

February  
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Ever mindful of the email barrage you receive every day, we have attempted to compile a useful and informative newsletter that provides valuable information on the energy analysis tools, methods and equipment McCotter Energy Systems employs to accomplish our mutual goal:

Providing reliable, energy efficient systems to our clients.

To that end, in this issue we provide information on the Smart Energy Analyzer and Smart Energy Lab which are available at no cost to our business partners and clients. We also hope you take a moment to read our Smart Energy Savings Profile detailing how a cost effective Riello burner upgrade saved the Lakeland School District \$28,000 in a single heating season. The Smart Energy News will also offer some valuable application information that will help in the design of efficient and reliable boiler systems.

Regards,

Dan McCotter  
President  
McCotter Energy Systems

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**Smart Energy Lab**

Smart Energy. Reliable Efficiency.™



The Smart Energy Lab is a one of kind facility designed for engineers, contractors, and end users to learn about and present the most efficient boiler technologies commercially available. The Smart Energy Lab, located at our main office in downtown Milwaukee, provides a unique opportunity to see and compare boilers of varying materials and performance (stainless steel, copper, aluminum). Operating boilers and burners are displayed in a comfortable lab setting designed to facilitate open and honest discussion of the most efficient and reliable system for a particular application. The latest and most efficient boiler retrofit technologies are on display and operational, whether a linkageless burner retrofit system or new high efficiency gas/oil burner.

For contractors and engineers, the facility is an excellent opportunity to show your clients the latest reliable efficiency technologies that your firm is specifying and/or installing. The Smart Energy Lab is available to our clients and business partners for tailored boiler technician training sessions.

To schedule a visit please call (800) 950-4822 or email [administration@mccotterenergy.com](mailto:administration@mccotterenergy.com).



## Smart Energy Analyzer

Smart Energy. Reliable Efficiency.

McCotter Energy has developed a mobile Energy Analyzer that will measure current performance characteristics of existing boiler systems. Accurate information on an existing boiler system is essential to size and source the correct high efficiency replacement or upgrade. The Smart Energy Analyzer will help build credibility with clients by providing them exact information about the performance of their existing equipment. The Smart Energy Analyzer can measure data and log:

- Supply and Return Water Temperature
- BTU Output
- Boiler Cycles
- Boiler Firing Rate
- O.A. Temperature
- Steam Pressure/Water Temperature

How does it work?

For instance, on a water boiler, strap-on sensors are placed on the boiler inlet and outlet piping and in ambient outside air. The Analyzer also monitors firing rate and boiler cycles via current sensors on the blower motor leads. The data is collected, collated in the Smart Energy Analyzer unit and graphed by McCotter Energy Systems in a clear and concise form for presentation to the client. The Smart Energy Analyzer is compact, easy to transport and install. The unit is available to our business partners to assist in providing the best possible efficiency solution for clients (based on availability).



To reserve the Smart Energy Analyzer, call the McCotter Energy office at 800-950-4822 or email to [administration@mccotterenergy.com](mailto:administration@mccotterenergy.com).

### Reliable Efficiency

### RIELLO BURNERS

#### Performance and Design



#### Slide out assembly

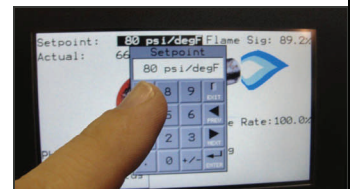
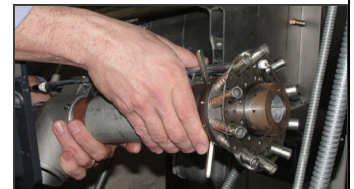
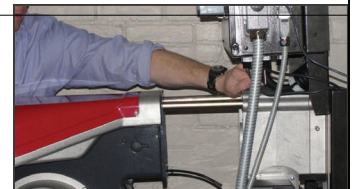
Designed with innovative slide bars which enable the burner assembly to be pulled outwards, allowing quick access to the combustion head for easy set up and servicing.

#### Touch screen controls

Touch screen control option fit to the Riello burner with Siemens LMV system. Easy to read touch screen panel provides operating information, fault history, burner status and set point adjustment.

#### Performance capabilities

High turndown, Low excess air, (3% O<sub>2</sub>) Low NO<sub>x</sub> Combustion





## Smart Energy Savings

Smart Energy. Reliable Efficiency.

## Lakeland HS, Minocqua, WI



**Justin Gavin**  
Sales Engineer  
Fox Valley

Lakeland School District in Minocqua, WI is geographically one of the largest school districts in the State of Wisconsin. The Lakeland High School is over 283,000 sq. ft. and serves 840 students with a staff of 125. The High School has 2 separate boiler rooms.

Both boiler systems were older, but were well within their usable "life cycle". One of the boiler rooms contains (1) Kewanee 400 HP wood burning boiler that had been converted to natural gas 19 years ago. The other plant has (2) 250 HP Iron Fireman scotch marine boilers. Both plants had reasonably modern, modulating burners that provided approximately 4:1 turndown.

