

# **ENERGY CONSERVATION**

## **REALITY CHECKS**

**Lead to**

## **REALISABLE CHEQUES**

**Indian Chemical Council**

**Energy Conservation & Carbon Tradings**

**Centrum W.T.C, Mumbai - 3/4 Nov-06**

# ENERGY AUDIT

Leads also to

# INNOVATION

# 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**
- **Compare data with plant design norms**
- **Compare with benchmarked norms**
- **Energy saving measures identified in 3 stages-  
short, medium and long term**
- **Work out payback period for Investment  
Decisions**
- **Monitor implementation**

# 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**

# BOILER HOUSE

- **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

# DISTRIBUTION

- **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 needs
  - Identify locations for installation of pressure & temperature gauges & recorders.
  - Recommend appropriate control equipment

- **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
- Recovery of flash steam from high pressure condensate
- Recovery of Low Pressure Steam through Thermocompressor

- **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**

# COMPRESSED AIR SYSTEM

- **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:

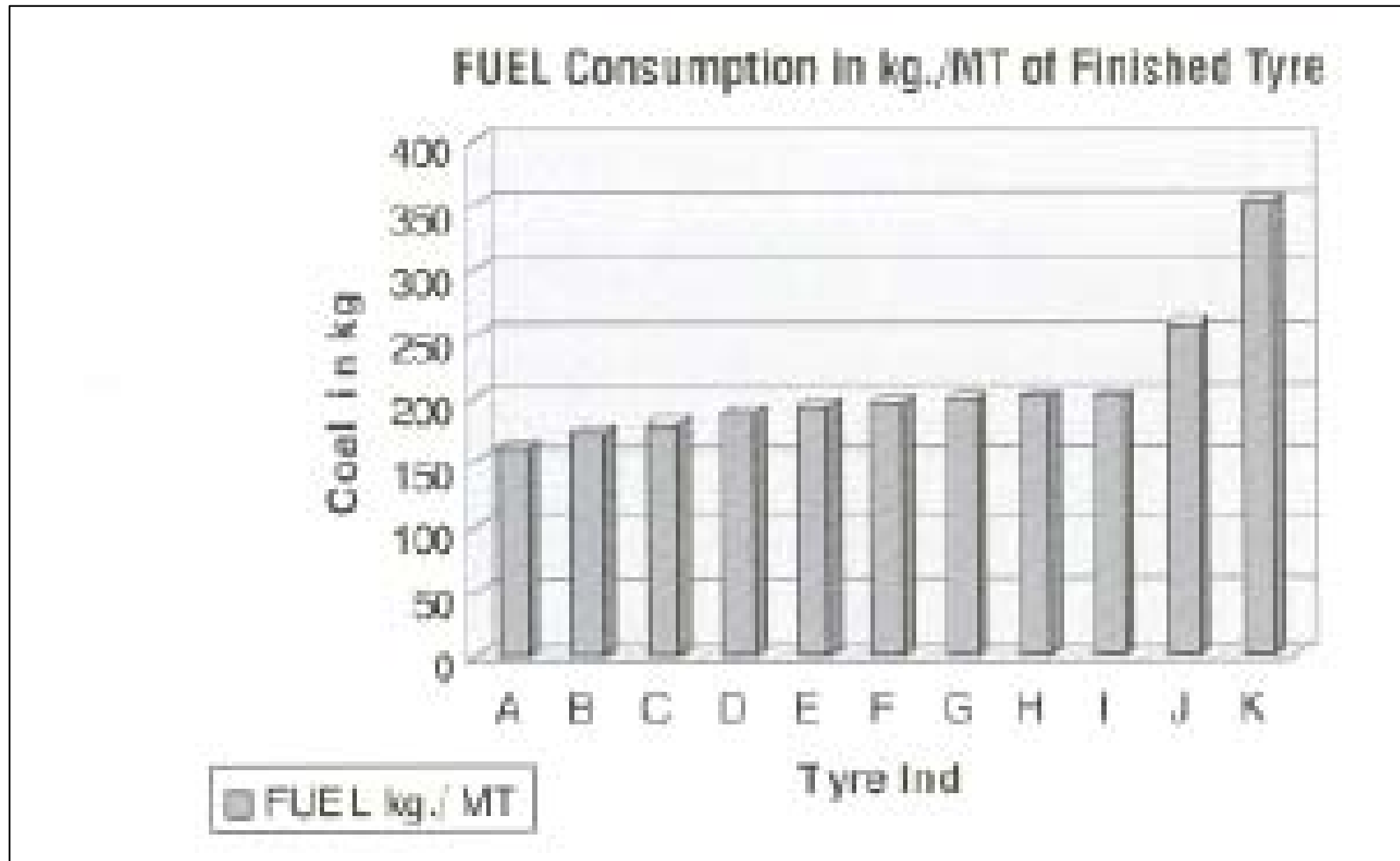
- **Analysis of data collected from plant log-books and generated by the field measurements**
- **Short, medium and long term investment proposals for energy conservation with complete cost benefit analysis**
- **MoU for implementation and performance monitoring**

