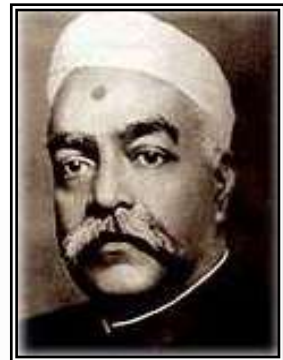




JK TYRE
& INDUSTRIES LTD.
CHENNAI TYRE PLANT



Late Lala
Juggilal Singhania

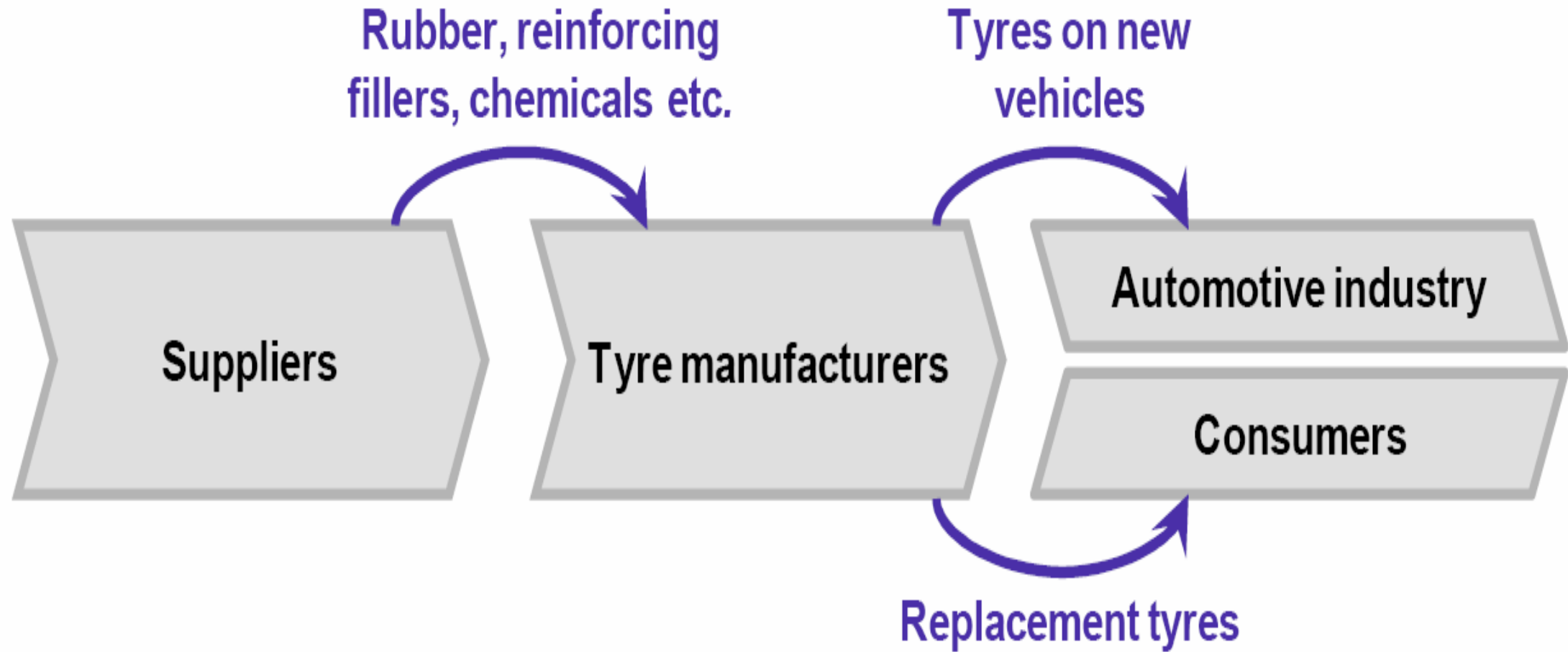


Late Lala
Kamlapat Singhania





Tyre Industry Supply Chain





Salient Features – Chennai Tyre Plant

- ❖ Location Selection – Automobile Hub
- ❖ Environment friendly technology considered during Plant Inception itself
- ❖ Equipment Selection for high Energy Efficiency
- ❖ Modern Technology and flexibility for upgrades
- ❖ Zero Liquid Discharge Plant
- ❖ Usage of Maximum Day lights
- ❖ High level of automation to reduce all resources and better process controls
- ❖ Highly optimized WIP material flow
- ❖ Modular designs for seamless expansion
- ❖ All Operatives are Diploma Engineers/ Science Graduates.



Green Co Journey

- ❖ **Registration with CII – Apr'14**
- ❖ **Green Co Summit – June'14**
- ❖ **Formation of CFT's - July'14**
- ❖ **Green Co implementation training on 21st & 22nd July'14**
- ❖ **Handholding visits by CII - Sep'14**
- ❖ **Document Submission – Sep'14**
- ❖ **Final Assessment - Oct'14**



Our Philosophy

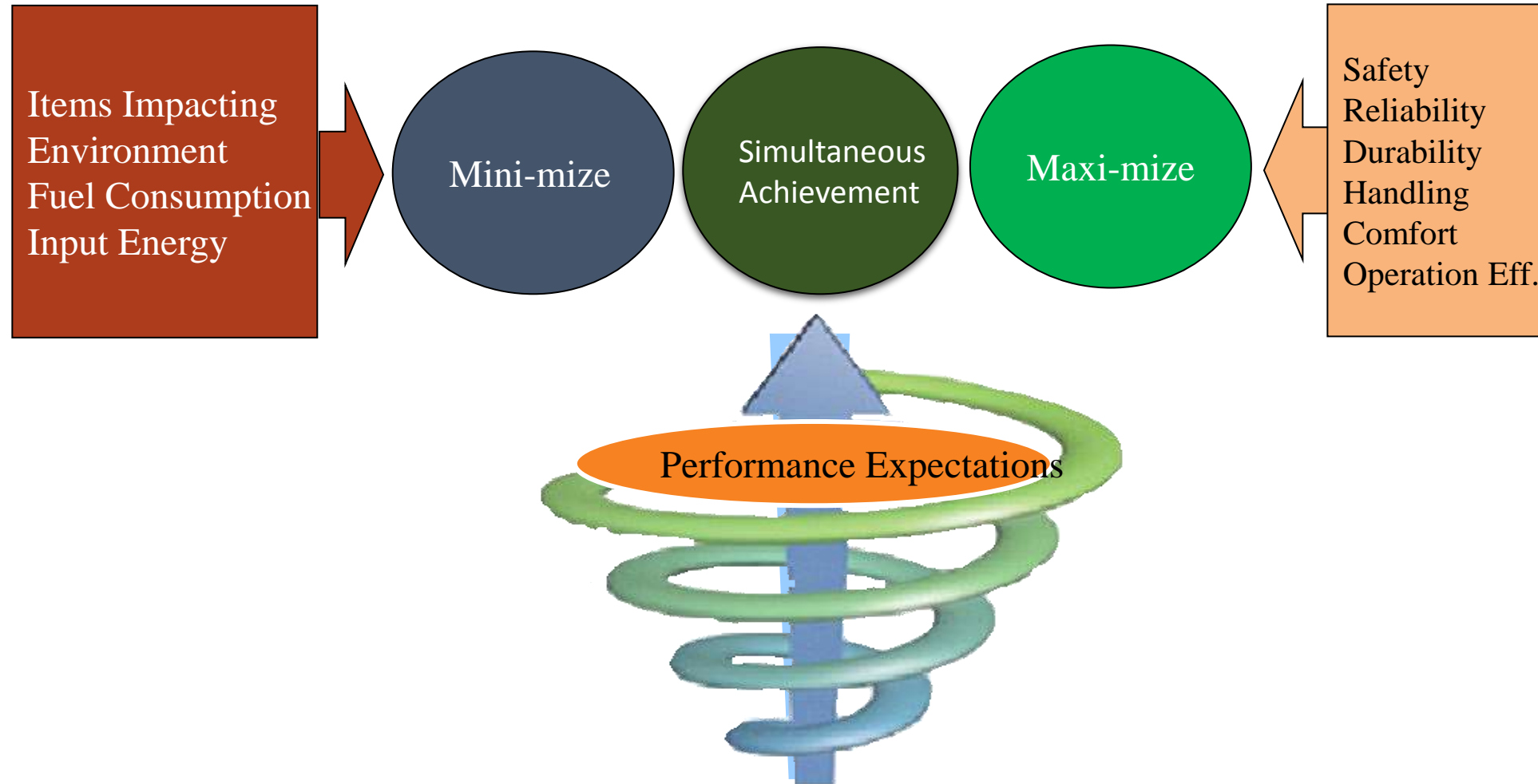
- ❖ Green Mobility
- ❖ Design, Equipment Selection
- ❖ Monitoring Process
- ❖ Improvement – Employee Engagement
- ❖ Developments
 - By Us
 - By our Suppliers



