

INDIAN PETROCHEMICALS CORPORATION LIMITED (BARODA COMPLEX)

COMPANY PROFILE

Indian Petrochemicals Corporation Limited with management control by Reliance Petroinvest Co. and one of the Navaratans established in 1969 by Govt. of India is a leading entity in Corporate circles of India. IPCL has formulated ambitious expansion plans and is currently considering upgrading and expansion of existing facilities. IPCL's multi-product portfolio includes Polymers, Synthetic Rubber, Synthetic Fibre & Fibre Intermediates, Solvents, Industrial Chemicals, Synthetic Resins, Engineering Plastics, Catalysts, Absorbents, Wire and Cable Compounds. Along with Baroda other two operating complexes are at Nagothane in Maharashtra and Gandhar near Bharuch.

Baroda Complex has several distinctions to its credit. Best performance award for 1990 among petrochemicals companies worldwide (CI London), FICCI Awards, ICMA Awards, National Energy Awards and several awards from National Safety Council, USA and British Safety Council, UK. Also ISO-9002 and ISO-14001 Certification of some of the plants of the Complex.

Energy Consumption

Baroda Complex energy consumption rate is around 50 MT of fuel oil equivalent i.e. 482 Million KCal per hour. 67 % of total energy consumed is purchased energy and balance 33 % energy is met through Internally generated fuel gas, CBFS and Slop Oil generated in the process internally and through various waste heat recovery and energy saving schemes implemented. Specific consumption pattern of last three years is as follows :

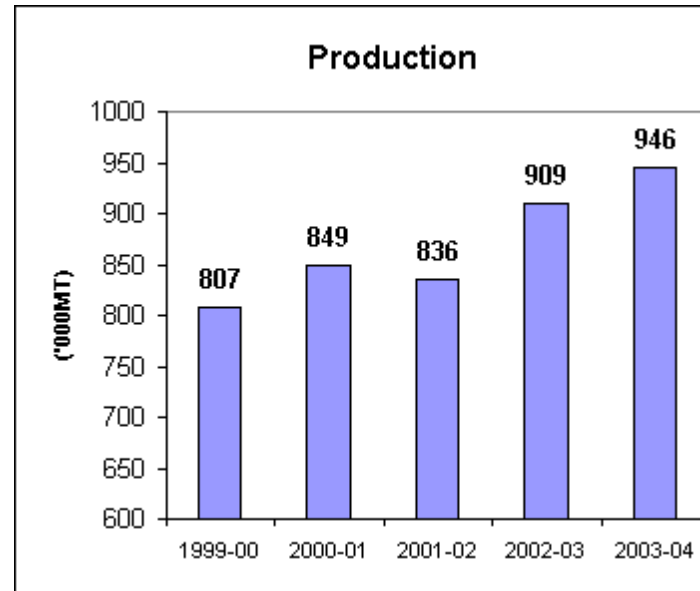
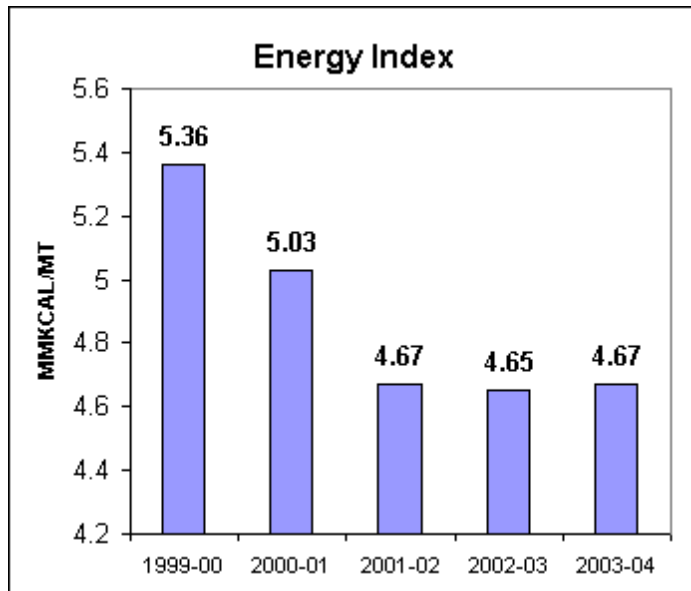
Year	Electrical energy Kwh/MT	Thermal Energy MMKcal/MT
2001-02	563	3.01
2002-03	543	3.01
2003-04	545	3.42

