

GHARDA CHEMICALS LIMITED
Lote Parshuram, Tal-Khed, Dist. Ratnagiri (Maharashtra)

Unit Profile

Gharda Chemicals Limited established in 1967, is a research-based private limited company. With world-class products and **sales of Rs. 550 crores in the year 2003-04 including exports of Rs. 354 crores**, Gharda today is among the top-ranking chemical companies in India.

The Lote Unit has undertaken various energy & water conservation programs through **GEMS** (Gharda Energy Management System) under coordination of an Energy Cell.

Gharda has successfully introduced **Sulfosulfuron, Oryzalin, Acetamiprid, Deltamethrin, Dicamba, Metamitron, Metazachlor, Chlorpyrifos, Permethrin, Diflubenzuron, Napropamide** in the recent past.

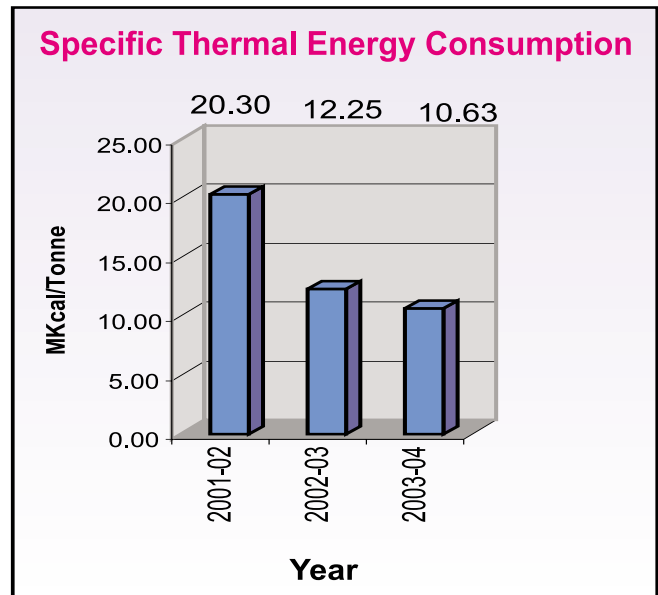
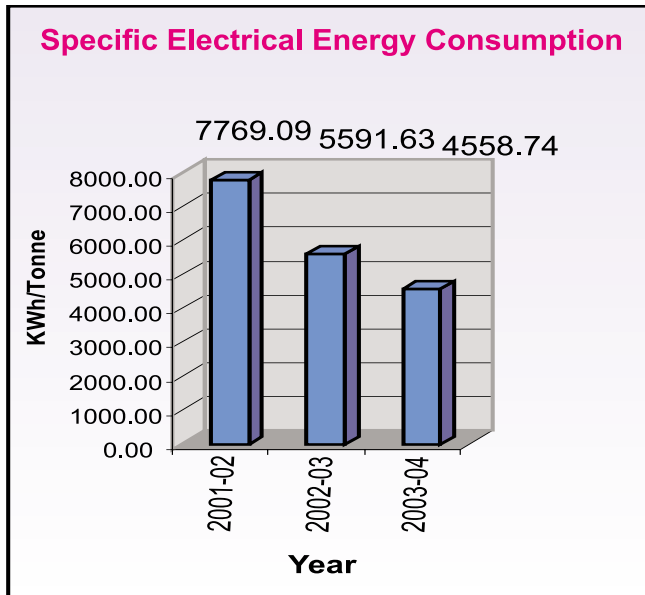
Gharda is the only Indian Company, which has received **U.S. Registration** (EPA Approval) for the sale of Chlorpyrifos (Insecticide) and Dicamba (Herbicide) and its formulation brands in the U. S. A.

Energy Consumption

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 four years is given below :

