

ICC  
Indian Chemical Council

**Seminar on**  
**“ENERGY CONSERVATION &  
CARBON TRADING”**

**Organized By ICC (3 - 4<sup>th</sup> November, 2006)**

**Case Study : Inorganic Chemical Sector**

Presented By :

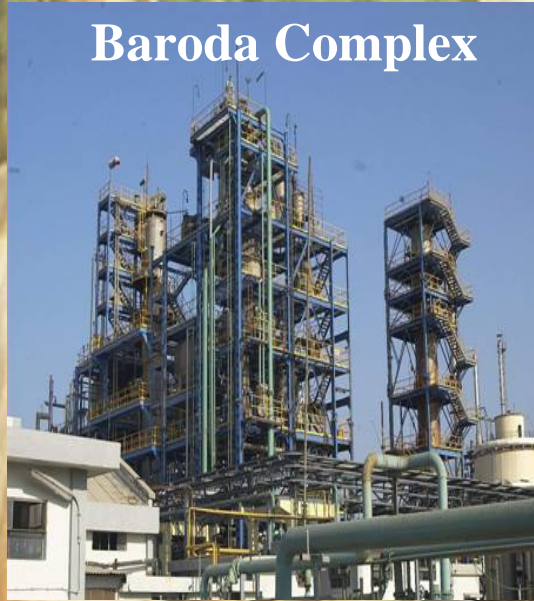
Mr. P.N. Parikh, General Manager (Materials Mgt. & Tech. Services)  
& Mr. M.N. Patel, Chief Manager (Energy & Production)

**GUJARAT ALKALIES AND CHEMICALS LIMITED, VADODARA**

# Company – An Overview

With a handful of Salt **Gandhiji** led the nation to freedom...

Baroda Complex



Dahej Complex



...Today **GACL** transforms this common mineral into 23 valuable multifarious products

# Our Locations on Gujarat Map



➤ Outputs  
• 26 Chemicals

## ➤ Inputs

- Salt : Largest Coastal strip in Gujarat
- Electricity : GACL-Self-sufficient by Cogen. Captive Power Plants

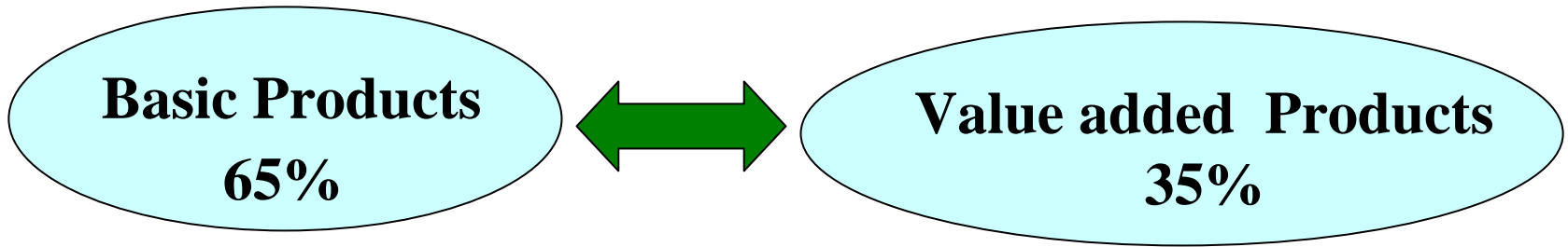
# Introduction

- Company promoted by Government of Gujarat and it commenced commercial operations with 37,425 MTA of Caustic Soda in 1976.
- Increased production capacity to 3,70,000 MTA and changed over completely to environment friendly & **Energy Efficient** Membrane Cell Technology in a phased manner since 1989.
- Added value added products like Sodium Cyanide, Chloromethanes, Hydrogen Peroxide, Potassium Hydroxide and Potassium Carbonate, Phosphoric Acid, Calcium Chloride, Poly Aluminium Chloride etc.
- Maintaining its leadership in Caustic-Chlorine in the country with 16% share.
- Company has been maintaining its plants more than 100% capacity utilisation as against about 84.2% Caustic Soda industry average.
- It employs 1395 employees and the total income has reached Rs.1094 Crores.
- Turnover per employee is around Rs.78 lacs.
- **Average Energy Cost** is 57 % of Manufacturing Cost for Caustic Soda.
- **Energy Bill** of company is **Rs. 253.30 Crores** during 2005-06.
- ISO 9001, ISO 14001, and IS 18001 Certified Company by BIS.

# Salient Features

- **Integrated Production Facility** which optimizes **Specific Energy Consumptions** for our all products
- **Capacity Utilization of 111% GACL vs. Industry** gives benefit of scale of production at reduced **Energy Consumption** in general and **Aux. Energy Consumption** in particular
- **Continuous up-gradation of technology** keeps GACL at par with **International Energy Consumption** norms.
- **Up-stream and Down-stream integration of Chlor Alkali product** is of world class which not only reduces the **Energy Consumption** but it also enables GACL to continuously expand its production capacities unmatchable by the competitors of Big Business Houses of India like Reliance & Birla Group in the Chlor Alkali sector.

# Integrated Production Facility

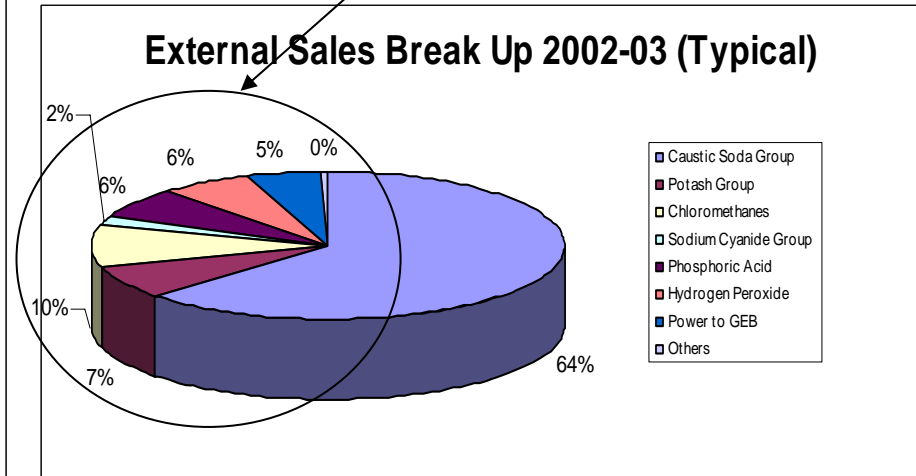
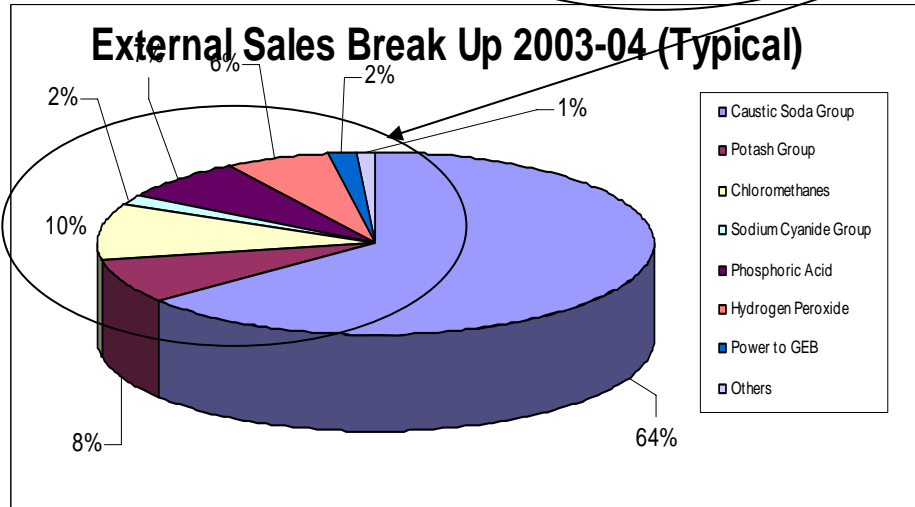


Sr. No.	Products	Unit	
		Vadodara	Dahej
1	Caustic Group	√	√
2	Potash Group	√	
3	Chloromethanes Group	√	
4	Sodium Cyanide Group	√	
5	Phosphoric Acid Group		√
6	Hydrogen Peroxide Group	√	
7	Captive Power Plant		√

*Vertically integrated; Value added products*

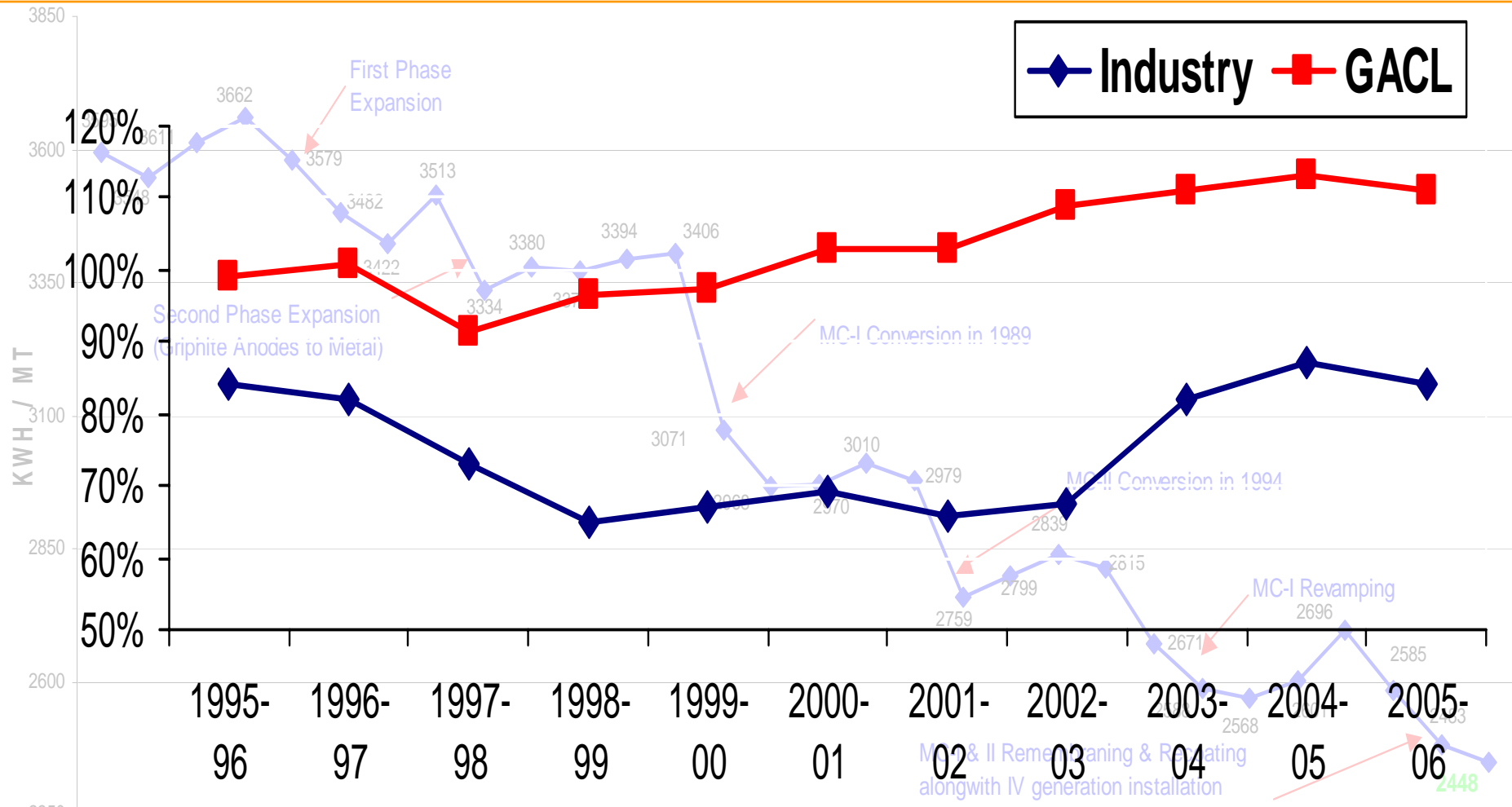
# Yearly Break Up of External Sales

Particulars	2003-04	2002-03
<b>A. Caustic Soda Group</b>	64.13%	63.06%
<b>B. Other Products</b>		
Potash Group	7.72%	7.22%
Chloromethanes	10.07%	9.30%
Sodium Cyanide Group	1.98%	2.09%
Phosphoric Acid	7.30%	6.45%
Hydrogen Peroxide	6.03%	6.30%
Power to GEB	1.57%	5.16%
Others	1.20%	0.42%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>



