

# Intern Program Key to Identifying Compressed Air Energy Savings

Ultrasound World

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# Background

- 11<sup>th</sup> year of program (2006 Pilot year)
- Partnership with EPA, KDHE, KCC, Engineering Extension
- Supported by
  - Utilities
  - K-State faculty
  - Industry
  - Vendors (UE Systems, lighting, painting)

# Purpose

- Designed to link top-level engineering and environmental sciences students with business and industry. These collaborations will focus on projects to reduce industrial emissions and wastes, while benefiting the Kansas environment.





# Real-world industry experience



# Real-World Impacts

- Waste diverted
- Energy saved
- Emissions reduced
- Dollars saved
- Water conserved

# Environmental Results

IMPACTS	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Water (million gallons)	N/A	25.4	187.1	9.9	22.2	6.0	11.8	7.8	N/A	10.2	280
Waste (tons)	1,025	5,506	1,707	6,720	585	318	126	519	N/A	N/A	16,500
Energy (MWh)	1,533	7,066	26,019	8,705	6,158	5,723	6,548	4,322	487	2,859	69,422
Operating/disposal \$ (million \$)	\$0.4	\$1.5	\$3.5	\$0.9	\$1.2	\$0.6	\$0.7	\$1.8	\$0.05	\$0.4	\$11.0
Greenhouse Gases (MTCO <sub>2</sub> e)	1,089	5,079	18,921	6,207	7,080	3,996	2,608	4,260	346	2,843	52,400

- Implementation rate – 66% (soon to be 75%)

## Summer 2015

Energy (kWh)	2,858,927
Natural Gas (therms)	2,660
Water (gallons)	10,154,700
MTCO <sub>2</sub> e	2,843
Cost Savings (\$)	\$398,708
Company Investment	<\$28,696.80

# Types of Projects (2015)

- 249 projects
  - Energy – 139 (65%)
  - Water – 50 (20%)
  - Waste – 44 (18%)
  - Natural Gas – 10 (4%)
  - Chemical Replacement – 1 (0.4%)
  - Diesel – 1 (0.4%)
- Energy-related Projects – 199 (80%)



# Host Companies

- Haldex Brake\*
- Columbian Chemicals Company^
- Frontier Refining
- The Monarch Cement Company
- Frito-Lay\*^
- Hallmark Cards^
- Philips Lighting
- Schwan's Global Supply\*^
- Wolf Creek Nuclear Operating Corporation\*^
- Via Christi\*^
- CertainTeed
- Unilever Foodsolutions
- Florence Manufacturing
- Associated Wholesale Grocers
- GTM Sportswear
- Compass Minerals\*^
- Gates Corporation^
- SPX Cooling Technologies^
- K-State\*
- Robbie Fantastic Flexibles^
- The Coleman Company\*^
- Deffenbaugh Industries
- Johnson County Community College
- Prairie Band Potowotami Nation
- Associated Purchasing Services
- Bombardier Aerospace Learjet^
- CST Storage\*^
- Hill's Pet Nutrition
- Kansas Army National Guard^
- Kickapoo Tribe in Kansas
- Mercy Regional Health Center\*^
- Capstan Ag
- Dillon's\*
- Advantage Metal Recycling^
- Capstan Ag System^

\*Companies participating multiple years

^Companies with compressed air projects (17)

# Cost to Company

- \$17/hour, plus fringe (8.9%)
- $\$7,480 + \$665.72 = \$8,145.72$ , assuming 40 hrs/week x 11 weeks
- Charged only for hours worked (verified by company)

# Big Impacts

- Columbian Chemicals – 73 leaks; \$36,200; 602,925 kWh
- Hallmark - \$37,200
- Schwan's Global Supply – 46 leaks; \$23,000; total \$172,365 and 3,400,000 kWh
- Via Christi (2007) – 35 leaks; \$14,871; 330,441 kWh
- Via Christi (2008) – 7 steam traps; \$127,734; 3,118,692 kWh
- Robbies Fantastic Flexibles – 31 leaks; \$3,050; 38,030 kWh
- Bombardier Learjet - \$7,180; 119,679 kWh
- CST Storage – 17 leaks; \$10,395; 173,250 kWh
- Gates Corporation – 59 leaks; \$27,000; 346,900 kWh
- Army National Guard – 7 leaks; \$2,000; 22,000 kWh
- Schwan's Global Supply (2011) – 109 leaks; \$56,000
- Via Christi (2009) – 11 defective steam traps; \$45,100
- Advantage Metal Recycling – \$2,950; 18,100 kWh
- CST Storage (2012) – 13 leaks; \$34,700; 55,000 kWh
- Mercy Regional Health Center – two defective steam traps; \$900
- SPX Cooling Technologies – 74 leaks; \$33,000; 366,529 kWh
- CST Storage (2013) – 43 leaks; \$47,265
- The Coleman Company – 85 leaks; \$40,500; 521,400 kWh
- CST Storage (2015) – 13 leaks; \$9,088; 90,884 kWh
- Wolf Creek Nuclear Operating Corporation - \$7,815; 66,228 kWh
- **TOTAL – 625 leaks; \$565,948; 9,270,058 kWh**

# Bigger Impact

- 75 interns
- Engineering
  - Chemical – 15
  - Industrial – 9
  - Mechanical – 13
  - Electrical – 6
  - Bio & Ag – 9
  - Civil – 5
  - Architectural – 4
  - Engineering Technology – 1
- Non-Engineering
  - Biochemistry – 4
  - Journalism – 2
  - Ag. Econ. – 1
  - Environmental Studies – 2
  - Sustainability, Society, and Resource Management – 1
  - Art – 1
  - Apparel and Textiles – 1
  - Chemistry – 1
- 40 companies



# Contact Information

Questions or recommendations?

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