

TATA MOTORS LIMITED

Jamshedpur



Unit Profile

Tata Motors, which is India's only fully integrated automobile company with multi-location plants, has product offerings spanning Medium and Heavy Commercial Vehicles, Light Commercial Vehicles, Multi-Utility Vehicles and Passenger Cars. The Commercial Vehicle Business Unit (CVBU) of Tata Motors is India's largest and world's fifth largest commercial vehicle manufacturer. Enjoying nearly 64% overall market share in commercial vehicle sector the company had a turnover of Rs. 31885 crores during 2006-07. As an important part of CVBU of Tata Motors, the plant at Jamshedpur manufactures Medium and Heavy Commercial Vehicles from 7 to 49 ton gross vehicle weight. Having an installed capacity of 96,000 vehicles, the plant produced 119431 vehicles during the year 2006-07. Company's global footprint include Daewoo Commercial Vehicle plant at South Korea, Hispano Carrocera, a reputed bus & coach manufacturer in Spain, JVs with Marcopolo of Brazil, Thonburi Automotive Assembly Plant in Thailand, Fiat Auto in Argentina resulting in significant global presence.

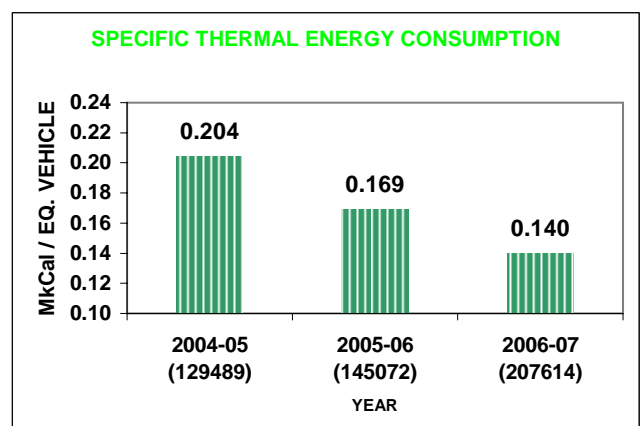
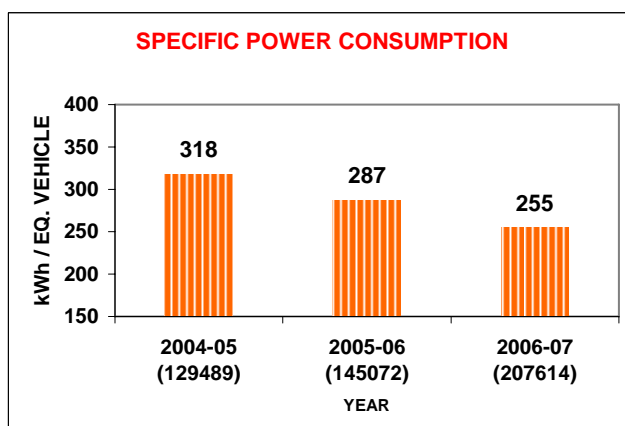
The Automobile unit at Jamshedpur has captive Forge and Foundry divisions which meet its requirement of all critical forgings and alloy iron castings. Working on Tata Business Excellence Model and integrating its initiatives of Six-sigma, Kaizen, SDT, TPM, WCM, ICR and ISO/TS 16949, the unit has been seeking newer and higher peaks of performance in industry.

Energy Consumption

Energy Conservation & energy efficiency improvement initiatives are implemented systematically and the Specific Energy Consumption as also Energy Cost as % of Manufacturing Cost has been coming down steadily. During 2006-07, savings of Rs 6.4 crores in energy resulted.

DESCRIPTION	UNIT	2004-05	2005-06	2006-07
Electrical energy	kWh / Eq. Vehicle	318	287	255
Thermal energy	MkCal / Eq. Vehicle	0.204	0.169	0.140
Manufacturing Cost	Rs. Lakhs.	453377	496491	713473
Total Energy Cost	Rs. Lakhs.	8985	9205	10456
Energy cost as % of Manufacturing Cost	%	1.98%	1.85%	1.46%

Declining Specific Energy Consumption



Energy Conservation Commitment, Policy and Set up



Conservation and improving energy efficiency in all our operations is a Top Management priority. Energy Policy as indicated below provides the guidelines for energy strategy and

Awareness & involvement of people at all levels has been a major plank for implementation of energy conservation measures.

