Reduce Operating Costs in Your Manufacturing Facility with Energy Efficiency

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Benefits of Energy Efficiency for Businesses

- Reduce operating costs

- Reduce emissions

- Reduce maintenance costs
  - Upgraded equipment
  - Better controls or more efficient operation

- Improve work environment or customer experience
  - Light quality
  - Temperature control, comfort

- Earn utility incentives/rebates or other grants

Opportunities to Improve Efficiency

- Upgrade existing equipment

- Upgrade planned equipment purchases to higher efficiency models

- Install automated controls

- Optimize use of existing controls

- Improve maintenance procedures

Some require little or no capital investment!

How to Find Efficiency Opportunities

- Staff suggestions

- External assessment

- Equipment vendors

Benefits of an External Assessment

- Energy expertise
- Metering and diagnostic tools
- Impartial advice
- Fresh set of eyes

- Find new savings opportunities
- Quantify savings potential for known opportunities
- Prioritize opportunities
- Compare options for upcoming equipment purchases
- Documentation to earn project approval or utility incentives

Industrial Assessment Center

- **<u>Free</u>** in-depth assessments to reduce energy and resource costs
  - ➤ Electricity, fuel (natural gas, oil, propane, etc) savings
  - ➤ Screening for combined heat and power (cogeneration) or renewable energy opportunities
  - ➤ Water savings
  - ➤ Waste reduction
- National program sponsored by U.S. Department of Energy, UMass serves New England

IAC Eligibility

- Manufacturing or water/wastewater treatment facility

- Annual energy bills $100,000 - $2.5 million

- If not eligible, we can help connect you with other free resources

IAC Recommendations & Savings

- $94,000/year average projected savings

- Average 2 year payback period
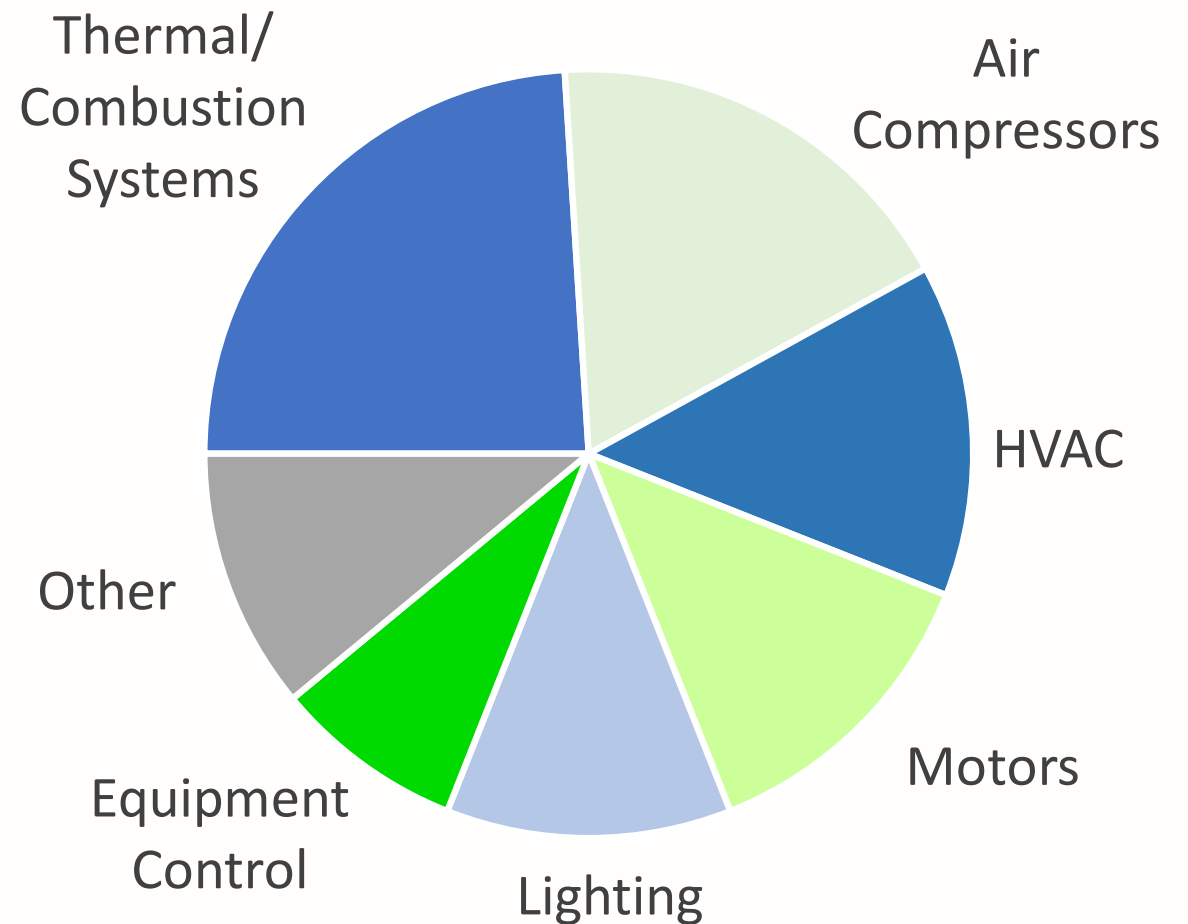
IAC Assessment Process

