Boilers: Hot Water or Steam
Turn Your System Green


Mary Bentsen, Education and Training Coordinator
SAIC, an Ameren Illinois ActOnEnergy Partner
Practical Items

- If you can't hear me, please type a message in the **Chat** window located on the right-hand side of your screen.

- Be sure you have called in to the conference call. See the first message at the top of the **Chat** window for call-in information.

- Please type any questions you have during the presentation into the **Chat** window located on the right-side of your computer screen.
Quiz Questions:
What do you already know about water heating through a boiler system?

1. How much of a commercial business's energy usage comes from its HVAC system?
2. What is the average lifespan of a steam trap before it will need repair or replacement?
3. What number of psig’s is considered medium pressure steam?
<table>
<thead>
<tr>
<th>Today’s Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water Systems</td>
</tr>
<tr>
<td>Steam Heating or Industrial</td>
</tr>
<tr>
<td>Standard HVAC Application Vs. Custom</td>
</tr>
<tr>
<td>Improvements &amp; Incentives</td>
</tr>
</tbody>
</table>
Commercial Energy Use

- Lighting: 18%
- Space Heating: 20%
- Space Cooling: 13%
- Water Heating: 10%
- Electronics: 8%
- Refrigeration: 6%
- Wet Cleaning: 3%
- Cooking: 3%
- Ventilation: 3%
- Other: 8%
- Computers: 2%
- Adjust to SEDS: 6%
Heating and Your Business: Basic Facts

- 33% of a commercial business's energy usage comes from its HVAC system.
- 30% of the energy usage comes from heating the air or water.
- Commercial facilities spend $1.19 per square foot on energy costs annually.
- Hospitals spend $2.26 per square foot on energy costs annually.
Hot Water Systems

• Hydronic boilers – A proven heating system for a number of purposes both commercially and residentially
• Multiple ways to distribute and deliver the heat
• Initial expense versus long life with better comfort
• Making improvements to your old boiler can make it as efficient as the systems of today
Boiler Old Versus New Condensing Boilers
Condensing Boilers

- New designs allow for AFUE above 90% to complete with best systems
- Smaller designs and multiple units to replace large boilers
- Gas valves and systems that ramp up or down to the current heat needs
- Higher tech control systems that help fix problems quickly
- New accessory items to help distribution
Saving Today and Beyond

- A commercial building recently converted their aging boiler to 3 smaller boilers and reported a savings of thousands per month through the heating season.
- The new setup all sits in half the space of the old boiler.
- The boilers are staged to use only the capacity that the control sensors and computer program tell it to use.
- The boilers often only use one of the three boilers in milder weather such as most of this winter.
- The new control systems allow for better comfort and savings for the whole facility.
- VFDs were added to the pumps for savings on pump motors.
Are you using variable frequency drives (VFDs)?

A. Yes
B. No
C. Don’t know
Radiant Infloor Heating
Radiant Hydronic Floor Heat

- This older heating system with new products and boilers has made a comeback.
- New condensing boilers, new piping materials that are easier to install, and hardware that is easy to use have made it popular.
- Heating the concrete or floor means less air movement and a better comfort level in the space.
- Less temperature changes and keeps the heat where you are.
- In high ceiling work spaces, this can mean big energy savings by keeping the heat near your feet instead of the ceiling.
- Snow melt can also be an option.
Steam Heating or Industrial

Typical Applications

• Steam is rarely used for space heating today – hot water systems are less maintenance intensive

• Exceptions

• Hospitals – need steam for sterilizers

• Older district heating systems

• Industrial plants which require process steam will use the same system for heating
## Classes of Steam

<table>
<thead>
<tr>
<th>Low Pressure Heating Steam</th>
<th>Medium Pressure Steam</th>
<th>High Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 psig</td>
<td>15-125 psig</td>
<td>Above 125 psig</td>
</tr>
<tr>
<td>Actual code is more restrictive</td>
<td>Used in hospitals, district steam systems, some industrial heating</td>
<td>Strictly industrial and power generating applications</td>
</tr>
<tr>
<td>Used strictly for space heating systems and single effect absorption chillers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piping becomes large for higher capacity systems</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Steam Traps

