg, U.S.A	Snamprogetti, Italy
Commissioned	March, 1981	
Daily Capacity (MTPD)	1215	2115
Annual Capacity (Lakhs MT)	4.0	7.0
Till Date Production (Lakhs MT)	138	240

IFFCO Phulpur Unit-I : Production Outline

RLNG

COAL

GTG-HRSG

Utility Boiler

RLNG

Ammonia Plant

HP Steam

HP Steam

Power

HP Steam

CO2

Ammonia

RAIL

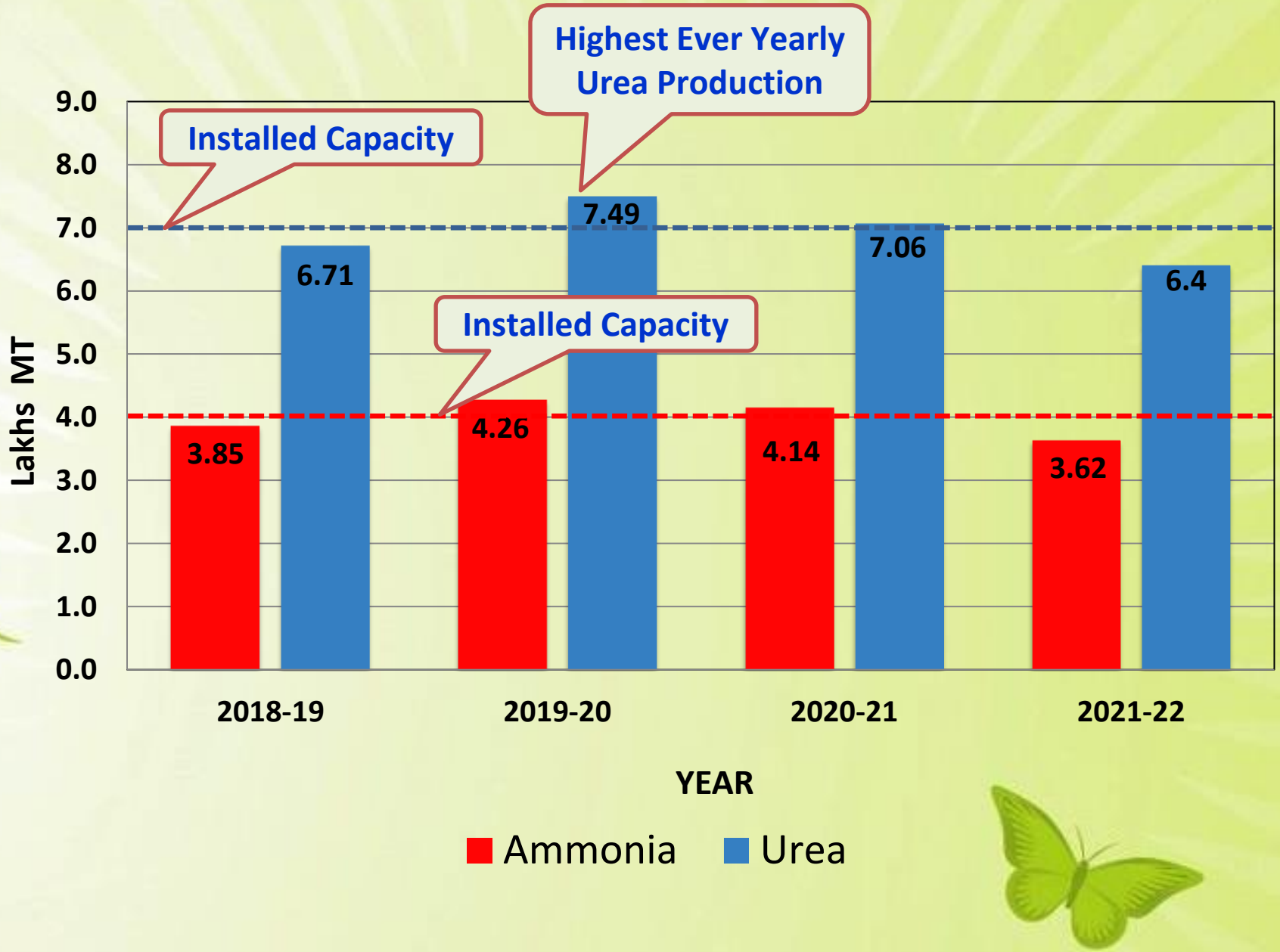
ROAD

Bagging Plant

Neem Urea

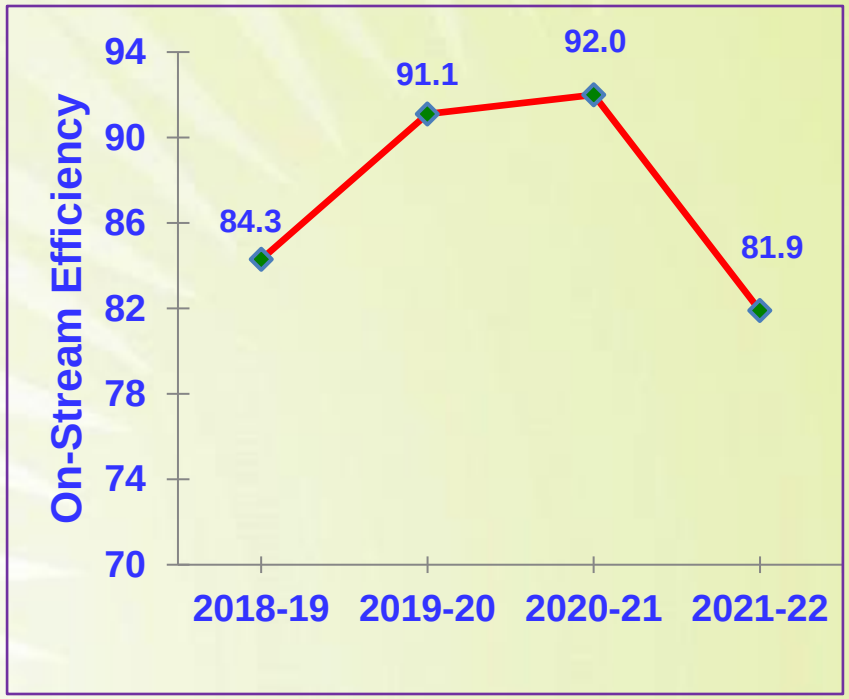
Urea Plant

Phulpur-I: Production Performance

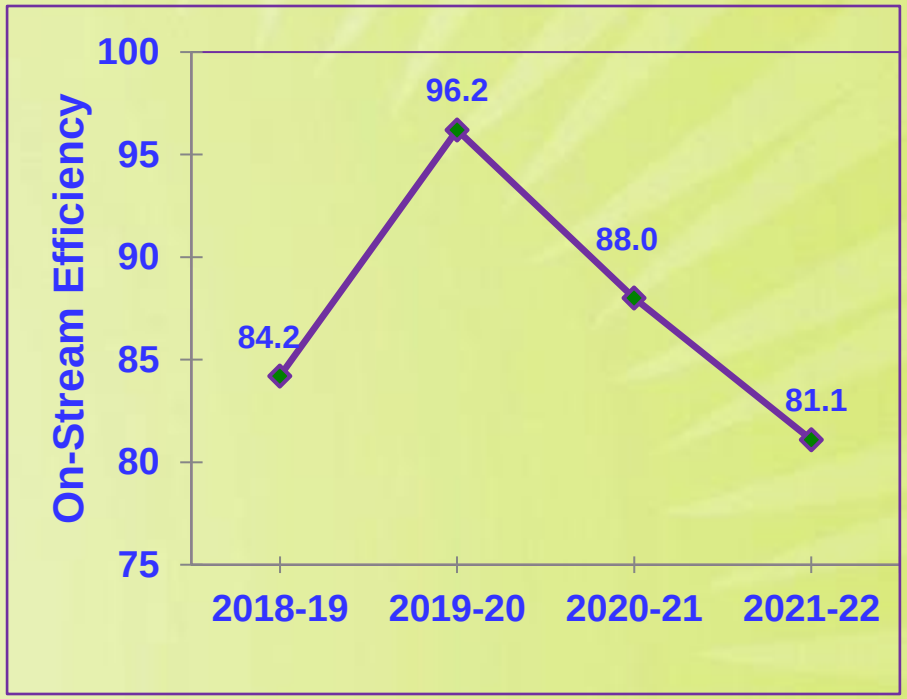


On-Stream Efficiency

Ammonia Plant On-Stream Efficiency



Urea Plant On-Stream Efficiency



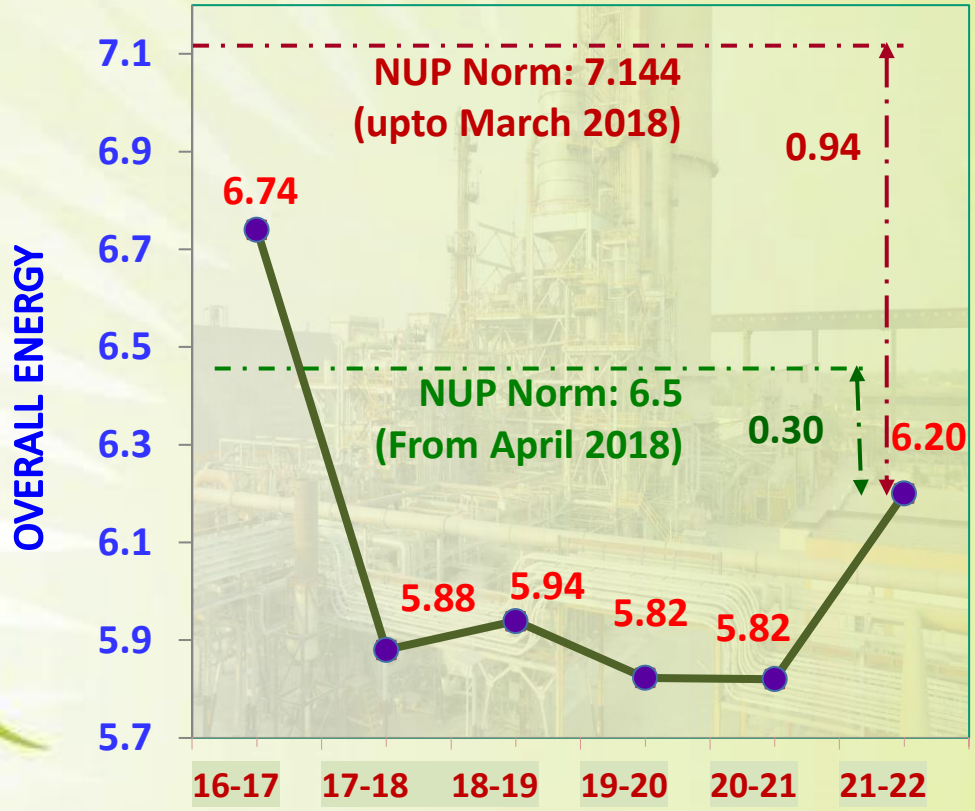
One of the important factor which effects the Productivity / Energy of the fertiliser plant is the Downtime of the plant. On-stream efficiency is less due to extended annual turnaround on account of COVID 19 and increase the number of unplanned shutdown.

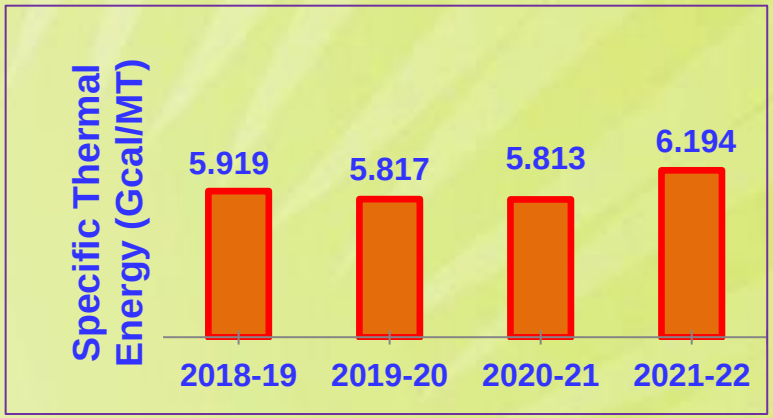
➢ **Poor Reliability of Plant & Equipments leads to:**

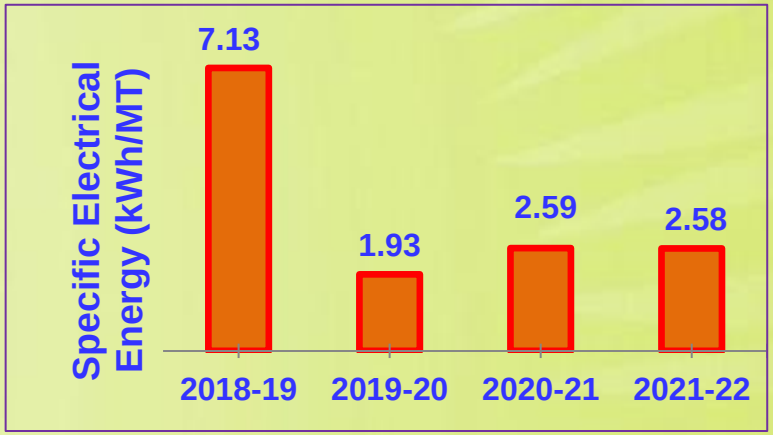
- ↑ *Duration of Downtime days* → ↓ *Productivity*
- ↑ *No. of Downtimes* → ↓ *Productivity / Energy Efficiency*

Phulpur-I : Sp. Energy Consumption

Energy in Gcal/MT of Urea







Energy Saving Schemes Planned in 2022-23	Annual Thermal Saving (Gcal)	Investment (Rs. Lakhs)
Installation of Methanator Feed Heater in Ammonia-I Plant	35174	123.0

Major Energy Conservation Measures in Phulpur-I Unit: 21 - 22

IFFCO
Wholly owned by Cooperatives