Boilers systems are designed by code to meet "Design Conditions" or the worst case scenario heating load. For Lakeland High School this is -20 ° Fahrenheit. However, when you look at the BIN data (degree days), Lakeland experiences these conditions less than 1% of the heating season. The majority of the heating the loads are 20% to 30% of design condition. Coupled with the internal heat load gains from lighting, equipment, and people, Lakeland High School had a significant opportunity to save energy and precious dollars by finding a solution to boiler cycling inefficiencies.

Lakeland High School explored options to increase the efficiency of its heating plants. Options included:

- Installing smaller tracking boilers to reduce cycling during lower load conditions.
- Upgrade the existing burners with "linkageless retrofit kits" to increase efficiency and turndown.
- Replace the existing burners with Riello high efficiency burners.

Installing tracking boilers is an excellent option, however, the costs compared to "upgrading" an existing boiler is often very expensive. Upgrading the burners with Linkage-

less controls was a viable option; however, the efficiency and turndown did not match that of replacing the burners with new high efficiency Riello burners. Although slightly more than linkageless upgrades, the Riello option was less than 1/3 the cost of installing tracking boilers. The Riello burners are designed to operate efficiently at 15% excess air throughout the complete 10:1 firing range providing peak efficiency. The burner heads are heavy gauge stainless steel and the flame pattern is designed to direct the heat away from the head which is crucial for low load conditions.

Lakeland High Schools installed Riello high efficiency burners and the savings have been remarkable. In the first six months of operation (the burners were installed in November of 2009) the District saved 26,751 therms over their seven year average usage equating to \$28,089 in savings. The return on investment will be under 3 years.

The District has benefited from efficiency gains and reduced maintenance costs. It takes considerable less time to maintain a linkageless burner due to the elimination of "slop" in the linkage and the required adjustment to ensure efficient fuel-air mixture.



	Nov	Dec	Jan	Feb	Mar	Apr
Therms Used (7 year avg)	26,735	35,028	38,147	33,020	28,606	17,862
Therms used after install	20,830	32,835	33,970	28,522	20,871	15,620
Therms Saved	5,905	2,193	4,178	4,498	7,735	2,242
Savings in Dollars (\$1.05 therm)	\$6,200	\$2,303	\$4,387	\$4,723	\$8,122	\$2,354
Total Savings						\$28,089
Project Cost						\$72,000
ROI						2.5 years

"The Kewanee boiler used to sound like a jet engine. You could hear it running throughout the hallways. Now you walk past the boiler room, and you don't know the boiler is running. It sounds like a quiet breeze coming off the lake. Our annual savings are \$21,000 over the original estimate. The burner upgrade has been a huge success for the District. We couldn't be happier with the savings and performance."

~Dave Arnold, Facilities Manager  
Lakeland School District



## Condensing Boiler Venting Solution

When designing a common-vent type exhaust system for multiple condensing boilers, it's important that you take condensate removal into account. When venting into a common stack, the condensate drains back to the boilers just like any other system. The difference is the fact that if the necessary precautions aren't taken to remove the large amounts of condensate created by multiple condensing boilers operating at once, some issues may arise that can cause equipment failures that may not be covered under warranty by the equipment manufacturer.

When designing a common-vent exhaust system, a good practice is to install vertical inline condensate drains in each boiler stack. The integral condensing boiler condensate drains are only designed to remove condensate from the individual boiler exhaust manifold and the individual exhaust stack associated with that boiler. In many cases, when multiple boilers are vented into a common stack, a large volume of condensate will drain back to the first boiler or the boiler closest to the outside termination. Boiler failures, faults and other issues may arise as a result. By installing secondary vertical inline drains in each individual boiler drop, you can

ensure that the boilers combustion chamber drain does not serve as the vent condensate removal system. It is also good practice to install a horizontal condensate drain in the common vent between the outside termination and the closest boiler to the outside termination.

It is also very important to calculate the exhaust stack sizing properly, as it is imperative that these exhaust systems are under negative pressure at all times.

We always recommend individual exhaust systems for each condensing boiler, but recognize that this is not always possible. By taking a little extra time during the design process, you can provide your customer with an added insurance policy against failures and nuisance faults, as a result of an undersized condensate removal system.

If you or anyone in your organization would like to discuss proper venting design for your next project, please feel free to contact one of our Sales Engineers and they will be happy to assist you.



**Adam Wedekind**  
Sales Engineer  
SE Wisconsin



**Shane Creger**  
Operations  
Milwaukee

## McCotter Parts Inventory

To provide timely and efficient service to our customers, McCotter Energy maintains a large inventory of parts in our warehouse ready for immediate shipment or pick up. In stock are parts for Aerco, Siemens, Riello, Bryan, Hurst, Smith and Gordon-Piatt products.



### McCotter Energy Expands Staff

Lori Phillips has joined McCotter Energy Systems as Marketing Manager and Inside Sales Support. Lori brings over 20 years of sales and marketing experience to the company. She will coordinate McCotter Energy Systems marketing programs, web site updates and will assist with sales support.

We are the factory sales and service representative for these and other high efficiency products.



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