

# India Polyfibres Limited, Barabanki

## **COMPANY PROFILE**

India Polyfibres Limited, situated at Barabanki (U.P), 28 Kms from Lucknow, started commercial production in January, 1987. The Company is engaged in manufacturing of Polyester Staple Fibre, Polyester & Tow with technology from Du Pont, USA. IPL had an installed capacity of 15,000 MT per annum but with its own development programmes, the Company has been able to enhance its capacity to 19400 MT per annum in 1994-95, 22400 in 1997-98, 31000 in 2002-03 and to 40000 MT in 2004-05.

In the year 1999, Company developed specialty polyester staple fibre "dope dyed black PSF",

In the year 2002, it had carried out plant revamping for modernisation of plant, increase production capacity and enhancing product quality. Following benefits were derived:

- Production of Dope Dyed Black Polyester Staple Fibre of international quality on continuous and sustained basis.
- Increase in production capacity of Dope Dyed Black Polyester Staple Fibre from 54 MT per day to 80 MT per day.
- Increase in production capacity of Semi Dull Polyester Staple Fibre from 65 MT per day to 90 MT per day.

**In the year 2004-05, it had developed and regularised production of Dope Dyed Super Black PSF**

## **QUALITY AND ENVIRONMENT MANAGEMENT SYSTEMS**

India Polyfibres obtained ISO-9002 Certification in June, 1994. The Certification has been renewed in 1997 & 2000 and upgraded to ISO 9001 : 2000 version in May 2003.

**The Company has obtained ISO 14001 : 2004 certification for Environment management system in September 2005.**

## **ENERGY CONSUMPTION**

IPL consumes fuels viz. RFO in Steam Boilers & Dow Vaporiser and LDO/HSD for own power generation. In addition IPL purchases electricity from UPPCL to meet their power requirements.

During the last 2 years, the energy consumption pattern was as below:

DESCRIPTION	UNIT	2003-04	2004-05
Electrical Energy	KWh/T	620	643
Thermal Energy	Mkcal/T	2.27	2.39
Total Manufacturing Cost	Rs Lacs	18036.70	23447.79
Total Energy Bill	Rs Lacs	1568.88	1975.10
Energy as % of Total Manufacturing Cost	%	8.70	8.42

## **ENERGY CONSERVATION COMMITMENT, POLICY AND SET-UP**

IPL Management recognizes the need of energy conservation in national perspective and is highly committed for it. This has been defined clearly in Company's Energy Management Policy.

### **IPL's Energy Management Policy & Objectives :**

**" IPL recognises the need of energy & environment management in national perspective and is highly committed for it. As a policy, we emphasise on cost effectiveness through energy conservation and energy efficiency.**

**The Company considers involvement of its people in ongoing energy programs and accomplishment of set energy consumption norms as most valuable."**

We have set the following energy targets (for dope dyed super black product) for 2005 - 2006:

Power - from 633 to 600 kWh per Ton of PSF (5% reduction)

Fuel - from 0.232 to 0.220 MT per Ton of PSF (5% reduction)

We shall achieve our objective by:

- Monitoring and controlling energy consumption on daily basis
- Creating awareness to the employees on efficient use of energy.
- Imparting training on energy conservation and energy efficiency
- Regular checking of steam, air, nitrogen & water leaks
- Improving insulation on pipes & vessels by regular checking
- Receiving, evaluating and implementing suggestions from in-plant personnel
- Continuous improvement of process, instrumentation and utilities to optimise the energy cost.
- Planning internal and external energy audits to identify areas of improvement.
- Adopting energy efficient and environment friendly technologies.
- Periodical review of energy efforts by C E C

Company's Environmental Policy also emphasises on making judicious use of natural resources & raw materials and minimising waste.

**To effectively monitor energy consumption and implementation of energy conservation programs, IPL has established an Energy Management Setup.**

A **Central Energy Conservation Cell** headed by the Vice-President (operations) meets at regular interval to;

1. Set key monitoring and target indices,
2. Monitor energy consumption,
3. Discuss and evaluate various proposals for energy conservation.
4. Approve and review progress of action plans.
5. Decide for the training of people and awareness programs on Energy Conservation.

There are three Sub-Energy Cells having membership from all levels, and having the following responsibilities :

1. to study equipments & processes and evaluate their performance.
2. to receive suggestions, proposals from in-plant personnel, carry out feasibility study and develop an action plan for submission to Central Energy Conservation Cell.
3. to monitor steam, air, nitrogen, water leakages and steam traps on regular basis and also monitor plant lighting,
4. to explore energy conservation opportunities by debugging process equipments and processes.

Help of external agency like PCRA is also taken for energy audits.

