

# **RELIANCE INDUSTRIES LIMITED**

**(VADODARA MFG. DIVISION)**

## **Company Profile**

Reliance Industries Limited (RIL) is world's leading and India's no: 1 Private Ltd. Company. RIL group is a highly diversified group and is in to multiproduct business like oil / gas exploration, retail of petro / consumer products and Mfg. of petrochemical / refining and textile products. Also in to infrastructure and transportation sectors.

RIL, Vadodara Mfg. Div. was earlier part of the Indian Petrochemicals Corporation Ltd. (IPCL) with Management control by Govt. of India. In 2002, due to divestment of the equity, the management control went in the hands of Reliance Petroinvest Co. of RIL group. On 5<sup>th</sup> Sept. 2007, IPCL got merged with RIL.

RIL, Vadodara Mfg. Div. multi-product mfg. portfolio includes Polymers, Synthetic Rubber, Synthetic Fibre & Fibre Intermediates, Solvents and Industrial Chemicals. It has several distinctions to its credit. **Accredited earlier for Best performance award 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.** Infact it has Integrated Management System in place comprising of ISO-9001, ISO-14001 and OSHAS-18001 Certification for all the plants and depts. of the Site.

## **ENERGY MANAGEMENT POLICY**

**Reliance is committed to Energy Management in all its forms. Please refer our “Energy Management Policy”, which is given in the following page.**

### **Qualitative Objectives:**

- To reinforce a culture for persistent exploration of possibilities for minimizing energy throughput across any system and thereby achieve reduction in production cost as well as enhancing environment quality.
- To create awareness and alert response to energy conservation movement among the employees, their families and society, thereby evolve a critical mass of people with shared value for energy conservation.

### **Quantitative objectives:**

To effect 3.0 % overall reduction in energy usage every year, thereby effect reduction in energy consumption and in purchased energy cost.

### **Energy strategy:**

- Retrofitting and modifications with a view of making vintage technologies more efficient.
- Technological change to adopt energy efficient processes.
- Operate plants at maximum capacity which reduces Specific Energy Consumption of products.
- Generate Utilities at full capacity so as to have lower specific consumption for the utilities generated.
- Monitoring energy consumption for identifying and correcting thrust areas.
- Use of non-conventional sources of energy for minimizing impact on environmental conditions. Also for conservation of conventional sources of energy.
- Prioritizing the cheapest and environment friendly natural gas over costly fuel oil and optimum utilization of available fuels.
- Improvement in house keeping. Special provision has been made in plant's maintenance budget for taking quick action to attend to steam leaks, rectification of damaged insulation and for rectification of malfunctioning steam traps. Annual rate contract for rectification of damaged insulation and arresting of steam leaks by online sealing arrangement has been made.



## **Reliance Industries Limited Energy Management Policy**

Reliance Industries Limited plays a leading role in the national and global economy by providing quality goods and services in the materials and energy value chain.

Our Mission is:

- ❖ To become the lowest specific energy consumer in the industry.
- ❖ To widen our options for energy sources and
- ❖ To minimize the adverse impact of our operations on the environment.

We plan to achieve the above within the framework of sustaining the business by:

- ❖ Integrating energy management with the business management and establishing performance driven goals.
- ❖ Upgrading hardware, deploying new technologies and improving our practices to increase energy efficiency, reduce greenhouse gas emissions and minimize environmental impacts.
- ❖ Supporting scientific research and technological efforts to deliver new sources of energy including renewable and alternate fuels.
- ❖ Carrying out regular audits and training employees to promote energy conservation as a culture across the entire business functions.
- ❖ Continuously benchmarking our energy efficiency and energy productivity against others.
- ❖ Promoting awareness on energy conservation among all members of the Reliance family and the community at large.

Mukesh D Ambani  
March 2007

### Energy Consumption:

Baroda Complex energy consumption rate is around 45 MT of fuel oil equivalent i.e. 450 Million KCal per hour. 65 % of total energy consumed is purchased energy and balance 35 % energy is met through fuel gas, CBFS and Mixed oil generated in the process internally and through various waste heat recovery and energy saving schemes implemented.

