KRIBHCO

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KRIBHCO UNIT PROFILE

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Krishak Bharati Cooperative Limited, (KRIBHCO) has been the world's premier fertilizer producing cooperative under the administrative control of the Dept. of Fertilizers, Govt. of India. It has an outstanding track record to its credit in all spheres of its activities, now having completed the 19th year of its operation. Incorporated in April 1980 as a national level Cooperative Society to manufacture and distribute chemical fertilizers and allied farm inputs, KRIBHCO has fully imbibed the co-operative philosophy and has made sustained efforts towards promoting the cause of modern agriculture and cooperatives in the country.

PLANT:

KRIBHCO operates two Natural Gas based Ammonia plants each of 1520 MTPD capacity and four Urea streams each of 1310 MTPD capacity. M.W.Kellogg Company USA designed ammonia plants while Snamprogetti, Italy designed Urea plants. The annual installed capacity of Urea plants is 17.29 Lakh MT of Urea. The complex is also having facilities to produce 30 MWH power and 550 MTPH HP steam and other utilities.

PRODUCTION PERFORMANCE:

KRIBHCO has achieved an average Capacity utilization of 112.29 % during the last eighteen completed years of service to the Nation. Production levels of 116.67%, 110.43%, and 122.11% of its Installed capacity of Urea were achieved respectively in the last three financial years (2001-02 to 2003-04).

ENERGY CONSUMPTION:

KRIBHCO operates a giant fertilizer complex, which facilitates highly energy intensive process operations for producing the Nitrogenous fertilizer Urea and Ammonia, which is an intermediate product. KRIBHCO is conscious in the energy spending and judiciously perform all the operational activities to reduce the energy usage. The principal raw materials for the Society are Natural Gas, Natural Gas liquid and Aromatic Rich Naphtha. (ARN).

KRIBHCO implemented some major modifications and many small modifications during its 19 completed years of service to the Nation and farming community to remain energy efficient and competent both at national and International level. Surpassing all the previous performances, KRIBHCO has created two consecutive best ever performances during the last two concluded years of operation, in the areas of Production, Specific Energy consumption and Dispatches. KRIBHCO a two-decade vintage plant could achieve this due to the dedicated efforts of all its employees.

KRIBHCO plants consume substantial quantities of Natural Gas and Aromatic Rich naphtha to meet the process feed and fuel requirements. In the year 2004-05 about 1146.199 Million SM3 of Natural gas costing Rs.473.27 Crores and 95947.54 MT of Liquid Naphtha (ARN) costing Rs.177.4501 Crores were consumed.

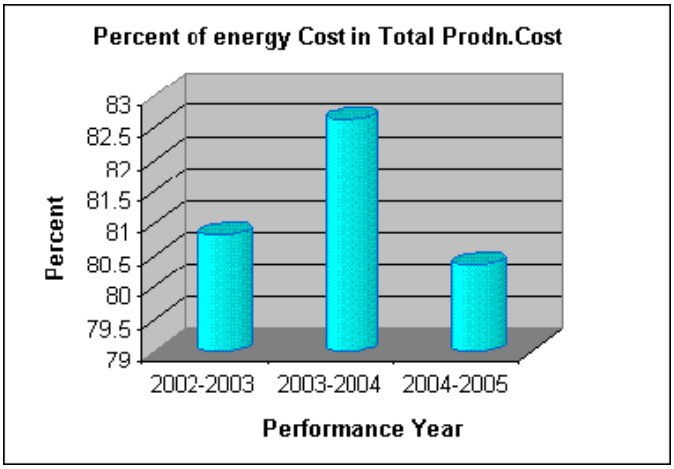
The Sp. energy for Ammonia, Urea, and Power achieved in 2004-05 were 8.301 Mkcal/MT, 5.872 Mkcal/MT, and 2.543 Mkcal/MWH respectively.

