

The Profits of Energy Management



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- Energy Program Director
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ActOnEnergy.com

Quiz Questions

1. How much does it cost to build a new coal power plant per kilowatt produced?
2. What is the typical cost of an energy-efficiency project per kilowatt-hour reduced?
3. What is the most cost effective electricity resource?
4. True or false? One of the benefits of energy efficiency to consumers is it reduces future energy rate increases.
5. For a typical motor what is the lifetime cost of energy as a percent of total lifetime cost?
6. What is an energy management program?

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- A. \$100 to \$487 per kW
- B. \$488 to \$1249 per kW
- C. \$1250 per kWh to \$2857 per kW**
- D. \$2858 to \$4587 per kW

2. What is the typical cost of an energy-efficiency project per kilowatt-hour reduced?

- A. 1.2 cents per kWh
- B. 3.2 cents per kWh**
- C. 5.5 cents per kWh
- D. 6.3 cents per kWh

3. What is the most cost effective electricity resource?

- A. Pulverized Coal
- B. Nuclear
- C. Natural Gas Combined Cycle
- D. Biomass

E. Wind

F. Energy Efficiency

4. True or false? One of the benefits of energy efficiency to consumers is it reduces future energy rate increases.

A. True

B. False

5. For a typical motor what is the lifetime cost of energy as a percent of total lifetime cost?

A. 1 to 2%

B. 2 to 5%

C. 20 to 30%

D. 50 to 60%

E. 90+%

6. What is an energy management program?

A. A systematic and continual improvement approach to managing and minimizing energy use and costs

B. A program that is integrated into how you do business

C. An approach that minimizes energy use/costs with the level of effort appropriate to your organization's energy costs

D. All of the above

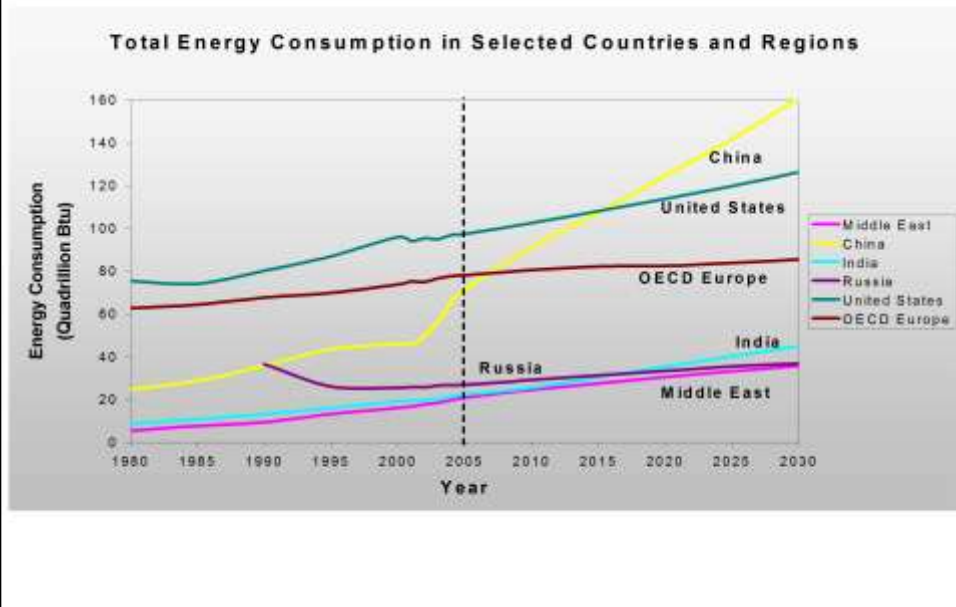
E. A and C only

Presentation Overview

- The Profits of Energy Management
- Using Resources Effectively
 - Developing an Energy Management Program
- Efficiency Results
 - Companies that are profiting from energy management



