

**GlaxoSmithKline Pharmaceuticals Limited  
Thane (Maharashtra)**

***(i) Unit Profile***

GlaxoSmithKline Pharmaceuticals Limited, Thane Factory, located 35 km north of Mumbai, is a Primary Manufacturing ('actives') site. When the construction at the site started way back in 1960, it was a greenfield site. The manufacturing operations later started in 1961.

The major bulk drugs presently manufactured at the site are Betamethasone and its derivatives (Valerate, Phosphate), Calcium Sennosides of different potencies, Acid Sennosides, Treated Senna Powder, Methdilazine hydrochloride and Isogel. Betamethasone and other steroids are used for formulations for the local market. Different Senna products and Isogel are for the export market. Betamethasone derivatives constitute about 90% of the total value of production.

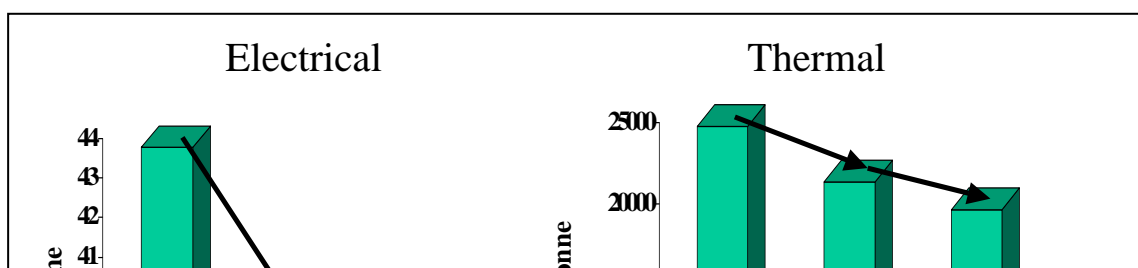
The total area at the site is about 58 acres. Out of this, the built-up area is 11 acres.

***(ii) Energy Consumption***

The specific energy consumption has dropped down steadily over the past three years due to the various energy conservation projects, which have been implemented.

Year	LSHS MT	FO in KL	Electricity		
			Purchased Lakh kWh	Generated Lakh kWh	Total Lakh kWh
2001-2002	1730.27	261.60	102.27	0.13	102.4
2002-2003	1730.27	261.60	98.49	1.97	100.46
2003-2004	1730.27	261.60	97.07	1.21	98.28

Description	Unit	2001-02	2002-03	2003-04
Annual Production (Betamethasone- ex dpa)	tonne	2.637	2.659	2.679
Total Electricity consumption- Electrical	Lakh KWh	115.43	102.40	100.46
Specific Energy consumption/annum	Lakh KWh/tonne	43.77	38.51	37.50
Total Thermal Energy consumption/annum	Million Kcal	24736	21355	19670
Specific Energy consumption - Thermal	Million Kcal/tonne	9380.36	8031.21	7342.29
Total Manufacturing cost,	Lakhs Rs.	8315	7808	7415
Total Energy Cost	Lakhs Rs.	784.34	642.49	656
Energy cost as a % of Total Manufacturing Cost	%	9.43	8.23	8.85



**(iii) Energy Conservation Commitment and Policy and Organisational Set up**

Energy Conservation has the sponsorship of the Technical Director, Dr.A.Banerjee and is therefore top driven. The Site has a well-defined Energy Conservation Policy (which is enclosed). The Senior Engineering Manager heads Energy Conservation. An energy manager coordinates the Encon activities at Site. Challenging targets for Encon are set every year. Cross-functional teams from various departments are involved in identifying higher energy consumption areas. A planned approach is adopted towards Encon. An Energy Plan is marked and activities are carried out as per the schedule. Awareness campaigns through posters, quizzes are held and the Encon week is celebrated. Special 'Spot the Energy waste ' contests are held, external faculties are called to train the staff in Energy Conservation. Engineers are deputed to attend external seminars for getting exposure to latest technology in energy efficiency. Comprehensive External Audits in areas such as Refrigeration, Steam, Electricity are conducted. Internal audits are regularly carried out to eliminate energy loss and conserve natural resources such as water. Strategy employed to achieve the Energy plan includes:

- Progress energy management programme by continuous emphasis on communication to staff
- Focus on efficiency improvement of Utility equipment
- Establish energy use accountably
- Continue search for new projects
- Carry out energy audits and the impact on environment
- Sustain momentum

#### **(iv) Energy Conservation Achievements**

There have been phenomenal savings in the Utility expenditure due to the various energy conservation projects that have been implemented. In the year 2001 the savings were Rs106 Lakhs whereas Rs64 Lakhs in the year 2002. The target for the year 2003 was Rs60 Lakhs.

