



**INDIAN RAYON AND INDUSTRIES LIMITED
(RAYON DIVISION)
VERAVAL**



Unit Profile

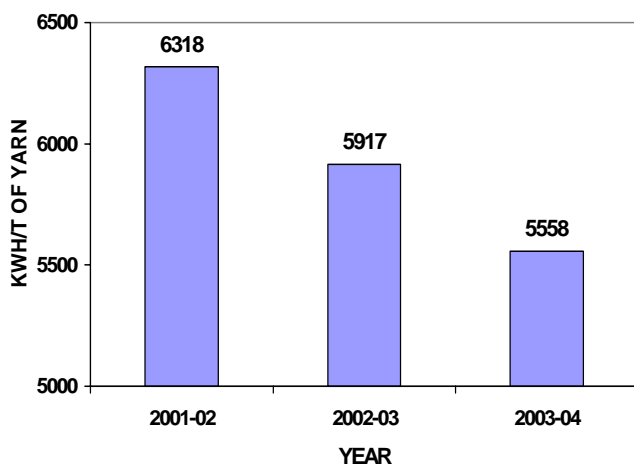
Indian Rayon & Industries Limited (IRIL) is an acknowledged market leader of **VISCOSE FILAMENT YARN** business. The Rayon division is one of the 9 divisions of Indian Rayon, located in Veraval Gujarat. The main product of Rayon division is the Viscose Filament Yarn apart from chemicals like SULPHURIC ACID, CARBON DISULPHIDE which are consumed in house and SODIUM SULPHATE, which is a by product. The total Production capacity is 42.5 TPD of Yarn. Comprising 40 TPD pot spun yarn (PSY) & 2.5 TPD Continuous Spun Yarn (CSY). During the year 2003-2004, 16060 MT of yarn was produced with the capacity utilization of 107.07 % . The Veraval unit's annual sale turnover was Rs. 312 crores in the same year.

Energy Consumption

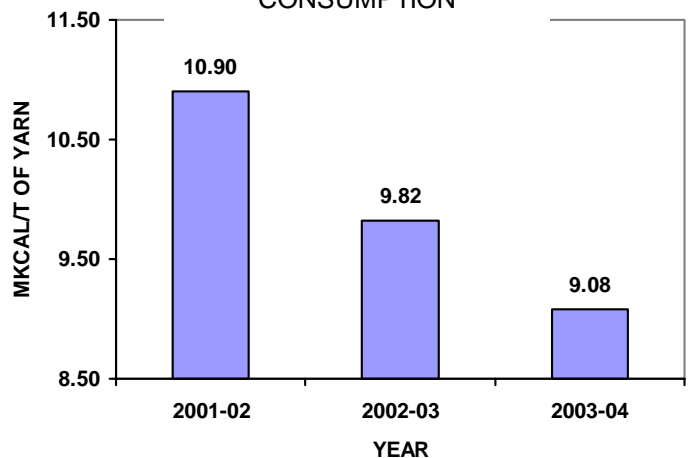
With the implementation of various energy conservation measures as ongoing practice, there is steady decline of specific energy consumption. Last three years specific energy consumption figures are shown below , Which depicts continual reduction in energy consumption over last two years due to our sustained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

DESCRIPTION	UNIT	2001-02	2002-03	2003-04
Electrical Energy	KWH/T	6318	5917	5558
Thermal Energy	M Kcl/T	10.9	9.82	9.08
Total Manufacturing Cost	Rs. lakhs	17222	19985	20735
Total Energy Bill	Rs. lakhs	3704	4299	4354
Energy as %age of Total Cost of Production	%	21.5	21.5	21.0

