

RALLIS INDIA LIMITED
(Agro-Chemical Division)
Turbhe, Navi Mumbai (Maharashtra)

Unit Profile

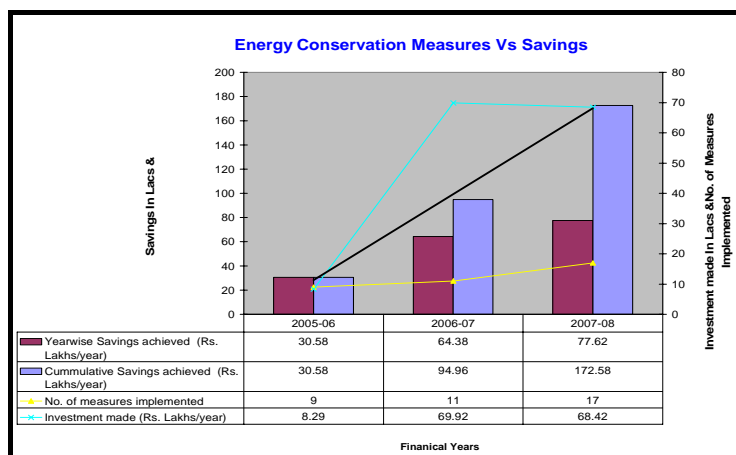
Rallis India limited established its first Production unit at Turbhe, Navi - Mumbai in 1967. Turbhe unit has undergone several transformations during its chequered history and decades of rapid technological advances. Today the Turbhe unit has two production plant for manufacturing Herbicides namely Pendimethalin, Metribuzin Technical and their formulation. Both production plants are equipped with latest technologically advanced Instrumentation & Equipments with enhanced safety features. The Turbhe unit is an ISO: 9001: 2000, ISO: 14001:2004, ISO: 18001: 2007 and BSC 5-Star certified unit.

The total combined production capacity of both Pendimethalin & Metribuzin plant is 1800 MT of Technical Products. During 2007-08 Total 1655.2 MT of Technical product and 1006.84 MT of Formulation of these products manufactured with plant capacity utilization of 93%. Annual sales turn over of Turbhe unit was Rs. 71.34 Crores for the year 2007-2008.

Energy Consumption

Rallis India limited, Turbhe unit considers the Energy Saving as a multi disciplinary approach. Even smallest reduction in Energy cost adds directly to its profit and above all contribution to the nation in preservation of precious resource of energy. Rallis India Limited has identified various energy conservation projects and formed cross-functional Project Team under TPM (Total productive maintenance) Six-Sigma DMAIC concept adopted in 2003. The energy conservation projects through TPM Six -Sigma-DMAIC concept has resulted in both tangible and intangible savings and above all contribution to the nation in preservation of precious recourses of energy. With implementation of various energy conservation measure there is steady decline in specific energy consumption per tonne of product manufactured, which depict continual reduction in Specific energy consumption over last three years. **Rallis India Limited, Turbhe Unit has been awarded National Energy Conservation Award -2006 "Certificate of Merit" and subsequently it bagged "1st Prize" in 2007 for its energy conservation efforts in the chemical sector. The Energy Conservation projects spearheaded by absolute internal resources has brought in an accrued financial saving of Rs. 172.58 Lakhs from 2005-08.**

Synopsis of the Tangible Savings By way of Energy Conservation (2005-2008)

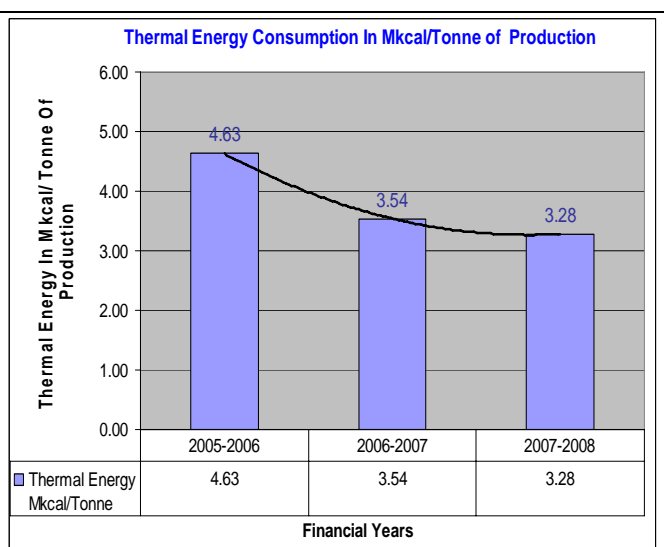
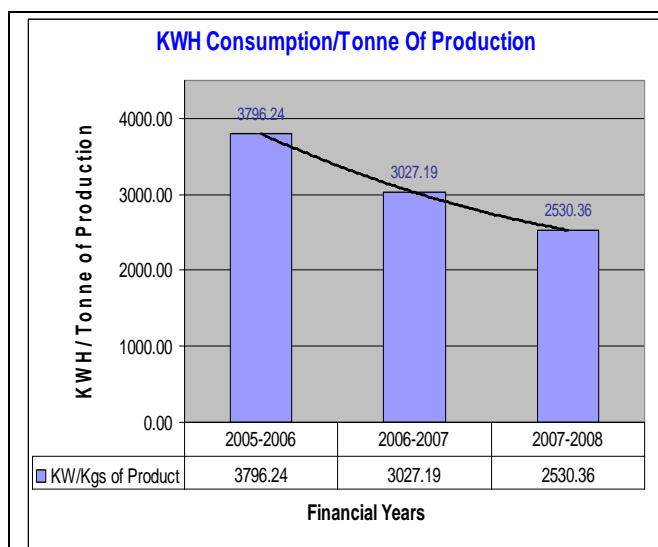
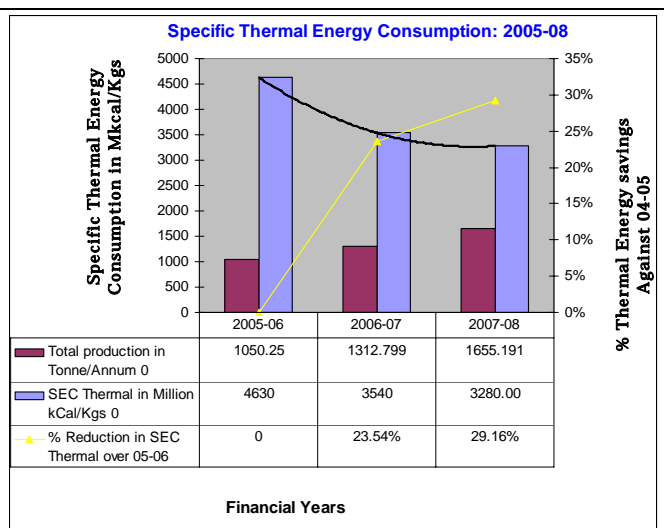
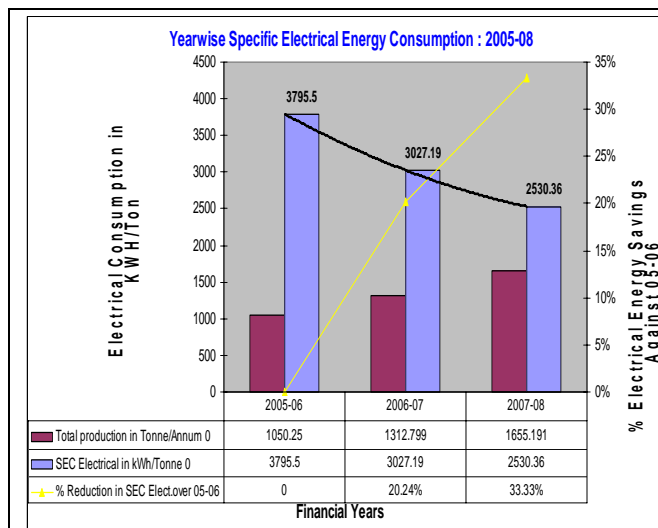
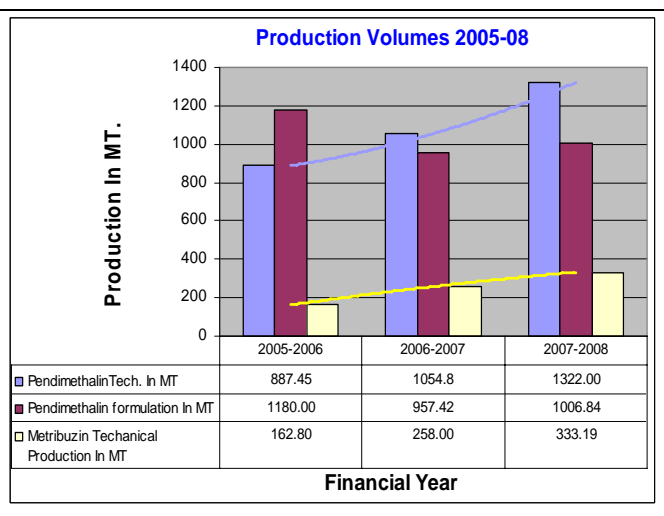
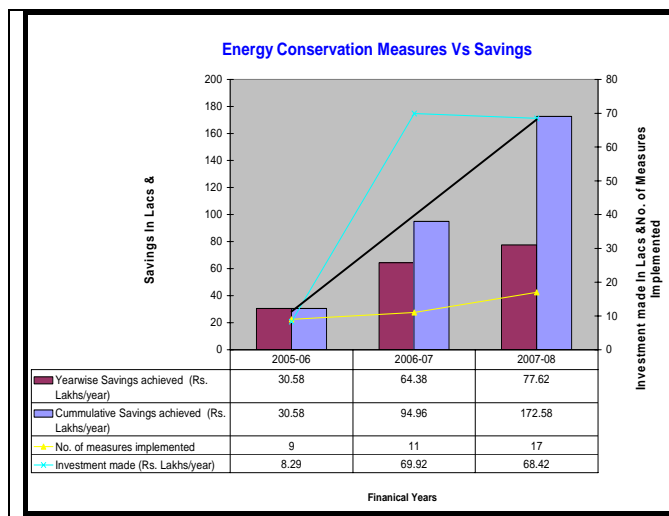


