

## MADRAS CEMENTS LTD., Alathiyur

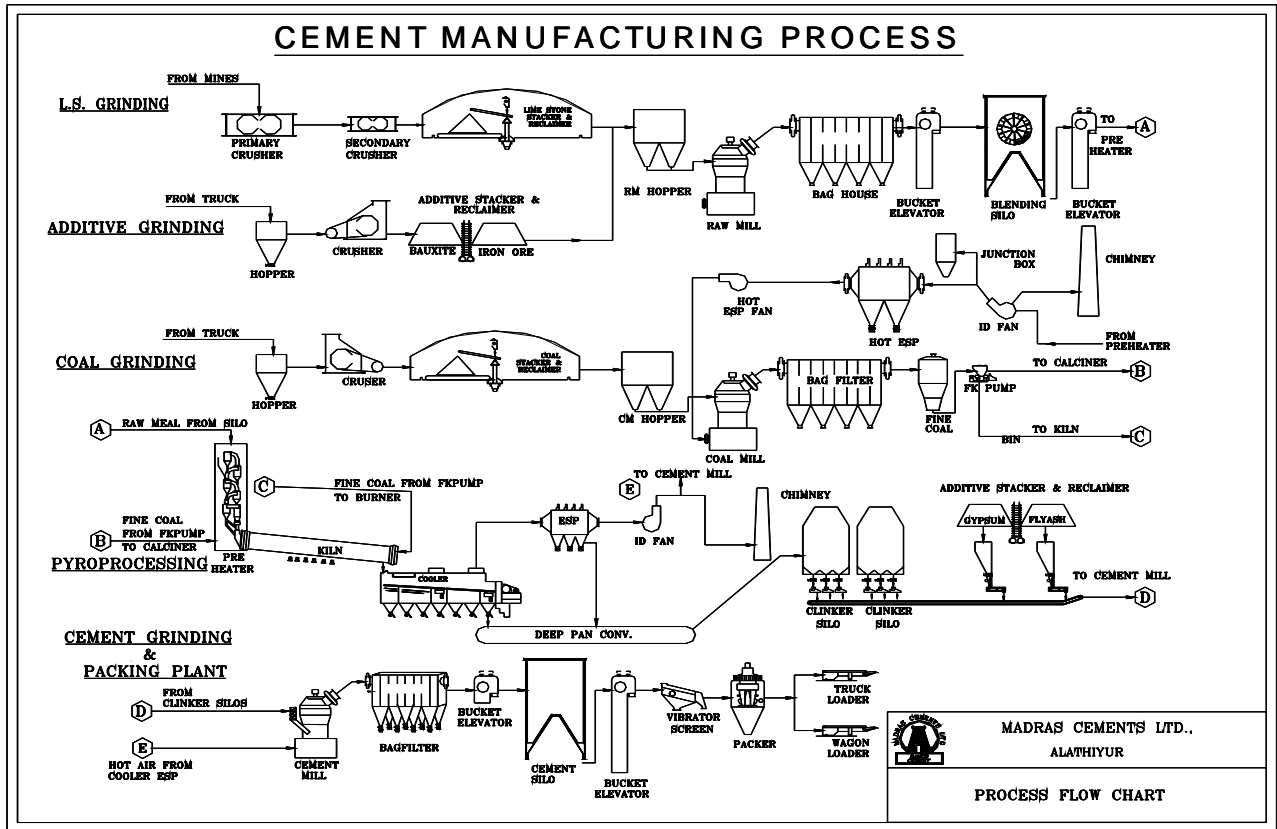
### Unit Profile

- The manufacturing unit at Alathiyur near Trichy were set up in two phases. The Line I has the designed capacity of 2200 TPD commissioned in the year 1997. Which was upgraded to 2950 TPD in the year 1999 and again upgraded to 3300 TPD in the year 2004. The Line II was designed for capacity of 3000 TPD, which comprises the South Asia's first SF Cross Bar cooler and largest Vertical Roller Mill for clinker grinding and commissioned in the year 2001 and upgraded to 3300 TPD in the year 2004. This is one of the very few energy efficient plants in the world and it is very friendly to ecology and environment.