GREEN MOBILITY

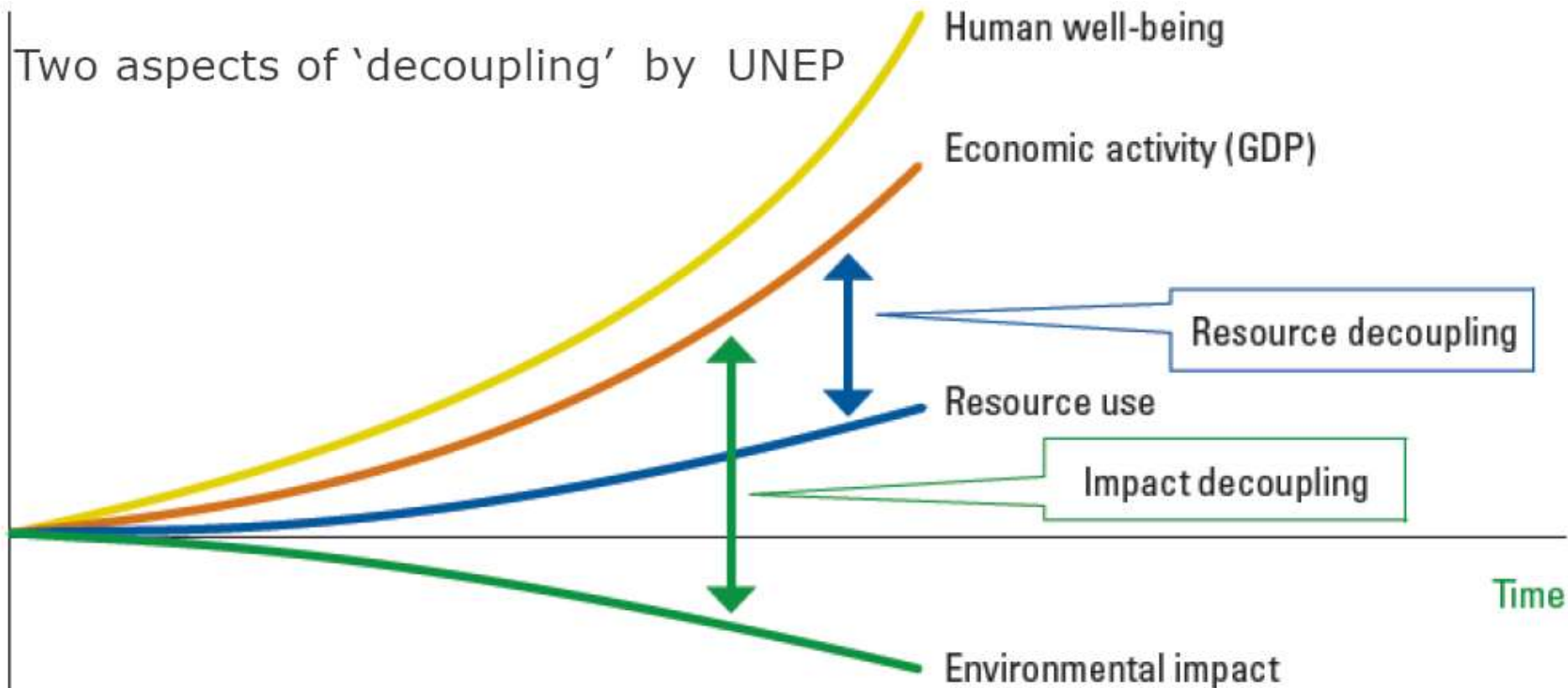


Green Mobility – OEM and Customer Needs





Green Mobility – How ?



Isolation of the causal correlation between:

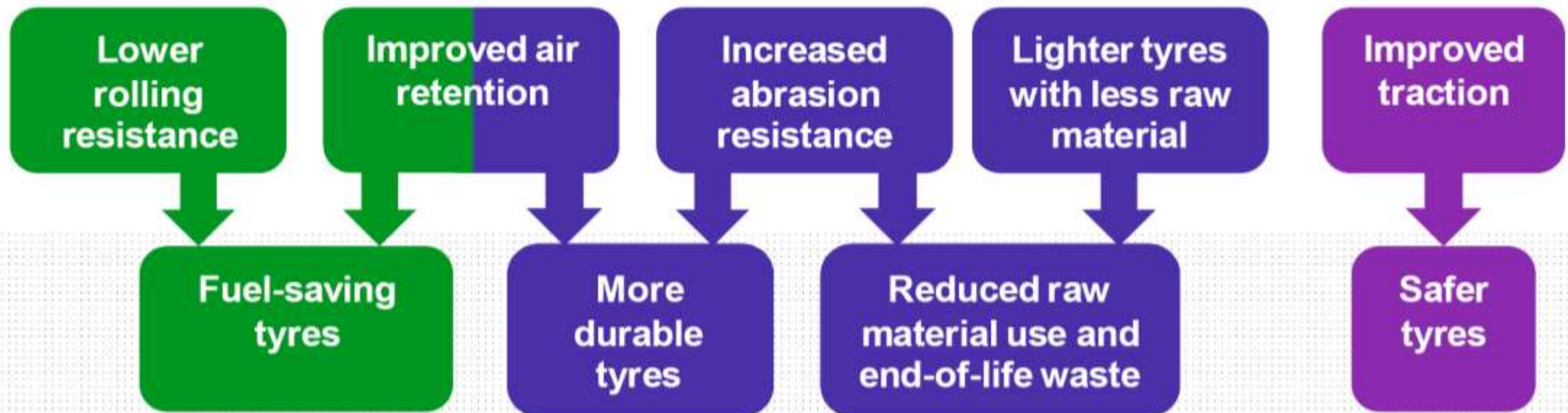
- population increase / economic growth
- resource consumption / environmental impact



Tyre Properties and Related Performance Improvements

- Key:**
- = Related to fuel-saving tyres
 - = Related to lighter or more durable tyres
 - = Related to safer tyres

Tyre properties



Performance benefit



Green Mobility – How?