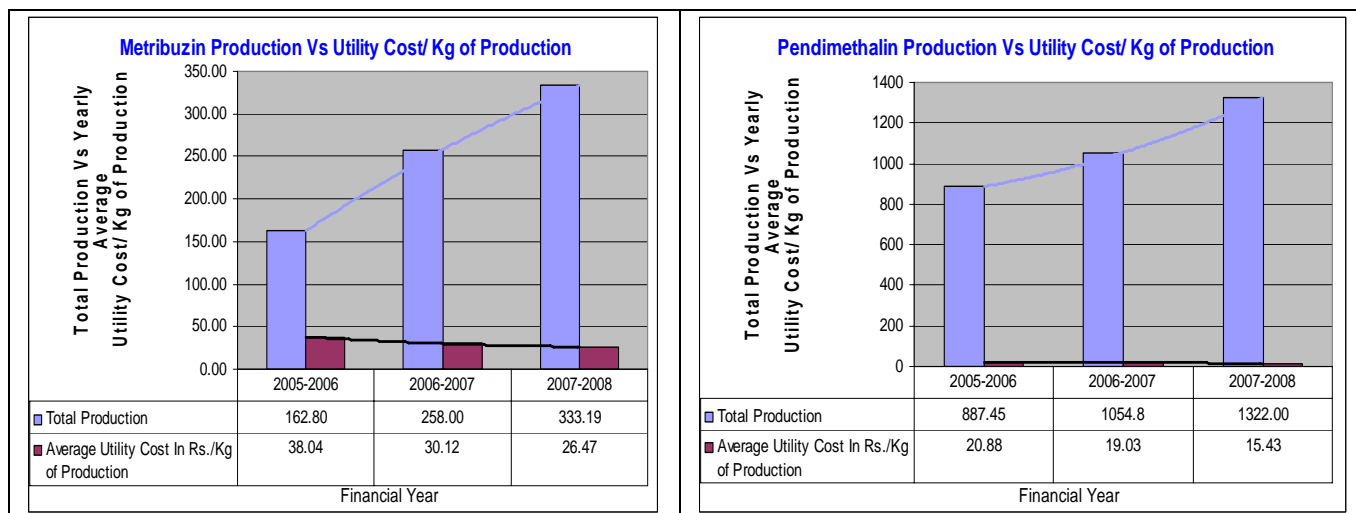
Specific Energy Consumption Reduction 2005-08:

| Description | 2005-2006 | 2006-2007 | 2007-2008 |
|--|-----------|-----------|-----------|
| Year wise Savings achieved (Rs. Lakhs/year) | 30.58 | 64.38 | 77.62 |
| Cumulative Savings achieved (Rs. Lakhs/year) | 30.58 | 94.96 | 172.58 |
| No. of measures implemented | 9 | 11 | 17 |
| Investment made (Rs. Lakhs/year) | 8.29 | 69.92 | 68.42 |

| Description | Unit | 2005-2006 | 2006-2007 | 2007-2008 |
|---|--------------|---------------------------------|---------------------------------|---------------------------------|
| Total Electrical Energy Consumption | Lakhs KWH | 39.86 | 39.74 | 41.88 |
| Total Thermal (Furnace Oil) Energy Consumption | KL | 502 | 480 | 109 |
| Total Thermal (Briquettes) Energy Consumption | MT | 0.00 | 0.00 | 1213.33 |
| Total Energy Cost (Electrical + Thermal) | Rs. Lakhs | 222.36 | 269.86 | 274.15 |
| Total Product Manufacturing Cost | Rs. Lakhs | 1152.61 | 959.36 | 863.22 |
| Energy cost as % of Manufacturing cost | % | 6.19% | 6.44% | 5.65% |
| Weighted average Utility cost/Kgs of product manufactured.* Pendimethalin , ** Metribuzin | Rs./ Kgs | *20.88 **38.04 | *19.03 **30.12 | *15.43 **26.47 |
| Total Technical Production | Tonne | 1050.3 | 1655.2 | 1655.2 |
| Total Formulation Production | Tonne | 1180 | 1312.799 | 1006.84 |
| Specific Electrical Energy Consumption | kWh/Tonne | 3795.5 | 3027.19 | 2530.36 |
| SEC Electrical for per kgs of Product Manufactured | KWH/Kgs | 3.80 | 3.03 | 2.53 |
| % Reduction in SEC Elect. over 2005-2006 | % | — | 20.24% | 33.33% |
| Specific Thermal Energy Consumption | mKcal/Tonne | 4.63 | 3.54 | 3.28 |
| % Reduction SEC Thermal over 2005-2006 | % | — | 23.54% | 29.16% |

