*First Prize* *Automobile*

# TATA MOTORS LIMITED
# Jamshedpur (Jharkhand)

## *Unit Profile*

Tata Motors is leading automobile giant in the country having its manufacturing units located at Jamshedpur, Luknow and Pune. Today, Commercial Vehicle Business Unit (CVBU) of Tata Motors is India's largest and world's sixth largest commercial vehicle manufacturers. Tata Motors is also India's only fully integrated company with product offerings spanning Medium and Heavy Commercial Vehicles, Light Commercial Vehicles, Multi-Utility Vehicles and Passenger Cars. Tata Motors which enjoys nearly 59% overall market share in commercial vehicle sector had a turnover of Rs. 15552 crores during 2003-04. As an important part of Commercial Vehicle Business Unit of Tata Motors, the plant at Jamshedpur which is the mother unit, manufactures Medium and Heavy Commercial Vehicles from 8 to 40 ton gross vehicle weight. Having an installed capacity of 60,000 vehicles, the unit produced 66765 vehicles during the year 2003-04 in keeping with the current buoyant demand in commercial vehicle industry. Having been certified to ISO/TS 16949 and integrating its interventions of Six-sigma, Kaizen, TPM and WCM the unit is set to become a global player to reckon with.

The Automobile unit at Jamshedpur has captive Forge and Foundry divisions which meet its requirement of all critical steel forgings and alloy iron castings. In order to achieve greater efficiencies and world class technological edge in its aggregate production, the manufacture of Axles and Gear Boxes is carried out by the subsidiaries HV Axles Ltd and HV Transmissions Ltd.

The unit has a decent township for its employees and supports community services as a part of its social responsibility towards its employees and local community.

## *Energy Consumption*

With the systematic implementation of Energy Conservation measures, the Specific Energy Consumption of all areas - Auto, Forge and Foundry divisions has been steadily declining. Also Energy Cost as % of Manufacturing Cost has come down. This resulted in saving of Rs 10.7 crores in energy during 2003-04. Last three years' specific energy consumption figures are as shown below:

| PRODUCT | DESCRIPTION | UNIT | 2001-02 | 2002-03 | 2003-04 |
|---|---|---|---|---|---|
| Automobile chassis | Electrical energy | KWH / Eq. Vehicle | **596** | **493** | **374** |
| | Thermal energy | MkCal / Eq. Vehicle | **0.411** | **0.337** | **0.258** |
| Forge Tonnage | Electrical energy | KWH / MT | **655** | **626** | **576** |
| | Thermal energy | MkCal / MT | **3.52** | **3.21** | **2.84** |
| Casting Tonnage | Electrical energy | KWH / MT | **2108** | **1926** | **1790** |
| | Thermal energy | MkCal / MT | **0.393** | **0.323** | **0.302** |
| Manufacturing Cost | | Rs. Lakhs. | 182583 | 237179 | 304141 |
| Total Energy Cost | | Rs. Lakhs. | 7641 | 8083 | 8373 |
| Energy cost as % of Manufacturing Cost | | % | **4.19%** | **3.41%** | **2.75%** |

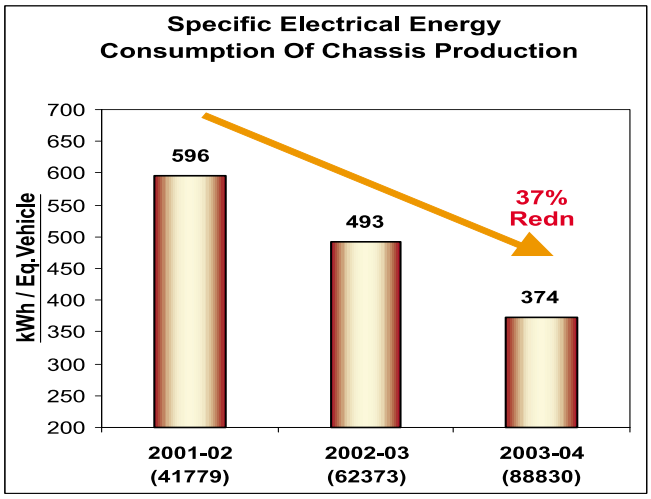
## *Energy Conservation Commitment, Policy and Set up*