SPECIFIC POWER CONSUMPTION



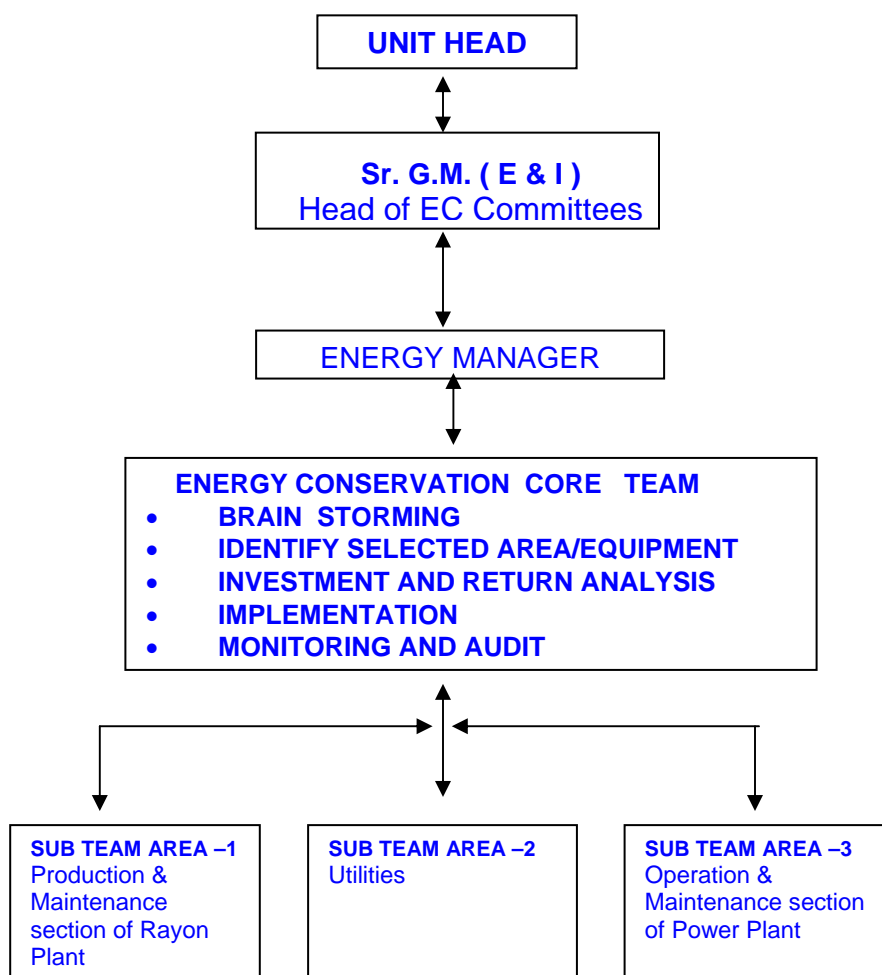
SPECIFIC THERMAL ENERGY CONSUMPTION



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



Energy Conservation Achievements

During the period 2001 - 2004, the unit implemented 70 energy saving ideas generated through periodic brain storming sessions. Annual savings of Rs.1845 lakhs was achieved with an investment of Rs. 933 lakhs with payback period of approx. six months only. It has resulted in percentage reduction of 12.03 % in electrical energy and 16.70% in thermal energy during last 3 years shown below.

YEAR	PRODUCT	KWH/TONNE	%REDUCTION OVER 2000- 01	MKCAL/ TONNE	%REDUCTION OVER 2000-01
2001-02	Viscose filament Yarn	6318	-	10.9	-
2002-03	Viscose filament Yarn	5917	6.35	9.82	9.91
2003-04	Viscose filament Yarn	5558	12.03	9.08	16.70

Major projects implemented for Energy conservation during 2003-04

1. Energy Saving By reducing the speed of motors during idle running hrs. (Trend Setter Project)

Brief Particulars of the Scheme :

We are having around 12500 high speed (9000 rpm) vertical induction motor known as potmotor to wind the yarn in the form of cake under high centrifugal forces. During the doffing time the motors were running at same speed resulting generation of waste of the product and loss of energy. By in house R & D efforts we have adopted dynamic breaking system and reduce the speed of potmotor during doffing period to reduce the godet waste and power losses. This is the technology which is **first time adopted in the world** to reduce the waste of product and reduce the power consumption.

Saving :

Saving	=	2112 KWH / Day
No. of Days of operation in a year	=	365 Days
Power Saving per year	=	7.71 Lakh kWh
Cost of Power	=	Rs. 5.25/ kWh
Saving Per Year	=	Rs. 40 Lakhs
Reduction in waste	=	Rs.48 lakhs
Total saving	=	Rs.88 Lakhs

Investment :

Cost of Implementation	=	Rs. 140 Lakhs
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Energy conservation and reduction of product rejection using Variable Frequency Drive

2. Energy Saving By installation of 525 TR single effect vapour absorption chilling machine in place of power driven centrifugal ice machines.
(Substitution of Energy)

Brief Particulars Of Scheme :

We were having Power driven Centrifugal type Chilling Machines to meet our plant refrigeration load. Power Consumption of those machines were very high (400 KW). We have replaced the above machines by steam driven single effect vapour absorption type chilling machine of 525 TR capacity. We have used the steam from extraction of our 16.5 MW captive power plant .

Saving :

Power Consumption of Centrifugal Machines	=	10000 kWh / day
Power Consumption of Vapour Absorption machine	=	400 kWh / day
Saving	=	9600 kWh / day
Working days / year	=	365 days
Net saving per year	=	35.04 Lakh kWh
Cost of Power	=	Rs. 5.25/ kWh
Saving Per Year in Rs	=	Rs. 184 Lakhs

Investment :

Cost of Implementation	=	Rs. 60 Lakhs
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Vapour Absorption Machine (Substitution of Energy)

3. Energy Saving by reduction in frequency of Diesel Power Generation from 50 HZ to 49.5 HZ. (Major saving with R & D efforts without investment)

Brief Particulars Of Scheme :

we were maintaining the 50 HZ frequency of our Diesel power House. By in house R & D efforts and innovative ideas of our energy conservation committee we reduced the same to 49.5 Hz .