Energy Conservation overall Savings realized viz. Quantitatively & Qualitatively: 2005-2008





Energy Conservation Commitment, Policy and Set up

Rallis India Limited, Turbhe unit considers the Energy Saving as a multi disciplinary approach. Even smallest reductions in Energy cost add directly to its profit and above all contribution to the nation in preservation of precious resource of energy. Units energy profile consists of electricity, furnace oil, diesel and water. Even though Rallis India Limited do not have separate “Energy Management Policy” the company has committed itself for energy conservation and the same is reflected in all it Policies like ISO:9001, ISO:14001 and also the targets and objectives under taken in ISO systems. The company has adopted Total Productive Maintenance (TPM) concept in 2003 under which company has appointed Corporate Energy Management Pillar Champion and Factory Energy management Pillar Champion specifically for Energy Conservation Activities. Company has arranged both internal and external training programmers on energy conservation for its employees also Energy saving slogans, posters are displayed at various locations in the unit of employees awareness. The company's senior management has provided all required tools and help to drive the energy conservation.

Company has provided its employees MINITAB software for quick and precise analysis of problems provided training to them for MINITAB Software and usage of statistical tools so as to raise their skill level to become TPM Six -Sigma BLACK & GREEN belt champions. The company has formed cross-functional teams for energy conservation projects, the senior management closely monitors the progress of the projects and provide all necessary budgetary and moral help. The team members of successful projects are appreciated by Company's MD by way of recognition letter and cash award to motivate them further.

Energy Conservation Achievements

De-Super Heater For Chilled Water Plant



New De- Super Heater For Chilled Water Plant & Hot Water Collection Tank with Pump (Inside)

Procured & Installed new De- super heater to chilled water plant before condenser and circulated soft water at room temperature through it, soft water out let temperature was greater than 65°C. With this de-super heater arrangement the load on ammonia condenser reduced drastically and thus with effective cooling first from de-super heater and than ammonia condenser the compressor suction / discharge pressure improved effectively which in turn reduced compressor motor load, thus reduced power consumption.

Beside above the soft water at greater than 65°C which we received from de-super heater is collected in tank coupled with pump arrangement is than supplied to boiler as feed water which in turn reduced daily briquettes consumption for boiler feed water heating. Also this hot water was circulated to worker amenities for bathing purpose. Thus eliminating the need of electrical geysers for hot water in amenity for bathing purpose. Thus savings from De- super heater are as follows

First Year saving Period from Date of Commissioning: :
Rs.1.33 Lakhs (From Two Months)

Savings On Year Basis...

| | |
|----------------------------------|-------------------------------|
| Thermal Energy Savings | : 127.75 MKcal/ Annum |
| Electrical Energy Savings | : 1.52 Lakhs KWH/Annum |
| Savings | : Rs. 8.07 Lakhs/Annum |
| Investment | : Rs 6.50 Lakhs |

AVR For Lighting Load



New Automatic Voltage Regulator For Lighting Load

During Energy audit it was observed that Utility, ETP and other areas Lighting put together have slightly above 2,50,000 kWh consumption/annum. And there was huge potential for reduction in lighting load if power for lighting is given through Automatic Voltage Regulator (AVR). Thus Procured and installed new Automatic Voltage Regulator (AVR) for factory lighting, re- routed power supply cable of different feeders through one common feeder via Automatic Voltage Regulator (AVR). Thus after installation of AVR not only power consumption by lighting reduced by 30% but also frequent blown up of lighting bulb reduced to drastically The savings from this are as follows....

First Year saving Period from Date of Commissioning: : **Rs.1.53 Lakhs (From Nine & Half Months)**

Savings On Year Basis ...

Electrical Energy Savings : 0.41 Lakhs KWH/Annum
Savings : Rs. 1.83 Lakhs/Annum
Investment : Rs. 2.50 Lakhs

VFD For Chilled Water Primary Pump



New VFD Panel For Chilled Water Primary Pumps (Inside Mega-G-80/160 Pump with EFF1 50 HP Motor)

Procured & installed one 37KW VFD to primary chilled water circulation pump Mega-G-80/200 coupled with 50 HP/2900 RPM, EFF1 motor, and also replaced all chilled water primary/secondary pumps gland packing arrangement with mechanical seal which resulted in reduced the motor load current by 1.8 Amps. Thus after installation of VFD to primary chilled water circulation pump Mega-G-80/200 coupled with 50 HP/2900 RPM, EFF1 motor, we were able to circulate the required chilled water pressure to plant with single primary pump only, thus it eliminated the earlier need for operating primary/secondary pumps for 7-8 Hrs/ day when plant chilled water pressure requirement was high.. The savings from this are as follows....

First Year saving Period from Date of Commissioning: : **Rs.4.31 Lakhs (From Twelve Months)**

Savings On Year Basis ...

Electrical Energy Savings : 0.97 Lakhs KWH/Annum
Savings : Rs. 4.31 Lakhs/Annum
Investment : Rs. 2.50 Lakhs

Defused Air System For ETP



New Defused Aeration System Blowers & Aeration Tank (Inside)

Procured and replaced existing 4 nos. old surfaced aerators system having 25 HP/1440 RPM EFF3 level motors with new Defused aeration system with required pipe line modification and installed 3 nos air blowers coupled with 15HP/1440 RPM motors, during trials itself it was found that only one blower operation is sufficient for treatment of effluent thus it further eliminated need of operating two blower simultaneously for aeration in ETP, beside this we did minor pipe line modification and stopped using one another blower coupled with 15HP/1400 RPM blower used for aeration of collected effluent in equalization tank . The savings from this are as follows....

First Year saving Period from Date of Commissioning: : **Rs.5.74 Lakhs (From Six Months)**

Savings On Year Basis ...

Electrical Energy Savings : 2.57 Lakhs KWH/Annum

Savings : Rs. 11.47 Lakhs/Annum

Investment : Rs. 20.00 Lakhs

Fuel Substitution for Boiler MR-12046 (Bagasse System)



Modified Briquettes Fired MR-12046 Boiler With Economizer and Blower (Inside)

Modified and converted 3 Ton capacity Boiler MR-12046 from furnace oil fired boiler to Briquettes (Bio- Mass Fuel) fired boiler consisting of one briquettes firing chamber, one 12.5HP/ 2900RPM stack blower, 2 nos 7.5 HP/2900 RPM feed water pumps. Beside this the plant installed one economizer before stack and circulated feed at 60-65°C (Obtained from chilled water plant De-super heater) water through it for maintaining boiler feed water temperature greater that 75°C which was maintained by steam purging for improving boiler efficiency. Thus with this energy substitution plant was able to maintain the required steam pressure by plant and thus without hampering production we were able to contribute in safe guarding of environment and precious natural resources as the stack emission contents of briquettes and negligible compare to furnace oil fired boiler.