1 - New Concept Development

- Dematerialisation
- Shared use of the product
- Integration of functions
- Functional optimisation of products & components

2 - Selection of low impact materials

- Non-hazardous materials
- Non-exhaustable materials
- Low energy content materials
- Recycled materials
- Recyclable materials

3 - Reduction of material

- Reduction in weight
- Reduction in (transport) volume

8 - Optimization of end-of-life system

- Reuse of product
- Re-mfg./refurbishing
- Recycling of materials
- Clean incineration



4 - Optimization of production techniques

- Fewer production processes
- Low/clean energy consumption
- Low generation of waste
- Few/clean production consumables

7 - Optimization of initial life time

- Reliability and durability
- Easy maintenance and repair
- Modular product structure
- Classic design
- User taking care of product

6 - Reduction of the environmental impact in the user stage

- Low energy consumption
- Clean energy source
- Few consumables needed during use
- Clean consumables during use
- No energy/auxiliary material use

5 - Efficient distribution system

- Less/clean packaging
- Efficient transport mode
- Efficient logistics



DESIGN & EQUIPMENT SELECTION



Site Location – Access to Public Transport / Shuttle Services

❖ Persons using Shuttle Bus facility
- **80.38%**

(Total Strength – 777 out of which 624 use the facility)



Staff shuttle services

❖ Persons with Housing facility within
6 Km radius – **62.46%**



Contractors shuttle services



Power Less Ventilation

- Turbo Roof Vents for Powerless Ventilation – 510 Nos.
- North / Day light provision in PEB



Per day equivalent
energy saving is
4646 KW
(considering 0.25 HP
motor)





Day Light Utilization - Lighting



Maximum utilization of Day light as a substitution of Electrical light in day time by installing transparent acrylic sheets.



Low / No Power Consumption - Lighting



LED Lights(100 Watts) are being used in place of metal halide lamps



Solar Light pipes in our office



Selection of High Energy Efficient Equipments



Vapor Absorption Chiller IPO Vapor Compression Chiller



AFBC Coal Boiler IPO Oil Fired Boiler



Screw type Compressor IPO Reciprocating Compressor



Fanless Cooling Tower IPO Fan Cooling Tower



Selection of High Energy Efficient Equipments



Dome Type Curing Press in other Tyre Plants



Platen Type Curing Press in CTP





Water Conservation – Rain Water Harvesting





Water Conservation – Rain Water Harvesting

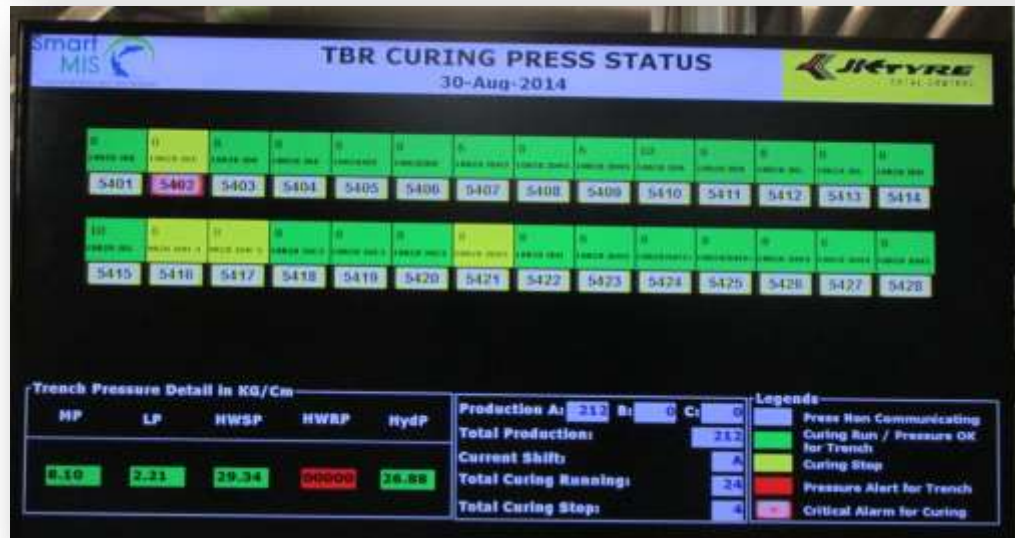
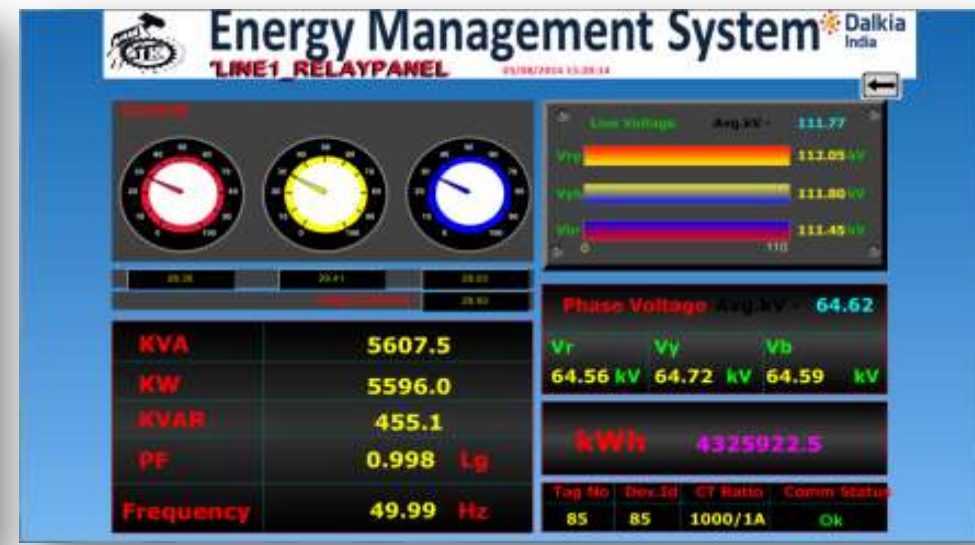
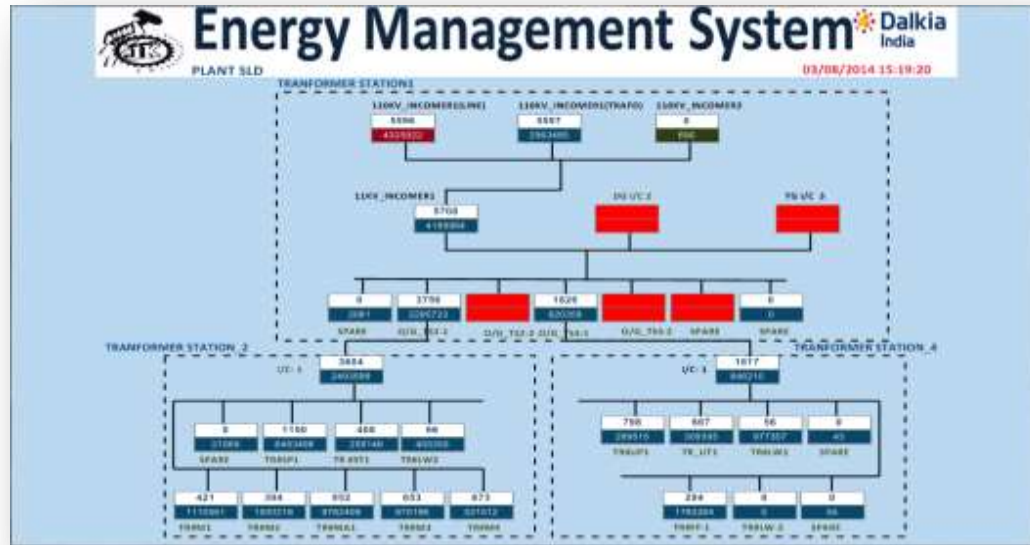