*Integrated Value Added Products hedges GACL against cyclical fluctuations of Chlor Alkali Industry*

# Capacity Utilisation Caustic Soda Lye of GACL



**Capacity Utilisation of near 100% achieved regularly. Utilisation levels are well above the industry average giving edge to GACL to be a low energy cost producer**

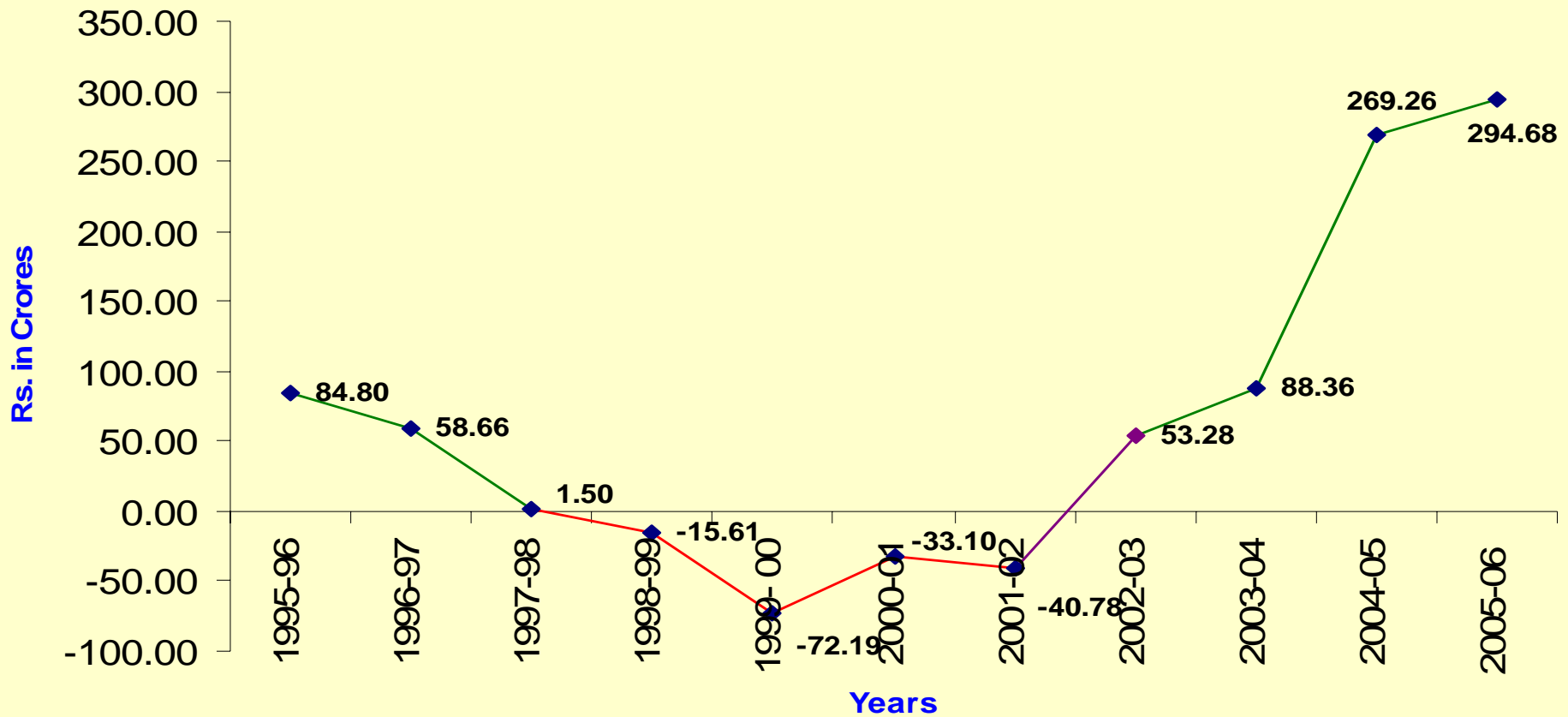


# Turnaround Initiatives

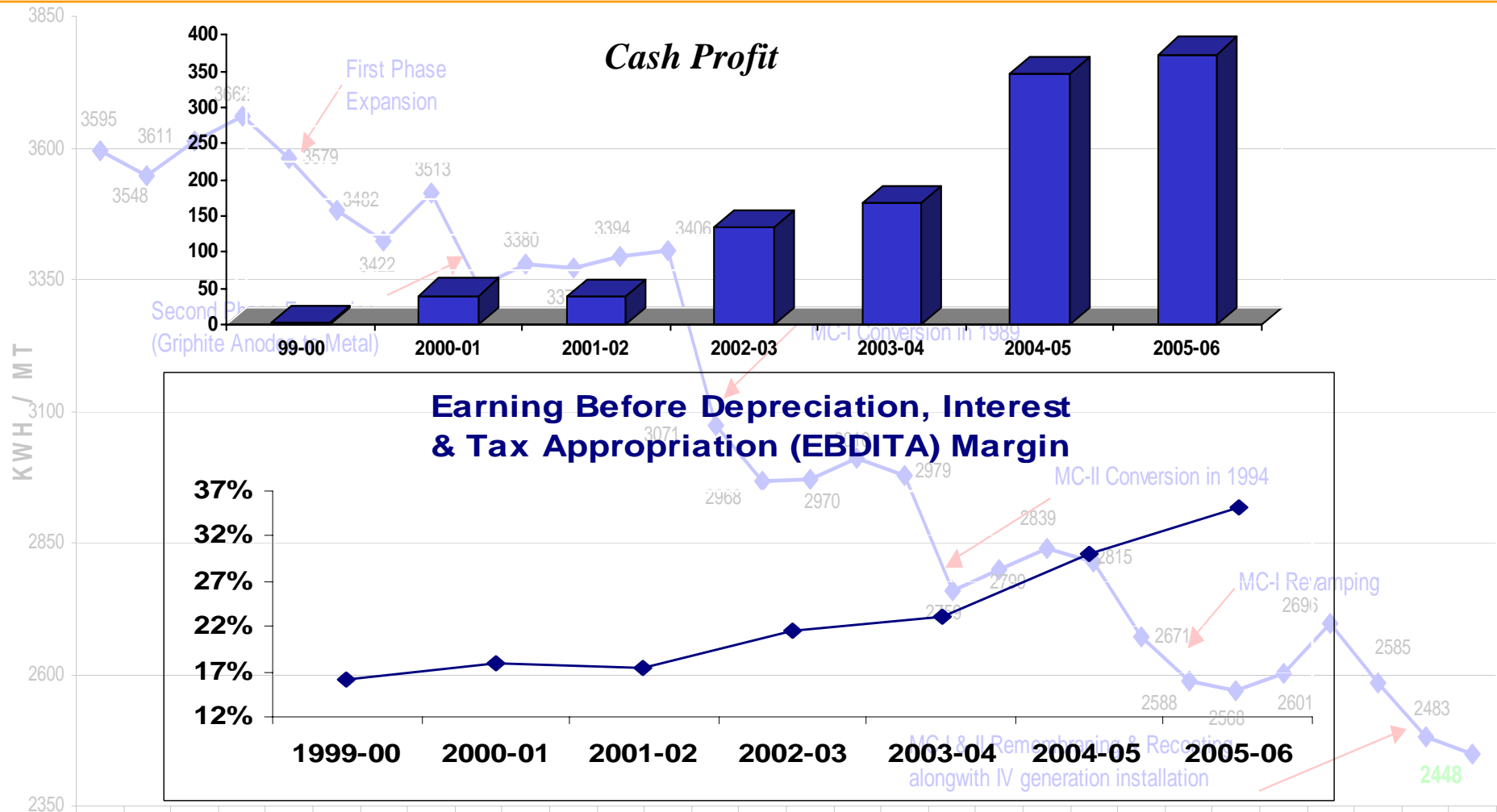


# Financial Performance

## Financial Result of last 11 Years (Profit / (Loss) Before Tax



# Financial Performance



*Company has always earned cash profit and good EBDITA margins whatever be the conditions by optimizing capacity utilization and energy management*



<b>SPECIFIC CONSUMPTION DETAILS - BARODA</b>		<b>Unit</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
Annual Production (Caustic Soda & Potash)	MT		157120	170620	177834
Total energy consumption per annum	Lacs KWH		3957.85	4105.12	4255.7
Total thermal energy consumption	MKacl		77366.3	54513.09	57293.71
Total Manufacturing Cost	Rs. Lacs		22903.27	21420.69	22925.42
Total Energy Cost (to Metal)	Rs. Lacs		13645.38	11719.92	11676.19
Energy Cost as % of Manufacturing Cost	%		59.8	54.7	50.93
DC Electrolysis Power Consumption	KWH/MT		2189	2090	2091
AC Electrolysis Power Consumption	KWH/MT		2280	2177	2178
AC Power Consumption with Auxiliaries & without CCU	KWH/MT		2519	2406	2393
AC Power Consumption with Auxiliaries & CCU	KWH/MT		2557	2442	2427
Auxiliaries Power Consumption only	KWH/MT		239	229	215
Power Consumption for CCU (Flakes)	KWH/MT		38	36	34
Thermal Energy Consumption	Mkcal/MT		0.4923	0.3195	0.3221




<b>SPECIFIC CONSUMPTION DETAILS - DAHEJ</b>		<b>UNIT</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
Annual Production		MT	142205	154310	151494
Total Energy consumption per annum	3595, 3548, 3611, 3559, 3482, 3422, 3513, 3380, 3394, 3406	Lacs KWH	3598	3963	3927
Total Thermal Energy Consumption		Million Kcal	56403	49397	58210
Total Manufacturing Cost in Rs. (lakhs)	3100, 3071, 3010, 2979	Rs. Lacs	19591	18190	18905
Total Energy Cost in Rs. (lakhs)		Rs. Lacs	11891	10704	11891
Energy Cost as % of Raw-Material cost	2968, 2970, 3010, 2979	%	60	59	63
DC Electrolysis Power Consumption	2759, 2799, 2220, 2815	KWH/MT	2220	2289	2304
AC rectification power consumption.		KWH/MT	2277	2348	2363
AC Power Consumption with Auxiliaries & without CCU	2588, 2577, 2601	KWH/MT	2530	2577	2592
Auxiliary Power Consumption only	2588, 2568, 2601	KWH/MT	253	229	229
Power Consump for CCU flakes & prills		KWH/MT	39	40	65
Steam Consumption		Mkcal/MT	0.3966	0.3201	0.3842



# Energy Conservation & Management




## Energy Management Policy




**GACL is committed to Energy Conservation by :**

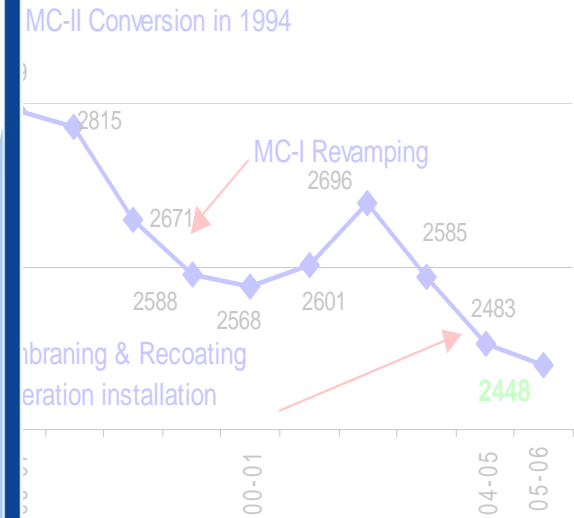
- Minimizing Specific Energy Consumption,
- Maximizing Capacity Utilization,
- Continuous fine-tuning and maintenance of operations,
- Upgrading of process and equipment for better energy efficiency,
- Motivating employees to achieve a minimum 1% reduction per annum in specific energy consumption,
- Monitoring and Reviewing energy conservation efforts.