The savings from this are as follows....

First Year saving Period from Date of Commissioning: : **Rs.15.91 Lakhs (From Eleven Months)**

Savings On Year Basis ...

Electrical Energy Savings : 0.83 Lakhs KWH/Annum

Thermal Energy Savings : 666.28 MKcal/ Annum

Savings : Rs. 15.91 Lakhs/Annum

Investment : Rs. 17.20 Lakhs

Optimization of ETP Collection Tank Pumps



New High Efficiency PP Pumps For ETP Collection Tank With PP Self Priming Pot & 5 HP/2900 RPM, EFF1 Level Motor

Procured & replaced existing 3 nos CI self priming pumps SP3L++ coupled with 7.5 HP/1440 RPM, EFF3 level motors with new high efficiency PP pumps with mechanical seal and PP self priming pot coupled with 5 HP/2900 RPM, EFF1 level motors. Thus with this new arrangement the effluent transferring time reduced drastically from average 20 Hrs./day to 12 Hrs./day beside this frequent failure of pumps reduced by 90% compared to earlier case. The savings are as follows....

First Year saving Period from Date of Commissioning: :
Rs.1.12 Lakhs (From Seven Months)

Savings On Year Basis ...

Electrical Energy Savings : 0.43 Lakhs KWH/Annum
Savings : Rs. 1.92 Lakhs/Annum
Investment : Rs. 1.08 Lakhs

Optimization of EDC Recovery Vacuum System



EDC Mechanical Booster With New (Inside) HE Pump CPKE-50/160 With 10HP/2900 RPM EFF1 Motor & VFD Panel For Mechanical Booster

Procured & replaced EDC recovery reactor agitator gland packing system with mechanical seal, replaced existing water ejector Pump DB-50/20 coupled to 15HP/2900 RPM EFF3 Level motor with new high efficiency CPKE-50/160 having mechanical seal & coupled with 10 HP/2900 RPM, EFF1 level motor also provided & configured one new VFD to new mechanical booster in such a way that it will increase the vacuum slowly. With this new arrangement the EDC recovery time cycle reduced from 16 Hrs./batch to 12 Hrs./batch also the EDC vapor losses reduce drastically as vacuum was increasing slowly but steadily & giving 3-4 Torr vacuum constantly at the end , hence with reduced batch time cycle and load on water/ejector mechanical booster we were able to reduce the power consumption by the EDC vacuum system. The savings from this are as follows....

First Year saving Period from Date of Commissioning: :
Rs.0.77 Lakhs (From Three Months)

Savings On Year Basis ...

Electrical Energy Savings : 0.57 Lakhs KWH/Annum
Thermal Energy Savings : 161.69 MKcal/ Annum
Savings : Rs. 4.12 Lakhs/Annum
Investment : Rs. 3.50 Lakhs

Optimization of PCN Recovery Vacuum System



**New PCN Mechanical Booster
 With VFD Control Panel (Inside)**

Replaced existing DB-32/16 pumps coupled with 15 HP/2900 RPM, EFF3 level motors with more efficient & spare DB-50/20 pumps coupled with 12.5 HP/2900 RPM, EFF2 motors and attached it to new mechanical booster with VFD configuration in such that mechanical booster would start during last 2 hours of PCN distillation & during which vacuum would increase slowly but steadily and remain constant above 750mmHg. Thus with this arrangement with minor increase in power consumption not only PCN yield/ batch increased but also helped in reducing batch time cycle and power/ thermal energy saving as after provision of this arrangement the average batch time cycle reduced from 10 to 8 Hrs. batch for vacuum distillation .

The savings from this are as follows....

First Year saving Period from Date of Commissioning: : **Rs.1.99 Lakhs (From Seven Months)**

Savings On Year Basis ...

| | |
|----------------------------------|-------------------------------|
| Electrical Energy Savings | : 0.14 Lakhs KWH/Annum |
| Thermal Energy Savings | : 137.64 MKcal/ Annum |
| Savings | : Rs. 3.41 Lakhs/Annum |
| Investment | : Rs. 4.80 Lakhs |

Energy Conservation Plans and Targets

| Energy Conservation Measures (Planned) | Anticipated savings In | | Approx. investment (Rs .lakhs) | Project Commencement & Completion year |
|---|----------------------------------|--------------|--|--|
| | KWH/Annum | Rs. Lakhs | | |
| Installation of De-super heater for recovering heat from Pendimethalin Plant EDC, Xylene recovery section vapors and using it for feed water heating, this will also reduce process cooling water & chilled water plant load in utility. | 0.80 MT briquettes savings/annum | 3.19 | 16.50 | 2008-2009 |
| Replacement of CWC-5 chilled water compressor V- belt with Flat belt. | 0.29 | 1.29 | 2.79 | 2008-2009 |
| Replacement of CWC-6 Chilled water compressor continuously running conventional 180 HP/1440 RPM (EFF3) motor with 180HP/1440 RPM, EFF1 Level motor | 0.93 | 4.14 | 1.75 | 2008-2009 |
| Replacement of continuously running conventional (EFF3) motor with EFF1 Level motor of plant (Total 11 Motors from 7.5HP to 25HP) | 0.52 | 2.31 | 4.25 | 2008-2009 |
| Procurement & installation of VFD for CWC-5 chilled water plant compressor | 0.89 | 3.96 | 5.00 | 2008-2009 |
| Procurement & installation of VFD for process cooling tower motors | 0.51 | 2.27 | 2.50 | 2008-2009 |
| Procurement & installation of VFD for refrigeration cooling tower motors | 0.51 | 2.27 | 1.50 | 2008-2009 |
| Installation of new automated centrifuge for Metribuzin plant having 423 Lts capacity & 25HP/1440 RPM, EFF1 level motor to stop/minimize usage of existing old 2 nos centrifuges coupled with 20HP/1440 RPM, EFF3 level motors to reduce power consumption and | 1.54 | 6.87 | 22.00 | 2008-2009 |
| Replacement of solvent yard existing BE pumps coupled with 5HP/1440 RPM, EFF3 level motors with new High efficiency BE pumps having mechanical seal and coupled with 5 HP/1440 RPM, EFF1 level motor and than automation of above pumps with level transmitters | 0.12 | 0.027 | 9.00 | 2008-2009 |
| Expected Savings and Investment Cost In Lakhs | | 26.32 | 65.29 | |
| EC Measure Implemented | | | EC Measure Under Implementation | |

Environment and Safety

To bring in awareness among employees Rallis India Limited, Turbhe Unit has taken various initiatives including safety audits, risk analysis, On-site emergency response plan, responsible care, HAZOP study, monitoring and measurement, health check-up for all employees including contract employees, Safety slogan / Posters suggestion & safety quiz competition etc are arranged during Safety Week. Also the EHS policy is displayed at various locations in the factory in both English and local languages.