Contribution of Energy cost in total production cost during last three years is as under:

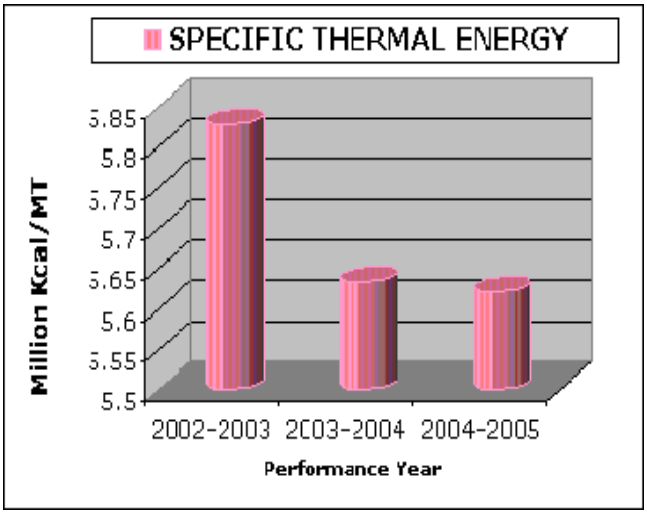
Performance Year	Total Cost of Production. in Rs. Lakhs	Cost of total Energy in Rs. Lakhs.	Percent of Energy Cost in Prodn. Cost.
2002-2003	73406.54	59327.26	80.82
2003-2004	77046.96	63654.26	82.62
2004-2005	80989.68	63654.26	80.36

The key performance indicators for the years 2002-03, 2003-04, 2004-05 are given below:

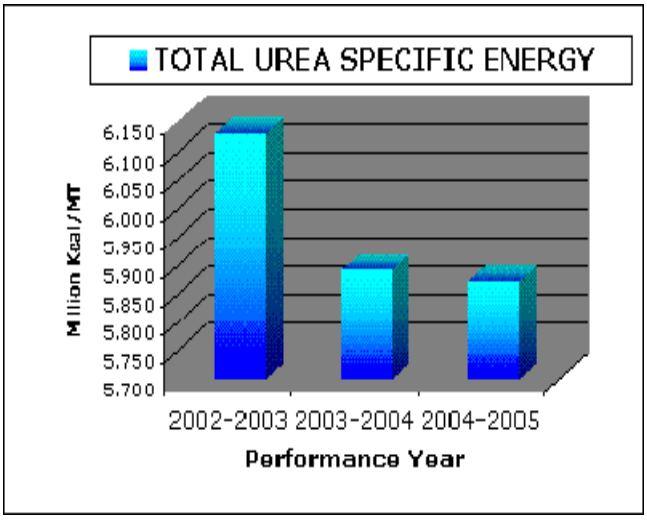
Performance Year	Percent of Energy Cost in Total Prodn. Cost
2002-2003	**80.82**
2003-2004	**82.62**
2004-2005	**80.36**



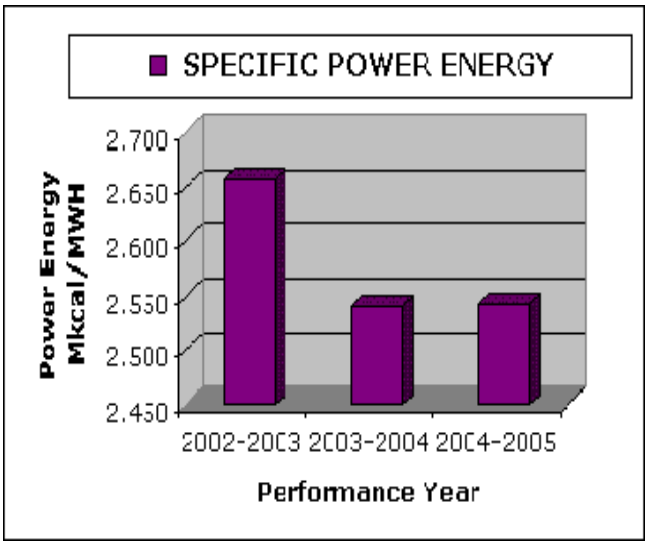
Year	Specific Thermal Energy Consumption Mkcal/Ton of Urea
2002-2003	**5.828**
2003-2004	**5.634**
2004-2005	**5.621**