The Thane factory has also won the Excellence Recognition Award for Energy Management from GlaxoSmithKline Global Manufacturing and Supply. This is a prestigious international award and recognition for the excellent work done by the factory in Energy Conservation during 2002.

The Site received the prestigious **Certificate of Merit under the National Energy Conservation Award 2003 in the Chemicals Sector from the Government of India**

The following are details of major Energy conservation projects completed in 2003-04

#### **Diffused / Submerged Aeration at Effluent Treatment Plant**

In the Earlier System, surface aerators (6 nos. of 20 HP each) were used to supply air to microbes in the aeration tank. In the new system air was supplied through diffusers installed at the bottom of the tank. The high contact area of the fine air bubbles generated through diffusers and high contact time due to the slow rise of air bubbles made the aeration system perform better in terms of Oxygen transfer efficiency. Besides other benefits, reduction in substantial power consumption from 67kW to 37.3 kW brought recurring annualised Saving of Rs. 780000/-



The earlier system is seen on the left. The Aeration tank with diffused aeration is seen at the right. The fixed surface aerators on the platform are redundant. The change from a high agitation but much less contact surface area to the uniform distribution of air is quite evident in above photographs.

#### **Variable speed drive for Town water pump**

Town water is supplied to the various user points in factory by an 11kW pump, which runs continuously. It was noted that the Pump's discharge pressure increased during periods when the load was low. This led to throttling losses during this period. After carrying out a detailed study, it was decided to install a variable frequency drive for this pump, which would maintain the delivery pressure in all conditions of load. The annualised savings were Rs1,00,000/- The payback was 2 years.

#### **Rationalisation of electricity at Substations to eliminate Transformer**

We have six different substations for the distribution of electricity and each substation has an 11kV / 415 V transformer. Transformers have no load loss, which is constant, and load loss, which is proportional to the load on the transformer. Due to various energy conservation measures the load on the transformers got reduced. Substation 3&5 have same capacity (1000kVA) transformers and on measurement it was observed that the load on both substation 3 & 5 is about 30% of the transformers capacity. That means one transformer can take the total load of substation 3&5 and the other

transformer can use as a stand by. Thus we can save the no load loss on one transformer. We have achieved this by inter connecting the LT side through a bus-coupler. This project delivered benefit of Rs.1.65 Lacs per annum, besides bringing flexibility and improving system efficiency.

### **Variable speed drive for Cooling water process pump**

A 55kW pump caters to the cooling tower, its load consists of heat exchangers of process and refrigeration equipment which are operated as per requirement. There was an increase of Pump's discharge pressure during period of low load resulting in throttling losses. After carrying out a detailed study it was decided to install a variable frequency drive on this pump. The annualised savings were Rs3,00,000/- and the payback was around 1.5 years.

### **High efficiency coating for Bldg6 Cooling Tower Process Pump**

A 37kW pump is used to circulate cooling water continuously for process requirement. The pump casing and impeller were applied with a High efficiency glass coating. There was a marked improvement in the Pump's efficiency amounting to an annual savings of Rs41,000/-

