



# ENERGY CONSERVATION

# OBJECTIVES

To provide total solution to the customer by

- In-depth study of process & system
- Establishing the facts with actual measurements
- Comparison of existing performance with accepted norms
- Identify potential for savings and improvement

# ENERGY AUDITS & HOW GAINS ARE ACHIEVED

- Quantify Energy Consumption & Utilization
- Comparing present operating conditions with norms
- Norms are continuously getting better due to improvements
- Energy saving measures identified in 3 stages- short, medium and long term
- Working out detailed payback period for Investment Decisions
- Ultimate objective is to conclude whether the energy being spent is spent efficiently or not.

# METHODOLOGY



# BOILER HOUSE

- Establish present efficiency by direct and indirect method
- Estimate losses
- Study loading pattern for optimisation
- Study fuel handling system and fuel parameters
- Study blowdown aspects with respect to water quality
- Study of accessories (deaerator, feed tank etc.)
- Opportunities for waste heat recovery
- Burner retrofit.

# DISTRIBUTION

- Pipe Sizing & Layout
  - Check adequacy & recommend improvement
  - Identify redundant piping & optimise layout for reduced losses.
- Insulation
  - Check adequacy & estimate losses
  - Recommend improvements
- Air Venting
  - Identify locations
  - Recommend right type, size & quantity
- Metering
  - Identify locations
  - Recommend right type & size.
- Trapping
  - Trap survey & recommendations
  - Estimation of loss through leaks
  - Recommendations of trap monitoring.

# PROCESS AREA

## Metering :

- Identify Locations

- Recommend right type and size

## Pressure & Temperature control :

- Analyze the process requirements

- Recommend appropriate control equipment

- Identify locations for installation of pressure & temperature gauges & recorders.

## Trapping :

- Recommend appropriate type, size & installation

- Trap monitoring

# CONDENSATE & FLASH MANAGEMENT

- Estimate present condensate recovery & study existing system of recovery
- Quantify possible recovery and recommend optimization of condensate system.
- Recommend recovering flash steam from high pressure condensate
- Study feasibility of thermocompressor system

# COMPRESSED AIR INSIGHTS

## Generation

- Monitoring

- Annual operating costs / base load / peak load

## Distribution and Pressure Drop Analysis

- Quantification of consumption

- Pressure Drops / Air venting

- Analysis of Headers and Distribution Systems

## Plantwise Air Distribution Schematics

- Piping Schematics and Modifications

- Optimisation

## Leakage Control

# COMPRESSED AIR SYSTEM

- Establish Generation Efficiency (CFM per KWH)
- Identify & Evaluate cost of leakages
- Study of Compressed Air peripherals such as dryers, air receivers & traps.
- Recommendations for improving air quality
- Validating line sizing, layout & recommendation for optimisation
- Pressure drop calculations for air system
- Compressed air balancing with respect to generation & consumption
- Compressed air metering

# ENERGY AUDIT REPORTS INCLUDE

- Analysis of data collected from plant log-books and that generated by the field measurements
- Short, medium and long term investment proposals for energy conservation with complete cost benefit analysis
- MoU for implementation and performance monitoring