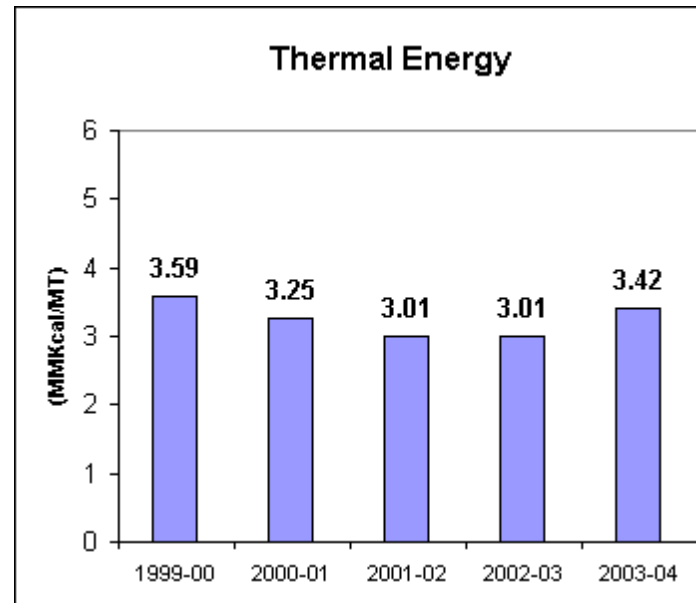
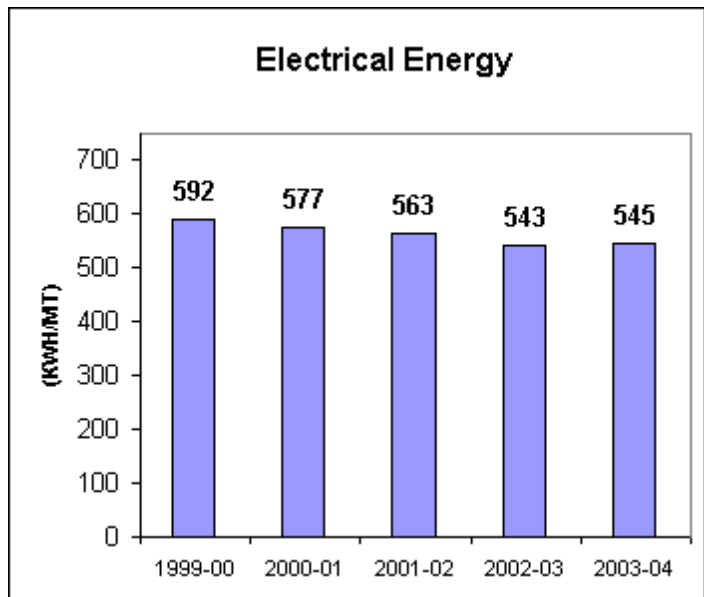
*Excluding byproducts

Energy cost as a percentage of Manufacturing cost comes to around 15.5%

Please find in the following page various trend of Energy Consumption of Baroda Complex
For the period 1999-00 to 2003-04

ENERGY PERFORMANCE FO IPCL BARODA COMPLEX (Year 1999-00 to 2003-04)





Photograph of Energy Conservation measure implemented at Paraffin Column in LAB plant.



Include one paragraph write-up on each major energy conservation project implemented during the year 2003-2004 only.

