

## Company Profile

- Cummins India Limited was established in 1962, in technical and financial collaboration with Cummins Engine Company Inc. USA

2,00,867 engines manufactured till date

More than 1,00,000 engines currently in operation

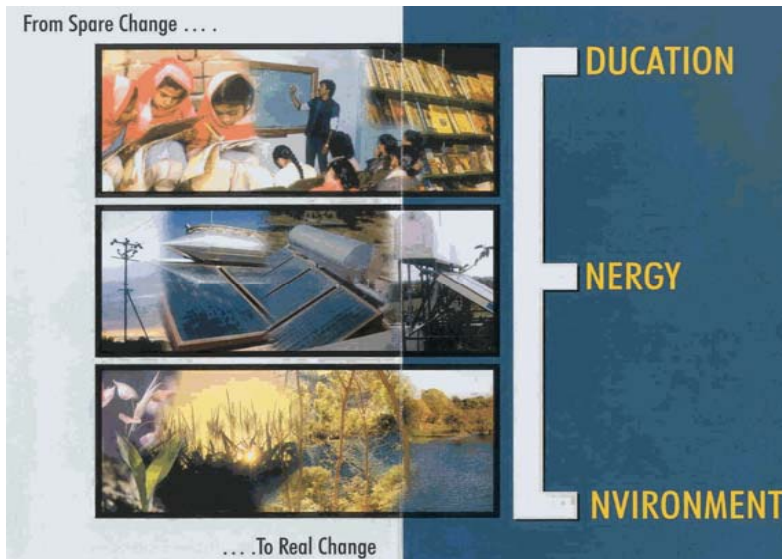
**Think of any application.... you will find Cummins there**



- Agri.
- Auto
- Compressor
- Construction
- Defense
- Marine
- Mining
- Oil & Gas
- Power Gen
- Pump
- Loco.

## ➤ Mission

Demanding that everything we do leads to a clean, healthier and Safer Environment