MONITORING PROCESS

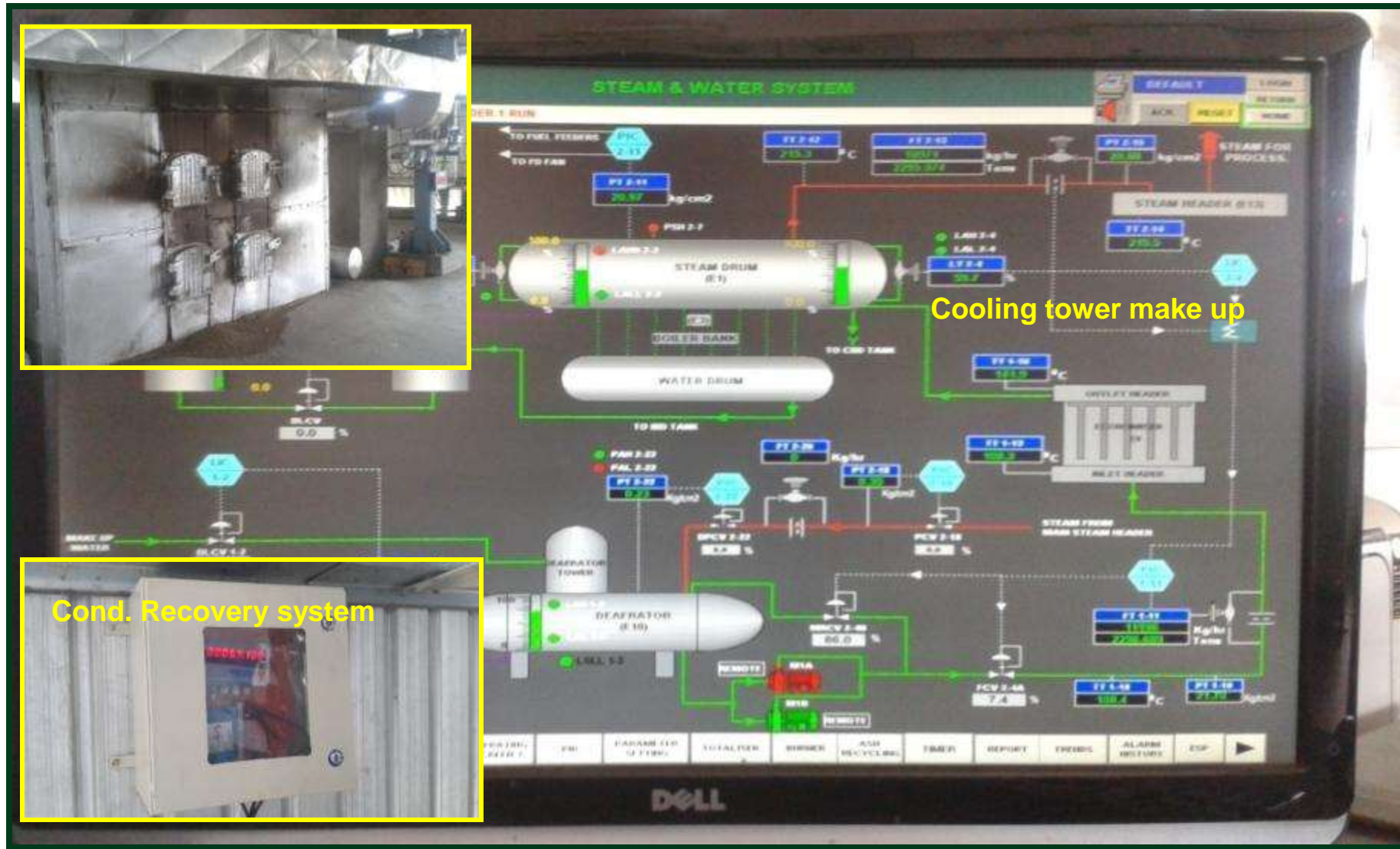


Online Monitoring Systems using SCADA





Water Metering at Boiler



Cooling tower make up

Cond. Recovery system



Water Metering at Critical Location

WTP – ultra filtration plant



WTP –Ro plant (process)



Canteen



Cooling tower make up





Meters across the Plant - Thermal

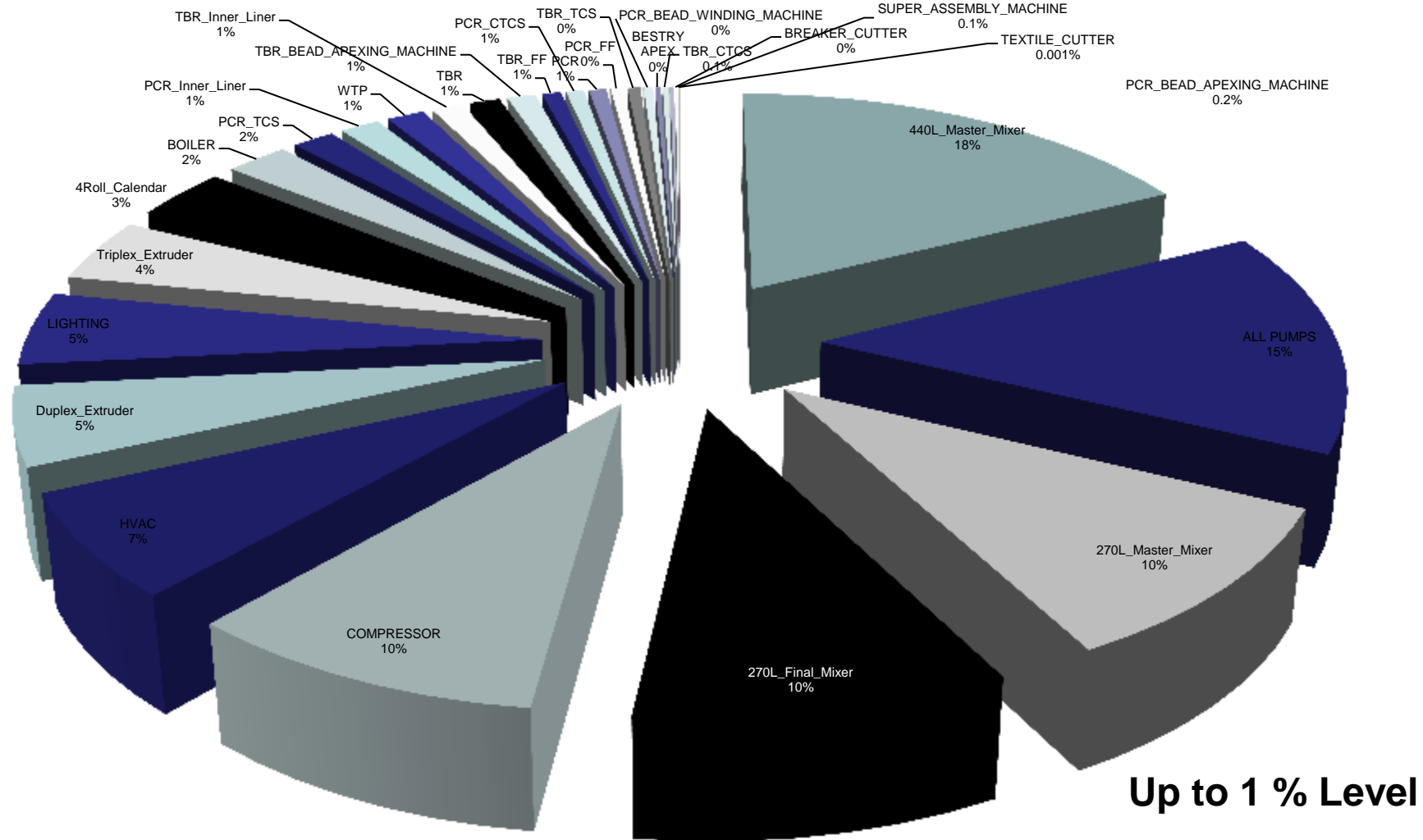
Online Pressure transmitter at PRS station



Steam Flow meters at PRS station



Energy Monitoring – Even at 1% level





Maintain Power Factor

CAPACITOR PANEL (APFC) DETAILS

❖ AREA

- ✓ FOR PCC-UT#1 (800KVAR)
- ✓ FOR PCC-UP#1 (800KVAR)
- ✓ FOR PCC-FF#1 (800KVAR)
- ✓ FOR PCC-SP#1 (800KVAR)
- ✓ FOR PCC-ST#1 (800KVAR)
- ✓ FOR PCC-MA#1 (800KVAR)

We have achieved an average P.F OF 0.994





Monitoring System – At High Energy Consuming Area

- Power consumption is being monitored in real time using SCADA system at machine locations.
- Idle running of the equipment can be detected by referring the production in each equipment (hourly/shift wise)
- Continuous improvement is carried to reduce specific power consumption.