Internal *Energy audits* are carried out regularly by an Engineering Audit group headed by certified Energy Auditor reporting to Dy GM (Utility Services) and also co-ordinate the energy conservation activities in the plant.

ENERGY POLICY

We, at Tata Motors are committed to optimum use of all forms of energy by:

- Using energy efficient alternatives, methods, work practices and eco-friendly technologies.
- Minimizing and eliminating wastages in all segments of our operations.
- Creating awareness on energy conservation amongst employees at all levels and using effective Energy Management system for reducing energy consumption and its cost.
- Using renewable energy sources where feasible.

Sep 20, 2004

A.P. Arya
Sr Vice President
Jsr & Lkw Works



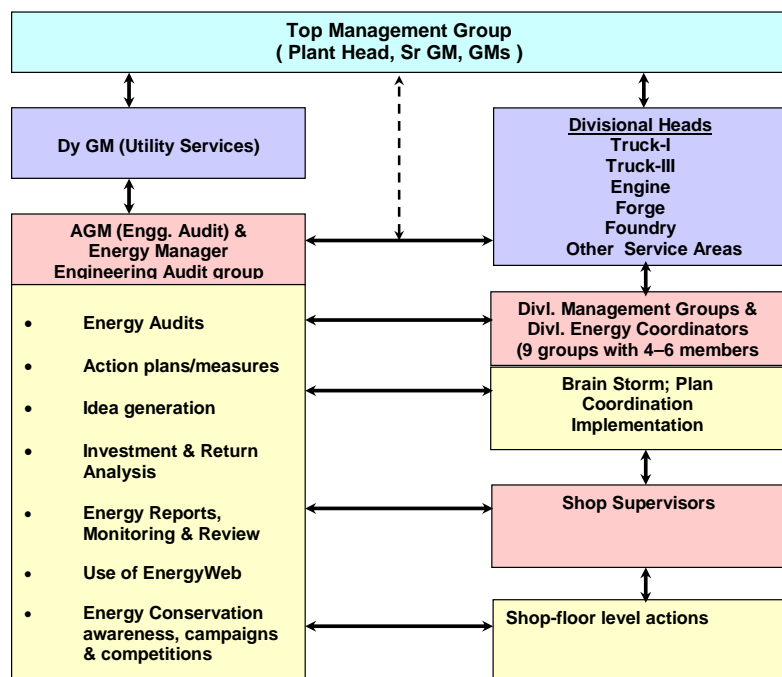
TATA MOTORS

Every year **Targets** are set for the various divisions & **Energy Conservation Action Plans** are worked out through brainstorming.

The Specific Energy Consumption & status of action plans is reviewed weekly with Divisional Energy Coordinators using a *common matrix* which is shared across all divisions and areas using ENERGYWEB on the Intranet to facilitate *cross-pollination of ideas*.

Ideas implemented by groups are encouraged by publication in in-house magazine 'Flashes'

Energy Conservation Team Set up



Energy Conservation Achievements

During 2004-07, the unit implemented 111 energy saving projects across the plant based on ideas generated during periodic brainstorming sessions held by divisional groups. These resulted in Specific Power and Specific Thermal Energy reduction by 19.8% and 31.4% respectively.

YEAR	PRODUCT	kWh/ Eq. Vehicle	% REDUCTION OVER 2004-05	MkCal/ Eq. Vehicle	% REDUCTION OVER 2004-05
2004-05	Auto Chassis	318	--	0.204	--
2005-06	Auto Chassis	287	9.7	0.169	17.2
2006-07	Auto Chassis	255	19.8	0.140	31.4

Energy Conservation Projects

Circuit Modification & Interlocking use of Chiller Units of 59 Machines

Chiller units for hydraulic oil had been installed on 59 Machines and were running 24 Hrs a day earlier. Interlocking the running of chiller unit with the main spindle control-On through a timer resulted in substantial saving in energy.