- Collect and review utility bills
  - Understand baseline use
  - Calculate utility rates

- Site visit
  - Meet with staff
  - Tour facility
  - Collect data, install data loggers

- Analysis

- Report with detailed recommendations within 60 days

- Find out about incentives & implement recommendations

Case Study – Philips facility in Fall River, MA

	Recommendation	Annual Savings			Implement. Cost	Payback Period
		Energy		**Cost**		
1	Reduce exhaust on scrubbers during off hours	Electricity (kWh)	182,994	$20,825	$20,400	7 months
		Natural Gas (MMBtu)	1,035	$14,159		
2	Turn off air compressor at night	Electricity (kWh)	212,716	$24,207	$1,000	1 month
3	Reduce speed of anodizing NO2 fan during off hours	Electricity (kWh)	174,066	$19,809	$3,330	2 months
4	Implement temperature setback in the office	Electricity (kWh)	14,575	$1,659	$1,000	1 month
		Natural Gas (MMBtu)	525	$6,864		
5	Repair compressed air leaks	Electricity (kWh)	73,575	$8,373	$2,400	3 months
6	Install VFD on pumps in aqueous washers	Electricity (kWh)	60,242	$6,856	$24,500	3.6 years
7	Reduce the compressor pressure	Electricity (kWh)	22,889	$2,605	$500	2 months
8	Turn off wash line pumps when conveyor belts are off	Electricity (kWh)	22,706	$2,584	$1,000	5 months
9	Reduce temperature in washer tanks	Natural Gas (MMBtu)	122	$1,597	$500	4 months
10	Insulate pipes and condensate tanks	Natural Gas (MMBtu)	94	$1,227	$1,013	10 months
11	Turn off the paint area exhaust fan	Electricity (kWh)	3,518	$400	$100	1 month
		Natural Gas (MMBtu)	52	$679		
Total		**Electricity (kWh)**	**767,281**	**$87,318**	**-**	**6 months**
		Natural Gas (MMBtu)	**1,828**	**$24,526**	**-**	
		Total	**-**	**$111,844**	**$55,743**	

Case Study – Recommendation 1

- Reduce exhaust when production isn't operating
  - Exhaust fans needed to vent air out of the production area were running at full speed continuously
  - Installing new motors with variable frequency drives (VFDs) allowed reduction of fan speed to 50% during off hours
  - Reduced electricity used for fans and gas for space heating
  - Annual savings $48,000