DEVELOPMENTS



Energy Efficiency Improvements



In PLC, Separate logic has been created for Automatic Stoppage of Mixer Auxiliaries if Idle run for more than 10 min



In PLC, logic has been created for Mixer Batch off Line Fan and Hydraulic motor run with Line running only



PLC programming modified for Extruder Auxiliaries operation is interlocked with line run and material present condition



Energy Efficiency Improvements

Increasing Productivity 3 times by introducing multi apexing unit in PCR Bead Apex machine with single extruder

Production Increased 2.8 Times





Energy Efficiency Improvements

STEAM CONSUMPTION REDUCTION - DISTRIBUTION HEADERS TRAPS

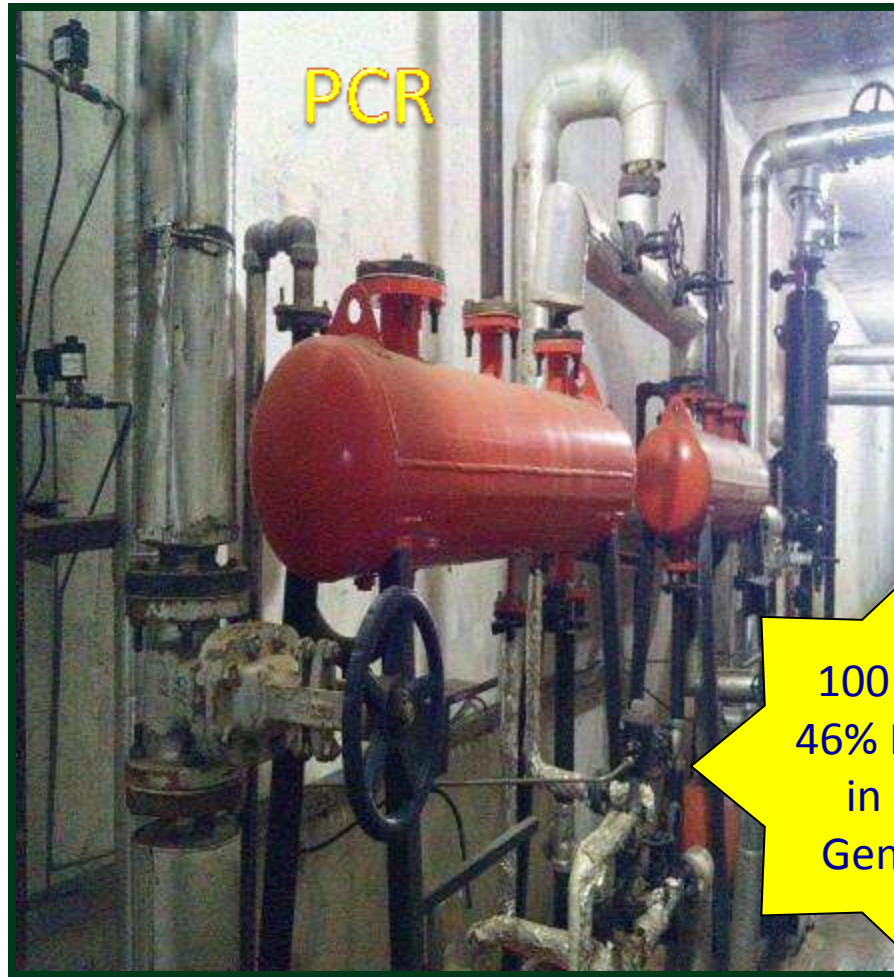


25 MTPD
Saving

Savings realised 25 MTPD. DM Water consumption reduced from 135 to 110 KLD



Projects to Recycle Process Water – Curing & VAM



100 KLD i.e,
46% Recovery
in Steam
Generation

Condensate Water recycling back to Boiler



Steam & Water Projects - Curing

PCR Bladder Flash to Boiler
Deaerator & Condensate Water
Recovery to Hot Water System

7 KLD
Saving

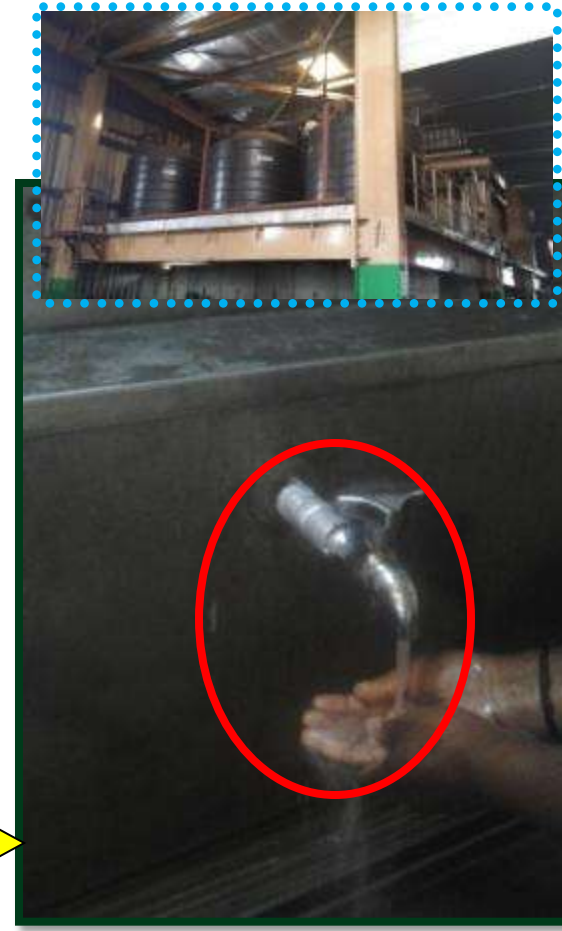




Domestic Water Projects – Drinking & Service Water



Pressurised Supply



Gravity Supply With ORIFICE

4 KLD
Saving



Installation of IRF & UF to Reduce Chemical Cleaning Effluent / Frequency of RO Plant (Process)



