

Jubilant Organosys Ltd

Jubilant Organosys Ltd. is one of the largest Custom Research and Manufacturing Services (CRMAS) companies in India and a leading manufacturer of acetyl products, pyridines, pyridine derivatives and fine chemicals. The company is amongst the global leaders in the manufacture and development of pyridine and pyridine derivatives.

*The meaning of "**Organosys**" is derived from an amalgamation of "Organic" i.e., life and nature and "**Sys**" i.e., systems, synthesis and science. This combination makes **Jubilant Organosys a Science Active Company** that is focused on moving up the value chain through research-based knowledge industries.*

The net sales of Jubilant Organosys Limited recorded a growth of 29.8% to Rs. 11145 Million in 2004-05 as compared to Rs. 8690 Million in the previous year. The corporate headquarters are at NOIDA (Near Delhi). The company is further supported by an international subsidiary in U.S.A. and representative office in China. Global customers in more than sixty countries rely on our Science Active quality products. Our export revenues were Rs.3644 million in 2004-05

Business Operation – The business of Jubilant Organosys Limited is organized into three divisions. The individual businesses have fully integrated strategic growth units. The science Active products from the business units serve a number of industries such as pharmaceuticals, agrochemicals, textile, construction, food & beverages and paper & packaging.

FACTS ABOUT THE COMPANY :

Jubilant Organosys Limited is the largest specialty chemical company of India and a leading global manufacturer in defined chemical categories viz. second largest in pyridine and its derivatives, third largest in solid polyvinyl acetate and leading positions in acetyls and other specialty chemicals. These include pharmaceuticals & life science chemicals, performance chemicals, organic intermediates, agri products and a range of other specialty chemicals.

Jubilant Organosys Ltd. was incorporated in the year 1978 under the Companies Act, 1956. The company is part of Jubilant Corporation, which also includes Jubilant Enpro, Domino's, Jubilant Biosys. The manufacturing facilities located at Gajraula in JP Nagar District, U.P.

The company established an R&D group in the year 1982 and the R & D was recognized by the Dept. of Science and Technology (DST). The groups have developed a number of products, which have been commercialized over a period of time. The various groups of the R&D carry out research in the field of Polymers & adhesives, Organic chemicals, Biotechnology and Environment.

DIMENSIONS OF THE SUSTAINABILITY

At Jubilant, the path to sustainability has four dimensions.

Eco-efficiency

- Maximize the use of renewable raw materials and non-conventional energy, conservation and reduction in the use of energy and resources as well as reduction and recycling of waste.
- Design and make products that are safe and environment friendly.

Environmental Protection, Safety & Health

- Take utmost care of the environment and reduce the impact of our operation on it.
- Protect the health and safety of our employees by encouraging and implementing best practices in occupational health, process safety and transportation safety.
- Actively participate in mitigating global environmental concerns.

Economics

- Continue to enhance value by achieving an average return on invested capital higher than the weighted average cost of the capital.
- Provide innovative products and cost-effective solutions to customers.
- Achieve a competitive advantage by expanding our leadership position in India and globally by achieving excellence in operational efficiency.
- Maintain transparency in sharing information.

Human Resources

- Train and develop our people to optimize their productivity.
- Inspire confidence and empower them to take decisions.
- Practice open dialogue – with employees, customers, government agencies, trade associations and with communities around all our facilities.

MORE ABOUT THE COMPANY :

The three main divisions are:

- Organic Intermediates Specialty & Fine Chemicals Division
- Performance Chemicals Division
- Plant Health & Animal Nutrition Division

I : Organic Intermediates, Speciality & Fine Chemicals Division:

The Organic Intermediate business is the largest producer of acetyl range of products in India and largest producer of acetic acid from renewable resources worldwide. Entire ethanol production, sourced in-house from one of the **world's largest** distilleries, is **utilized captivity for down stream**. This makes us reliable and consistent supplier of ethanol based products.

Pyridine, a basic organic chemical, is an excellent solvent and versatile building block in agrochemical and pharmaceutical industries. It acts as an acid scavenger and can catalyse reactions. The major uses of pyridine is conversion to bipyridyl compound for agrochemicals. Chlorinated, brominated and hydrogenated pyridine and pyridine derivatives are popular intermediates in the pharmaceutical industry

Products	Principal Applications
Acetaldehyde	Organic chemical
Glacial Acetic Acid	Ethyl Butyl and other esters, Vinyl Acetate, Acetic Anhydride, PTA, Dyes, Drugs, Agro-chemicals, Textiles etc.
Acetic Anhydride	Dyes-stuffs, Paracetamol, Aromatic chemicals, Cellulose acetate, Agro-chemicals, Aspirin.
Ethyl Acetate	As a solvent

