

NOMINATION

NATIONAL ENERGY CONSERVATION AWARD 2007

TYRE SECTOR



PREPARED & SUBMITTED BY:-

ENERGY CONSERVATION & MANAGEMENT CELL.

MRF LIMITED, P.B.No 2,VADAVATHOOR.P.O,KOTTAYAM.KERALA STATE

UNIT PROFILE

MRF- India's most trusted, No 1 tyre manufacturing company having plants at Tamil nadu, Andhra Pradesh, Goa, Puducherry and Kerala. MRF staying ahead through its uncompromised quality measures on manufacturing and internationally proven manufacturing system and equipments to deliver world class tyres. MRF crossed Rs 5000 Crore turn over during 2006-07 and is the forerunner among all other Indian tyre manufacturers.

MRF Kottayam unit started during 1969 having more than 1600 direct work force. State of the art Mixing plant having world class rubber mixing facility with F620, P270 (2nos) and 11D(2nos) banburies assisted by SCADA based recipe management and control for accurate mixing parameters. Other plants with upgraded systems for Tube, Tyre and PCTR manufacturing delivers world class product.

ENERGY CONSERVATION & MANAGEMENT

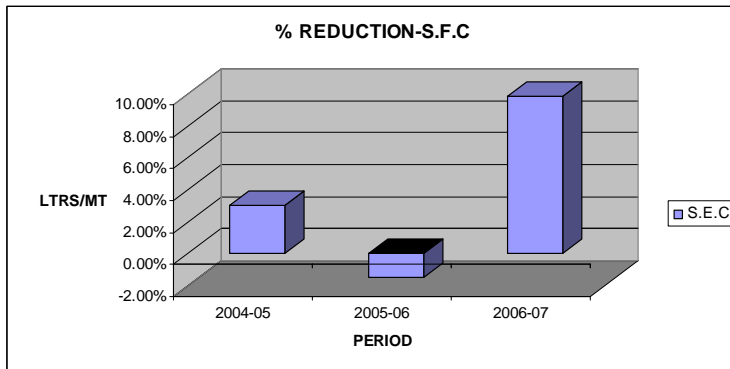
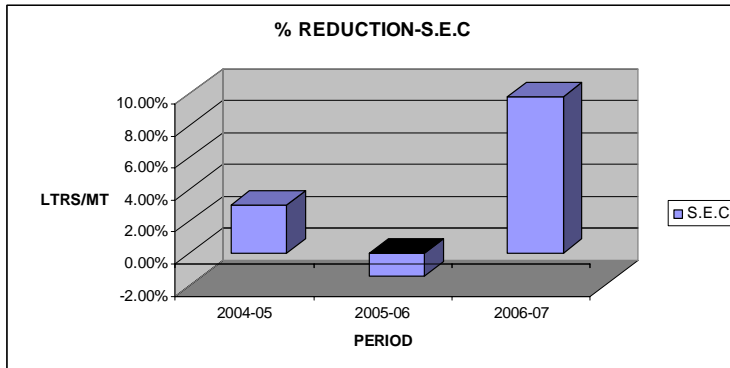
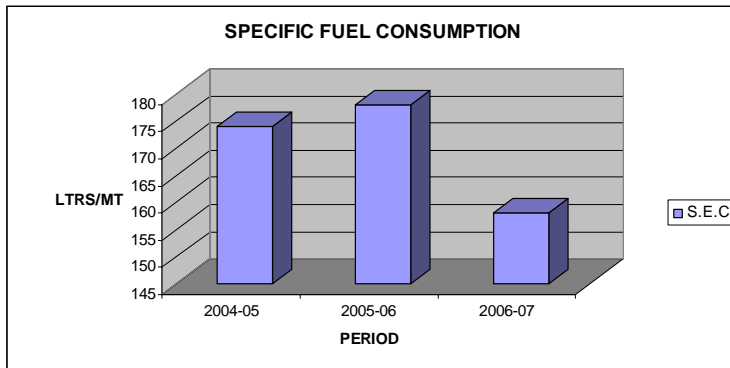
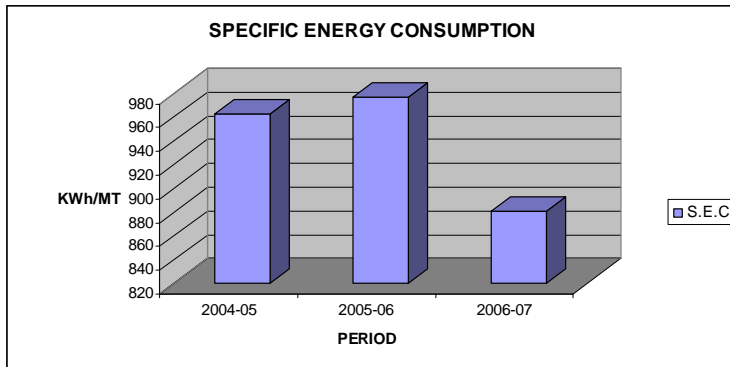
Energy Conservation & Management Cell coordinates all ENCON activities within the plant as per the guidelines from M/s Bureau of Energy Efficiency and Energy Management Center, Kerala.