Name of Energy saving Projects	Investment (INR Million)	Electrical Savings (kWh)	Thermal Savings (Million Kcal)	Saving (INR Millons)	Pay Back (Month)
Replacement of Methanator Effluent Cooler (115-C) with higher capacity cooler in Ammonia-I Plant	12.00	0.0	20794.4	55.92	2.6
Scheme for installation of additional Cold Ammonia Pump (118-JB) in Ammonia-I Plant	3.50	236867.0	0	2.10	20.0
Connecting Blow down Steam in GT-HRSG with LS Header	0.65	0.0	1425.3	6.23	1.3
Replacement of LT Steam Super-heater Coil in Ammonia-I Plant	120.00	0.0	20900.5	91.31	15.8
Change orientation of Ammoniacal water pre-heater (1501-C) in Ammonia-I Plant	0.08	0.0	4709.8	12.67	0.1
Replacement of 1st Stage Inter-cooler of Process Air Compressor in Ammonia-I Plant	13.61	0.0	1986.1	5.34	30.6
Installation of M.P Steam Ejector Vacuum System for Common Steam Condenser in Ammonia-I Plant	3.50	0.0	4034	10.85	3.8
Replacement of 400 Nos of 2X36 W, 4 feet Tube light Fittings & 17 W per Choke with 2X2 feet, 20 W Surface Mounted LED Fixtures at Central School in Township	0.32	50068.0	0	1.00	3.8
Replacement of 400 Nos of 2X36 W, 4 feet Tube light Fittings & 17 W per Choke with 2X19 W LED Fixtures at Ammonia & Urea MCC Buildings	0.27	103170	0	2.06	1.6
Replacement of 200 Nos 250 W SON-T Fittings with 120 W Street Light at Bagging area & Plant Roads in Offsites	0.37	49309.0	0	0.99	4.5
Replacement of 2400 Nos 36 W, 4 Feet Tube Lights with 19 W, 4 feet Tube Lights at Bagging floor & Offsite area	0.42	77378.0	0	1.55	3.3
Replacement of 15 Nos 1000 W Tower Light Fixtures from Towers of Boundary wall with 300 W Flood Light	0.16	19913.0	0	0.40	4.8

