GlaxoSmithKline Pharmaceuticals Limited
Nasik (Maharashtra)

Unit Profile

GlaxoSmithKline Pharmaceuticals Plc.

- GlaxoSmithKline (GSK) is a world leading research-based pharmaceutical company with a powerful combination of skills and resources that provides a platform for delivering strong growth in today's rapidly changing healthcare environment.
- Headquartered in the UK and with operations based in the US, the new company is one of the industry leaders, with an estimated seven per cent of the world's pharmaceutical market.

GlaxoSmithKline Pharmaceuticals Limited - India

- GlaxoSmithKline Pharmaceuticals Ltd. - India is the Number One Pharmaceutical company with a market share of 5.9 %. GSK commands the number one position in six of the 10 therapeutic categories in which it operates.
- Other than pharmaceuticals. GSK has two businesses - Agrivet Farm Care (AFC) and Qualigens Fine Chemicals (QFC).

- AFC is the market leader in the animal health sector with an estimated market share of 10 per cent. It has a significant presence in the cattle segment and also markets a range of specialized poultry products.
- QFC has an estimated market share of 29 per cent in the laboratory chemicals market. It also has a significant presence in the Diagnostics business.
- GSK - Pharma has two manufacturing units in India, located at Thane and Nashik
- The strong field force of GSK, backed by a nation wide network of stockiest, ensures that the company's products are readily available across the nation. This combined with the quality of the products means that GSK is able to strengthen the hands of doctors by offering superior treatment and healthcare solutions. It is our constant endeavor to improve the quality of life by enabling people to do more, feel better & live longer.

Energy Consumption

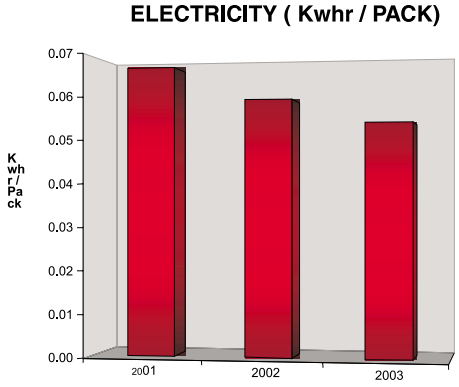
A proactive approach towards implementation of Energy conservation measures has resulted in substantial reduction in resources consumption per unit packs of production. The trends of specific consumption of water, electricity & Furnace oil are encouraging to initiate more efforts towards conservation of energy resources.

YEAR	PRODUCTION Million packs	ELECTRICITY Million Kwhr	WATER Million KL	F.O. Million KL
2001	109.09	7.33	0.25	0.59
2002	139.75	8.31	0.28	0.93
2003	152.72	8.24	0.27	1.07

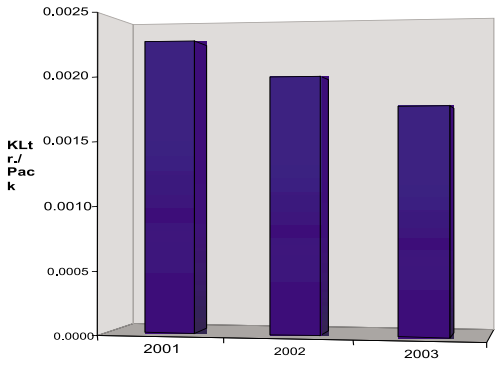
Trends of specific resources consumptions:

Year	Electricity		Water		Furnace oil	
	Kwhr/pack	%Redcn.	KLtrs./pack	%Redcn.	KLtrs./pack	%Redcn.
2001	0.067	-	0.0023	-	0.0054	
2002	0.059	11.5	0.0020	12.6	0.0067	-23
2003	0.054	9.3	0.0018	11.8	0.0070	-5.3