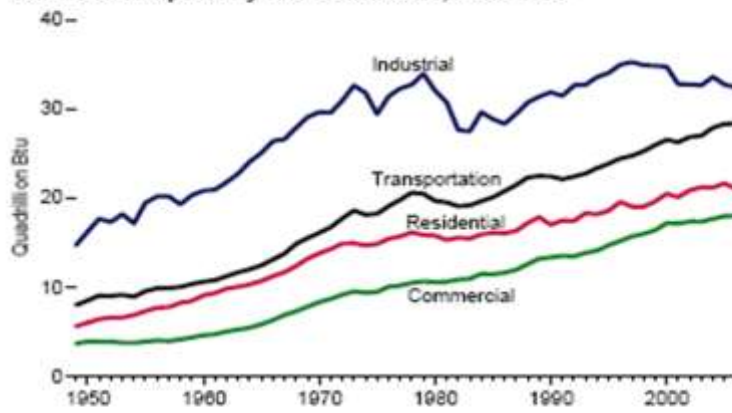
Global Energy Use (Source: DOE)



Sources: **2002:** Energy Information Administration (EIA), *International Energy Annual 2002*, DOE/EIA-0219(2002) (Washington, DC, March 2004), web site www.eia.doe.gov/iea/. **Projections:** EIA, *System for the Analysis of Global Energy Markets* (2005).

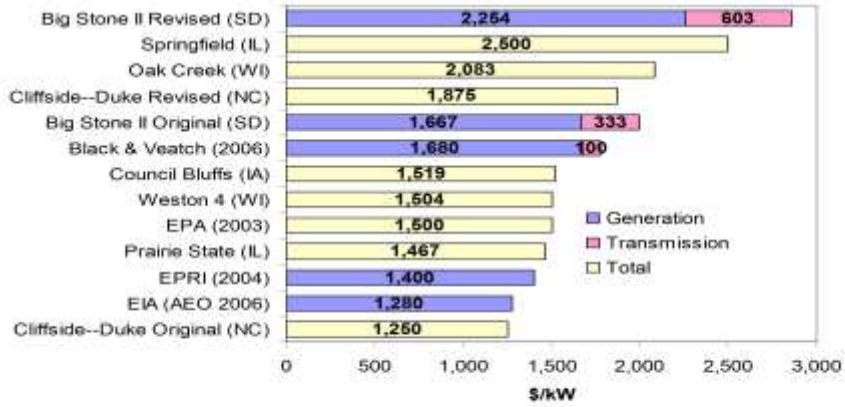
US Energy Consumption (EIA)

Total Consumption by End-Use Sector, 1949-2006



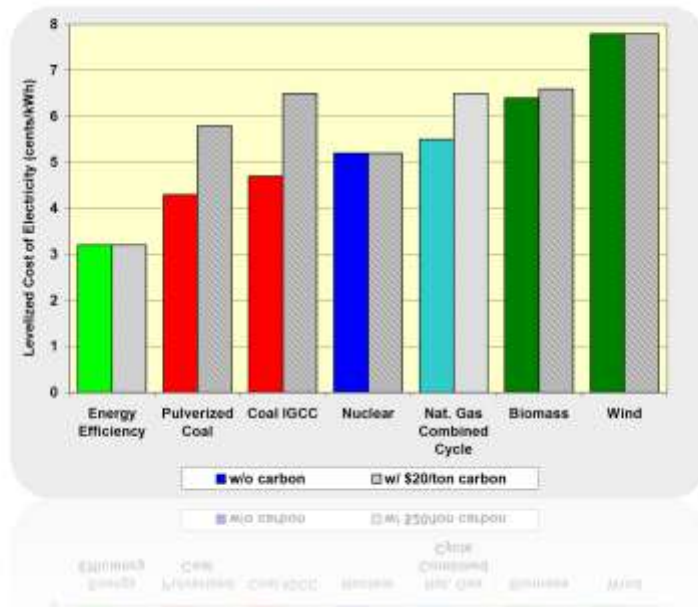
Cost of New Coal Power Plants (ACEEE)