Major Energy Conservation Measures in Phulpur-I Unit: 20 - 21

Name of Energy saving Projects	Investment (INR Million)	Electrical Savings (kWh)	Thermal Savings (Million Kcal)	Saving (INR Millons)	Pay Back (Month)
Online cleaning of aMDEA Solution Solution Plate Type Heat Exchanger (1107-C) in Ammonia-I Plant	0.19	0.0	1029.5	1.59	1.4
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	0.19	73642.0	0.0	1.26	1.8
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	0.10	7204.0	0.0	0.12	10.0
Replacement of 100 Nos 150 W old High Pressure Sodium Fixure from Township with 70 W Crompton make LED Street light fixtures	0.12	12807.0	0.0	0.22	6.5
Replacement of 10 Nos 80 W Fluorescent tube Lamp from Administration Building with 40 W Recess / Suspended LED Fitting	0.01	699.0	0.0	0.01	12.0
Replacement of 47 Nos 80 W Fluorescent tube Lamp from Central Canteen Building with 40 W Philips make Recess Mounting LED Luminaire	0.04	6567.0	0.0	0.11	4.4

Major Energy Conservation Measures in Phulpur-I Uni : 19- 20

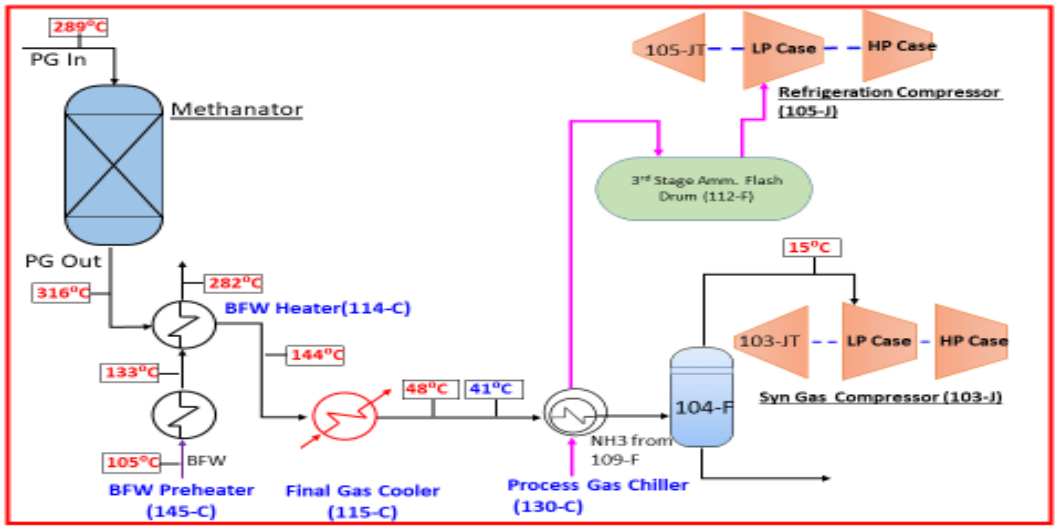
IFFCO
Wholly owned by Cooperatives

Name of Energy saving Projects	Investment (INR Million)	Electrical Savings (kWh)	Thermal Savings (Million Kcal)	Saving (INR Millons)	Pay Back (Month)
Optimum Load Operation, Maximization of on-stream days & optimization of Process Parameters.	0.00	0.0	42120.2	87.24	0.0
Online replacement Air suction Filter of Air Compressor in Gas Turbine with New suction filter in Phulpur-I Unit	5.98	0.0	25690.5	78.54	0.9
Replacement of plain tubes with finned tubes of 1st Stage Inter-cooler (129-JC) of Process Air Compressor in Ammonia-I Plant	3.95	0.0	8837.2	14.28	3.3
On-line Revamping of old Urea-I Plant Cooling Tower in Phulpur-I Unit	36.84	0.0	5691.5	15.20	29.1
Replacement of 385 Nos of 80 Watt HPMV Well Glass Fixtures with 45 Watt LED Well Glass Fixtures in Urea-I, Ammonia-I Cooling Tower, Offsite-I Plant in Phulpur-I Unit	0.57	45127.0	0.00	0.66	10.4
Replacement of 45 Nos of 400 Watt HPMV Bay Light Fixtures with 120 Watt LED Bay Light Fixtures in Ammonia-I Plant	0.18	110678.4	0.00	1.62	1.3
Replacement of 550 Nos of 80 Watt HPMV Well Glass Fixtures with 45 Watt LED Well Glass Fixtures in Ammonia-I Plant	0.82	64467.0	0.00	0.94	10.5
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	0.07	15070.0	0	0.22	3.8
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	0.05	1206.0	0	0.02	30.0
Replacement of 385 Nos of 35L Storage Type Old Geysers with 35L Storage Type 5 Star Geysers in Township residence	0.53	14986.0	0	0.22	28.9

1. Replacement of Methanator Effluent Cooler (115-C) with higher capacity cooler in Ammonia-I Plant:

- Due to increased plant load and installation of BFW preheater in aMDEA Section, the required heat duty of 115-C was increased. This is resulting into higher Process Gas temperature at the suction of Final make-up chiller (130-C).
- Because of higher heat load on Final make-up chiller (130-C), the vapour load of Refrigeration Compressor (105-J) was increased causing higher MP Steam Consumption in Refrigeration Compressor Turbine.
- So higher capacity 115-C installed during Annual Turn around in March & April, 2021 and the heat load capacity of 130-C is reduced resulting in direct savings of MP Steam in Refrigeration Compressor Turbine. Refrigeration Compressor Turbine RPM reduced from 6695 to 6560.
- By this replacement, annual thermal saving is 20794.4 Gcal. The investment for the scheme is around 120 Lakhs.

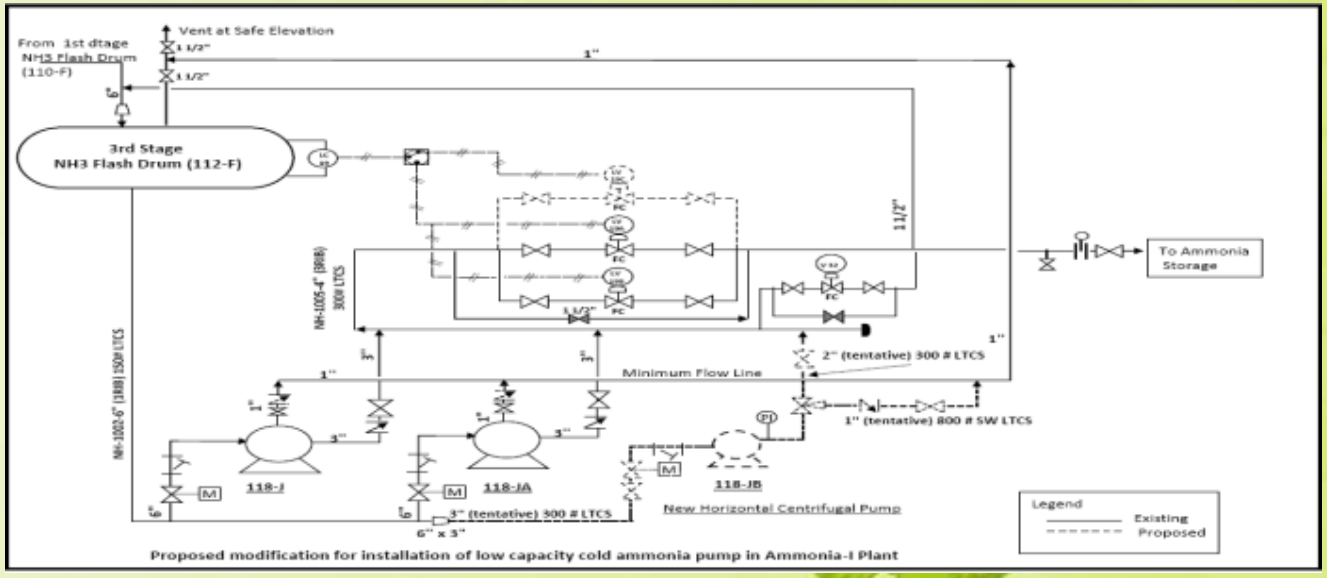
Schematic Diagram of proposed modification



