

Khaitan Agro
(A Unit of Khaitan Chemicals & Fertilizers Ltd.)
Soya Division, Ratlam.(M.P.)

1. Unit profile

Khaitan Chemicals & Fertilizers Ltd. is an acknowledged market leader of Single Super Phosphate Fertilizer, Sulphuric acid, Soya oil & De oiled cake business. The Soya division is one of the two divisions of Khaitan chemicals & fertilizers located at Ratlam (M.P.). The Soya division was established in the year 1992 with commissioning of 400 MTPD capacity solvent extraction plant. Progressively the 100 MTPD oil refinery plant was commissioned in the year 2000 and the new 1200 MTPD solvent extraction plant was commissioned in the year 2005 along with the 1000 Kw co-generation extraction cum back pressure steam turbine and 18 MTPH steam generation coal based boiler.

This unit produces one of the best quality Soya oil in the country meeting the international quality parameters. The refined oil is 100% consumed in the domestic market while de-oiled cake is 100% exported. The by-products are wet gums, acid oil and deo-distillate fatty acid.

The company has installed lecithin plant for captive consumption of wet gums and hypro, de-hulling unit to produce high protein DOC in the year 2007-08. The unit has crushed 108842 MT Soya seed and produced 17946 MT Refined Oil, having turn over of Rs.266.65 Crore in the year 2007-08



2. Energy Consumption

The company gives top most importance to energy conservation, as the cost of energy is above 50% of total manufacturing/ processing cost of Soya oil. There has been continuous reduction of specific energy consumption since last 3 years, which shows the sustained efforts being put in to conserve energy on continual basis. The various energy conservation measures have been taken as on going practice. The in put for various energy conservation schemes comes from brain storming, MIS reports on monthly basis, Internal and External audit reports generated from Integrated Management Systems i.e. ISO 9001:2000, ISO 14001:2004 and OHSAS 18001:1999,

Energy Audit reports from experts/organizations, CII National Reports and SOPA (Soyabean Processors Association of India) Reports.

Energy Cost

Description	unit	2005-06	2006-07	2007-08
Electrical Energy	Kwh/MT	197.72	329.69	258.99
Thermal Energy	MKcal/MT	202.93	458.75	339.03
Total manufacturing cost	Rs. Lakhs	713.80	1540.51	1176.93
Total Energy Bill	Rs. Lakhs	400.65	788.44	598.02
Energy cost as % of manufacturing cost	%	56.13	51.18	50.81

Specific Power and Thermal Energy Consumption

PRODUCT	YEAR	SPECIFIC POWER CONSUMPTION KWH/MT	SPECIFIC THERMAL ENERGY CONSUMPTION MKCAL/MT
Refined Oil	2005-06	59.59	0.4115
	2006-07	58.60	0.4062
	2007-08	57.01	0.4007
Seed Crushing	2005-06	34.28	0.2618
	2006-07	34.00	0.2605
	2007-08	33.50	0.2553

3. Energy conservation commitment, Policy and Organizational setup

KCFL visualized importance of energy conservation while implementing Quality Management System ISO 9001:2000 in the year 2003 to achieve continual improvement on electrical power and fuel consumption. While implementing Environment Management System ISO 14001:2004, the emphasis has been centered on conservation of natural resources, which also includes power, fuel, air, water etc. The management programme for continual improvements are identified and implemented under ISO14001:2004 and OHSAS 18001:1999 to sustain the certifications. The energy conservation is a part of our operations and operating practices. The core energy conservation team is led by Senior V.P.(P&D) having members as V.P.(Works) Head of Soya Division Operations, G.M.(Operations- Fertilizers Divisions), GM (Finance and commercial) and Energy Manager. Sub committees are formed in each unit i.e. at NIMRANI, NIMBAHERA, JHANSI, RATLAM and MALWAN. The sub committee members include HOD Electrical and Instrumentation, HOD production, HOD maintenance, Supervisors and Head of the Unit. All the sub committees are meeting at their respective units on quarterly basis. The co-ordination and secretary ship is done by the energy manager at RATLAM works. All the necessary instruments for energy conservation are kept at RATLAM works under the control of energy manger.

The constitution of energy cell is given as per annexure III and copy of the company policy is given as per Annexure - IV

4. Energy Conservation Achievement.

During the year 2007-08 the unit implemented 12 major energy saving ideas generated through periodic brain storming sessions.

The annual savings of **Rs. 9.59** Lacs was achieved with an investment of **Rs. 20.07** with payback period of approximate **6 months** only. It has resulted in reduction of 4.33% and 2.27% in Electrical Energy and 2.62% and 2.48% in Thermal Energy over the year 2005-06 for Refined Oil and Seed Crushing respectively as shown below.

PRODUCT	YEAR	KWH/ TONNE	% REDUCTION OVER 2005-06	MKCAL/ TONNE	% REDUCTION OVER 2005-06
RO	2005-06	59.59		0.4115	
	2006-07	58.60	1.66%	0.4062	1.29%
	2007-08	57.01	4.33%	0.4007	2.62%
SEED CRUSHING	2005-06	34.28		0.2618	
	2006-07	34.00	0.82%	0.2605	0.50%
	2007-08	33.50	2.27%	0.2553	2.48%

Major Project implemented for Energy Conservation during 2007-08

- P1 Installation of Fan less mist cooling tower in Oil refinery for dirty water cooling as replacement to conventional evaporative cooling tower



1 No. fan less mist cooling spray tower was installed in Oil refinery plant for dirty water cooling as replacement to conventional cooling tower using 15 Kw forced draft fan. This has resulted power saving of 10 Kw. The fine mist is formed through the specially designed nozzles. The cooling is very effective. The cold water temperature achieved is 2° above the wet bulb temperature.

Investment : Rs.1.03 Lakhs
Saving : Rs0.35 Lakhs

- P2 Installation of 20 HP VFD on dirty water cooling tower pump-I in oil refinery.



1 No. 20 HP VFD (AC Drive) was installed on dirty water cooling tower pump-I in oil refinery Plant. This has resulted power saving of 2Kw.

Investment : Rs.0.76 Lakhs

Saving : Rs.0.25 Lakhs

P3 Trimming of pump impeller of dirty water cooling pumps II in oil refinery.



The trimming of the pump impeller was done for dirty water pump-II in oil refinery Plant from 219 mm dia meter to 208 mm dia meter. This has resulted power saving of 1.4Kw.

Investment : Rs.0.05 Lakhs

Saving : Rs.0.25 Lakhs

Pay back : 2.5 Months

P4 Installing 25 HP, 20 HP and 7.5 HP VFDs on ID Fan, FD Fan and PA Fan respectively for 5 MTPH coal base boiler.



The 25 HP, 20 HP and 7.5 HP VFDs were installed on ID Fan, FD Fan and PA Fan respectively for 5 MTPH coal base boilers. This has resulted power saving of 10Kw. And coal saving of 21.450 MT as combustion efficiency due to better control of excess air as compared to manual controls.

Investment : Rs.1.9 Lakhs

Saving : Rs.0.30 Lakhs power

Rs.0.80 Thermal Energy

Pay back: 1.7 years.

P5 Installation of 125 HP VFD on raw water pumps in solvent extraction plant I.



The 125 HP VFD was installed on raw water pumps in solvent extraction plant I. This has resulted power saving of 13.5Kw.

Investment : Rs.3.45 Lakhs

Saving : Rs.0.75 Lakhs power
Rs.7.94 Thermal Energy

P6 Installation of 20 HP VFD each on 736 A dust blower and 736 B exhaust blower in SEP PREP I



The 20 HP VFD each on 736 A dust blower and 736 B exhaust blower were installed in SEP PREP II. This has resulted power saving of 5Kw.

Investment : Rs. 1.31 Lakhs

Saving : Rs.0.75 Lakhs power

Pay back: 1.8 years

P7 Installing 30 HP, 40 HP and 20 HP VFDs on 36A/A hot air blower, 36B air blower and 36A/B Exhaust air blower



The 30 HP, 40 HP and 20 HP VFDs were installed on 36A/A hot air blower, 36B air blower and 36A/B Exhaust air blower. This has resulted power saving of 13.5Kw.

Investment : Rs. 3.85 Lakhs

Saving : Rs.1 Lakhs power

P8 Installation of 5 HP Grund Foss make BFW pump replacing conventional KSB make pump for 5 MTPH coal base boilers.



The 5 HP Grund Foss make BFW pump was replaced with conventional KSB make pump for 5 MTPH coal base boiler. This has resulted power saving of 1Kw.

Investment : Rs.0.48 Lakhs

Saving : Rs.0.15 Lakhs power

P9 Installing 7.5 HP Grund Foss make BFW pump replacing conventional KSB make pump for 7 MTPH coal base boiler.