Vinyl Acetate	Polyvinyl Acetate & co-polymers, Polyvinyl alcohol & compositions, used in adhesives, coatings, inks and fibers.
Pyridine Alpha-Picoline Beta-Picoline Gama-Picoline 2-Cyano-pyridine 3-Cyano-pyridine 4- Cyano-pyridine 2-3-5-Collidine 2-3 Lutidine, 2-6 Lutidine, 3-5 Lutidine Pyridine hydro-bromide Pyridine hydro-chloride	Herbicides, Biocides, Pharmaceuticals Vinyl Pyridine, Agro-chemicals Insecticides, herbicides, vitamins Isoniazid (anti TB drug), 4-vinyl pyridine Agro-chemicals Niacinamide Isoniazid Intermediate in pharmaceuticals and agro-chemical products Pharmaceuticals Pharmaceuticals Pharmaceuticals

Custom Research & Manufacturing Services:

Jubilant Organosys is “**One stop shop**” for giving pharma companies services right from early stage development phase to commercial production which include product development, process development and technology scale-up, in-house research and integrated engineering capabilities complying quality and environmental regulations. Its strong IT & communication network and efficient supply chain management systems support effective solutions.

We offer seamless scale up from grams to Metric Tonne quantities:

- Grams quantities of intermediates for API, agrochemical and other industries can be offered from our lab facilities.
- Smooth scaling-up process from grams quantities in lab to kilograms and few MTs in our **kilo lab** facilities. Our process of manufacturing at this stage is completely developed and ready to cater large-scale requirements.
- Commercial quantity requirements (5 to 100MTs and above) can be produced at our multipurpose facilities using process developed at the lab and kilo lab levels of manufacturing.

Chemistry services:

Jubilant offers chemistry Services on **molecule or FTE** basis for advance intermediates and NCEs in milligrams to grams quantities for drug discovery, pre-clinical and clinical studies.

Multipurpose Production Facilities:

Our multipurpose production facilities at Gajraula, **strictly operating on cGMP guidelines**, is the latest addition. The facility is used to manufacture wide range of intermediates for pharmaceutical, agrochemical and other industrial applications. Multipurpose facilities are supported by process development, analytical laboratories, solvent recovery and recycling facilities and incinerators for both organic and inorganic effluents.

II : Performance Chemicals Division:

The Performance Chemicals business is a recognized leader in the manufacture of products such as emulsion polymers, adhesives, wood finishes, speciality polymers, Liquid CO₂, and their application to industry segment as diverse as tyres, textiles, construction, decorative paints, packaging, paper coating, food & beverages. The business works closely with customers, using research and development to introduce new products to suit the end consumer's needs.

The products are sold under the brand names vamicol, vamigum, shakticol, vambond and vamifix. An umbrella brand **JIVANJOR** has been adopted for the branded products of Jubilant Organosys Limited.

Products	Principal Applications
Emulsion Polymers	Paint Coating, Textile & Lamination, Pressure sensitive packaging, Cigarettes & Adhesive.
Solid Polyvinyl Acetate	Chewing Gum / Bubble Gum base
Hot Melt Adhesives	Book binding, Packaging and Labeling, Telecom cables, and white goods electronics.
Flexible Packaging Adhesives (Polyurethane)	Lamination – ➤ Film to film, Metalized BOPP ➤ Metalized PET
CO₂	Soft drinks and food, Green houses, Fire extinguishers, Shield gases for MIG, MAG, welding for Ferro steel material.
Foot wear and leather products adhesives	Foot wear substrates, Leather garments, Belts, Purses, Upholstery,
Art and Craft adhesives	Art and craft adhesives, Bonding of papers, Card boards, Fabric, Rubber and leather substrates,
Wood finishes chemicals	Furniture, Interiors,

III : Agribusiness Division:

The growth unit focuses on improving soil health and providing crop nutrition and Crop protection products for farmers. The core products manufactured by this unit include Fertilisers,

Organic manures and Insecticides. The endeavor of this unit is to provide refined technology for the benefit of farmers by working with them, anticipating their needs and doing so with a more environmental friendly approach. The range of products offered are in the following segments of use

➤ **Soil Health** : Ramban Organic Manure (ROM)

This is an eco-friendly manure manufactured by recycling agricultural solid waste into a beneficial “Soil Enricher” by composting and value addition. ROM helps to maintain soil fertility and protects soil health making it an ideal partner for sustainable agriculture.

➤ **Crop Nutrition** : Ramban – Single Super Phosphate (SSP)

This is a high quality Phosphorus and Sulphur supplying fertilizer

- Ramban – SSP is the largest selling brand of SSP in Northern India and is the preferred brand amongst the farmers.
- This plant is the first ISO 9002 accredited SSP manufacturing facility in the country with an annual capacity of 1,32,000 TPA.
- It has bagged the Environment Protection Award several times. The latest being for the year 2000-2001.
- The plant has a 180 tons per day capacity Sulphuric Acid (98.4% conc.) manufacturing unit.