MRF Kottayam unit was achieving 3-5 % reduction in Specific energy consumption consistently for many years (Excl 2006-06, low production due to IR problems) How ever the total scenario has changed upon implementation of world class management philosophy, Total Productive Management (TPM). All sectors contributing to Specific Energy Consumption (SEC) were analysed and systematic approach led to around 10 % reduction in Specific energy Consumption. Apart from ENCON initiatives, de bottlenecking of process activities to improve Over all equipment effectiveness and scrap reduction helped us to achive this.

SPECIFIC ENERGY/FUEL CONSUMPTION TREND

PERIOD	SPECIFIC ENERGY CONSUMPTION KWh/MT	% REDUC TION	SPECIFIC FUEL CONSUMPTION LITERS/MT	% REDUCTI ON
2004-05	963	3.02%	174	7.45 %
2005-06	977	-1.45%	188	-2.3%
2006-07	881	9.83%	158	11.24%

Total savings from Specific energy consumption / Specific fuel consumption reduction and power factor improvement for the year 2006-07 is Rs 3 Crores per annum.



ENERGY CONSERVATION & MANAGEMENT CELL

GENERAL MANAGER –KOTTAYAM PLANT (UNIT HEAD)

Plant engineering manager (President)

Manager electrical maintenance (Vice President)

M/s BEE Certified Energy Manager (Coordinator)

Members

Area in charges – Production, Mechanical & Electrical –Plant 1

Area in charges – Production, Mechanical & Electrical –Plant 2&4

Area in charges – Production, Mechanical & Electrical –Plant 3

Representatives from QA, Industrial engineering and Accounts.

Apart from this each Plant is having Plant energy cell with participation from all Plant departments including staff and workmen. Plant energy cells to carry out ENCON activities and Training in coordination with EC & MC. Energy conservation activities status included in weekly and Monthly PM Pillar meetings. ISO / TS 16949 Management review meetings, ISO 140001, OHSAS Management review meetings etc.

Training.

- **Periodic training being carried out for Staff and Workmen on ENCON**
- **2 days program conducted as part of National safety week celebrations with support from Energy Conservation Society and KSEB.**
- **External training for Engineers provided through M/s Energy Management Centre Kerala.**

Other initiatives

- **Energy management system for online monitoring of energy consumption at 110 KV substation and Plant # 3 would be carried out during 2007-08 with SCADA system as Phase 1.**
- **Renewable energy plans:- Solar water heater for canteen and Bio gas from canteen waste etc. being studied through support from ANERT, Kottayam office.**
- **Kaizen invited for energy saving suggestions and 45 projects were implemented at various plants through Kaizens.**
- **Energy audit being conducted annually and the projects suggested by In house energy audit team being implemented for achieving targeted Specific energy reduction.**

- **Brain storming sessions were carried out by the team led by General Manager to initiate and boost ENCON activities at plant level and to show the management commitment towards energy conservation.**



MRF -KOTTAYAM

ENERGY CONSERVATION & MANAGEMENT POLICY.