1.5 KLD
Saving

Cleaning Frequency reduced by 50%



Projects to Reduce Fresh Water Consumption

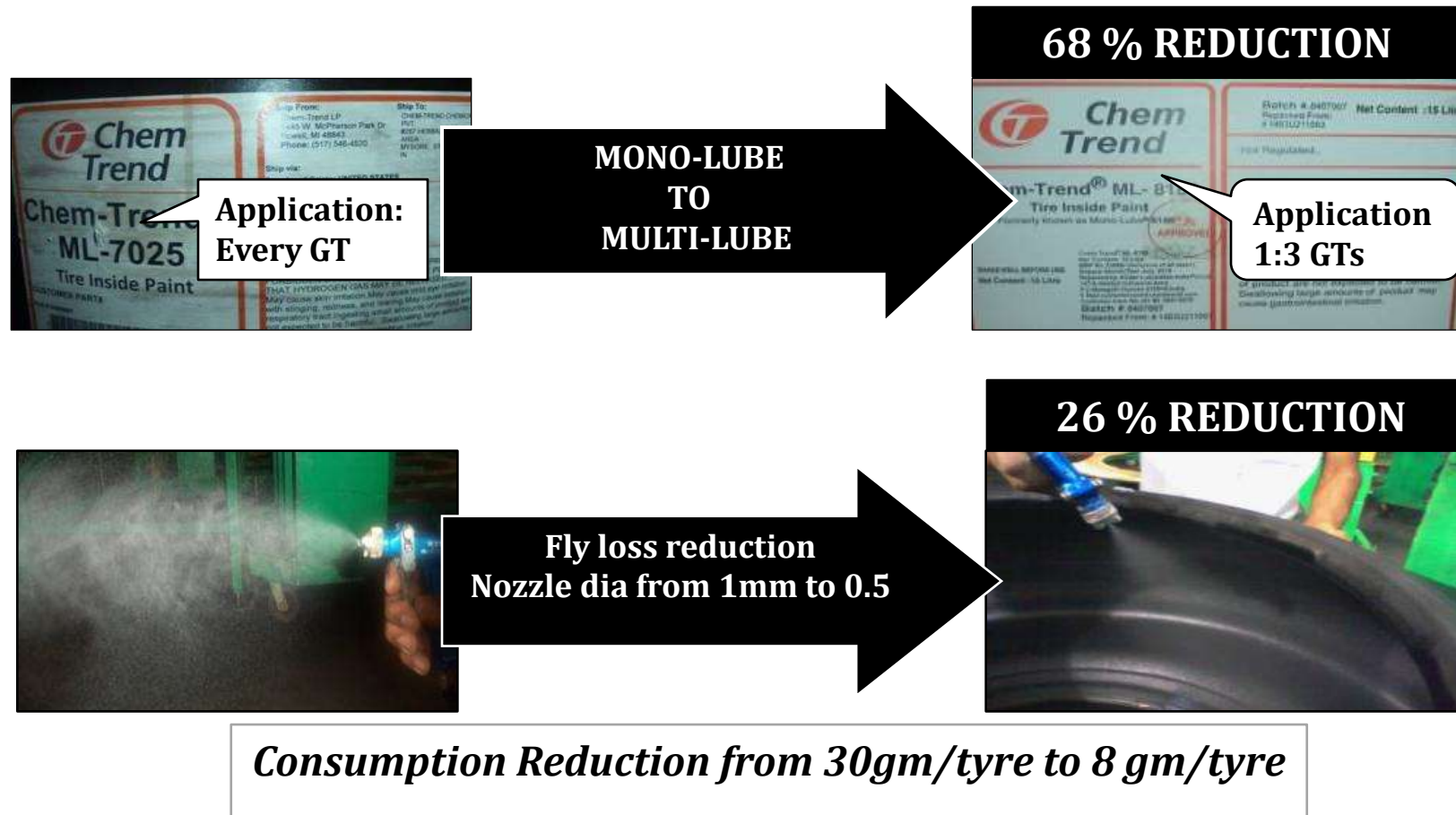


VAM CT Blow Down used as Ejector CT Make up to reduce Fresh Water Consp.



Raw Material Conservation

➤ REDUCTION IN LUBE CONSUMPTION:





Dust Carbon Recovery

A direct line from dust collector to mixer is connected with weighing system.

CARBON RETRIEVED BY DCS : 350 kgs/ per month

*1.5% in TOTAL CARBON USED is replaced
with RECOVERED CARBON per batch*

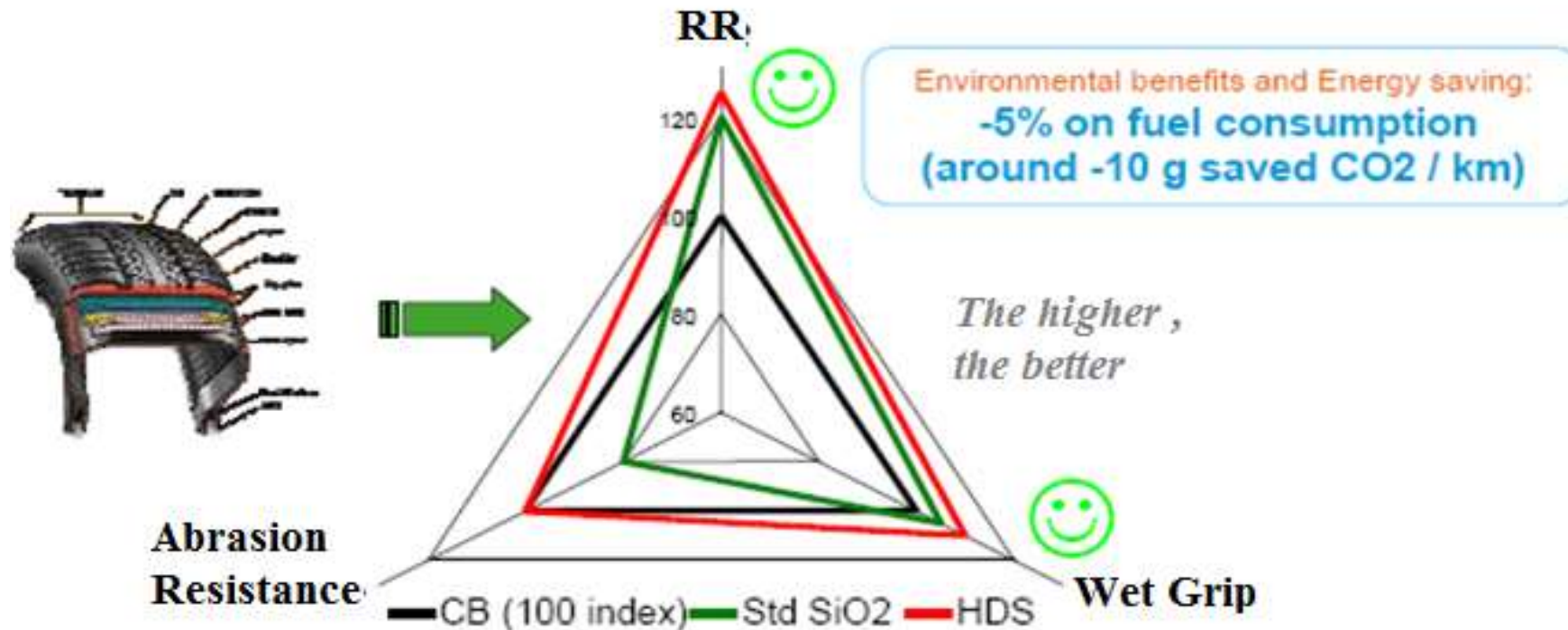


DUST COLLECTOR SYSTEM



GHG Emission Intensity Reduction

In the 90's, the modification of the PC Tire Tread using the combination of a highly dispersible silica, a coupling agent, a specific elastomer and an adapted rubber process technology enabled the development of the Green Tire.



Impact of Low Rolling Resistance : 5% fuel consumption reduction (10gms CO₂ saved per kg)
Retreadability increased for Truck from 1.8 times/to 2.2 times



Oil Reclamation

INTRODUCTION

For every alternate filling of the tank of dust seal oil, the oil which drains from the mixer dust top will be reused after reclamation process. The process will be carried out in house facility .



ADVANTAGES

- ✓ Green strategy (cradle - grave) adopted.
- ✓ Cost saving for the company

Oil Filtration

- Increasing drain intervals of oil in gearboxes
- Increasing the life of oil being used in the system
- Reduce used oil generation
- Improves the life of machine parts
- Recycled Quantity : 12740 Liters