Products	Principal Applications
Powdered Single Super Phosphate	Useful for short duration crops such as Oil seeds, Pulses and Vegetables.
Granulated Single Super Phosphate	Effective and useful in long duration crops like Sugarcane , Wheat and Paddy.

- Ramban SSP gives pronounced results in Sulphur deficient soils and Sulphur loving crops like Oil seeds and Pulses.
- Ramban SSP increases oil content and protein in seeds.
- Besides improving the quality of produce, significant yield improvements with the use of Ramban SSP have been reported.
- Ramban SSP is also a good soil conditioner and helps to reclaim the alkaline soil.

❖ **Technical Capabilities**

The company has a large technical design, Project and Engineering department, which are well equipped with modern engineering tools, such as process simulation, optimization and drafting software packages. All plant expansions, modernization & designs are mastered and improved from the basic technology received through the licensor. The group has the capability to offer basic and detailed engineering services for its range of plants & products.

❖ **Sound Communication Systems**

The company has established an elaborate communication network between its various locations. The plant and branches are connected with HO through lease line network, V-Sat & telephones. It has established a network through E-mail among all plants, branches & HO. It has established LAN at various locations, which is being further strengthened to make the company utilize the potentials of efficient network communications. A high level of computerized operation has been achieved in the field of financial accounting, stores, sales, purchase, dispatch and personnel functions through the use of ERP system BaaN.

❖ **Self sufficiency on Steam & Power front**

The company has installed adequate captive steam & power generation capabilities through Boilers, Steam Turbines and Diesel Generating Sets to ensure uninterrupted operation of the plants while utilizing the co-generation concept.

(ii) ENERGY CONSUMPTION :

The company has accorded top priority for minimizing energy consumption by putting consistent efforts towards optimization of operating / process parameters, modernization / upgradation of plant / equipment. The main energy source is in the form of Coal, FO, LDO, HSD and Biogas (own generation) and electricity. The company has 100 % self-sufficiency on power front.

The annual energy bill of the company for the year 04-05 was Rs.7394 lacs and was 19.7 % of the total manufacturing cost. Continuous efforts have been made to bring down the figure from 24.6 % during 1997-98 indicating a significant reduction in the energy expenses as compared to previous years, inspite of rising prices of fuels and higher production levels. This has become possible by optimization of process parameters, technology innovation, R & D at the plant level and through analysis of Energy data at various levels. The energy consumption trends for the last five years as a function of the manufacturing cost for the site have been presented in the Table below.

DESCRIPTI ON	UNIT	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
Electrical Energy	Lacs KWH	985	1102	1195	1231	1245	1298	1278
Thermal Energy	M kcal	473018	519998	592084	566360	543705	645200	479086
Manufacturi ng Cost	Rs.lakhs	15240	19424	20695	22223	25376	29976	37474
Total Energy Bill	Rs.lakhs	3743	4266	5513	4875	4924	6541	7394
Energy as % age of total Cost of Manufacturi ng	%	24.6%	22.0%	26.6%	21.9%	20.9%	21.8%	19.7%

Note: Administrative expenses are not considered in Manufacturing cost

(iii) ENERGY CONSERVATION COMMITMENT, POLICY & SETUP :

Commitment :

The top management is committed towards Energy Conservation. There is a full-fledged Energy Cell for close monitoring and control of Energy consumption parameters. Losses through the distribution network are monitored on regular basis and analyzed for preventive and corrective action.

Energy saving proposals are prepared by the plant heads involving section incharges, shift incharges and the workmen. The schemes are first discussed with the Head of Engineering / Head of CRI (Cost reduction initiative) and once the schemes are found feasible with 1-2 years pay back, they are forwarded to the top management for approval. These proposals are taken in to implementation once the top management gives the approvals.

The head of CRI (Cost reduction initiatives) is functionally responsible for...

1. Identification area for improvement in Yield of finished product, Specific Energy consumption, Quality improvement and Capacity enhancement.

