

**MAHINDRA & MAHINDRA LTD
AUTOMOTIVE SECTOR- PLANT I
NASHIK**



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Mahindra Automotive Sector



**CII National Award for
Excellence
in water Management 2008**

16th Dec – 17th Dec 2008

CII-Hyderabad



CERTIFICATION

Occupational Health & Safety



**OHSAS
18001:2007**

Environment



ISO 14001:2004

Quality



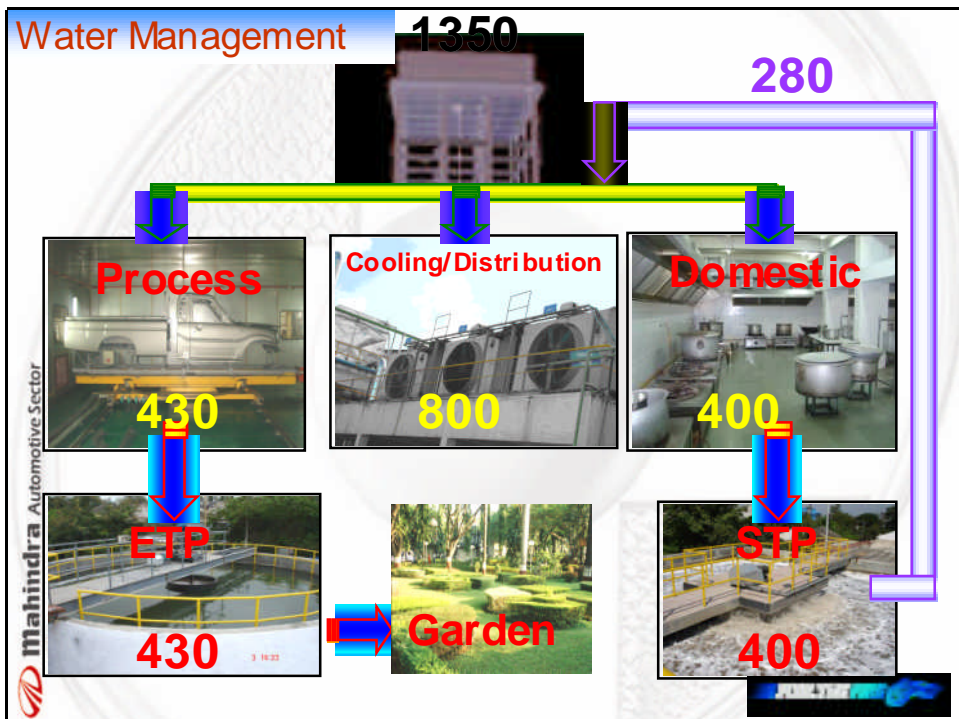
ISO TS 16949

**Information
Security**



ISO 27001:2005

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Water audits

1. For total plant audit by CII in 2006
2. For treated water distribution by MMK in 2006
3. For Sewage distribution system by C11 in 2008
4. For rain water harvest by Greenfield technology in 2007
5. For ground water survey by GSDA in 2007
6. For total plant water balance by Technogreen in 2007
7. For sustenance by internal audits.