Plant has the State-of-the-Art Technology and equipment at every stage of production. Surface miners for mining, Energy efficient MMD crusher for limestone, Vertical roller mills for Raw materials and Clinker grinding.

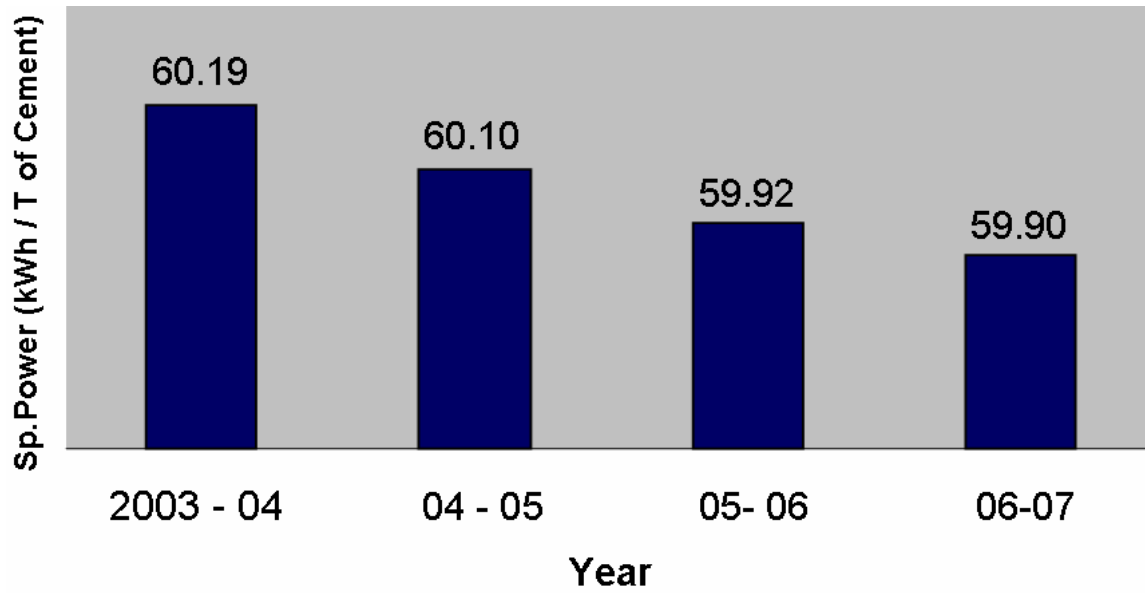
- Madras Cements always believes in sustainable approaches for specific power and energy cost reduction. Already energy independent with largest wind mills with a capacity of **33 M.W** at 2 locations in Tamilnadu. Company has spent around **Rs.96 Crores** for installation of **2 X 18 M.W** Coal based Power plant to reduce the power cost and to save **Rs.1.5 / Kwh**.
- There is 20 MW (6MW \* 2 & 4 MW \* 2) captive power generation, which will meet 75 % of Plant Power demand.
- **2 X 18 M.W** Coal based Power plant was installed to reduce the power cost.
- Operating efficiency of the equipment in each section in the plant range from 100 to 115 % of installed capacity.
- The plant is ISO 9001 ,ISO 14001 & OSHAS 18001 systems certified.