Safety

"Safety First" is the slogan of the company and so the unit and the same is reflected in the EHS policy. EHS audits are carried out periodically both by internal and certified agencies and corrective actions are taken as per the outcome of the audits to minimize the potential risks in the factory. For enhancing the health and safety performance we have adopted OHSAS 18001: 2007 along with EMS ISO 14001:2004 standards for ensuring good environment, health and safety management standard. The Hazards Identification and Risk Assessment (HIRA) for each and every activity done in plant is carried out, which has resulted in identifying potential risk to its employees, equipments and environment in better way. This has in turn resulted in providing better control systems like safety interlocks to the potential risks involving equipment or activity. In-line with our EHS policy for continual enhancement of safety standards, the unit has taken various initiatives to avoid fire hazards like installation of new diesel generator operated fire hydrant system with sprinkler, gas leakage detector, Smoke detectors etc.

Environment

In-line with our EHS policy, Turbhe plant is committed for preserving precious energy resource, social responsibility and protecting environment. For achieving the same, unit has adopted EMS ISO : 14001:2004 system. External environment audits through certifying agencies are conducted and various environment initiatives including environmental monitoring are implemented to maintain the ecological balance in and around company premises .All requirements relating to various environment protection and EHS legislation are being duly complied with by the company. Also all other statutory requirements under Factory Act are being complied by the company.

IOL CHEMICALS AND PHARMACEUTICALS LIMITED
 Mansa Road, Barnala (Punjab)

Unit Profile

IOL Chemicals and Pharmaceuticals Limited is a chemical manufacturing industry located in Barnala in Punjab. IOLCP began with a small project of Rs. 65 million to manufacture 4500 TPA of Acetic Acid and has now diversified into a multi product company to manufacture the 50000 TPA of Acetic acid, 33000 TPA Ethyl Acetate, 12000 TPA Acetic Anhydride, IOLCP is National Energy Conservation Award Winner (2nd prize) in 2005, 2006, 2007 and certified with ISO: 9001, 14001, Halal And Kosher certification and Strong market presence in 47 countries.



Energy Consumption

IOLCP has identified various Energy Conservation Projects, Which has resulted in Energy Saving and contribution to the nation in preservation of precious resources of Energy. Last three years Energy Consumption figures are shown below.

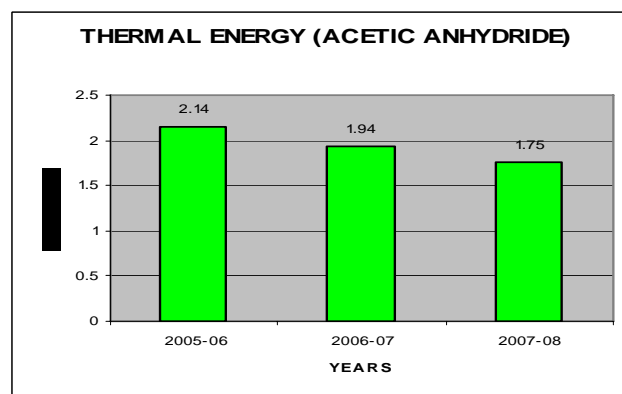
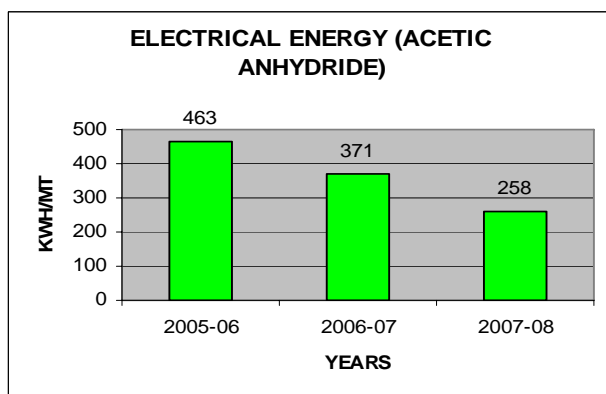
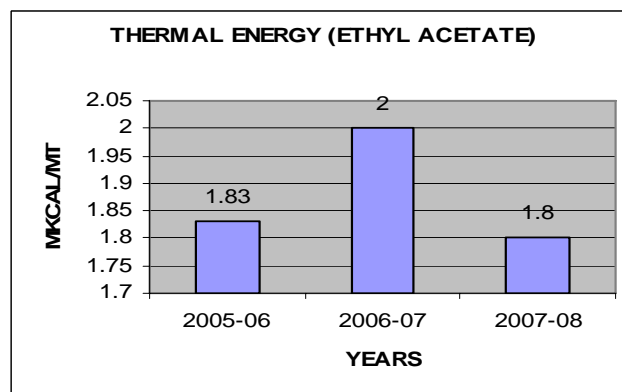
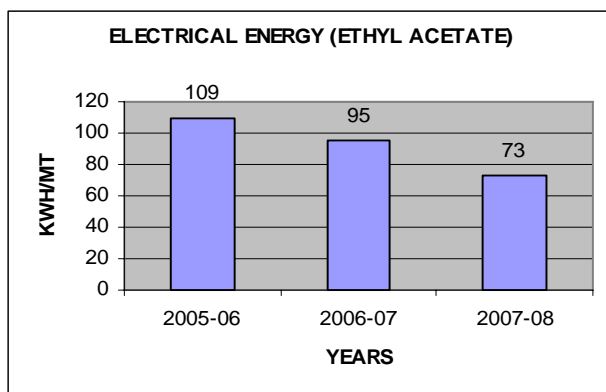
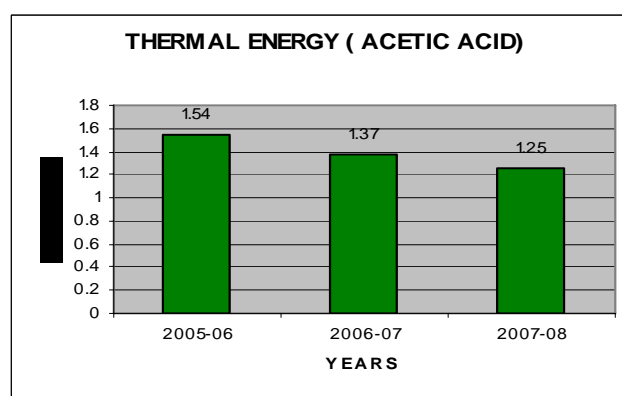
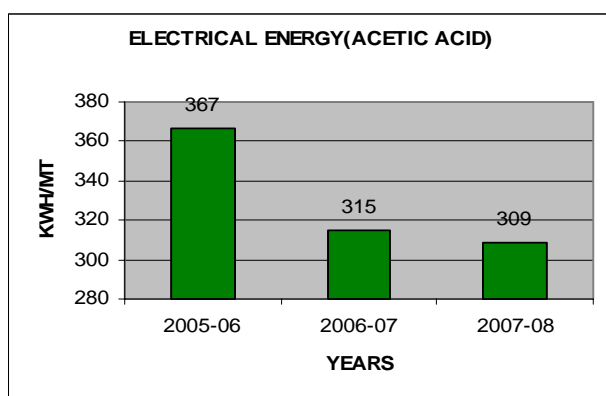
| Description | Unit | 2005-06 | 2006-07 | 2007-08 |
|---|-------------------|---------|---------|---------|
| Total Electrical Energy Consumption | Lakhs Kwh | 171.23 | 235.9 | 207.07 |
| Total Thermal energy consumption | Million Kcal/Year | 100714 | 143029 | 150277 |
| Total Electrical energy cost | Rs. Lakhs | 767 | 934 | 658.3 |
| Total Thermal Energy cost | Rs. Lakhs | 781.62 | 1499.86 | 2064.4 |
| Energy cost as % of manufacturing cost | % | 89 | 91 | 87 |