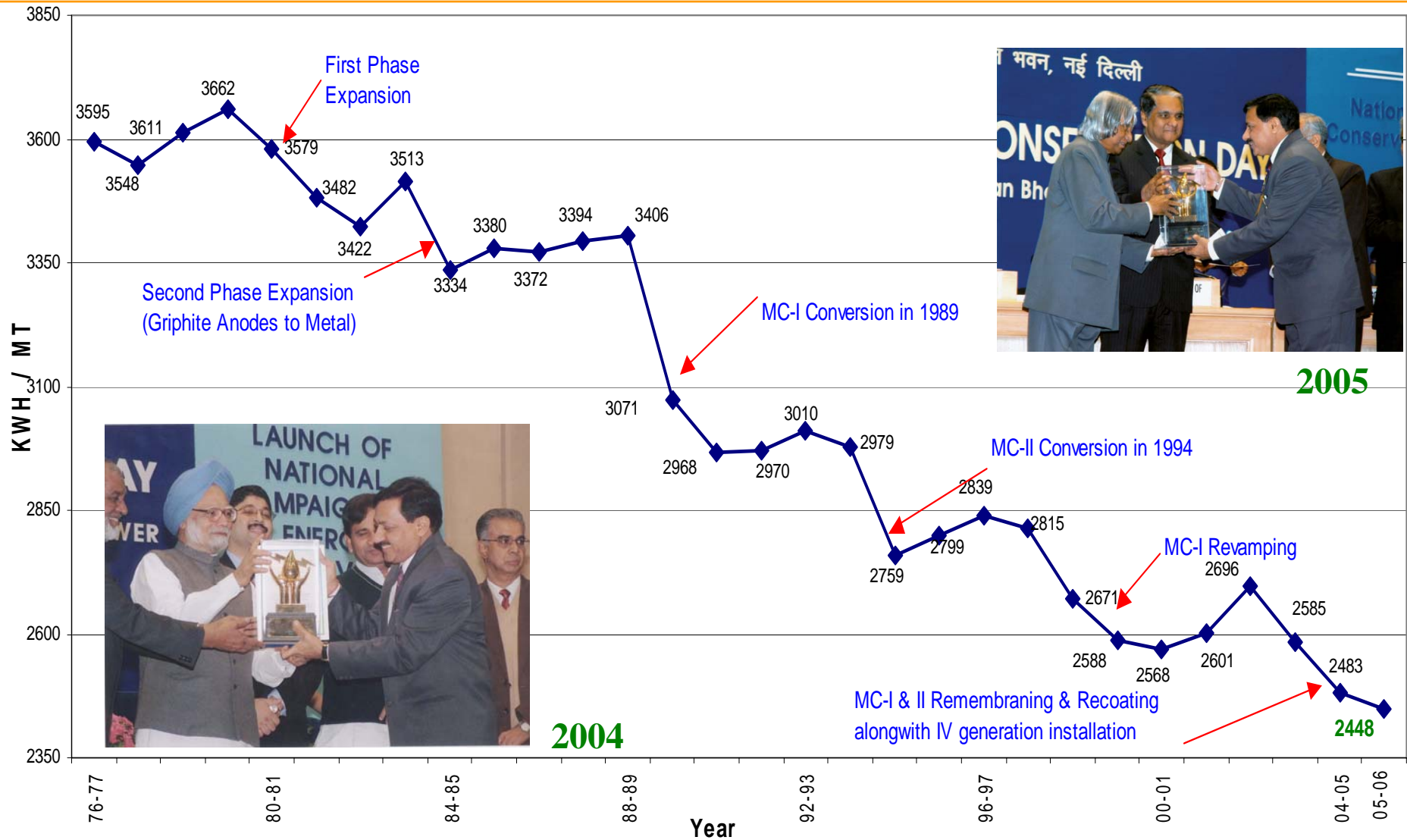
**VADODARA**  
DATE :01/10/2005



**P. K . TANEJA, IAS**  
MANAGING DIRECTOR



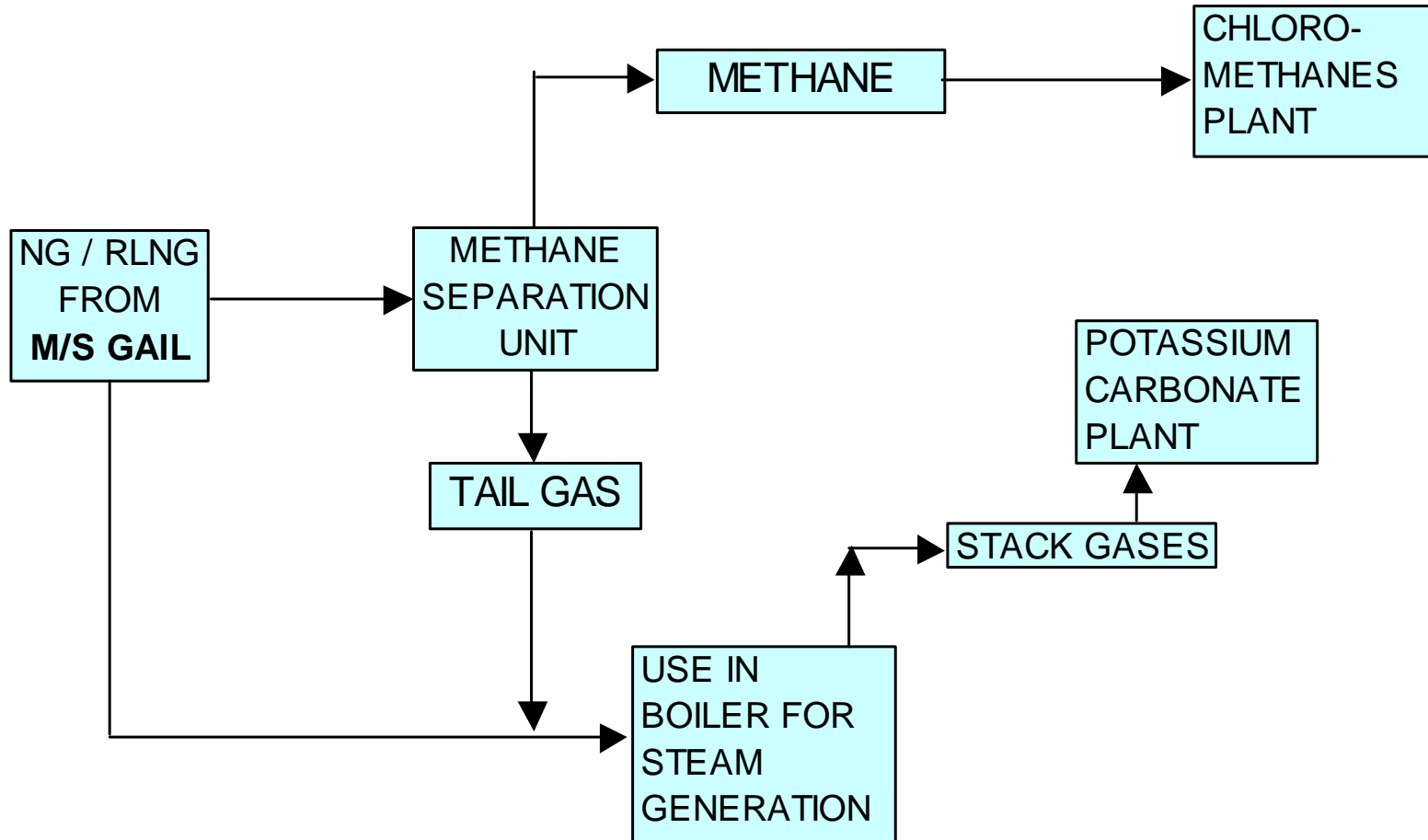
# Year Wise Total Power Consumption in KWH/MT for Caustic Soda Production



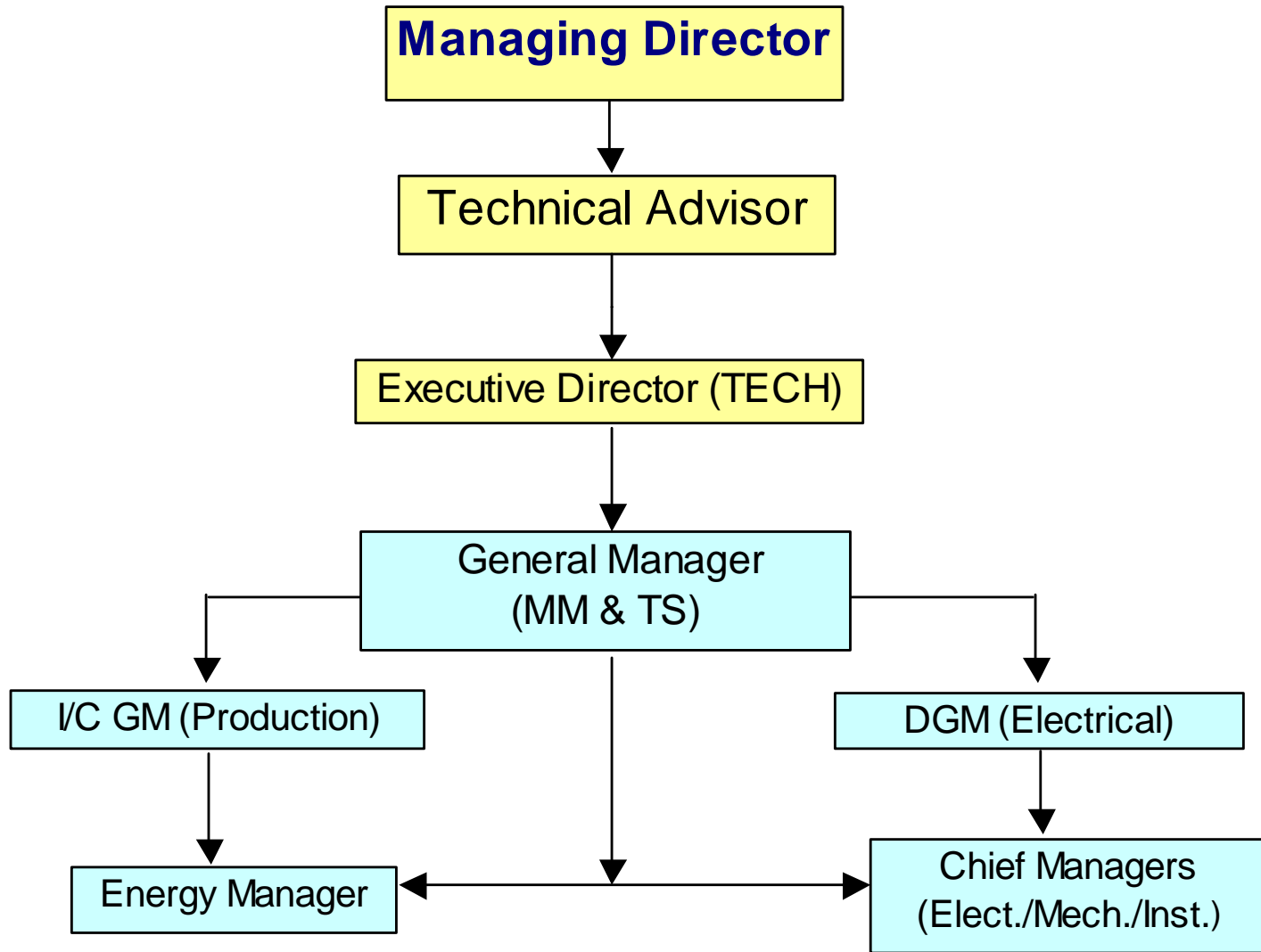
**GACL is winner of 1<sup>st</sup> prize of National EC Award – 2004 & 2005.  
By Ministry of Power, Govt. of India**