# Annexure - I

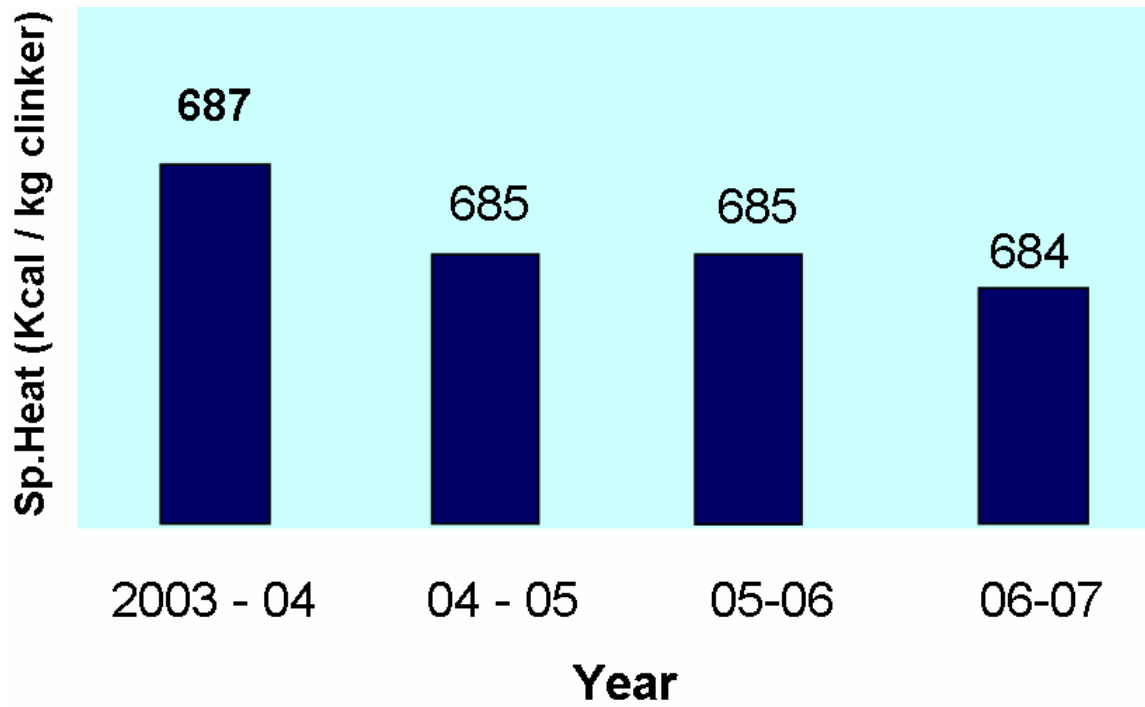


## Annexure – II

### Reduction in Sp. Power Consumption from 2003 – 2007



### Reduction in Sp. Heat Consumption from 2003 – 2007



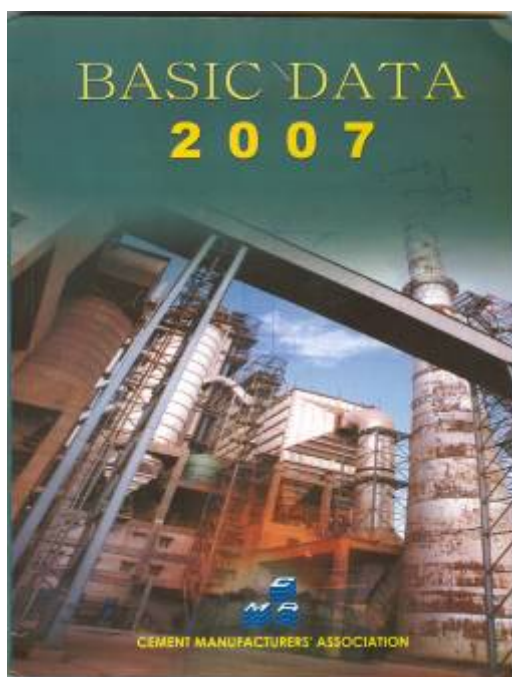
### Annexure - III

#### Comparison with National and International Benchmarks

	National	Inter-national	MCL
Specific Energy Consumption Thermal Kcal/Kg Clinker	734	730	684
Specific Energy Consumption Electrical Kwh/T of Cement	84	101	59.90