2. Bringing in operations ease, improving process safety and minimizing damage to the environment.
3. Finding alternative technologies for processing fine chemicals.
4. Creating value added outlet for the waste products

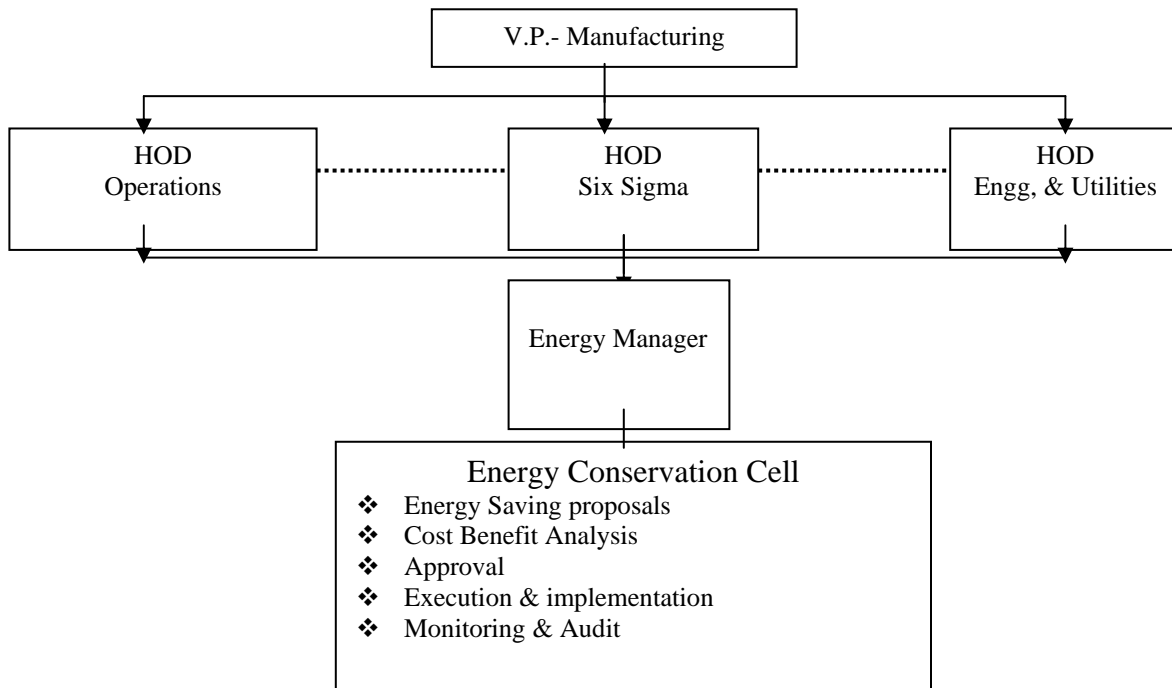
Jubilant Energy Policy :

Our policy is to manufacture and supply products with the lowest specific energy consumption.

We target to achieve this through..

- ❖ Maximizing utilization of non conventional fuel
- ❖ Continuous benchmarking with the global best in the industry.
- ❖ Effective management of energy resources through good operating and maintenance practices.
- ❖ Incorporating energy efficient technologies
- ❖ Training & developing awareness about energy conservation programme among employees.

Energy Conservation Team Setup:



(iv) ENERGY CONSERVATION ACHIEVEMENT :

Jubilant Organosys Limited has consistently achieved reduction in Energy consumption at the same time increasing production and productivity consistently. The company has improved its own earlier achieved specific consumption, norms consistently.

Various Energy Conservation schemes in house & suggested by external agencies were taken up on continuous basis, as a result there is a steady decline on the energy consumption of our major products as following in the next page.

Energy Conservation Initiatives - Completed projects 2004-2005	
Project No.	1
Description:	Reduction of Steam Consumption in Distillery by (1) Optimizing cleaning frequency of PHEs of Distillation Plants for heat recovery from Spent Wash. (2) Converting the existing single pass PHE's to multipass system (3) Diverting scrubber water for molasses dilution for alcohol recovery. This water has 2 % alcohol & earlier it was being sent for distillation & was diluting the F/W containing 7.8 % Alcohol.
Target CTQ	MT of Steam Consumed per KBL of Alcohol Produced.
Baseline Information	
CTQ Value:	1.76
Post Implementation Information	
CTQ Value:	1.6
Implementation Status	
Capex No.	BB-7354
Investment	Rs. 13.6 lacs
Fuel Savings (Coal)	2061 MT
Savings accrued till 31-Mar-05	Rs. 43 Lacs

Project No.	2
Description:	Reduction of power consumption in distillery by (1) Trimming the impellers of Fermenter's circulation pumps having a capacity & head of 450 m3/hr & 25 mtr against process requirement of 450 m3/hr 10 mtr thus reducing the power requirement by approx 20 kW per hr of operation. (2) Providing 100 m3/hr capacity pump with 15 mtr head to transfer F/W from fermenter nos. 1-4 to holding vessel & stopped using the F/W circulation pumps of 450 m3/hr & 25 mtr head for this service thus reducing power requirement by 35 kW per hour of operation.
Target CTQ	W of power Consumed per KBL of Alcohol Produced.
Baseline Information	
CTQ Value:	110 kW/KBL (@ Low capacity operation of Distillery)
Post Implementation Information	
CTQ Value:	90 kW/KBL (@ Low capacity operation of Distillery)
Implementation Status	
Capex No.	BB-7321
Investment	Rs. 2.5 lacs
Power Savings	4.33 lacs kWh
Savings accrued till 31-Mar-05	Rs. 12.4 Lacs

