

# Energy Efficiency Market Transformation Opportunities for Texas

September 13, 2007

## Non-Non Transmission Industrial Compressed Air Market Transformation

**SCOTT STROUP**, President  
Airometrix, Inc.

Mr. Stroup is a graduate of Colorado State University with a B.S. in Mechanical Engineering. Mr. Stroup has worked for energy service companies and consulting engineering firms where his primary focus has been industrial energy conservation. He has performed energy studies and audits in a wide range of industrial facilities from food processing to chemical industries, pharmaceuticals, pulp and paper, primary metals, and assembly manufacturing. Over time, he found himself increasingly focused on compressed air systems and this path culminated in the formation of Airometrix Mfg., Inc. in 1999. He is now President of Airometrix, a third party, independent consulting engineering firm specializing in performance testing of air compressors and providing air system evaluations. His firm performs air system testing and audit services throughout North America and have worked on systems from 25 hp to 25,000 hp. Mr. Stroup believes education is the key to energy efficiency and optimal system performance. He has been contracted as a corporate trainer at many large industrial facilities, utilities, and invited to speak at various trade shows and conferences nationwide.



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Managers of Texas**

Austin, TX

# Non-Transmission Industrial Compressed Air Market Transformation

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## EUMMOT Workshop Series

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Compressor Performance Testing

September 13th, 2007

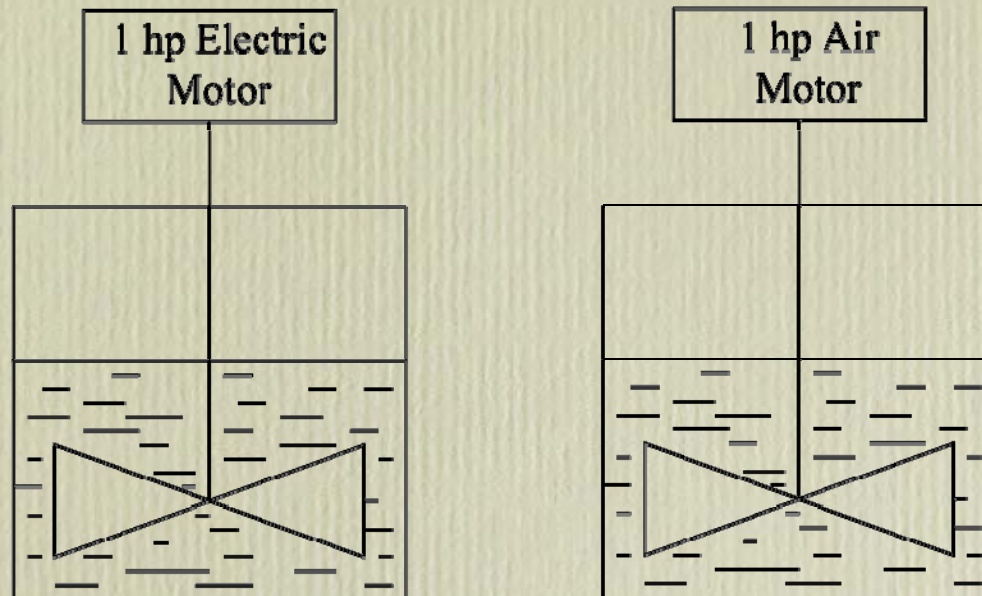
# **Airometrix Mfg., Inc.**

**Compressor Performance Testing**

## **Who we are:**

- Provide independent, third party, vendor-neutral compressed air system analyses nationwide
- Patented flow meter technology for in-field performance testing of air compressors
- Experienced: Over 100,000 hp of compressors tested and analyzed
- Training programs for O&M, reliability, and efficiency - more than 60 to-date
- Extensive Utility program experience