SOURCE :

National - BASIC DATA 2007 – PUBLISHED BY CMA



Inter-national - WHITEHOPPLEMAN BENCHMARKING REPORT 2004

## Annexure – IV

### Energy Conservation Commitment Policy & Setup

Top most priority has been given for implementing energy conservation ideas and proposals to conserve energy not only for the benefit of the organization, but also to conserve natural resources for the betterment of future generations. This goal is achieved by the energy conservation team headed by energy manager with the support of top management and managers to identify, monitor, control, implement the proposals.

#### Levels of Management

#### Responsibility

Vice President – Works	}	Long term plans	
Vice President – Admn.		Targets setting	
	}	Objects & Support, Review of Results, Cost control, Budget and Reward / Appreciate the achievements.	
Sr.Managers – Maintenance		}	Plan, Do, Check, Act, Brain Storming, Quality circles, Energy management report, Payback analysis
Managers – Maintenance			
Dy.Managers – Maintenance			
Sr.Engineers - Maintenance	}	Implementation of Energy Products, Reporting, Brain storming, Quality circles, Suggestion schemes.	
Engineers - Maintenance			
Supervisors - Maintenance			
Workman - Maintenance			
Sr.Engineers – Production	}	Execution, Production Optimal production, Maintaining optimal Parameters.	
Officers – Production			
Workman - Production			

## Annexure – V

### List of Energy Conservation Projects implemented during 2004 – 2007

Sl No	Title of Energy Saving project implemented	Year of Implementation	Annual Electrical Savings achieved		Annual thermal savings		Total Savings	Investment Made	Payback Months
			Units Million	Rs Million	Tons of Coal or Oil	Rs Million	Rs Million	Rs Million	Rs Million
1	Coal Conveying line Optimization at Kiln-II	04-05	0.0792	0.277	0	0	0.277	0.02	0.1
2	Pre heater cyclone modification at Kiln – I	04-05	0.7425	2.599	0	0	2.599	1	0.4
3	Provide software interlock to stop the dedusting fan whenever feeding conveyor stops	04-05	0.016	0.056	0	0	0.056	0	0.0
4	Provided dampers in the inlet of dust collector fans in packer to control the suction whenever the packer operates with single discharge	04-05	0.125	0.439	0	0	0.439	0	0.0
5	Changed 100 nos of fittings from 80 Watts HPMV lamp to 50 Watts MH lamp at Packing plant	04-05	0.0131	0.045	0	0	0.045	0.12	2.7
6	Godrej ControlAir for compressed air system at Flyash handling	04-05	0.1353	0.4736	0	0	0.4736	0.69	1.5
7	Modification of inlet box in Line -II Prehaeter fan	04-05	0.18	0.63	0	0	0.63	0.07	0.1
8	Nozzle ring modification & Grit cone extension at Coal mill	04-05	0.546	1.913	0	0	1.913	0.05	0.0
9	Classifier blades modified from Flat to Curved at Both raw mills	04-05	1.296	4.536	0	0	4.536	1.5	0.3
10	Raw mill inlet duct modification at Line -I	04-05	0	0	784	2.89	2.89	0.05	0.0
11	2 X 18 M.W Coal based power plant to reduce the energy cost	04-05	0	110	0	0	110	950	8.6
12	Replacement of high efficiency I.D.Fan in Line-1	05-06	0.432	1.512	0	0	1.512	1.6	1.1

13	Replacement of high efficiency Vent.Fan in Line-1	05-06	0.0594	0.2079	0	0	0.2079	0.5	2.4
14	Introduction of Delta Tube in Cement Mill - II	05-06	0.0749	0.2622	0	0	0.2622	0.04	0.2
15	Installation of Power Boss for variable load applications such as conveyors & Elevators to reduce power	05-06	0.0168	0.0588	0	0	0.0588	0.21	3.6
16	Stopping of bag filter fan in Line II kiln	05-06	0.075	0.2625	0	0	0.2625	0.014	0.1
17	Optimization of extraction blowers.	05-06	0.048	0.1680	0	0	0.1680	0.016	0.1
18	Installation of Power Boss for variable load applications such as conveyors & Elevators to reduce power	06-07	0.0168	0.0588	0	0	0.0588	0.21	3.6
19	Stopping of bag filter fan in Line I Raw Mill	06-07	0.0934	0.3269	0	0	0.3269	0.15	0.5
20	Modification of inlet box in Line -II Raw Mill fan	06-07	0.396	1.3860	0	0	1.3860	0.016	0.0
21	Separate HG/LG hoppers for Limestone to avoid variation in Limestone quality.	06-07	0	0.0000	312	1.12	0.0000	0	0.0
22	Changed 10 nos of fittings from 250 Watts lamp to 120 Watts at Entrance	06-07	0.01139	0.0399	0	0	0.0399	0.073	1.8

**Summary :**

**projects implemented : 22 Nos.**

**Total investment for the projects : 956.33 Rs in Million**

**Total savings after implementation : 128.14 Rs in Million**

## Annexure – VI

### Innovative Project

#### 1. Inlet Box Modification of Raw Mill Fan

Inlet suction box modification .

#### Modifications

1. Inlet box re-engineered
2. Inlet cone gap adjusted

**Result : Power saving around 150 K.W per hour**

	Units	Before Modification	After Modification
Flow	m3/hr	324500	331250
Fan Power	KW	1370	1220
Savings	Kw/ Hr	150	

**Power Savings = 150 KW/Hr**

**Total Savings = 150 X 24 hours X 120 Days X Rs.3.5**  
**= Rs.1.51 Million / Annum**

## Annexure – VII

### **Ultimate Target, Objectives & Strategies to sustain benchmarks**

The company always believes in continuous up date of technology to improve the productivity and hence reduction in power and fuel consumption. The target being

**Electrical Energy : 56.0 Kwh / T of Cement**

**Thermal Energy : 675 Kcal / Kg of Clinker**

### **Energy Conservation Measures taken up**

1. Modification of inlet box in Line - II Raw Mill fan and savings in power by 150 KW/ hr.
2. Stopped one bag filter fan in Line - I Raw Mill
3. Changed 10 nos of fittings from 250 Watts lamp to 120 Watts at Entrance
4. Installation of Power Boss for variable load applications such as conveyors & Elevators to reduce power.
5. Two of our executives have become Energy managers accredited by BEE and they are responsible for identifying and implementing ENCON projects and also to create awareness and to train the employees.

## **To achieve the Desired targets**

The following energy conservation projects under progress to achieve the desired targets and for sustenance

1. Raw mill classifier re-configuration to improve the productivity.
2. SPRS for cement mill fan Line – II to save power by 0.70 KWH/ MT of Cement.
3. Separate High grade & Low grade limestone feeding system, to enhance uniform quality of limestone and thus improve the productivity of kiln.
4. Variable frequency drives for FD Fan, Cooling water pumps and boiler feed water pumps to reduce auxiliary power consumption of power plant by 1 %.

## **Annexure - VIII**

### **Resource Utilization**

Our organization has taken various initiatives for Resources Conservation ,minimizations And Effective utilizations at various levels.