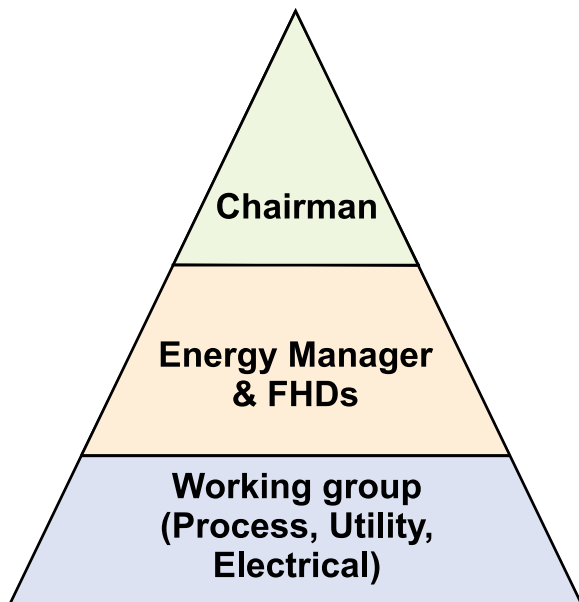
SNO	Description	Unit	2001-02	2002-03	2003-04
1	Annual Chemicals production	Tones	3561.83	4680.59	6633.46
2	Total Electrical Energy Consumption/Yr	Lakhs KWH	276.72	261.72	302.40
2	Specific Electrical Energy Consumption/Yr	KWH/Ton	7769.09	5591.63	4558.74
4	Total Thermal Energy Consumption/Yr	M Kcal	72313.24	57324.38	70514.99
5	Specific Thermal Energy Consumption/Yr	M Kcal/Ton	20.30	12.25	10.63
6	Total Manufacturing Cost	Rs. Lakhs	9669.48	12119.60	13472.41
7	Total Energy Cost	Rs. Lakhs	1751.91	1668.39	1933.93
8	Energy Cost as %age of Total Manufacturing Cost	%	18.12	13.77	14.35

FIG : REDUCTION IN SPECIFIC ENERGY CONSUMPTION



Energy 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 co-ordinators from various departments at all levels. They identify the problems, look for continuous improvement, conduct brain storming discussions, arrive at remedial measures and implement the same by involving all employees. The performance is monitored continuously, reviewed periodically and reported to management.

Energy Conservation Achievements

The major projects implemented during 2003-2004 are given below.

1) Conversion of Furnace Oil fired boiler into Solid Fuel fired Boiler :

■ Background :

- Furnace oil was used as a fuel in the boiler previously.
- Capacity of the boiler was 12 TPH steam generation.
- The cost of steam was ~ Rs. 900 per Ton.

■ Observations :

- The existing boiler can be converted to a Solid fuel fired boiler by provision of an external furnace.
- Bagasse Briquettes can be used as a solid fuel which is a cheaper option to the conventional furnace oil fuel.
- The calorific value of Bagasse Briquettes is ~ 3400 Kcal/Kg.
- The cost of the steam will be ~ Rs. 600 per Ton.

■ Action Taken :

- Detailed study for boiler conversion completed.
- Vendor for boiler modification finalised.
- Vendor for Bagasse Briquettes finalised.
- Boiler modification was completed & system taken in line for daily use.

■ Payback Period :

- Annual saving : Rs 82.76 Lakhs
- Investment : Rs 80.00 Lakhs
- Payback : 12 Months

2) Pumping Head optimization of Utility pumps viz. CHW circulation of Plant-2 :

■ Background :

- For Plant-2 in the earlier system, chilled water was being pumped from Central Utility System, (CUC) to a separate cold well in plant, then it was circulated through the plant & collected in a hot well in the plant. From this hot well it was pumped to the hot well of CUC.
- For above duty 2 nos. intermediate pumps (one each of 30 HP & 40 HP) & 2 nos. plant circulation pumps (both of 50 HP) were used.

■ Observations :

- Chilled water from CUC can be directly pumped to plant by avoiding separate hot well & cold well in plant-2.
- By doing this we can eliminate the above said 4 no. pumps by installing a single pump of required capacity & head.

■ Action Taken :

- Required flow rate & head of chilled water pump was determined. Flow rate – 250 M3/Hr, Head – 50 Mt, Pump HP – 75.
- Piping layout finalised, piping & pump installed & system taken in line.

■ Payback Period :

- Annual saving : 461040 KWh
- Annual saving : Rs 16.6 Lakhs
- Investment : Rs 5.00 Lakhs
- Payback : 3.6 Months

3) Pumping Head optimization of Utility pumps viz. CTW circulation of Plant-2 :**■ Background :**

- For Plant-2 in the earlier system, cooling tower water was being circulated from a Cooling Tower using 3 no. small capacity circulation pumps.
- For above duty 3 nos. pumps (one each of 60 HP) were used.
- As these pumps were of small capacity & very old, their efficiency was on lower side.

■ Observations :

- Cooling Tower water from Cooling Tower can be pumped to plant by using single pump.
- By doing this we can eliminate the above said 3 no. pumps by installing a single pump of required capacity & head.