CIL Campus- With Dense Trees

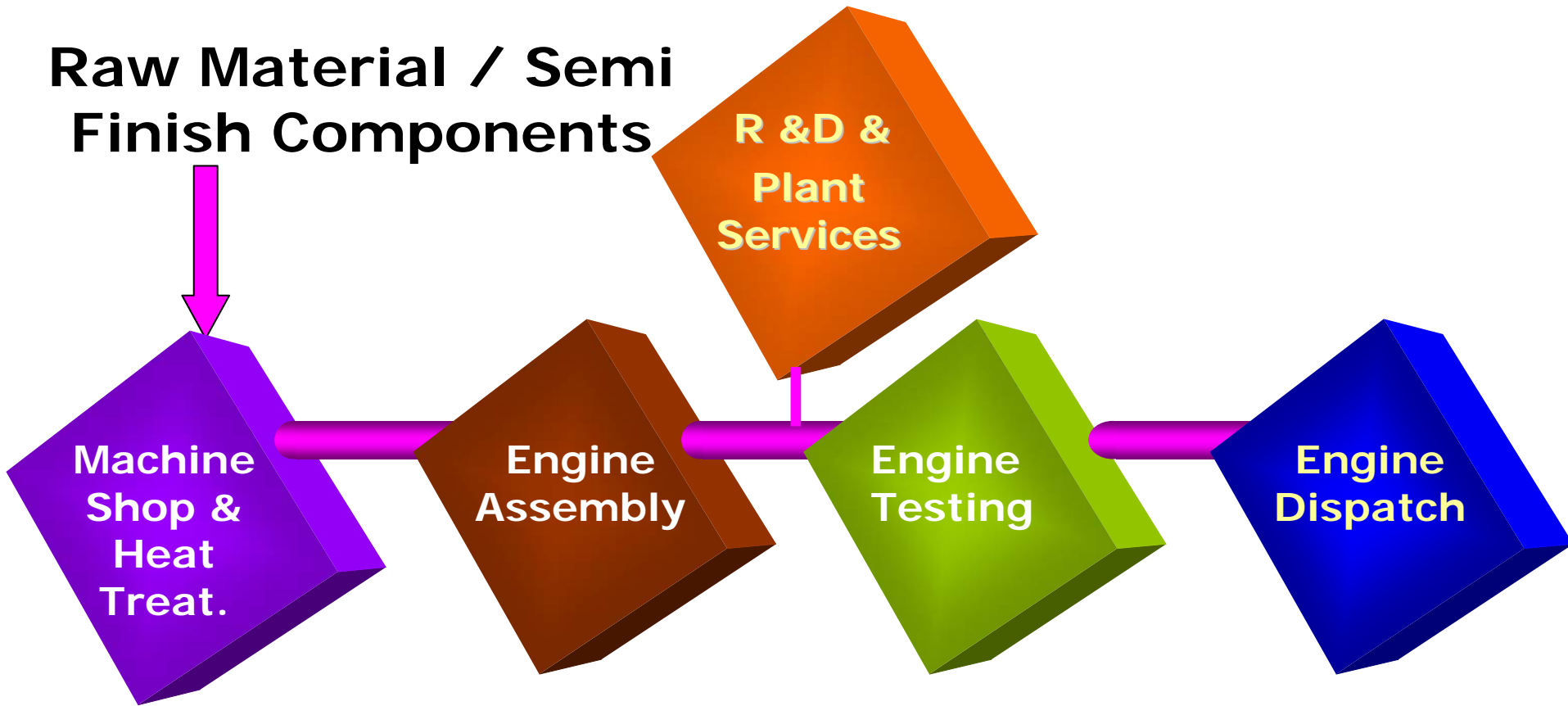


### **Environment:**

Nature and human share a symbiotic relationship. It is therefore our duty to conserve