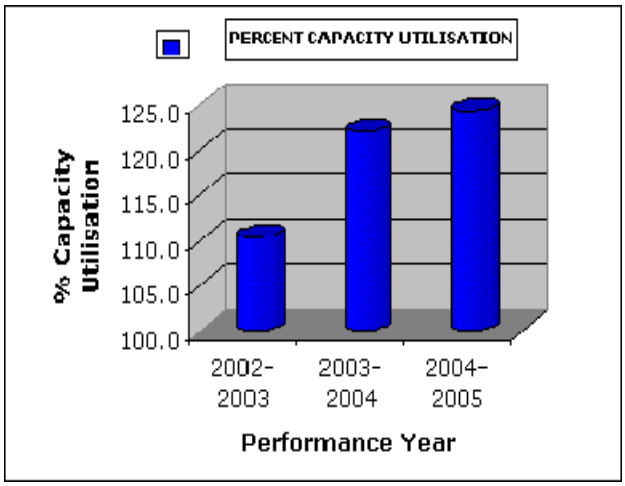
Year	Total Energy Consumption Mkcal/Ton of Urea
2002-2003	6.130
2003-2004	5.891
2004-2005	5.872



Year	Power Energy Mkcal/MWH
2002-2003	2.658
2003-2004	2.541
2004-2005	2.543



Year	Capacity Utilisation for Urea %
2002-2003	110.43
2003-2004	122.11
2004-2005	124.35



ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP:

Since commissioning, KRIBHCO is very conscious about energy consumption in the plant and has implemented several energy conservation schemes. KRIBHCO continues to strive for excellence and gives utmost importance to energy conservation by regular monitoring, analyzing fuel and utility consumption, optimizing plant operation by introducing online and offline optimizers in Ammonia plant and up keep of plant and machinery.

In pursuit of excellence in energy conservation, KRIBHCO has constituted an exclusive energy conservation cell, which is headed by GM (Tech) who is reporting to the Operations Director. This EC cell comprises of executives having experience and drawn from different disciplines and plants. This EC cell in its regular meetings deliberates and decides on the various prospective options for reducing the energy consumption in the plants.

KRIBHCO has declared its Energy Policy and volunteered its commitment towards Energy conservation. KRIBHCO has set up Quality policy and Environment policy, which have been framed integrating the energy saving objectives and Goals as well.

ENERGY CONSERVATION ACHIEVEMENTS:

Right from the inception stages, KRIBHCO has been continuously striving to reduce the energy consumption of the process plants. This has been achieved by optimizing the plant operations, implementing innovative technological changes and by increasing the reliability of the equipments, which in turn reduces the down time of the plant. Every unplanned down time of the plant increases the energy consumption due to unproductive energy consumed during startup and shut down of the plant. KRIBHCO started commercial production in 1986.

Due to the continued untiring efforts put by KRIBHCO to reduce the energy consumption, the Urea Specific energy consumption has reduced from 6.441 Mkcal/MT in the year 1987-88 to 5.872 Mkcal/MT in 2004-05. For Same Period, Ammonia Energy has reduced from 8.689 Mkcal/MT to 8.301 Mkcal/MT.

ENERGY PERFORMANCE IMPROVEMENT OVER THE YEAR 1987-88:

SR. NO	PARAMETER	SP.ENERGY		REDUCTION OVER BASE YEAR	
		AMMONIA	UREA	AMMONIA	UREA
1.0	Daily Energy during base year 1987-1988	8.440	6.327		
2.0	Daily Energy during the year 2004-2005	8.075	5.798	4.32% (Daily basis)	8.36% (Daily basis)
3.0	Yearly Energy during base year 1987-1988	8.689	6.441		
4.0	Yearly Energy during the year 2004-2005	8.301	5.872	4.47% (Yearly Basis)	8.83% (Yearly Basis)

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The following major energy saving schemes have been implemented during the year 2004-2005.