■ Action Taken :

- Required flow rate & head of cooling tower water pump was determined. Flow rate – 800 M3/Hr, Head – 35 Mt, Pump HP – 120.
- Piping layout finalised, piping & pump installed & system taken in line.

■ Payback Period :

- Annual saving : 70176 KWh
- Annual saving : Rs 2.53 Lakhs
- Investment : Rs 1.00 Lakhs
- Payback : 4.75 Months

4) Pumping Head optimization of Utility pumps viz. CTW circulation of CUC Condenser**■ Background :**

- For CUC condenser in the earlier system, cooling tower water was being circulated from a Cooling Tower using high head & lower capacity circulation pumps.
- For above duty pump of capacity 540 M3/Hr, 45 Mt, (100 HP) was used.
- As these pumps were of high head & very old, their efficiency was on lower side.

■ Observations :

- Cooling Tower water from Cooling Tower can be pumped to CUC condenser by using lower head ,high capacity & high efficiency pump.
- By installing high efficiency pump of required capacity & head we can conserve the energy.

■ Action Taken :

- Required flow rate & head of cooling tower water pump was determined. Flow rate – 550 M3/Hr, Head – 22 Mt, Pump HP – 60.
- Piping layout finalised, piping & pump installed & system taken in line.

■ Payback Period :

- Annual saving : 285600 KWh
- Annual saving : Rs 10.28 Lakhs
- Investment : Rs 0.8 Lakhs
- Payback : 1 Month

5) Pumping Head optimization of Ejector water circulation pumps in Pl.2 :**■ Background :**

- For Ejectors of pl.2 in the earlier system, water was being circulated by using high head & lower capacity circulation pumps. (10 Nos.Ejector system)
- For above duty pump of capacity 35M3/Hr,55 Mt,(20 HP) was used.
- As these pumps were of small capacity, high head & very old, their efficiency was on lower side.

■ Observations :

- For water circulation to ejectors energy efficient pump can be used.
- By installing high efficiency pump of required capacity & head we can conserve the energy.

■ Action Taken :

- Required flow rate & head of ejector water circulation pump was determined. Flow rate – 55 M3/Hr, Head – 35 Mt, Pump HP –12.5.
- New high efficiency pumps were procured & pump installed & system taken in line.

■ Payback Period :

- Annual saving : 225624 KWh
- Annual saving : Rs 8.13 Lakhs
- Investment : Rs 1.38 Lakhs
- Payback : 2 Month

6) Condensate recovery system from process heating from PI.1 / PI.2 / PI.3/ PI.4. :**■ Background :**

- Total steam consumption of all the plants is @ 300TPD.
- Condensate from PI.1 /PI.2 / PI.3 /PI.4 was drained to gutter & also flash steam was vented to atmosphere.
- Condensate piping was not properly sized.

■ Observations :

- By installing separate flash drum & collection tank for each plant we can able to collect condensate & can be used as boiler feed water.
- Flash steam from flash drum can be used for heating boiler feed water.

■ Action Taken :

- Proper sizing of LP, MP, HP steam header was done. Separate header for MP,HP steam was installed.
- Proper designing of flash drums (One each for PI.1/2/3) was done & installed.
- Condensate Recovery done – 40 KL/day.
- Proper instrumentation was done for all the four system & taken in line.

■ Payback Period :

- Annual saving : 884 MKcal
- Annual saving : Rs 11.98 Lakhs — (Only cost of condensate is considered.)
- Investment : Rs 5.00Lakhs
- Pay back : 5 Months

7) Diffused aeration system for Bio-reactors (4 Nos.) in ETP :**■ Background :**

- For reduction of COD in Bioreactors, surface aerators were used in previous system.
- For surface aerators in Bioreactors 25HP motor was used.

■ Observations :

- By replacing existing surface aerator by diffused aeration system, effective COD reduction can be achieved.
- By installing diffused aerator system we can reduce electricity consumption as diffused aeration system included small capacity blower.