# 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

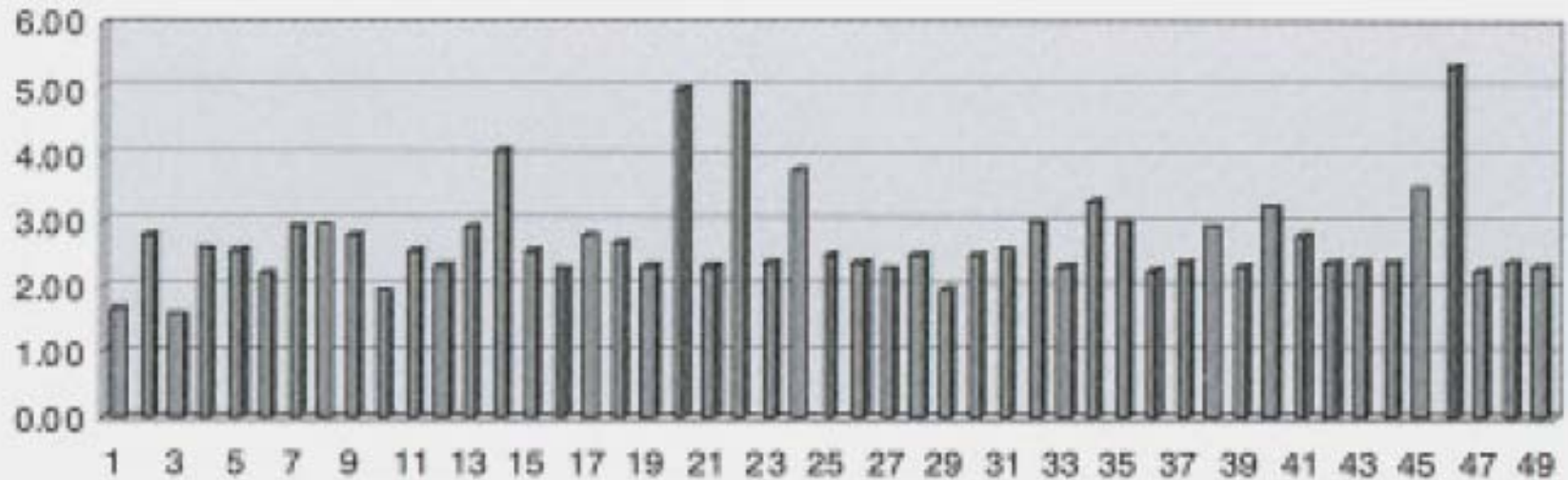
## Tyre Industry



# TIME TO GET SPECIFIC

## Textile Industry - Tirupur

Fuel consumption in kg / kg



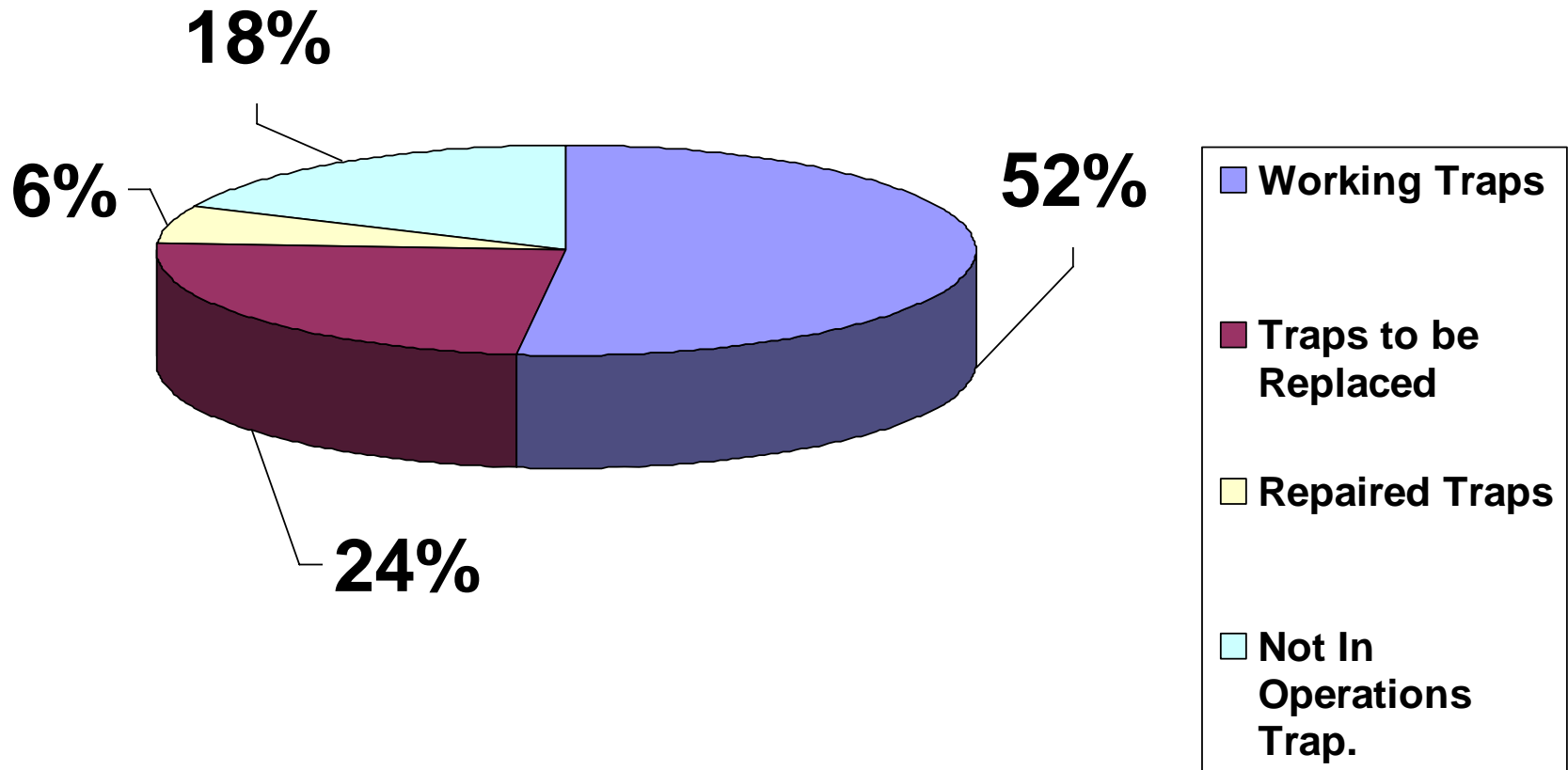
■ kg Fuel / kg Cloth

# % 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%



# Results



# Results

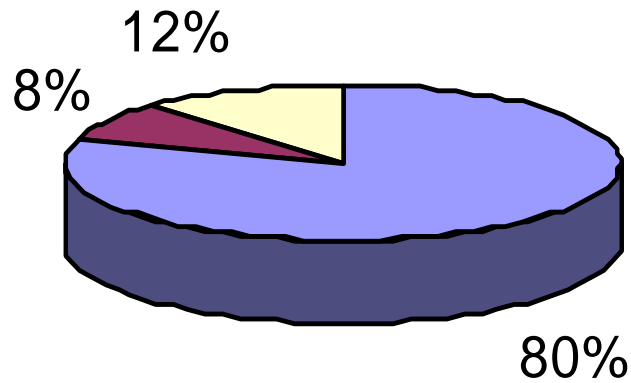
- **“Zero Leak” of Trap System.**
- **Electronic Data Base with easy to understand nomenclature.**
- **Inventory Control.**
