



GRAHAM PARTNERS

# Addressing Barriers to Industrial Energy Efficiency Engagement

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# AGENDA

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- State of Industrial Energy Efficiency
- Barriers to Energy Efficiency
- Overcoming Barriers + Promoting Energy Efficiency
- Business Case for Energy Efficiency and ICT: Successful Case Studies



# GRAHAM PARTNERS OVERVIEW

Graham Partners is a private investment firm focused on growth-oriented industrial and manufacturing-related businesses



The Graham Partners team is comprised of 45 individuals, including 26 investment professionals



Operations Team plays a critical role with our 15 portfolio company management teams



The committed capital raised since inception through the Graham Partners funds together with Graham led co-investments totals approximately \$1.9 billion



# INDUSTRIAL ENERGY USAGE: EFFICIENCY OPPORTUNITIES<sup>1</sup>

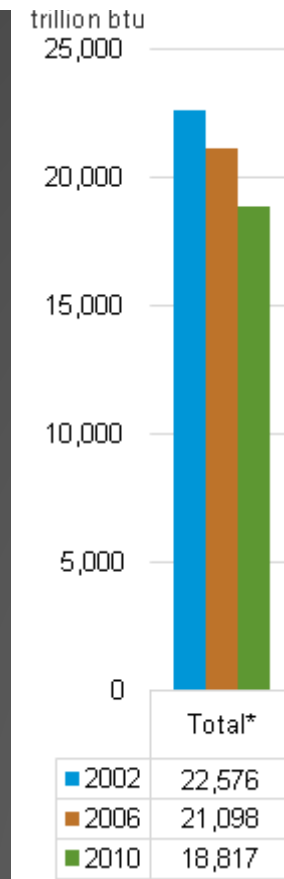
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- 32% of all energy consumption in the United States (2012)
- Projected to increase 22% by 2025
- Accelerating adoption rate of energy efficiency could reduce energy consumption by an additional 15%-32% by 2025 → Reduction in national consumption by 6%-12%



# TOTAL MANUFACTURING ENERGY USAGE IS DECREASING

## Total U.S. Manufacturing Energy Consumption (Source: U.S. EIA)



Total U.S. manufacturing energy usage declined 17% for all purposes from 2002-2010<sup>2</sup>



# ECONOMIC BARRIERS TO INDUSTRIAL END-USE ENERGY EFFICIENCY<sup>1</sup>

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- Internal competition for capital (1-3 year paybacks)
- Failure to recognize non-energy benefits



# REGULATORY BARRIERS TO INDUSTRIAL END-USE ENERGY EFFICIENCY<sup>1</sup>

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- Utility business model
- Industrial participation in ratepayer-funded energy efficiency programs
- Failure to recognize all energy and non-energy benefits
- Energy resource planning not required



# INFORMATIONAL BARRIERS TO INDUSTRIAL END-USE ENERGY EFFICIENCY<sup>1</sup>

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- **Adoption of systematic energy management system (lack info on benefits of modern EnMS)**
- **In-house technical expertise**
- Awareness of incentives and risk
- Metering and energy consumption data (lack of disaggregated data and evaluation tools)





# BARRIERS TO ENERGY EFFICIENCY: GRAHAM PARTNERS

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- Graham Partners portfolio companies' top expenditures
  1. Raw materials
  2. Labor
  3. Energy
- Other operational priorities with material impacts competing against EE:
  - Inventory reduction
  - Throughput/cycle time improvement
  - Labor productivity
  - QA/QC



# CEO SURVEY: TOP ISSUES AND OPPORTUNITIES

Issues	Mostly	Somewhat	Not At All
1) High number of sole source vendors for mission critical parts/commodities	43%	50%	7%
2) Buyers focus on day to day buying duties rather than strategic cost reduction efforts	38%	46%	15%
3) Frequent supplier performance issues – late deliveries, long lead times, quality issues, shortages, etc.	23%	61%	15%
4) Higher than desired manufacturing overhead / facility spend	38%	38%	23%

Opportunities	
1) Establish a steady pipeline of cost savings projects	71%
2) Establish annual Purchasing / Strategic Sourcing organization savings goals	57%