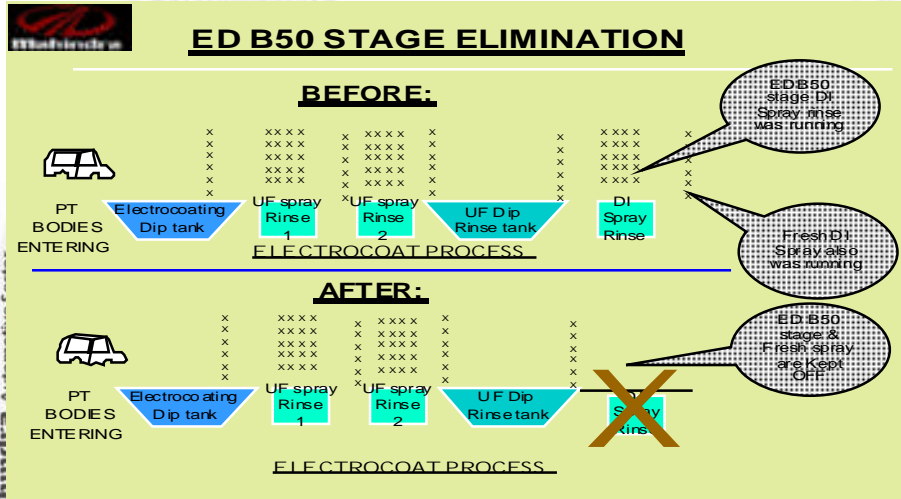
Water saving projects- 2004 To 2008

| Sr. no | Category | No. of projects | Investment Rs Lacs | Saving m3 |
|--------|----------------------------|-----------------|--------------------|---------------|
| 1 | Zero investment | 14 | 0 | 35000 |
| 2 | Minor investment \leq 2L | 12 | 19 | 110000 |
| 3 | Major investment \geq 2L | 10 | 380.27 | 316506 |
| | Total | 36 | 399.27 | 461506 |



Water saving projects

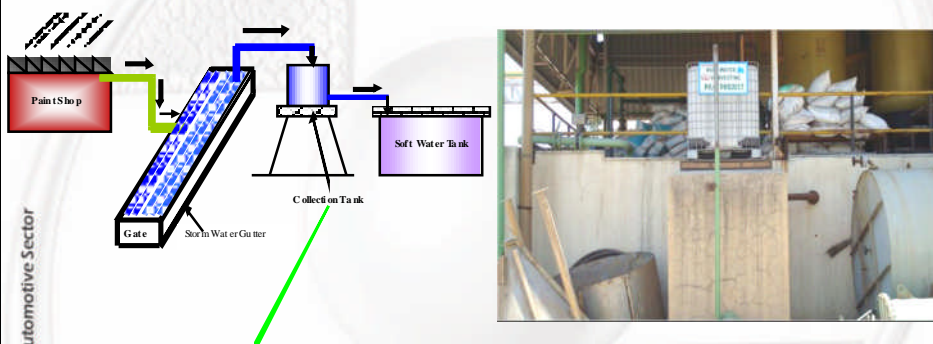
Specific water reduction by process optimization



Total Water Saved = 13490 M³ Investment = 0

Water saving projects

Rain water harvesting at paint shop



Total Water Saved = 2971 M³

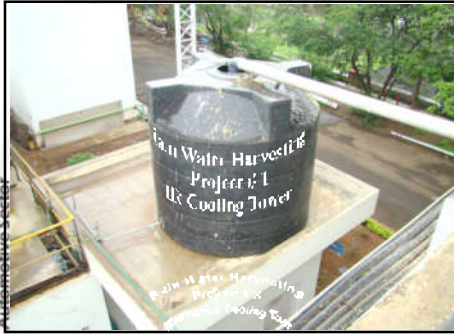
Investment = 0

Water saving projects

Rain Water Harvesting Project for cooling tower ponds

Compressor cooling tower

Body-shop tower



Water Saved : 1253 m³ this monsoon
Investment : Rs 0.2 lacks

Water saving projects

Water distribution through gravity & all pipes are above the ground. No underground leakages



Before

Variable Pressure
12 Pumps



After

Uniform pressure
2 Pumps
Savings-1.15 lac Kwh/annum

Water Savings : 30000 m³/ Annum
Investment : 30 lacks

Water saving projects

Optimizing the painting process by combining cab & cargo on single fixture.



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Before
Two fixtures required

Electricity - 207 kWh/body
LPG - 26 kgs/body

After
Single fixture

Electricity - 167 kWh/body
LPG - 13 kgs/body

Water Savings 10 CMD OR 2880 m³/annum



Water saving projects

Replacement of inefficient pumps with efficient Hydro MPC for air compressor water circulation .



