



**INDIAN RAYON**  
**( a Unit of Aditya Birla Nuvo Ltd. )**  
**(RAYON DIVISION)**  
**VERAVAL**



***Unit Profile***

Indian Rayon (a Unit of Aditya Birla Nuvo Ltd.) is an acknowledged market leader of VISCOSE FILAMENT YARN business. The Rayon division is one of the 8 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 2006-2007, 17669 MT of yarn was produced with the capacity utilization of 107.74 % . The Veraval unit's annual sale turnover was Rs. 334.22 crores in the same year.

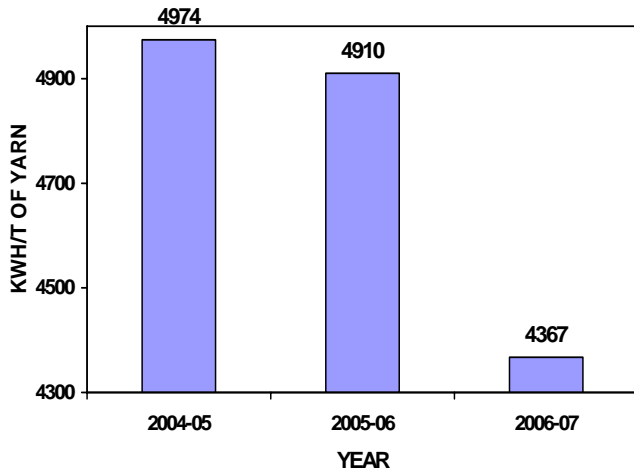


***Energy Consumption***

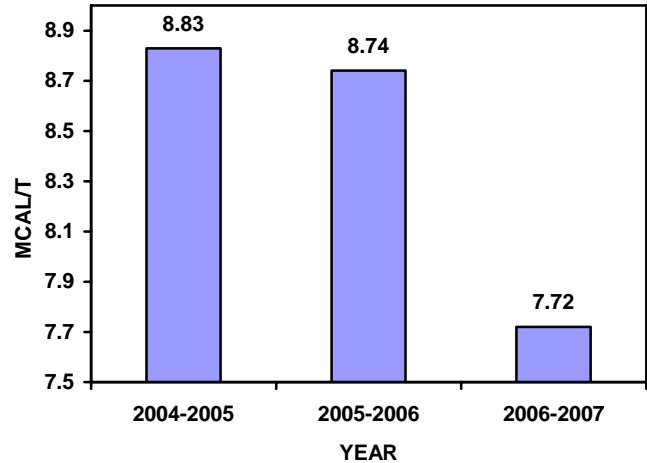
With the implementation of various energy conservation measures as ongoing practice, there is steady decline of specific energy consumption. Last three years specific energy consumption figures are shown below , Which depicts continual reduction in energy consumption over last two years due to our sustained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

DESCRIPTION	UNIT	2004-05	2005-06	2006-07
Electrical Energy	KWH/T	4974	4910	4367
Thermal Energy	M Kcal/T	8.83	8.74	7.72
Total Manufacturing Cost	Rs. lakhs	24987	22099	25574
Total Energy Bill	Rs. lakhs	5095	4101	4028
Energy as %age of Total Cost of Production	%	20.39	18.56	15.75