2. Innovative Scheme for installation of additional Cold Ammonia Pump (118-JB) in Ammonia-I Plant :

IFFCO
Wholly owned by Cooperatives

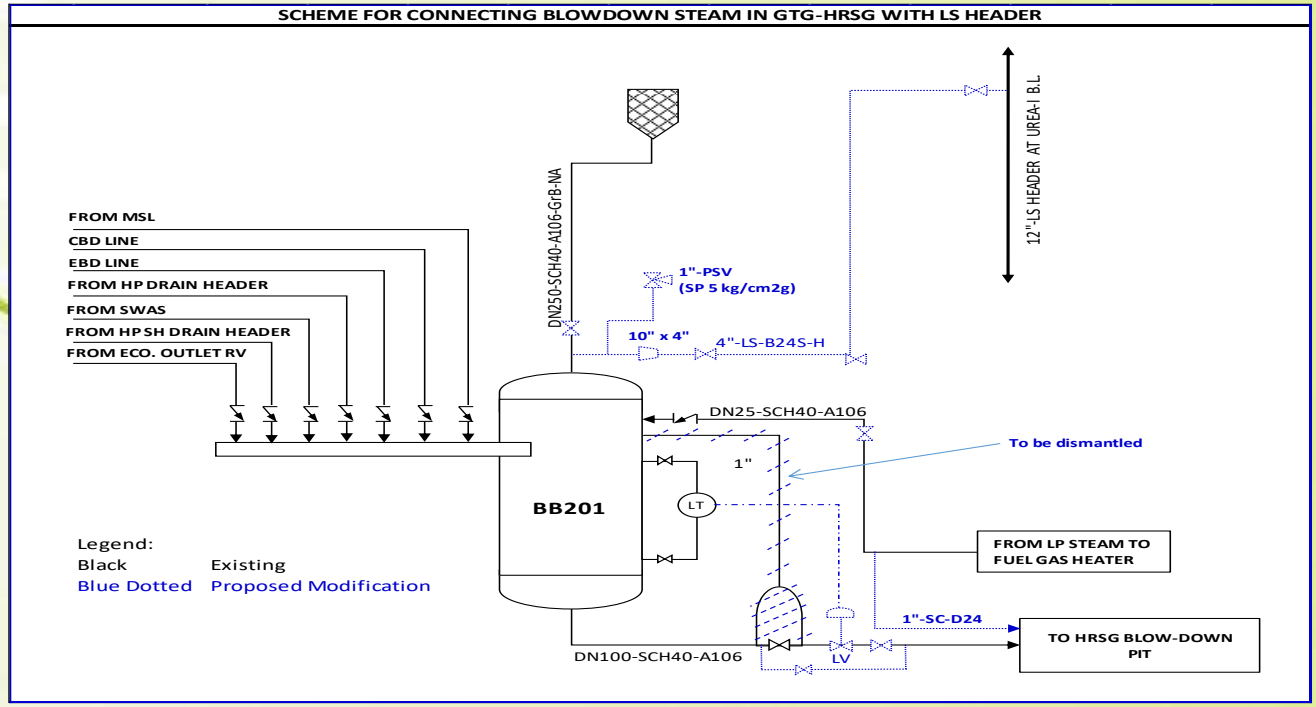
- After implementation of Energy Saving Project in the year 2016-17, the flow of cold ammonia going to Ammonia Storage was reduced to 5-10 MT/hr against the earlier flow of 35 MT/hr.
- Due to above mentioned process changes, the load on cold Ammonia Pumps (118-J/JA) was reduced and the operation has been inefficient.
- In view of the above, it was proposed to installed additional pump (118-JB) of lower capacity parallel to the existing pumps (118-J/JA) for the reduced flow requirements and smooth operation.
- The new small pump facilitates faster and smooth ammonia transfer to storage. The Scheme implemented during Annual Turnaround in March & April, 2021. Due to this modification the power saving is 236867 kWh. The investment for the scheme is 35 Lakhs.



Proposed modification for installation of low capacity cold ammonia pump in Ammonia-I Plant

3. Innovative scheme for Connecting Blow down Steam in GT-HRSG with LS Header :

- Previously, the blowdown from HRSG of GTG was flashed in a Blowdown Tank at atmospheric pressure and the flash steam was being vented to atmosphere at the top of Steam Drum Floor of HRSG.
- For energy saving and minimizing the low grade heat loss in the complex, it was proposed to generate Saturated Low Pressure Steam at 3.5 kg/cm2g & 148 °C by flashing the blowdowns from the HRSG in the same tank and connect the outlet line to 12" LS Header near Urea-I Plant B.L.
- The Scheme implemented and taken in line after Annual turn-around in March and April, 2021. Annual thermal saving is 1425.3 Gcal. The investment for the scheme is 6.5 Lakhs.

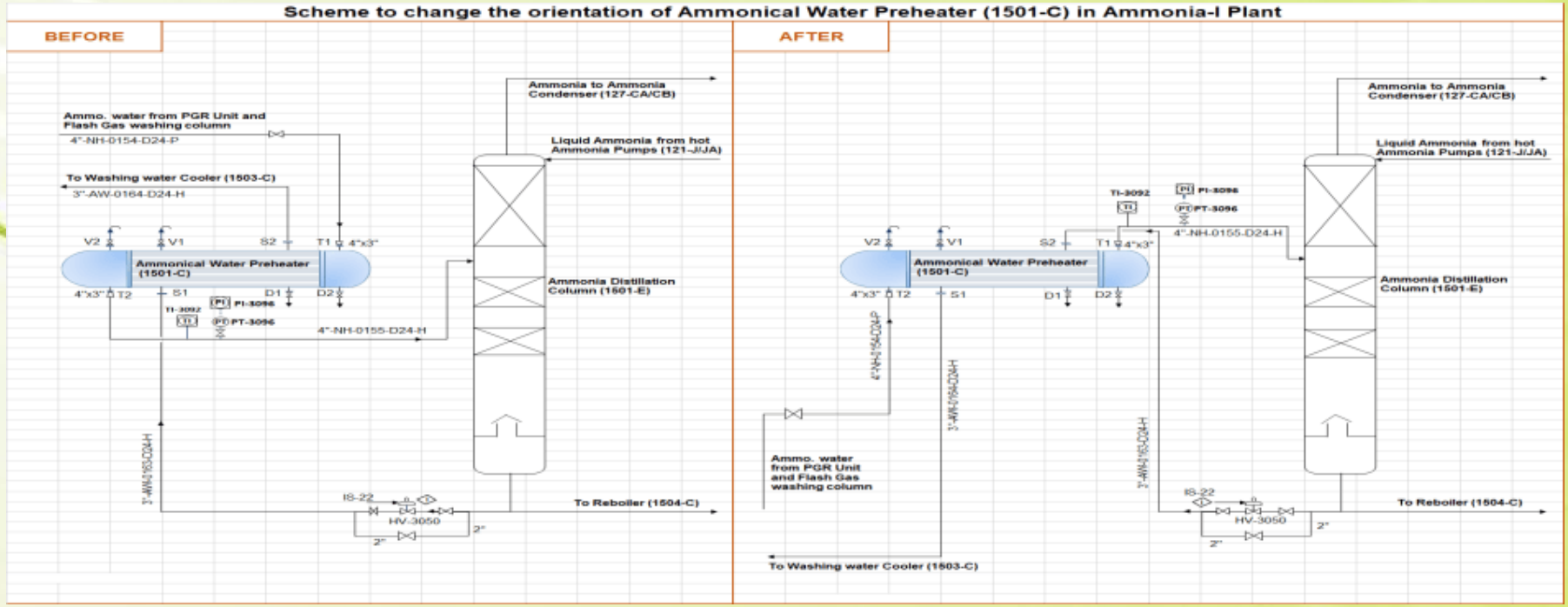


4. Replacement of LT Steam Super-heater Coil in Ammonia-I Plant:

- LT Super heater Steam Coil in convection section of Primary Reformer has been replaced with new one with upgraded MOC of intermediate tube-sheets and support brackets.
- During inspection in November, 2016; it was observed that all three "Intermediate Tube Sheets" of Low Steam Coil shifted axially and came out from their Support Bracket. Thereafter it was decided to replace the coil with upgraded MOC.
- The new coil installed during Annual Turnaround in March & April, 2021. Due to this modification the energy saving is 20900.5 Gcal. The investment for the scheme is 12 Crores.

