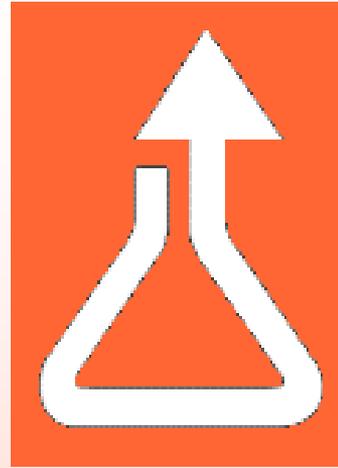


**ROHM
AND
HAAS
TEXAS
INCORPORATED**



Quietly Improving the Quality of Life

ENERGY MANAGEMENT PROGRAM

March 17, 2003

2003 Texas Technology Showcase

2003 Texas Technology Showcase

Rohm and Haas Texas Inc. Plant Tour



Hotel Agenda

- | | |
|-------------|---|
| 2:00 – 2:05 | Welcome and Agenda |
| 2:05 – 2:30 | Plant Energy Management Program Overview |
| 2:30 – 2:45 | Steam Trap and Leak Program |
| 2:45 – 3:00 | Plant Optimization System |
| 3:00 – 3:05 | Plant Safety Video |
| 3:15 | Bus Depart Hotel for Plant
(two videos on bus) |
| 3:45 | Bus Arrive at Plant |

2003 Texas Technology Showcase

Rohm and Haas Texas Inc. Plant Tour



Plant Tour

- | | |
|-------------|---|
| 3:45 – 4:10 | N TOUR STOP
Flare Optimization
Refrigeration Improvements |
| 4:15 – 4:40 | MONOMERS TOUR STOP
Thermal Oxidizers Optimization
Cooling Tower Pumps |
| 4:45 – 5:05 | ACID RECOVERY PLANT TOUR STOP
Furnace NG Optimization
Atomizer Air Compressor |
| 5:15 | Bus Departs Plant for Hotel |
| 6:00 | Bus Arrives at Hotel for Reception |

Rohm and Haas Texas Plant

- Located on the Houston Ship Channel in Deer Park, Texas
- Plant started production in 1948
- Largest and most complex plant
- Largest energy consumer
- Plant site is over 900 acres
- Almost 800 employees
- Manufactures over 2 billion pounds of chemical products yearly



Energy Program Benefits

- Cost Savings
- Emission Reductions
- Sustainable Development

Sustainability (Washington Post Quote)

“Rohm and Haas Company is committed to ensuring that our operations and products meet present needs without compromising the ability of future generations to meet their needs. Energy use reduction is part of that commitment. Recently, our Houston Plant, our largest energy user, surpassed our goal of a 15% reduction in energy consumption per pound of production, five years ahead of schedule. We are using the momentum from that achievement to make further gains in Houston and throughout the company.”

Raj Gupta
Chairman and CEO
Rohm and Haas Company

Awards

- DOE - OIT 2001 Plant-of-the-Year Award; Runner-up
- 2001 Texas Environmental Excellence Award
(large industrials)
- Industrial Energy Technology Conference
2001 Energy Award