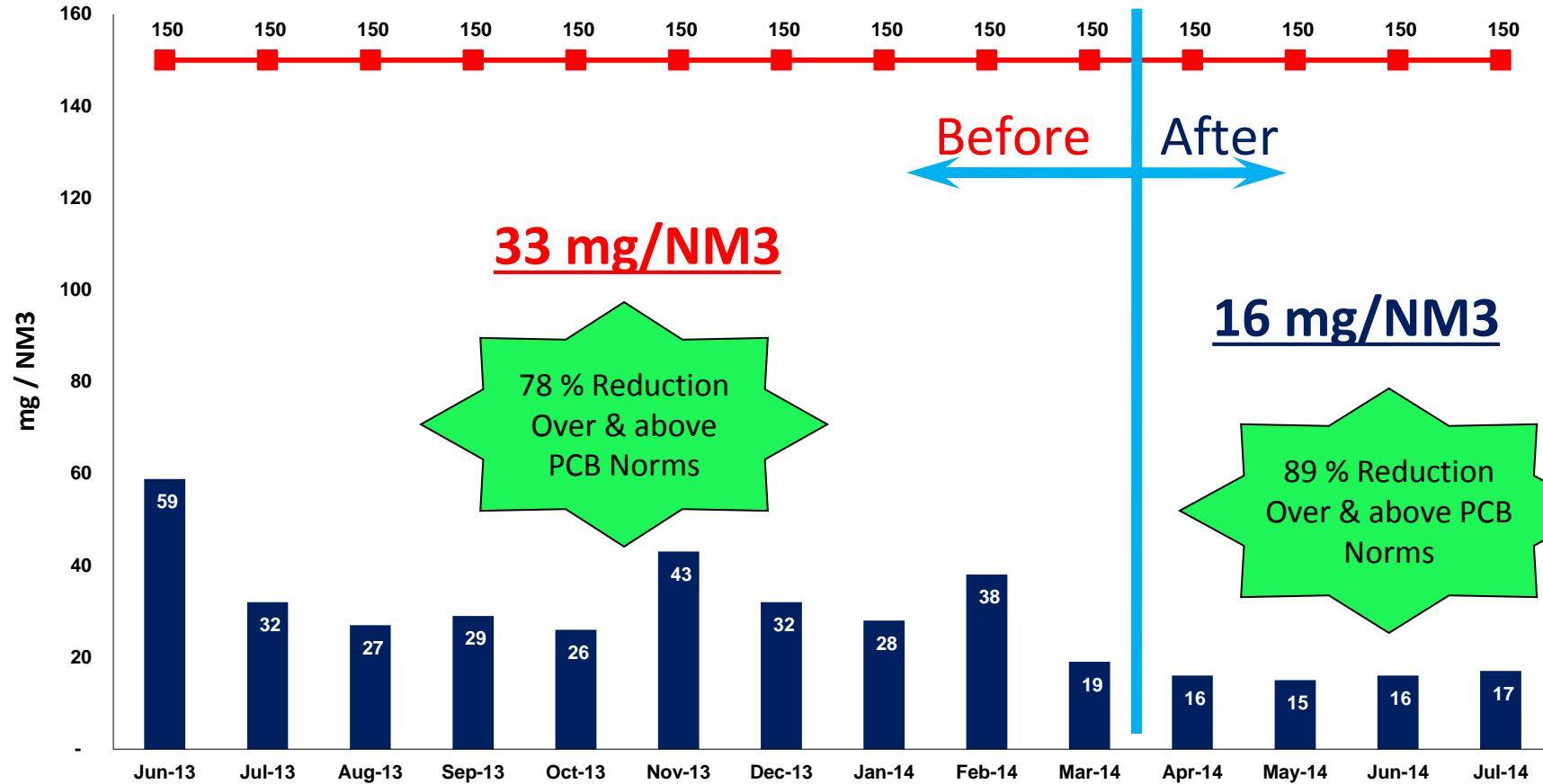




Gaseous Waste Management

REDUCTION IN BOILER STACK AIR POLLUTION

Boiler Stack Emission - (Actual Vs Norms)





Gaseous Waste Management

USAGE OF LOW ASH CONTENT - HIGH GCV COAL FROM APR '14

Coal GCV Vs Ash Generation / Disposal



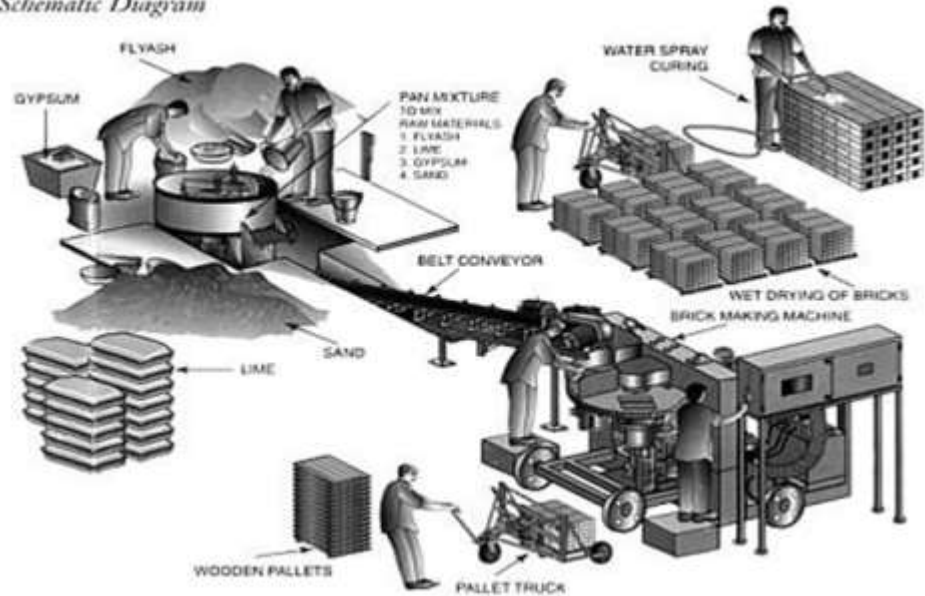


Gaseous Waste Management

DISPOSAL OF FLY ASH – BOILER (GRAVE TO CRADLE)

Alternate use of Boiler Fly Ash as Raw Material in
Brick Manufacturing Process (TNPCB Approved Agency)

Schematic Diagram



Brick
Manufacturing
Machine



Fly Ash Brick



Green Belt & Landscaping

PLANTING THE SAPLINGS





Green Belt & Landscaping

We have earmarked 25 Acres of the total area of 101.07 Acres of land exclusively for Green Belt development

We have also developed green belt of 5mt width all along peripheral boundary of our site and trees planted at every interval of 3mts and planted 400 trees per hectare





Green Belt & Landscaping





Green Belt & Landscaping





DEVELOPMENTS AT OUR SUPPLIER END



Green Supply Chain – Procurement Guideline

- Energy efficiency gets reflected in all Purchase documents.
- Taking measures in EMS being Proactive, innovative and cost effective including procurement of energy efficient products & services.
- For all Raw Materials, Green initiatives like packing standards etc., form part of Specifications issued to suppliers and specification forms an integral part of the Purchase contract.
- Working closely with suppliers having manufacturing plants in South also to cater to requirements of our plant. Eg. :- Carbon Black, Zinc Oxide, Bead wire, Reclaim rubber, Stearic Acid .
- Visiting Suppliers plants and evaluating green initiatives at their sites



Green Supply Chain – Procurement Guideline

- **Transport route optimization:** Raw material supply truck used to carry our finished goods to various customers and depots.
- We minimise the transit distance by selecting the vendor which is near to our plant.

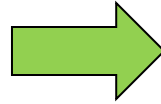
We are avoiding Transportation distance of material approx. 13 lac kms per year.





Green Supply Chain – Procurement Guideline

Silica was received in Paper bags of 25 Kg which has been changed to jumbo bags of capacity 400 Kg





Reduction of Packaging Material in RM

➤ **ELIMINATION OF WOOD PACKING IN Natural Rubber :**

Domestic packing of NR – in form of bales as such.