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Before

3.22 Lacs Units/Year

After

1.60 Lacs Units/Year

Water Savings /annum 1500 m³

Investment Rs.14.5 Lacks



Water saving projects

Fire hydrant line above the ground



Before



After

Water Saving: 250 m3 leakage losses eliminated
Investment : 40 Lacks



Global Norms / Bench mark

Benchmarks for Specific Water Consumption

| | National Benchmark * | International Benchmark* | MPCB Benchmark** |
|--|--|--------------------------|------------------|
| Specific Water Consumption M3/vehicle | Tata Motors – 5.23 Ford India- 2.56 GM- 7.56 | Toyota Motor- 1.97 | 2.74 |

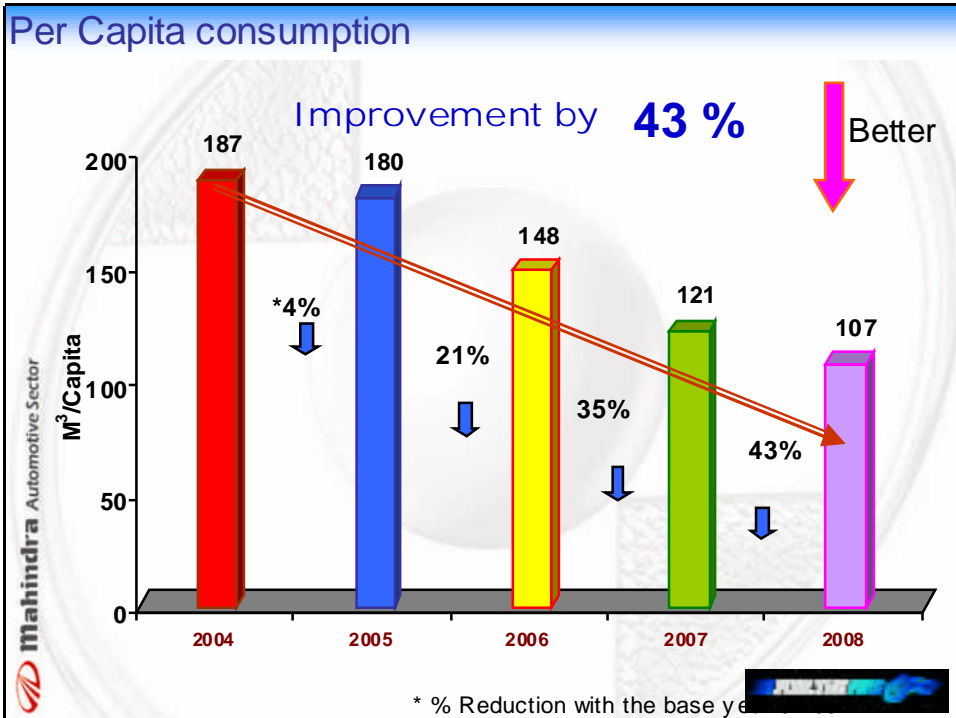
Benchmarks for Wastewater Discharge

| | National Benchmark * | International Benchmark* | MPCB Benchmark** |
|--|----------------------|--------------------------|------------------|
| Specific Water Consumption M3/vehicle | Ford India- 0.67 | Renault- 0.5 | 0 |

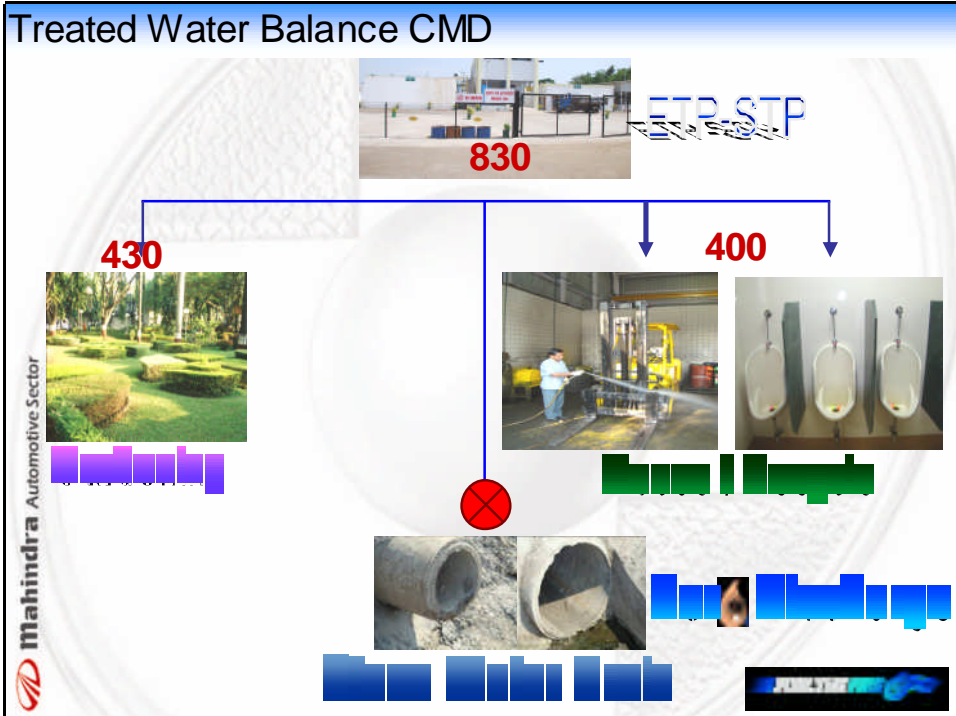
*:- Source from CII, Hyderabad.