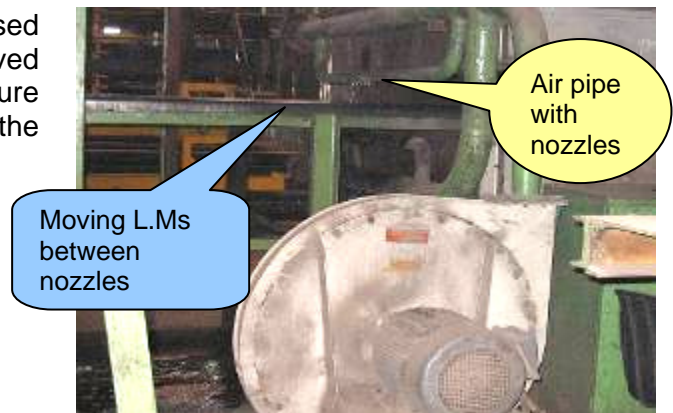
Daily energy reduced from 8664 to 7076 kWh
Energy saving: 1588 kWh / Day
: 4.92 Lakh kWh /Year
: Rs 17.71 Lakh / Tear



Installing lower pressure Blower and stopping use of Compressed Air

Earlier LM drying operation used compressed air at 80 psi as the Long Members moved between a series of nozzles. A lower pressure Air Blower instead was installed and served the purpose.

Annual savings elect. Energy: 120000 kWh
Net Saving in energy cost : Rs 4.32 Lakhs
Investment: Rs 0.25 Lakh
Payback period: 1 months



Installation of Robotic painting and improving productivity & Sp Energy

Installed 4 Nos of Robotic painting with high speed conveyor to reduce painting cycle time & at the same time improve quality & Sp Energy and Fuel Oil consumption in Ovens.

Energy saving: 13.5 Lakh kWh per year, and
260 KL of LDO per year

Saving : Rs 121 Lakhs / year
Investment : Rs 800 Lakhs



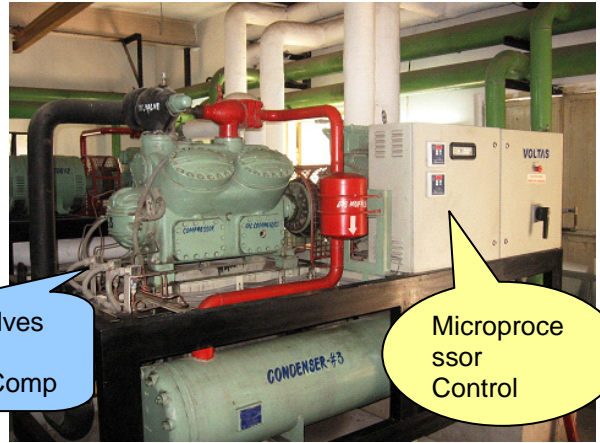
Microprocessor Control system on A/C Plant for saving Energy

Microprocessor based Control system has been installed on 3 Nos centralized A/C Plants whereby refrigerant compressor loading/unloading done in 3-stages based on chilled water supply temperature. Current drawn reduced from 110 A earlier to varying between 45 – 93 A, resulting in saving in energy consumption.

Energy saving: 280843 kWh / Yr
 Saving : Rs 10.11 Lakhs / Yr
 Investment: Rs 9.3 Lakhs

Solenoid valves controlling refrigerant Comp

Microprocessor Control



Installation of Solar Water Heaters in Company Guest Houses

Two nos. of 300LPD each Solar Water heaters installed in Dalma and Telco Guest Houses in place of electric geysers for hot water in kitchens.

Energy saving: 9400 kWh / yr
 Saving : Rs 33840 Lakhs / Yr;
 Investment: Rs 3.6 Lakh



In situ Vibration-based Dynamic Balancing of Rotary Equipment

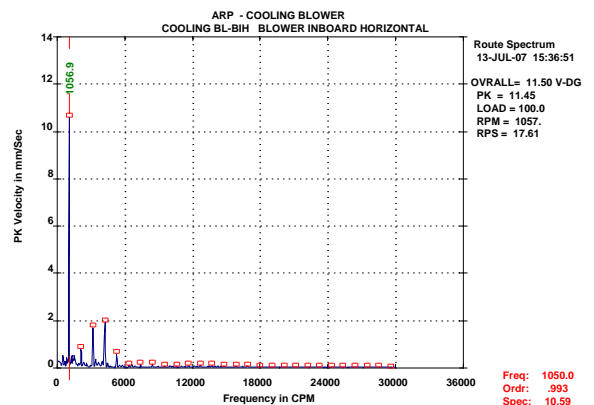
The Blower impeller of Air Replacement Plant was found to be unbalanced during periodic vibration measurement under predictive maintenance program. When *in-situ* dynamically balanced the 1st harmonic vibration level was brought down.