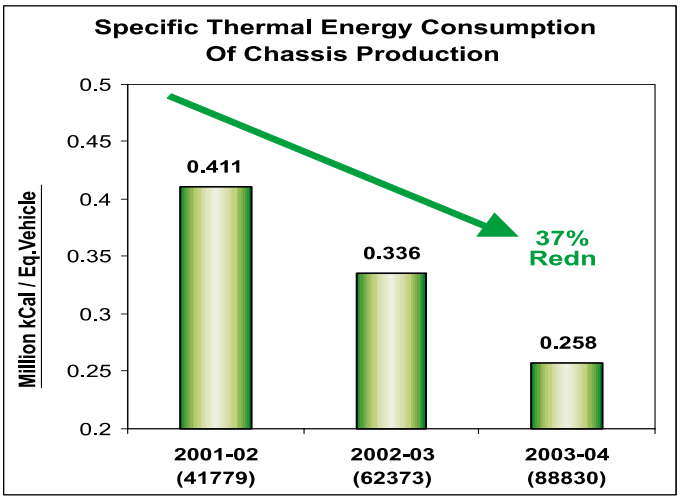
Energy Conservation is a Top Management priority for the unit and an Energy Policy is in place. An Engineering Audit group co-ordinate the energy conservation activities in the plant.

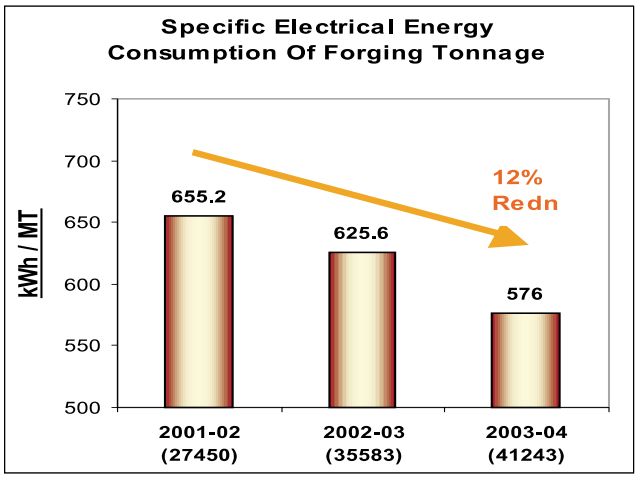
***Awareness & involvement*** of people at all levels has been a major plank for implementation of energy conservation measures. ***Energy auditing*** is a function of the Engineering Audit group. Every year ***Targets*** are set for the various divisions & ***Energy Conservation Action Plans*** are worked out. The Specific Energy Consumption & status of action plans is reviewed weekly with divisional coordinators using a *common matrix* which is shared across all divisions and areas to facilitate *cross-pollination of ideas*. Ideas implemented by groups are encouraged by publication in in-house magazine 'Flashes'

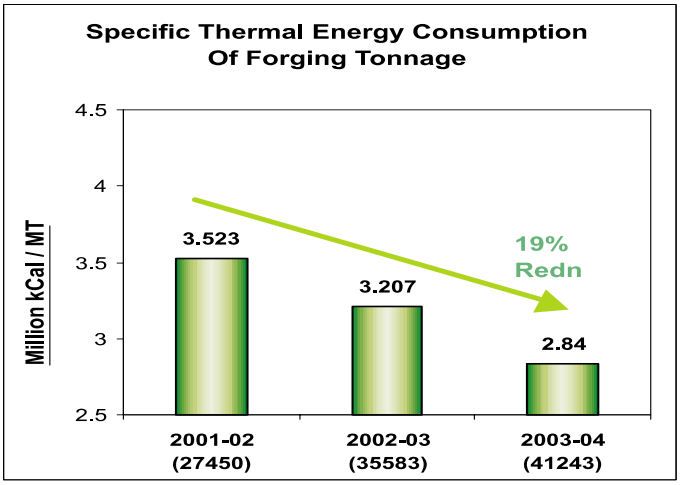
Specific consumption of each area is monitored by Engineering Audit on daily basis & is shared with each Divisional Head / divisional Coordinator as well as the Top management.