# Integrated approach to use Natural Gas for energy saving



# Energy Conservation Cell



# Our Achievements - Baroda

**Technology Up gradation:** GACL has continued further changing of the energy efficient new version – 4 electrolyzers from UHDE Germany during this year also to get the benefit of power saving agenda. The following data shows the energy saving and investment during the year 2005-06.

**Saving in Power:** 2005-06.....**22.32 lacs kWh**  
**Saving in Cost** during 2005-06.....**117.18 Rs.lakhs**  
**Total Investment** during 2004-05.....**784 Rs.lakhs**  
**Pay back period**.....**6.7 years**

**Remarks:** Cost of investment is high due to innovative technology.



**Re-membraning & Re-coating of Cell House No. 1 :** GACL has continued re-membraning/re-coating of more electrolyzers in 2005-06 also which will be completed in coming year 2006-07. Taking competitive advantage of up-graded technology. Power saving during current year is as under during the year 2005-06.

**Saving in Power**.....**14.83 lakhs kWh**  
**Saving in Cost**.....**77.85 Rs. lakhs**  
**Total Investment**.....**126.86 Rs.lakhs**  
**Payback period**.....**1.7 years**



# Our Achievements - Baroda

**Revamping of Cooling Tower hardware**s inclusive of using **Aero Dynamic** blades in place of normal metallic blades as a result of reduction in **Drift losses & improvement in Air circulations**. The following data shows the energy saving and investment during the year 2005-06.

<b>Saving in Energy</b> .....	<b>4.3 lakhs kWh</b>
<b>Saving in cost</b> .....	<b>22.57 Rs.lakhs</b>
<b>Total Investment</b> .....	<b>45 Rs.lakhs</b>
<b>Pay back period</b> .....	<b>2 years.</b>



## **Complete Change-over of Boiler fuel from Furnace oil to Natural Gas:**

We had installed **dual fuel** burners in our 5 no. of boilers since its commissioning & one boiler was without dual fuel burner which was changed to dual fuel burner. So, this change over to better energy efficient fuel was implemented at negligible cost. This reduced SO<sub>x</sub> emission & suspended solid particulates in the flue gases. The following data shows the energy saving and investment during the year 2005-06, for the balance to boilers.

<b>Saving in Energy</b> .....	<b>2562 Mkal.</b>
<b>Saving in cost</b> .....	<b>87 Rs.lakhs</b>
<b>Total Investment</b> .....	<b>10 Rs.lakhs</b>
<b>Pay back period</b> .....	<b>2 Months</b>



# Our Achievements - Baroda

## Replacement of Damaged Hot & Cold Insulations and Minimizing Steam Leakages :

The unit being 30 years old, We plan regular replacement of Hot & Cold Insulations of Pipe lines and Equipments and we have a planned budget provision and annual maintenance contract for replacement of Hot & Cold Insulation as required. The following data shows the energy saving and investment during the year 2005-06.

<b>Saving in Electrical Energy.....</b>	<b>2.59 lakhs kWh</b>
<b>Saving in Thermal Energy.....</b>	<b>686 Mkal.</b>
<b>Saving in cost.....</b>	<b>18.5 Rs.lakhs</b>
<b>Total Investment.....</b>	<b>85 Rs. lakhs</b>



## Installation of water separator in Hydrogen Gas line of Caustic Concentration unit to save heat of evaporation of water present in Hydrogen Gas:

The Hydrogen from electrolyzers contains water which needs to be removed before it is burnt as a fuel in Caustic concentration furnace to improve the combustion efficiency and NCV of Hydrogen Gas. This is carried out by installing a water separator in the gas line before it is fed to the burner system and the savings as under have been observed during the year 2005-06.

<b>Saving in Energy.....</b>	<b>1.02 Mkal.</b>
<b>Saving in cost.....</b>	<b>6.6 Rs.lakhs</b>
<b>Total Investment.....</b>	<b>5 Rs. lakhs</b>



# Our Achievements - Baroda

**Replacement of old equipments: CHLORINE EVAPORATORS & KOH EVAPORATORS.** As we operate our plant for 360 days out of 365 days we had no option but replace the evaporator after about 10/13 years of service as under during the year 2005-06.

- i) We supply 70-100 tons of pure evaporated liquid chlorine to our next door client (IPCL) through pipe-line.
- ii) We also consume 65 tons of evaporated chlorine captively for our chloromethanes plants through pipe-line.
- iii) We also replaced Caustic Potash evaporators of 53 TPD capacity.

**Saving in Energy..... 1.8 lakhs kWh.**  
**Saving in Thermal Energy.....989 Mkal.**  
**Saving in cost.....14.8 Rs.lakhs**  
**Total Investment.....30.7 Rs. lakhs**



**Renewable energy project: (Trend Setter)**

**PV SOLAR SYSTEM for industrial use (Powering the DCS and Instrumentation Systems)** GACL has introduced for the first time across all industries in India **use of Photovoltaic Solar System** generating DC power from sun light and directly use for critical application of DC power required for instrumentation system in a chemical process plant connected to DCS. This is an unique energy efficient application where the generation is DC electricity matching the requirement of load also of DC electricity for 24X7 hours application giving feasible cost benefit in deployment of renewable energy resource as under for the year 2005-06. System is designed for **3.3 KW DC power at 24 Volts** to feed Instrumentation/DCS load of Caustic Chlorine Plant operating for 360 days having 300 sunny days in Gujarat.

**Saving in Energy..... 0.25 lakhs kWh.**  
**Saving in cost.....1.3 Rs.lakhs**  
**Total Investment.....10.5 Rs. lakhs**  
**Pay back period.....8 years**



# Our Achievements - Dahej

## A) Energy saved in Cell House.

As per Industries norms, the cell element voltage increases with the aging of membrane and hence power losses increases to the tune of 40 kwh/MT. By maintaining brine temperature and quality of brine and ensuring minimum deposition calcium and magnesium salts and hence less power consumption. The energy saved by above activities is as below:

<u>TARGET</u>	<u>2005-06</u>
1) Based on base figure of 2385 kwh / MT for the year 2003-04 and industry norms 40 kwh / Ton / year increases due to aging of cell membranes in 2005-06.	2465
2) Specific power consumption kwh / MT.	2363
3) Caustic Production (MT).	151494
4) Saved energy in 2004-05 kwh / MT	77
5) Saved elect. Power in 2005-06 kwh / MT	102
6) Net saving 102 – 77 = 25 kwh / MT	25
7) Saving in Power (Lakh kwh/year)	37.87
8) Power cost (Rs./kwh)	2.92
<b>9) Amount saved per year (Rs. In Lakh ).</b>	<b>110. 58</b>



Cell House

## B) Switching off 5 nos. Air Compressors and installing high Capacity Screw Compressor.

Five nos. of air compressors used to supply the air to individual plants. After installation of higher capacity air compressor, which alone supplies the air to all plants and stopped all other four compressors. The saving of electrical energy is as below:

1) Before modification power consumed by five compressors was kw	- 326.40
2) After modification power consumed by five compressors was kw	- 226.00
3) Power saved per year kwh ( lakhs )	- 5.13
4) Cost of power Rs. / kwh	- 2.92
<b>5) Amount saved (Rs. Lakh).</b>	<b>- 14. 98</b>



Atlas make Air Compressor

# Our Achievements - Dahej

## C) Improvement in Performance of H.P. Cooling Water PP

Improvement in performance of H.P. C.W. pump by overhauling the pump, attending the butter-fly valve & stopping the re-circulation to C.T. basin. The electrical energy saved is :

1) Before attending the maint. jobs power cons. kw	...	463
2) After attending the maint. jobs power cons. kw	...	433
3) Total Electrical energy saved kwh lakhs/yr	...	2.52
4) Cost of energy Rs. Lakhs	...	2.92
5) Cost for maintenance Rs. Lakh.	...	0.20
<b>6) Amount saved (Rs. In Lakh)</b>	<b>...</b>	<b>7.36</b>



**HP Cooling Water PP**

## D) Waste Hydrogen Gas used as fuel instead of N.G. for our new CCU furnace :

Hydrogen Gas is generated as bi-product during production of NaOH is being let out to atmosphere. The same is used in CCU and CaCl<sub>2</sub> furnace in-place of N.G.

1) Hydrogen gas used as fuel (NM3 lakhs)/year.	...	117.60
2) Hydrogen Gas Calorific Value Kcal / NM3.	...	2500.00
3) Natural Gas Calorific Value kcal / NM3.	...	9083.00
4) Natural Gas saved (Nm3 lakhs)/year	...	32.37
5) Cost of N.G. per (Rs. / NM3)	...	8.00
6) Cost of the Project Rs. in lakhs	...	20.00
<b>7) Amount saved (Rs. Lakhs )</b>	<b>...</b>	<b>258.96</b>



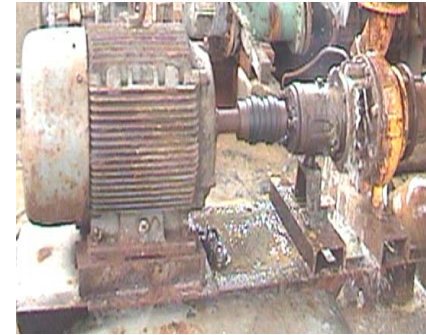
**Hydrogen Control Station**

# Our Achievements - Dahej

## Replacement of oversized motor 75 kw with suitable size motor of 55 kw for Lagoon pump and 37 kw with suitable size motor of 15 kw for Vacuum PP in New CEU

Effluent lagoon pump 75 kw motor and 37 kw motor has been replaced with 55 kw motor and 15 kw motor to perform same duty.