New pulverized coal capital costs



Cost of Electricity Resources

(Source: ACEEE 2006 & EPRI 2006)



Financial Benefits of Efficiency

1. Reduces energy costs for facility

Typical facilities can save 10 to 15% of energy use with best practices over 5 years

2. Provides Competitive Edge

Reduced product costs are important in global market

3. Reduces future rate increases

Energy Efficiency < \$500 per kW while it costs >\$2,000 per kW for new power plants



Costs of Energy Efficiency

1. Creating a team or champion
2. Scheduled meetings
3. Identifying opportunities
4. Creating an energy management plan
5. Investing in behavioral changes
6. Investing in projects



Benefits of Team or Champion

- Savings potential is 10 to 15% over five years for 0 to 2 year payback projects
 - For \$1,000,000 of energy costs this means savings of \$100,000 to \$150,000
 - 50% savings from no to very low cost measures
- Benefits of champion or energy team
 - \$50,000 to \$75,000 from no/low cost savings
 - 20% of other cost savings justified
 - At \$80/hour this results in justification for 150 to 225 hours per year for champion or team

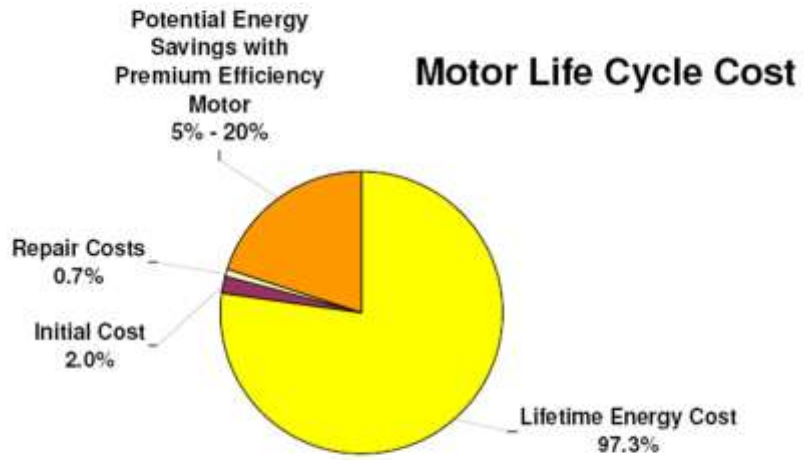


Benefits of Project Investments

- Cost of energy usually goes up over time
- Most efficiency projects are low risk
 - Many proven best practices
- Many have additional benefits
 - Quality improvements
 - Employee comfort
 - Reduced risk of equipment failure
- Community and customer image
- Many projects are very low cost and some are NO cost



Lifetime Costs Justification



Effectively Using Resources

- Designate energy team or champion
- Use ActOnEnergy staff to help identify opportunities
- Use vendors to specify projects
- Use ActOnEnergy incentives to buy down costs for projects
- Develop an Energy Management plan
- Monitor project results and energy use