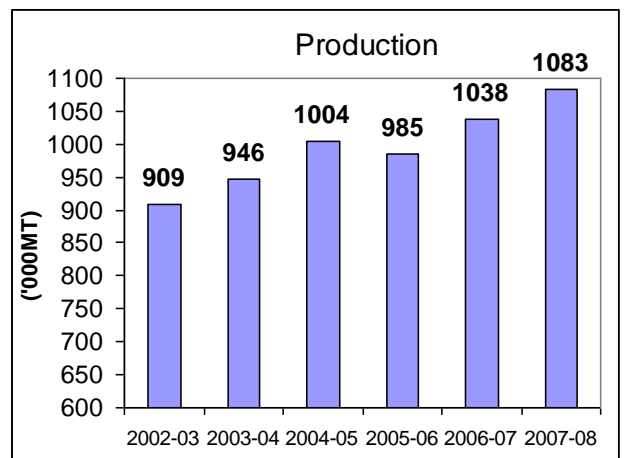
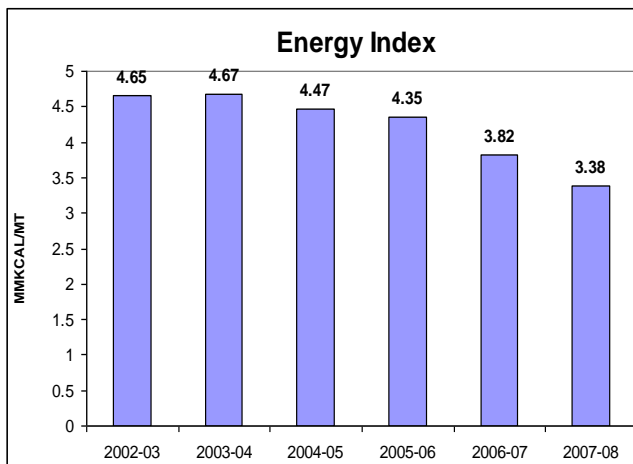
**Overall specific energy consumption during 2007-08 has been reduced by 11.5 %. Also during 2007-08 RIL VMD's most of plants (Ethylene, Propylene, FPU, PPCP, PP4, PBR-I, PBR-II and ACN) achieved ever highest production.**

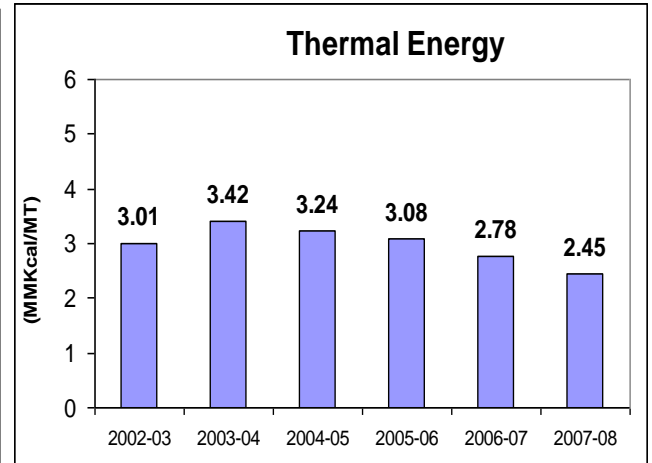
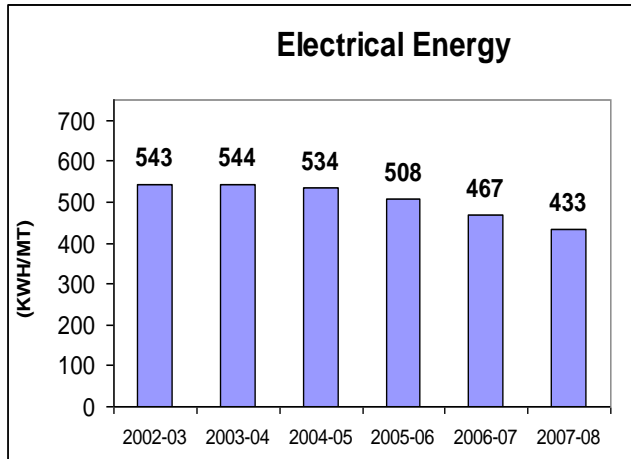
**RIL-VMD achieved 1<sup>st</sup> position in Captive Power Plant Bench marking amongst all RIL-Manufacturing sites.**

#### **Specific Consumption Details:**

Parameter	Unit	2005-06	2006-07	2007-08
Annual Production	MT	984656	1037979	1082590
Overall Specific Energy Consumption	MMKcal/MT	4.35	3.82	3.38
Thermal Energy	MMKcal/MT	3.08	2.78	2.45
Electrical Energy	KWH / MT	508	462	433