1) Before replacement of motor power cons. kw. ...	112.00
2) After replacement of motor power cons. kw. ...	67.00
3) Power saved in kw. ...	45.00
4) Electrical energy saved per year (kwh lakhs). ...	3.78
5) Power cost in Rs. / kwh. ...	2.92
6) Investment made ( Rs. Lakhs ). ...	1.50
7) <b>Amount saved ( Rs. Lakhs ).</b> ...	<b>11. 04</b>



**ETP PUMP, 55 KW MOTOR**

## Modification of HRSG – 1 to recover more heat from the hot gasses

Modification in HRSG – 1 in CCP for homogeneous distribution of hot gasses by providing baffle plates below each module to restrict the short circuit of hot gasses between the module and the duct.

1) Before modification stack temperature was 190 deg. C and HP steam generation was MT. ...	50.00
2) After modification stack temperature was 170 deg. C and HP steam generation was MT. ...	56.00
3) After modification additional steam generated MT	6.00
4) With additional steam generation of 6 MT generated additional generation in MW. ...	1. 55
5) Power saved ( kwh lakhs )/ year. ...	122.76
6) Investment made ( Rs. Lakhs ) ...	5.00
7) Power cost in Rs. / kwh ...	2.92
8) <b>Amount saved ( Rs. Lakhs )</b> ...	<b>358.46</b>



**HEAT RECOVERY STEAM GEN. - 1**

# Our Achievements - Dahej

## Cooling Tower Performance improvement, Which saved power in CT Fans 2 Nos.

Cooling Tower performance of CCP improved by replacing defective complete timber and fills. This ensured proper distribution of air across the cooling tower, which reduced the load on CT Fans. The Cooling Tower range improved from 5.75 deg C to 10 deg C. Power Saved in cooling tower fans is :

Before Revamping of cooling tower power consumed (kw)	88.90
After Revamping of cooling tower power consumed (kw)	60.00
Power Saved in kw	28.90
Electrical Energy saved ( kwh lakhs ) per year	2.43
Cost of Power Rs. / kwh	2.92
Investment made Rs. in lakhs	15.00
Amount saved ( Rs. Lakhs )	7.10



**Cooling Tower Revamping**

## Five Nos. of Variable Frequency Derives installed for different applications

Variable Frequency Drives are used for different applications in New CCU, CaCl<sub>2</sub> Spray Dryer, which saved electrical energy as below :

Power consumed before VFDs installation (kw)	152.50
Power consumed after VFDs installation (kw)	69.50
Total energy saving per year ( kwh Lakhs) per year	6.97
Energy cost (Rs. / kwh)	2.92
Investment made Rs. in lakhs	5.00
<b>Total amount saved for the year (Rs. In Lakh)</b>	<b>20.35</b>



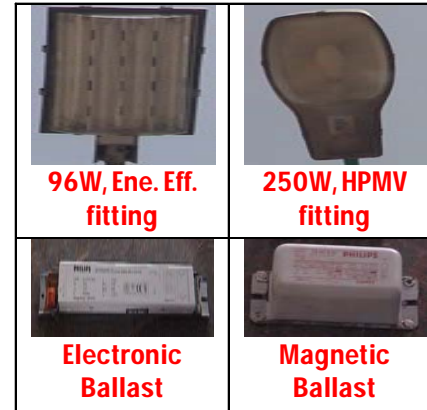
**VFD Panels installed in CCU**

# Our Achievements - Dahej

## I) Power saved by replacing energy efficient Fittings, Electronics Chokes and Lighting T/F

By Replacing 5 nos Energy efficient fittings of 4x24 watt in place of 250 watt HPMV Lamps and 100 nos electronics chokes for 40 watt fluorescent tubes, and providing low loss core material step down transformer which saved energy as below :

Before Fittings/Chokes/ Transformer Replacement Power Consumed Kw	19.70
After Fittings/Chokes Replacement Power Consumed (Kw)	13.30
Total Energy Saved per Year (kwh Lakhs)	0.23
Investment made ( Rs. Lakhs )	1.50
Energy cost (Rs. / kwh)	2.92
<b>Amount Saved (Rs. Lakhs) per Year</b>	<b>0.67</b>



## J) Most Innovative Measure for saving costly imported petrol . Petrol Saved by arranging Bus Transportation instead of individual Two Wheelers for attending Duty :

Company used to provide conveyance allowance for individual employee to use their two wheelers to attend duty. Subsequently Company Management decided to provide Busses instead of two wheelers to save Costly imported petrol and also safety of the employees increases. In India Automobile sector consumes 50% of petrol / diesel, which can be saved if such type of sharing/pooling systems are devised basing on requirement basis. The savings in petrol is as below :

With two wheelers employees transport petrol consumption / year in ltrs. -lakhs (357 employees travel 12.94 km-lakhs/yr)	0.3234
With Busses diesel consumption for employees Transportation / year in ltrs ( lakhs )	0.0986
Amount Spent with two wheelers transportation in Rs. ( lakhs)	16.17
Amount Spent with Busses for transportation in Rs. ( lakhs)	3.45
Saving in Rs (lakhs )	12.72