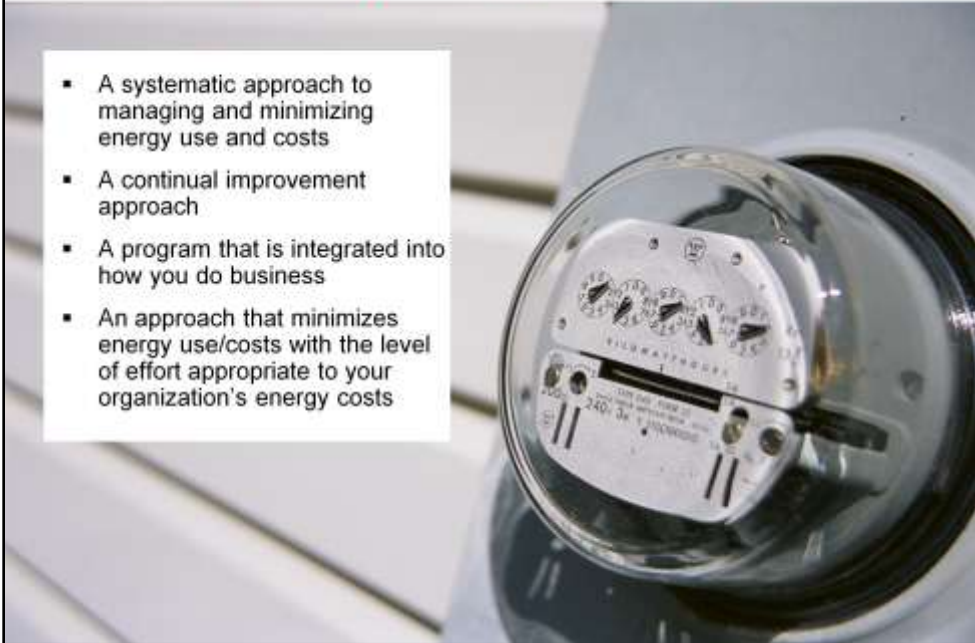
Team or Champion Tasks

- Meet on a regular schedule
- Identification of opportunities
- Develop and implement energy management plan
- Solicit vendor quotes
- Oversee project installations
- Track project results
- Monitor facility energy use



What is an Energy Management Program?

- A systematic approach to managing and minimizing energy use and costs
- A continual improvement approach
- A program that is integrated into how you do business
- An approach that minimizes energy use/costs with the level of effort appropriate to your organization's energy costs



Why are Energy Programs Useful?

- Energy costs are increasing and becoming a larger percentage of total costs
- Systematic plan approach ensures that **all** opportunities are considered
- Continual improvement plan approach ensures **new** opportunities are considered
- Energy can be managed and many businesses are not capitalizing effectively on this opportunity



Best Energy Programs

- Strong leadership & resource allocation
- Culture that recognizes value of EE
- Sub-metering
- Energy assessment of all capital projects
- "On the fly" adjustments for EE

Source: Kamen, James A. 2002.
"Energy Management Practices
Provide Manufacturing Advantage".
Energy User News.



Energy Management

...in Theory

- Management Commitment...
- Energy Champion...
- Measure & Monitor...
- Report & Communicate...
- Set Energy Savings Goal...
- Implement Projects...

...in Practice

- ...Management Concern
- ...Another "Hat" for Someone
- ...No Payback on Sub-Meters
- ...Monthly Actual vs. Budget
- ...Based on What?
- ...No Support



Energy Management Steps

1. Establish a Baseline Energy Use and Facility Profile
2. Estimate Energy Use for Major Systems
3. Identify Best Practice Opportunities
4. Quantify Savings and Project Costs of Opportunities
5. Prioritize Projects
6. Project Management

Step 1a - Baseline Energy Use

Clearwater Wastewater Treatment Facility

Electric Rate

\$0.06

Month	MWh/MG	Consumption (MWh)	Prod Units MG of Wastewater	Billed Demand (kW)	Total Electric Cost
Jan	6.88	330	48	320	\$19,800
Feb	6.42	308	48	320	\$18,480
Mar	6.22	336	54	360	\$20,160
Apr	6.07	364	60	400	\$21,840
May	6.14	387	63	420	\$23,220
Jun	6.02	397	66	440	\$23,820
Jul	6.06	400	66	440	\$24,000
Aug	6.00	414	69	460	\$24,840
Sep	5.71	394	69	460	\$23,640
Oct	5.52	348	63	420	\$20,880
Nov	5.67	340	60	400	\$20,400
Dec	5.59	302	54	360	\$18,120
AVG	6.02			400	
TOTAL		4,320	720		\$259,200
5% GOAL	5.72				-\$12,960

* One megawatt-hour (MWh) = 1000 kilowatt-hours (kWh)