5. Innovative Scheme to Change orientation of Ammoniacal water pre-heater (1501-C) in Ammonia-I Plant :

- Due to the present orientation of both hot and cold side, there was a chance of vapour locking resulting the temperature of heated ammonical water to distillation column much lower against PFD figure, which corresponds to higher MP Steam consumption in 1501-E to strip out ammonia from ammonical water.
- After change the orientation i.e heated ammonical water from pre-heater will exit from the top of the tube side in preheater and treated water from 1501-E will enter at the top of shell side of the Preheater.
- The Scheme has been done successfully during ATR-2021. Thereby saving of MP steam in Re-boiler. Due to this modification the energy saving is 4709.8 Gcal. The investment is less than one Lakh.



6. Replacement of 1st Stage Inter-cooler of Process Air Compressor in Ammonia-I Plant:

IFFCO
Wholly owned by Cooperatives

- The 1st Stage Intercooler of Process Air Compressor were leaking frequently in spite of change and plugging of its tubes.
- Due to the leaking, the Air compressor was not perform satisfactorily and facing load limitation problem. Therefore, it old exchanger with new exchangers.
- The Scheme implemented during Annual turn around in March & April, 2021. By Installing New cooler yearly Energy saving of 1986.1 Gcal. The investment for the scheme is 136.1 Lakhs.

Before

After

7. Installation of Medium Pressure Steam Ejector Vacuum System for Common Steam Condenser in Ammonia-I Plant :

- Ammonia-I Plant was designed for Single Surface Condenser (101-JC) for all Steam Turbines with LP Steam (3.5 Kg/cm2g) Ejector Vacuum System.
- The performance of existing vacuum ejector system was not satisfactory at higher plant loads leading to lower vacuum. Therefore, these ejectors replaced with New Medium Pressure Steam (38.5 kg/cm2g) Ejector System.
- The Scheme implemented during Annual turn around in March & April, 2021 and vacuum has improved resulting steam saving in turbines. By Installing New Ejector system, yearly Energy saving comes of 4034 Gcal.

New MP Steam Ejector in Ammonia-I Plant

Electrical Energy saving during 2021-22

1. Replacement of 400 Nos of 2X36 W, 4 feet Tube light Fittings & 17 W per Choke with 2X2 feet, 20 W Surface Mounted LED Fixtures at Central School in Township

To reduce the energy consumption, 400 Nos. of 2X36 W, 4 feet Tube light Fittings & 17 W per Choke replaced with 2X2 feet, 20 W Surface Mounted LED Fixtures at Central School in Township. Annual saving comes 50068 kWh.

2. Replacement of 400 Nos of 2X36 W, 4 feet Tube light Fittings & 17 W per Choke with 2X19 W LED Fixtures at Ammonia & Urea MCC Building:

To reduce the energy consumption, 400 Nos. of 2X36 W, 4 feet Tube light Fittings & 17 W per Choke replaced with 2X19 W LED Fixtures at Ammonia & Urea MCC Buildings. Annual saving comes 103170 kWh.

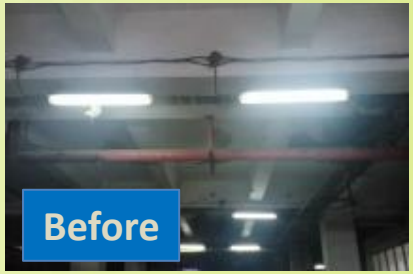
Electrical Energy saving during 2021-22

3. Replacement of 200 Nos 250 W SON-T Fittings with 120 W Street Light at Bagging area & Plant Roads in Offsites:

To reduce the energy consumption, 200 Nos 250 W SON-T Fittings replaced with 120 W Street Light at Bagging area & Plant Roads in Offsites. Annual saving comes 49309 kWh.

4. Replacement of 2400 Nos 36 W, 4 Feet Tube Lights with 19 W, 4 feet Tube Lights at Bagging floor & Offsites:

To reduce the energy consumption, 2400 Nos 36 W, 4 Feet Tube Lights replaced with 19 W, 4 feet Tube Lights at Bagging floor & Offsites. Annual saving comes 77378 kWh.



5. Replacement of 15 Nos 1000 W Tower Light Fixtures from Towers of Boundary wall with 300 W Flood Light:

To reduce the energy consumption, 15 Nos 1000 W Tower Light Fixtures from Towers of Boundary wall replaced with 300 W Flood Light. Annual saving comes 19913 kWh.

UTILISATIONS OF RENEWABLE ENERGY RESOURCES

Raw water Pump House

Bagging Top Floor

Roof of Central Canteen

Roof of Control Room

Solar Unit at Plant

Solar Power Pack:

- 585 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-2019-20	Solar PV System	Electrical	Onsite	0.585	0.707
FY-2020-21	Solar PV System	Electrical	Onsite	0.585	0.742
FY-2021-22	Solar PV System	Electrical	Onsite	0.585	0.710

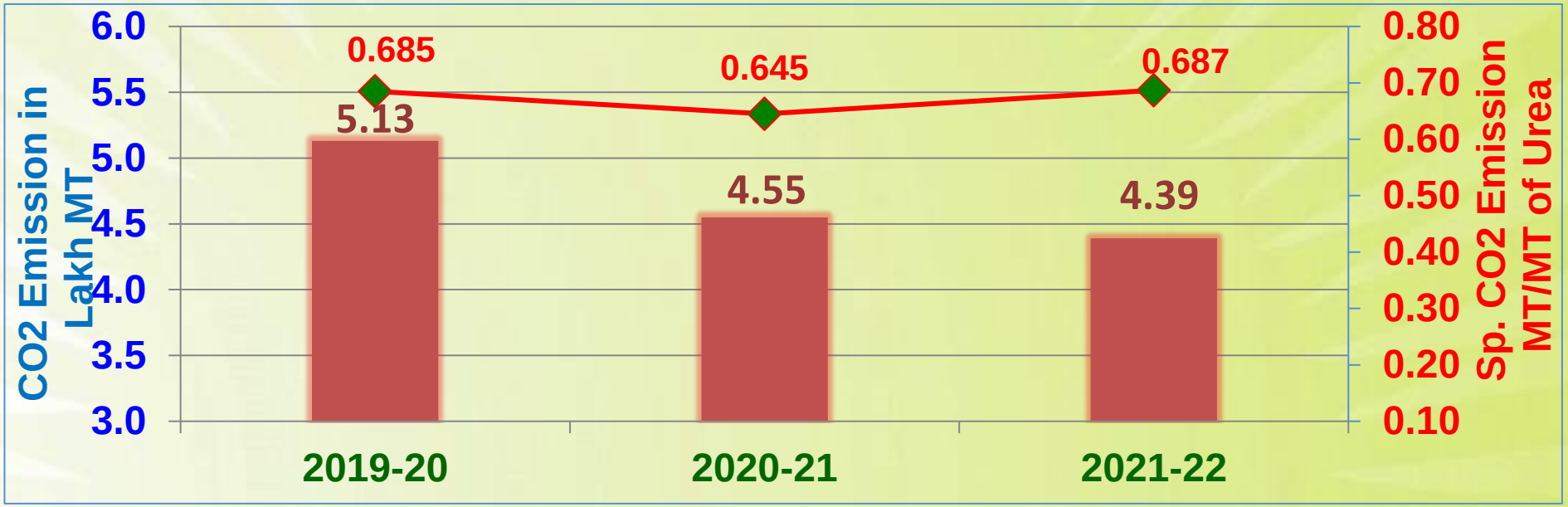
Solar Water Heaters

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

Bio-Methanation Plant

Carbon Foot Print

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.