Caring for your trap saves

Common application use
# Types of Traps

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermostatic</td>
<td>Common in two pipe steam heating systems</td>
</tr>
<tr>
<td>Thermodisc</td>
<td>Simple and easy to maintain trap, few moving parts</td>
</tr>
<tr>
<td>Float &amp; Thermostatic</td>
<td>F&amp;T trap separates venting air and draining condensate</td>
</tr>
<tr>
<td>Float Trap</td>
<td>Free float variant</td>
</tr>
<tr>
<td>Bucket Trap</td>
<td>Resembles an upside down open bucket</td>
</tr>
</tbody>
</table>

Average life before replacement or repair = 7 years
Broken Traps Waste Energy

Traps – particularly bucket traps – have limited life

- If a trap fails closed: will interrupt production
- If a trap fails open: production will continue with no problem, but large amounts of steam will be wasted

- Our program offers incentives to help cover the cost of the steam trap survey and replacements as well as incentives to help pay for boiler tune-ups
- Boiler tune-ups are also a great way to save
What are you using your boiler for?

A. Hot water system heating
B. Steam heating
C. Industrial processes
D. Don’t know
Standard HVAC Application Vs. Custom

• The boilers up to 2000 kbtuh (2,000,000 btu capacity input) can be found on the HVAC application for tune-up incentives and replacement incentives

• Over this size are to use the CUSTOM application

• Not all standard HVAC applications need pre-approval
Custom Application

- Boilers over 2000 kbtuh (2,000,000 btu capacity input) can be found on the Custom application.
- If you have a steam boiler please remember your boiler is likely referred to in HP (horsepower).
- 1 Boiler HP is equal to approximately 33,340 btu or 60hp and bigger will use a custom application under the current program year applications.
- All Custom applications need to be pre-approved.
Programs by Business Type
We've bundled our incentives to help businesses in these industries get started
- Agriculture
- Lodging
- Grocery/Convenience
- Commercial Kitchen
- Multi-family Rental
- New Construction
- Healthcare
- Manufacturing

Click here to see HVAC incentives.

Click here to see Custom incentives.

Programs by Equipment Type
Any business can enjoy these incentives, no matter what industry you serve
- Lighting
- Heating / AC
- Water Heaters
- Refrigeration/Freezers
- Steam Boilers
- Compressed Air Leak Survey
- Custom Incentives

Click here to see HVAC incentives.

Click here to see Custom incentives.

Online Store
Business customers can shop online for energy-efficient products at a discounted rate
Start Shopping!
Shop by popular items:
- CFL Light Bulbs
- Exit Signs
- T8 Lighting
- Motion Sensors
- Vending Controls

FIND A Contractor
FREE Business Symposium Registration >>>
SEE WHY IT Pays to Act Now $$$
SEE OUR Offers $$$

Questions?
Follow Us!
A Systematic Approach to Savings

HVAC & Water Heaters

Proper heating, ventilation and air-conditioning (HVAC) are key to maintaining a comfortable and productive work environment. Collectively, these systems account for up to 40% of the energy used in businesses. Your organization can enjoy significant savings year after year with improvements to your HVAC system.

Cash incentives are available for a variety of HVAC/Water Heater projects, including:

- Furnace and boiler replacements
- AC and chiller tune-ups
- Heating equipment tune-ups
- Water heater
- Variable Frequency Drives

Get $200-$800 to replace your furnace & $400-$600 to replace your boiler!

Real Results

See how an HVAC upgrade is saving one Ameren Illinois customer nearly $1,200 in annual heating costs!

How to Begin

For more information or to apply, please download the HVAC/Water Heater Project Guide of your choice. Here you can:

1. Determine eligibility
2. Get details on cash incentives
3. Apply for incentives (Pre-approval required for project incentive requests exceeding $10,000)
4. Submit required final paperwork

Click here to apply for HVAC incentives.
Improvements & Incentives

- HVAC tune-ups (no service contract or tune-up in past 12 months)
- AC, Chillers: air and water cooled: $25, 8, or 4 per ton AC*
- *up to 50% of tune-up cost (no parts included)
- Gas boilers under 2,000 kbtuh: $150-1,200 per boiler
- Over this size are custom application based on the therms saved. The bigger boilers show an average of 1 to 10% improvement in energy use. Pre-combustion & post analysis required
Case Study: Boiler Tune-ups for Catholic Charities