### **Water jet Ejector as a replacement for steam Ejector**

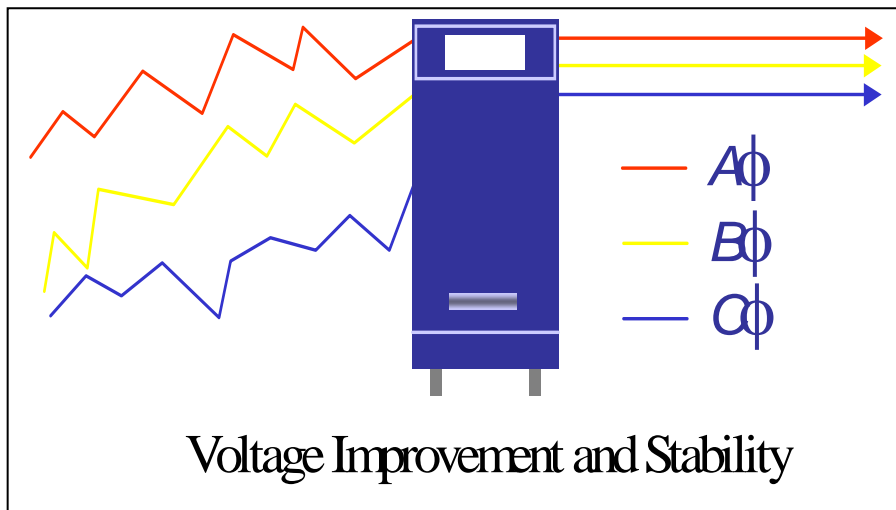
Production requirement for transferring solvent in a reactor involved vacuum, which was provided by a steam jet ejector. After baselining the energy consumption, it was found that water jet ejector requiring lesser energy could be used for vacuum transfer. The steam jet ejector was replaced by water jet ejector. The annualised savings were Rs3,48,000/-. The additional benefit was reduction of noise in the area due to stoppage of steam ejector.

### **Electroflow device for quality electricity supply at Substation 1**

Electroflow energy saving and power conditioning system has been installed at a Substation. It provides the following:

1. Voltage improvement and stability,
2. Three phase balancing
3. Surges and transient suppression
4. Broadband harmonics filtering
5. Power factor improvement.

This has led to an annual savings of Rs2,00,000/-



### **Rationalising vacuum service for vacuum ovens in Senna Plant**

Vacuum ovens 1,2 & 16 are used for drying 20% & 13% Calcium Sennoside with hot water in coils. Oven 1 & 2 were having a single pump connection with interconnected line. Oven 16 was having a dedicated line & pump. Whenever oven 16 and any one of two ovens 1 or 2 were in use then two vacuum pumps were required to be run. This team identified this wastage of energy. Using LS tools such as Gemba, brain storming and process observation, all the three vac ovens were interconnected so that whenever any two ovens were in operation only one vacuum pump would run. Interconnection of the vacuum line manifold gave saving of Rs.29, 000/-p.a

## **No.of other small Projects implemented in 2003-2004: 25**

These are small projects, which includes initiatives like rationalisation of services, replacement of existing motors by energy efficient motors, efficiency improvement of energy generation & distribution system, process improvement, etc.

**Total Encon savings for the year 2003-2004: Rs. 60,28,000/-**

### **(v) Energy Conservation Plans and Targets**

A challenging target awaits the Site for the next year . The Plans consist of the following projects:

- a. Variable speed device for Process Pumps
- b. Electroflo equipment for quality electricity supply
- c. Optimisation of vacuum system
- d. Rain water harvesting
- e. Energy efficient distilled water unit
- f. Electronic expansion valve for Refrigeration units

### **(vi) Environment and Safety**

The site has impressive safety record. This has been recognized by the Group as well as by the local industry associations. The Site was audited by M/s SGS, an International Audit firm and was **awarded ISO 14001 AND OHSAS 18001** on 16<sup>th</sup> January 2004.

The site has also been awarded several times by the State and Central Governments for its safety performance. The various awards won by the site are listed below:

- Several awards from the Government of India for outstanding safety performance.
- National Safety Award from the Government of India (two times) for largest accident free period.
- Two times winner of trophy for the lowest accident frequency rate in the pharmaceutical industries in the state of Maharashtra
- Managing Director's Trophy for the best site in terms of Safety, Health & Environment amongst all the Glaxo India sites.
- Six times winner of Chief Executive's Certificate for working one million man-hours without lost-time accidents, with one occasion being that of working for two million injury free hours.
- Awarded Chief Executive's trophy for outstanding EHS management
- Winner of trophy for the 'Best safety performance in the local industry zone. This award was given jointly by the Directorate of Industrial Safety & Health & Thane Manufacturers Association.
- Award for the best entry in Safety Drama Competition organised by the State Directorate of Industrial Safety & Health and Bombay Television.
- Award by the State Directorate of Industrial Safety and Health for the best display in the "Envirosafe " exhibition (exhibition promoting "Safety, Health & Environment" amongst all the industries at Thane)
- Award by the Rotary Club in the annual competition for the best garden amongst the industries in Thane area.