Saving :

Reduction in Power Consumption of Rayon Plant with 49.5 HZ.	=	2400 kWh / day
Cost of Power	=	Rs. 5.25/ kWh
Saving Per Year in Rs	=	Rs. 46.00 Lakhs

Investment :

Cost of Implementation	=	Nil
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Frequency reduction of Power Generation from 50 Hz to 49.5 HZ

4. Conversion of fuel from LDO to HFO for 4 Nos. x 2270 KVA D.G. Sets

Brief Particulars of the Scheme :

We are having 9 Nos. D.G. Sets which were operating on L.D.O. We have modified and converted 4 Nos. D.G. Sets to operate on H.F.O. due to difference in cost of fuel

Saving :

Power Generation during the year 2003-04	=	32.95 Lakhs KWH
Average Rate difference between HFO & LDO	=	Rs.4.50 per litre
Fuel consumed	=	87 KL
Saving due to cost difference	=	Rs. 391 Lakhs
Saving due to increase in efficiency	=	Rs. 93 Lakhs
Cost of heating of HFO	=	Rs. 19 Lakhs
Net Saving	=	Rs. 465 Lakhs

Investment :

Cost of Implementation	=	Rs. 299 Lakhs
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Saving in fuel efficiency and cost by substitution of fuel from LDO to HFO

Other Major initiatives taken for energy conservation during the year 2003-04

SNo	Description	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Replacement old and inefficient transformers	44.87	35.50
2	Replacement of conventional lights by CFL	11.96	1.18
3	Replacement of in efficient motors, fans, pumps	57.00	22.50
4	Replacement of inefficient compressor by efficient compr.	7.91	6.00
5	Installation of Variable Frequency Drive	22.45	30.00
6	Modification of tightening of CS2 furnace bus bars	4.60	0.48
7	Optimisation of use of compressed air	50.0	0.00
8	Process monitoring and control instrumentation	52.00	86.00
9	Reduction of rejects in the production losses	48.00	30.00
10	Recycling of material	8.64	1.44
11	Use of natural resources in place of electricity	2.30	2.00
12	Installation of PHE in place of chilling machine	16.00	7.50
13	Stopping of idle running equipments	14.80	0.00
14	Human resources development for energy conservation	0.00	1.50
	Total	340.53	224.10

Major Plans and Targets for energy conservation for the year 2004-05

SNo	Description	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Optimise Exhaust system in Spinning halls	2.09	2.00
2	Replacement of 9 inefficient fans with high efficient fans	5.44	8.50
3	Optimise operation of booster fans	1.36	0.00
4	Optimise operation of spray pumps in Air washer	3.97	7.00
5	To install Variable Frequency Drive in Textile Airwasher fans	2.81	9.00
6	Ceramic fibre lining in CS2 furnaces	16.35	32.00
7	To Install H2 fired VAM and utilize vent H2 as fuel	9.07	20.00
8	Arrest air in filtration in boiler No.1	12.03	5.00
9	Reduce one stage of the boiler feed water pump in PP	15.81	39.00
10	Replacement of existing cooling water pumps with new pump	10.27	8.00
11	Replacement of power driven main air blowers by steam driven	22.12	25.00
12	To install correct size condenser pumps for one effect VAM	8.93	6.00
13	To install high efficiency correct head pumps in WT plant	4.52	5.00
14	Installation of computerized energy metering system	0.00	25.00
	Total	114.77	191.5

Environment and Safety

The unit is committed to preserve its environment and safety of its employees. Following major improvements have been made during last three years :

a) Water Effluent

The effluent from various section of industry is led to the common effluent treatment plant. The acidic effluent flow are neutralized by addition of lime slurry and then fed to two zinc clarifiers for effective removal of zinc. The overflow from clarifier is fed to the mixing chamber where the effluent from other two drains also joined. The mixed effluent is then pumped to suspended solid clarifier . The overflows flows into a holding tank, from where it is disposed off to sea creak.

The quality of this treated effluent will within the prescribed norms of GPCB.

b) Air

Regarding control of air pollution the company has installed ESP & Bag filter in power plant & boilers, scrubbers in acid plant & caustic plant for dispersion of process gas. The industry has provided a stack of 52.5 mtrs height. The company is regularly monitoring the all polluting parameters of stack & also the ambient air quality surrounding the industry.

All the gaseous emission are always found well within the norms prescribed by GPCB norms.

c) Solid waste

Mainly lime sludge is generated & disposed as a solid waste in low lying land area.

Our industry has got ISO 14001 & OHSAS certification & we are committed to follow all the guidelines as per ISO standards.

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