Specific Energy Consumption

Specific Energy Consumption for Chemical Plants: (Chemical Division)

Electrical and Thermal Energy

| Description | Unit | 2005-06 | 2006-07 | 2007-08 |
|-------------------------------------|----------|---------|---------|---------|
| For Acetic Anhydride | Kwh/MT | 463 | 371 | 258 |
| Specific Thermal energy consumption | | | | |
| For Acetic Acid | MKCal/MT | 1.54 | 1.37 | 1.25 |
| For Ethyl Acetate | MKCal/MT | 1.83 | 2.00 | 1.80 |
| For Acetic Anhydride | MKCal/MT | 2.14 | 1.94 | 1.75 |



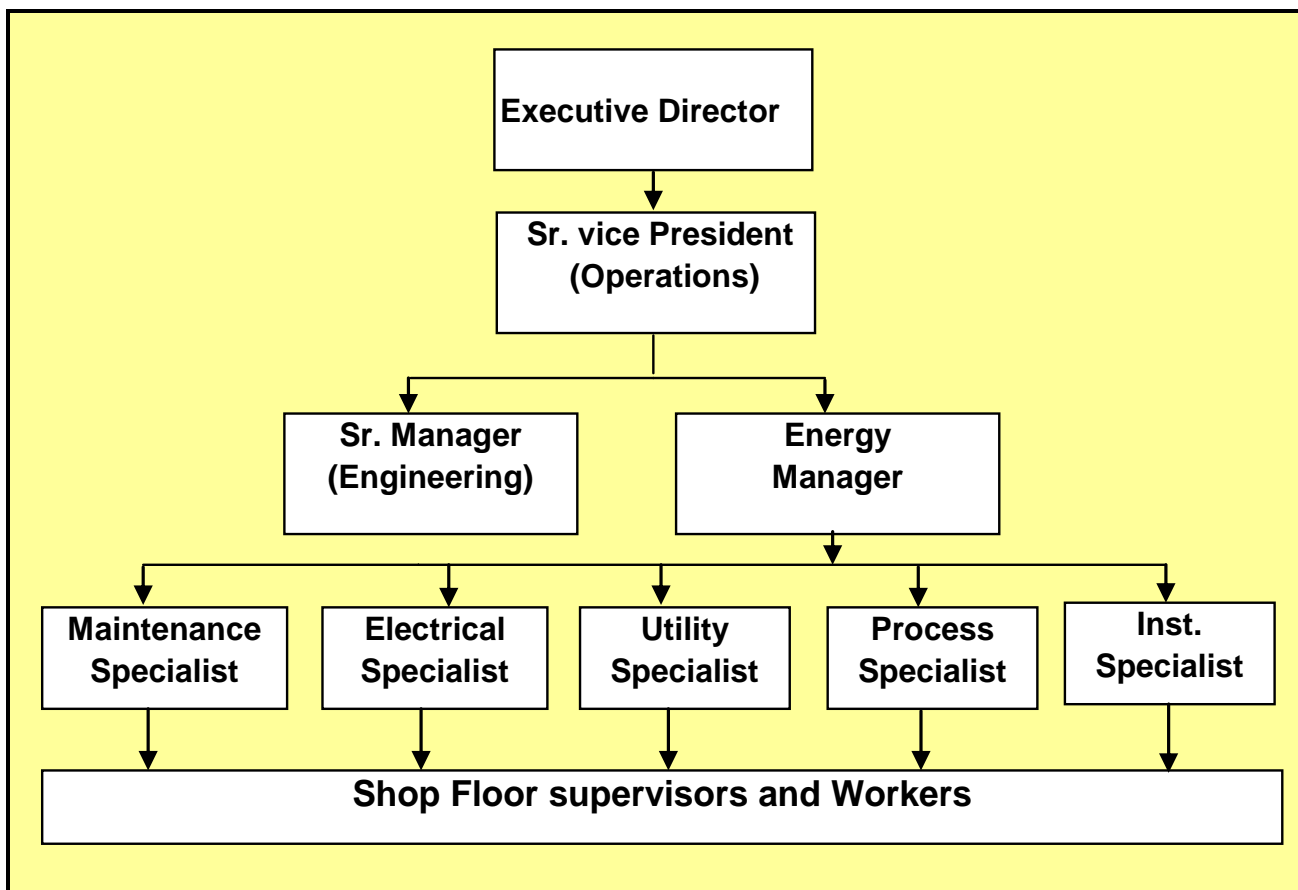
Energy Conservation Commitment, Policy and Set up

Energy conservation continues to be an area of major emphasis for IOL chemicals & pharmaceuticals limited. The unit has been continuously making efforts to reduce specific energy consumption by both improving the technology and energy efficiencies.

Objectives

To procure and manage energy supplies and their use in the most cost effective manner consistent with the industry's wider objectives and the resources available.

Energy Conservation Cell Structure



Energy Management Policy

IOL Chemicals and Pharmaceuticals Ltd are committed to conserve energy at all levels, to be competitive and save Environment through following ways.

- Adopting best energy management practices
- Regularly monitoring energy use
- Reporting quarterly on energy use to staff and at Management Board Meetings
- Establishing an Energy Management organization structure

- Encouraging Energy Managers of significant facilities to initiate Energy Management Committees and/or Energy Champions for their facilities
- Ensuring that new appliances, equipment, and building projects are energy efficient
- Identifying all areas of opportunity for improved energy performance via detailed consultation with staff
- Facilitate developing and implementing an action plan
- Checking the effectiveness of the energy saving measures, periodically document any changes in procedures resulting from process improvement, and make comparisons with objectives and targets
- Continual interaction with the technology suppliers and visits and interactions with best alcohol based plants in India and benchmarking various parameters is an ongoing exercise at chemical division
- Everyday energy consumption is reviewed in daily coordination meeting and corrective actions are taken best achieved consumption is taken as target

Energy Conservation Achievements

During the last five years IOLCP has implemented around 100 nos. energy saving proposal of small & large measures, which resulted reduction of specific energy consumption. In the year of 2007-08, the Plant has implemented 20 nos of measures and saving Rs 340 lakhs per annum was achieved with an investment of Rs 468 Lakhs. The increasing consciousness for energy conservation and step taken towards effective monitoring, better operational control and process optimization in addition to various modification of energy efficient equipments have contributed greatly in energy conservation. Specific electrical energy consumption and specific thermal energy consumption reduction is shown below.

| Description | Unit | 2005-06 | 2006-07 | 2007-08 |
|--|---------------|----------------|----------------|----------------|
| Specific Electrical energy Consumption | | | | |
| For Acetic Acid | Kwh/MT | 367 | 315 | 309 |
| % Reduction in electrical energy over 2005-06 (Acetic Acid) | % | | 14.16 % | 15.8 % |
| For Ethyl Acetate | Kwh/MT | 109 | 95 | 73 |
| % Reduction in electrical energy over 2005-06 (Ethyl Acetate)) | % | | 12.8 % | 33 % |
| For Acetic Anhydride | Kwh/MT | 463 | 371 | 258 |
| % Reduction in electrical energy over 2005-06 (Acetic Anhydride) | % | | 19.53 % | 44.27% |

Environment and Safety

The IOL chemical and pharmaceuticals Ltd has taken various initiatives including safety audits, risk analysis, Monitoring and measurements. The unit is having ISO 14001 -2004 certificate for environment. The company fulfills all requirements regarding various environmental legislations and Environmental protection act.