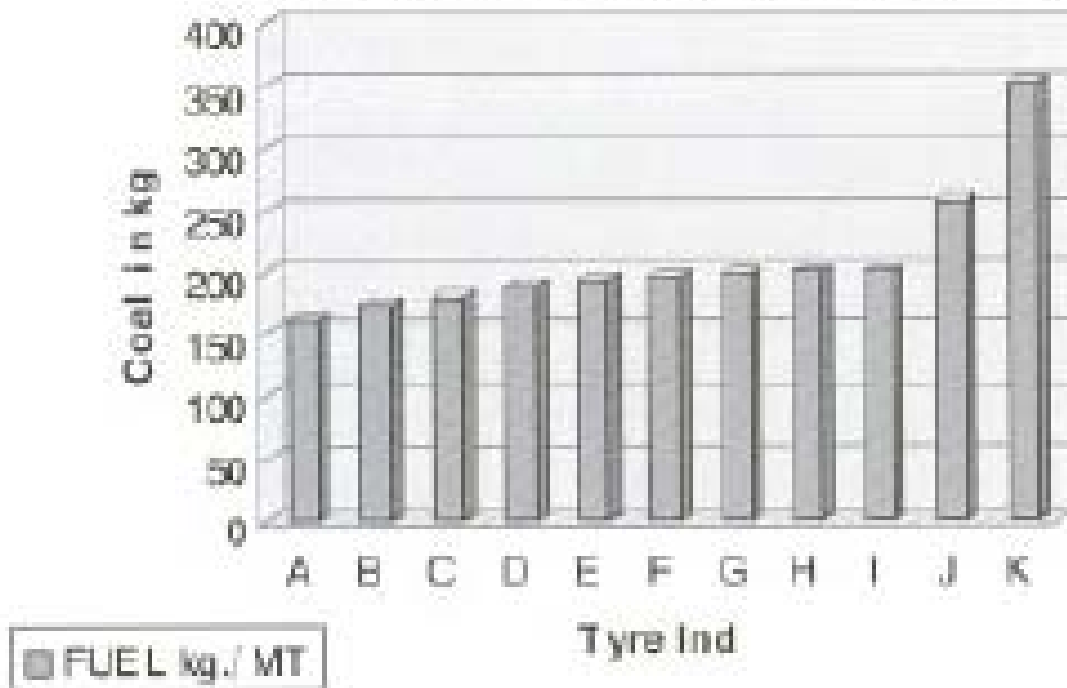
# BENCHMARKS OF SUCCESS

- Reduced Specific Energy Conservation.
- Increased process output.
- Improved product quality.
- Reduced down time.
- Reduced manpower requirement.
- Improved monitoring and control process.
- Direct monetary savings.

# TIME TO GET SPECIFIC

## Tyre Industry

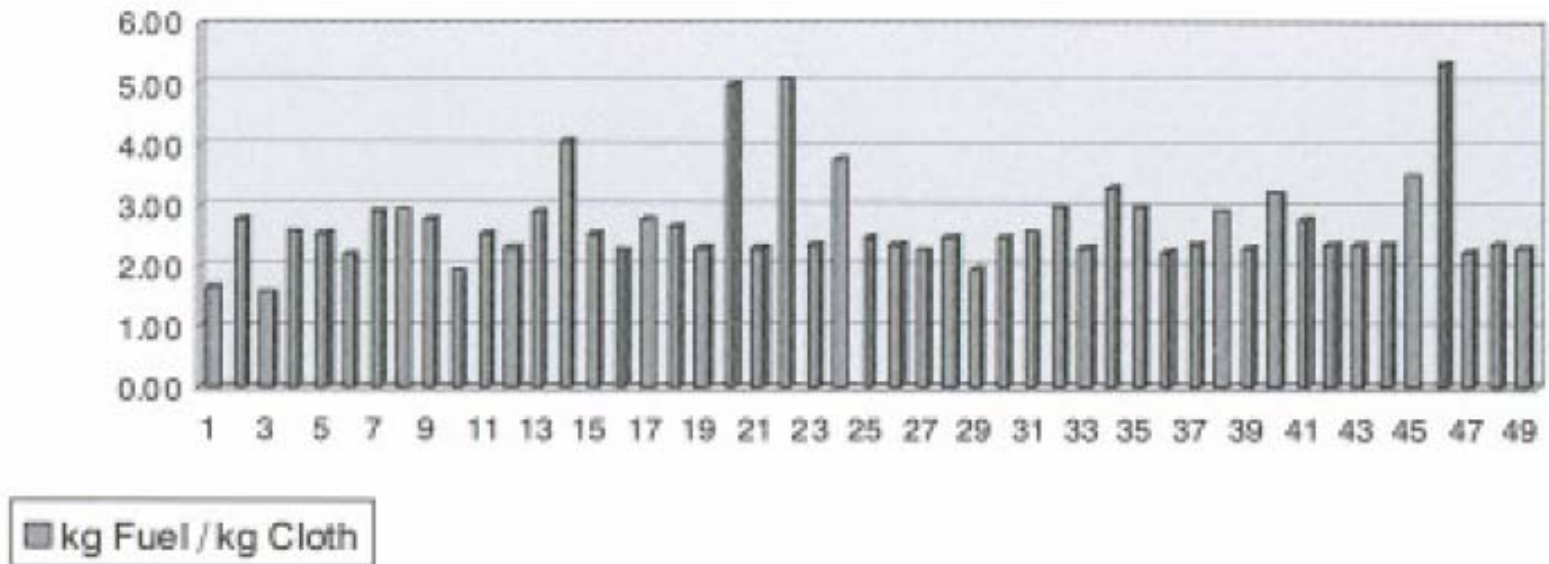
FUEL Consumption in kg./MT of Finished Tyre