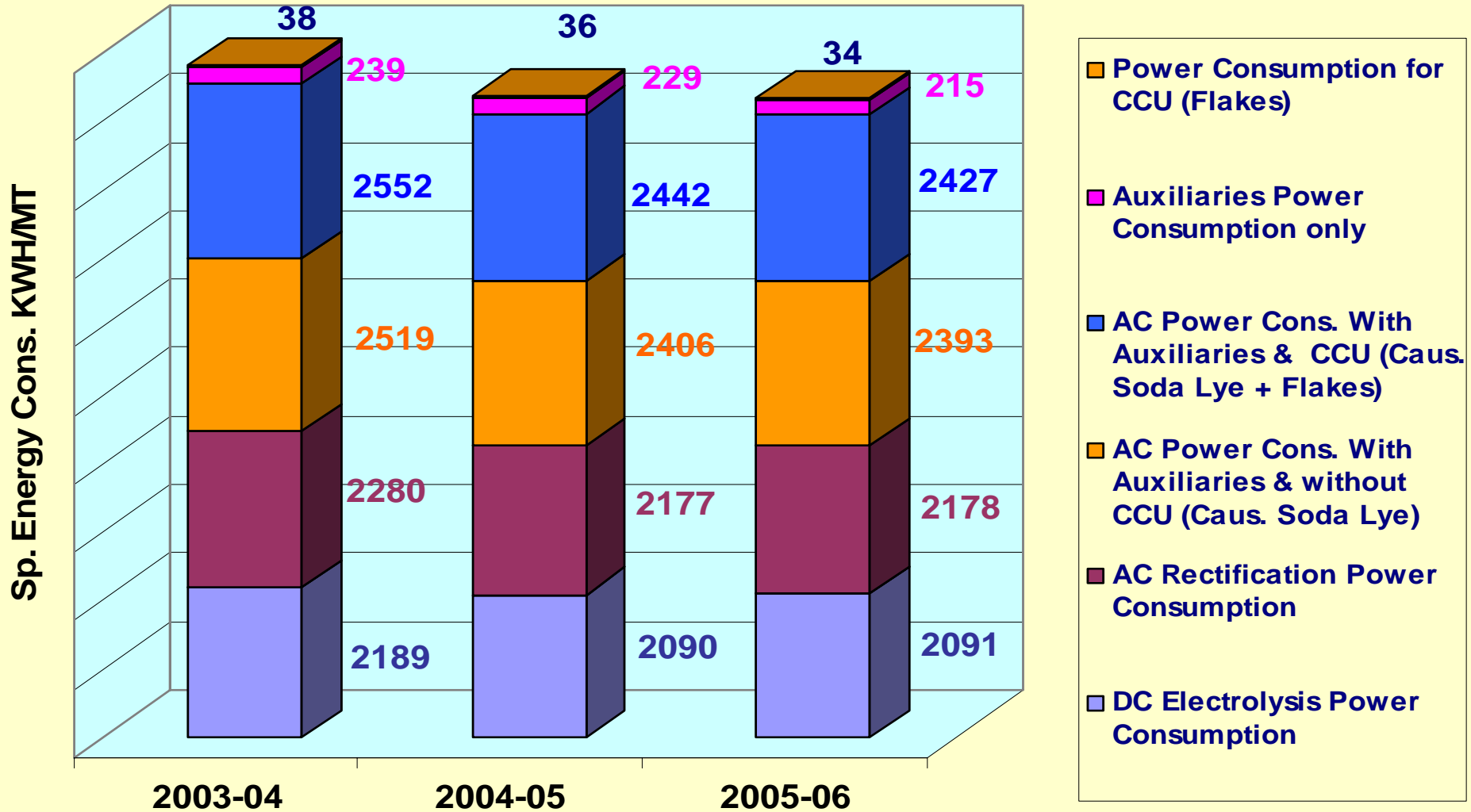


**Common Bus Transportation to employees instead of Two Wheeler**

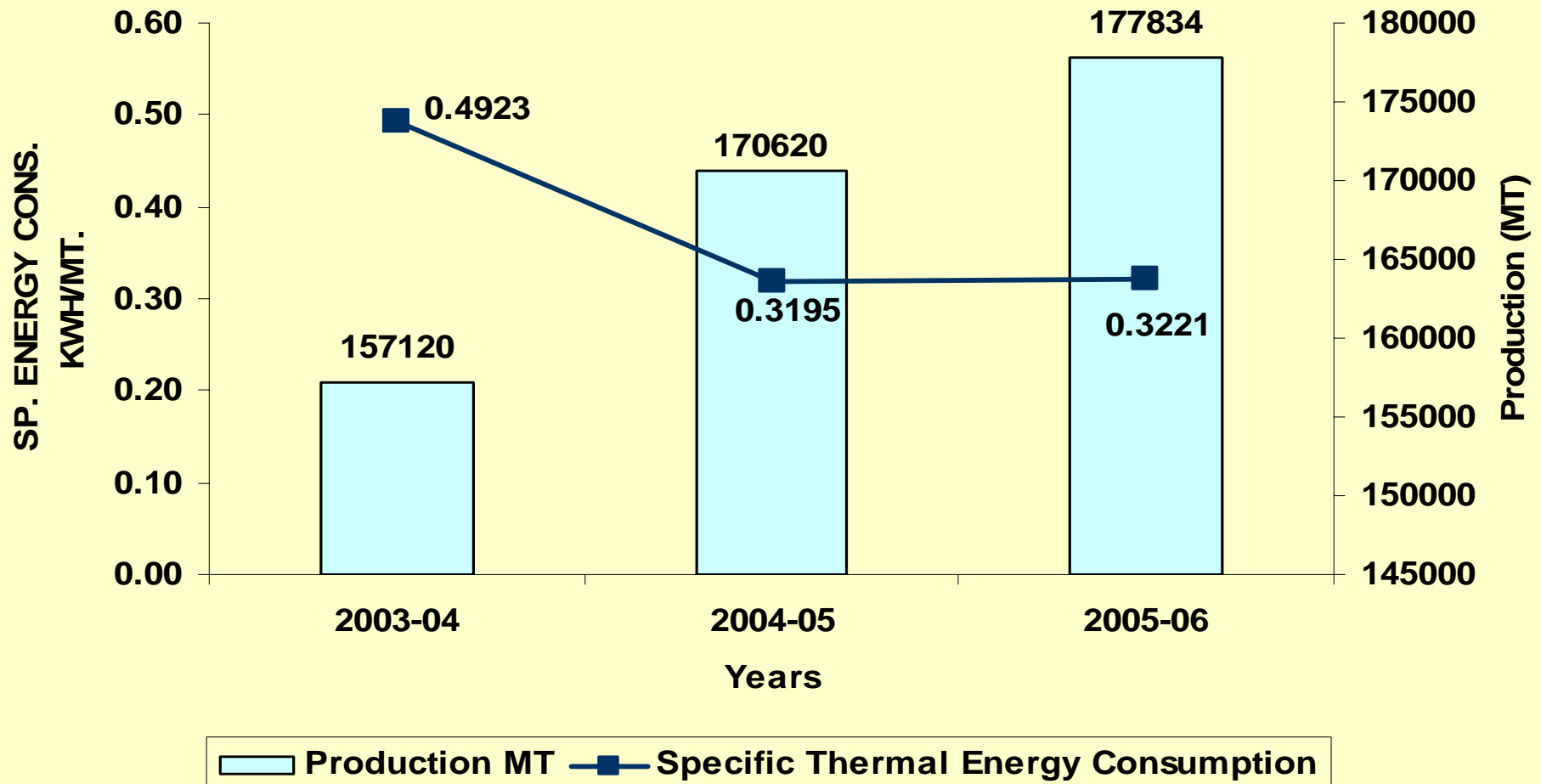
## Performance Indicators 2005-06

- **Specific Energy Consumption - Baroda**
- **Specific Thermal Energy Consumption - Baroda**
- **Prod. Vs. Energy Cost as % of Mfg. Cost - Baroda**
- **H2 Gas used as fuel in CC Units - Baroda**
- **Power Cons. Comparison with Production - Baroda**
- **Specific Power Consumption Comparison - Dahej**
- **Sp. Aux. Energy Cons. Kwh / MT - Dahej**
- **H2 Gas utilization as fuel - Dahej**
- **Energy Consumption Lakh Kwh per Year - Dahej**
- **Manufacturing Cost Vs Energy Cost - Dahej**

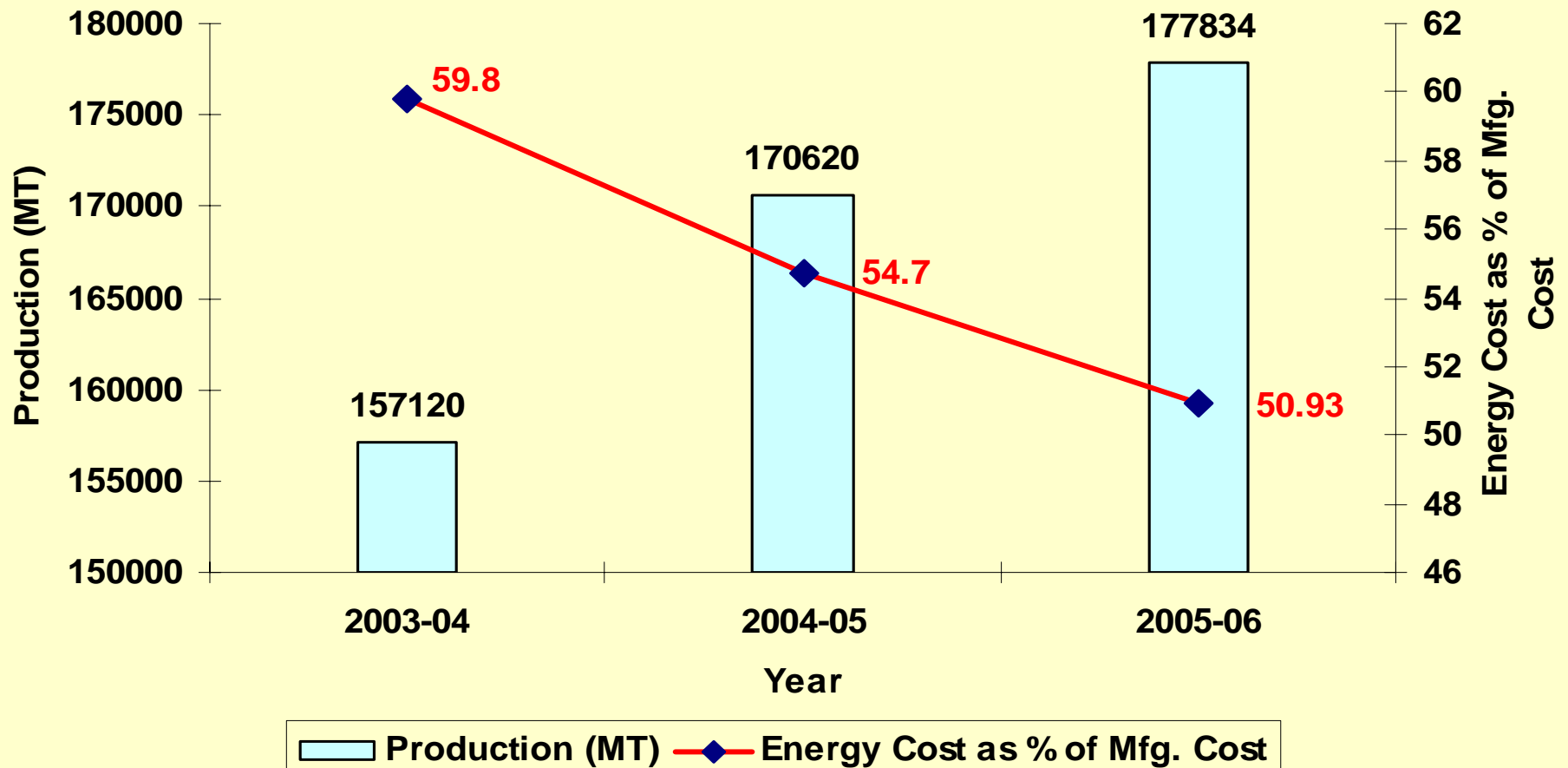
# Specific Energy Consumption - Baroda



# Specific Thermal Energy Consumption - Baroda



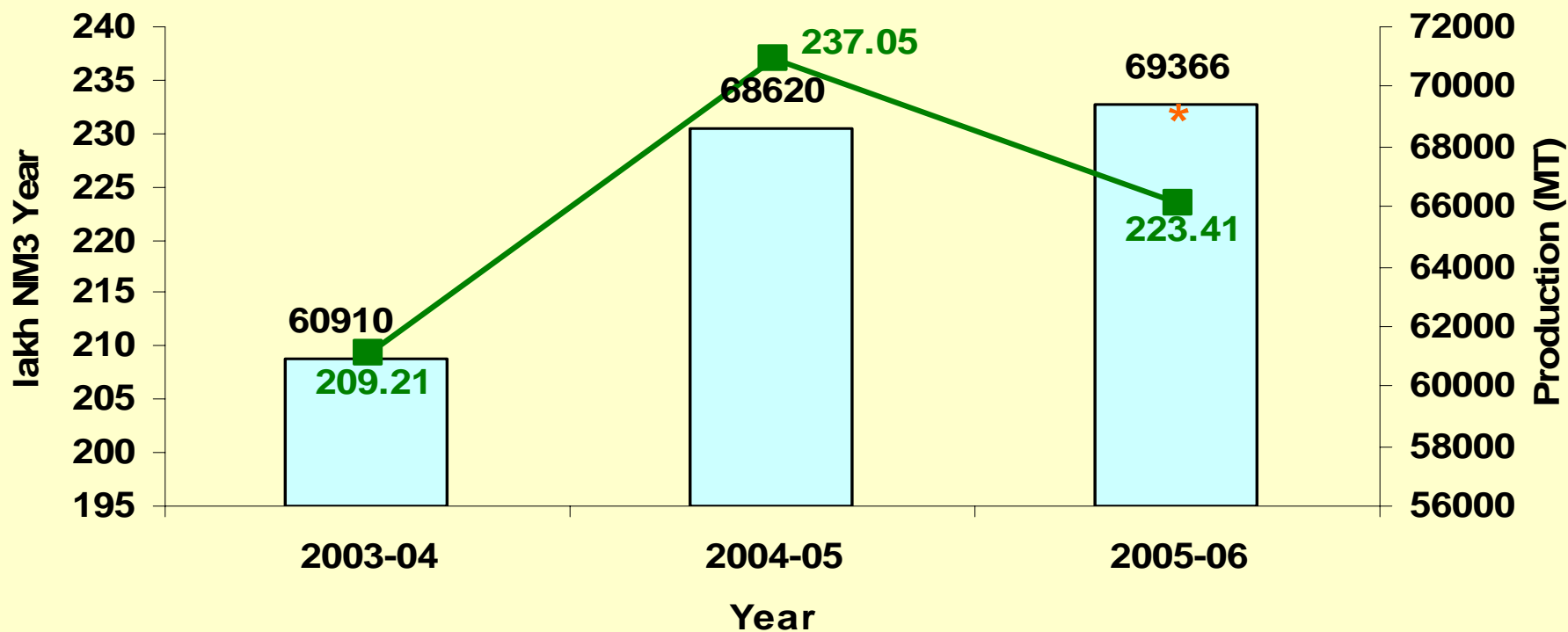
# Production Vs. Energy Cost as % of Mfg. Cost - Baroda



## Co-Product H<sub>2</sub> Gas utilization as fuel - Baroda

Particulars	Unit	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
(1)H <sub>2</sub> gas generated	NM <sup>3</sup>	38991400	39435000	38893600	41456400	42515600	46253600	48284880
(2)H <sub>2</sub> gas used as fuel	NM <sup>3</sup>	17171812	19844605	18293180	19101320	20920635	23705255	22341113
in C/S Flaking Units	%	<b>44</b>	<b>50</b>	<b>47</b>	<b>46</b>	<b>49</b>	<b>51</b>	<b>46</b>
(3)H <sub>2</sub> gas used for	NM <sup>3</sup>	8231565	7341320	7981915	8751880	9639990	10243980	12680985
manufacturing of HCl	%	<b>21</b>	<b>19</b>	<b>21</b>	<b>21</b>	<b>23</b>	<b>22</b>	<b>26</b>
(4)H <sub>2</sub> gas used for	NM <sup>3</sup>	8801215	8955988	10351960	10199960	10359560	10223900	9918750
manufacturing of H <sub>2</sub> O <sub>2</sub>	%	<b>23</b>	<b>23</b>	<b>27</b>	<b>25</b>	<b>24</b>	<b>22</b>	<b>21</b>
(5)H <sub>2</sub> gas supplied in	NM <sup>3</sup>	1891151	1730967	1235551	1267181	1176967	1278955	1539175
Cylin.& Thro.Pipe Line	%	5	4	3	3	3	3	3
<b>Total % Utilisation</b>	<b>%</b>	<b>92.57</b>	<b>96.04</b>	<b>97.35</b>	<b>94.85</b>	<b>99.02</b>	<b>98.27</b>	<b>96.26</b>

