



## Indian Rayon and Industries Limited (Rayon Division) , Veraval



### **Unit Profile**

Indian Rayon & Industries Limited (IRIL) is an acknowledged market leader of **VISCOSE FILAMENT YARN** business. The Rayon division is one of the 9 divisions of Indian Rayon, located in Veraval Gujarat. The main product of Rayon division is the Viscose Filament Yarn apart from chemicals like SULPHURIC ACID, CARBON DISULPHIDE which are consumed in house and SODIUM SULPHATE, which is a by product. The total Production capacity is 45.0 TPD of Yarn. Comprising 40 TPD pot spun yarn (PSY) & 5.0 TPD Continuous Spun Yarn (CSY). During the year 2004-2005, 16420 MT of yarn was produced with the capacity utilization of 102.63 % . The Veraval unit's annual sale turnover was Rs. 352 crores in the same year.

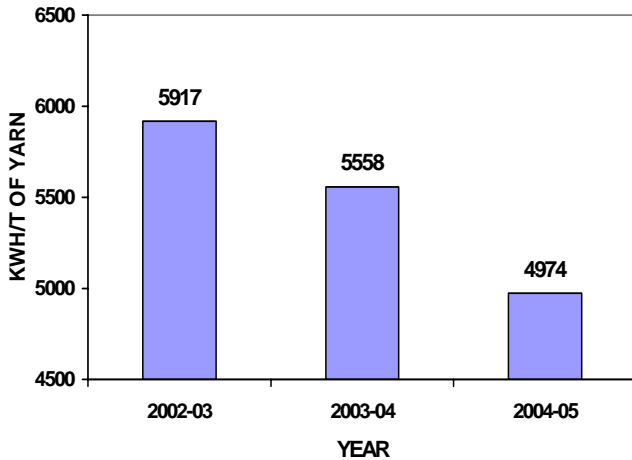


### **Energy Consumption**

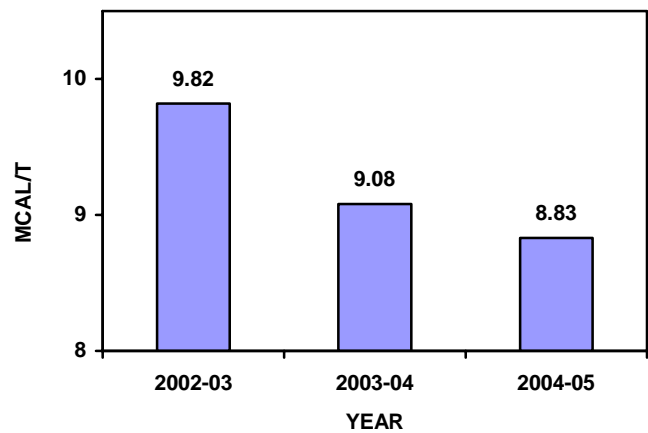
With the implementation of various energy conservation measures as ongoing practice, there is steady decline of specific energy consumption. Last three years specific energy consumption figures are shown below , Which depicts continual reduction in energy consumption over last two years due to our sustained efforts to conserve it with the implementation of various energy conservation measures & ideas to increase efficiency of equipments.

DESCRIPTION	UNIT	2002-03	2003-04	2004-05
Electrical Energy	KWH/T	5917	5558	4974
Thermal Energy	M Kcl/T	9.82	9.08	8.83
Total Manufacturing Cost	Rs. lakhs	19985	20735	24987
Total Energy Bill	Rs. lakhs	4299	4354	5095
Energy as %age of Total Cost of Production	%	21.5	21.0	20.39