**MRF-K IS COMMITTED TO MAINTAINING ENERGY EFFICIENT
PRACTICES IN ITS PLANTS PROCESS LINES.**

To achieve this goal, all the plant departments shall

- Optimize the usage of energy through various Energy conservation activities.
- Optimize the usage of available energy through proper Energy management practices.
- Continuously monitor and upgrade systems & machineries to improve energy efficiency and to reduce wastages.
- Continuously monitor usage of energy at all levels and would reduce Specific energy / fuel consumption to maximum possible limits.
- Train all our employees to perform their activities in an energy efficient manner to reduce wastages.

It is our endeavor that each of our manufacturing lines ensures best energy efficient systems and practices.


Respective Plant Energy Cell leader is assigned the responsibility of carrying out the Energy conservation & management activities by collaborating with Energy Conservation & Management Cell.

Date 15.01.2006


Michael Rebeiro, GM-KP

Major energy conservation initiatives:-

1 Dust collector optimization 8” and 10” Tube extrusion line

	<p>Dust collectors with 20 HP motor and 3 HP rotary feeder were used for each Tube extrusion process lines. This was replaced with 2HP low r.p.m dust collector and 0.5 HP rotary feeder.</p> <p>Investment - Rs.3.25 Lakhs</p> <p>Savings - Rs 4.72 Lakhs</p>
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2 Plant 2 Lighting energy saver

	<p>21KVA and 30 KVA Duex E mag lighting energy savers provided to reduce lighting consumption.</p> <p>Investment - Rs.3.2 Lakhs</p> <p>Savings - Rs 2.7 Lakhs</p>
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3 Bead extruder No 1:- 20HP DC motor/1HP blower replacement with 20HP AC motor and VFD.



20HP DC motor and 1HP cooling fan used for Bead extruder. This was replaced with 20HP AC motor and VFD.

Investment - Rs.1.2 Lakhs

Savings - Rs 0.64 Lakhs

4 Plant 1 120TR Chiller evaporator replacement and Micro controller




120T chiller No 2 evaporator replaced with retrofit one and both chillers controlling done through Micro processor controllers.


Investment - Rs.9.1 Lakhs

Savings - Rs 5.24 Lakhs


5 Low watts Air circulators in place of Man cooler fans

	<p>17 nos 550 watts man coolers were replaced with 180 watts air circulators.</p> <p>Investment - Rs.0.90 Lakhs</p> <p>Savings - Rs 1.58 Lakhs</p>
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6 Power factor improvement APFC panels, Group/ Individual compensation

	<p>3nos 250 KVAR APFC panel, Group and individual compensation for motors etc given to improve p.f to 0.96 lag from 0.93 lag..</p> <p>Investment - Rs. 14 Lakhs</p> <p>Savings - Rs 20 Lakhs</p>
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7 New freezer developed to replace higher HP freezers and to eliminate CFC

	<p>5.5HP freezer with Freon 12 refrigerant is used for green tube splice area cooling. All 10 nos freezers were replaced with 32nos 200 watts Mini freezers with R143 refrigerant for energy reduction</p> <p>Investment - Rs. 7.01 Lakhs</p> <p>Savings - Rs 8.35 Lakhs</p>
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8 Furnace oil consumption reduction using high efficiency burner



In 20 T boiler, Thermax Oretli burner replaced, with energy efficient imported Weishaupt burner to improve steam to fuel ratio.

Investment - Rs. 35 Lakhs

Savings - Rs 39.17 Lakhs

9 Tyre building machine 59J conversion with VFD



59J tyre building machine was having ordinary 15 HP double speed motor and controls. Whole system upgraded with 10HP motor with Allen Bradley Power flex drive.

Investment - Rs. 1.6 Lakhs

Savings - Rs 0.70 Lakhs

10 Tyre curing trench Hot water fill with VFD



60HP hot water fill pump is using in tyre curing trench to avoid pressure drop during Hot water fill cycle. Allen Bradley make VFD provided and interlocked with all curing press operations through PLC

Investment - Rs. 2.9 Lakhs

Savings - Rs 5.43 Lakhs

11 68” calendar wind up 20HP DC motor/ fan replacement with AC motor and VFD.