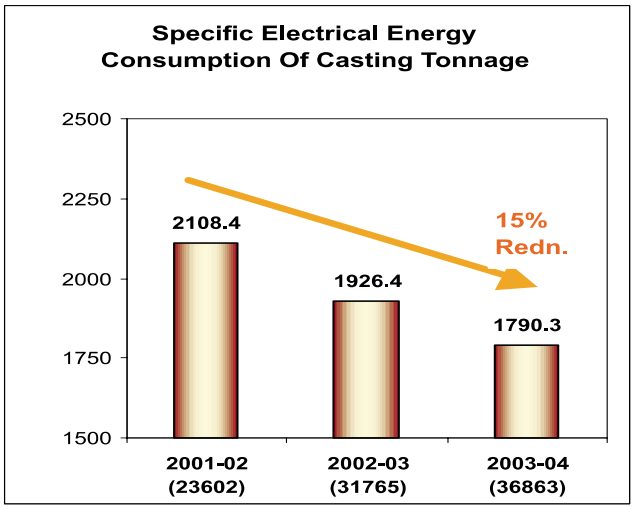
## *Steadily Declining Specific Energy Consumption*

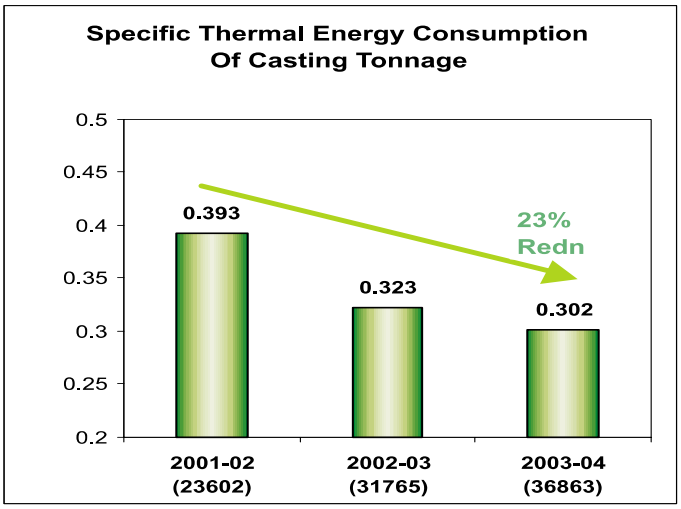


## *Energy Conservation Achievements*

### Energy Conservation Projects implemented during 2003-04

**Variable Frequency Drive at Pre-wash pumps**

A 100 HP VFD installed for dual speed operation at 25Hz and 45Hz resulting in energy consumption.

| | | |
|---|---|---|
| Before Installation | : | Energy Cons 319 kWh / Shift |
| After Installation | : | Energy Cons 159 kWh / Shift |
| Savings Achieved | : | Rs 3.64 Lakhs per annum |
| Investment | : | Rs 2.80 Lakhs |
| Payback | : | 9 Months |


**ControlAir system for Compressed Air in Inner Complex**

A demand side pressure management system for Compressed Air in Inner Complex area has resulted in reduced pressure requirement by 4-8 psi in different user areas.

Energy consumption reduced by 3350 kWh/Day

| | | |
|---|---|---|
| Energy saving | : | 10.05 lakh kWh / Year |
| Annual saving | : | Rs 38.69 Lakhs |
| Investment | : | Rs 38 Lakhs |
| Payback period | : | 12 months |

**Rad Heat Tube Gas Heating Oven in place of Electrical**

A Rad Heat Tube Gas heating element in place of earlier 90 kW electrical heating in one Oven for coating sand in Shell Core shop.

| | | |
|---|---|---|
| Earlier energy consumption | : | 1112 kWh/Day |
| Now, LPG consumption | : | 88 kg/Day |
| Annual savings in Energy cost | : | Rs. 6.16 Lakhs |
| Investment | : | Rs 5.88 Lakhs |
| Payback period | : | 11 months |