**To support the above system, IPL has nominated Energy Manager and Energy Auditor who are certified by BEE.**

#### **ENERGY CONSERVATION ACHIEVEMENTS DURING 2004-2005 :**

Following are the few energy conservation achievements during the period 2004-2005,

##### **1) INSTALLATION OF ENERGY EFFICIENT BOILER**

Average Steam Load on New Boiler	=	5 TPH
Steam to Fuel Ratio of New Boiler	=	14.5
Fuel consumption of New Boiler per hour	=	0.345 MT
Steam to Fuel ratio of old boilers	=	13.99
Fuel consumption of old Boiler per hour	=	0.357 MT
Saving in fuel per hour	=	0.012 MT
Annual fuel saving (@ 8000 running hours)	=	100 MT
Cost of fuel	=	Rs 13138.85 per MT
Saving in Energy Cost	=	Rs 13.2 Lakhs

(2) REPLACEMENT OF RECIPROCATING AIR COMPRESSOR WITH ENERGY EFFICIENT SCREW TYPE AIR COMPRESSOR

Capacity	=	1524 cfm at 7.5 kg/cm <sup>2</sup>
Av. Power consumption per MT with reciprocating compressor	=	70.3 kwh per MT
Av. Power consumption per MT with new Screw type Compressor	=	60.0 kwh per MT
Saving in power Consumption per day	=	(70.3-60)*80 = 824 kwh
Saving in power consumption per annum	=	3.0 lakh kwh
Cost of Power	=	4.32 Rs per kwh
Saving in cost	=	Rs.12.96 lakh

3) INSTALLATION OF ELECTRONIC CHOKES IN PLACE OF CONVENTIONAL CHOKES

Power consumption in conventional choke TL	=	47 W
Power consumption in Electronic choke TL	=	36 W
Saving in power per TL	=	11 W
Number of chokes installed	=	850 no.
Total saving in power consumption per day	=	850x11x24 /1000
	=	224.4 kwh
Saving in energy per annum	=	0.82 lakh kwh
Av. Power cost	=	Rs. 4.32 per kwh
Saving in energy cost per annum	=	Rs. 3.50 lakh

4) INSTALLATION OF AUTOMATIC VOLTAGE REGULATOR FOR LIGHTING

Avg. lighting consumption per day	=	3700 kw
Avg. lighting consumption during 8 hrs in night, 10 pm to 6 am	=	1357 kwh
Avg. voltage during 8 hrs in night	=	250 V
Avg. lighting load during 8 hours, at 250 volts	=	169.6 kw
System resistance	=	368.6 k Ohms
Avg. voltage required to be reduced during 8 hrs in night	=	220 V
Avg. lighting load during 8 hours, at 220 volts	=	131.3 kw
Avg. lighting consumption during 8 hrs in night at reduced voltage	=	1050.6 Kwh
Saving in lighting consumption during 8 hours per day	=	306.1 kwh
Saving in lighting consumption per year	=	1.10 Lakhs kwh
Cost of UPPCL Power	=	Rs. 4.32 per KWH
Saving in power cost per year	=	Rs. 4.80 Lakhs

5) ADDITION OF 2 x 40 KVAR CAPACITOR BANK

Av. Power load on electricity board supply	=	1100 kw
Power factor before capacitor bank	=	0.978
kva at 0.978 power factor	=	1100/0.978
		1124.74 kva
Power factor after capacitor bank	=	0.980
kva at 0.980 power factor	=	1100/0.980
	=	1122.45 kva
Saving in kvah per day	=	55.1 kvah
Saving in kvah per annum	=	55.1x365
	=	20108 kvah
Cost per kvah	=	Rs. 4.23
Saving in energy bill per annum	=	20108x4.23
	=	Rs. 0.90 lakh

#### 6) IMPROVEMENT IN DG EFFICIENCY ( KWH/LTR)

Average load on Critical DG	=	23040 KWH
Fuel consumption at DG efficiency 3.55	=	6.490 KL
Fuel consumption at DG Efficiency 3.65	=	6.312 KL
Saving in fuel per day	=	0.178 KL
Saving in fuel per annum	=	0.178 x 365
	=	64.97 KL
Saving in energy cost per annum (@Rs22.93/Ltr)	=	Rs. 14.9 lakh

#### 7) IMPROVEMENT IN BOILER STEAM TO FUEL RATIO

Average steam consumption per day	=	100 MT
Fuel consumption at SFR value 13.87	=	7.209 MT
Fuel consumption at SFR value 13.99	=	7.148 MT
Saving in fuel per day	=	0.061 MT
Saving in fuel per annum	=	0.061 x 365
	=	22.3 MT
Cost of Fuel	=	Rs 13138.85 per MT
Saving in energy cost per annum	=	Rs. 2.9 lakh

**In the last 16 years specific energy consumptions were as below:**

<u>YEAR</u>	<u>FUEL IN MT/ TON OF FIBRE</u>	<u>POWER IN KWH/ TON OF FIBRE</u>
1989-90	0.464	1293
1990-91	0.430	1206
1991-92	0.338	971
1992-93	0.314	868
1993-94	0.276	721
1994-95	0.278	684
1995-96	0.271	676
1996-97	0.274	647
1997-98	0.273	637
1998-99	0.221	548
1999-00*	0.251	661
2000-01*	0.255	663
2001-02*	0.253	701
2002-03	0.245	630
2003-04	0.227	620
2004-05*	0.239	643