68” calendar wind up was having 20HP DC motor, 1HP cooling fan and DC drive. To reduce energy consumption 20 HP AC motor and VFD provided

Investment	- Rs. 1.2 Lakhs
Savings	- Rs 0.47 Lakhs

12 Heat exchanger pumps replacement with energy efficient



4nos 15 HP ordinary motor with Johnson pumps were used for heat exchangers. To optimize load all the four heat exchanger pumps were replaced with 10HP Grundfos energy efficient pumps

Investment	- Rs. 8.6 Lakhs
Savings	- Rs 5.32Lakhs

13 Replacement of ordinary welding sets with IGBT based welding set



Miniarc 150, IGBT based welding set procured to replaced ESAB 15 KVA welding set for application up to 150A

Investment	- Rs. 0.64 Lakhs
Savings	- Rs 0.15 Lakhs

CONSOLIDATED LIST OF SAVINGS

POWER				
Sl.No	Description	Investment in Lakhs	Saving per annum in Lakhs	Payback
1	Dust collector optimization 8" and 10" Tube extrusion line	3.25	4.72	0.69
2	Plant 2 Lighting energy saver	3.2	2.7	1.19
3	Bead extruder No 1:- 20HP DC motor/1HP blower replacement with 20HP AC motor and VFD.	1.2	0.64	1.88
4	Plant 1 120TR Chillers evaporator replacement and Micro controller	9.1	5.24	1.74
5	Low watts Air circulators in place of Man cooler fans	0.9	1.58	0.57
6	Power factor improvement APFC panels, Group/ Individual compensation	14	20	0.70
7	New freezer developed to replace higher HP freezers and to eliminate CFC	7.01	8.35	0.84
8	Tyre building machine 59J conversion with VFD	1.6	0.7	2.29
9	Tyre curing trench Hot water fill with VFD	2.9	5.43	0.53
10	68" calendar wind up 20HP DC motor/ fan replacement with AC motor and VFD	1.2	0.47	2.55
11	Heat exchanger pumps replacement with energy efficient	8.6	5.32	1.62
12	Replacement of ordinary welding set with IGBT based welding set	0.64	0.15	4.27
13	Operation optimisation of various process machines to avoid idle running	1.5	3.4	0.44
14	Lighting energy optimisation- Incl. Electronic chokes, slim tubes and other lighting energy reduction combined.	9.8	12.30	0.8
	Total	64.9	71	0.91
FURNACE OIL				
1	Furnace oil consumption reduction using high efficiency burner	35	39.17	0.89
2	Oxygen trimmer ,Siemens-. Weishaupt	3	0	0.00
3	40 nos Spirax -Ball float steam traps in place of Nicholson Thermo static valves	3	2.7	1.11
4	Rewamping insulation of steam lines	8.5	6	1.42
5	120m , 2" damaged condensate pipe line replaced to avoid losses	9	11	0.82
6	1810 steam leak correction-	6	12	0.50

7	3 Nos flash vessels for condensate recovery	5	2	2.50
8	Plant 1 Valve heating chamber, modification to optimize chamber size and to improve insulation	0.9	1.7	0.53
	Total	70.4	74.57	0.94

ENVIRONMENT AND SAFETY

MRF-Kottayam is aiming for " Green productivity" to preserve environment. Self discipline and mandatory requirements needed to fulfill ISO 14001 and OHSAS standards being strictly followed. Classes on Global warming, energy conservation etc made available to all to know the impacts on Global society and India. 45 Small-scale energy conservation projects were identified for CDM and PDD preparation activities being done by consultants M/s Ernst & Young.

Water effluent:-

State of the art effluent treatment plant cater the needs of the plant. The quality of treated water being monitored and is as per the norms prescribed by State Pollution control board.

Air pollution:-

None of our equipments contributing to air pollution as we have self imposed strict measures to contain all. All dust collectors were installed with high efficient filter bags and Wet scrubber provided for boilers.

Solid waste:

Solid dry waste from ETP being used as manure.

MRF-Kottayam unit strictly following all standards applicable for ISO14001 and OHSAS and no non-conformities were raised in last 3 years.

Safety

MRF -Kottayam strictly follows all safety norms and no fatal accidents were reported in last many years due to the continuous efforts taken by Plant safety committee. Periodic awareness programmes, Safety day observation and safety week celebration keep employees vigilant round

the year to comply with safety standards. SHE (Safety Health and Environment) pillar taking care of all activities as guided by TPM steering committee.

END.