- **Activity completed in defined time frame.**
- **Training - On Job & Classroom.**
- **Documentation of Savings.**
- **Savings By Replacement Of Passing & installation of new 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

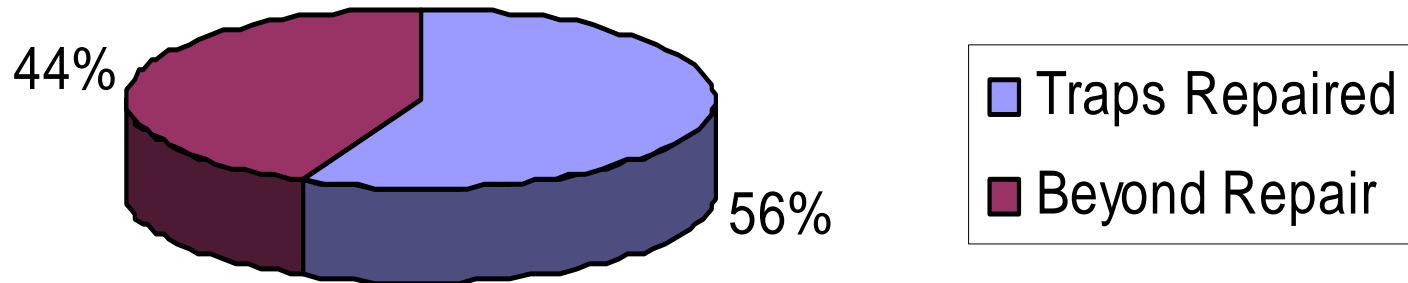
- **Total saving achieved by repairing and replacement of the steam trap is Rs. 51.32 Lakhs**
- **Total saving to be achieved by replacement of the steam trap is Rs. 353.54 Lakhs**
- **Total Investment = Rs. 35 Lakhs.**