Case Study – Recommendations 2 & 5

Metering of air compressor power
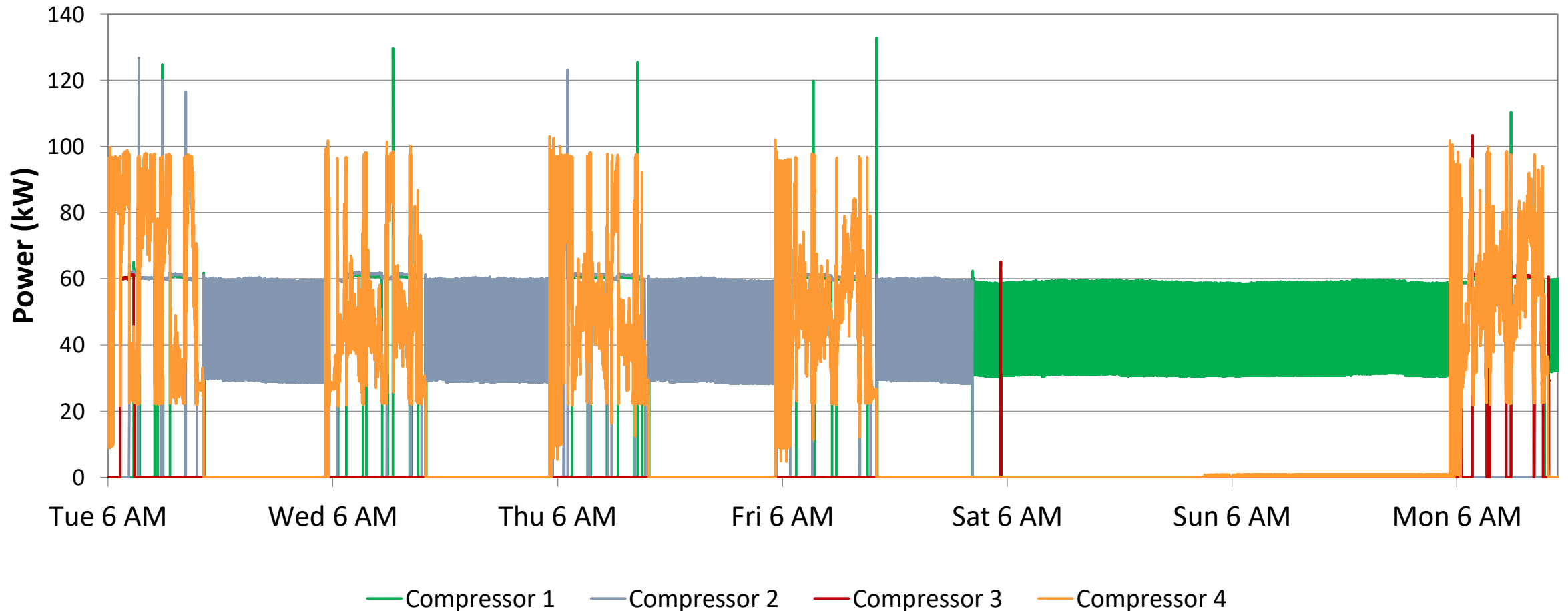
Case Study – Recommendation 2

- Turn air compressors off when plant isn't operating
  - Meter data showed a compressor running during off hours
  - Compressor management tool needed to be reprogrammed
  - Annual savings $24,000

Case Study – Recommendation 5

- Repair leaks in compressed air distribution system
  - Meter data showed significant energy use at night to feed leaks
  - A typical plant loses about 20% of its compressed air through leaks, ongoing maintenance required to minimize leakage
  - Annual cost savings $6,000

Case Study – Recommendation 6

Valves observed during site visit

Case Study – Recommendation 6

- Improve controls on pumps
  - To get needed flow rate, flow was throttled by partially closing valves
  - Meter data showed pumps operating at 88% of full power, which corresponds to 70% of maximum flow for a throttled valve
  - Installing VFDs provided better control and higher efficiency, can adjust to 70% flow and use only 34% of full power
  - Annual savings $10,000

Case Study – Results

- 7 of 12 recommendations implemented

- Annual cost savings $102,000

- Implementation cost after utility incentives $31,000

- Payback period 4 months

It was a great experience. The detail was amazing. For anyone who can get help from them – it's a great thing. Another set of eyes is always good.

Philips Facility Manager

Massachusetts Energy Efficiency Partnership

- Training program operated by UMass, sponsored by Eversource and National Grid

- 1-2 day sessions in Norwood, MA
  - Commissioning
  - Compressed air systems
  - Data centers
  - HVAC
  - Lighting control systems

Contact us to discuss how we can assist your business

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