



Green: Cost Savings From Improved Energy Efficiency

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Saving \$\$ Will Cost \$\$

- ▶ What you can accomplish & what not to expect
 - Energy costs will continue to increase
 - A few low or no cost activities
 - Expect to borrow \$\$ to make major savings
 - Need to consider return on investment (ROI)
 - Can reduce \$\$ & increase ROI with rebates & tax credits
 - Technology is advancing rapidly; improvements in efficiency and cost anticipated



Your Energy Cost Records

- ▶ Electric
 - consumption & demand charges
- ▶ Natural Gas
- ▶ Transportation
- ▶ Sub-Metering
- ▶ Utility's Smart Meters
- ▶ Energy Measurement Meters (Readers Digest)



Energy Savings Categories

- ▶ Divided an assisted living facility into energy using components
 - Building envelope
 - Water heating
 - Kitchen
 - Lighting
 - Landscaping
 - Office
 - Resident rooms
 - Laundry
 - Motors
 - HVAC
 - Transportation
 - Remote sensing

Building Envelope

Typical building energy losses

- 48.3% Ventilation
- 26.5% Walls
- 12.1% Roof
- 10.5% Infiltration
- 1.5% Closed windows
- 1.1% Perimeter

Building Envelope

- ▶ Insulation
 - Wall & roof
 - Bottom floor & @ exterior basement walls
- ▶ Caulking & weather stripping
- ▶ Windows & doors
 - Drapes & shades
 - Window types
 - Door types
- ▶ Passive storage
- ▶ Green roofs

Resident Rooms

- ▶ Air temperature controls
- ▶ Window coverings
- ▶ Electric light motion detection controls
- ▶ Monitor windows open/closed
- ▶ Monitor running water, phantom toilet flushes
- ▶ Control water temperature to rooms

Water Heating

- ▶ A MAJOR EXPENSE
- ▶ Electric vs gas heating
- ▶ Heater efficiency, insulation
- ▶ In-line & individual heaters
- ▶ Wastewater heat recovery
- ▶ Hot & cold water piping proximity & insulation
- ▶ Solar water heating

Laundry

- ▶ Washing temperatures
- ▶ Hot water down drain
- ▶ Dryer discharge air heat recovery
- ▶ Solar water heating
- ▶ In-line water heaters
- ▶ Building zone or room water heaters

Kitchen

- Energy Star rating – refrigerators, dish washers, etc.
- Kitchen operations
 - Lids on pots & pans when cooking
 - Cooking in small, insulated cookers rather than ovens
 - Turn burners, ovens off when cooked food is removed
- Kitchen on separate thermostat than other areas
- Turn thermostat down rather than open windows
- Brief training for kitchen workers in energy efficiency
- Exhaust fans
- Hot water down drain

Motors

- ▶ High efficiency motors
- ▶ Reduced energy starters
- ▶ Matching motor to driven equipment
- ▶ Motor connections to electric system
- ▶ Motor connections to driven equipment

Lighting

- ▶ Interior lighting
 - Replace old fixtures, use T8 or T5, electronic ballasts
 - CFLs, but they contain mercury
 - LEDs are here, very efficient if claims are true
 - Wall, floor, furniture colors control lighting
 - Glare on work surfaces reduces lighting effectiveness
 - Add spot lighting in work areas or resident rooms
- ▶ Interior controls
 - Timers
 - Dimmers
 - Daylight sensors

Lighting, cont'd

- ▶ Exterior
 - Dusk to dawn sensors
 - On-off sensors where don't need continuous light
 - Dark sky lighting – minimum above fixture wastage
 - Night lights not operating during day
 - Bulb types
 - Fixture reflectors

HVAC

- ▶ Furnaces & air conditioners
 - Unit efficiency
 - Which to use?
 - Gas or electric or geothermal or air source
 - Zone control or room control?
- ▶ Steam heat– a specialty
- ▶ Exhaust fans
 - Motor efficiency
 - Makeup air
 - Insulation on louvers

Landscaping

- ▶ Wind breaks
 - Trees on north & west sides
- ▶ Sun control
 - Trees on south & west sides
- ▶ Reflection control
 - Grass & bushes below windows
 - Minimize concrete & asphalt near doors
- ▶ Driveways, parking lots, patios, sidewalks
 - Permeable concrete requires proper reinforcing
 - Permeable pavers
 - Grass or artificial turf

Transportation

- ▶ Gasoline receipts
- ▶ Vehicle types
 - Learn total cost of each vehicle type
- ▶ Smooth starts & stops while driving
- ▶ Mileage varies by gasoline grade, check it
- ▶ Constant velocity while driving up-hill
- ▶ Brief employee training

Office

- ▶ Equipment efficiency ratings
- ▶ Temperature control
- ▶ Window coverings
- ▶ Dress for weather, no space heaters
- ▶ Windows not open while furnace or AC are on
- ▶ Turn off equipment overnight
- ▶ Brief employee training

Remote Sensing

- ▶ Energy monitoring & security
- ▶ Monitor for energy
 - Motors amp draw, run time, vibration
 - Windows & doors open/closed
 - Temperatures
- ▶ Monitor for security
 - Video - watch quality
 - Exterior, office, wing doors open/close
- ▶ Record & central display

Cost Analysis

- ▶ Cost basis – energy prices will double with or without Cap & Trade
- ▶ Decide on required payback period (ROI)
- ▶ Calculate savings & cost payback

Potential Funding Sources

- ▶ Utility rebates
- ▶ Tax credits
- ▶ EPA – ??
- ▶ DOE – Home Star, Building Star
- ▶ DNR – Energize Missouri
- ▶ Banks, S&Ls

Technical Information & Resources

- ▶ Websites
 - <http://www.missouribusiness.net/eac/p2/sectors/hospitality>
 - <http://www.missouribusiness.net/eac/p2/sectors/healthcare>
 - <http://www.practicegreenhealth.org>
- ▶ Audits – use only accredited auditors
- ▶ College student internships
- ▶ Contractors – use accredited contractors
- ▶ Continued information from MU CSE