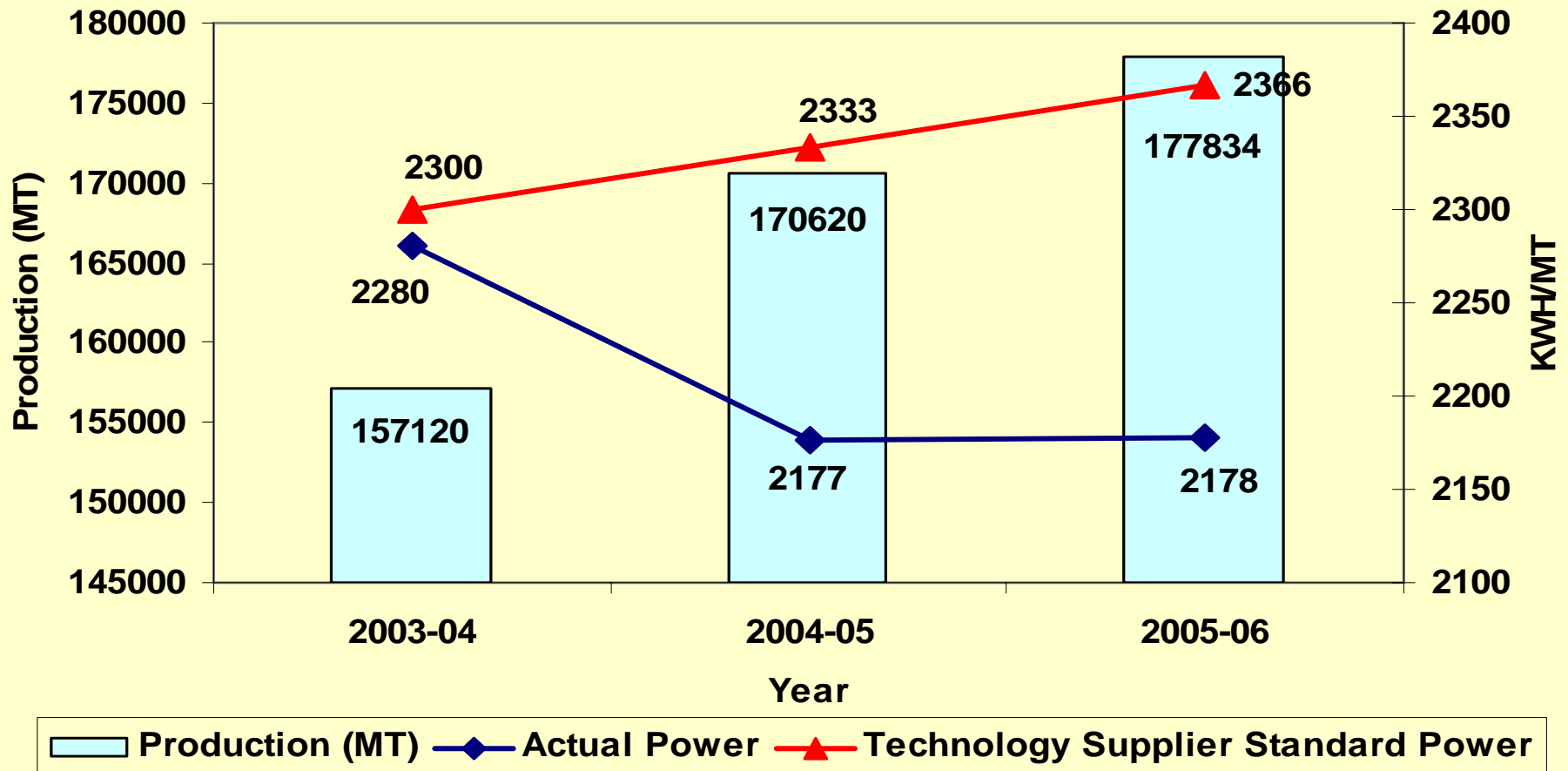
# Co-Product H2 Gas used as fuel in Caustic Conc. Units - Baroda



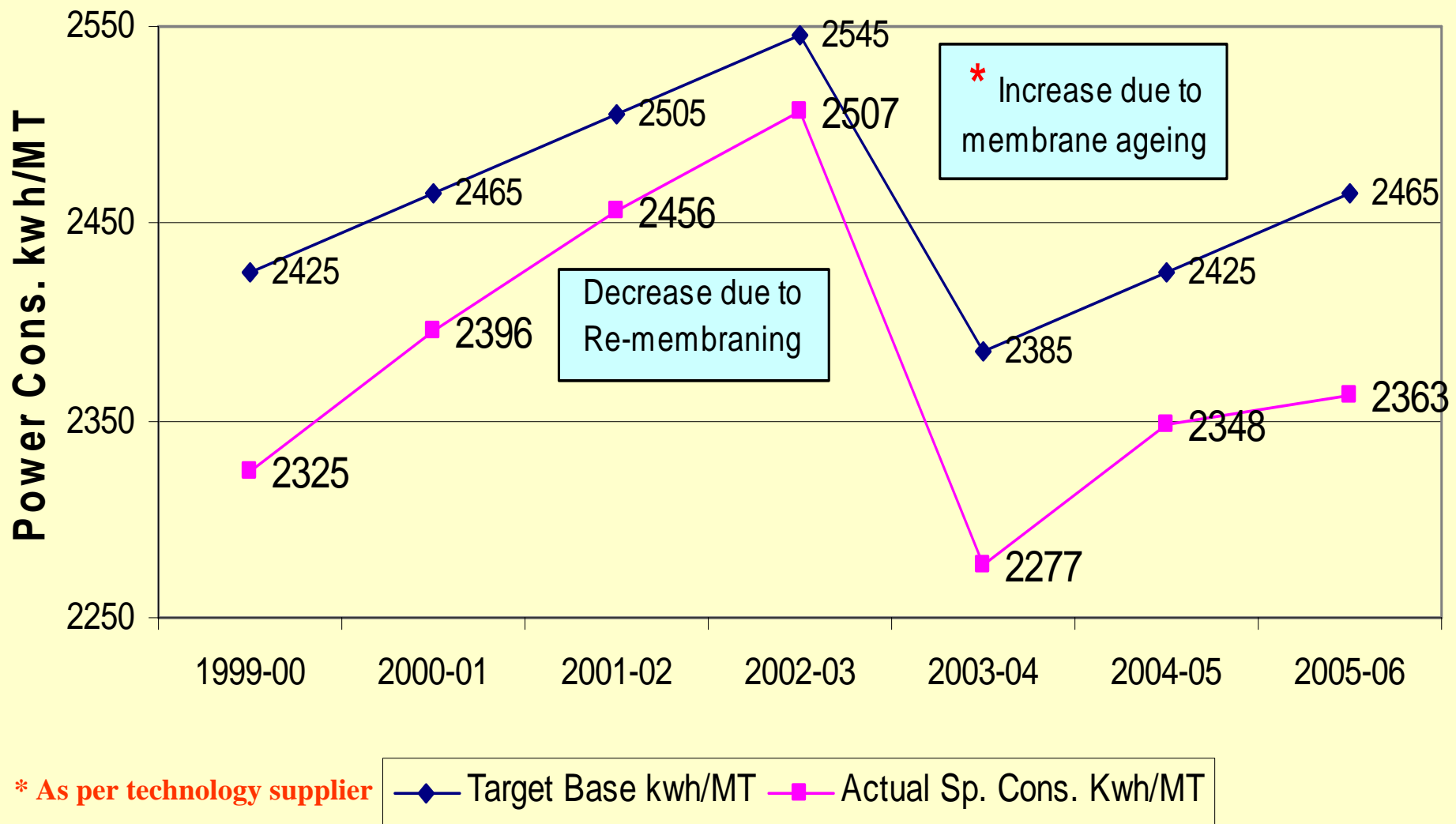
Caustic Soda / Potash Flakes (Production) —■— H2 Gas used as fuel in CC Units

\* Hydrogen Consumption is reduced eventhough production is high as moisture removed from H2

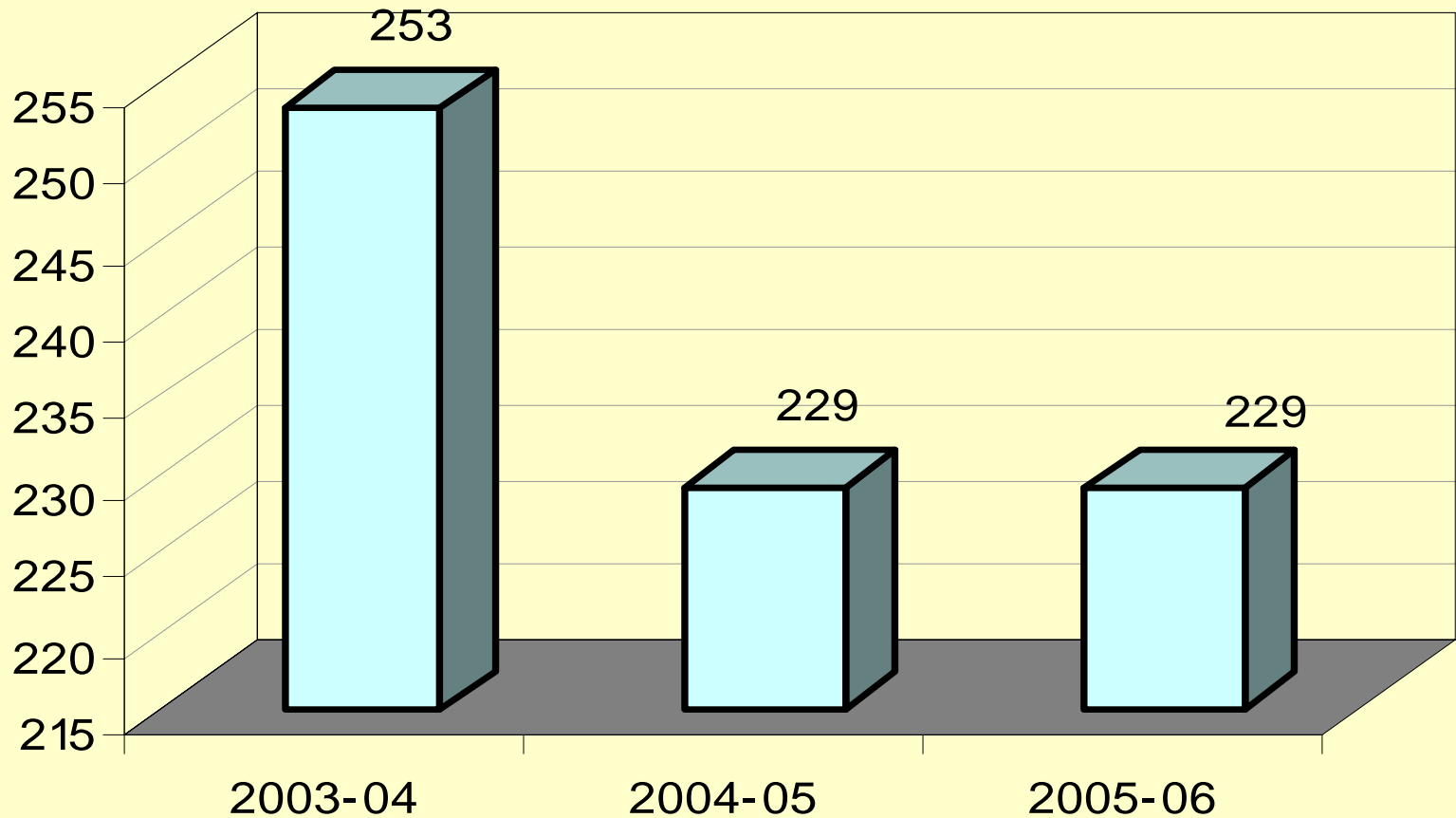
# Power Consumption Comparison with Production - Baroda