1. Diversion of Vinyl Acetylene from flare to fuel :

Since the commissioning of new BD plant, Vinyl Acetylene at a rate of 50 Kg/Hr was going to flare. It was suggested to divert this stream to Pyrolysis Gasoline Hydrogenation unit 1st stage reactor for hydrogenation & then divert to fuel. Considering 8000 operating hours the total quantity of fuel diverted to fuel system was be around 2000 MTA. Hardware used are one small eductor, two nos of XV valves and about 500 meter line. All the material was arranged in-house. This is very innovative scheme and the idea was explored jointly by Plant and Technology. HAZOP study was done and lots of deliberation was done before coming finalisation of the scheme. With Fuel price of 6000 Rs./MT, estimated Annual saving of Rs. 120 Lakhs.

2. Effective Cleaning of Convection zone of SRT Heater of Naphta Cracker Plant

SRT heater cleaning is carried out when Heater is down for Tubular line exchanger cleaning. On top of the convection zone there are 2 nos. of manholes which are opened and through each man hole a duct is laid connected to a separate vacuum blower. On the sides of the convection zone peeping openings are there. From here air lancers are introduced. Air at a pressure of 10 kg/cm² pressure is injected through air lancers and the dust is removed from top due to vacuum provided at the manhole. When cleaning was started, initially the result was good. During second cleaning of the same heater after few months stack temperature drop was lesser in view of fairly cleaner surface. This system of cleaning was started from December'03. Cleaning time requirement is around 8 hours for a heater. Drop in stack temperature for the heaters during 1st cleaning varied from 10 to 40 oC depending upon the fouling. Reduction in fuel consumption resulted in estimated Annual saving of Rs. 113 Lakhs.

3. Improvement of Acrylonitrile plant Incinerator Efficiency :

There has been continued efforts for further enhancement in the performance of Acrylonitrile plant Incinerator Efficiency during the year 2003-04. The Stack Temperature was reduced from 700 oC to 670 oC. By reducing this it was observed that there was no violation of Gujarat Pollution Control Board norms in terms of slippage of cyanide content in the flue gas. Investment in the scheme was nil. The measure was based on trial and error. Fuel saving was around 1229 MT of fuel gas. Annual saving of Rs. 68.36 Lakhs.

4. Energy Recovery from MP Condensate :

MP condensate at 180 oC and 10kg/cm²g is generated form Dilution steam generator system. Nearly 14 MT/Hr of this condensate was being sent to Aux. Boiler unit where it was getting mixed in the atmospheric condensate tank. Flashing of steam was there from the condensate tank resulting in to loss of energy. A scheme was prepared wherein MP condensate was used to preheat Charge gas surface condensate in the Cracker plant to recover the heat of MP condensate. Annual saving of Rs. 104 Lakhs.

5. Chemical Cleaning of Nitric acid tower of Acrylic Fibre plant :

In Acrylic fibre plant, Nitric acid towers are one of the major consumers of steam. The Towers were insulated and chemically cleaned which resulted in substantial saving of energy due to reduction in heat loss from the surface of the tower and improvement in heat transfer of the exchangers of the towers. Estimated saving in steam consumption is 1MT / MT of fibre in AF plant. Annual saving of Rs. 60 Lakhs.

6. Steam Saving measures of Dry Spun Acrylic Fibre plant (DSAF) :

Steam forms major utility consumption of DSAF plant. Various measures were taken for saving steam which resulted in saving of steam to the tune of 4 MT / MT of fibre. The measures are as under :

- a) Around 800 Kgs/Hr of flash steam from atmospheric tank was diverted to Monomer Column.
- b) Load was optimized of Solvent Column thereby steam load reduced.
- c) Polymer dryer Productivity was increased by which steam consumption was reduced.
- d) Malfunctioning steam traps were attended / replaced. Also Steam leaks in the plant were attended. All these measures resulted in saving of 300 Kgs / hr.

Annual Saving due to all above measures is Rs. 60 Lakhs.