and nature the environment we live in.

For us Energy Conservation Is Energy Generation

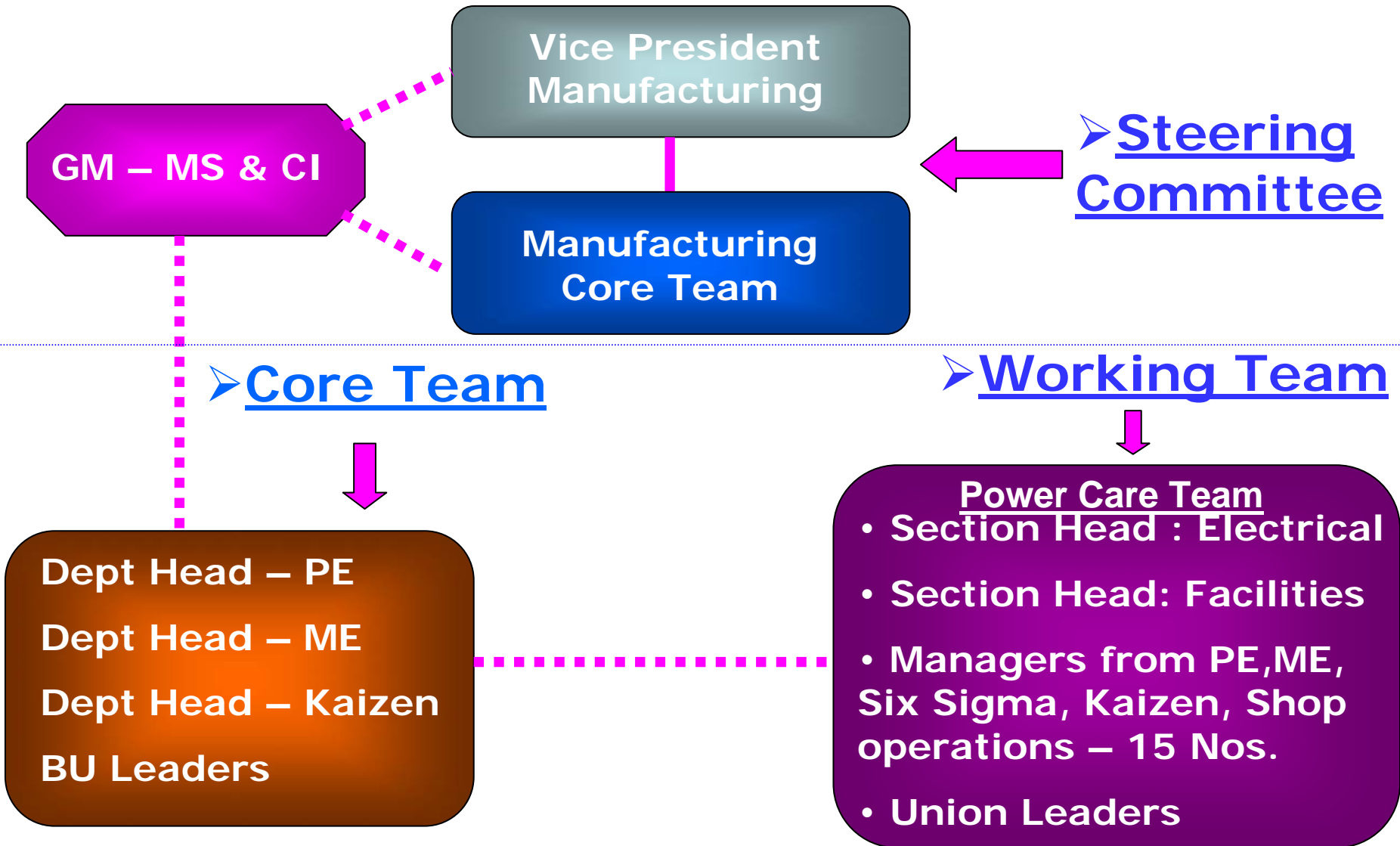
**Raw Material / Semi  
Finish Components**