SPECIFIC POWER CONSUMPTION



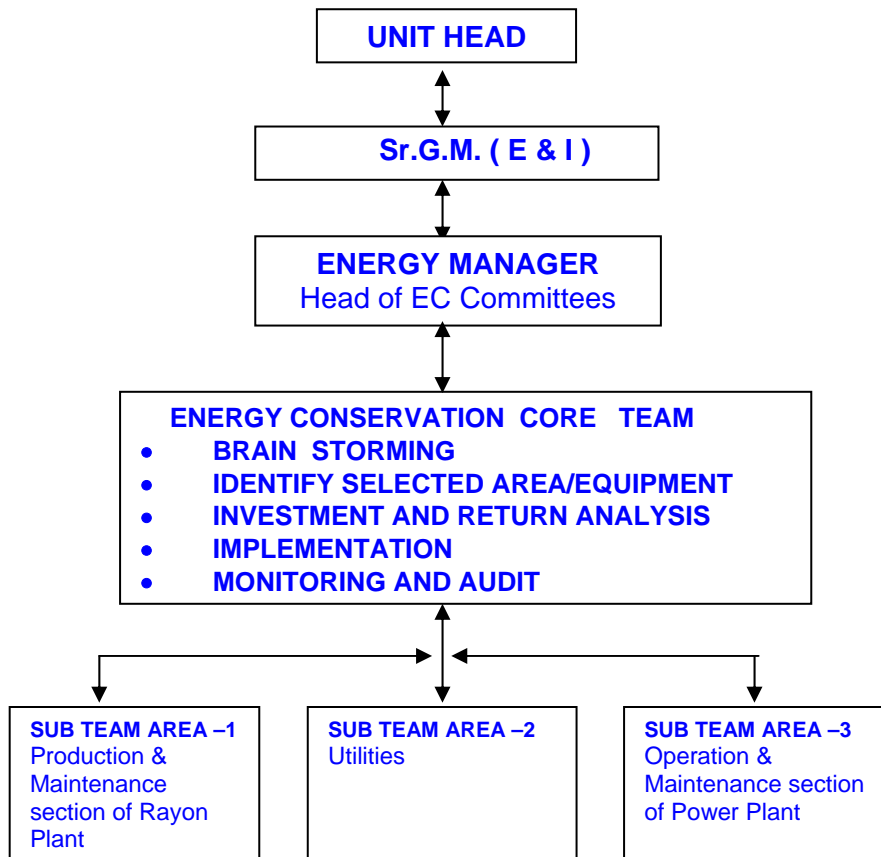
SPECIFIC THERMAL ENERGY CONSUMPTION



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

Indian Rayon 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 Energy Manager constitutes 11 nos. of subcommittees in the plant. Subcommittee consist 2 to 4 members from different areas. All the team meets periodically for review & implementation of new identified energy saving schemes. At Indian Rayon, energy cost accounts 20% of production cost and the unit gives utmost importance to energy conservation

**ENERGY CONSERVATION TEAM STRUCTURE**





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## ENERGY MANAGEMENT POLICY

Indian Rayon, a Unit of Aditya Birla Nuvo Ltd., 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.

( V.G.Somani )

PRESIDENT

## Energy Conservation Achievements

During the period 2004 - 2007, the unit implemented 101 energy saving ideas generated through periodic brain storming sessions. Annual savings of Rs.573.71 lakhs was achieved with an investment of Rs. 467.19 lakhs with payback period of approx. eight months only. It has resulted in percentage reduction of 12.20 % in electrical energy and 12.57% in thermal energy during last 3 years shown below.

YEAR	PRODUCT	KWH/TONNE	%REDUCTION OVER 2004- 05	MKCAL/ TONNE	%REDUCTION OVER 2004-05
2004-05	Viscose filament Yarn	4974	-	8.83	-
2005-06	Viscose filament Yarn	4910	1.29	8.74	1.02
2006-07	Viscose filament Yarn	4367	12.20	7.72	12.57

### Major projects implemented for Energy conservation during 2006-07

#### 1. Installation of Variable Frequency Drives in Chimney Exhaust Fans ( Trend Setter Project )



We have installed Variable Frequency Drives in place of ordinary Star delta Starters on all the 9 Nos Chimney Exhaust Fans. Speed of all these fans are controlled at centralized control room by changing the frequency of VFD as per the air flow requirement.

Power saving: 7.01 lakh kwh per annum

Investment: Rs. 70 lakh

Saving: Rs. 38.55 lakh per annum

**2. Adoption of pressure control system with VFD on washing pumps**



We have installed Variable frequency drives with pressure control on all the 19 Nos. washing pumps in our After Treatment Process of yarn. We have optimized the power consumption of washing pumps by variation in speed of pump as per the variation in Denier(Thickness) of Yarn.

Power saving: 7.67 lakh kwh per annum

Investment: Rs. 80 lakh

Saving: Rs. 42.71 lakh per annum

**3. Reduction in height of spinning halls by installation of false ceiling**



We have provided false ceiling in the spinning halls. Due to which the height of the halls reduced by 3 feet and hence reduction in hold up air volume in spinning halls. As a result the power Consumption of hall conditioning equipment is reduced.