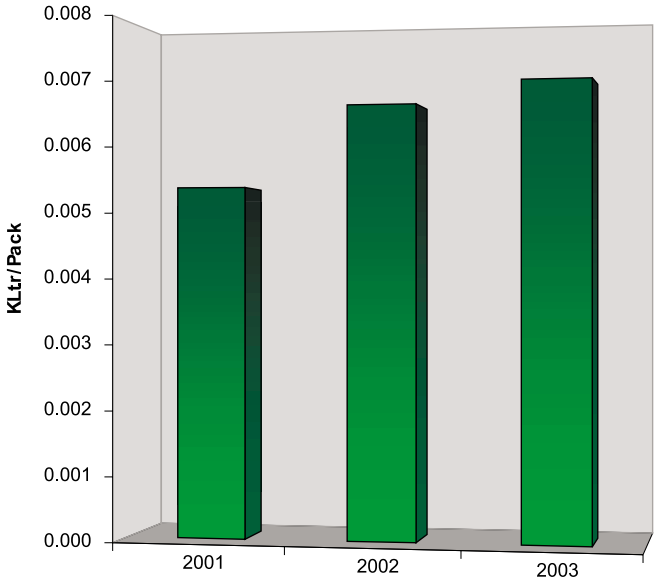
Electrical power consumption in Kwhr / Pack



Potable Water consumption in Kl / pack



Furnace Oil Consumption in KL / Pack



Energy Conservation Commitment, Policy and Set up

Commitment:

GlaxoSmithKline Pharmaceuticals Limited, India, is committed to high standards of Energy Management as an integral part of business activities, in line with corporate values and continuous improvement. GlaxoSmithKline Pharmaceuticals Ltd., India's guiding principle is that "energy saved is energy generated".

Policy:

It is the policy of GlaxoSmithKline Pharmaceuticals Limited, Nashik to:

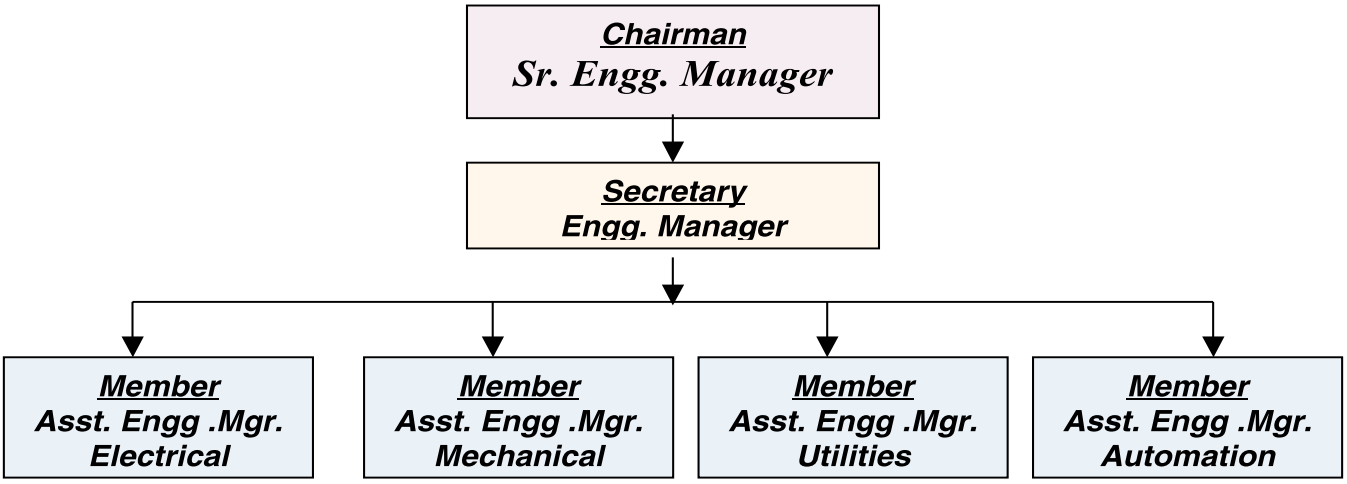
- Efficiently utilize the energy supplied by external authority for carrying out manufacturing activities throughout the factory.
- Operate our business in an energy efficient, environmental friendly and socially responsible manner;
- Commit to continuous improvement in energy conservation performance;
- Comply with legal requirements and global GSK Standards;
- Make Energy conservation an integral to all GSK Pharmaceuticals business processes, planning and decision making;
- Establish business practices and Energy conservation strategies that optimally utilize resources and prevent pollution to ensure the long-term sustainability of GSK Pharmaceutical Ltd, India and the global environment;
- Ensure that all employees work with due regard to energy management conservation approach. Their attitude to energy conservation will be a factor in determining their career advancement.
- GSK Pharmaceutical Limited, India will use effective systems, metrics and goals in the management of all of our Energy Management activities.