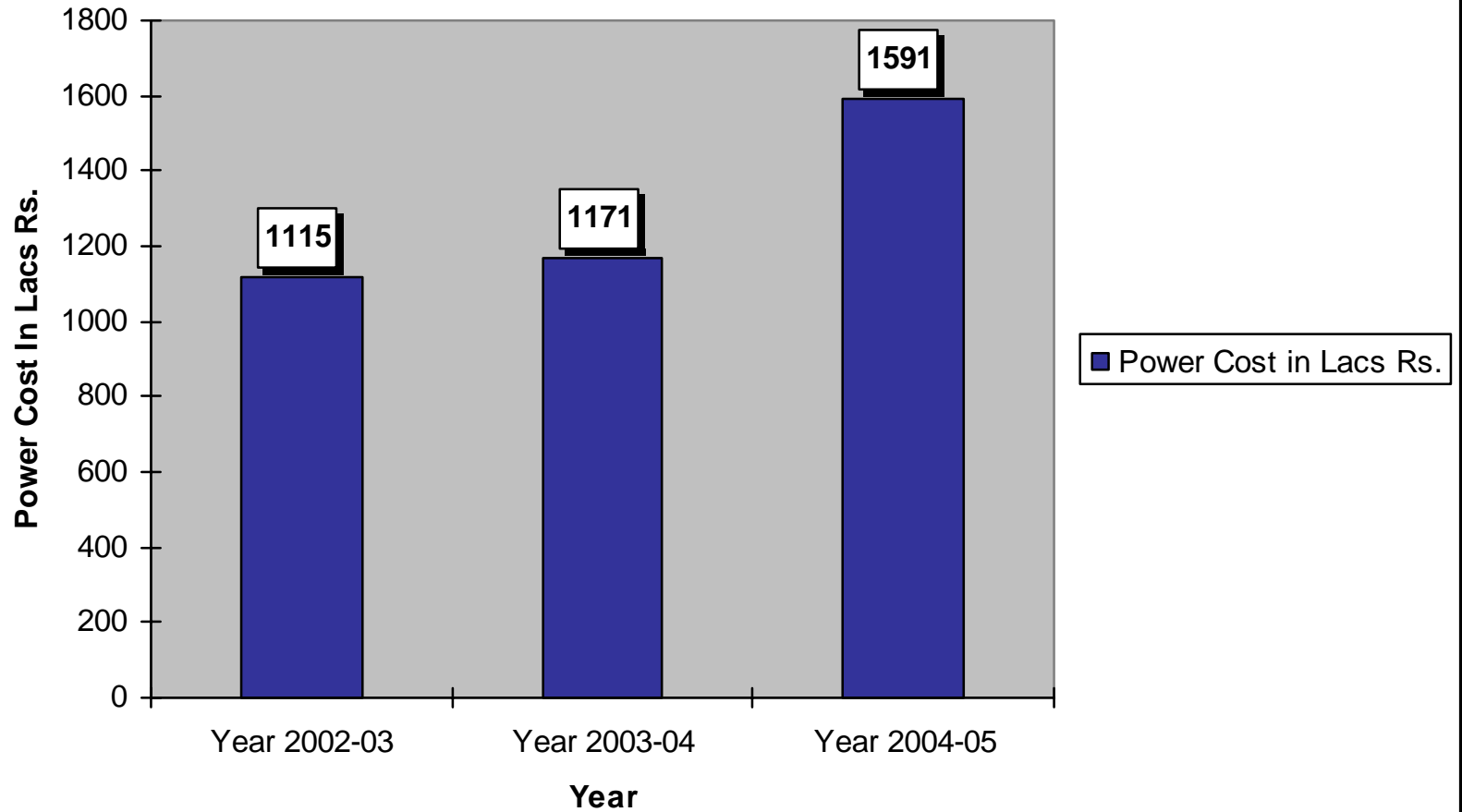
**Energy Input**

➤ **Electrical** : Machines, Furnaces, Utilities

➤ **Thermal** : Diesel, LPG

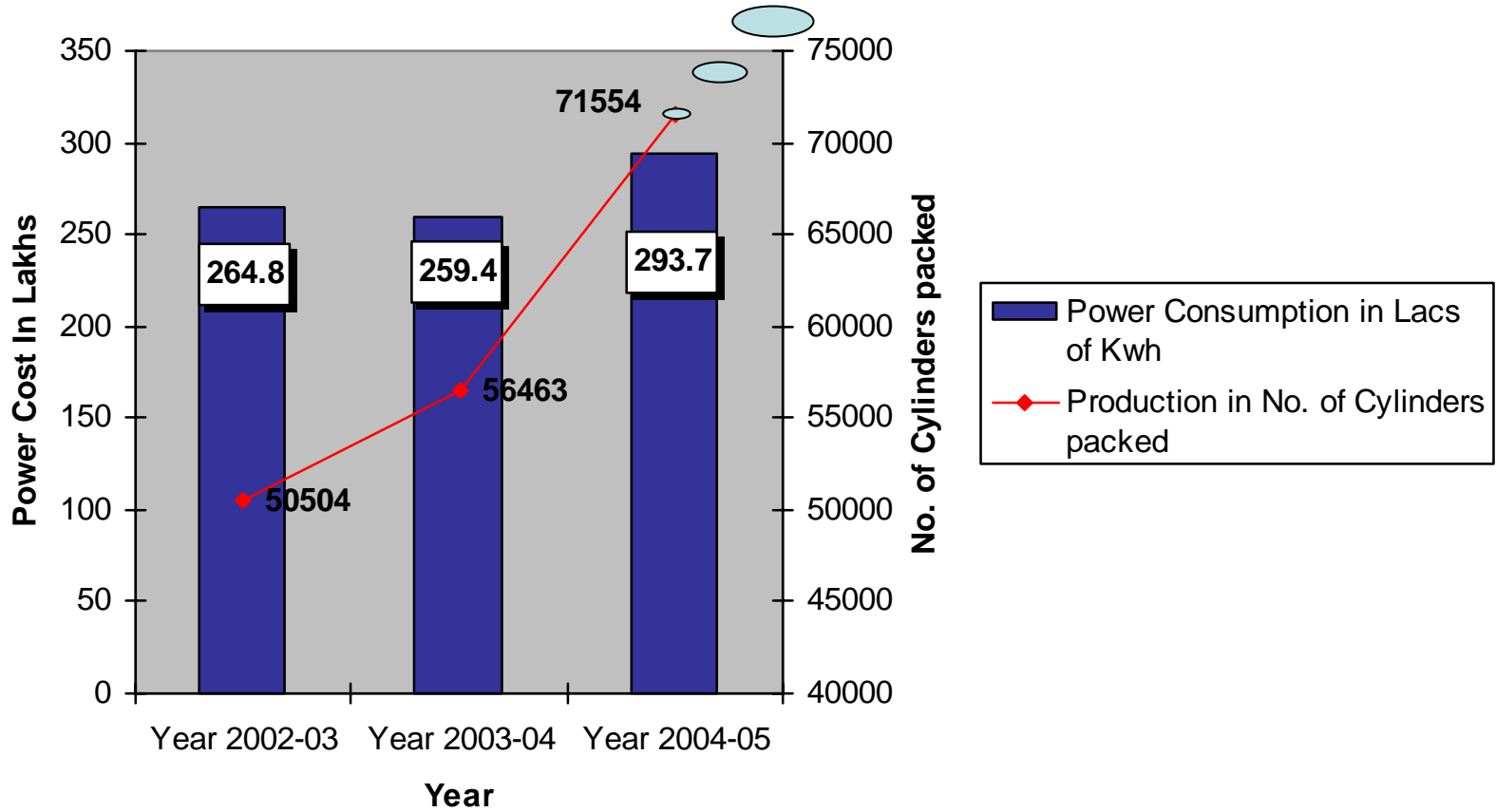


### CIL Energy Cost For Year 2002 to 2005



# CIL Power Consumption

Production rise by 41% compared with year 2002-03

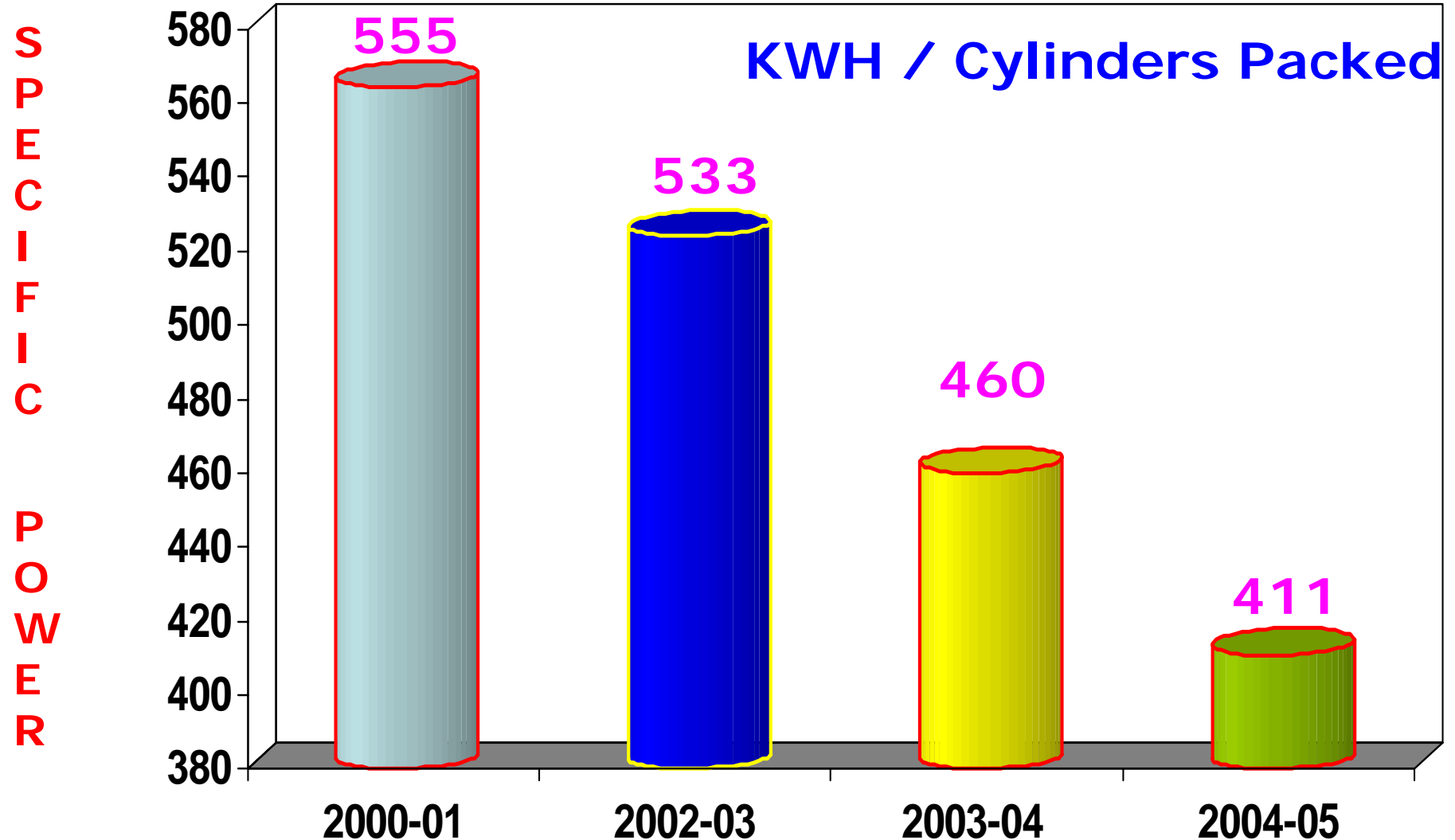




# Excellence in Energy Management

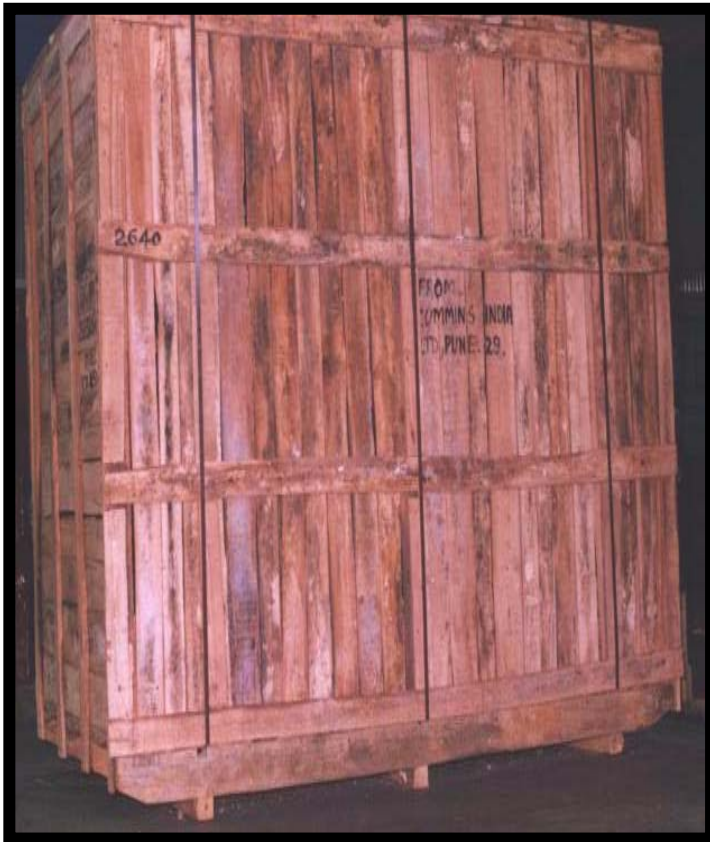


## Reduction in specific energy consumption over Last 3 Years



## ❖ Replaced Wooden Packing with Metal Skids

Before



After



❖ Savings: 5100 Trees / Annum

❖ Saving In Packing Cost

❖ Reduction In Per Day Water Consumption From 1100 KL to 750 KL

❖ Rain Water Harvesting

❖ Tree Plantation

❖ Cyanide Free Company

❖ Nature Club Activity –  
Cummins India  
Foundation- Support



