

Let's Save Energy



School Energy Managers Project



March 2014

Power factor: Is there opportunity for savings?

That has been the question districts have asked during the past few months. It refers to a utility billing line called "power factor," or "PF." Simply put, PF is a ratio that describes the relationship between useful and non-useful work.

Districts are learning the importance of keeping an eye on utility bills. In doing so, they are being asked to consider many options for reducing the cost of utilities. However, before making decisions on power factor equipment installation, school leaders should become more familiar with the facts about these kinds of options.

Not all electrical circuits function efficiently. Some power is lost naturally through heat dissipation as flowing current encounters the resistance imposed by power lines. Other losses can occur due to increased electrical requirements created by a poor power factor. Power factor losses usually occur in large motors or lighting circuits



Students at Richardsville Elementary (Warren County Schools) review the process of a Geothermal HVAC with visitors in their schools.

ELECTRIC CHARGES		
Contract 195708		
Rate Type:	Time-of-Day Secondary Service	
\$ 200.00	Basic Service Charge	
\$ 3,264.40	Energy Charge (\$0.03773 x 86,520 kWh)	
\$ 785.40	Peak Demand Charge (\$4.25 x 184.8 kW)	
\$ 19.13	87.85% Peak PF Adjusted to 90.00% (\$4.25 x 4.5 kW)	
\$ 496.08	Intermediate Demand Charge (\$2.65 x 187.2 kW)	
\$ 11.93	87.88% Intermed PF Adjusted to 90.00% (\$2.65 x 4.5 kW)	
\$ 830.00	Base Demand Minimum Applied (\$3.32 x 250.0 kW)	
\$ 41.53	Electric DSM (\$0.00048 x 86,520 kWh)	
\$ 231.57	Environmental Surcharge (7.36% x (\$5,648.47 - \$2,502.16))	
\$ 244.85	Fuel Adjustment (\$0.00283 x 86,520 kWh)	
\$ 183.75	Rate Increase For School Tax (3.00% x \$6,124.89)	
\$ 33.69	Franchise Fee- (0.55% x \$6,124.89)	
\$ 6,342.33	Total Charges Contract 195708	

Utility companies may "adjust" to 90% and your account will be charged for the difference. In the example provided, the school is paying \$19.13 for this one month to correct the PF from 87.85% to 90%. Some months may not require correction, while in others it may be slightly higher.

that are not designed or installed correctly. Fortunately, most circuits and equipment designs within a school are optimized. Additionally, most utility providers do not penalize their customers for power factor correction unless the power factor ratio falls below 90 percent.

With a better understanding of PF, the next step is to **determine if your school is being charged a "PF penalty."** For this step, review your utility bills over the last year. If you are not being charged a significant penalty, installing power factor corrective equipment is not likely to be cost-effective for most situations.

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As your district determines the most appropriate expenditures for energy savings, use the following analysis:

- *Confirm that the current PF is consistently < 90 percent*
- *Consult with your energy manager or engineering consultant*
- *Consult with KDE District Facilities Branch*
- *Review third-party engineering/financial analysis*
 - ◊ Confirm power losses for each facility

- ◊ Verify claimed power loss savings
- ◊ Verify payback period
- ◊ Require detailed proof and support for claimed savings
- *Require detailed examples of post-installation performance calculations*

Your energy manager can help you select your best energy conservation measures based on cost/benefit and life-cycle analysis as envisioned by KRS 157.455.

102 Districts Participate in Energy Management Compliance Training

One-hundred-and-two school districts participated in the Energy Management Compliance Training sessions held in four locations throughout Kentucky during February. The purpose of the training was to assist districts in compliance with KRS 160.325 and Board Policy 05.23, as well as implementation of best energy practices as envisioned by KRS 157.455. This training was designed for district personnel responsible for energy management.

The flowchart (*shown on back page*) presents the steps that a district energy man-

ager should follow to meet the goals envisioned by the statute and board policy. Eighty-six school personnel, 13 energy providers and five energy curriculum partners attended the four regional meetings. As participants were reminded, compliance requires that:

1. A district-level committee shall be appointed by the superintendent/designee to develop and implement an energy management plan (EMP).
2. The district-level committee shall track and monitor the EMP to determine progress toward managing and reducing energy costs.
3. The superintendent/designee shall report the EMP results for each fiscal year, including annual district energy usage, costs and anticipated savings.

After recognizing the compliance obligations, participants then were led through a series of presentations showing practical applications for saving money and energy within a school district.

Aside from achieving dollar savings by using less energy, it is important to be on the correct utility rate. Participants at the regional meetings were given an update of utility rates across Kentucky. Different rates structures and rate elements were reviewed, giving the attendees insight into



Ron Willhite, Director of the School Energy Managers Project, is shown during a discussion of the Kentucky Gas Aggregation Program and opportunities for reducing gas utility costs.

opportunities for billing reductions. A rate comparison tool was provided to help them easily calculate potential rate changes.

Understanding that each school district must develop and implement an energy management plan (EMP) is also not enough. Participants learned about a process that took them through the steps from the EMP to budget actions. The steps included auditing, cost/benefit analysis, and funding options. Best practices were shared by energy managers active in the Kentucky Education Energy Managers Association.

As participants all agreed, the mission of school districts is to provide the best education possible to all children in Kentucky. Given the rising costs of utilities and the complexities of energy management, KSBA's SEMP program is available to assist districts in understanding options. SEMP



David Huff, Director of Energy Efficiency & Smart Grid Strategy with LGE/KU, reviews new opportunities for districts to manage "demand."

provides professional development for all school energy managers in Kentucky and provides matching funding for districts to employ an energy manager in their district.



Jon Nipple, Project Manager-School Energy Managers Project, reviews how to audit school facilities to then narrow-down to priority energy projects.

"When returning from the Energy Compliance Training, I reviewed my district's utility bills to learn we were paying over \$5,000 annually in state sales tax that has now been corrected. Additionally, when understanding that my school flashers were on a state highway, I contacted the Transportation Department who has now corrected the responsibility for billing, representing approximately a \$600 annual reduction in utility costs."

*Darren Sparkman,
Morgan County Facilities Director*

Energy Management Flowchart