# TIME TO GET SPECIFIC

Textile Industry - Tirupur

Fuel consumption in kg / kg

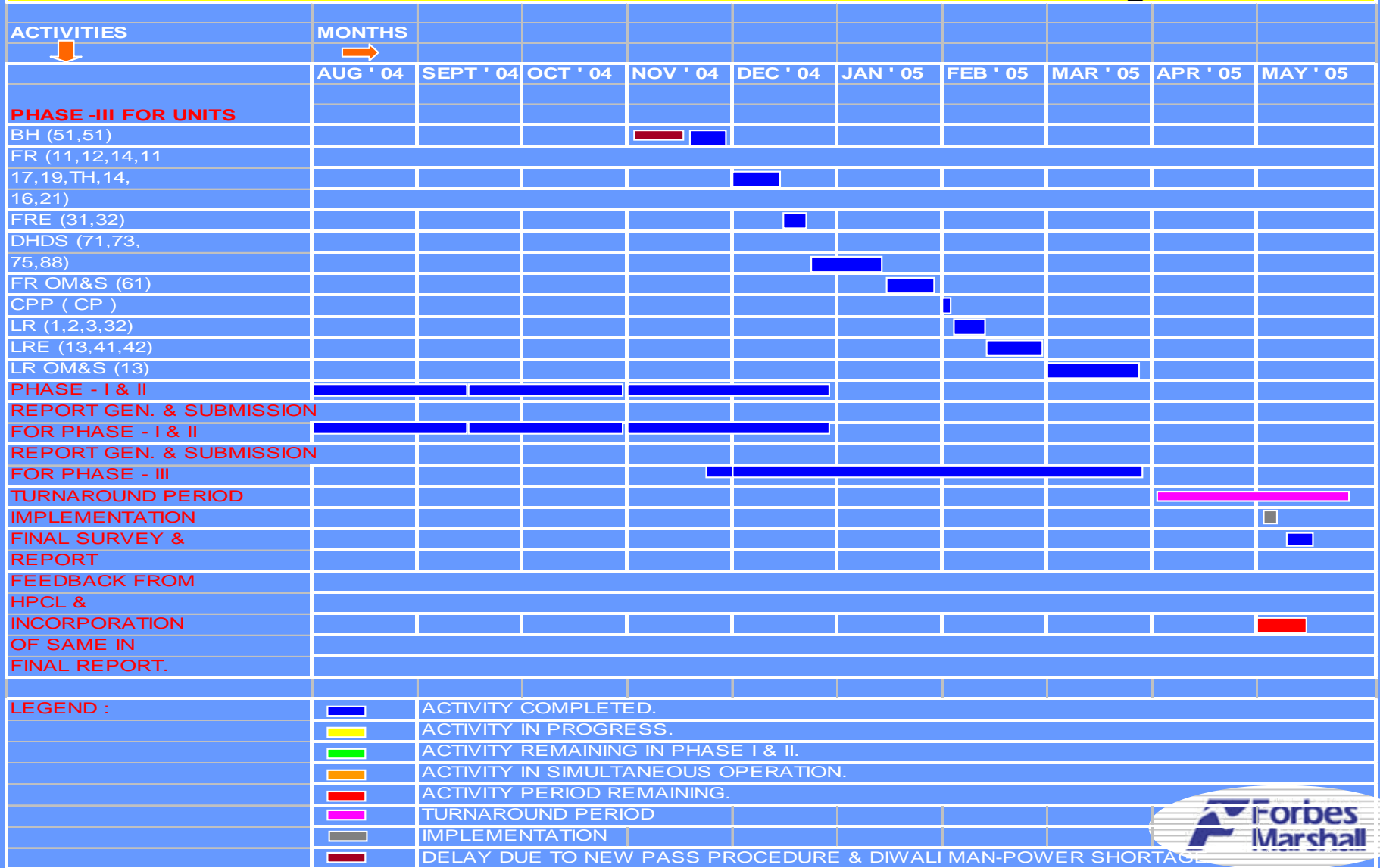


# % REDUCTION IN FUEL BILL CII-FM ENCON STUDY

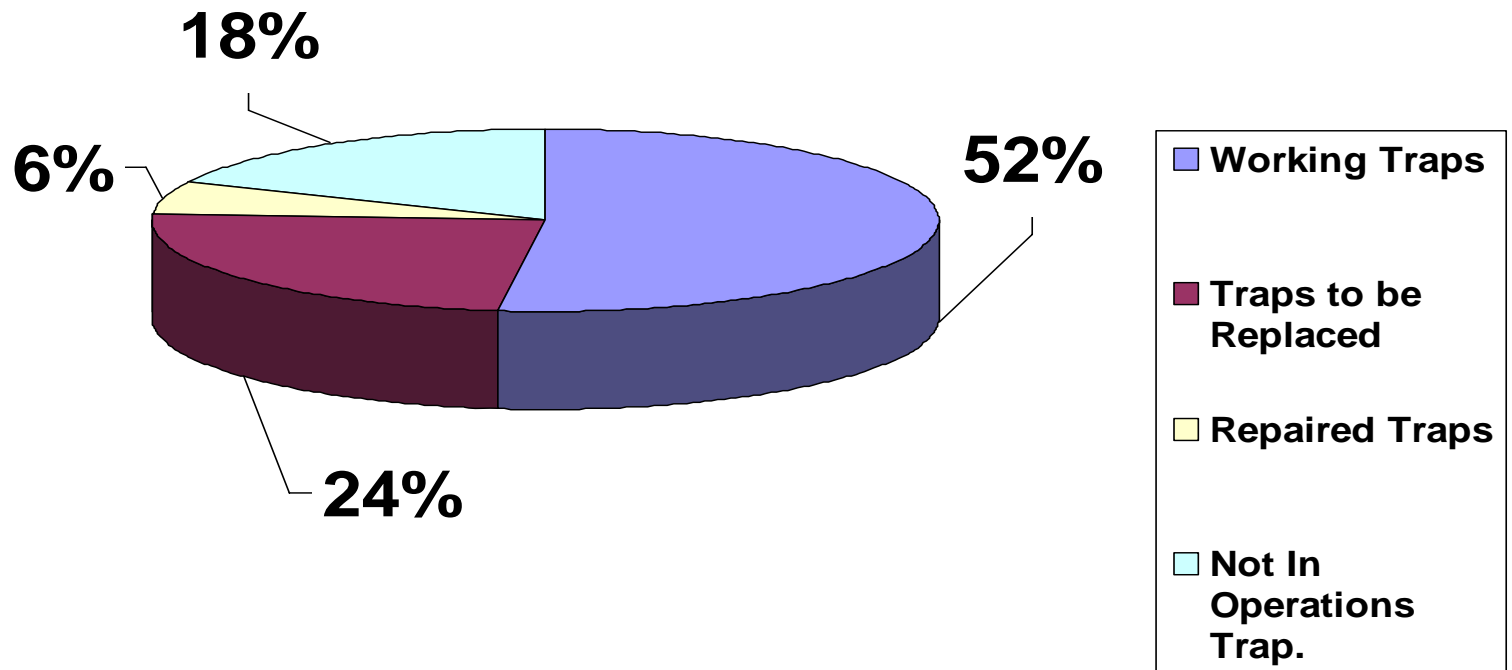
Industry	Steam Generation	Distribution & utilization	Condensate & Flash Recovery	Capacity Utilisation	Total
Tyre	9%	7%	7%	0%	23%
Solvent	7.5%	3.5%	3%	12%	26%
Brewery	7%	1.5%	2.5%	13.5%	24.5%
Beverage	9%	9.5%	2.5%	11%	32%
Textile	12%	7%	7%	NA	26%
Average	9%	6%	4%	9%	26%