1) Air

The company is regularly monitoring parameters of stack and also the air quality surrounding the industry. Plant has started a new plantation scheme, for better the surrounding area of the premises of the company. Scrubbers are used in the chemical section for scrubbing of vent gases. All Chimneys' stack of Boilers and furnaces are according to the pollution control board standard.

2) Water Effluent

The Acidic nature Effluent flow is neutralized by Physiochemical Treatment, Anaerobic and Aerobic treatment process. Water is recycling after the Secondary and tertiary treatment. Under tertiary treatment the equipments are involved pressure sand filter and activated carbon contactor.

3) Solid Waste

Generated Solid waste is disposed as a filling material in low lying areas. And special room has constructed for solid waste.

NATIONAL PEROXIDE LIMITED

Village: Vadavali, Kalyan West (Maharashtra)

Unit Profile

National Peroxide Limited (NPL) are Pioneers and acknowledged market Leaders in the manufacture of Hydrogen Peroxide (H_2O_2) in India. The Company jointly promoted by Bombay Dyeing and manufacturing Company Limited **and** Laporte Industries Ltd. U.K. was incorporated in the year 1954. The Plant of 500 TPA capacity for H_2O_2 (50% w/w) was set up at Wadala in Mumbai.

The Company commissioned its 5250 TPA (50%w/w) capacity Plant in Kalyan, Maharashtra in 1976. The Plant was based on the latest Auto Oxidation (AO) Technology. A.O. Plant was expanded in 1988 to 14,000 TPA capacity which was further expanded to 30000 TPA in 1995, 49000 TPA in 2006 and 54000 TPA in 2007.

Sodium Perborate Plant of 840 TPA capacity as Monohydrate was set up in 1992.

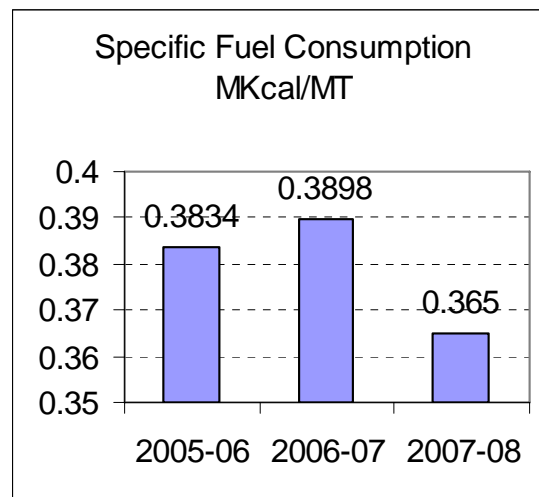
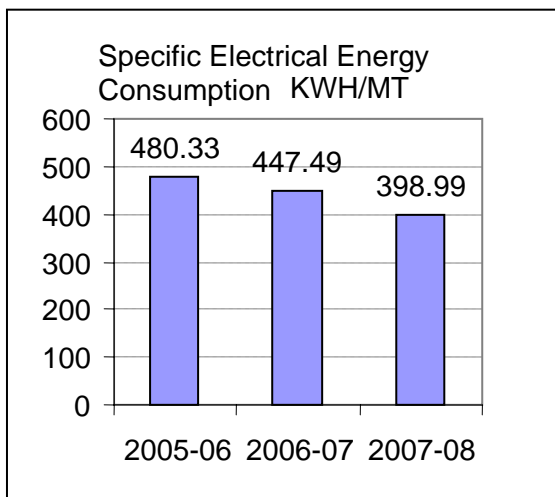
To meet Hydrogen requirement for A.O process, Captive H_2 Plant with a capacity of 700 Nm³/Hr was set up in 1986. As the need increased a new Plant with a capacity of 1500 NM³/Hr was installed in 1994 which was further revamped to 3300 Nm³/Hr in 2006.



Energy Consumption

With the implementation of various ongoing Energy Saving measures, a steady reduction in Specific Energy Consumption (SEC) has been achieved. The last three years Specific energy consumption figures shown below depict continual reduction in energy consumption due to sustained efforts to conserve energy.

| DESCRIPTION | UNIT | 2005-06 | 2006-07 | 2007-08 |
|--|---|---------|---------|----------|
| Specific Electrical Energy Consumption | KWH/MT of H ₂ O ₂ | 480.33 | 447.49 | 398.99 |
| Specific Fuel Consumption | MkCal/MT of H ₂ O ₂ | 0.3834 | 0.3898 | 0.3650 |
| Total Manufacturing Cost | Rs. In lacs. | 5205.44 | 5025.58 | 8237.21 |
| Total Energy Bill | Rs. In lacs. | 826.078 | 912.022 | 1314.218 |
| Energy Cost as % of Total Cost of Production | % | 15.87 | 15.87 | 18.15 |



Energy Conservation Commitment, Policy and Set up

NPL visualized the importance of energy conservation way back in 1997. Since then, NPL has been involved in continual improvement on conservation of energy. The core team led by General Manager, Energy Manager and Working group consisting of Production Manager, Engineering Manager, Operators and Technicians in the plants. All the Team members meet periodically for review and implementation of newly identified energy measures. At NPL, Energy cost accounts for over 15% of Production cost. Utmost importance is being given to Energy Efficiency and Energy Conservation.



National Peroxide Limited

ENERGY MANAGEMENT POLICY

WE AT NATIONAL PEROXIDE LIMITED, ARE COMMITTED TO

- Demonstrate excellence in Energy Management
- Improve Performance on a continual basis.

These will be achieved by -

- ◆ Monitoring and control of consumption of Energy through Effective Energy Management System and Periodic Energy Audits.
- ◆ Fine tuning Operations and Maintenance continuously to achieve the above goal.
- ◆ Continuous Up-gradation of Process / Equipments with Energy Efficient & Eco friendly Technology to optimise the energy cost.
- ◆ Create awareness among all Employees for Innovative ideas towards Conservation of Energy.
- ◆ Training all Employees to do their job proficiently and promote Energy Culture.
- ◆ Bench mark performance with National and International Standards.

Sd/-
 S. R. LOHOKARE
 MANAGING DIRECTOR

Energy Conservation Achievements

During the period 2005-2007 the Company implemented more than 24 energy saving ideas generated through periodic brain storming sessions. The total saving of Rs.162 lakhs was achieved with investment of Rs.387 lakhs with average payback period of less than 30 months. This does not include benefits other than energy consumption which amount to Rs.1164 Lakhs. It has resulted in percentage reduction of 5% in Electrical Energy and Thermal energy.