#### **Graphical Representation of Specific Energy Consumption:**





## Energy Conservation Achievements

RIL, Vadodara Mfg. Div. has implemented various schemes big and small, some of them quite innovative and thereby had been successful every year in reducing the Specific Energy Consumption. The year 2007-08 had been quite successful on Energy front. Revenue Saving due to various measures carried out during the year is **Rs. 2336.80 Lakhs**. Major Energy Conservation Projects implemented during the 2007-08 are as under:

### **i. Detailed Thermography survey of SRT Cracker Heaters**

Rectification jobs for the refractory bricks and burner blocks as per the mapping chart prepared based on the exhaustive Thermography carried out.

**Total Annual savings** : Rs. 70.10 Lakhs

**Total investment** : Rs. 29.7 Lakhs

**Payback period** : 5 months



## ii. Pinch Analysis study application for reduction in steam consumption

Reduction of steam consumption in Steam turbines at Cracker plant by increasing steam pressure and temperature.

**Total Annual savings** : Rs. 29.4 Lakhs

**Total investment** : Nil.

**Payback period** : Immediate



## iii. Optimization of steam cons. in auxiliary boilers

Optimized with the availability of gas by adopting following measures:

- a) Stopping of steam atomization and replacement with air atomization.
- b) Stopping of soot blowing,
- c) Stopping steam supply to coil air preheating
- d) Reduction of furnace oil storage temperature, taking advantage of lower pour point.

**Total Annual savings** : Rs. 180.0 Lakhs

**Total investment** : Nil

**Payback period** : 1 month



#### iv. Optimization in Air Consumption in Utility Plant

Extensive drive on the Optimization of air consumption resulted in stoppage of an air compressor in Utility thereby reducing consumption of plant air for non-productive purposes.

**Total Annual savings** : Rs. 80.0 Lakhs

**Total investment** : Rs. 2.0 Lakhs

**Payback period** : Immediate



#### v. Replacement with energy efficient circulation cooling water pump of Utilities cooling tower

The efficiency of M/s M & P make is higher than that of M/s Jyoti. The proposal was worked out for replacement with M/s M & P make.

**Total Annual savings** : Rs. 21.0 Lakhs

**Total investment** : Rs. 37.6 Lakhs

**Payback period** : 22.0 months



## vi. Reducing Utilities losses in Yard piping region

Major drive was carried out during the year for reducing the Energy losses in Yard Piping Area. Arresting of the various leakages has saved enormous energy and revenue for the Complex.

**Total Annual savings** : Rs. 1159.0 Lakhs

**Total investment** : Rs. 50 Lakhs

**Payback period** : 1.0 Month



## vii. Major refractory repair of an auxiliary boiler

Major repair of refractory of baffle plates and superheater region were carried out thereby short-circuiting of flue gases was averted.

**Total Annual savings** : Rs. 50.0 Lakhs.

**Total investment** : Rs. 14.8 Lakhs

**Payback period** : 4 months



### viii. Major insulation repair of an auxiliary boiler

A detailed survey was carried out and mapped for all the hot spots. Insulation jobs were carried out as per the desired thickness for all the Hot zone surfaces of all the Auxiliary Boilers and steam headers.

**Total Annual savings** : Rs. 30.0 Lakhs.

**Total investment** : Rs. 9.9 Lakhs

**Payback period** : 4 months



### Other schemes of 2007-08 are:

- ix. Stoppage of a Boiler feed make up pump
- x. Replacement of control valve Installation of VFD in LAB plant for fin fan cooler.
- xi. Replacing of pump with lower rating
- xii. De-lamping of cellers, substations and corridors and installing of intelligent street light controllers with astro timers .
- xiii. Maximisation of steam generation in Heat Recovery Steam Generators.
- xiv. Alternative waste fuel i.e. internally generated 964 MT of CBFS was used in place of costly LSHS oil in all the Auxiliary boilers.
- xv. Last phase of Steam trap audit completed.
- xvi. Underground water leakages of fire water header arresting and prevent los of raw water.
- xvii. Utilization of treated effluent in place of fresh raw water for gardening.