Project No.	3
Description:	Reduction in power consumption at Biogas plant by Increasing organic loading in one of the two MURs/BCCRs and stopping the other MUR/BCCR without effecting the Biogas generation. Improved Biogas hydraulics by header replacement with improved design.
Target CTQ	Average Power consumption for Biogas plant in KWH/day
Baseline Information	
Description:	To reduce Power consumption by 20 % in Biogas generation
CTQ Value:	Average Power consumption for Biogas plant 20822 KWH/day
Post Implementation Information	
Scheme implemented	Biogas-II plant gas header connected to gas header of Biogas-I plant: One Blower of 95 kw is stopped Replacement of BCCR-I & II gas header to gas header of biogas -I plant done: Existing line Pressure drop was high. Proper line installed and hence stopped 30 kw Blower. Increased the organic loading on MURs and spare one MUR-VI without effecting the biogas generation: Due to sparing MUR-VI, Total 183 kw power driving equipment have been stopped.
CTQ Value:	Average Power consumption for Biogas plant 17522 KWH/day
Implementation Status	
Investment	14 Lacs
Power Savings	10.6 lacs kWh
Savings accrued till 31-Mar-05	Rs 30.3 Lacs
Project No.	
4	
Description:	Reduction of Power consumption Norms for 3CP production
Target CTQ	Power consumption norm kWh/MT
Baseline Information	
Description:	Base line Power Consumption Norms based on last 15 month data (May-03 to Aug-04)
CTQ Value:	Power consumption Norms (Water base): 1347 KWH/MT and Power consumption Norms (Air base): 2140 KWH/MT
Post Implementation Information	
Scheme implemented	Process Air for 3CP reactor was supplied by two compressors in which the air venting was high due to excess air available. Air requirement was optimized by pulley size adjustment thereby reduced the air venting.
CTQ Value:	Power consumption Norms (Water base): 1138 KWH/MT and Power consumption Norms (Air base): 1800 KWH/MT
Implementation Status	
Capex No.	No capex was raised to complete above modifications.
Investment	Nil
Power Savings	1.88 lacs kWh
Savings accrued till 31-Mar-05	Rs 5.4 Lacs

Project No.	5
Description:	Reduction of LDO consumption by 18% in Hot oil furnace for 3CP production
Target CTQ	LDO Consumption in 3-CP production in kL/MT.
Baseline Information	
Description:	Base line LDO Consumption Norms based on last 12 month data (April-03 to April-04)
CTQ Value:	LDO consumption Norms (Water base): 0.1486 KL/MT and LDO consumption Norms (Air base): 0.223 KL/MT
Post Implementation Information	
Description:	(a) We were loosing @ 61000 Kcal/hr heat due to non-insulated process air line of superheater from the compressor discharge. The discharge temperature of the compressor is 85 °C whereas, at the inlet of superheater is 45 °C. <i>Insulation Job completed, Air temp improved from 45 to 70°C</i>
	(b) DM water is which used for cooling of Hot oil to maintain the Reactor temp was optimised as there are provision to feed steam in place of DM water. <i>Till date we are able to reduced DM water to 50-100 kg/h, based on Heating furnace minimum turndown capabilities.</i>
CTQ Value:	LDO consumption Norms (Water base): 0.133 KL/MT and LDO consumption Norms (Air base): 0.183 KL/MT
Implementation Status	
Capex No.	No capex was raised to complete above modifications.
Investment	Rs 2.0 Lacs for insulation of Air line
Fuel Savings (LDO)	37.6 KL
Savings accrued till 31-Mar-05	Rs 8.75 Lacs
Remarks	In March-05, Rs 53 Lacs capex has been approved to install a Process air-Reaction product heat exchanger to avoid the Hot oil furnace in steady state. Material procurement and implementation is under progress.
Project No.	6
Description:	Reduced steam consumption in 4CP by effective utilisation of flash steam and condensate for hot water generation.
Baseline Information	
Description:	L.P.(2 kg/cm ²) Steam was used to generate the Hot water for 3CP batch distillation column.
CTQ Value:	Steam Consumption Rate = 200 kg/h (1600 MT/year)
Post Implementation Information	
Description:	Steam condensate (with flush steam) from jacketed lines of 4CP batch column was being drained as waste. The same heat energy is being utilised to cater enthalpy required to maintain Hot water temperature at 70-80°C instead of using steam.
CTQ Value:	Steam Consumption reduction by 80 kg/h (640 MT/year)
Implementation Status	
Capex No.	No capex was raised to complete above modifications.
Investment	Nil
Fuel Savings (COAL)	191.8 MT
Savings accrued till 31-Mar-05	Rs 4 Lacs