**Use of Celdek Pad in Air Replacement Plant in Paint shop**

Celdek Pad in place of high pressure water spray jet system has been installed in 2 of the ARPs thereby reducing the size of pump from 11 kW to 1.5 kW and saving electrical energy.

| | | |
|---|---|---|
| Earlier consumption: 2x11x0.88x16 | = | 282 kWh per day |
| After change consumption | : | 39 kWh / Day |
| Annual Energy saving | : | 1.46 Lakh kWh |
| Annual saving | : | Rs5.62 lakh |
| Investment: Rs 8 Lakhs; Payback | : | 17 months |

**Modification of Rotary Hearth Furnace**

Rotary Hearth furnace in N-Line was modified to prevent leakages and ensuring proper water sealing and reducing fuel oil consumption.

| | | |
|---|---|---|
| Fuel oil consumption | : | 20 litres/Hr reduction |
| Saving | : | 24 KL per Year |
| Annual Energy Cost saving | : | Rs 3.89 Lakhs |

**Installation of Energy Efficient Wieshaupt Burners**

Use of fuel efficient Weishaupt burners has been made in two places in Centralised paint shop resulting in saving of 34 KL of LDO per year.

| | | |
|---|---|---|
| Energy cost saving | : | Rs 6.4 Lakhs per year |
| Investment | : | Rs 10 Lakhs |
| Payback Period | : | 1 Yr and 7 months |

## 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**

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**Besides the above other projects implemented during 2003-04 are:**

- Change-over to lower wattage energy efficient lamps for lighting in the plant & improved luminaries and circuit & control.
- Reduced idle running of motors of drives using timers, interlocking , temperature controller.
- Use of VFD's at 5 locations for flow control of pumps and blowers and saving energy.
- Improved work practices and organization of office space resulting in reduced shift running of production lines, certain equipment and A/Cs .
- Down-sizing of under loaded motors at 5 locations in Forge division.
- Replaced metallic blade Fans by energy efficient FRP blades for Man-coolers & one cooling Tower
- Reduced thermal losses in Furnaces and Ovens by improved insulation.
- Further 140 more translucent roof sheets were installed in different areas to harness natural day light in place of using high-bay lamps during day time.
- Technical improvements in process in various areas for reducing energy consumption.

## *Energy Conservation Plans and Targets*

Jamshedpur unit of Tata Motors is committed to further improve its energy performance by exploring new avenues for energy saving on a continuous basis. Some of the major proposals as a part of future plan for achieving targets in energy conservation are:

(1) Installing and commissioning Medium Frequency Induction furnace in Foundry for saving in energy.

(2) Installing VFD's in Engine Cooling Tower , Town Filter Plant and other identified areas to save power.

(3) Continuing with phased installation of Translucent roof sheets for day lighting in identified areas.

(4) Use of RadHeat LPG heating in place of electric heating in all ovens Shell Core Sand in Foundry.

(5) Installing Celdek pad in place of water spray in remaining Air Replacement plants in CPS

(6) Continuing with phased Conversion of existing metallic blade to FRP blade for man-coolers .

(7) Demand side management of Compressed air through use of Controllers for various pressure requirements in remaining areas.

(8) Installing smaller size Energy efficient screw compressors for ensuring better capacity matching during different times of the day.

(10) Installing more energy efficient Weishaupt burners in Ovens in CPS.

(11) Converting 2000 lb electrical heat treatment furnaces into thermal heating.

(12) Trying alternative fuels for reducing energy cost and improving environment.

## *Environment and Safety*

Jamshedpur unit of Tata Motors places a high importance on preserving Environment, employee health and safety.

In line with the Environment Policy of the Company the Jamshedpur unit has a full-fledged department to monitor and coordinate the safety and environment aspects of the Plant and the Township. The unit is well set for acquiring ISO 14001 certification.

A major Centralized Effluent Treatment Plant has been set up and replaced the existing ETP. A sewage disposal set-up at a cost of Rs 4 crores for the extended part of River View town-ship for improved treatment and disposal of sewage water is complete.

Centralised Paint Shop has been converted from AED to CED in June, 2003 reducing the effluents substantially.


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