Step 1b - Facility Profile

Facility Energy Profile - Summary

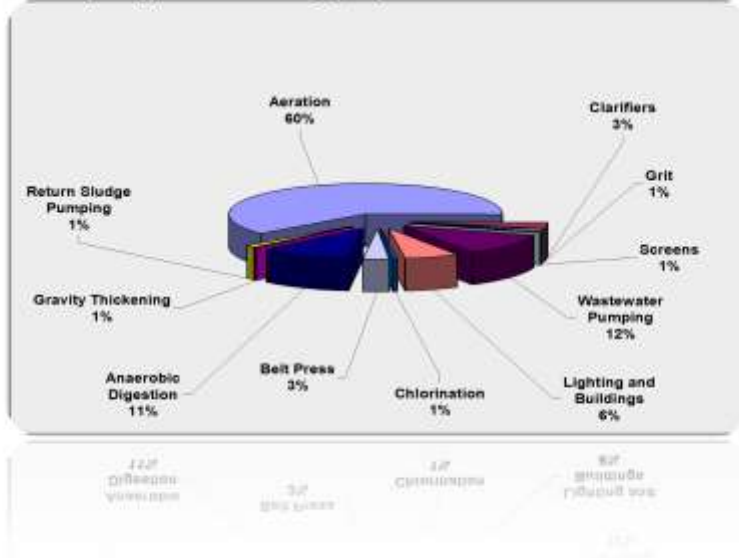
(Does not include gas, water or other utilities that should also be tracked.)

Clearwater Wastewater Treatment Facility

Electricity	2005	2004	2003	% Change
				2004 to 2005
Consumption (MWh)	4,320	4,500	4,872	-4.00%
Electrical Cost (\$)	\$259,200	\$247,500	\$243,600	4.73%
\$ per MWh	\$60.00	\$55.00	\$50.00	9.09%
Key Performance Indicators				
Millions of Gallons(MG/Yr)	720	740	761	-2.66%
MWh per MG	6.00	6.08	6.40	-1.37%
Electric \$ per MG	\$360.00	\$334.60	\$320.19	7.59%
Business Indicators				
Operating Costs	\$2,700,000	\$2,750,000	\$2,800,000	
Electricity as % Oper. Costs	9.60%	9.00%	8.70%	

Step 2 - Energy Use of Major Systems

Electricity for Typical Activated Sludge (WEF)



Step 3 – Identify Opportunities

#	TITLE
1	Variable Frequency Drive Applications
2	Reduce Fresh Water Consumption
3	Optimize Flow with Controls
4	Operational Flexibility
5	Staging of Treatment Capacity
6	Manage for Seasonal/Tourist Peaks
7	Flexible Sequencing of Tank Use
8	Recover Excess Heat from Wastewater
9	Cover Basins for Heat Retention
10	Optimize Aeration System
11	Fine-Bubble Aeration
12	Aerobic Digestion Options
13	Biosolids Processing Options
14	Biosolids Mixing Options: Aerobic
15	Variable Blower Air Flow Rate: Aerobic
16	Dissolved Oxygen Control: Aerobic
17	Biosolids Mixing Options: Anaerobic
18	Ultraviolet (UV) Disinfection Options
19	Final Effluent Recycling

Steps 4 through 6

4. Quantify Savings and Project Costs of Opportunities
 - Estimate savings
 - Get vendor quotes
5. Prioritize Projects
6. Project Management



Review Question

What are the steps for Energy Management?

If you know the first step in Energy Management, raise your hand.