■ Action Taken :

- For procurement of diffused aeration system ,various vendors were consulted & quotations were received.
- Finalisation of competitive vendor was done. Piping was done as per vendor's re

Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs.lakhs)	Project Commencement & Completion year
	Energy Value (specify units)	Rs. lakhs		
Boiler-Wood as fuel	40077.00	543.00	2.00	July'04 & Oct'04
Boiler-Producer gas	6412.00	86.86	5.00	Sept'04 & Dec'04
Boiler-economiser	3264.00	44.21	2.00	Sept'04 & Feb'05
Co-generation plant	-	-	-	This project is under Feasibility Study
Pumping head optimisation	4.08	14.69	1.20	May'04 & Feb'05
Steam Trap Conversion	391.76	5.31	5.45	Sept'04 & March'05
R&D Efforts - Electrical	22.00	79.20	8.00	April'04 & March'05
R&D Efforts - Thermal	4000.00	54.19	8.00	April'04 & March'05
Screw Compressor-Air	4.08	14.69	38.00	Nov'04 & March'05
CT-FRP Blades	0.12	0.42	0.25	Nov'04 & Jan'05
Condensate Recovery	884.00	11.98	10.00	Sept'04 & Feb'05
Plant lighting-CFL lamps	0.57	2.04	0.22	Sept'04 & March'05
Motors-Star delta	1.27	4.57	2.00	Oct'04 & Feb'05
High Efficiency agitators	1.69	6.09	1.50	Sept'04 & March'05
RPM reduction in reactors	1.27	4.57	0.75	Sept'04 & March'05
Wind Power Utilisation	3.07	11.04	10.00	Sept'04 & March'05
Solar Power Utilisation	1000.00	13.55	15.00	Sept'04 & March'05
Total	-----	896.38	109.37	-----

Note : Units for electrical energy saving is lakhs KWh & thermal energy saving is Mkal.

Year	Electrical*	Thermal*	Reduction over the year 2003-04	
			Electrical%	Thermal%
2003-04 (Base year)	4558.741	9.289	-	-
2004-05	4011.692	8.175	12.00	12.00
2005-06	3610.523	7.357	20.80	20.80

Note : Units for electrical energy saving is lakhs KWh/Tonne & thermal energy saving is Mkal/Tonne.

Energy Conservation Plans and Targets

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

Specific Energy Consumption Planned Target for the year 2004-05 & 2005-06

Environment Management System And Safety

As per the Environmental Policy, GCL is committed to continual up gradation of technology, prevention of pollution, conservation & optimal utilization of natural resources by adopting Recycle, Reuse & Recovery methods, training for Environmental awareness to employees, safe operation of the plant & equipment, complying with all the applicable environmental legislations & regulations to preserve its environment and ensure safety of its employees.

GCL has bagged the prestigious ISO-14001 awards from BVQI during September, 2003.

Green Belting

- House Keeping
- Development of green belt in and around the factory.
- Planting of sapling by employee in the factory premises on his birthday.
- Various types of plants and lawns developed around the factory to improve the environment.

Safety

- Functioning of Central & Departmental Safety Committee.
- Daily Safety Inspection at the shop floor and report the unsafe acts to the top management.
- Fire safety, First Aid Training & Basic Orientation Training to all employees about safety.
- Periodical Mock Drill is being conducted to increase safety awareness.
- Work Permit system for various types of jobs involved.
- On-site & Off-site emergency plans.
- Celebration of National Safety Day during March every year / worker participation and pledge taking.



GHARDA CHEMICALS LTD., LOTE ENVIRONMENTAL POLICY

WE AT GHARDA CHEMICALS LIMITED, LOTE ARE COMMITTED TO CONSERVE AND PROTECT THE ENVIRONMENT. WE SHALL FOLLOW ALL THE ENVIRONMENTAL RULES, REGULATIONS AND ACTS RELEVANT TO OUR BUSINESS ACTIVITY.

WE SHALL EMPHASIZE ON RECYCLE, RECOVERY AND REUSE OF RAW MATERIALS, SOLVENTS, WATER AND PACKING MATERIAL



WE SHALL BE RESPONSIVE TO THE ENVIRONMENTAL NEEDS OF THE NEIGHBOURING INDUSTRIES AND VILLAGES.

WE SHALL IMPART TRAINING TO ALL OUR EMPLOYEES TO CREATE ENVIRONMENTAL AWARENESS AMONGST THEM AND THE IMPACT OF THEIR ACTIVITIES ON ENVIRONMENT.

WE ARE ALSO COMMITTED TO PREVENT POLLUTION THROUGH OUR R&D EFFORTS, TOWARDS CONTINUAL IMPROVEMENT IN PROCESSES, PRODUCTS AND INPUTS.

**ISSUED ON DATE 01-01-2003
REVISION : 00**

**U. VIDYASAGARAN
LOCATION HEAD AND CEO**