# PROMOTING ENERGY EFFICIENCY

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- Getting an audience
  - Monthly energy data (PortfolioManager)
  - Bottom line and operational efficiency
    - Demand response programs
    - Successful energy assessment results
  - Top-down commitment
    - Sustainability policy
    - Semiannual reporting to Board of Directors

# FOCUS ON SUSTAINABILITY AND ENERGY REDUCTION



## Sustainability Achievements in Action

- Actively engaged with the **Graham Sustainability Institute** at the University of Michigan

- Focused on **energy assessments**

**20** Energy/lighting assessments

**13%** Annual energy cost savings identified

**\$1.7MM** Total annualized savings identified

**\$700,000 +**

Portfolio-wide annual energy cost savings implemented since 2013

**2,300+**

Tons of CO<sub>2</sub> emissions reduced



# DEMAND RESPONSE AND ENERGY VISUALIZATION TO REDUCE CONSUMPTION



- Facility launched an investigation to determine why non-production load was still 1/3 of peak load



# DOE AND INDUSTRIAL ASSESSMENT CENTER PARTNERSHIP

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- University Industrial Assessment Centers (IAC)s conduct no-cost, one day assessments
- Seven of these assessments have thus far identified a total of \$500,000 in annual cost savings opportunities
  
- Piloting DOE's strategic energy management tool, eGuide, at select portfolio company facilities
- All portfolio companies provided access to an educational strategic energy management (SEM) webinar





# HENRY CASE STUDY: EFFICIENCY PAYS BACK

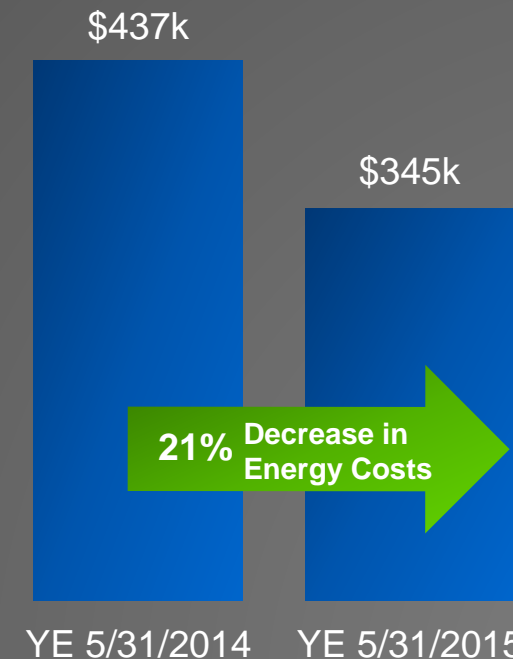
✓ Lachine, QC

- No in-house energy expertise
- 100+ year old facility
- No reassessment of plant systems after major operational changes

→ Conducted 2-day energy assessment with Graham Partners consultant and intern

✓ Decreased energy costs by **\$92,000 (21%)** through improved lighting and compressed air efficiency at Lachine, Quebec facility with average payback periods <1 year

## Annual Energy Costs Henry Facility – Lachine, Quebec





# COMAR CASE STUDY: EFFICIENCY AND COLLABORATION PAY BACK

✓ Buena, NJ

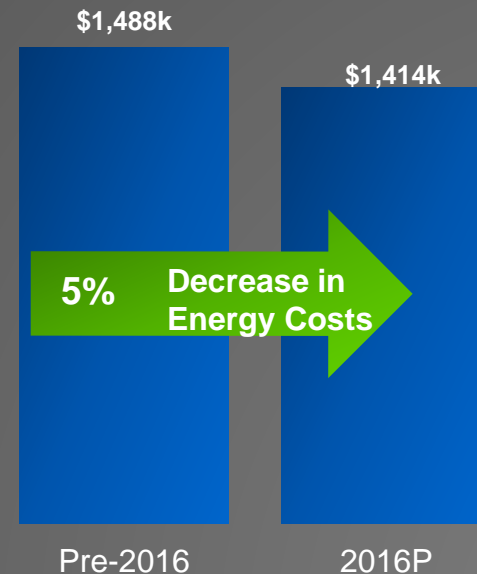
- Aware of utility incentives but had not done costing work

→ Conducted energy assessment with Graham Partners and University of Delaware Industrial Assessment Center