SPECIFIC POWER CONSUMPTION



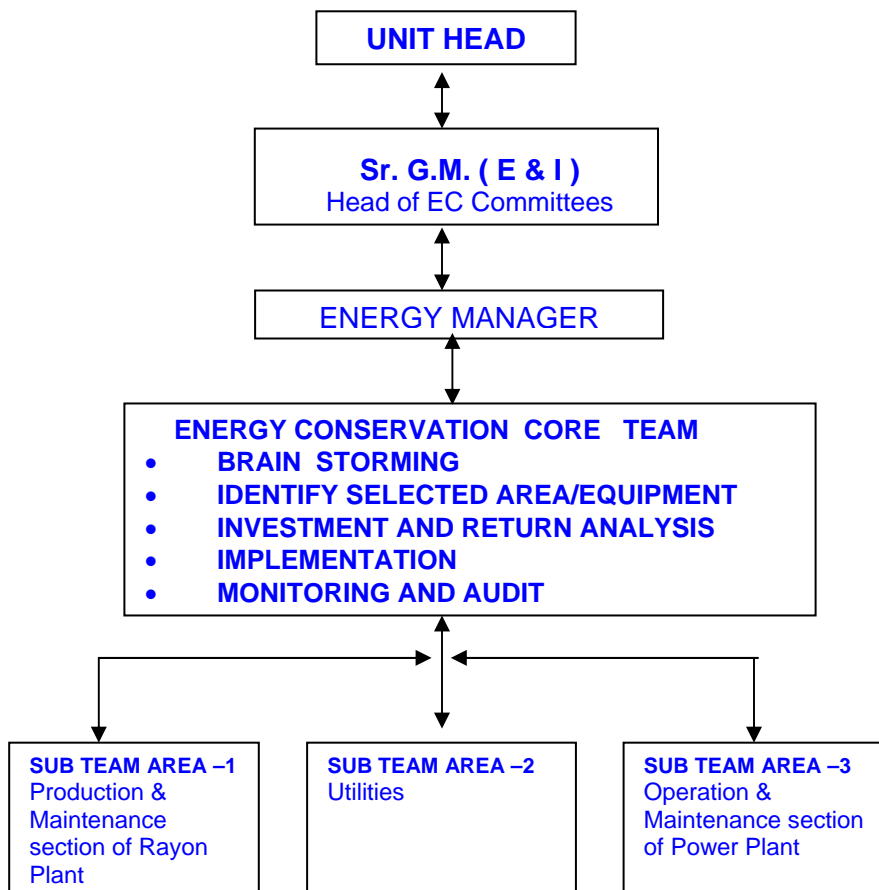
SPECIFIC THERMAL ENERGY CONSUMPTION

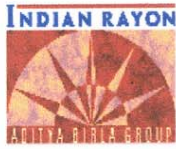


**Energy Conservation Commitment, Policy and Set up**

IRIL visualized importance of energy conservation way back in 1990. Since then we have been involved in continuous improvement & energy conservation. Our Core team led by unit head & headed by Sr.GM (E&I) constitutes 11 nos. of subcommittees in the plant. Subcommittee consist 2 to 4 members from different areas. All the team meet periodically for review & implementation of new identified energy saving schemes. At Indian Rayon & Industries Limited, energy cost accounts 20% of production cost and the unit gives utmost importance to energy conservation

**ENERGY CONSERVATION TEAM STRUCTURE**





INDIAN RAYON AND INDUSTRIES LIMITED  
(RAYON DIVISION)  
VERAVAL



## ENERGY MANAGEMENT POLICY

Indian Rayon and Industries Limited, Veraval is committed to demonstrate excellence in Energy Management Performance on a continual basis. To achieve this, we are committed for -

- Monitoring and Control of consumption of Energy through effective Energy management System and periodic energy audits.
- Continuous Upgradation of process with energy efficient & eco-friendly technology to optimize the energy cost.
- Promoting & Propagating Energy Awareness among all the employees.
- Bench marking our performance with the best and endeavoring to be ahead in the world.

(K.C. Jhanwar)  
EXECUTIVE PRESIDENT

## **Energy Conservation Achievements**

During the period 2002 - 2005, the unit implemented 91 energy saving ideas generated through periodic brain storming sessions. Annual savings of Rs.787.38 lakhs was achieved with an investment of Rs. 509 lakhs with payback period of approx. six months only. It has resulted in percentage reduction of 15.94 % in electrical energy and 10.08% in thermal energy during last 3 years shown below.

YEAR	PRODUCT	KWH/TONNE	%REDUCTION OVER 2002- 03	MKCAL/ TONNE	%REDUCTION OVER 2002-03
2002-03	Viscose filament Yarn	5917	-	9.82	-
2003-04	Viscose filament Yarn	5558	6.07	9.08	7.54
2004-05	Viscose filament Yarn	4974	15.94	8.83	10.08

### **Major projects implemented for Energy conservation during 2004-05**

#### **1. Energy Saving By replacement of old & inefficient TG sets by energy Efficient TG Set**



We have stopped 3 Nos TG sets which are very old and inefficient by installing one no. 2.5 MW energy efficient TG Set. Specific steam consumption of old TG sets was around 12.8 KG/Kwh and with new TG set it is 10.5 Kg/Kwh.

Investment Rs.325.00 lakh  
Saving Rs. 192.72 lakh

#### **2. Installation of Energy Management System**

We have installed computer based energy management system with around 350 Nos of high accuracy (class 0.5) energy meters with necessary software to monitor equipment wise, dept. wise and feeder wise power consumption on line as well as to get historical trends  
Investment Rs.25.00 lakh

3. Energy Saving by installation of PLC system for auto loading / unloading of instrument air compressor



We have installed PLC for automatic loading / unloading on inst. Air compressor (40 HP) in our Engine room dept. for power saving .