- In Phulpur Unit Carbon Di Oxide Recovery (CDR) Plant of 450 MTPD capacity installed 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.

WASTE MANAGEMENT AND WASTE UTILISATION

YEAR	TYPE OF WASTE	QUANTITY OF WASTE GENERATED (KL)	DISPOSAL METHOD	TYPE OF WASTE	QUANTITY OF WASTE GENERATED (MT)	DISPOSAL METHOD
FY- 2019-20	LUBE OIL & TRANSFORMER OIL	47.25	Sent to Authorise Vendor	SPENT CATALYST	56.67	Sent to Authorise Vendor
FY- 2020-21	LUBE OIL & TRANSFORMER OIL	52.50	Sent to Authorise Vendor	SPENT CATALYST	NIL	Sent to Authorise Vendor
FY- 2021-22	LUBE OIL & TRANSFORMER OIL	52.50	Sent to Authorise Vendor	SPENT CATALYST	50.92	Sent to Authorise Vendor

YEAR	NAME OF FUEL	QUANTITY OF WASTE FUEL USED (MT/YEAR)	HEATING VALUE MILLION KCAL/YEAR
FY- 2019-20	TAIL GAS AND FLASH GAS	33069.481	126555
FY- 2020-21	TAIL GAS AND FLASH GAS	33300.817	127439
FY- 2021-22	TAIL GAS AND FLASH GAS	29651.492	113474

Environment monitoring system and reduction of Stack emission

IFFCO
Wholly owned by Cooperatives

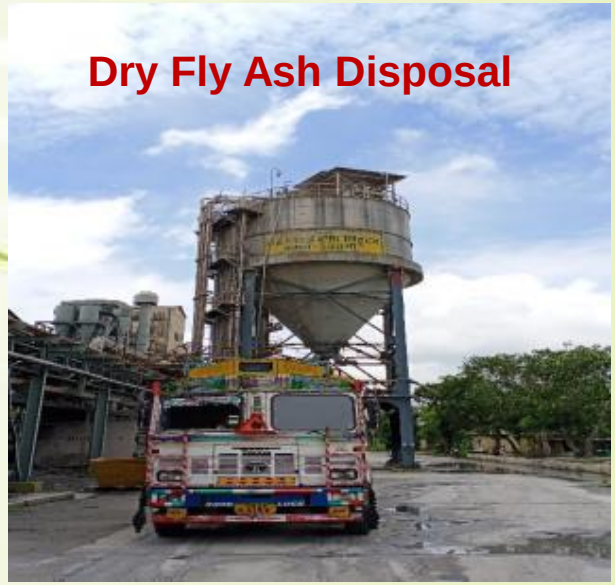
New Electrostatic Precipitator (ESP) in Coal Fired Boilers


ESP of Boiler No. 1


ESP of Boiler No. 3

ESP of Coal fired boilers were very old and their performance was deteriorated in due course of time and needed improvement. So, new ESP installed in both Boiler 1 & 3.

WASTE DISPOSAL


Dry Fly Ash Disposal

- Fly Ash Generated in Power Plant being gainfully utilised by Cement industries.
- Fly Ash also used for Brick Making at in-house Fly Ash Brick Plant. Thereafter Brick is used for Paving & Boundary walls and for Usar land reclamation.


Fly Ash Brick Plant

Environment & Sustainability : *Liquid Effluent Treatment*

IFFCO
Wholly owned by Cooperatives

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.

Installation of Online Environment Monitoring System

IFFCO
Wholly owned by Cooperatives

PM (Particulate Matter) Monitoring System in Boiler ducts:

IFFCO Phulpur Unit Continuously is measured and monitored the Particulate Matters (PM) in Boiler ducts and maintained within permissible limit.

Installed Transmitter & Receiver on Boiler Duct and Local Display

Installation of Vent Silencer in Ammonia-I Plant to Reduce Noise Pollution:

Phulpur-I Plant commissioned in the year 1981. For safety of the Plant there are several vent valves and PSVs are provided. The vent valves are connected to a vent header. During start up, shutdown and any other abnormal condition of the plant, the gas has to vent through the vent header and created noise, as there was no vent silencer. To reduce the noise pollution, the vent silencer provided in Ammonia-I Plant.

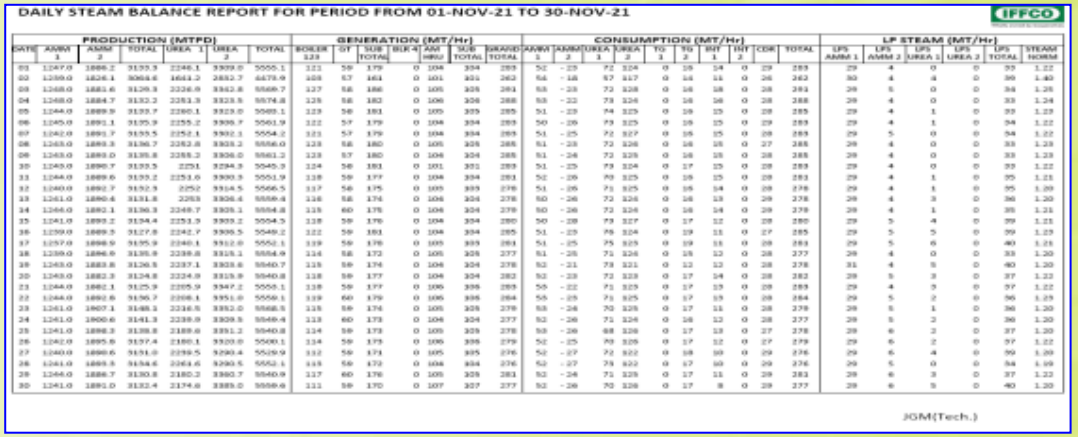
Teamwork, Employee Involvement & Monitoring

IFFCO
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.



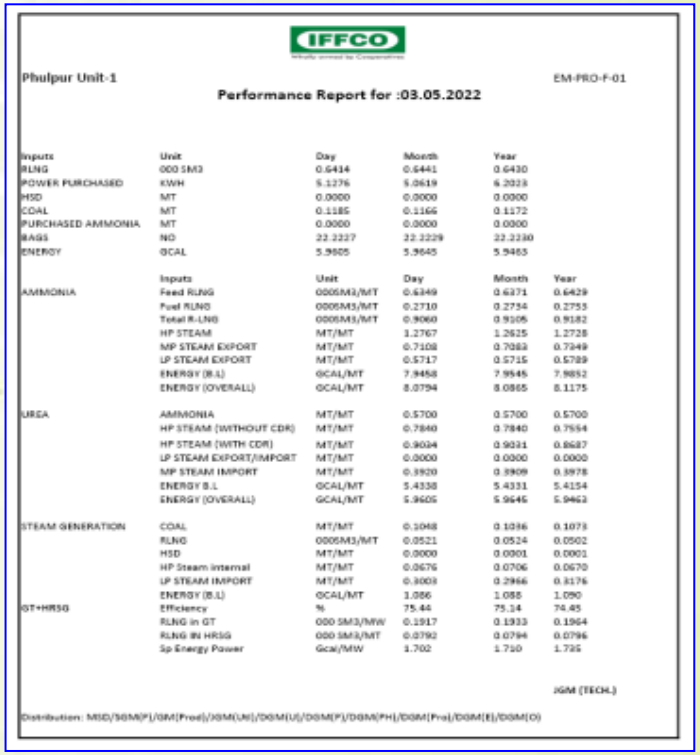
DAILY STEAM BALANCE REPORT FOR PERIOD FROM 01-NOV-21 TO 30-NOV-21