**:- Maharashtra Pollution Control Board





- ### Sustainability
- F Daily input and output water monitoring.
 - F Tighter consumption control in the high consumption shop
 - F Internal water management team.
 - F Continuous improvements through team review.
 - F Internal and External audit for improvement validation.
 - F Monthly water quality analysis.



•Treated water reuse for the Press shop car body panel washing.

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- Investment: Zero
- Water Saving: 1560 m³/annum
- Implemented in Nov 2008

- Investment: Zero
- Water Saving: 120 m³/annum
- Implemented in Oct 2007

Recycling of treated water

Raw water inlet

Waste water tank

To spray lance

Before implementation ...

Waste water recycled

Raw water

Recycle

Waste Water Tank

To spray lance

After implementation ...

Water consumption M³

30000 m³

15600 m³

Before

After

In-house Project.

Water Saving: 15600 M3

Investment: 0.2 Lacks

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Monitoring system

- Ø30 meters across the plant.
- ØDaily morning meter reading.
- ØDaily MIS report to top management.
- ØDaily shop consumption published.
- ØVariability captured by departments.
- ØDaily water management.
- ØFortnightly CFT meets for opportunities.

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Monitoring system

- Ø Monthly treated water balance charts.
- Ø Monthly water balance charts.
- Ø Monthly specific water trends.
- Ø Water testing as per MPCB norms.
- Ø Water testing as per ISO10500 STD.
- Ø Monthly water cooler management.
- Ø Monthly management review.

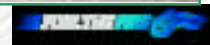


Monitoring & Reporting

- Ø Water meters at user interface
- Ø Daily monitoring & analysis
- Ø Daily Pressure Monitoring



Put a Stop - to the Drop



Green Areas in Nashik Plant



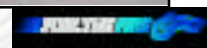
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Green Areas in side Nashik Plant shop area



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Awareness & Involvement within the Plant

- Ø **Celebration of Water Conservation week-24th to 30th March**
- Ø **Organizing Slogan , Poster Competition for Employees and their families.**
- Ø **Awareness session to workmen through “Workers Training Course”.**
- Ø **ECON stall on Founders Day(2nd Oct)- visited by 15-20 thousand people.**



Preservation Towards Environment

- Expertise team for EMS
- Tree plantation target - 1 Lac / year
- Special team in R&D working for Alternative fuel
- Rain water harvesting for paint shop.
- Formation of vendor cluster to reduce transportation
- New research on non ODS refrigerant



Preservation Towards Environment

- Special management programs to reduce hazardous waste
- Introducing energy efficient equipment in new projects/expansions.
- Involving employee in environment preservation program.
- Maximize use of treated water.



Environmental projects

- **Planting of 1 Million trees**
- **Planting of “Jatropha” Plant**
- **Use of Bio Diesel**
- **Use of Renewable energy**
- **Use of Treated water**



Environmental projects

- Recycle of used thinner
- Recycle of Exhaust gases in paint shops
- Scrubber chambers for spray booths
- Reduction/Reuse of effluent sludge.



At Mahindra we follow Five Mantras

✓ LEADERSHIP

✓ COST EFFECTIVE

✓ CUSTOMER CENTRIC

✓ GLOBALISATION

✓ INNOVATION