S. A. Phadke

Sr. Engineering Manager, Nashik Factory

Issued on : Jan. 2003.

Organizational Setup:



Execution of Energy Conservation policy

Approach: A distinct approach i.e. operational excellence in Energy conservation has been adopted by the company in order to make the GSK-Nashik as the most energy efficient pharmaceuticals manufacturing facility of the world.

Operational Excellence in Energy Conservation

What it is

Operational Excellence is a new way of working. It combines the best of whatever went in past and is fresh approach to achieving excellence in Energy Management.

O.E. Components:

- Common language & processes
- Education & training.
- Knowledge Management
- Lean Sigma, plus methods & tools to continuously measure & improve.
- Performance management & bench marking.

Why it is important

The ambition is to create, in GlaxoSimthKline, the best pharmaceutical company in the world. Some elements of the company can already claim to be the best in the industry, but not all. There are many areas of energy management where we know we need to raise our performance and maintain it at those higher levels. Like wise, there are areas within the global functions where their processes can be improved.

What it means for us

Operational excellence will be a challenge for everyone in energy management. It will encourage us to challenge the way we do our job & the processes & techniques used by us. It will challenge long held beliefs & entrenched practices. It will challenge the good as well as merely satisfactory in the search for excellence. Initially, it may make many people feel uncomfortable, because change makes us all feel uncomfortable, to some degree or another.

However, Operational excellence presents great opportunity for us all. It presents opportunities for training & learning, for developing skills & competence's, and for career development. It also presents opportunities to work with colleagues from other sites and functions to improve the way we operate.

In summary, Operational Excellence provides the tools for us to achieve excellence in our function, site or business community.

The fourth component of O.E. i.e. "Lean Sigma, plus methods & tools to continuously measure & improve" is specifically practiced to effectively initiate & implement the energy conservation measures across the site.

Lean Sigma Concept:

- Base lining - To know, where we are?
- Identifying the Waste / variations
- Evaluating the cost of waste
- Brain storming to find out the means / measures for elimination or minimization of cost of waste
- Implementation of most suitable option.
- Post implementation performance evaluation & continuous monitoring & control.

Base line study of utilities operated throughout the factory has resulted in following facts & figures towards op-ex on various utilities provided for manufacturing activities across the factory.

Per unit op-ex on utilities :

Sr.No.	Description of Utilities	Unit	Cost in Rs. per unit
1	Potable water supply	Rs./m3	22.30
2	Raw Steam supply	Rs./kg.	1.33
3	Cooling water supply	Rs./m3/hr	10.10
4	Compressed air supply	Rs./m3	1.02
5	DM Water Supply	Rs. / m3	199
6	Distilled water supply	Rs. / m3	415
7	Clean Steam supply	Rs./kg.	2.34
8	Chilled water supply	Rs. / TR	7.34

The implementation of lean sigma concept in energy conservation measures has resulted in identifying, analyzing & elimination of waste & variations in a realistic & scientific way in order to make the system most energy efficient / economical in all respect.

- The energy conservation initiatives / achievements play a key role in yearly performance appraisal of every individual of Engineering Dept..
- As a part of lean sigma recognition / appreciations the initiatives are short listed & sent for competition at world level. Some of our initiatives have been recognized world wide & bagged first prizes at world level competition.
- Yearly budget of resources specifically requires commitment for energy conservation every year.