IFFCO

DATE	PRODUCTION (MTPD)					GENERATION (MT/Hr)					CONSUMPTION (MT/Hr)									LP STEAM (MT/Hr)				
	AMM 1	AMM 2	TOTAL	UREA 1	UREA 2	TOTAL	BOILER 123	GT	SUB TOTAL	BLR 4	AM HRU	SUB TOTAL	GRAND TOTAL	AMM 1	AMM 2	UREA 1	UREA 2	TG 3	TG 2	BIT 1	TMT 2	CDR	TOTAL	LPS AMM 1	LPS AMM 2	LPS UREA 1	LPS UREA 2	LPS TOTAL	STEAM NORM
01	1247.0	1846.1	3155.9	2246.1	3309.0	5555.1	121	58	179	0	104	104	283	52	23	72	124	0	19	14	0	29	283	29	4	0	0	33	1.22
02	1249.0	1826.1	3084.6	1614.2	2832.7	4479.9	108	57	164	0	101	101	265	51	18	57	117	0	16	11	0	26	242	30	4	4	0	38	1.40
03	1248.0	1881.6	3129.3	2226.9	3362.8	5589.7	127	58	186	0	105	105	291	53	23	72	128	0	18	18	0	28	281	29	5	0	0	34	1.28
04	1248.0	1884.7	3132.2	2251.3	3323.5	5574.8	126	56	182	0	106	106	288	53	22	73	126	0	16	16	0	28	288	29	4	0	0	33	1.24
05	1244.0	1889.9	3133.7	2260.1	3323.0	5583.1	123	58	181	0	105	105	285	51	23	74	125	0	16	15	0	28	285	29	4	1	0	33	1.23
06	1245.0	1891.1	3135.9	2255.2	3306.7	5561.9	122	57	179	0	104	104	283	50	20	73	125	0	16	15	0	29	283	29	4	1	0	34	1.22
07	1242.0	1891.7	3133.5	2251.1	3302.1	5554.2	123	57	179	0	104	104	283	51	25	72	127	0	16	15	0	28	284	29	5	0	0	34	1.22
08	1243.0	1893.3	3136.7	2252.8	3303.2	5556.0	123	58	180	0	105	105	285	51	23	72	126	0	16	16	0	27	285	29	4	0	0	33	1.23
09	1243.0	1893.0	3135.8	2258.3	3306.0	5561.3	123	57	180	0	104	104	285	51	24	72	125	0	16	15	0	28	285	29	4	0	0	33	1.23
10	1243.0	1890.7	3133.5	2251	3294.3	5545.3	124	58	181	0	101	101	283	51	23	73	124	0	17	15	0	28	283	29	4	0	0	33	1.22
11	1244.0	1891.6	3135.2	2253.0	3303.3	5551.9	118	59	177	0	105	104	281	52	26	73	125	0	16	15	0	28	281	29	4	1	0	35	1.25
12	1240.0	1892.7	3132.3	2252	3314.5	5566.5	117	58	175	0	103	103	278	51	25	71	125	0	16	14	0	28	278	29	4	1	0	35	1.26
13	1241.0	1890.4	3131.8	2263	3306.4	5569.4	116	58	174	0	104	104	278	50	26	72	126	0	16	13	0	29	278	29	4	3	0	36	1.30
14	1244.0	1892.1	3136.3	2248.7	3305.1	5553.8	118	60	178	0	104	104	278	50	26	72	126	0	16	14	0	29	278	29	4	1	0	35	1.25
15	1241.0	1893.2	3134.4	2253.3	3303.2	5556.5	118	58	176	0	104	104	280	50	28	73	127	0	17	12	0	28	280	29	5	4	0	38	1.35
16	1239.0	1889.5	3127.8	2242.7	3306.5	5549.2	122	59	181	0	104	104	285	51	25	73	124	0	17	15	0	27	285	29	5	5	0	39	1.37
17	1257.0	1898.9	3155.9	2240.1	3312.0	5552.1	119	58	176	0	105	105	281	51	25	75	125	0	19	15	0	28	283	29	5	6	0	40	1.41
18	1239.0	1886.8	3125.8	2238.8	3316.1	5554.9	114	58	172	0	105	105	277	51	26	71	126	0	16	12	0	28	277	29	4	0	0	33	1.20
19	1243.0	1883.8	3126.5	2237.1	3303.6	5540.7	118	58	176	0	104	104	278	52	21	73	121	0	12	12	0	28	278	31	4	3	0	40	1.30
20	1243.0	1882.3	3124.8	2234.9	3319.9	5540.8	118	58	177	0	104	104	282	52	23	72	123	0	17	14	0	28	282	29	5	3	0	37	1.32
21	1244.0	1882.1	3125.9	2255.9	3347.2	5556.1	118	59	177	0	106	106	283	50	22	71	125	0	17	15	0	28	283	29	4	3	0	37	1.32
22	1244.0	1892.8	3136.7	2258.1	3351.0	5559.1	119	60	179	0	105	105	284	55	25	71	125	0	17	15	0	28	284	29	5	2	0	36	1.29
23	1241.0	1907.1	3148.1	2236.5	3352.0	5588.5	118	58	176	0	105	105	279	53	26	70	126	0	17	11	0	28	279	28	5	1	0	34	1.20
24	1241.0	1900.6	3141.3	2239.9	3309.5	5549.4	118	60	178	0	104	104	277	52	26	71	126	0	16	12	0	28	277	28	5	3	0	36	1.30
25	1241.0	1898.3	3139.3	2189.0	3351.2	5540.2	114	59	173	0	105	105	278	53	26	68	126	0	17	13	0	27	278	28	5	3	0	37	1.30
26	1242.0	1895.8	3137.4	2180.1	3303.0	5500.1	114	59	173	0	105	105	279	52	25	70	126	0	17	12	0	27	279	29	6	2	0	37	1.32
27	1240.0	1890.6	3131.0	2259.5	3290.4	5529.9	112	59	171	0	105	105	276	52	27	72	122	0	18	10	0	29	276	29	6	4	0	39	1.39
28	1241.0	1893.5	3134.6	2264.6	3290.5	5552.1	115	58	173	0	104	104	276	52	27	73	122	0	17	10	0	29	276	29	5	0	0	34	1.69
29	1244.0	1888.7	3130.8	2180.2	3280.7	5560.9	117	60	176	0	105	105	281	52	24	71	126	0	17	11	0	28	281	28	6	3	0	37	1.32
30	1241.0	1891.0	3132.4	2174.6	3285.0	5559.6	111	59	170	0	107	107	277	52	26	70	126	0	17	8	0	29	277	28	6	5	0	40	1.30

JGM(Tech.)