I. **Installation of Parallel Process Air Pre-Heat Coil In Ammonia-II Plant Primary Reformer Convection Zone:** This scheme helped in reducing the Stack temperature of Primary Reformer about 5 Deg C. Additional waste Heat recovery of about 0.5 Mkcal/hr has been achieved, which other wise going to atmosphere through the vent stack. Realized savings is 0.007 Mkcal/MT of Ammonia. The cost of the scheme was about Rs. 25.0 Lakhs and annual savings of Rs. 37.80 Lakhs RLNG was realized.

II. **Installation of Magnetic Resonators on Fuel Lines of Burners of Power Plant Boiler No:III for Fuel Saving/Energy Saving:** Magnetizers were installed on fuel lines at the inlet of Burners in the Boiler No:III of Power Plant. This resulted in fuel saving of about 0.754%. The scheme had been tested and about 0.0035 MKcal of energy per MT of Urea was realized. The cost of the scheme was Rs. 7.11Lakhs and annual savings realized were Rs.66.25 Lakhs of Naphtha fuel.

III. **Reuse of waste water (Tertiary treated water) from township sewage water plant as cooling tower make up:** Tertiary units were developed comprising three stages of additional filtration and chlorination so that the treated water is suitable for reuse in cooling Tower make up in the Process Plants. Water recovered is about 90 to 100 M3/hr. The cost of the scheme was about Rs 147.0 Lakhs and an annual water cost of Rs 60.0 Lakhs was saved.

IV. **Providing car-seal bypass valve for 172-C & 174-C Heat exchangers:** Car-seal bypass valves have been provided for C.W. outlet isolation valves of 172-C and 174-C heat exchangers in Ammonia-I plant. This has helped in closing the 10" inch main isolation valves and reducing the cooling water flow across these exchangers by 450 M3/hr. The cost of the scheme was 0.20 Lakhs and RLNG saving of about Rs.37.30 Lakhs was achieved.

V. **Staggered Load Operation of Steam Boilers in Power Plant:** Operating load has been staggered for the two running boilers of Steam and Power generation plant so that one set of ID & FD fans in low load operated Boiler could be stopped. This resulted in Electrical power saving of about 350 KW. No investment was required for implementing this operational change, which has resulted in saving of Aromatic Rich Naphtha Fuel having a worth of Rs 124.29 Lakhs during the year.

OUTSTANDING PERFORMANCE IN THE YEAR 2003-2004:

The overall performance of KRIBHCO during the year 2003-2004 was excellent. KRIBHCO the 18 year old vintage plant has created new records in Urea Specific Energy & Production, Ammonia Specific Energy & Production surpassing all the earlier records achieved in the previous 17 years of performance. A total of twelve new records were created and the list of Records is shown below in tabular form.

Sr.No.	Performance Parameter.	Achieved During Year 2003-2004	Previous Best Achieved during Last 17 years.	Previous Best Achieved Year
1.0	Urea Production	1773041 MT	1771511 MT	1997-1998
2.0	Ammonia Production	1117167 MT	1080487 MT	1997-1998
3.0	Urea Specific Energy	5.891 Gcal/MT	6.053 Gcal/MT	2001-2002
4.0	Ammonia Specific Energy	8.313 Gcal/MT	8.427 Gcal/MT	2001-2002
5.0	Urea Plant On-Stream Days	343.2 Days	342.6 Days	1995-1996
6.0	Bio-Fertilizers Production	536.0 MT	390.0 MT	2001-2002
7.0	Bio-Fertilizer Sales	516.0 MT	373.0 MT	2001-2002
8.0	Urea Despatch	1785206 MT	1778550 MT	1997-1998
9.0	Seed Production	1.21 Lakh Qtls.	1.08 Lakh Qtls.	2002-2003
10.0	Urea Sales	18.37 Lakh MT	17.82 Lakh MT	1991-1992
11.0	Ammonia Sales	98884 MT	88446 MT	1996-1997
12.0	Krishak Bharati Kisan Seva Kendras Turnover.	3052.0 Lakhs.	2081.0 Lakhs.	2002-2003

OUTSTANDING PERFORMANCE IN THE YEAR 2004-2005:

Again KRIBHCO the 19-year-old vintage plant has created new records in Urea Specific Energy, Production, Dispatch Ammonia Specific Energy surpassing the records set in 2003-2004 year.

