



Energy Efficiency Opportunities for Small Businesses

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Small Business Sustainability

A New Interest in Going Green?

- Many small businesses are showing a strong interest in being green to:
 - Respond to current public trends
 - Earn/keep consumer trust
 - Retain key accounts
 - Explore new market opportunities
 - Reduce carbon footprint
 - Build credits that may have financial value
 - Improve efficiency and productivity
 - Create a safer and healthier workplace for employees
 - Stay compliant with government regulations



Sustainability Strategies: Building Blocks to Go Green

- Stop and double check – ensure environmental compliance
- Beyond compliance, wring out the waste in resource use
start where there is a strong business case
- Consider going off the grid with renewable energy and micropower technologies to achieve energy independence
- Consider green purchasing
- Consider LEED for new building and renovations
- Engage employees to get their commitment and tap into their great ideas
- Commit for continuous improvement over the long-term; what's good today may no longer be good in three or five years



Go Green: Wring out the Waste

- Where to start? Where is there a strong business case?
 - Where are the bottom line impacts the greatest for small business?
 - Where is the greatest potential for significant environmental and/or energy benefit?
 - Where is there existing proven technology that can be implemented quickly?

ANSWER: ENERGY EFFICIENCY



Extra Incentive: Disproportionate Costs of Energy for Small Businesses

- On an energy cost per sales basis, small firms are hardest hit by rising energy costs:
 - In the manufacturing sector, firms with fewer than 50 employees pay 35 percent more than the sector average for electricity while firms with more than 1,000 employees pay 17 percent less than the sector average*
 - The median commercial sector industry has a small entity energy cost per sales ratio that is 2.7 times the ratio for large entities; in the commercial sector small businesses face a 30 percent price differential for electricity and a 20 percent price differential for natural gas*

*Source: April 2008 US SBA Office of Advocacy Report



Silver Buckshot Approach to Energy Independence and Climate Change: *Include Small Business*

- Assuming small commercial and industrial energy consumption equals 50 percent of the total; if small firms used energy efficiency to achieve realistic reductions of 20-30 percent:
 - \$12 to \$18 billion in direct energy cost savings annually
 - 93 to 140 million tons of carbon dioxide emission reductions annually
- Major role exists for small business in combating climate change



EMAP Services

- Toll-free confidential environmental hotline
- Confidential on-site assessment visits to look for cost saving opportunities
- Confidential assistance identifying and understanding compliance requirements
- Assistance for developing, financing and marketing new environmental technologies
- Links to additional sources of technical and financial assistance



Who Can Benefit? All Clients

- Start-ups
- Buying an existing business – New building construction, renovation or expansion
- All existing businesses



EMAP Energy Assistance Approach

- Pre-Assessment preparation
 - Utility bill analysis
 - Equipment inventory
 - Hours/shifts operations
 - Needs assessment



EMAP Energy Assistance Approach cont'd

- Utility bill analysis
- On-site energy assessments
 - General building envelope
 - IR Camera
 - Lighting
 - Light meters
 - HVAC
- Consumption and technology research



EMAP Energy Assistance Approach cont'd

- Report preparation provide recommendations and estimated costs, savings, and paybacks
- Assistance identifying qualified vendors and contractors
- Grant applications & other financing assistance



CFLs Versus Incandescent Light Bulbs

LIGHT OUTPUT EQUIVALENCY

To determine which ENERGY STAR qualified light bulbs will provide the same amount of light as your current incandescent light bulbs, consult the following chart:

INCANDESCENT LIGHT BULBS	MINIMUM LIGHT OUTPUT	COMMON ENERGY STAR QUALIFIED LIGHT BULBS
WATTS	LUMENS	WATTS
40	450	9-13
60	800	13-15
75	1,100	18-25
100	1,600	23-30
150	2,600	30-52





Saving Opportunities

- Turn off heating and air conditioning before the end of operating hours (programmable thermostat).
- Have your heating, ventilating, and air conditioning systems serviced and adjusted routinely.
- Turn off machines and equipment when not needed.
- Make sure all automatic controls are in good working condition and set properly.