## Cummins India Ltd Kothrud Pune

**Project 1** : Improve Power Generation efficiency of the DG sets from 3.36 to 3.99 Units/Lit.

**Background** : Increasing fuel cost had started affecting the cost of Power generation. In Order to compensate for fuel price it was decided to concentrate on fuel economy of our old Gen-sets ( age between 14 years to 20years). Instead of investing in new engines ,it was decided to utilize existing assets through performance up-gradation. Final focus kept was end customer who will be benefited if we get succeed.

**Observations** :

1. Gen-sets were old age more than 14years hence fuel consumption was more.
2. Varying load pattern with no. of machines more than 800 hence load optimization was needed.
3. We were aiming this improvement with minor investment so that we as well as end customer will be beneficial.

**Technical analysis:**

1. Correct combination of turbocharger & after-cooler were identified so that engine performance gets optimize.
2. Based on the fuel trials, fuel priority has been chosen.
3. Load management system trimmed so as to maintain optimum load on Gen-sets all the time.

**Financials** : Saving of fuel 8,50,000Lit per annum.  
Saving in fuel cost is Rs. 208Lacs per annum.

**Impact of implementation:** : 1. Recurring savings increase with increase in fuel prises.  
2. Better utilization of existing assets.  
3. Beneficial for our end customers.

**Project 2** : Street light 250/150 W SON lamp fittings replaced with 56/36W CFL lamps

**Background** : We were having around 250 street light poles in the plant. In order to reduce power consumption we have modified the fitting with CFL lamps.

**Observations** :

- 1 Lux level of the 250/150w SON and 56/36 w CFL remains same.
2. Running cost of CFL lamp is less than that of SON lamps.

**Technical analysis:**

Basic change made was reflector of the fitting. Also high lux output lamps were used.