Energy Management Steps

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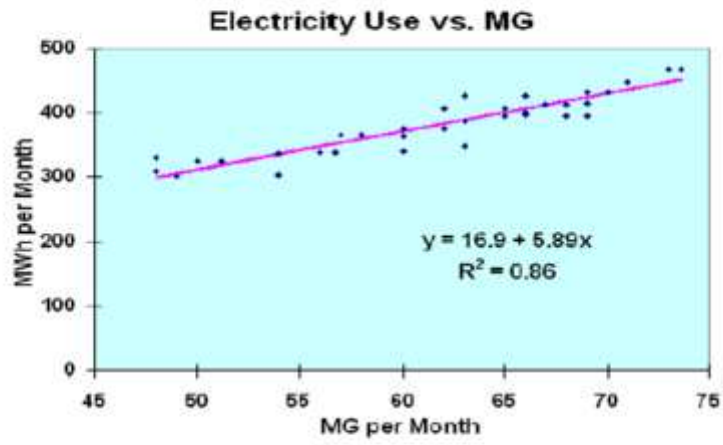
Ongoing Energy Management

1. Strong commitment from Management
2. Track Energy Saving Performance
3. Form an Energy Team
4. Develop a Long-Term Energy Management Plan
5. Establish a System for Continual Improvement

Tracking Performance - KPI



KPI Analysis



Practical Energy Management (PEM) Tool



- Template of spreadsheets and forms to use to develop and administer a program
- Uses continual improvement approach
- Designed to meet ANSI/MSE 2005 standard for energy management
- Good starting point for new program efforts

PEM Sections

1. Management Plan
2. Facility Profile
3. Energy Use Profile
4. Best Practices
5. Project Prioritization
6. Project Management
7. Key Performance Indicators
8. Continual Improvement

PEM Approach

Figure 14 – Continual Improvement Cycle



PEM Tool is Free

- For Ameren Illinois business customers the PEM tool is free
- A program representative can come to your facility to show you the PEM binder and discuss how best to use it



Review Question

Which of the following statements are true about the PEM Tool? Choose all that apply.

The PEM Tool:

- A. Is a template of spreadsheets and forms to use to develop and administer a program
- B. Uses continual improvement approach
- C. Is designed to meet ANSI/MSE 2005 standard for energy management
- D. Is a good starting point for new program efforts

Which of the following statements are true about the Practical Energy Management Tool? Choose all that apply. The PEM Tool:

- A. Is a template of spreadsheets and forms to use to develop and administer a program
- B. Uses continual improvement approach
- C. Is designed to meet ANSI/MSE 2005 standard for energy management
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The correct answers are A, B, C, and D.

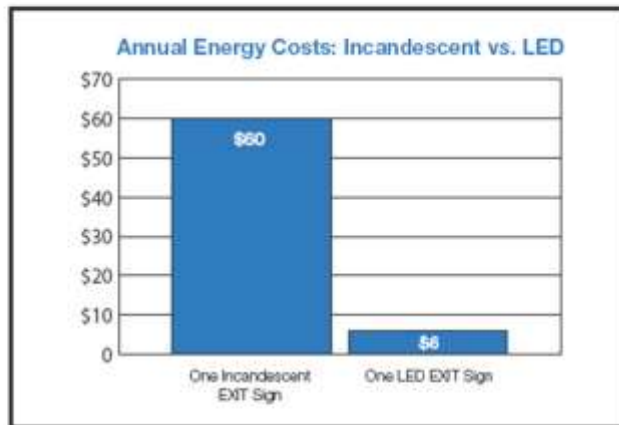
Companies Benefiting From Action

- St. Anthony's Memorial Hospital
- Bradley University
- Kroger
- Evonik Industries
- Continental Tire