## Energy Conservation Planned and Target

### **Planned Specific Energy Consumption Target for the year 2008-09 & 2009-10:**

Year	Electrical kWh/MT	Thermal MMKCAL/MT	Reduction over the year 2006-07	
			Electrical %	Thermal %
2007-08 (Base Year)	433	2.45	-	-
2008-09	424	2.40	2.0	2.0
2009-10	416	2.35	3.9	4.1

### **Major future plans for energy conservation are as under:**

1. Energy Conservation Turbine installation for steam letdown area of Utility plant from HP to LMP steam level. Power generation of 1600 KW equivalent. Investment of around Rs. 2.0 Crores.
2. Solar Energy based air conditioning system for Engg. Services building. Investment of Rs. 2.0 Crores. Payback period is around 5 and 1/2 years.
3. Installation of additional Gas Turbine for improving the Energy Efficiency and Reliability of the system. Investment of around Rs. 100.0 Crores.
4. Detailed Pinch Analysis study for ACN and VCM plants.
5. Installation of 470 nos. On/Off device for ACs, Split ACs and Water Coolers for saving of power.
6. Use of spare exchanger at LDPE to stop venting of low low pressure steam. Capex expenditure of Rs. 15.0 Lakhs. Annual saving of Rs. 90.0 Lakhs.
7. Vapour absorption refrigeration system for LDPE & PPCP plants. Annual saving of Rs. 125.0 Lakhs.
8. Zirconium coating for SRT Heater radiation zone for improving efficiency of heater. Fuel saving of around 3-5%. Investment of around Rs. 15.0 Lakhs.

## SAFETY

### Reliance Safety Policy

**“Safety of a person overrides all the production targets.”**

Reliance believes that all injuries, occupational illnesses as well as safety and environmental incidents are preventable. Reliance shall strive to be a leader in the field of management of Health, Safety and Environment.

***Our Chairman Shri MDA says that our peace of mind depends on the Safety of our PEOPLE. No amount of money is worth if it is made by Sacrificing the LIFE.***

#### **Initiatives taken for achieving safety excellence:**

- **Launch of DuPont Safety Resources Engagement (DSRE) Project** by our Chairman Sh. MDA on **26th Oct 2007** at Makers, Mumbai.
- Launch of “Journey to Safety Excellence” by Whole time director Sh. S K Anand on **03.11.2007** at RIL-VMD.
- **Feb 6, 2008:** ‘100 days of JWCS’ (Journey to World-class Safety)’. VC/PVC awarded for ‘Incident Reporting & Investigation’.
- **May 2, 2008:** ‘25 weeks of JWCS’ (Journey to World-class Safety)’. PP-IV awarded for ‘Housekeeping’.
- Safety Observations and Incident Investigation sub committees established and started functioning

## Environment

RIL, Vadodara Mfg. Div. has taken several environment friendly measures. Infact new plants / expansion have 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. RIL, Vadodara have received several environment excellence awards like FICCI Award for environment preservation and pollution control and GreenTech awards for environment excellence. ISO 14001 Certification has been achieved for all the plants and depts. of the Site w.e.f. May 2007.

### **Major environmental improvements during the Year 2007-08 are summarized below:**

1. Reduction in hazardous Calcium Fluoride waste generation from 1.84 to 0.887 MT/ MT of Linear Alkyl Benzene product.
2. Reducing of Carcinogenic Benzene loss to atmosphere and exposure to employees from 38 to 24 kg / MT of the PBR product.
3. Reducing generation of the hazardous waste – EDC heavy end in VCM plant from 0.034 to 0.021 MT / MT of VCM. Further in 2007-08, Recovery of 350 MTA of EDC & VCM in VC PVC plant by process optimization and LDAR.
4. Reducing of Waste Polymeric oil generation from 2.00 to 0.75 MT / Month from PP plant.
5. Installation of NH<sub>3</sub> based Ref system as an alternative to Freon 12 in Utility block II plant.
6. Prevention of HCN emissions by provision of cooler at HAD outlet in ACN plant & HCN column bypass.
7. 1550 MT Oil Recovery from Surge pond No. 3 at Effluent treatment plant.
8. Reduction in Waste Slop oil generation by 30 MTPM (MT per Month) by diversion of spent hydrocarbon to gasoline fractionators in NCP during the year 2007-08.
9. Reuse of 3000 m<sup>3</sup>/day of treated effluent for gardening/ Eco farm in 2007-08.

The performance trend of Environment improvement during the last 3 years is exemplified by the following graphs:

