

KIRLOSKAR COPELAND LIMITED, Karad - Atit

Unit Profile –

Kirloskar Copeland Limited is a joint venture between Kirloskar Brothers Limited, India's leading engineering company and Copeland Corporation of the USA, the world leader in air-conditioning and refrigeration compressors.

1. The company is into in-house development of air-conditioning and refrigeration compressors, having manufacturing unit at Karad & Atit in Maharashtra.
2. Its sales turnover exceeds over 50 million US Dollars.
3. KCL is a leader in hermetic compressor market in India having over 40% share of RAC market, over 55% share of commercial Refrigeration market & over 65% share of Commercial Air Conditioner market.

KCL is working with a vision to **“Be the most preferred supplier to the Air conditioning & Refrigeration customers in India & Middle East”**. In order to fulfill this vision, KCL has embarked upon with set of objectives like

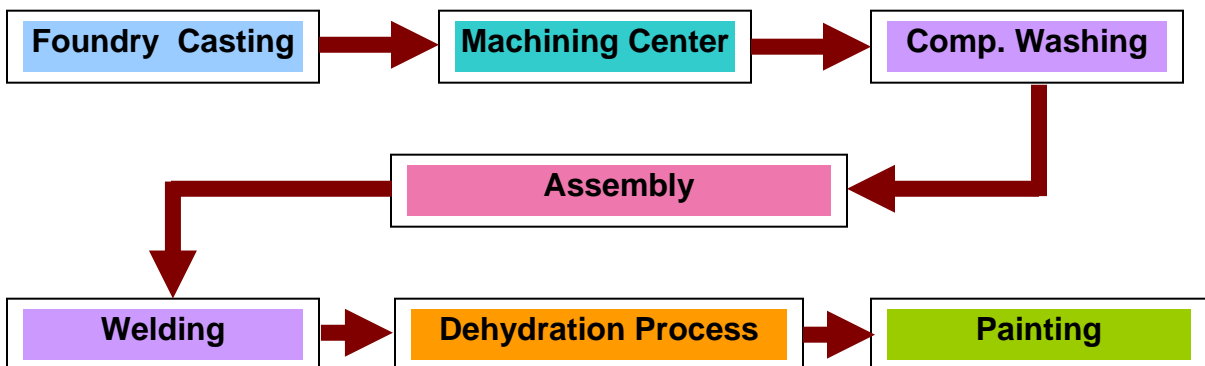
- ❖ Providing proactive response to customer needs & expectations.
- ❖ Achieving excellence in quality
- ❖ Be cost effective to compete in Global markets.
- ❖ Develop innovative & energy efficient products.
- ❖ Implement effective & efficient systems to meet delivery commitments at all the times.

Explore continuously new market opportunities & develop into profitable business.

At the companies research and development facilities, a team of scientist and engineers sharing global know how and having access to state of art infrastructure and equipment are shaping the compressor of tomorrow, relentlessly and silently - two traits that are also common in the working of all its compressors.

At its two state of art plants, team of manufacturing & quality professionals are building the compressors to meet every application

Process Flow Chart

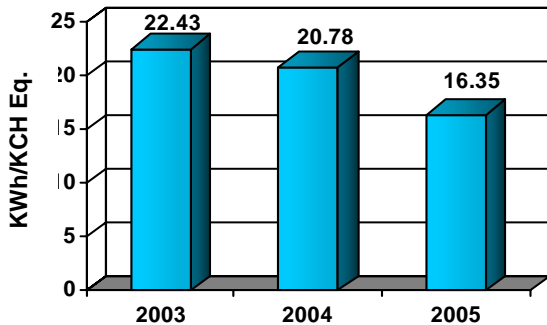


Energy Consumption

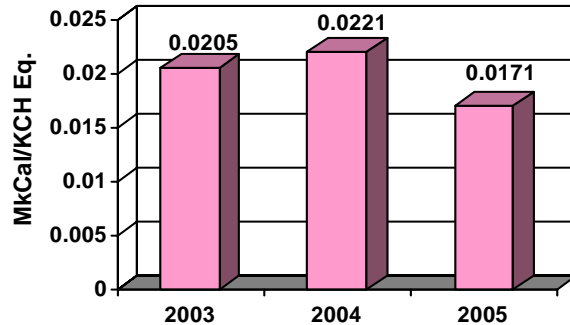
Description	Unit	2002-2003	2003-2004	2004-2005
Annual Production per KCH Eq.	Nos.	401406	411955	597426
Total Electrical Energy consumption/annum	Lakhs kWh	90.03	85.59	97.65
Specific Energy Consumption – Electrical	KWh/KCH Eq.	22.43	20.78	16.35
Total Thermal Consumption/annum	Million kCal	8242.85	9106.68	10205.67
Specific Energy Consumption - Thermal	MkCal/KCH Eq.	0.0205	0.0221	0.0171

Year	Electricity		Thermal (Fuel)	
	KWh/ KCH Eq.	% reduction over 2002-2003	MkCal/KCH Eq.	% reduction over 2002-2003
2002 - 2003	22.43	-	0.0205	-
2003 - 2004	20.78	7.35%	0.0221	(7.80)%
2004 - 2005	16.35	27.10%	0.0171	16.58%

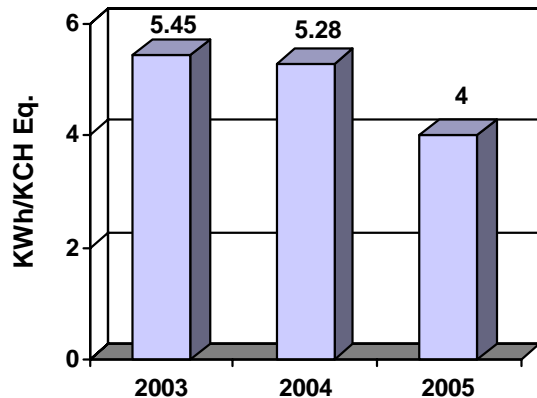
Electrical Consumption



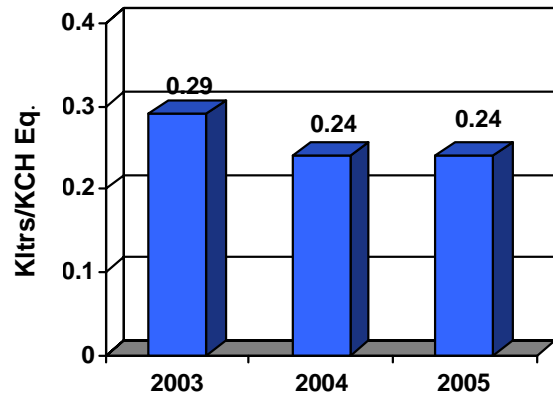
Thermal Consumption



Compressed Air Consumption



Water Consumption



Energy Conservation Commitment Policy and Set Up

KCL has developed the culture of reviewing all processes by RKQP model (Ravi Kirloskar Quality Prize). This model has derived from CII-EXIM BANK Business Excellence model. KCL has set 14 programs as Key Business processes. Cost reduction is one of the main Key Business process in which Energy Cost reduction is major sub process.

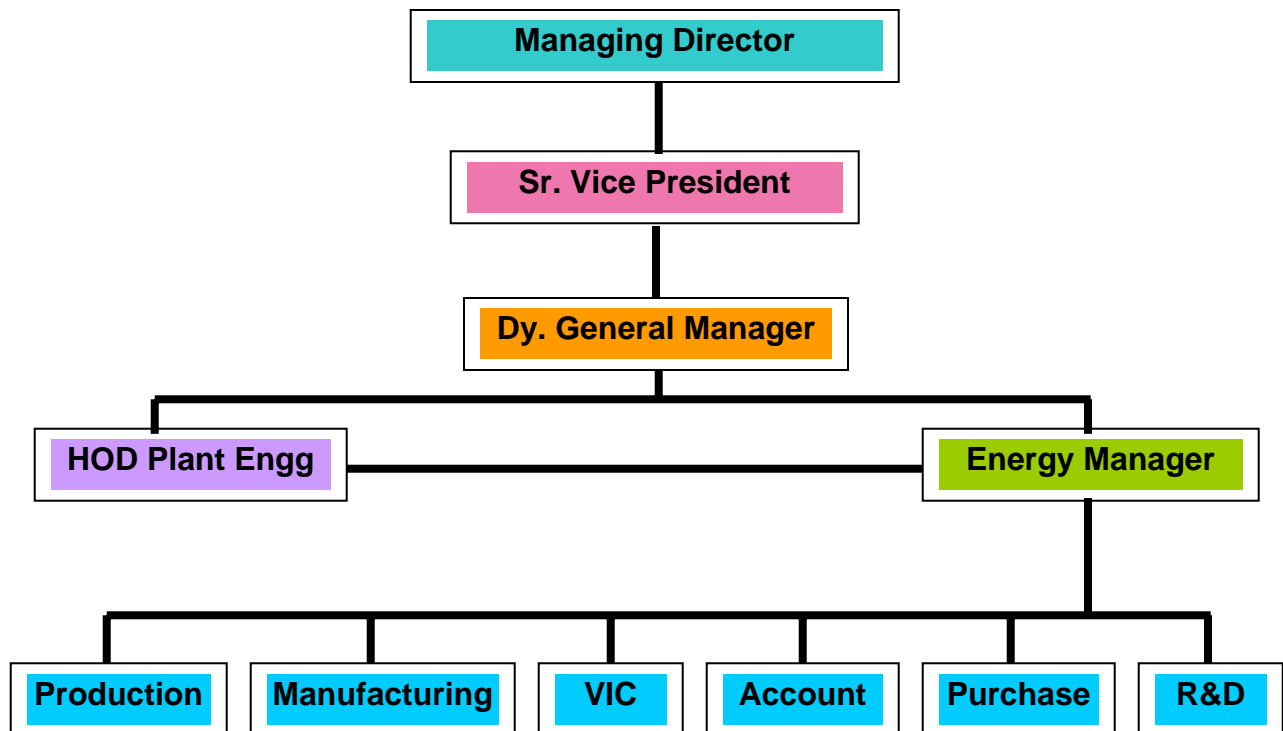
At the beginning of the financial year, according to business forecast & planning, all projects are reviewed by Top Management & targets are set a annual basis. Individual teams then does SWOT analysis (Strengths, Weakness, Opportunities & Threats) and prepare action plan.

In Energy Management activity a dedicated team of 24 members from various functional department is involved. This activity is lead by BEE certified Energy Managers,

Over the period KCL has developed a Encon culture at all level to reduce specific energy consumption per unit, bring improvement in process & imbibed a Encon culture in society by the way of

- ❖ Minimizing Waste
- ❖ Using energy efficient processes and equipment
- ❖ Conducting periodic energy efficiency improvement studies and implementing improvement measures.
- ❖ Involvement of employees of all levels in the energy conservation efforts
- ❖ Effective dissemination of information
- ❖ Establishing norms and initiating programmes to reach these norms
- ❖ Promotion of non-conventional energy usage

ENERGY CONSERVATION CELL STRUCTURE



*Cross Functional Department team members

Energy Conservation Achievements

During the period 2004-2005, Kirloskar Copeland has implemented 53 Nos energy saving proposals through Engineering initiatives, workmen's suggestions scheme, internal audits and Total Productive Maintenance methodology resulting into total saving Rs 96.60 Lakhs. This has resulted in to a reduction of 27.10% in specific electrical energy consumption and 16.58% in specific thermal energy consumption over 2002-2003. In water conservation also the unit has reduced the consumption by 17.24%

This Encon activity initiated in 1989 and is in force for last 15 years and added a savings into companies profit Rs 520.40 Lakhs

As well as, we have been short listed for National Award for Excellence in Energy Conservation and Management for the year 2005.

Energy Conservation Projects Implemented During The Year 2004-2005

1, Indirect Solar Water Heating System for Ultrasonic Crankshaft Washer

Before –

Electrical heating,
Electrical Consumption 62155 kWh,
Loss of productivity

After –

Converted Electrical heating to solar heating
Energy Saving – 21600 kWh (sun hrs only)
Productivity improved, taking hot water for top up the tanks

Investment – Rs 5.50 Lakhs

Saving – Rs 0.734 Lakhs

SPP – 90 Months



2. Recover Waste Heat From Exhaust of the Burner-Off Zone and use it to generate steam for utilization of Bluing Zone.

Before –

Electrical steam generator used for steam generation,
Electrical consumption 15 kWh/day

After –

Steam generated from waste heat exhaust burn-off zone,
No Electrical consumption,

Investment – Rs 4.40 Lakhs

Saving – Rs 4.59 Lakhs

SPP – 11 Months



3. Replaced Constant Frequency Motor-Generator Drives by Static Frequency Converter.

Before –

Motor- Generator set used for constant freq.
Supply to testing purpose.
High Mechanical and Drive losses

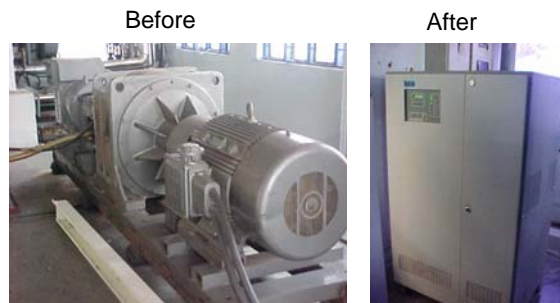
After –

MG set replaced by Static frequency Converter.
Mechanical and Drive losses eliminated.

Investment – Rs 3.50 Lakhs

Saving – Rs 1.86 Lakhs

SPP – 24 Months



4. Use Heat Recovery Unit for 300CFM Air Compressor for Elimination of Electrical Heaters

Before –

Generated heat dumped in to the atmosphere.

After –



Heat recovered through WHR unit and generate hot water @ 55°C used for washing section.

Investment – Rs 0.50 Lakhs
Saving – Rs 1.46 Lakhs
SPP – 4 Months

5. Paint Baking Oven Painted by Heat Repellant Paint

Before –

Oven wall heat losses was more.
Oven Skin temperature was 49°C

After –

Painted oven by high emissivity heat repellant paint.
Reduced wall heat losses of oven.
Oven skin temperature reduced by 8°C

Investment – Rs 1.10 Lakhs
Saving – Rs 0.50 Lakhs
SPP – 26Months



6. Variable Frequency Drive for 300 CFM Low Pressure Air Compressor.

Before –

At 3rd shift 300 VFM compressor was catering the load,
Actual requirement was 200 CFM,
Low capacity compressor was not available & new
compressor cost was high,
Loading – 4.5 Hrs, Unloading – 3.5 Hrs,

After –

Compressor Capacity controlled by VFD & Pressure
controller

No unloading,

Power consumption reduced by 76kWh/day

Investment – Rs 2.49 Lakhs
Saving – Rs 0.884 Lakhs
SPP – 34 Months



Other Encon Projects Implemented During 2004-2005

No of Projects implemented 55 Nos,

Installation of waste heat recovery units on Paint baking Oven, Thermic Fluid Heating System Exhaust.

Installation of Variable Frequency Drive for Variable Load.

Reduction of Fixed Energy by installation of Energy Efficient Tubes, FRP Fan Blades, Human Motion sensors, Stabilizer for street lighting etc.

Making Process Better and Better and Energy Efficient.

Waste Identification and Elimination like under loaded motor connected in Star, Use of cooling tower waster in place of Chiller.

Adopt new technologies for Energy conservation like Fan less cooling tower, Heat repellant Paint, Energy Efficient Air guns, Static Freq. Converters Etc.

3rd Party Wind Power Purchase by 20 Paise less than MSDC kWh

Avail the Maximum benefits by maintaining a Power factor Unity.

Benefits from Super Express Feeder.

Encon Kaizens scheme added a additional benefits in Total Encon Benefits,

No. of Encon Kaizens Implemented - 12 Nos

Energy Conservation Plan and Targets

<i>Program</i>	<i>Target</i>	<i>Projects</i>	<i>Target Taken</i>	
			<i>From</i>	<i>To</i>
Energy Cost Reduction	From Rs 85/KCH Eq. to Rs 80/KCH Eq.	Reduction of Variable	11 kWh	9.87 kWh
		Reduction of Fixed Energy	6.35 kWh	4.39 kWh
		Reduction of Fuel	0.0171 MkCal	0.0145 MkCal

KIRLOSKAR COPELAND LIMITED

ENERGY POLICY

Achieving optimum use of energy in our operations and bringing about improvements in the energy efficiency of our processes and products will form an important component of the continuous improvement efforts in our organisations.

We shall strive to reduce energy consumption per unit of value added by :

- Minimising Waste
- Using energy efficient processes and equipment
- Conducting periodic energy efficiency improvement studies and implementing improvement measures
- Involvement of employees of all levels in the energy conservation efforts
- Effective dissemination of information
- Establishing norms and initiating programmes to reach these norms.
- Promotion of non-conventional energy usage.

In achieving these, we shall utilise the knowledge and expertise available from various sources including sister organisations, collaborators and outside experts.

We shall make efforts to bring about continuous improvement in the energy efficiency of our products.



29th May 2003


K. Taranath
Managing Director