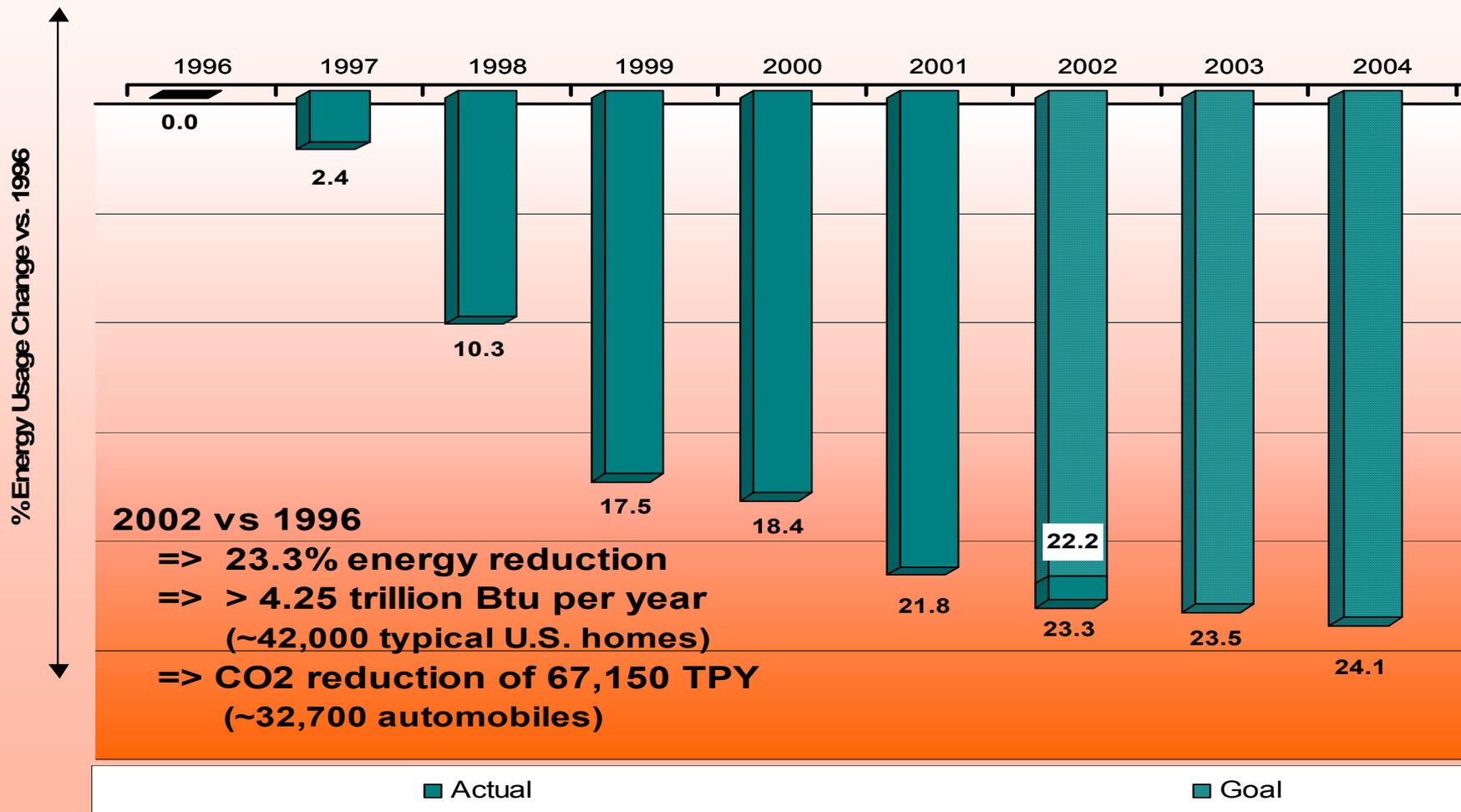
Energy Program Results

- Annual cost savings over \$18.5MM dollars in 2002
- 23.3 % energy intensity reduction since 1996
(Energy requirement per pound of production)
- Annual energy reduction exceeds 4.25 trillion BTU's
(Energy consumption roughly equals 42,000 typical U.S. homes)

Energy Program Results

- Surpassed original 2005 energy goal five years ahead of schedule
Goal : 15% energy intensity reduction
- On track to surpass 2004 goal
Goal : 24.1% energy intensity reduction
- CO₂ reduction approximately 67,150 TPY
Equivalent to removing 32,700 automobiles from the streets
Roughly 1.8 cars for every Rohm and Haas employee
- NOx reduction approximately 440 TPY

Plant Total Energy Usage Change per Pound of Production (%)



Energy Program

- Started mid 1997
- Supply-side and demand-side energy and utility opportunities
- Cross-functional energy team formed with dedicated resources
- Team membership (10 - 15)
- Equivalent full time persons
 - 1998 = 7.5
 - 2002 = 4.0