- ✓ Decreased compressed air energy costs by **\$74,000 (5%)** annually at Buena, NJ facility with average payback period of 1.1 years

## Annual Energy Costs

Comar Facility – Buena, NJ





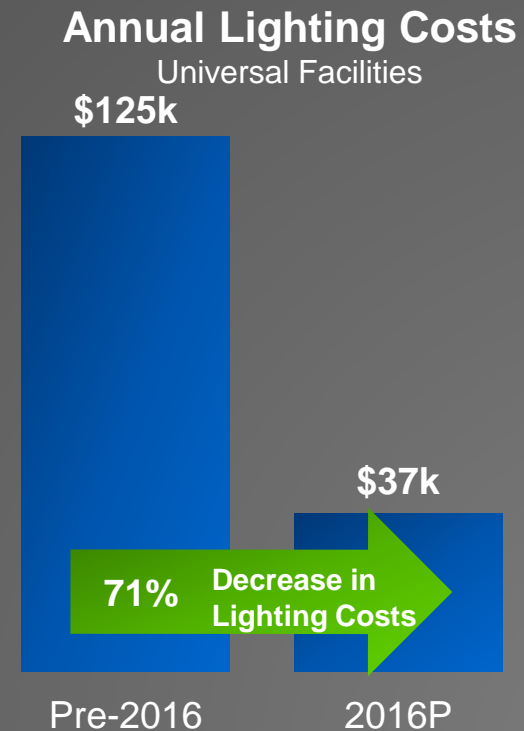


# UNIVERSAL CASE STUDY: EFFICIENT LIGHTING

- ✓ Villa Rica, GA and Malvern, PA
- Two new facilities
- No lighting/energy expertise

→ Facilitated free lighting upgrade assessment at each plant with SmartWatt, Inc.

- ✓ Decreased lighting costs by **\$88,000 (71%)** annually at new Malvern, PA and Villa Rica, GA facilities with 2.6 and 2.2 year payback periods, respectively





# THANK YOU!

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Questions?

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# REFERENCES

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1. U.S. Department of Energy. “Barriers to Industrial Energy Efficiency” June 2015.
2. U.S. Energy Information Administration, Manufacturing Energy Consumption Survey – Table 1.2: First Use of Energy for All Purposes (Fuel and Nonfuel), 2002, 2006, and 2010



# APPENDIX

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# BARRIERS TO INDUSTRIAL END-USE ENERGY EFFICIENCY<sup>1</sup>

## Economic/Financial

- **Internal competition for capital (1-3 year paybacks)**
- **Failure to recognize non-energy benefits**
- Corporate tax structures (depreciation, treatment of energy bills)
- Program planning cycles (mismatch with utility and state cycles)
- Split incentives between business units
- Energy price trends (uncertain returns)

## Regulatory

- Utility business model
- Industrial participation in ratepayer-funded energy efficiency programs
- Failure to recognize all energy and non-energy benefits
- Energy resource planning not required
- Environmental permitting (uncertainty, complexity, costs can deter facilities from moving forward with efficiency)

## Informational

- **Adoption of systematic energy management system (lack info on benefits of modern EnMS)**
- **In-house technical expertise**
- Awareness of incentives and risk
- Metering and energy consumption data (lack of disaggregated data and evaluation tools)



# DEMAND RESPONSE AND EIS

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- Henry Company in Kimberton, PA agreed to a summer demand response pilot program that included EIS software

“In my opinion the EIS is the meat of our current curtailment program. Without it, making a concerted reduction effort would not be nearly as fruitful. Having the data as to what your draw is almost real time ( 5 minute delay) was and is quite an eye opener.

One of the most **shocking things we learned** using the software was what our base load was during non-working hours. Much to our surprise we found out that **our load during non-operational times was 1/3 of peak demand**. That **visibility really made us ask why** and launched multiple **investigations that have ultimately led to conservation**.

Barriers to implementation if any, are largely **cultural in changing employee habits**. Simply turning equipment off if it is not being used can yield some decent efficiency gains. **Presenting the data that the EIS captures goes a long way in gaining understanding and awareness**. The installation was painless, the cost was not prohibitive, ROI was a no brainer and it helped us do our small part to be a positive member of the environmental community!” – Henry Kimberton Plant Manager