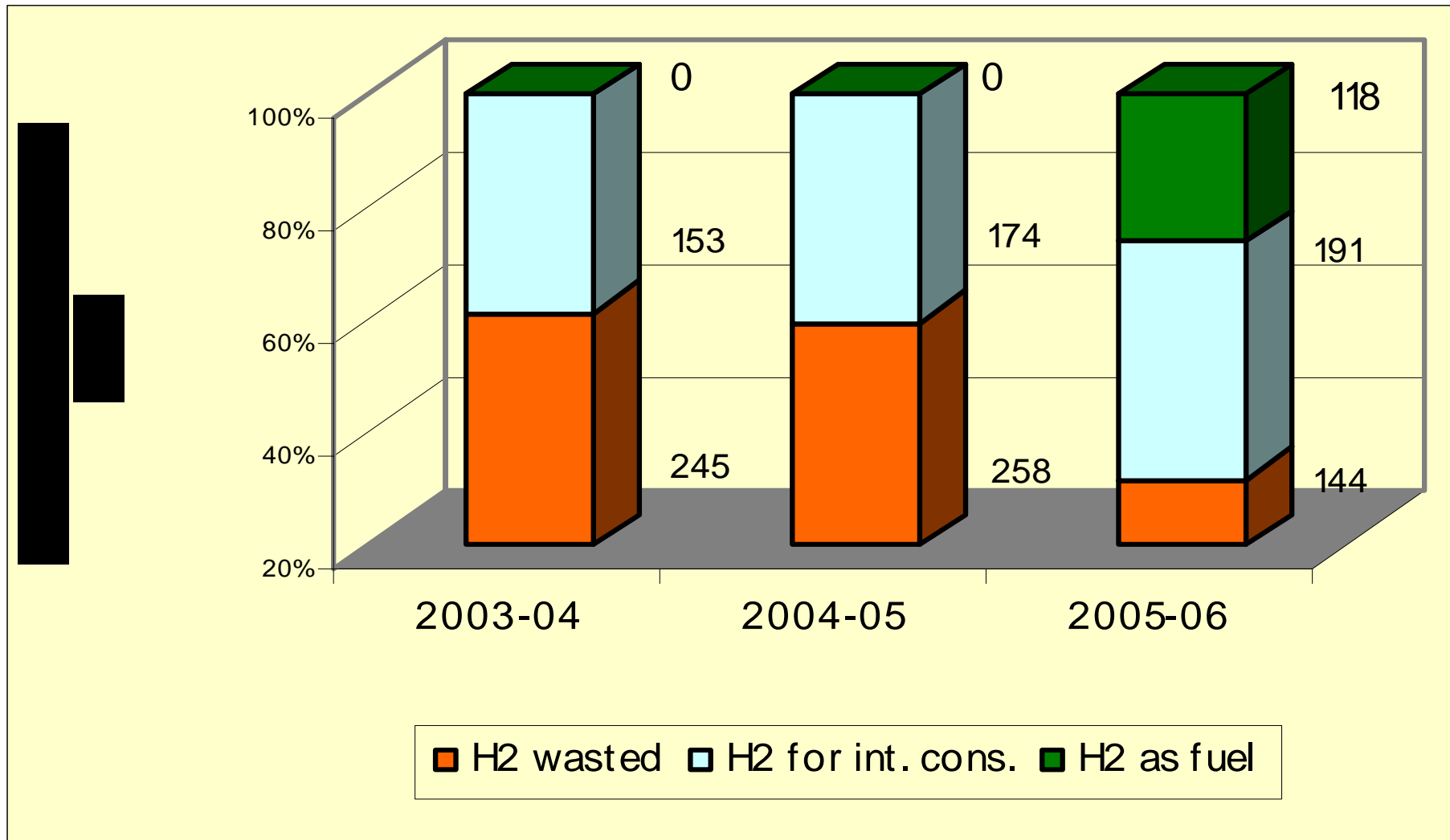
# Specific Power Consumption Comparison - Dahej



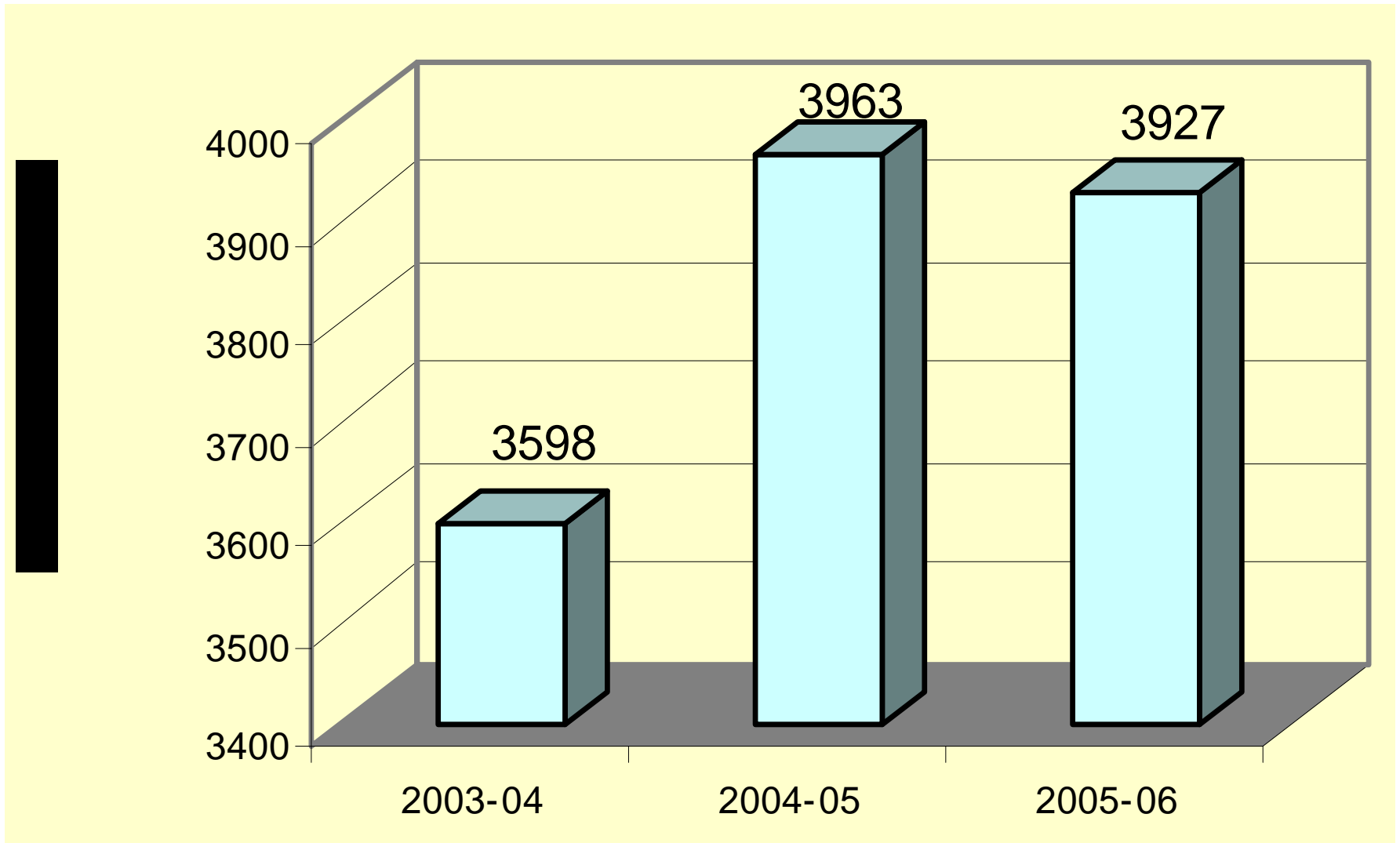
# Sp. Aux. Energy Cons. Kwh / MT - Dahej



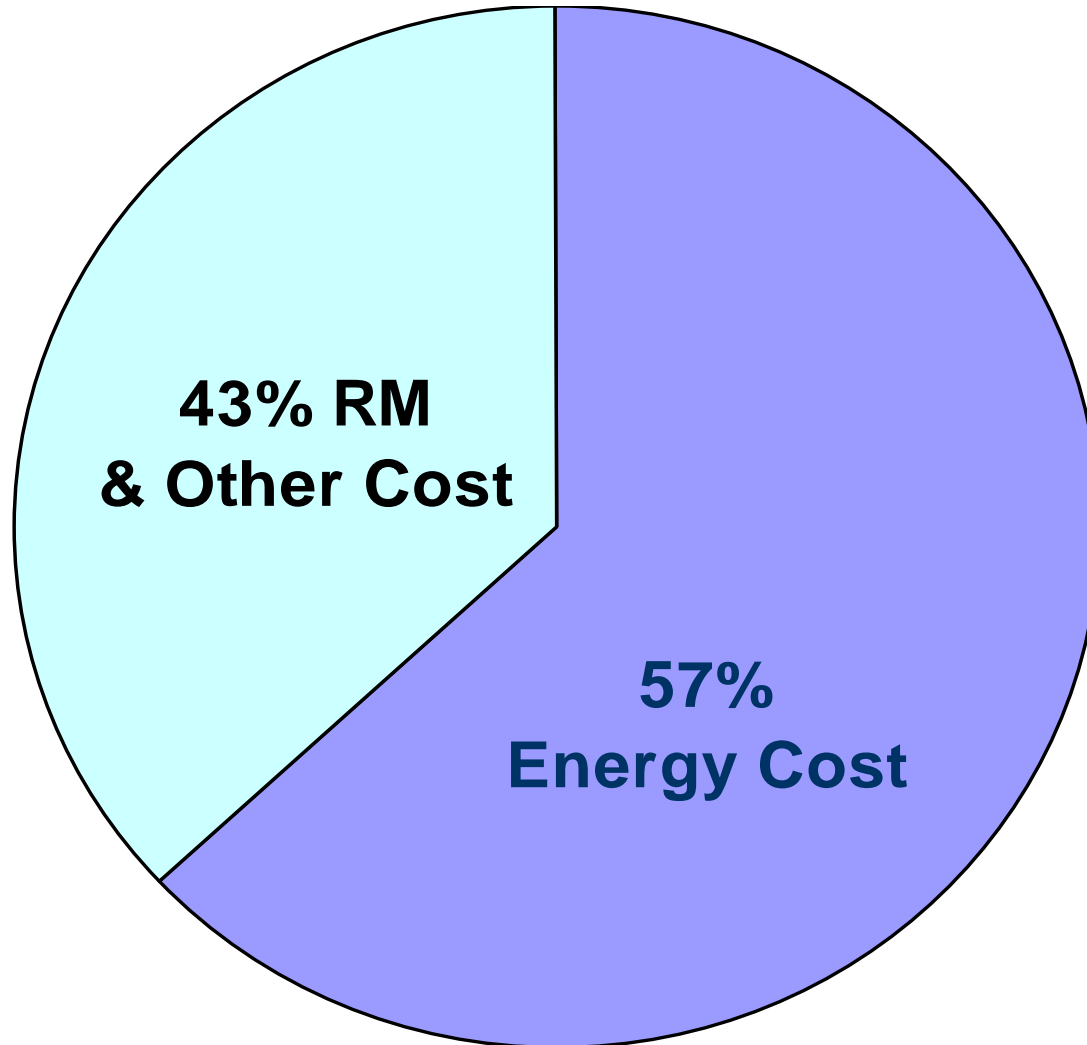
# Co-Product H2 Gas utilization as fuel - Dahej



# Energy Consumption (Lakh kWh per Year) - Dahej



# Manufacturing Cost Vs Energy Cost at Corporate level



# GACL : Commitment