Project No.	7
Description:	Generation of Chilled water from Ammonia Vaporization in P&P Plant / 3-CP resulting in Power Saving
Baseline Information	
Description:	To reduce Power consumption from 154.5 KWH per MT of P&P (Chilled water Power only) to 100 KWH per MT of P&P (Chilled water Power only) and Power and steam saving in 3-CP Plant resulting in an estimated saving of Rs 38.0 Lacs / Annum.
CTQ Value:	Average Power consumption for P&P plant for Chilled Water is 154.5 KWH/MT
Post Implementation Information	
Description:	<p>Approx 2000 Kg/Hr ammonia is used in P&P Plant as major Raw material (equivalent to 175 TR chilled water generation) - Approx 300 Kg/Hr ammonia is used in 3-CP Plant equivalent to 30 TR chilled water generation.</p> <p>Old Chilling Unit based on Ammonia vaporisation was not efficient and capacity was limiting (100TR) - Old Unit of P&P Plant (100 TR) shifted to 3-CP Plant to generate chilled water from ammonia vaporisation .</p> <p>A New Chilling Unit based on Ammonia vaporisation (200 TR) is installed in P&P plant to cater the chilled water requirement in P&P Plant - Unit yet to be commissioned. These will results in saving of Rs 5.6 Lacs on account of Power saving and 7.9 Lacs on account of steam saving.</p> <p>This results in stopping of One No 110 KW Compressor in Utility area .</p>
CTQ Value:	Average Power consumption for Chilled water in P&P plant 100 KWH/MT
Implementation Status	
Capex No.	BB7306
Investment	37.99 Lacs
Power Savings	6 lacs kWh
Savings accrued till 31-Mar-05	Rs 17.19 Lacs (In P&P Plant)
Project No.	8
Description:	Reduced Batch Distillation Time in Azeo Column of Pyridine & Picoline Plant
Baseline Information	
Description:	There are thre Azeo Column in P&P Plant for distillation of Pyridine and Beta Picoline. The Average batch distillation time was 96 Hrs for Azeo-I, 84 Hrs for Azeo-II and 144 Hrs for Azeo-III .
CTQ Value:	To reduce Batch distillation time from 96 Hrs to 80 Hrs in Azeo-I, from 84 Hrs to 72 Hrs in Azeo-II, from 143 Hrs to 124 Hrs in Azeo-III column

Post Implementation Information	
Description:	<p>The bottom stream of Pyr-NO Column is fed in Azeo-I & II Column for distilling Pyridine</p> <p>The bottom stream of Residue Column is fed in Azeo-III Column for distilling Beta Picoline</p> <p>A decanter was installed for better performance of Pyr-NO Column (This results in low impurity in Feed of Azeo-I&II Column)</p> <p>Performance of NO-Pyr Column is also dependent on Feed to DM water ratio . For better monitoring, Metal Tube Rotameter with DCS output for feeding DM water in place of glass tube rotameter was installed.</p> <p>A Steam Ejector was installed for better operation of Residue Column .(This results in low impurity in feed of Azeo-III Column)</p>
CTQ Value:	Batch distillation time reduced from 96 Hrs to 84 Hrs in Azeo-I, from 84 Hrs to 77 Hrs in Azeo-II, from 143 Hrs to 124 Hrs in Azeo-III column
Implementation Status	
Capex No.	BB7262
Investment	2 Lacs
Savings accrued till 31-Mar-05	Rs 0.9 Lacs (In P&P Plant) + Batch Distillation capacity increase by approx 1800 TPA
Project No.	9
Description:	Reduced LDO Consumption in Pyridine Plant by optimising Air Requirement to Reactor
Baseline Information	
Description:	To reduce average LDO consumption in P&P Plant from 0.078 KL/MT to 0.03 KL/MT of Product in P&P Plant . (The base line information was based on Data from Dec- 03 to Mar-04)
CTQ Value:	Average LDO consumption in P&P Plant 0.078 KL/MT.
Post Implementation Information	
Description:	<p>In P&P Plant, there are three furnaces which were operated all the time to maintain the temp of regenerator . Air into Regenerator was optimised from 1800 Kg/hr to 1200-1400 Kg/hr to reduce catalyst consumption in P&P Plant . This optimisation of air also resulted in reduction of heat loss, which we were providing by furnace. Earlier Furnace was ON all the time. Now furnace is operated at the time of startup only.</p> <p>By above, we were able to closed down to Furnace. By improving insulation, we closed down 3rd Furnace also. This reduction of Heat loss resulted in saving of LDO consumption (from 0.078 KL/MT to less than 0.03KL/MT) in P&P Plant.</p>
CTQ Value:	Average LDO consumption in P&P plant 0.03 KL/MT
Implementation Status	
Capex No.	Nil
Investment	Nil
Fuel Savings (LDO)	567 KL
Savings accrued till 31-Mar-05	Rs 131.84 Lacs (In P&P Plant)