Energy Conservation Achievements

1. Installation of solar Water Heater system :

Status before implementation of the project :

a. Water heating through electrical heaters

b. Op-Ex per day - Rs. 713.00

c. Op-ex per annum - Rs. 2,31,725.00

Status After implementation of the project :

a. Water heating through solar system.

b. Op-ex per day - Nil

c. Op-ex per annum - Rs. 50,000.00

(electrical heating during foggy weather)

Savings per annum After implementation of the project :

a. Savings per annum - Rs. 1,78,250.00

2. Replacement of Heatless air dryer with Refrigerated Air dryer :

Status before implementation of the project :

a. Compressed air is dried using heatless air dryer where in the loss of compressed air is in the range of 10 - 14 % of rated capacity.

b. Cost of Waste due to air loss per day Rs. 460.00

c. Cost of waste per annum - Rs. 1,38,143.00

Status After implementation of the project :

a. The desired dew point of C.A. is achieved through refrigerated air dryer.

b. Op-ex per day - Rs. 53.00

c. Op-ex per annum - Rs. 1333.00

Savings per annum After implementation of the project :

a. Savings per annum - Rs. 1,39,809.00

3. Installation of Ultra filtration Plant for supply of WFI quality water for sterile washing activities :

Status before implementation of the project :

a. WFI Quality water was supplied through MCDWP which utilizes huge amount of steam for producing WFI quality water.

b. Steam consumption per day - 3402 Kg.

c. Op-ex on steam per annum - Rs. 11,95,943

Status After implementation of the project :

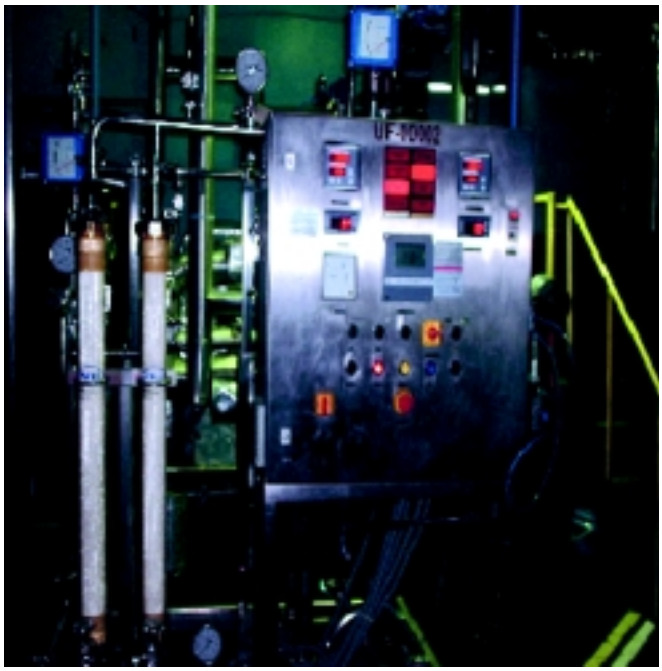
a. The WFI quality water for washing activities is produced by Ultra filtration plant which does not require steam supply for operation.

b. Steam consumption - Nil

c. Op-ex on steam per annum - Nil

Savings per annum After implementation of the project :

a. Savings per annum - 11,95,943.00



4. Installation of VFD for reciprocating air conditioning plant :

Status before implementation of the project :

a. Mechanical control on loading & unloading of plant based on setting of loading control mechanism resulting in fluctuating conditions, frequent switching operation under fluctuating loading conditions.

b. Electricity consumption per day - 205 Kwhr.

c. Op-ex per day - Rs. 943.00

Status After implementation of the project :

a. Smooth control through VFD to run the motor at low speed during unloaded mode of operation resulting in favourable conditions with energy savings.

d. Electricity consumed per day - 168 Kwhr.

e. Op-ex per day - Rs.772.00

Savings per annum After implementation of the project :

a. Savings per annum - Rs. 51,060.00

5. Energy Management & operational control through SCADA System

Status before implementation of the project :

a. Operational control at shop floor level by the operator only, no data available for analysis.

b. Energy consumption trends not available for analysis.

c. Specific energy consumption for various products not available.