**Financials** : Saving are Rs. 4 Lacs per annum..

**Impact of implementation:** : Recurring savings.

**Project 3** : Optimize operation of R & D testing. cooling towers

**Background** : Idea was to operate the cooling towers with 6-8° C of  $\Delta T$  but could not get because of mixing of hot and cold water. We have installed the temperature controllers enables to switch off the cooling towers whenever temp. within limit.

**Observations** : Running time of cooling tower reduced by 30%.

**Technical analysis:** We have installed the temperature controllers enables to switch off the cooling towers whenever temp. within limit.

**Financials** : Saving are Rs. 8 Lacs per annum..

**Impact of implementation:** : Recurring savings.

**Project 4** : Installation of Variable speed drive for R & D pump house

**Background** : Idea was to stop flow of water going through HE of the engine which is not running. We have connected variable speed drive through pressure feedback system and maintained constant 2.5kg pressure.

**Observations** : Power has been reduced by 60%.

**Technical analysis:** We have connected variable speed drive through pressure feedback system and maintained constant 2.5kg pressure which is the requirement.

**Financials** : Saving are Rs. 25 Lacs per annum..

**Impact of implementation:** : Recurring savings.

**Project 5** : Energy saving through toilet occupancy sensors

**Background** : Toilets on shop and office areas were having continues power consumption through lights and exhaust fans. We have installed occupancy sensor which gave us reduced power consumption. Based on the running time of that area, toilet lights are ON.

**Observations** : Big savings came from office areas where people work for 1 shift and lights and exhaust fans were ON for 24hrs.

**Technical analysis:** Offices are working for 1 shift but lights were ON for all 3 shifts. Because of introduction of occupancy sensors working hrs. of light and fan has reduced by 60%

**Financials** : Saving are Rs. 14 Lacs per annum..

**Impact of implementation:** : Recurring savings.

**Project 6** : Energy saving lighting at shop floor.

**Background** : We were having 150 w high bay lamps on our shop. Lux level on shop was also less i.e between 150-200Lux. We have decided to revamp entire lighting system for better illumination as well as less power consumption.

**Observations** : Electronic choke reduces the Power consumption. Also tri-laminated Special reflector gives better reflection. Hence overall lux level improved and power consumption reduced.

**Technical analysis:** T-5 lamps gives better lux out put also electronic ballast reduces power consumption.

**Financials** : Saving are Rs. 7.42 Lacs per annum..

**Impact of implementation:** : Recurring savings.

**Project 7** : Automation of centralize air conditioning plants.

**Background** : We are having 11nos. of centralize air conditioning plants which are located in the radius of 400mtrs. Majority of the plants run for 1 or 2 shifts. Because of the distance plants ON/OFF operation was getting delayed causing power wastage.

**Observations** : On and average all plant starting was taking 45min. Same was the time For stopping of the plant. If we plan a centralize operation, it could save manpower as well as delay in stopping the plant.

**Technical analysis:** PLC controlled system helped in monitoring the air-conditioning Plant for start/stop as well as for parameterize report generation.

**Financials** : Saving are Rs. 10 Lacs per annum..

**Impact of implementation:** : Recurring savings.

**List of Energy Conservation Projects implemented during 2002 – 2004**

SI No:	Title of Energy Saving project implemented	Year of Implementation	Annual Electrical Savings achieved		Annual thermal savings		Total Annual Invest. Made Savings	
			Units Million	Rs Million	Tons of Coal or Oil	Rs Million	Rs Million Savings	Rs Million Investment
1	Improve Power Generation efficiency of the DG sets from 3.36 to 3.99 Units/Lit	2004			766.8	20.88	20.88	0.818
2	Street light 250/150 w SON replaced with 56/36 w CFL lamps phase 3 50 no of fittings replaced	2004-05	0.05	0.4			0.4	0.3
3	Office area a/c units with energy savers Phase 1	2004-05	0.0127	0.07			0.07	0.05
4	R & D pump house 150hp pump with VFD	2004-05	0.3125	2.5			2.5	0.5
5	Cooling tower energy savers	2004-05	0.145	0.8			0.8	0.09
6	Toilet occupancy sensors for controlling tube light and exhaust fan consumption	2004-05	0.127	0.7			0.7	0.5
7	Lighting improvement for Unit-6 areas and heat treatment.( Removal of 150W Highbay lamps & replaced with CFL)	2004-05	0.135	0.742			0.742	0.13
8	Compressed air leakage & wastage	2003-04	0.4	2			2	0.4