Project No.	10
Description:	Reduction in Power Consumption in CO2 Plant by (1) Changing the discharge network from CO2 compressors from 40 NB to 80 NB thereby reducing the power requirement to overcome the pressure drop because of under size piping. (2) Relocating the CO2 blowers near to RAW CO2 outlet from CO2 Scrubber of Distillery plant. This helped in switching off one 37 KW blower which otherwise was required to operate CO2 plant -1 at full capacity because one blower was not sufficient to overcome the pressure drop in a long suction network.
Baseline Information	
Description:	kW of power Consumed per MT of CO2 Produced.
CTQ Value:	255 kW/MT (@ Low capacity operation of CO2 plant)
	230 kW/MT (@ full capacity operation of CO2 plant)
Post Implementation Information	
Description:	kW of power Consumed per MT of CO2 Produced.
CTQ Value:	230 kW/MT (@ Low capacity operation of CO2)
	220 kW/MT (@ Full capacity operation of CO2)
Implementation Status	
Capex No.	CB-7368
Investment	Rs. 7.2 lacs
Power Savings	0.769 lacs kWh
Savings accrued till 31-Mar-05	Rs. 2.2 Lacs
Project No.	11
Description:	Reduction in Power consumption for cooling water by proper sizing of pump
Baseline Information	
Description:	Consumption of Power for VAHP-II CW Circ Pump in KW
CTQ Value:	87
Post Implementation Information	
Description:	Consumption of Power for VAHP-II CW Circ Pump in KW
CTQ Value:	60
Implementation Status	
Investment	2 lacs
Power Savings	1.57 lacs kWh
Savings accrued till 31-Mar-05	4.5 Lac
Point No.	12 in Wartsila DGs
Description:	Replaced electrical heaters with steam heaters at lube oil separators.
Baseline Information	
Description:	Electrical system: Operating cost of electrical heating system per hour
CTQ Value:	Rs. 53.6 per hour
Post Implementation Information	
Description:	Steam heated system: Operating cost of steam heating system per hour
CTQ Value:	Rs. 16.4 per hour
Implementation Status	
Capex No.	BB 7102
Investment	Rs. 14.9 lacs
Power Savings	3.32 lacs kWh
Savings accrued till 31-Mar-05	Rs. 9.53 Lacs

Project No.	13 in CO2 Plant
Description:	Replaced motors with high efficiency motors at CO2 , Pyridine & Solid PVA Plant
Baseline Information	
Description:	kW of power Consumed per MT of CO2 Produced.
CTQ Value:	255 kW/MT (@ Low capacity operation of CO2 plant)
	230 kW/MT (@ full capacity operation of CO2 plant)
Post Implementation Information	
Description:	kW of power Consumed per MT of CO2 Produced.
CTQ Value:	230 kW/MT (@ Low capacity operation of CO2)
	220 kW/MT (@ Full capacity operation of CO2)
Implementation Status	
Capex No.	CB-7381
Investment	Rs. 2.43 lacs
Power Savings	0.769 lacs kWh
Savings accrued till 31-Mar-05	Rs. 2.2 Lacs
Project No.	14 in SPVA Plant
Description:	Replaced motors with High efficiency motors in SPVA Plant
Baseline Information	
Description:	In SPVA Plant, the agitators installed were inefficient and high energy consumer (Anchor Type).
CTQ Value:	To design high efficiency Agitators for New SPVA Reactors (In Expansion)
Post Implementation Information	
Description:	In SPVA Expansion, High efficiency Agitator (Helical type) supplied by M/s Chemineer were installed in all the new Reactors and Agitated Vessels
	This results in saving of Power Consumption form avg 1200 KWH/MT to 650 KWH/MT in SPVA plant
CTQ Value:	Power consumption Norm - 650 KWH/MT of SPVA
Implementation Status	
Capex No.	CB7090
Investment	The amount for high efficiency Agitator was Rs 45 Lacs whereas anchor type agitator was Rs 35 Lacs
Power Savings	23.35 lacs kWh
Savings accrued till 31-Mar-05	66.79 lacs

The energy consumption effort has been combined with environment management to achieve the overall impact and the company has maintained a good track record on the energy management front. **The company has been awarded first position on three occasions for energy conservation efforts / measures, by the Ministry of Power, for the Chemical sector.**

Besides, the company has bagged various prestigious awards in the past & the Table below enumerates them.