## COMPARISON OF COSTS ELECTRIC vs. AIR MOTOR

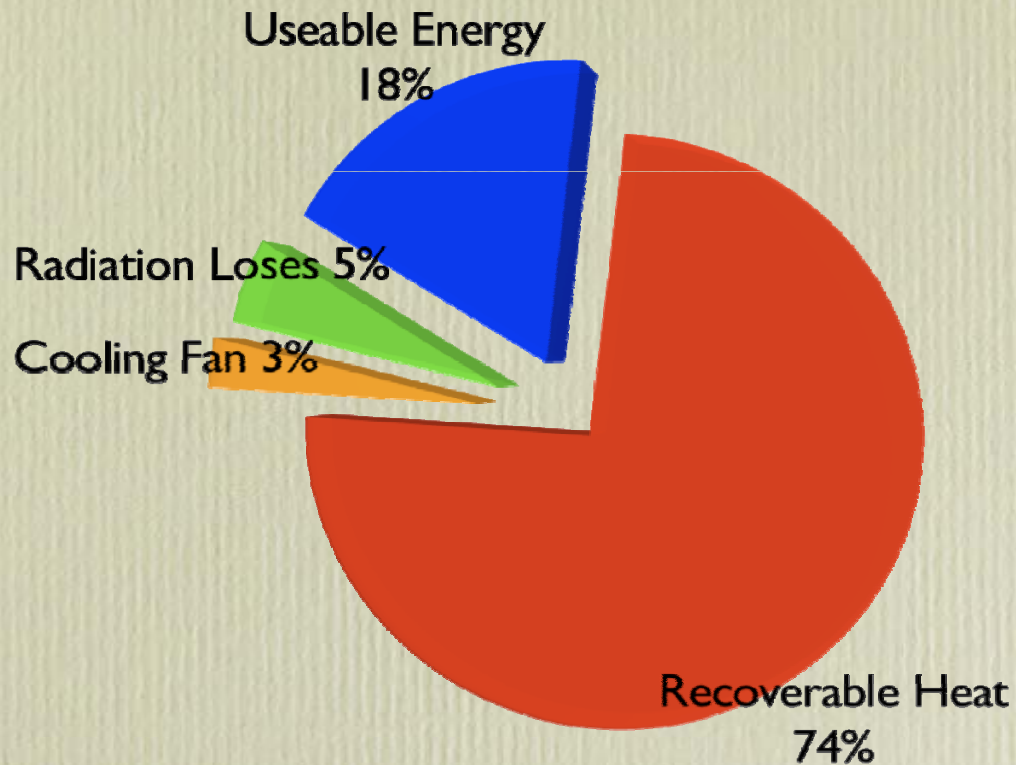


**Approx. \$200/year**  
Power Cost

**Approx. \$1,500/year**  
Power Cost

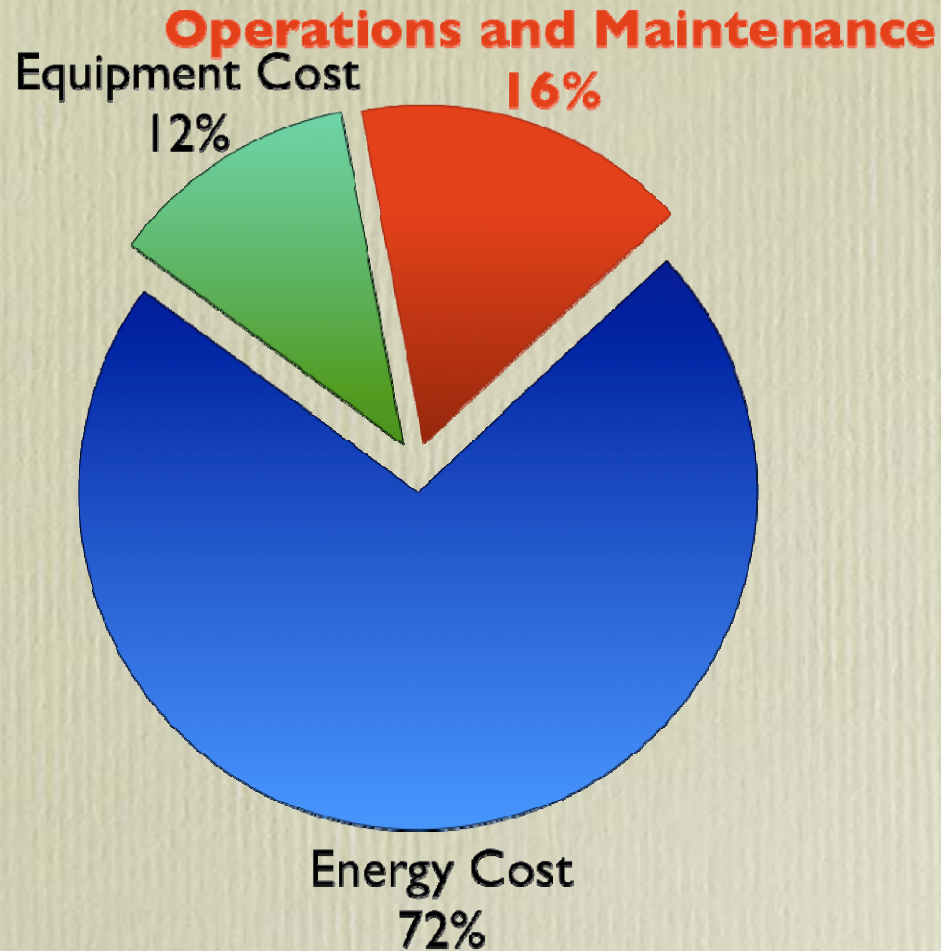
\* Air Motors Require About 7hp of Compressor Capacity or 27-30cfm/hp Output  
Based on 5,000 hours/year at \$0.05/kWh