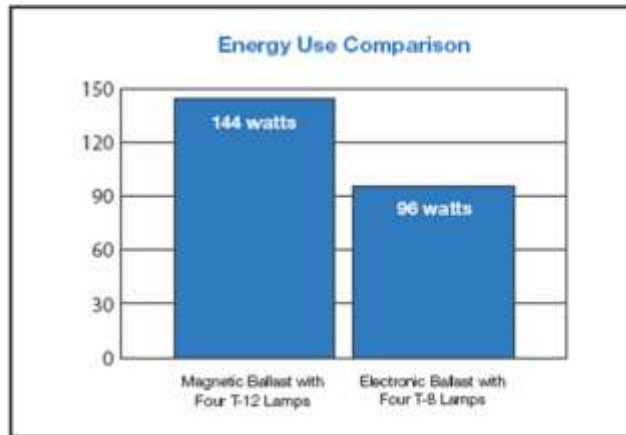
St Anthony's Hospital – LED Exit Signs

- 90 LED exit signs installed
- \$1,800 incentive
- \$4,800 per year savings



Bradley University – T12 Lighting

- 1800 T12 lamps replaced
- \$21,000 incentive
- \$17,000 per year savings



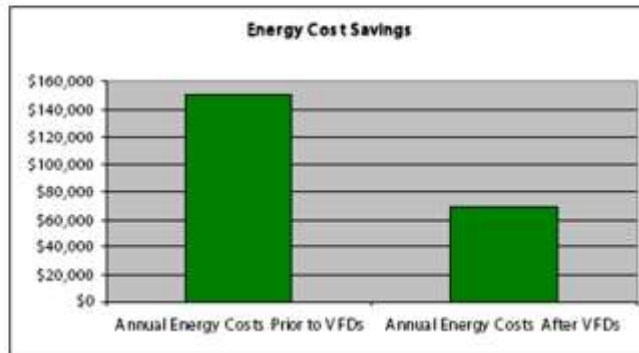
Kroger – LED Case Lighting

- LED replace fluorescent case lighting
- 2,000,000 kWh annual savings and
- \$300,000 annual savings in 30 stores
- Better quality of light
- Last 5 times as long



Evonik Industries – VFDs

- 6 VFDs installed
- \$51,000 incentive
- \$80,900 per year savings
- 1.1 Year payback



Continental Tire – Compressed Air RCx

- Retro-commissioning study (80% paid)
- \$236,000 custom incentives
- \$200,000+ per year savings
- 0 to 1.5 Year paybacks



Quick Hit Projects

Justification can be enhanced by success:

- CFLs
- LED Exit Signs
- T12 to T8 lights
- On-line store (now open to all customers)



Benefits of Project Installation NOW

- Start saving sooner
- ActOnEnergy incentives have been increased on many standard measures through Dec 31st, 2011
- **ActOnEnergy incentives are only good while the funds last!**

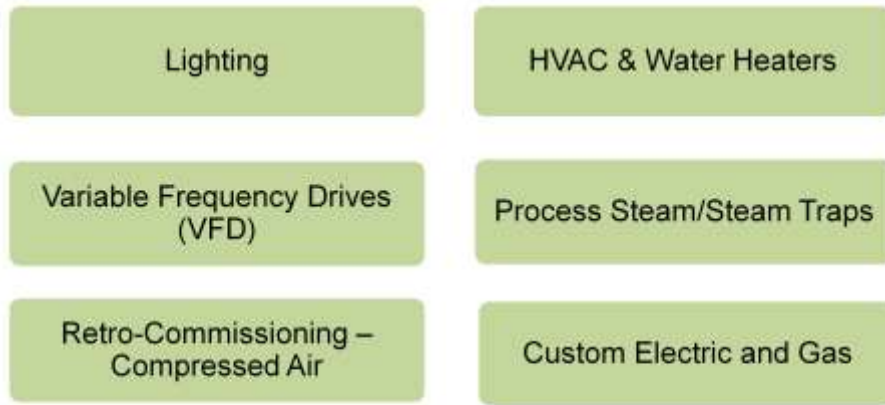
What is **ActOnEnergy**?

So, what is ActOnEnergy? Ameren Illinois' ActOnEnergy program offers financial incentives to customers to be more energy-efficient. Energy-efficient upgrades not only lower your energy bills, they can also reduce maintenance costs, improve comfort, provide precise control and extend equipment life. The Ameren Illinois' ActOnEnergy initiative helps businesses use less energy and save more money.