# Success Story -1

## PROGRESS OF ZERO STEAM LEAK PROGRAMME - Leading PSU



# Results



# Results

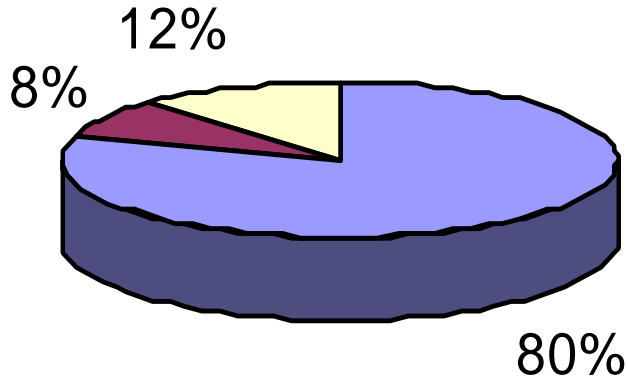
- “Zero Leak” of Trap System.
- Electronic Data Base with easy to understand nomenclature.
- Inventory Control.
- Activity completed in defined time frame.
- Training - On Job & Classroom.
- Documentation of Savings.
- Savings By Replacement Of Passing & installation of new trap at no trap locations is Rs. 9.2 Lakhs/Annum

# Success Story -2

## Objective:

- Health Monitoring Phase Basic EA Done To Establish Database, Performance of Traps.
- Defect Rectification Phase Repairs Supervision & On Job Training

# Results



- Traps to be replaced
- Traps already been replaced
- Traps Repaired

# Results

Total saving achieved by repairing and replacement of the steam trap is Rs. 51.32 Lakhs

Total saving to be achieved by replacement of the steam trap is Rs. 353.54 Lakhs

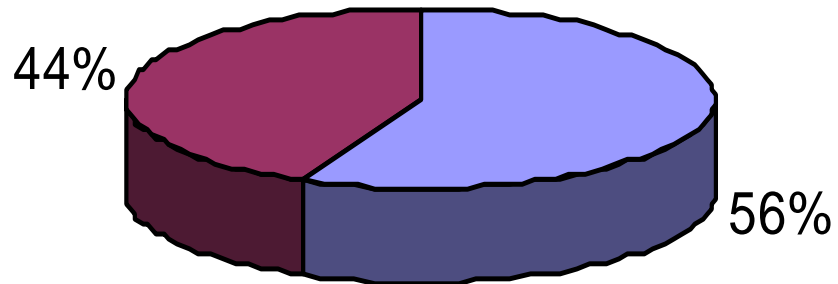
Total Investment = Rs. 35 Lakhs.

# Success Story -3

## Objective:

- Mapping of steam traps were done during this phase.
- Pre-Steamming Repairs/Maintenance Of Steam Traps & Replacement of Defective Traps.
- Steam Trap Module Audit after Steaming of the plant.

# Results



■ Traps Repaired  
■ Beyond Repair

# Results

- Total saving achieved by repairing of the steam trap is Rs. 134.2 Lakhs/Annum
- Total saving to be achieved by replacement of the steam trap is Rs. 297.1 Lakhs/Annum

## Performance curve for steam leaks upto round-5 @ HPCL Vizag