Power saving: 7.88 lakh kwh per annum

Investment: Rs. 85.45 lakh

Saving: Rs. 43.34 lakh per annum

**4. Development of in-house Software for centralized monitoring of steam consumption**

GENERATION			
	1st Shift	2nd Shift	3rd Shift
STEAM FLOW TO TU	163.36	98.08	111.00
WASH STEAM FLOW FROM PP	36.51	28.00	34.79
HIGH ACID PLANT STEAM	28.21	26.79	28.00
WASH BLD CPN	0.00	0.00	0.00
BOILER TO PG STEAM	0.00	0.00	0.00
OLD ACID PLANT STEAM	0.00	4.00	0.00
BOILER HQ-4 STEAM SMO	0.00	0.00	0.00
DRAG STEAM FROM PP	160.00	160.00	160.00
<b>Total</b>	<b>488.08</b>	<b>426.76</b>	<b>443.79</b>

CONSUMPTION			
	1st Shift	2nd Shift	3rd Shift
CAT WASHING STATION	0.00	0.00	0.00
CAT DRYER	0.00	11.04	0.00
NAT WASHING STATION	0.00	0.00	0.00
NAT DRYER	0.00	0.00	0.00
R & R STEAM	0.00	0.00	0.00
W-DRY/TEST/CCR1&2	0.00	0.00	0.00
W-DRY/TEST/CCR1&2	0.00	0.00	0.00
SPINNING WASH	0.00	0.00	0.00
SEWAGE CHILLER	0.00	0.00	0.00

We have developed in-house Software and connected all the Steam flow meters in the field with centralized PC for atomization of steam monitoring through centralized system. The system helps the user for analyzing the reasons of variation in steam consumption and taking necessary action for reduction in steam consumption.

**Steam saving: 3650 MT per annum**

**Investment: Rs. 20.00 lakh**

**Saving: Rs.16.42 lakh per annum**

**5. Optimizing the steam consumption in vapour absorption machines and Air washers**



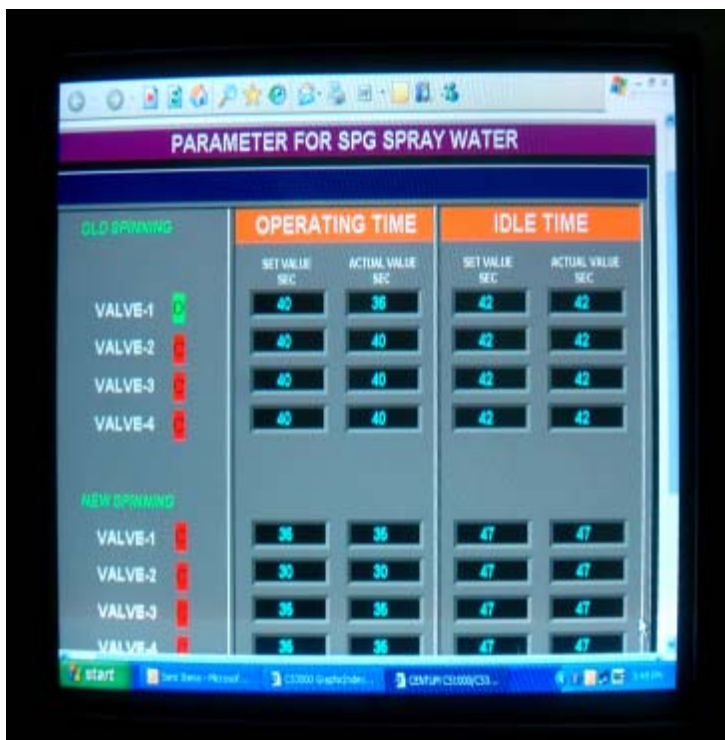
Chilled water requirement of the process and hall condition inside the spinning halls changes as per the change in ambient condition. We have optimized the steam consumption by chillers (VAM) and Air washers by close monitoring of the ambient temperature.

**Steam saving: 12775 MT per annum**

**Investment: Nil**

**Saving: Rs.57.50 lakh per annum**

## 6. Reduction in Steam consumption by optimization of spray water flow in spinning department



We have optimized the hot water spray in spinning department by installation of timer through which we can change the ON & OFF time of spray water cycle as per the change in % RH of halls. Due to this steam consumption for hot water spray is optimized.