## Why Is Compressed Air So Inefficient?



- Less than 20% of input energy available for work
- Pressure drops and regulators reduce useable energy
- Typical air tool has 12-15% overall efficiency

## How Much ???! A Question of Initial Cost



@ \$0.06/kwh, a single stage rotary screw compressor costs about \$10,000/year per 100 cfm to operate!



Reciprocating



Centrifugal



Screw

# “Texas-Sized” Market Potential

- 2005 IOU Industrial Load - 54,472,060 MWh
- 2005 IOU Industrial Customers - 79,954
  
- Source: Energy Information Administration (EIA)

# “Texas-Sized” Market Potential

- 54,472,060 MWh Total Load
- Assumes 40% Non-Transmission Industrial
- 21,788,824 MWh Non-Transmission
- Assumes 10% Compressor Energy per DOE
- 2,178,882 MWh of Compressor Load
- Potential Energy Savings of 30% per DOE and Airometrix’s Past Experience

# “Texas-Sized” Market Potential

- **Non-Transmission Industrial Customers**
- 653,665 MWh of Potential Compressed Air Energy Savings
- **75 aMW or 94 Peak MW**
- (assumes 80% load Factor)

# “Texas-Sized” Market Potential

Our Research Shows:

**< 1,500 Transmission Level IOU Customers  
in the State of Texas out of  
80,000 Total Industrial Customers**

# 2008 Market Transformation Program Overview

- TPUC Compressed Air Template Approved
- Available for 2008 Program Implementation
- Pilot Program Opportunities
- Airometrix Eligible to be Program Implementor

# 2008 Market Transformation Program Details

- **Comprehensive In-Plant Audit Services and Training**
  - Pre-Metering to Set Baselines
  - Investment Grade Audit of Air Systems
  - Vendor Neutral Recommendations
  - Facilitate Implementation
  - M&V Services Including Post-Metering
  - Compressed Air System Efficiency Courses

# Market Transformation

## How Do We Do It?

**Goal: Change Culture and Attitudes to Transform the Market**

Concerns Cited by Most Plant Personnel (in Decreasing Order of Importance):

1. Reliability
2. Air Quality
3. Preventative Maintenance
4. Efficiency and Operating Cost

**What it takes: Education, Information, Demonstration =  
Transformation**

# Market Transformation Targeted Savings Potential



Leaks

Dryer Selection and Operation

Compressor Controls

Drain Traps

Eliminate Open Blowing

VSD on Compressors



# Success Stories: CenterPoint Energy RCX

- 6 Sites, 10 Projects
- Over 11,500kW Identified Savings
- 8,185 kW Verified On-Peak Savings
- Plus 1,340 kW of Avoided Load
- 21,257,376 kWh Verified Energy Savings
- \$1,275,443 Annual Customer Cost Savings

# Additional Opportunities with RCX Customers Through a Market Transformation Program

- Estimated Energy Savings With Market Transformation:
  - Additional 6.3 MW On-Peak Reduction
  - Additional 31,631,600 kWh
  - Additional Customer Savings of \$2,317,896

# Success Stories: Airometrix Projects

- Sample of 37 Projects with **Verified** Savings
- 84,665 hp of Compressors Analyzed/Tested
- 380,024,729 kWh of Energy Consumed
- 70,325,656 kWh Saved - Savings Ranged from 8% to 85%
- 15,193 kW On-Peak Savings
- \$3,627,265 in Annual Customer Savings
- 0.8 Year Simple Payback

# Success Stories: Airometrix Projects

- Environmental Savings
  - 83,437,558 lbs of CO<sub>2</sub> Reduced
  - 177,272 lbs of SO<sub>2</sub> Reduced
  - 126,727 lbs of NO<sub>x</sub> Reduced

# Program Cost Effectiveness

- **Airometrix Compressed Air Market Transformation Program is Typically Half the Cost of the Standard Offer Program**

# Summary

- **Airometrix Compressed Air Market Transformation Program**
  - PUC Template Approved
  - Program and/or Pilot Available for 2008
  - Half the Cost of SOP
  - Airometrix Eligible as Market Implementor

# Questions?

- **Presented by:**
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