# 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

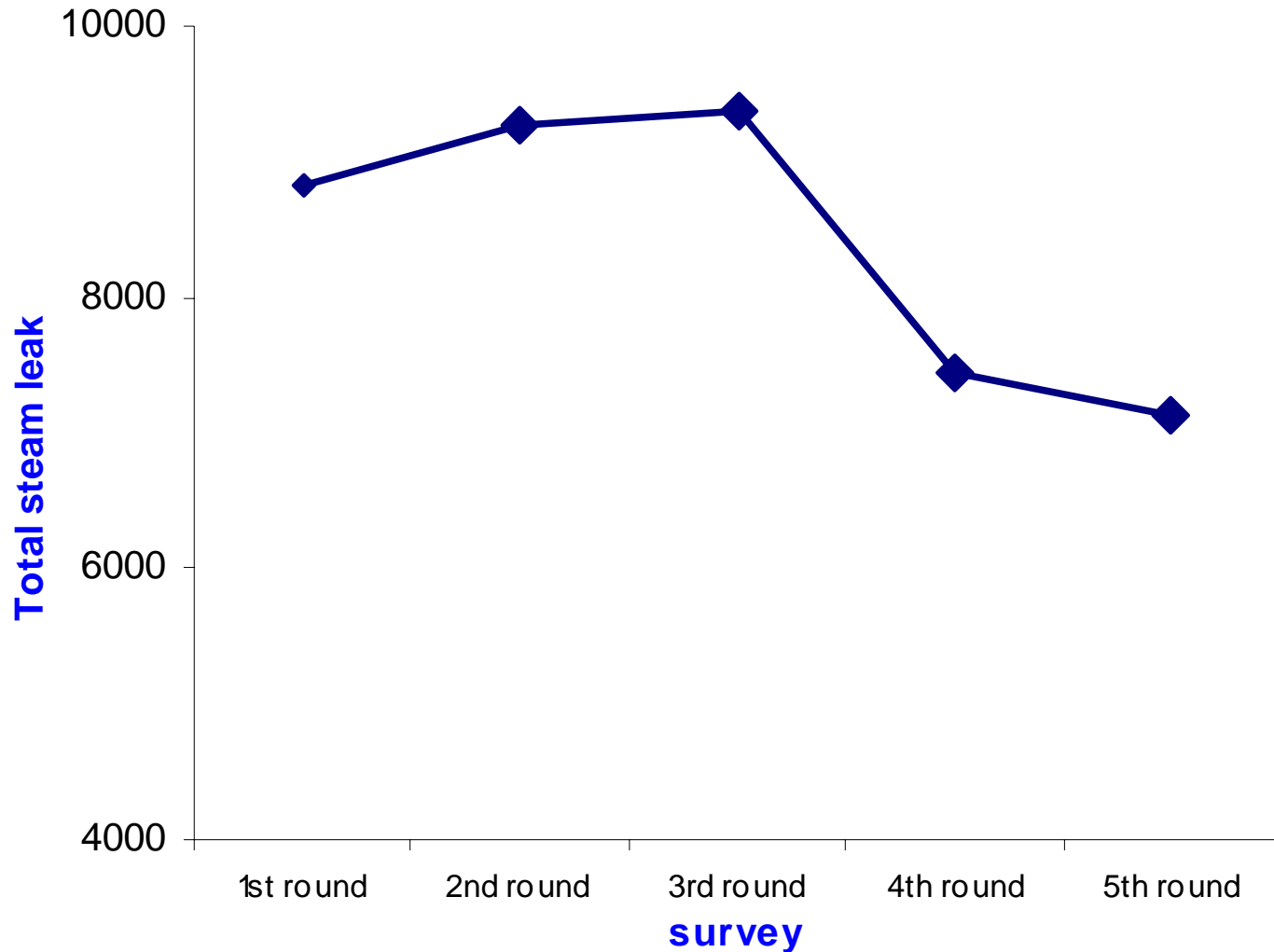


# Results

- **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 up to round-5 @ HPCL Vizag



**THANK YOU**

Ramani Iyer