

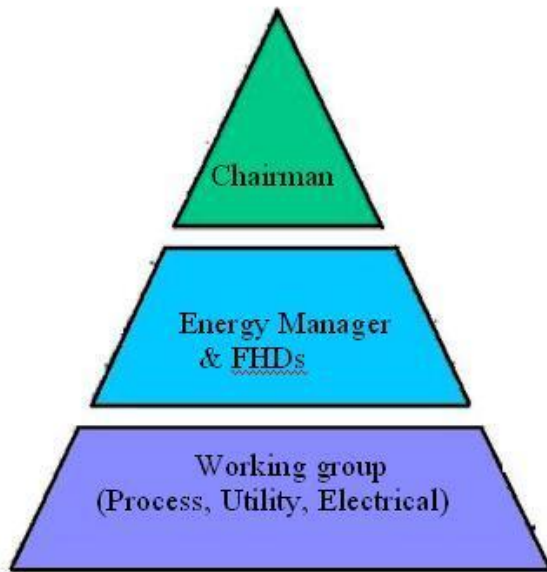


ENERGY & WATER CONSERVATION COMMITMENT, POLICY AND

SET UP

GCL is committed to Total Energy & Water Management and prevention of energy & water wastage. Because of this commitment, various energy & water conservation features have incorporated in the design stage itself and also there have been continuous efforts to reduce the energy & water consumption. GCL has set up an **Energy Management Cell viz Gharda Energy Management System (GEMS)** and Energy Management Policy to reduce its specific energy & water consumption.

Energy Management System comprises of three groups



The Apex group indicates the involvement & commitment of the top Management. It also gives all necessary support & encouragement to GEMS activities. The core group forms the middle level Management includes all department heads including Energy Manager.

The working group comprises of plant energy coordinators from various departments at all levels. They identify the problems, look for continuous improvement, conduct brainstorming discussions, arrive at remedial measures and implement the same by involving all employees. The performance is monitored continuously, reviewed periodically and reported to management.

Any Modification suggested will go through a modification proposal system. Any modification will flow as follows:

Modification proposal initiation by initiator → Approval of functional head
→ Costing of the proposal & cost benefit analysis by Technical Cell Approval by
→ modification committee (D &D, Engineering, Safety, → Production)
Approval by Location Head.



**ENERGY CONSERVATION BY TECHNOLOGY INNOVATION AND R&D
EFFORTS**

Technology innovation measures under taken in the plant to reduce energy consumption From 2005 to 2008:

1. Sparger for Air oxidation system is provided to improve the gas to liquid mass transfer
2. Providing Dry lower HP vacuum pumps in place of Conventional water and steam jet ejectors to reduce steam consumption and power consumption
3. Development of High efficiency impellers based on Lab scale trials and scale up for main batch reactors
4. Pumping power consumption reduced by providing suitable capacity pumps by doing energy audit in existing system.
5. Filtration system air consumption is reduced by automation of the system.

In House R&D efforts:

- 1) Yield improvement in Chlorpyrifos, Anilophos, Deltamethrin, & Tempos, thereby reducing the specific energy consumption at increased capacity.
- 2) Installation of Mechanical vapor recompression unit for reduction in the steam consumption.
- 3) Installation of Variable speed drive to reduce the power consumption.
- 4) Optimization of Pump impeller sizing for pumping head optimization.
- 5) Recovery of heat from steam condensate to preheat Boiler Feed water from 30°C to 90°C.
- 6) Installation of 28Watt Retrofit Tube lights in place of 40Watt conventional bulbs.
- 7) Installation of mechanical seal in reactors in place of gland packing.
- 8) Utilization of Byproduct DME as fuel for Boiler.



ENERGY CONSERVATION PLANS AND TARGETS (2008-2009)

List of energy conservation measures planned for the future, investment planned & expected savings include the following.

Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs. Lakhs)	Project Commencement & Completion year
	Energy Value (specify units)	Rs. Lakhs		
Vapor ammonia absorption system	18.8 lakhs KWH	85.00	100.00	Dec-08
Co-generation plant	112 Lakhs KWH	900.00	1000.00	Mar-09
Agro waste based boiler	7720 million Kcal	120.00	30.00	May-09
Cooling tower Fans modification	1 Lakh KWH	4.50	0.70	Mar-09
Reciprocating compressor replacement	16.00 Lakh KWH	72.00	50.00	Aug-09
Lithium bromide base compressor unit	3.4 Lakh kWH	15.30	35.00	Aug-09
Ammonia absorption for chilled water	3.4 lakhs KWH	15.00	35.00	Mar-09
Distribution of utility load to CT water	5 Lakhs KWH	22.50	10.00	Mar-09
Pumping systems utility Modifications	6 Lakhs KWH	27.00	3.00	Dec-08
Total	-----	541.72	2568.9	-----