The 7.5 HP Grund Foss make BFW pump was replaced with conventional KSB make pump for 7 MTPH coal base boiler. This has resulted power saving of 1.3Kw.

Investment : Rs.0.87 Lakhs

Saving : Rs.0.15 Lakhs power

P10 Installation of heat exchanger for cooling crude oil by utilizing waste heat to heat Miscella process oil to save steam.




The heat exchanger was installed for cooling crude oil by utilizing waste heat to heat Miscella process oil to save steam. This has resulted coal saving of 90.701 MT.

Investment : Rs.3.00 Lakhs


Saving : Rs.3.39 Lakhs power

Pay back: 11 Months

- P11 Installation of 30 HP, 30 HP and 10 HP VFDs on ID Fan, FD Fan and PA Fan respectively for 7 MTPH coal base boiler.

	<p>The 30 HP, 30 HP and 10 HP VFDs were installed on ID Fan, FD Fan and PA Fan respectively for 7 MTPH coal base boilers. This has resulted power saving of 12.5Kw. And coal saving of 32.346 MT as combustion efficiency due to better control of excess air as compared to manual controls.</p> <p>Investment : Rs.3.32 Lakhs Saving : Rs.0.50 Lakhs power Rs.1.20 Thermal Energy Pay back: 2 years.</p>
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- P12 Trimming of 10 HP Hot Well pump impeller in refinery from 318mm to 306 mm Diameter.

	<p>The trimming of the pump impeller was done for dirty water pump-II in oil refinery Plant from 219 mm dia meter to 208 mm dia meter. This has resulted power saving of 1Kw.</p> <p>Investment : Rs.0.05 Lakhs Saving : Rs.0.15 Lakhs Pay back : 4 Months</p>
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5. Energy conservation plans and targets.

S. N	Description	Saving in Lakh KWH	Saving Rs. In lakhs	Investment Rs. In lakhs
2008-09				
	Expansion of oil refinery capacity 130 MTPD from 100 MTPD	1.29 Lakhs KWH	6.45	9.00
	Mist cooling for clean water in refinery	0.46 Lakhs KWH	2.30	2.25
	Improvement in Boiler efficiency by 2% & Installation of online monitoring of O ₂ .	901.00 Million Kcal.	7.44	8.00
	Modification of HP /LP ratio of steam turbine	1315.000 Million Kcal.	10.86	1.00
	Higher Utilization and Throughput of SEP	1.50 Lakhs KWH	7.50	1.00

S. N	Description	Saving in Lakh KWH	Saving Rs. In lakhs	Investment Rs. In lakhs
2009-10				
	Flash steam recovery from steam condensate	192.50 Million Kcal.	1.59	4.00
	Improving plant capacity utilization by installing balancing equipments	0.75 Lakhs KWH	3.75	1.00
	Mist cooling for 400 MTPD SEP Plant.	0.50 Lakhs KWH	2.50	2.50

6. Environment and safety

The company is committed to preserve its environment and safety of employees. The company is certified for ISO 9001:2000, ISO 14001:2004 and OHSAS 18001:1999 Management systems by BSI management systems (India) P Ltd. New Delhi,. QMS 9001:2000 is certified from the year 2003 and EMS ISO 14001:2004 and OHSAS 18001:1999 from the year 2005, Now the Company is in process of upgrading OHSAS 18001:1999 to OHSAS 18001:2007, which is scheduled for certification in the month of January 2009.

The following major improvements have been achieved during last three years

A Effluent water

"Zero liquid discharge system" has been maintained at the unit, thereby no effluent water was discharge out side the boundaries of the unit. Micro enzyme based treatment has been used in effluent treatment plant which has reduced generation of lime sludge as solid waste. Treated water within permissible MPPCB norms is used for horticulture applications within the premises of the unit.

B Air

The bag filters have been installed on coal based boilers and thus keeping air emission norms within the permissible limits of MPPCB. Work environment monitoring is being done on periodical basis including noise. On and above the legal requirements the efficiency of the Hexane recovery system has been improved in solvent extraction plant resulting into improved work environment and lower specific Hexane consumption per ton of seed crushing.

C Solid Waste

Lime sludge is generated in the effluent treatment plant, which is dispose off to M/s. MP Waste Management Pvt. Ltd., Pithampur as Authorised by MPPCB BHOPAL,