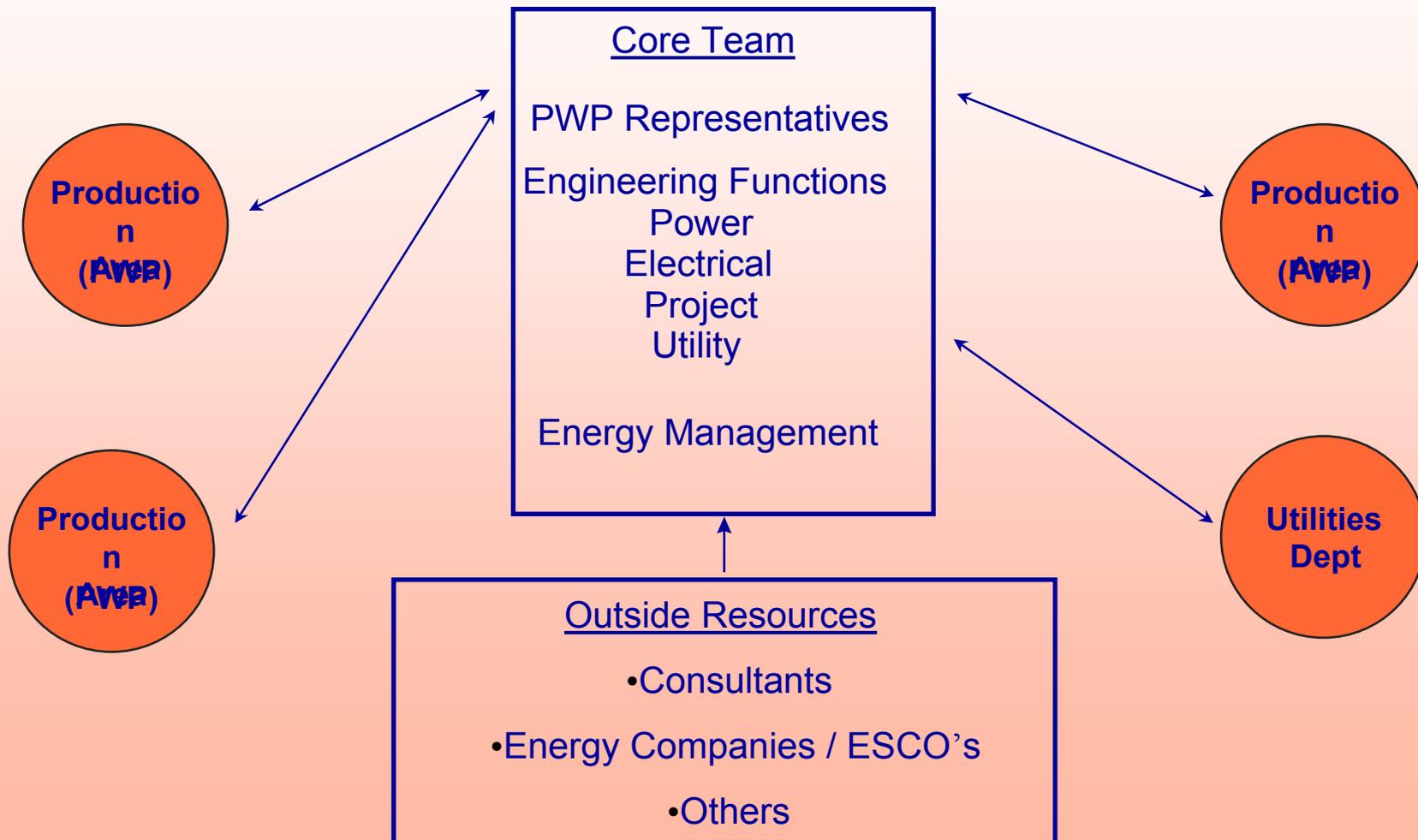
Energy Program Challenges

- Baggage from prior programs (false starts, unsustainable)
- Complex operations
- Plant consists of several different production areas that operate to a large degree autonomously as Plants Within A Plant (PWP)

Energy Program Challenges

- High degree of process utility integration between PWP's
- High degree of process production independence between PWP's
- Large amount of by-product energy production

Energy & Utilities Cost Reduction Core Team



Energy Program Goal

Achieve a state of normal operations where the plant's total energy cost is optimized on a verifiable, real time and long-term basis such that the lowest total operating cost is achieved year in and year out.