Status after implementation of the project :

a. Real time data available.

b. Operational control extended to higher management.

c. Trends to analyse & improve made available directly on screen.

d. Automation resulted in optimum utilization of equipment run time.

Benefits After implementation of the project :

a. Reduction in energy consumption through better operational controls on utility equipment at Utility - I.

b. Reduction in energy consumption through better operational controls on utility equipment at Utility - II.

c. Real time consumption trend of individual dept.

d. Automatic control resulted in optimum utilization of eqpt. Run time.

6. Installation of Drykor dehumidifier(Lithium Chloride based dehumidification system) :

Status before implementation of the project :

a. Dehumidification of production area required running of chilled brine plants, steam supply etc. in order to maintain the required humidity in side the production area.

b. Op-ex per day - Rs. 4040.00

Status After implementation of the project :

a. The drykor Lithium Chloride based dehumidifier has been installed to absorb the moisture in the air & ensure the supply of dehumidified air to production area in order to maintain the required humidity at production floor. The system independently take care of the humidity to the extent of 6 months on a year. Resulting in huge amount of energy savings by stopping the CHB plants when not required.

b. Op-ex per day - Rs. 1354.00

Benefits After implementation of the project :

a. Savings per annum - Rs. 3.02 Lakhs

Other Energy Conservation projects implemented during the year 2003

- Reduction in LPG Consumption by installation of gas saving device for burner at canteen
- Reduction in energy consumption by modification of pulley size of DCU at tablet service area.
- Reduction in electrical energy consumption by replacement of condenser of CHB PLANT OF U-II with higher capacity condenser.
- Replacement of conventional ballast with electronic ballasts
- Replacement of conventional blowers with energy efficient blowers for 9 nos. of air curtains
- Replacement of tube light fittings cover with transparent acrylic covers
- Reduction in electrical energy consumption through operational controls of utlity equipments at Utility - I & II.
- Installation of push to flush valves in change rooms to avoid wastage of water.
- Elimination of open tanks (18 nos. of 1 HP pumps) dedicated pumping system of B/W machines by providing Water supply through centralized circulation system.
- Replacement of conventional electrical powered area exhaust blowers with turbine type self powered exhaust blowers in Ampoule S.A.

Energy Conservation Plans and Targets

Sr. No.	Energy conservation initiatives	Anticipated savings in Rs. Per annum in Lakhs	Approximate Investment in Rs.(Lakhs)	Project commencement & completion year
1	VFD Installation for A/C Plants, air compressors, package A/C Units & blowers	12	9	2004 - 2005
2	Procurement & installation of energy efficient blowers	4	2	2005
3	Reduction in Maximum Demand by rescheduling the operating horus of major production eqpts.	2.5	0	2004
4	Effective Air circulation instead of air conditioning in non-manufacturing areas.	4	8	2005
5	Installation of energy efficient motors & pumps	3.5	6	2004
6	Upgradation of dust extraction system.	4.5	8	2005
7	Utilization of low tariff zone.	3.75	2.6	2004
8	Upgradation of manufacturing facility by procurement & installation of energy efficient, improved productivity manufacturing eqpts.	8	15	2004-2005
9	Upgradation of lighting system throughout the factory	3.28	5	2004-2005
10	Implementation of condition monitoring system for utility eqpt.	1.5	2	2004

Environment and Safety

GlaxoSmithKline Pharmaceuticals Limited, Nashik, is committed to high standards of Environment, safety and Health management as an integral part of business activities, in line with corporate values and continuous improvement. GlaxoSmithKline Pharmaceuticals Ltd., India's guiding principle is that all accidents are preventable and all identified Health risks are containable.

GlaxoSmithKline, Nashik is committed to implement the environmental, health & safety policy laid down by the global organization. To meet the requirements of policy, objectives & targets, Nashik site has agreed to implement the environmental management system as a tool. The entire EMS system is based on OE principals & PDCA cycle.