Major Projects implemented for Energy conservation during 2007-08 are as follows:

1. Waste Heat recovery with NG Pre- reforming



Normally, H₂ plants use Pre-reformer for Naphtha feed stock. Original plant design by M/s Projects and Development India Ltd, (PDIL) envisaged by passing of Pre-reformer while using Natural gas feed stock. Plant decided to use Pre-reformer for Natural gas. This is the only plant in India which uses a Pre-reformer for Natural gas. Very few plants in the world use this as well. Hence no operating data was available for guidance. The use of Pre-reformer resulted in part of the endothermic reaction being carried out at lower temperature in the pre-reformer instead of the reformer. This resulted in lower consumption of Natural Gas used as a fuel in the reformer and reduced steam generation in waste heat boilers. The use of Natural Gas in place of Naphtha commenced from 4th March 2008

Extra heat recovered : **1355.423 Mkal/year**
 Total investment : **Nil ***
 Total Saving in Fuel : **Rs.2.40 Lakhs in March 2008**
 Total Saving in Fuel : **Rs.28.65 Lakhs/Year**
 * Existing Installation used.

2. Changeover of H₂ Plant feedstock from Naphtha to Natural Gas



Designed H₂ Plant for Dual Feed Operation i.e. Natural Gas as well as Naphtha on economic considerations as price of Natural Gas in general is lower than that of Naphtha. This also enabled the Plant to save electrical power while operating on Natural Gas feed stock, as certain motor drives which are required to operate for Naphtha feed stock are not required for Natural Gas.

However cost of Natural gas as compared to Naphtha has resulted in saving of Rs. 53.53 Lacs during the March 2008.

Natural Gas pressure reducing Station in hydrogen plant



Total investment : Rs. 70.00 Lakhs
 Reduction in power consumption : 35.00kw
 Total Saving In power cost : Rs. 11.84 Lakhs
 Per year

Savings in cost due to Use of Natural Gas in Place of Naphtha : **Rs.53.53 lakhs in March 2008**

Annual Savings based on 350 days of operation With Natural Gas : **Rs. 669 lakhs**

3. Installation of Automatic Recycle Valve (ARC) and Variable Frequency Drives



Automatic Recycle Valve and Variable Frequency Drives were installed for Boiler Feed water Pumps.

Total investment : Rs. 10 Lakhs
 Reduction in power consumption : 3.89 kW.
 Total Saving In power : Rs. 1.3 Lakhs /Year

4. Installation of new Centrifugal Air Compressor



Installed a new energy efficient Centrifugal Air Compressor in place of the running 2 Nos old reciprocating compressors of lower rating.

This has resulted in extra air availability of 1200NM³/hr giving 5000 Tons/Annum of extra production with a contribution of Rs. 425 Lacs/Annum as compared to reciprocating Machines. Use of Centrifugal compressors has resulted in higher reliability with lower downtime, reduced maintenance cost and reduced specific power consumption.

Total investment : Rs. 70 Lakhs
 Reduction in power consumption : 43.33kw.
 Total Saving In power : Rs. 14.66 Lakhs /Year
 Additional contribution due to availability of Extra air : Rs.425 lakhs

5. Replacement of Air ends of old Centrifugal Air Compressor



Replaced old Centrifugal Air compressor and Motor with Energy efficient motor in place of old compressor & motor.

The replacements were carried out as old air ends and its motor had reached the end of its life. This also resulted in high air flow of 200NM³/hr giving 833Tons per Annum of extra Hydrogen Peroxide production with a contribution of Rs. 70 Lakhs per Annum as compared to old Centrifugal Machine. The plant reliability was also enhanced as old compressor results in greater amount downtime, higher maintenance cost and reduced specific power consumption.

Total investment: Rs. 50.00 Lakhs
Reduction in power consumption: 30.37 kw.

Total saving in power Rs.10.28 Lakhs/Year.
Additional contribution due to availability of
Extra air : Rs. 70 lakhs

6. Replacement of old Process Cooling water Pump



Replaced old process cooling water pump with new Energy efficient pump as the efficiency of old pump had dropped from 84% to 68%.

The Phosphor Bronze was selected as MOC for impeller to reduce the corrosion of impeller and hence to give longer life and maintain efficiency, and reduced specific power consumption

Total investment: Rs. 5.00 Lakhs

Reduction in power consumption: 21.18 kw.

Total saving In power Rs.7.17 Lakhs/Year.

7. Replacement of old 200KW Motor with energy efficient motor



Old standard motor of Oxidiser Feed pump 47/c was replaced with new energy efficient motor with EF-1 efficiency level.

The old repaired motor has outlived its life & was replaced for enhancing the plant reliability and reduced specific power consumption.

Extra investment due to choice of EF-1(15%) : Rs.1.17 lakhs

Total investment: Rs. 9.00 Lakhs

Reduction in power consumption: 9.48 kw.

Total saving in power Rs. 3.21 Lakhs/Year.

8. Replacement of 160W and 70W Lamps with 24W CFL Lamps for Plant Lighting



In the plant 160W and 70W lamps were replaced with 24W CFL lamps and reduced specific power consumption.

Total investment : Rs. 0.25 Lakhs
Reduction in power Consumption 8.50 kW
Total saving in power: Rs. 2.88 Lakhs/Year



9. Replacement of old motor control center



The old MCC-1 and MCC-7 installed in the year 1975, were replaced with new MCC's with latest switchgears for addressing obsolescence to enhance the plant reliability and reduced specific power consumption.

Total investment; Rs. 11.50 Lakhs
Reduction in power consumption: 1.5 kw.
Total saving In power Rs. 0.51 Lakhs/Year.

10. Replacement of old Insulations of Equipments and piping



The insulation of plant equipments and piping was replaced with new better quality Insulation.

Total investment: Rs. 1.50 Lakhs

Reduction in fuel consumption: 1.58 MT/Year

Total saving in fuel Rs. 0.33 Lakhs/Year.

Environment and Safety

The Unit is committed to preserve its environment and the Safety of the Plant and its Employees. Following major improvements have been made during the last three years:

Environment /Pollution Control

a. Water

The Company is governed by water (Prevention & Control of Pollution) Act 1974.

Following are the specified limits of standards for Treated Effluent along with latest reported values:

| Sr. No. | Test | Units | Limit | Actual Values |
|---------|------------------------|-------|------------|---------------|
| 1. | PH | | 5.5 to 9.0 | 7.6 |
| 2. | Scrapped Solids | PPM | 100 max | 23.0 |
| 3. | BOD (3 Days 27 Deg C) | PPM | 100Max | 52.0 |
| 4. | COD | PPM | 250Max | 150.0 |
| 5. | Oil & Grease | PPM | 10 | 1.5 |

b. Air

The Company is governed by Air Act (Prevention & Control of Pollution) Act 1981. The Company is with in limits for SPM/TPM & SO₂ emissions as limit set by MPCB.

However the Company has immediate plans to reduce the SO₂ emissions by commissioning the existing installation of LSHS. This will result in reduction of SO₂ emission by 50%.