Specific Energy Consumption Planned Target for the year 2008-09 & 2009-10:

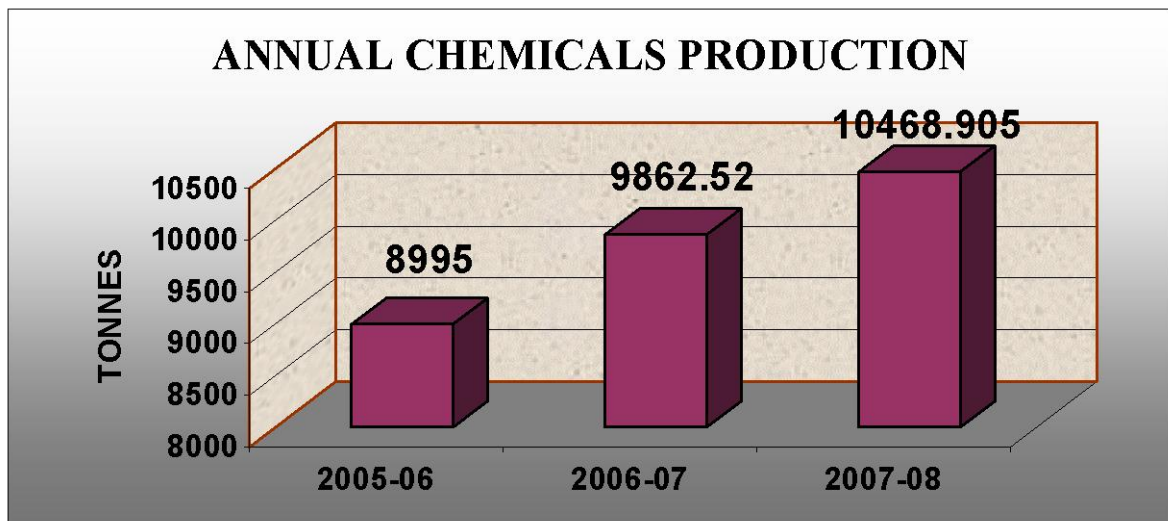
Year	Electrical* lakhs KWH/tonne	Thermal* MKCal/tonne	Reduction over the year 2003-04	
			Electrical%	Thermal%
2007-08 (Base year)	3025.055	1.391	-	-
2008-09	2662.048	1.224	12	12
2009-10	2395.844	1.102	20.8	20.8

ENERGY CONSUMPTION TREND



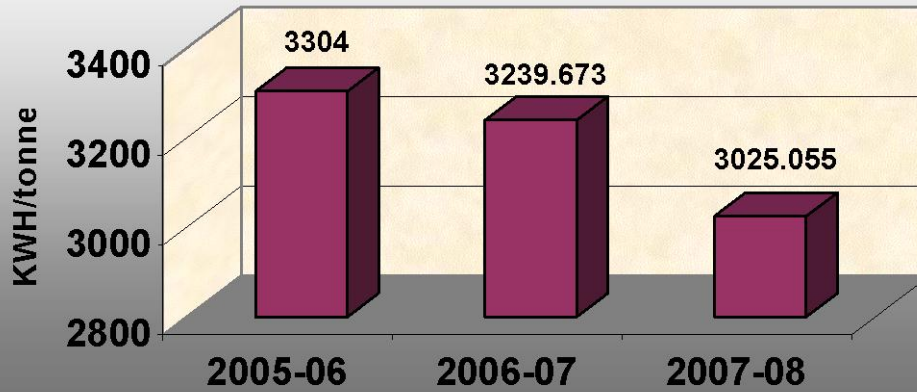
There is a steady decline of specific energy consumption due to implementation of various energy conservation measures. The Energy scenario of GCL in the past three years is given below.

Sr. No.	Description	Unit	2005-06	2006-07	2007-08
1	Annual Chemicals	Tonnes	8995	9862.52	10468.905
2	Total Electrical Energy Consumption/yr	Lakhs KWH	297	319.513	316.690
3	Specific Electrical Energy Consumption/yr (All Products)	KWH/tonne	3304	3239.673	3025.055
4	Total Thermal Energy Consumption/yr	MkCal	68386.797	74121.995	78527.604
5	Specific Thermal Energy Consumption/yr (All Products)	Mkcal/tonne	7.603	7.603	7.603
6	Total Manufacturing Cost	Rs. Lakhs	20712	67830	Annual report under preparation
7	Total Energy Cost	Rs. Lakhs	1677	4463.72	
8	Energy Cost as %age of Total Manufacturing Cost	%	8.1	6.5%	





SPECIFIC ELECTRICAL ENERGY CONSUMPTION/yr (CHEMICALS)



SPECIFIC THERMAL ENERGY CONSUMPTION/yr (CHEMICALS)