AWARDS MERITS RELATED TO ENERGY/ENVIRONMENT
• NATIONAL ENERGY CONSERVATION AWARDS

Energy Conservation Awards from the Government of India, Ministry of Power for the Chemical Sector	
Year	Award Gaining Position
1997	First
1998	First
1999	Second
2000	First
2001	Second
2003	Second
<ul style="list-style-type: none"> • ICMA Energy Conservation Award 1999 – Certificate of Merit • National Safety Award for 1997 & 1998 • FAI Runners Up Award for best overall Performance in Environmental Protection for Fertilizer Division in 1997 • Best Distillery in U.P. for Environmental Performance 2001 	

The company has saved Rs. 339 lacs as a result of energy savings during the year 2004-05 with an investment of Rs.133.62 lacs and has plans for saving Rs.252 lacs during the year 2005-06 with an investment of Rs. 150 lacs. (Please refer Annexure- 4 & 7A for details)

(v) ENERGY CONSERVATION PLANS & TARGETS :

Energy Conservation Initiatives (2005-06)						
Sr.No	Cooling Tower No.	Proposal for reduction of consumption of energy	Saving	Annualised	Estimated	Target of Completion
			KW	Saving-Rs lacs	Investment-Rs Lacs	
1	CT-1A	Low pressure pump alongwith booster pump for ACH1 & ACOH1, Seperate pump for VAHP-I (CT-1A)	67	16.2	15.5	Sept'05
2	CT-3	Low pressure pump alongwith booster pump for ACH II & ACOH II A (CT-3)	68	16.44	10.18	Sept'05
3	CT-6	LP, HP header system for distillery 1,2 and 3 considering highest pressure as 48 m (CT-6)	58	13.83	11	Nov'05
4	Fert-CT	Provision of one high effieciy pump to replace two lower capacity pumps (Fert - CT)	11	2.43	0.5	Sept'05
5	Boilers	Excess air control in one boiler by installing Oxygen analyser		4.9	4	July'05

6	CT	CT Fans - Installation of Dual speed motors & temperature control	85	20	19	Sept'05
7	Power	Replacement of Electrical heaters steam heaters at RFO Separator (1No) and Booster unit (1 Nos)		12.8	14.9	July'05
8	Power	Revamping of WHRB-3 to generate 1.8 MT of steam	1.8 TPH LP Steam	60	21.4	Sept'05
9	Power	Increase LP steam generation from WDG-5 & 6 WHRBs (Increase in steam generation from 1 TPH to 2 TPH on each WHRB)	4 TPH LP Steam	62	2.0	Jun'05
10	CT-4	Rationalisation of Cooling water suply to EA & AC2O plants. (Low head pumps for heat exchangers at loer elevation & booster pump for heat exchangers at higher level)	101	17.0	20	Oct'05
11	CT-8C	Optimiation of Cooling water header for Pyridine plant to save energy from 230KWH to 200 KWH (CT-8C)	30	6.6	-	Sept'05
12	SAP	Installation of high capacity blower (Equivalent to air capacity of 210 TPD sulphuric Acid) with the objective of reducing power consumption	40	8.8	20	July'05
13	Elec	Photosensors on streetlight network, conversion of existing M V lamp to CFL. Provision of high efficiency lighting fixtures	37	5.8	5.8	Aug'05
14	Elec	Replacement of 7.5 MVA transformer with 500 KVA on UPSEB power	40	4.4	5.5	Aug'05
T O T A L			537	252	150	

SPECIFIC ENERGY CONSUMPTION TARGETS						
Year	Product	Electrical	Thermal	Red. over the year 04 - 05		
		Lacs KWH	MMKcal	Electrical %	Thermal %	
2004-05	Vam & Intermediates	125.09	1.23	-	-	
	Polymer, Co-polymers	199.48	0.15	-	-	
	Speciality Chemicals, Pyridine & derivatives	367.7	3.0	-	-	
	Carbon-di-oxide	236.41	0.03	-	-	

	SSP / Sulphuric Acid	45.98		-	-
2005-06	Vam & Intermediates	117.79	1.19	5.8	3.0
	Polymer, Co-polymers	193.19	0.14	3.15	10.0
	Speciality Chemicals, Pyridine & derivatives	323.58	2.88	12.00	4.0
	Carbon-di-oxide	215.93	0.03	8.7	7.0
	SSP / Sulphuric Acid	41.38		10.0	-
2006-07	Vam & Intermediates	110.58	1.16	6.1	3.2
	Polymer, Co-polymers	186.80	0.12	3.3	10.5
	Speciality Chemicals, Pyridine & derivatives	282.81	2.76	12.6	4.2
	Carbon-di-oxide	196.29	0.03	9.1	7.4
	SSP / Sulphuric Acid	37.04		10.5	-
Anticipated money saving at the end of 2006 - 07 = Rs 850 Lacs (Cumulative for three years)					