Some of salient features are :

1. Implemented the powerful ERP(Entrepreneurs Resource Planning) system,which helps us in planning at each levels.
2. Pet coke a refinery waste enables us to use our low grade limestone ( $\text{SiO}_2$  – 16 to 20 %) about 2.0 Lac tones / Annum, which indeed extends the life of our mines.
3. Power plant waste Fly ash is being used for blended cements.
4. Waste oil generated from our heavy equipments at Mines is being reused in our conveying equipments (Drag Chains) at our LSS (Limestone storage shed,Coal storage shed and Additive storage shed)
5. Our colony generated Sewage is treated in the STP(Sewage treatment plant) and recycled to our colony for gardening purposes.
6. Bio waste fuels such as cashew shell,Ground nut shell is being used as alternative fuels.
7. Waste tyres and cut piece rubber which pollute the atmosphere while disposal is fired in our kiln.
8. Commissioning of Power plant eliminates the usage of Gensets for power generation thereby consumption of Furnace oil and Diesel are nil.
9. Energy Managers accredited by BEE.

## **Annexure – IX**

### **Role of Energy Manager**

1. Study and implementation of suggestions from the suggestion schemes.
2. Quantification of fixed and variable energy consumption trends vis-à-vis production levels
3. Creating awareness of Energy Conservation and motivating to develop ideas on ENCON.
4. Identification of best practices (based on the external benchmarking data)
5. Conducting energy conservation audits, through internal and external auditors and implementing the audit findings in time.
6. Impart training to Field staff on energy conservation and Environmental improvement activities.
7. Preparation of Management reports and submission to Top Management.

## **Annexure - X**

### **Environmental Improvements**

Clean environment is one of the major objectives of the organization. The plant is an ISO – 14001 and OSHAS 18001 Company . The emission levels speaks of the eco & enviro-friendly environment in the plant, the following measures were taken to prevent and control pollution.

#### **At Plant & Mines:**

1. Green belt development in Plant and Mines.
  
2. Development of bituminous roads in and around the plant and mines, to suppress fugitive emission. Limestone from the pit is transported to crusher by means of dumpers. These vehicles are maintained leak-proof, not overloaded to avoid spillage from the vehicle. Water Sprinkling system were adopted to prevent dust generation from roads.
  
3. Rain water harvesting in both the plant and mines are carried out, so as to conserve the available water resources.
  
4. Output of the water treatment plant used for the plantation purposes in the Plant and in the mines.
  
5. Transportation of limestone to plant is done through closed belt conveyors of 3 km distance. Thereby avoiding usage of heavy vehicles and its fuel, spillages and fugitive emissions coming out from the vehicles. Also ensures safety by avoiding heavy traffic in the mines.

6. Installed Reverse air Bag house for venting Raw mill and kiln, Bag filter for coal mill and Cement mill and ESP for cooler venting gases.

7. All the material transfer points were connected to Unit bag filters.

8. The dust let - off in the stacks are well below the prescribed limits.

The results of test conducted by the TNPCB is given below:

<b>Stack</b>	<b>TNPCB Norms (Mg/N Cu.m)</b>	<b>Actual results (13.2.2007) (Mg/N Cu.m)</b>	<b>Equipment</b>
<b>Raw mill</b>	<b>100</b>	<b>21</b>	<b>Baghouse</b>
<b>Coal mill</b>	<b>100</b>	<b>32</b>	<b>Bag filter</b>
<b>Cooler</b>	<b>100</b>	<b>17</b>	<b>ESP</b>
<b>Cement Mill</b>	<b>100</b>	<b>28</b>	<b>Bag Filter</b>
<b>Power Plant</b>	<b>100</b>	<b>32</b>	<b>ESP</b>

Madras Cements has the following arrangements for achieving zero accident in plant.

- a. Employees should wear safety shoes and helmets in the plant.
- b. The plant has safety & fire protection equipments.
- c. Safety audits are conducted by (Internal) safety committee members.
- d. An external auditor inspects the plant for safety measures implemented in the plant and report for improvements.
- e. A hospital is arranged in colony to meet any emergencies.
- f. Safety interlocks provided for each equipment in the computerized plant operating system. Which ensures accident free operation in the plant.
- g. **OHSAS 18001:2000** Safety Management system certified by BIS.
- h. **ISO 9001:2000, ISO 14001:2004** systems certified by BIS.