Sample Steam Balance Reports



IFFCO

Phulpur Unit-1 EM-PRO-F-01

Performance Report for :03.05.2022

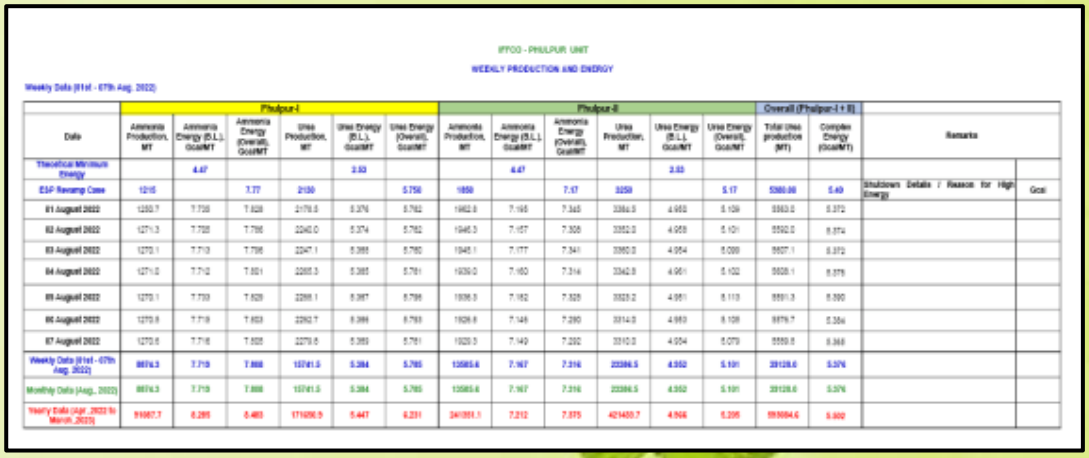
Inputs	Unit	Day	Month	Year
RLNG	000 SM3	0.6414	0.6441	0.6430
POWER PURCHASED	KWH	5.1276	5.0619	5.2023
HSD	MT	0.0000	0.0000	0.0000
COAL	MT	0.1185	0.1166	0.1172
PURCHASED AMMONIA	MT	0.0000	0.0000	0.0000
BAGS	NO	22.2227	22.2229	22.2230
ENERGY	GCAL	5.9665	5.9645	5.9463

	Inputs	Unit	Day	Month	Year
AMMONIA	Feed RLNG	000SM3/MT	0.6349	0.6371	0.6429
	Fuel RLNG	000SM3/MT	0.2710	0.2754	0.2753
	Total R-LNG	000SM3/MT	0.9060	0.9106	0.9182
	HP STEAM	MT/MT	1.2767	1.2625	1.2728
	MP STEAM EXPORT	MT/MT	0.7108	0.7063	0.7349
	LP STEAM EXPORT	MT/MT	0.5717	0.5715	0.5789
	ENERGY (B.L)	GCAL/MT	7.9458	7.9545	7.9852
	ENERGY (OVERALL)	GCAL/MT	8.0794	8.0865	8.1175
UREA	AMMONIA	MT/MT	0.5700	0.5700	0.5700
	HP STEAM (WITHOUT CDR)	MT/MT	0.7840	0.7840	0.7554
	HP STEAM (WITH CDR)	MT/MT	0.9024	0.9021	0.8687
	LP STEAM EXPORT/IMPORT	MT/MT	0.0000	0.0000	0.0000
	MP STEAM IMPORT	MT/MT	0.3909	0.3909	0.3978
	ENERGY B.L	GCAL/MT	5.4338	5.4331	5.4154
	ENERGY (OVERALL)	GCAL/MT	5.9605	5.9645	5.9463
STEAM GENERATION	COAL	MT/MT	0.1048	0.1036	0.1073
	RLNG	000SM3/MT	0.0521	0.0524	0.0502
	HSD	MT/MT	0.0000	0.0001	0.0001
	HP Steam Internal	MT/MT	0.0676	0.0706	0.0670
	LP STEAM IMPORT	MT/MT	0.3003	0.2966	0.3176
	ENERGY (B.L)	GCAL/MT	1.086	1.088	1.090
GT+HRSG	Efficiency	%	75.44	75.14	74.45
	RLNG in GT	000 SM3/MW	0.1917	0.1933	0.1964
	RLNG IN HRSG	000 SM3/MT	0.0792	0.0794	0.0796
	Sp Energy Power	Gcal/MW	1.702	1.710	1.735

JGM (TECH.)

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

Sample Performance Reports



IFFCO - PHULPUR UNIT

WEEKLY PRODUCTION AND ENERGY

Weekly Data (01st - 07th Aug, 2022)

Date	Phulpur-I						Phulpur-II						Overall (Phulpur-I + 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	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	Total Urea production (MT)	Complex Energy (Gcal/MT)	Remarks
Theoretical Minimum Energy		4.47			2.83			4.47			2.83				
ESF Revamp Case	1215		7.77	2130		5.758	1650		7.17	3250		5.17	5380.00	6.40	Shutdown Details / Reason for High Energy
01 August 2022	1250.7	7.728	7.828	2178.5	5.376	5.762	1662.8	7.195	7.345	3364.0	4.968	5.129	5542.5	6.372	
02 August 2022	1271.3	7.728	7.786	2240.0	5.374	5.762	1646.3	7.157	7.308	3352.0	4.958	5.101	5592.0	6.374	
03 August 2022	1270.1	7.713	7.796	2247.1	5.385	5.760	1645.1	7.177	7.341	3360.0	4.954	5.099	5607.1	6.372	
04 August 2022	1271.0	7.712	7.801	2265.3	5.385	5.761	1639.0	7.160	7.314	3342.0	4.961	5.102	5608.1	6.378	
05 August 2022	1270.1	7.709	7.829	2268.1	5.387	5.796	1636.8	7.162	7.325	3323.0	4.951	5.113	5591.8	6.390	
06 August 2022	1270.8	7.718	7.803	2262.7	5.389	5.793	1626.8	7.148	7.290	3314.0	4.960	5.108	5576.7	6.384	
07 August 2022	1270.6	7.716	7.805	2279.6	5.393	5.791	1620.3	7.149	7.292	3310.0	4.954	5.079	5589.6	6.368	
Weekly Data (01st - 07th Aug, 2022)	8874.3	7.719	7.808	15741.5	5.384	5.765	13585.6	7.167	7.316	23386.5	4.962	5.101	39128.0	6.376	
Monthly Data (Aug., 2022)	8874.3	7.719	7.808	15741.5	5.384	5.765	13585.6	7.167	7.316	23386.5	4.962	5.101	39128.0	6.376	
Yearly Data (Apr, 2022 to March, 2023)	91667.7	8.285	8.483	171656.9	5.447	6.231	241351.1	7.212	7.375	421400.7	4.956	5.206	593084.6	6.602	

Sample Weekly Energy Reports

Procurement Process

IFFCO Wholly owned by Cooperatives

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.

INTERNATIONAL CERTIFICATIONS

IFFCO
Wholly owned by Cooperatives

bsi.

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 Effective Date: 2020-12-18
Latest Revision Date: 2020-12-18 Expiry Date: 2023-12-17

Page: 1 of 1

...making excellence a habit.

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 Effective Date: 2020-05-16
Latest Revision Date: 2020-12-14 Expiry Date: 2023-05-15

Page: 1 of 1

...making excellence a habit.

SGS

Indian Farmers Fertiliser Cooperative Limited

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

IFA Protect & Sustain Product Stewardship Programme

To achieve the level of IFA Product Steward Excellence

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

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

protect&sustain

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 Effective Date: 2020-05-16
Latest Revision Date: 2020-12-14 Expiry Date: 2023-05-15

Page: 1 of 1

...making excellence a habit.

bsi.

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

Page: 1 of 1

...making excellence a habit.

SGS

Indian Farmers Fertiliser Cooperative Limited

IFA Protect & Sustain Product Stewardship Programme

To achieve the level of IFA Product Steward Excellence

protect&sustain

ENCON PROJECT BUDGET ALLOCATION

Details	2018-19	2019-20	2020-21	2021-22
Total turn over of company/plant (Rs. Million)	17221.5	17167.1	15650.9	22101.0
Amount Invested in ENCON Projects (Rs. Million)	145.41	48.99	0.649	154.88
Investment %	0.84	0.29	0.004	0.70

Learning from CII Energy Award 2021 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

IFFCO
Wholly owned by Cooperatives

22nd National Award for Excellence in Energy Management in 2021 by CII .

Winner of Greentech Energy Conservation Award - 2021

Platinum Award for Grow Care Energy Conservation 2021

"National Energy Conservation Awards-2020"

FAI Best Production Performance Award-2020

IFFCO. Bringing smile to millions

The Journey continues…

Team Member:
T.K.Singha (9112580296)
N. Khuswaha (9041661375)
S. Prajapati (7376794504)