	prevention through distribution network shrinkage & modification in machine logic							
9	Automation of 12no. of centralize air conditioning plants with remote monitoring and control	2004	0.2	1			1	1.4
10	Modification of piping layout of R & D test beds( 30years old pipe line replaced)	2003-04	0.22	1.1			1.1	0.3
11	Heat treatment furnace load optimization	2003-04	0.4	2			2	0
12	Street light 250/150 w SON replaced with 56/36 w CFL lamps phase 1 & 2 50 no of fittings replaced	2003-04	0.144	0.72			0.72	0.8
13	Reduction in scrap of V-28 cyl. head casting from 40% to 10% resulted in reduced machining time	2002-03	0.04	0.2			0.2	0.04
14	Optimization of Engine Performance Running Time on Production Test Bed	2003-04	0.18	0.79	422	7.91	8.7	1
15	COld cleaning of engine block( 1st stage) by Synclean-21 without hampering quality	2003-04	0.043	0.184			0.184	0.02
16	Automation of test bed water pumps( remote	2003-04	0.18	0.79			0.79	0.4

	switching & pump scheduling							
17	Heat recovery system on DG set exhaust for usage of painting oven and cleaning booth	2002-03	0.08	0.36			0.36	0.8
18	Modification of machine ladder to avoid idle running of motors	2002-03	0.07	0.34			0.34	0
19	Installation of polycarbonate sheets for natural light	2002-03	0.848	3.65			3.65	2.8
20	Controlled operation of shop ventilation blowers	2002-03	0.061	0.26			0.26	0.01
21	Frequency optimization of DG sets from 50.2 to 49.6Hz	2002-03	0.079	0.34			0.34	0
22	Replace Aluminum blades for industrial fan with FRP blades	2003	0.2	0.85			0.85	0.38
23	Localize pull switch for lighting in engineering office	2004	0.0832	0.4			0.4	0.2
24	Replace 20years old 110Kw rewind motor with new motor	2003-04	0.027	0.13			0.13	0.18
25	Energy efficient lighting with combination of electronic ballast, T5 lamp and special reflector for main shop	2002	0.4	1.7			1.7	7
26	Optimize State electricity board supply power factor from 0.99 to 1( Rebate from Board)	2002		1.5			1.5	0.4
27	Replaced 27 Nos	2002	0.15	0.64			0.64	0

	of 3 Ton split A/C Units with Air Conditioning Plant( ** due to some rearrangement A/C Plant was available hence No Investment							
28	Carried out Energy Audit of cleaning Booth ( 17 Nos). Changed sensor position,set temperature and tank capacity.Reduced Heater Operating Hours	2002	0.34	1.45			1.45	0.02
29	Reduction in Transformer No Load Losses ( 5 MVA Stand by Transformer switched off after load rearrangement)	2002	0.1	0.43			0.43	0
30	Replace 2x36w fluorescent tubes with 11W CFL in toilets	2004	0.0832	0.4			0.4	0.2

**K. List of major environmental improvements made during 2001– 2004**

- 1.Upgrade our engine design to comply CPCB norms of emission**
- 2.Acoustic treatment for Power House to reduce noise coming out of the Power House.**
- 3.Upgradation of Effluent Treatment Plant .**
- 4.Upgradation of Power House stacks.**

**5. Use of Recycled water from ETP Plant for gardening. In last three years we have used around 72000 KL of recycled water**

**6. Reduction in daily water consumption from 1100 KL to 750 KL**

**7. Tree Plantation :-**

**8. Replaced wooden packing cases with metal skids.**

**9. Canteen waste is converted in to vermi-compost manure that is used for gardening.**

**10. Segregation of different types of waste including hazardous and plastic waste.**

**11. Stopped cyanide use in Heat Treatment operation. Ours is cyanide free company.**

**12. changeover from synthetic coolants to water base coolants.**

**13. Upgradation of scrap yard to collect oil percolation.**

**14. Emergency preparedness and response.**

**15. Company Visiting cards from recycled paper**

**16. Spillage prevention measure for coolant on machines**

**17. Dust Collectors & mist separator.**

**18. Forced ventilation system on shop floor.**

**19. Support to Nature Club activities in Schools organized by Cummins India Foundation.**