- Nearly $1,750 in total cash incentives from ActOnEnergy
- Natural gas usage decreased by more than 2,000 therms annually
- Reduced maintenance costs
- Reduced risk of equipment breakdown and safety issues
- Every therm saved helps conserve precious natural resources
- Every dollar saved can go to the business, or in this case, the non-profit organization, to use for their programs
HVAC Equipment Replacement

• Boiler for HW under 300 kbtuh or 85% AFUE: $400-3,000 per
• Boiler HW project over 300 kbtuh & 90%AFUE: $800-6,000 per
Example: Boiler Replacement
ActOnEnergy Incentives: Water Heaters

- Water heaters are a great way to save on the water you have to heat for business.
- Tank less models heat only what you are using and can have up to 98% AFUE!

Incentives on HVAC application:

- Gas tankless $1,200
- Electric tankless $300
- Tank electric or gas $150 to 300
- Pipe insulation, shower heads, faucet aerators also have incentives
Example: Tankless Water Heater

• A national chain steakhouse replaced their large water heater with four 98% AFUE tankless water heaters

• Projected therm savings: 1,808 conservatively

• Incentive: $4,800.00

• Multiple units gives the water you need at the time you need it without continuing to heat unused tanks
When was the last time your boiler system was tuned-up or your traps were checked for operation failure?

A. 1 - 6 months ago  
B. 7 -12 months ago  
C. More than 12 months ago  
D. Can’t recall
Steam Trap Program

- The average steam trap last 7 years. You’re on borrowed time after this.
- The steam trap survey will help find the bad ones and pay to help do so.
- Incentive of $30 - $50 per trap based on psig.

- Replace or repair the failed traps:
- Incentive of $100 – $400 based on the pressure psig.
Finding Providers and Contractors

Click here to find a Contractor who is an ActOnEnergy Program Ally.
Conclusion

- Boilers are like people: they need an annual checkup and cleaned occasionally.
- A boiler system will usually last twice as long as a forced air system.
- Boiler systems are better for allergy sufferers according to the American Lung Association (Heats with less air movement).
- Even steam heat can be efficient and green (Dan Holohan).
- Find a good “boiler & controls” tech to save the most with today’s systems.
Resources


Phone: 217-649-8897
Email: rod.rhoads@gdsassociates.com

Website: ActOnEnergy.com/Business
Phone: 1.866.800.0747
Fax: 1.309.677.7950
Email: ActOnEnergyBusiness@Ameren.com
What is the most useful or interesting thing you learned today?

Type your response into the Chat window.
Quiz Questions:

What do you know about water heating through a boiler system?

1. How much of a commercial business's energy usage come from its HVAC system?

2. What is the average lifespan of a steam trap before it will need repair or replacement?

3. What number of psig’s is considered medium pressure steam?
Resources


Phone: 217-649-8897
Email: rod.rhoads@gdsassociates.com

Website: ActOnEnergy.com/Business
Phone: 1.866.800.0747
Fax: 1.309.677.7950
Email: ActOnEnergyBusiness@Ameren.com
Ameren Illinois and the Association of Energy Engineers (AEE) are partnering to host Certified Energy Manager training.

<table>
<thead>
<tr>
<th>Dates:</th>
<th>March 26 - March 30, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time:</td>
<td>8:00 a.m. to 5:00 p.m.</td>
</tr>
<tr>
<td>Location:</td>
<td>Ameren Illinois</td>
</tr>
<tr>
<td></td>
<td>300 Liberty Street</td>
</tr>
<tr>
<td></td>
<td>Peoria, Illinois 61602</td>
</tr>
<tr>
<td>Cost:</td>
<td>$1795.00</td>
</tr>
<tr>
<td>Contact:</td>
<td>Mary Bentsen</td>
</tr>
<tr>
<td></td>
<td>309.677.5703</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:mbentsen@ameren.com">mbentsen@ameren.com</a></td>
</tr>
</tbody>
</table>

Since its inception in 1981, the Certified Energy Manager (CEM) credential has become widely accepted and used as a measure of professional accomplishment within the energy management field.

Last chance to sign up for CEM training!

Reserve your spot now and take advantage of Early Bird pricing! Limited seats available.