Team Mission

Identify, evaluate, recommend, and champion improvements to the plant energy and utilities operating and management systems that deliver the lowest total long term operating cost.

Team Key Activities

- Identify and evaluate opportunities
- Maintain and manage portfolio of opportunities
- Recommend and champion opportunities to management
- Develop, maintain and communicate metrics tracking results
Performance sustainability is an important issue

The Approach

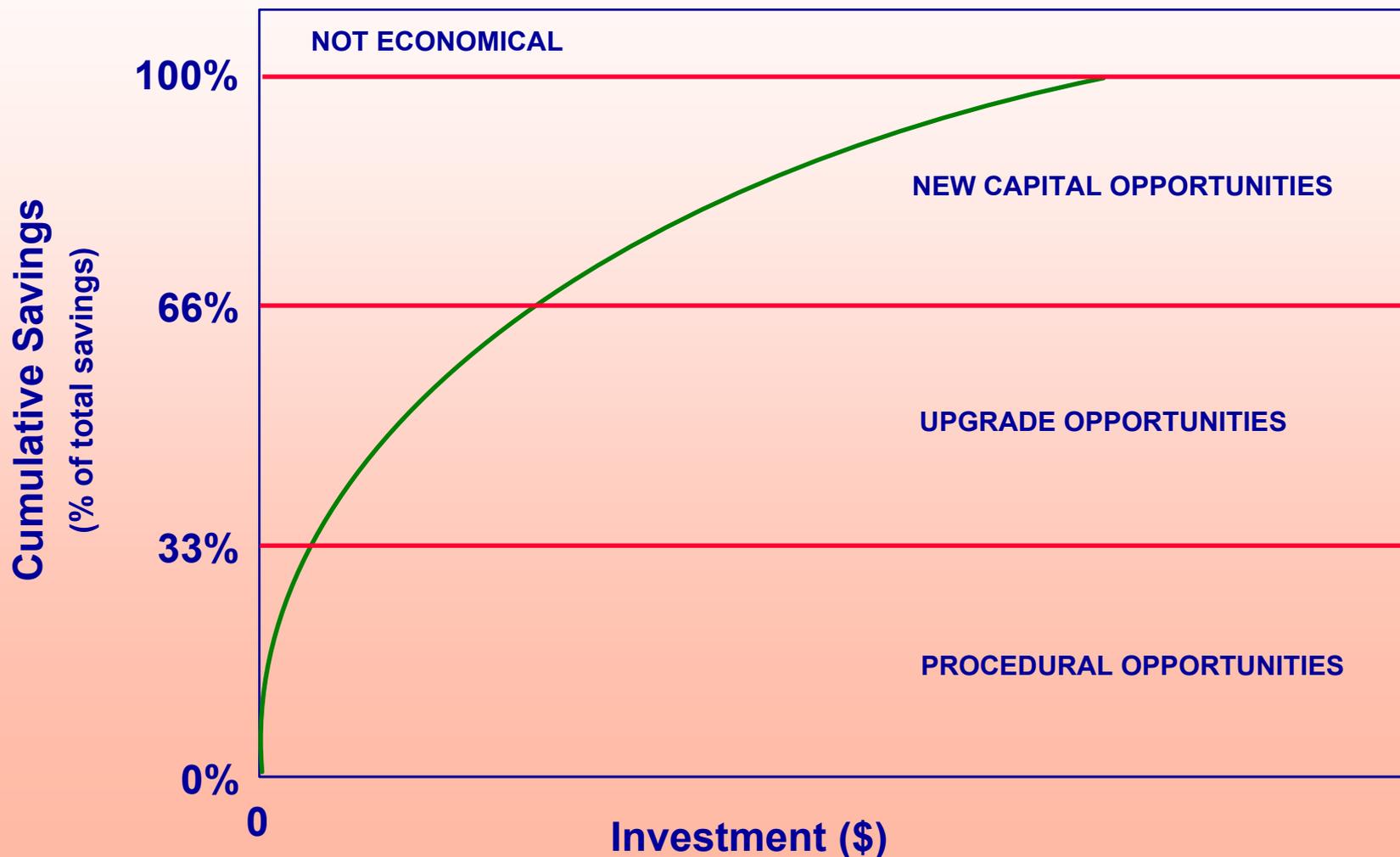
- Developed portfolio of over 150 energy / utility opportunities
- Install enablers for real time monitoring and optimization
- Utilized tactical approach for non strategic projects to deliver fast energy reductions