Saving Opportunities Cont'd

○ Lighting

- Inefficient light sources
- Transmission losses (dirt, obstructions)
- Over lighting
- Excessive “on” hours



Saving Opportunities Cont'd

- **Envelope** – the buildings “shell” is made up of windows, outside doors, walls, foundations, floor, roof and maybe skylights

The envelope is the barrier between the carefully controlled, temperature indoor environment in your building and the fluctuating outdoor environment.

- Stop infiltration
- Reduce heat transfer
- Control humidity
- Control sunlight



Saving Opportunities Cont'd

- **HVAC** – Heating, Ventilation, and Air Conditioning. Typically the biggest user of energy.
 - Turn it off when not needed
 - Run it less and with more efficient temperature settings
 - Make it more efficient



Saving Opportunities Cont'd

○ Hot Water

- Reduce the heat loss in the system
- Reduce the temperature of the hot water; it often is much hotter than necessary
- Reduce the amount of hot water used
- Reduce the time the water heater operates
- Maintain the system
- Invest in energy saving technologies



Saving Opportunities Cont'd

○ Machines

- Turn off whenever possible
- Don't forget the "hidden" machines and equipment (the silent computer, photocopier down the hall, etc.)
- Adjust controls to a temperature, speed, or other setting that uses less energy but still does the job properly
- Good O&M program (clean, tune, lube, etc.)
- Load equipment to capacity vs partial loads



Saving Opportunities Cont'd

- **New Buildings/Additions**
 - Not too many lights; enough daylight
 - Energy efficient fluorescents and ballasts
 - Sufficient insulation for roofs and walls
 - Thermal windows; adjustable shades, blinds
 - Caulking and weather stripping



A Couple of Ideas...

○ **Fluorescent lighting**

- Use low-mercury T-5 or T-8 bulbs
- Four-foot lamps have nearly double the life of eight-foot lamps (retrofit kits)
- Task lighting
- Exit signs
 - A single 40 watt exit sign may consume nearly 260 kw annually and require multiple lamp change-outs
 - Light emitting diode (LED) retrofit kits for exit signs may only use 20W annually and require maintenance every 20 years



A Couple of Ideas...

- **Compressed Air**

- Turn compressors “off” whenever there is no demand
- Reduce the line pressure
- Implement a leak inspection plan



Resources

- Use resources like ENERGY STAR® *Small Business* case studies and fact sheets to educate yourself and inform your clients www.energystar.gov
- Take clients the first step: provide an analysis of energy cost/square foot/year
- State Energy Offices and Environmental Agencies
- Utilities
- Department of Energy



Equipment Used

- IR camera
- Light meter
- Digital multimeter
- Digital thermometer
- Electronic distance tool
- Voltage data logger