The funds come from the Ameren Illinois rate payers (residential and business), based on the amount of electric and/or gas energy they use. All eligible customers are paying into the Energy Efficiency Program with a Rider EDR charge on the monthly electric bills, and a Rider GER charge for gas services.

Next, we'll talk about what incentives the ActOnEnergy program offers.

ActOnEnergy Incentive Areas

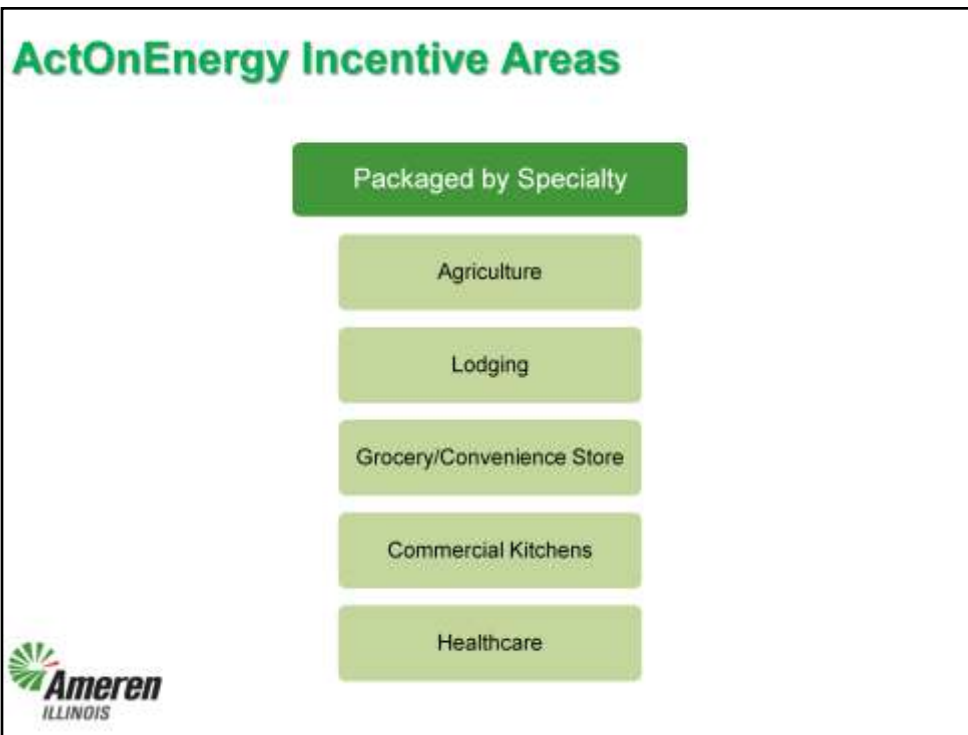


The ActOnEnergy incentive areas include electric and gas incentives, where the incentive is paid to you after you complete the project, and energy-saving products that are available on the on-line store, where the incentive is built into the price.

This chart shows the electric and gas incentives.

There's lots of other great programs available. For instance, if your furnace or water heater is getting a little old, there's incentives available to upgrade to a premium efficiency model.

Next, we'll discuss the specialty programs we offer.



Our programs are also packaged by specialty for your convenience.

Refrigeration incentives can now be found under the industry specific applications, which include: grocery, commercial kitchens, agriculture, and lodging.

Any business can use any type of application. For example, just because you are a nursing home does not mean that you cannot use the lodging application to receive an incentive for that ice maker you want to replace.

Next, we'll talk about the ActOnEnergy resources available.

Resources

- Website: ActOnEnergy.com
- Phone: 866-800-0747
- Fax: 309-677-7950
- Email: ActOnEnergyBusiness@Ameren.com

ActOnEnergy.com



Here are some resources to get more information about the ActOnEnergy Program. Please visit our website to learn more and determine which projects are right for you.

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- B. Nuclear
- C. Natural Gas Combined Cycle
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E. Wind

F. Energy Efficiency

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A. True

B. False

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D. All of the above

E. A and C only

Questions?