The Approach

- Developed long term strategic plan to select best portfolio of opportunities that ensure the development of systems and infrastructure to deliver the lowest total long term production cost
- Utilize metrics to validate and sustain benefits



Energy Savings Vs. Investment Curve



Procedural or Administrative Control / Contract

- ✓ No capital investment/short payback time
- ✓ Implementation timing usually fast
- ✓ Shutdown not normally required to implement
- ✓ Typically represents ~ 1/3 of total energy savings

Minor Equipment Upgrade / Modification

- ✓ May require small capital or maintenance investment
- ✓ May require shutdown to implement
- ✓ Typically represents ~ 1/3 of total energy savings

Capital Projects (New Equipment)

- ✓ Higher Investment / New Equipment / Longer Payback Time
- ✓ Longer implementation time (CDP)
- ✓ Usually requires shutdown to implement
- ✓ Typically represents ~ 1/3 of total energy savings

Path Forward

- Continued facilitation of a plant culture where energy awareness is well understood and practiced at both plant operating and engineering design levels
- Expand real time plant-wide energy optimization system and increase day-to-day use
- Increased use of energy performance metrics for day-to-day operations

Path Forward

- Continued energy audits / assessments
- Implement new position of Plant Energy & Utility Operations Coordinator
- Extension to water and other sustainability resources
- Extension to other plants / Replication across corporation

Energy Program Key Elements

- Well defined mission, goals and energy strategy
- Know Program's Critical Success Factors
- Know “lessons-learned” (good and bad) from past energy efforts (internal & external)
- Know energy / utility flows and balances
- Understand and use best practices in energy efficiency (seminars, conferences, networking with companies, energy agencies, etc.)

Energy Program Key Elements

- Implement operational best practices
- Utilize audits (internal and external) to identify opportunities on an on-going basis
- Perform energy technology assessments (pinch, combustion control, atomization, flares)
- Be flexible (bend but do not break)

Internal Cost Distribution

- Change energy and utility cost distribution from allocated to actual usage where appropriate
- Reduce PWP energy budgets as projects are implemented

Critical Success Factors

- Develop Short and Long Term Goals Supportive Of Business Goals
- Assign Dedicated Resources To Energy Management
- Develop Thorough Knowledge Of Facility Energy and Utility Maps, Balances, and Cost Flows
- Perform A Complete Fundamental Engineering Analysis Of Facility
- Perform Fair Comparison Between Energy and Production Projects Competing For Capital Funding

Critical Success Factors

- Identify and Continuously Monitor (Measure) and Control Key Energy Variables
- Maximize Asset Utilization Of Production Facilities
- Benchmark Cost Performance Against Peers
- Communicate Well
- Have An Upper Manager Sponsor Of Energy Management Program

#1 Question Asked is . . .

How do you overcome obstacles and barriers
and implement a successful energy program ?

The Answer is . . .

Treat your energy program with the same
respect as other important programs.

The Answer is . . .

Do not allow your energy program to become . . .