\* Note : The sp. consumption in 99-00, 00-01 and 01-02 were marginally high due to change in product mix, i.e. from the standard Semi-dull polyester staple fibre to Dope Dyed Black fibre. However, in 02-03 and 03-04, it has been brought down substantially due to energy conservation measures taken by the company. **The sp. consumption in 2004-05 was high due to installation of new facilities under diversification project & stabilization of the plant.**

#### ENERGY CONSERVATION PLANS AND TARGETS

In last 14 years, the Company has made a total expenditure of Rs. **649 Lacs**, but has achieved larger savings in rupee term as well as in power and fuel.

YEAR	EXPEN DITURE MADE	CONSUMPTION PER MT OF FIBRE		SAVINGS IN POWER		SAVINGS IN FUEL		TOTAL SAVING S
	Rs.in Lacs	Power KWH	Fuel MT	Lacs Kwh	Rs.in Lacs	MT	Rs.in Lacs	Rs.in lacs
1991-92	--	971	0.338					
1992-93	0.40	868	0.314	12.76	24.75	297.5	13.37	38.12
1993-94	3.24	721	0.276	26.91	57.85	695.7	36.30	94.15
1994-95	9.03	684	0.278	7.57	20.21	--	--	20.21
1995-96	4.00	676	0.271	1.51	4.27	132.2	7.51	11.78
1996-97	1.02	647	0.274	5.53	17.30	--	--	17.30

1997-98	0.67	637	0.273	1.86	7.27	18.6	1.28	8.55
1998-99	0.63	548	0.221	21.32	85.28	1245.7	77.83	163.11
1999-00	2.04	661	0.251	1.21	4.97	154.02	23.16	28.13
2000-01	7.95	663	0.255	2.27	11.35	1.4	0.15	11.50
2001-02	306.83	701	0.253	5.32	25.97	627.8	60.29	86.26
2002-03	61.02	630	0.245	19.39	76.81	54.50	6.39	83.20
2003-04	97.30	620	0.227	12.78	51.52	233.60	28.00	79.52
2004-05	154.69	643	0.239	5.68	24.56	187.27	31.00	55.60
	<b>648.82</b>	<b>9670</b>	<b>3.715</b>	<b>124.11</b>	<b>412.11</b>	<b>3648.29</b>	<b>285.28</b>	<b>697.39</b>

**Target for 2005-2006,**

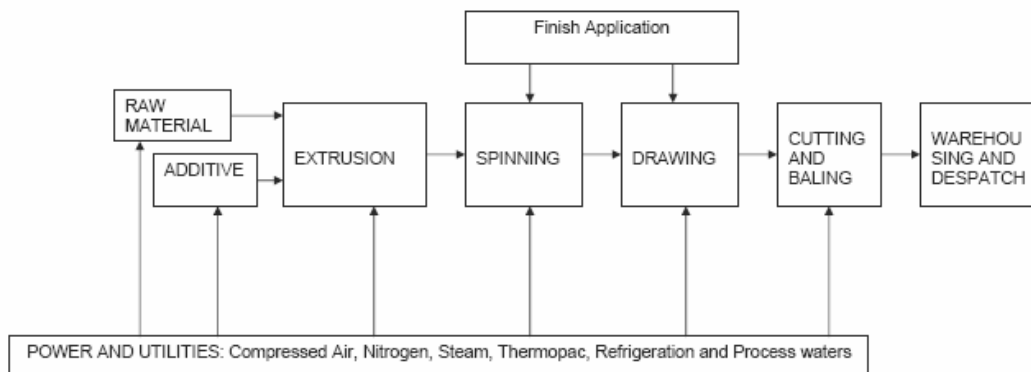
POWER- 600 kWh per Ton of Fibre (for dope dyed super black fibre)  
 FUEL - 0.220 MT (2.20 MKCal) per Ton of Fibre (for dope dyed super black fibre)

The Company Management and employees are highly committed for continuous energy conservation programs and are confident of further improving upon their achievements.

**Future Plans**

Energy Conservation Measures	Anticipated Savings in Rs. Lakhs	Approx. Investment (Rs Lakhs)	Project Commencement & Completion Year
Replacement of remaining old centrifugal chillers with new energy efficient and environment friendly chillers.	18.00	40.60	2006-07
Reduction in Nitrogen consumption by process optimisation (Six Sigma Philosophy)	6.70	0.00	2005-06
Reduction in Steam consumption by process optimisation (Six Sigma Philosophy)	33.58	0.00	2005-06
Putting up a 7.5 MW F.O.based DG Set.	427	621	2005-06 2006-07

**INDIA POLYFIBRES LIMITED, BARABANKI**



**PROCESS FLOW DIAGRAM ( EXTRUSION ROUTE)**