➤ **USING RE-USABLE METAL BINS in place of wooden packing for synthetic rubbers. The same bins are returned back to vendor for reuse.**





People Involvement

1. **Class room training** –All Employees were trained with Green Initiatives like plant Energy consumption & Energy efficiency methodology in planned intervals
2. **Visual aids** – Training has been taken with different visual aids for better understanding on Green Initiatives.
3. **Displaying posters** – On shop floor stickers/posters were pasted to create awareness in every individual.
4. **Cross Functional Team /Kaizens** – In shop floor, CFT Approach followed to understand the Energy consumption & process of their equipment/machine.
5. **Motivation by Awards & Recognition** – Awards & recognition has been given to employee upon their performance which can be indicated as KAIZEN's etc.,

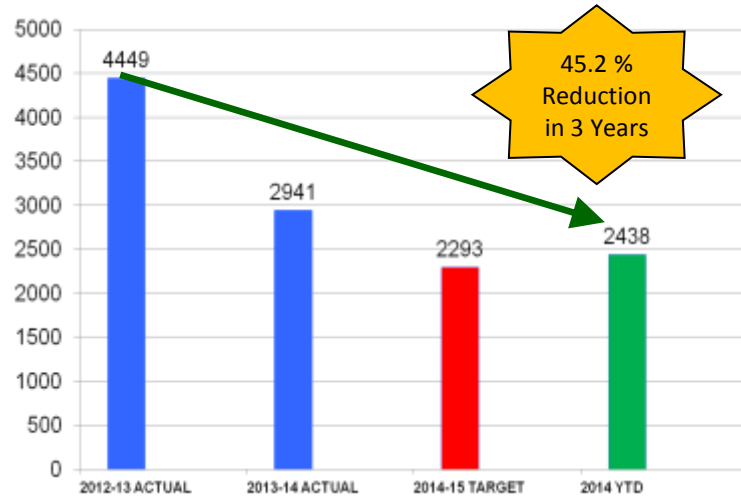




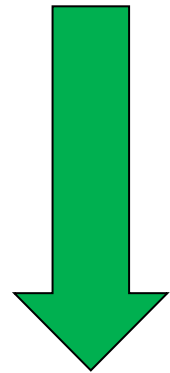
RESULTS OF GREEN INITIATIVES



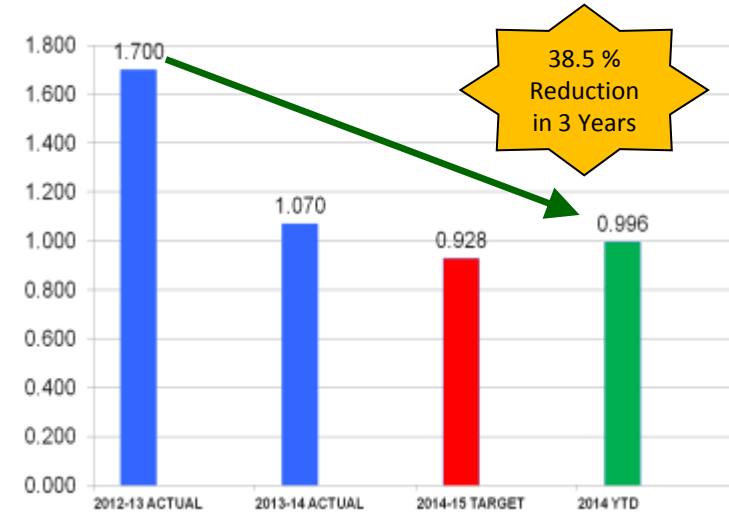
Results - Specific Consumption



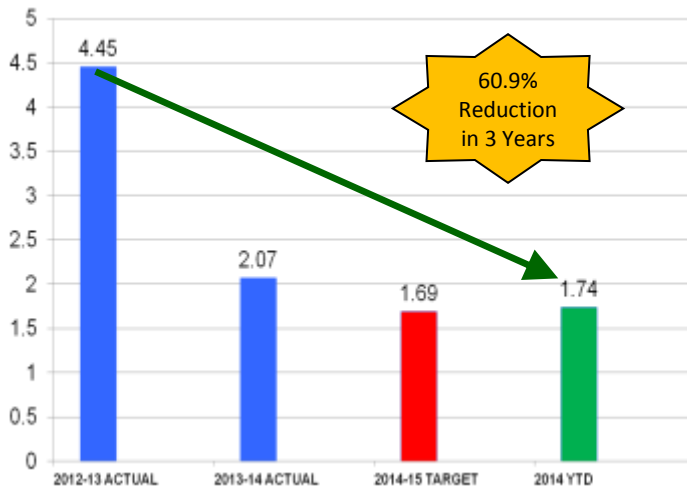
Total Energy



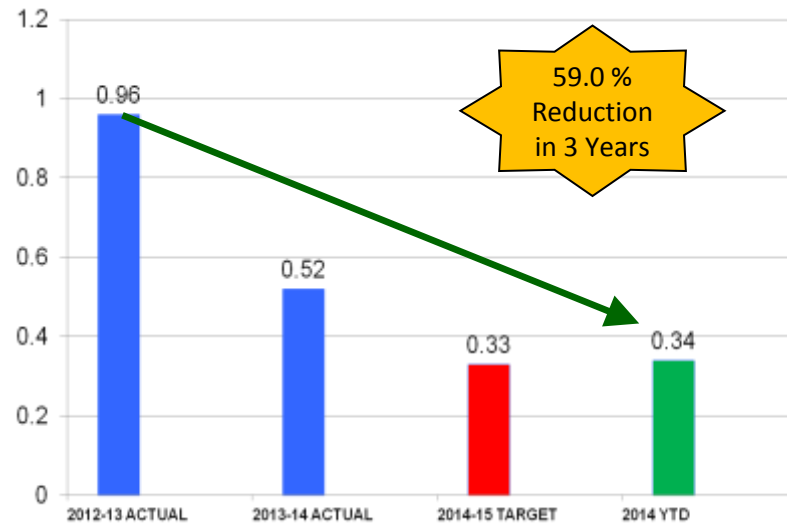
Good



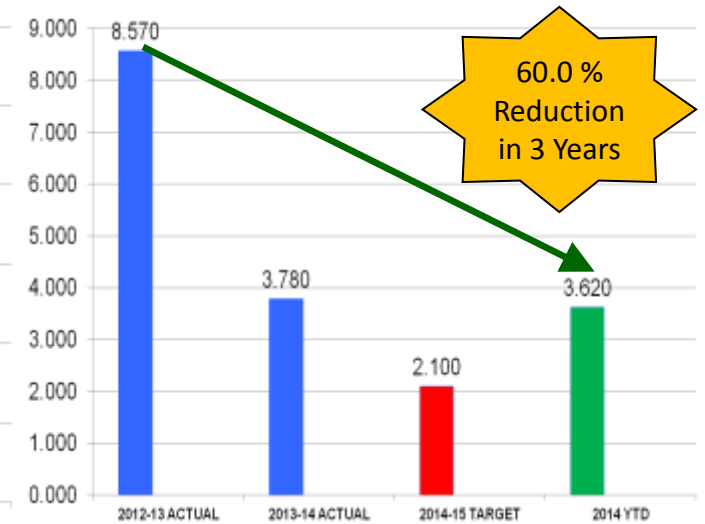
Power



Steam



Coal



Water



Results Achieved

- ❖ Reduced Energy Consumption by **38.5%**
- ❖ Reduced Steam Consumption by **60%**
- ❖ Monitoring system for **100%** Energy Consumption
- ❖ Reduction in Coal Consumption by **59%**
- ❖ Reduced Water Consumption by **60%**
- ❖ Scrap reduction by **63.69%**
- ❖ Improvement in performance of Tyre
Low rolling resistance to reduce **5% less Fuel Consumption and GHG emissions**



Green Co – Gold Award

“Greenco Gold” company by CII-Godrej GBC in November 2014. JK-Tyre Chennai Tyre Plant has been certified as a .





Way Forward



Renewable Energy - Projects

Units/annum	Renewable Energy	Target 2015-2016
48 Lakhs. KWh	Installation of Solar PV panels at our Plant Roofs	4.8 % substitute of plant Energy consumption
106 Lakhs. KWh	Energy through Wind farming.	10.6% substitute of Plant Energy consumption

**15.4% substitute of Plant
Energy consumption**



Various projects to

- ❖ Reduce Energy Consumption
- ❖ Reduce Steam Consumption
- ❖ Reduce Coal Consumption
- ❖ Reduce Water Consumption
- ❖ Reduce Scrap and wastages
- ❖ Improve in performance of Tyre **to Reduce Fuel Consumption and GHG emissions**
- ❖ Reduce CO2 & GHG emission in all our processes.
- ❖ Work on and improve on – Rework, Reuse, Reduce, Renew



JK Tyre
Tested by champions.
Built for you.

Thank You



JKTYRE

TOTAL CONTROL

Visit us at www.jktyre.com