7. Power Saving measures of Dry Spun Acrylic Fibre plant (DSAF) :

Power forms next major utility consumption of DSAF plant. Various measures were taken which are as under :

- a) Scheduling of reactor run. Due to this optimization power consumption was reduced.
- b) Increase in poly drying.
- c) Installing of Flat belt conveyor.
- d) Replacing of heavy fans.

Estimated Power saving of 3500 KWH with Annual Saving of Rs. 47.72 Lakhs.

8. Utilities area COC improvement :

Utilities plant COC was down for last few years in view of underground Cooling water leakages from the pipeline. Detailed survey was carried of Fire water and at several suspected places along the cooling water pipeline path ground digging was done. However to the surprise , Cooling water line passing underneath the open water sewer was leaking and water was found flowing in to it. This was known during repair work which was going on near open water sewer. After arresting of leakages of the cooling water pipeline, COC improved from 2.0 to 5.5. Reduction in make-up water was 60 M3/Hr. Annual saving of 38.7 Lakhs. This also helped in stoppage of one booster pump of 30 KW for additional saving of Rs. 3.5 Lakhs. Total annual saving of Rs. 42.2 Lakhs.

9. Energy Recovery from Condensate in Acrylic Fibre plant :

Usage of Condensate in 2nd Dryer of line A of Acrylic Fibre plant started in 5th & 6th coils in place of low medium pressure steam of 175 oC and 5.5 kg/cm²g . Estimated Steam saving of 2700 MTA. Annual saving of Rs. 16 Lakhs.

10. Power Saving in LAB Plant :

In LAB plant Paraffin column contact condenser grid replacement by packing & replacement of cold reflux distributor & nozzles helped in saving of power consumption. A pump with motor rating of 135 KWH of power was stopped. Estimated annual saving of 430 MWH of power. Annual saving of Rs. 5.68 Lakhs. Please refer Photo graph of Paraffin Column section of the plant where Energy Conservation Measure was implemented

11. Revenue Saving by Utilisation of cheaper Low value CBFS fuel :

Internally generated 14950 MT of CBFS used as fuel in place of costly LSHS in boilers resulted in Annual saving of Energy bill by Rs. 223 Lakhs.

12. Revenue Saving by Utilisation of cheaper Low value Slop Oil :

Low value internally generated SLOP Oil from EQ plant used as fuel from Nov.'04 onward in place of costly LSHS in boilers. Annual saving potential of Rs. 28.8 Lakhs.

Energy Conservation Plans and Targets

The company has set quantitative objectives of 2.0 % overall reduction in energy usage every year during the Ninth Plan period, so as to effect reduction in purchased energy bill.

Future plans for energy conservation are as under :

- *Inlet Air chilling for a Gas Turbine machine for power augmentation by 4 MW.
- * Installation of Thermo-compressor in Acrylic Fibre plant'
- *Online washing of Gas Turbine machines air compressor.
- * Automatic Blow down system for a Aux. Boiler.
- * VAR for Poly Propylene Co-polymer Plant.

Environment and Safety

a) Environment Conservation

IPCL, Baroda Complex has taken several environment friendly measures. Infact new plants adopted are cleaner and with energy efficient technologies. Meets all CPCB & GPCB statutory regulations for air, water and soil. A multi-purpose incinerator for the disposal of hazardous solid waste is existing. Also existing is the secured landfill site for solid waste disposal. IPCL has twice been awarded the FICCI Award for environment preservation and pollution control. ISO 14001 Certification has been achieved for many plants of the complex. For 2001 Baroda Complex received award for Excellence in Environment Preservation and Pollution control.

b) Safety :

IPCL's Baroda Complex safety is well organised, established and planned for minimising losses caused by unexpected situations. Various safety practices/procedures/rules have been inbuilt in the Company ever since the inception. The Baroda Complex is recipient of no. of prestigious awards for the last three years are listed below:-

- Award of Merit by National safety council U.S.A during the year 2001.
- Three Star Safety award by British Safety Council for the year 2001 and 2002.
- 2001-02 – Recorded Highest Ever Safe days Operation i.e more than 10 million man hours without any lost time injury