Investment Rs. 1.88 Lakh  
Saving / Yr Rs. 3.52 Lakh

4. Rain water harvesting in our residential colonies



We have implemented rain water harvesting system for water conservation by recharging the wells and bore wells in our residential colonies as well as in the near 53 villages in Veraval Taluka.

**5. Installation of VFDs on Cooling water pumps.**



We have installed VFDs on two out of three pumps of cooling water pumps to supply water as per the loading on double effect Vapour Absorption Machine in engine room dept. which operates in close loop as per the flow requirement.  
Investment Rs.9.00 Lakh  
Saving Rs. 10.28 Lakh

**6. Installation of specially designed lighting transformer in our 16.5 MW CPP**



We have replaced 3 nos x 40 KVA high voltage & high losses lighting transformers by 1 NO. 250 KVA, 415 Volts / 380 volts low loss lighting transformer in our 16.5 MW CPP.

Investment Rs. 3.00 Lakh  
Saving Rs.2.97 Lakh

**7. Energy saving by insulation of top electrode and isolation of Neutral from earthing of CS2 furnace.**

We have 6 Nos transformers to supply the power to the Arc furnaces for the production of Carbon di sulphide. We have insulated the top electrode of all the furnaces from the body and disconnected the neutral from earthing to prevent the leakage of current and to minimize the losses.

Investment                      Rs. 0.50 Lakh  
 Saving                              Rs. 12.00 Lakh

**Other Major initiatives taken for energy conservation during the year 2004-05**

SNo	Description	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Replacement of old and high losses transformers	27.17	27.00
2	Installation of VFDs on various equipments to minimize losses	88.05	62.10
3	Replacement of electrical heaters by steam heaters	10.60	4.00
4	Replacement of ordinary tubelight by Asian E+	18.50	9.60
5	Installation of PLC in Centrifugal Ice Machine	3.33	2.00
6	Installation of new capacitors in place of faulty capacitors	4.82	3.00
7	Optimisation of filter water consumption in our 16.5 MW CPP	2.46	0.00
8	Optimisation of soft water consumption in our 16.5 MW CPP	2.81	0.00
9	Conversion of fuel from LDO to HFO in 2x 2270 KVA DG sets	138.00	100.00
10	Installation of energy efficient Xanthomat in viscose dept.	1.45	5.00
11	Installation of auto pulp feeding system to mixer	0.00	20.50
12	Installation of plate type heat exchanger for process optimisation	0.00	1.50
13	Arresting steam leakages from pipe lines through out the plant	9.00	1.00
14	Removal of idle steam headers within the section of plant	3.85	2.00
15	Installation of PLC in place of timers	0.00	4.50
16	Installation of photocells to switch off the ACs automatically	5.35	0.54
17	Replacement of pumps, motors by energy efficient pumps & motors	29.34	7.75
18	Lighting circuit modification, optimization of voltage & installation of energy efficient Ballast	4.06	1.10
	<b>Total</b>	<b>348.79</b>	<b>251.59</b>

**Major Plans and Targets for energy conservation for the year 2005-06**

Sno	Department	Equipment	Scheme
1	Viscose	Dissolvers	Replacement of Dissolvers by grinder
2	Spinbath	Condensor	Smaller size mixing condensor for power saving
3	Air Washer	Air Washer	Replacement of existing spray type AW No.2
4	Air Washer	Air Washer	Heat recovery of AT effluent for saving Steam in Spg. AW
5	Power Plant	Boiler Feed water pump	Installing steam turbo drive for boiler feed water pump
6	- do -	ID Fans	Installing steam turbo drive for boiler ID fan
7	Engine Room	Vapour Absorption Machine	Installation of single effect VAM for Steam balancing
8	- do -	Vapour Absorption system	Installation of steam operated ammonia VA system for caustic lye chilling

9	Power Plant	Turbine	Utilising part of intermediate un controlled extraction from new Co-generation plant for double effect chiller
7	Power Plant	Instrument Air Compressor	Optimising the operation of sonic soot blowers to minimize air compressor
9	Rayon Plant	Steam pipe fitting	Insulation of bare steam pipe fitting in Rayon plant
10	- do -	Water pumps	Replacement of old and inefficient pumps with energy efficient pumps
11	Air Washer	Fan	Replacement of Cast Aluminium fan blades by Aero dynamically designed FRP blades
12	Boiler House	Deaerator	Reducing Deaerator temp. for reduction in auxiliary steam consumption
13	- do -	Crusher	Reducing un burnt in bottom ash by checking and reconditioning crusher internals
14	DPH	Jacket Cooling Water	Recovery of heat from DG jacket cooling system and utilizing the same for After treatment process heating.