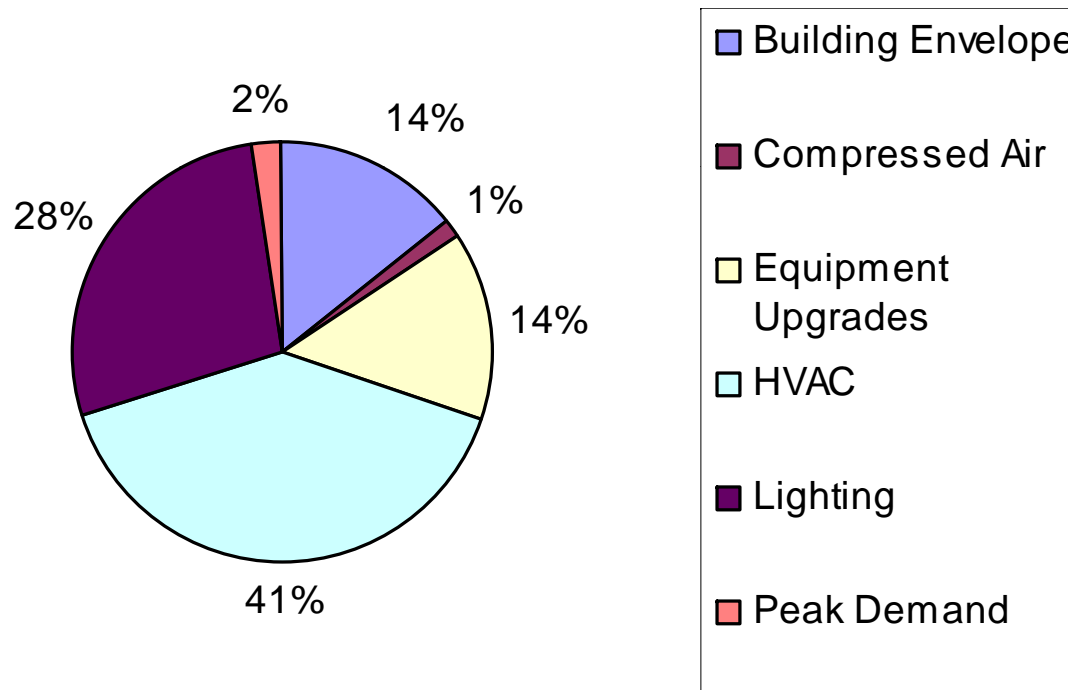


EMAP On-site Energy Assessments

- Over the last four years EMAP has conducted over 240 on-site energy assessments
- Tom and I have conducted over 70 assessments between the two of us



What Types of Projects Are EMAP Clients Implementing?





Helping Small Businesses Implement Energy-Saving Projects

- Since 2005, businesses have implemented 115 energy efficiency projects in their facilities
- Average actual annual savings of \$2,871 per project
- Savings ranged from \$200 to \$37,000 per year per project
- Average Payback: 4.8 years



How does EMAP Measure Success?

Actual Savings for Businesses!

○ **General Store (Ramey, PA)**

- Applied for \$4,464 in SBAG funding during 2005/2006 cycle
- Installed energy efficient deli equipment, refrigeration units, and lighting
- Predicted savings: \$1,060
- Actual measured savings: \$1,125/year



EMAP Success Story

Tripp's Grill, North Bend

- Switched from GS3 (large general service) to GS1 (small general service) electric rate
 - Save at least \$430 annually
- Installed walk-in coolers and new freezers
- \$4,800 capital investment
- Save \$1,000 annually in electric costs (5yr payback)
- Save 12,300 kWh/yr – 8 tons air emissions!

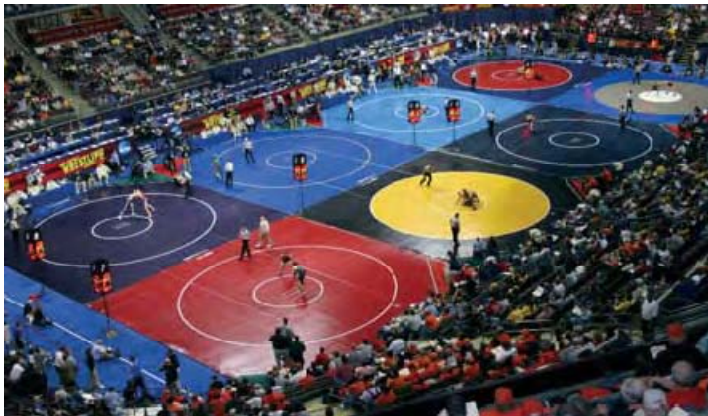


Music Mart, Inc. Success Story Cont'd

- Transitioned from incandescent to compact fluorescent bulbs
 - 90% of energy used by incandescent is converted heat
- Upgrades air conditioner to Energy Star-qualified unit
- Capital cost \$1,100
- Savings \$1,450 annually (10 month payback)
- 18,100 kWh/yr saved – 11 tons of air emissions reduced!



Resilite Sports Products, Inc.



- Sporting Mat Manufacturer
- A new set of eyes and a couple of questions led to significant cost savings:
 - Boiler and steam distribution system project
 - Project cost of \$11,600
 - First year fuel oil savings of 11,000 gallons; a cost savings of \$37,888
- Winner of a 2007 Pennsylvania Governor's Award for Environmental Excellence



Central PA Settlement LLC



- Service Business
- A progressive and comprehensive approach to energy efficiency
 1. building envelope
 2. heating system
- Boiler upgrade cost \$8,600 and cut the gas bill by over two thirds in the first year, saving \$6,200
- 2007 US EPA ENERGY STAR Small Business Award Winner



Developing Energy Efficiency Services

- Develop in-house capabilities
- Partnerships
 - Electric utilities
 - Auditing capabilities
 - Rebates and other financial incentives
 - State Energy Offices
 - Trade Associations
 - Marketing and outreach



QUESTIONS

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