Steam saving: 2190 MT per annum

Investment: Nil

Saving: Rs.9.85 lakh per annum

## Other Major initiatives taken for energy conservation during the year 2006-07

### (A) Saving of Electricity :

Sr. No	Description	Saving in lakh kwh	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Replacement of SS impeller with FRP impeller of Exhaust fans -4Nos.	2.27	12.50	12.50
2	Replacement of mixer energy efficient pulper in Viscose Department	1.52	8.37	14.54
3	Replacement of old and inefficient water pumps by Energy efficient pumps	1.05	5.78	7.00
4	Replacement of old and inefficient (39 Nos.) motors by energy efficient motors	2.63	14.45	27.00
5	Replacement of ordinary Tube lights by Asian E+ tube lights	1.65	9.08	6.00
6	Replacement of Electrical Heaters by Solar heater at Guest house & colony	0.35	1.92	3.55
7	Installation of Variable frequency drives on Mixer No. 3 in Viscose Department	1.46	8.03	5.00
8	Installation of variable frequency drive on SpinBath pump to minimize the overflow	0.36	2.00	2.00
9	Replacement of 50 Nos. 160 Watt mercury vapour lamp by 25 watt CFL in charcoal godown	0.30	1.62	2.00

Sr. No	Description	Saving in lakh kwh	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
10	Modification in the lighting circuit	1.82	10.00	1.00
11	Installation of inverter drive in place of PIV drive in spinning	1.61	8.83	110.70
12	Optimization of loading on Air-compressors by pressure optimization.	3.65	20.08	1.00
13	Improving the efficiency of all the air compressors by inspection and cleaning	3.65	20.08	10.00
14	Switching off unnecessary lights	1.82	10.00	0.00
15	Optimisation of the power consumption of various process by effective utilization of energy monitoring system	7.30	40.15	0.00
16	Optimizing the usage of chilled water in the plant	3.65	20.07	0.00
	<b>Total</b>	<b>35.09</b>	<b>192.96</b>	<b>202.29</b>

**(B) Saving of steam :**

Sr No	Description	Saving in MT	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
01	Installation of steam vortex flow meters (7 Nos.) at identified locations	1095	4.93	7.00
02	Installation of steam traps in MSFE to avoid the steam wastages from condensate	1825	8.21	5.00
03	Reduction of steam consumption in anhydrous sodium Sulphate by installing flash vessel	1825	8.21	1.00
04	Improving the insulation of the steam pipeline in various section of the plant	1825	8.21	5.00
05	Minimising the exhaust of steam from backpressure turbine by substitution of high pressure steam with low pressure steam in the plant.	3650	16.42	0.00
06	Optimising the steam in SpinBath heat exchanger by installing control valves	4745	21.35	0.00
07	Usage of steam generated from waste heat boilers in the acid plant instead of venting	3650	16.42	0.00
08	Removal of steam wastages in idle steam headers and steam traps	1825	8.21	0.00
09	Use of condensate water in process instead of steam	4745	21.35	0.00
	<b>Total</b>	<b>25185</b>	<b>113.31</b>	<b>18.00</b>

## **Major Plans and Targets for energy conservation for the year 2007-08**

Sr No	Description	Saving in lakh kwh	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Installing capacitor in High Frequency Turbine	3.65	20.07	10.00
2	Recirculation of SpinBath from sand filter to storage tank instead of gravity tank	0.91	5.00	6.00
3	Replacement of old and inefficient SpinBath pumps	7.3	40.15	25.00
4	Installation of false ceiling in Textile halls to reduce the load on Air washer	3.65	20.08	20.00
5	Providing spinning pot bucket to reduce the Power Consumption	5.4	29.70	20.00
6	Micro mapping of power and Steam Consumption to identify the losses	7.3	40.15	0.00
	<b>Total</b>	<b>28.21</b>	<b>155.15</b>	<b>81.00</b>

### **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 creek.

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.

**Submitted by** : **Anupam gupta**  
**Senior General Manager (Elect. & Inst)**  
**Indian Rayon (a Unit of Aditya Birla Nuvo Ltd.)**  
**VERAVAL – 362 266**  
**(Gujarat)**  
**Telephone: 02876 248422**  
**Fax: 02876 243220**  
**Cell : 09924222110**  
**E-mail : anupamgupta@adityabirla.com**