Earlier 1xrpm vibration: 37.32 m/s
 Power consumption: 16.5 kW

Now 1xrpm vibration : 10.68 m/s
 Power consumption: 13.8 kW

2 Nos equipment were *in situ* Dynamically Balanced during 2006-07.

Energy saving: 2.21 Lakh kWh / yr
 Saving : Rs 7.96 Lakh / Yr;



Besides the above, other projects implemented during 2006-07 are:

- * Temperature Reduction of Thermic fluid of TP-15 boiler from 220°C to 170°C after introduction of QD paint for small parts & Bumper painting..
- * Change-over to lower wattage energy efficient lamps for lighting in the plant & improved luminaries and circuit & control.
- * Low cost automation using timers, inter-locking, solenoid valve etc for saving energy.
- * Use of Variable Frequency Drives (13 Nos) on motors of centrifugal pumps and blowers as flow control strategy for saving energy.
- * Installed 3 nos. 1000 CFM energy efficient screw compressors.
- * Systematic Kaizen exercises small improvements in equipment, improved work practices and improved hearth loading and scheduling resulting in reduced shift running of production lines & certain equipment.
- * Vibration based in situ Dynamically Balancing of rotary equipment and saving energy.
- * Reduced thermal losses in Furnaces and Ovens by improved insulation / combustion efficiency.
- * Modification of transmission header of compressed air line and replacement of 6" line with 8" about 700 meters to reduce pressure drop in transmission.
- * Installation of Translucent polycarbonate roof sheets in Foundry and Cab-Cowl areas.
- * Use of SCADA system for energy monitoring and maximum demand management.

Energy Conservation Plans & Targets

Tata Motors is committed to further improve its energy performance by exploring new avenues for energy saving on a continuous basis and targets have been set for 2007-08. It is understood that adopting further improvements in energy efficiency will call for changes in processes involving higher investment. Some of the major proposals as a part of future plan for achieving targets in energy conservation are:

- (1) Installing one more high capacity Cold Core Making machine and enhancing and reduce dependence on power intensive shell core machines.
- (2) Installation of Cast Cooling conveyor and consequent stopping of vibratory units, fans & rotoclones.
- (3) An exercise has been carried out to evaluate Alternate Sources of Heat and accordingly use of Propane in place of LDO is planned for cost saving in Ovens.
- (4) Installing VFD's in other identified areas to save power.
- (5) Continuing with phased installation of Translucent roof sheets for day lighting in identified areas.
- (6) Installing energy efficient billet induction heating and automation of same, replacing old inefficient oil fired R/H furnace.
- (7) Installing smaller size Energy efficient screw compressors for ensuring better capacity matching during different times of the day.
- (8) Converting 2000 lb electrical heat treatment furnaces into thermal heating.

Environment & Safety

Tata Motors, Jamshedpur has Environment Management system certified to ISO 14001 for the Works and its Town services. Certified to OHSAS, ISO 18001 certification, the Company also makes Corporate Sustainability Report under GRI guidelines. The Environment Policy is shown alongside.

The company monitors and controls air pollution for which bag filtering and roto-clone system is installed. Also safety audits by Audit teams are carried out regularly to ensure use of safe practices.

Every year tree plantation by senior officers and employees is undertaken. 16000 saplings were distributed and planted in surrounding community areas. Campaigns for Preserving Environment and Conserving Energy are regularly taken up. Over 425 students and 50 opinion leaders & facilitators from rural communities were given class room Awareness program as also taken around the plant during 2006-07.

An eco-friendly Rainwater Harvesting project at cost of Rs 3.5 crores was completed during 2006-07. The project having 35000 m3 storage, is an ASR (Aquifer Storage & Recovery) system, the biggest of its kind in the country.

It is expected to save nearly 200 Million Gallons of water every year besides raising the ground water level in surrounding areas.

Further, recycling of treated water from ETP is done for cooling towers thereby reducing consumption of water