Sr.No.	Performance Parameter.	Achieved During Year 2004-2005	Previous Best Achieved during Last 18 years.	Previous Best Achieved Year
1.0	Urea Production	1805500	1773041 MT	2003-2004
2.0	Urea Specific Energy	5.872 Gcal/MT	5.891 Gcal/MT	2003-2004
3.0	Ammonia Specific Energy	8.301 Gcal/MT	8.313 Gcal/MT	2003-2004
4.0	Urea Dispatch	1804668.3 MT	1785206 MT	2003-2004

ENERGY CONSERVATION PLANS AND TARGETS:

KRIBHCO desires to remain as the world-class fertilizer-manufacturing unit and it's quest for excellence in every sphere of its activity is a permanent commitment. KRIBHCO over the years achieved consistent reduction in Specific energy consumption of its products and strives to better its own record in this direction. KRIBHCO has decided to implement the following modifications to reduce the energy consumption in the plants.

Apart from the above KRIBHCO has awarded a major Ammonia Plants Revamp study job to M/S KBR-USA for evaluating the feasibility of various options for reducing the Energy consumption. The Study has been completed and Report was received in January-2005. KRIBHCO is awaiting third stage Fertilizer Policy to be announced by DOF to decide on the implementation of findings of M/S KBR revamp study.

KRIBHCO has planned to implement the following Energy saving schemes in the next two years of time:

Energy Conservation Measures. (Planned)	Anticipated Savings in		Approx Investment (Rs.lakhs.)
	Energy Value Mkcal/Year	Rs.Lakhs Per year	
a) Installation of new CO2 Absorber for CO2 & H2 recovery from 122-F flash gases in **Ammonia-I** Plant.	6394	24.2	20.0
b) Installation of new CO2 Absorber for CO2 & H2 recovery from 122-F flash gases in **Ammonia-II** Plant.	6394	24.2	20.0
c) Installation of Hydraulic Turbine on 102-F out let process condensate line for Power recovery in **Ammonia-I Plant**	853.2	3.95	10.52
d) Installation of Hydraulic Turbine on 102-F out let process condensate line for Power recovery in **Ammonia-II Plant**	853.2	3.95	10.52
e) Providing car-seal by pass valve for C.W. outlet isolation valves of 172-C & 174-C exchangers in Ammonia-II Plant	3960.0	12.67	0.3

Energy Conservation Measures. (Planned)	Anticipated Savings in		Approx Investment (Rs. Lakhs)
	Energy Value Mkcal/Year	Rs.Lakhs Per year	
d) Providing Piping to operate 159-C & 115-C in series mode on cooling water side both in Ammonia-I & II Plants.	5413	17.32	9.0
e) Installation of Heat exchanger to recover waste heat from CBD water in Ammonia-I & II Plants.	4752	15.21	5.0
f) Lining up of C-3 off gases of Urea Plants to Ammonia plant for Energy recovery.	5055.6	16.2	10.0
g) Changing fill material of Cooling Towers of Ammonia Plants.	15048	48.15	90.0
h) Suction chilling of Process Air compressors in both the Ammonia Plants	7104.2	22.73	15.0
I) Lining up Rinsing effluent water of Ammonia & Urea plants Polisher units during regeneration.	81000 M3 Water & 0.30 Lakh KWH Power	6.42	19.4
Sum Total	**55827.24**	**194.922**	**209.74**

TARGETS: **Urea Specific Energy Consumption Planned Target for the years 2005-06 & 2006-07 are as under :**

Year	Electrical*	Thermal*	Reduction over the year 2004-05	
			Electrical%	Thermal%
2004-05 (Base year)	98.7	5.621	-	-
2005-06	97.7	5.604	1.01	0.30
2006-07	96.7	5.590	2.03	0.55

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