



Buildings



Devices



Points

Sun Prairie, WI  
Commercial



<http://bacnetinternational.org>

## WPPI Energy Office & Operations Facility

WPPI Energy is a regional power company serving 51 customer-owned utilities that provide electricity to more than 195,000 homes and businesses in Wisconsin, Upper Michigan, and Iowa. The company had outgrown their Office and Operations Facility in Sun Prairie, WI, and recently expanded to double the size of their original building from 25,000 to 50,000 square feet.

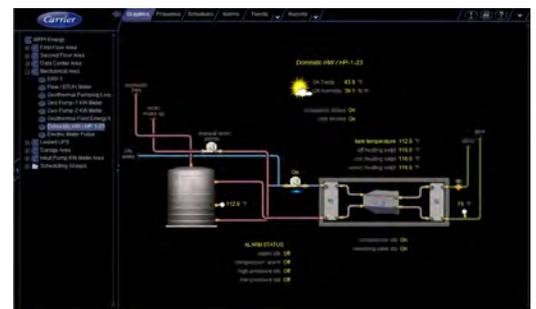
The newly expanded WPPI Energy headquarters facility provides additional conference rooms and work space, plus an employee fitness center and break room. The facility also incorporates many elements of sustainable design, including solar tubes and daylighting, high performance light fixtures, energy efficient plumbing, photovoltaic panels, and a geothermal heating and cooling system with heat recovery ventilation.

### Unique Challenges

With sustainability on their minds, WPPI Energy consulted with Temperature Systems, Inc. (TSI), a Carrier Distributor in Madison, WI, to help design the control system for the newly expanded building. There were many challenges associated with the expansion, but based on a previously relationship with Shane Lyle, the Controls Manager for TSI, they knew that they could count on him to design an integrated control solution to meet all of their needs:

- 1) Control equipment as efficiently as possible, while also providing comfort to ensure employee productivity;
- 2) Eliminate the constant hot & cold battles between employees;
- 3) Provide a means to monitor and tweak the system for better performance;
- 4) Achieve LEED Gold certification with full points for energy efficiency;
- 5) Conserve energy and capture energy savings.

Shane began designing the WPPI Energy solution with BACnet® in mind because of its flexibility. "I had a good relationship with Iconica, the engineers for this project, and was fully aware that one of the LEED Gold objectives was interoperability on the equipment side", explained Shane. He knew that sustainability was also a driving force in the building, and that various equipment manufacturers would be chosen based on that criteria. "It was up to me", explained Shane, "to work directly with Iconica to make sure that



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everything tied together for WPPI Energy, no matter what equipment they chose for their building. And tying everything together for them meant that they would need total control of all equipment through a single user interface.”

The first step in Shane’s solution was to work diligently with Iconica and all of the various equipment manufacturers to make sure that BACnet® data could be provided for all equipment. This way he could install the i-Vu® web-based user interface, which provides the seamless integration capabilities that WPPI Energy needed to tie everything together. Using i-Vu®, facility operators would be able to control all equipment, regardless of manufacturer, as efficiently as possible. The end result would be optimum performance for the entire system.

## Satisfied Customer

So, what did the final sustainable design look like? Success! A total of 9 different equipment manufacturers came together to form the integrated BACnet® solution: ClimateMaster & Carrier both supplied water-source heat pumps; Florida Heat Pump provided control for the domestic hot water heater; AAON supplied heat recovery units; Liebert supplied UPSs; Veris supplied kWh meters; Onicon supplied BTU meters; Control Solutions Inc. provided a BACnet interface for air flow monitoring at each heat pump; and Carel provided control of the central plant. The super-efficient heating and cooling system was comprised of 69 total pieces of equipment and 2,300 total points, all accessible to WPPI Energy facility operators through the web-based i-Vu® user interface. In the expanded facility, WPPI Energy employees enjoy a bright, comfortable new workspace, and their hot & cold battles have been eliminated.

“The heart of the BACnet® solution was definitely the i-Vu® user interface”, explained Shane. “Without it, WPPI Energy would not have been able to tweak the system for optimum performance, which was key in providing them with full points for energy efficiency towards LEED Gold.” Jake Oelke, Assistant Vice President of Energy Services at WPPI Energy said, “Being able to check the geothermal system online from home via the i-Vu® interface has enabled us to find and correct equipment that was running on weekends or holidays. We also like that we’ve been able to experiment with settings without re-programming each piece of equipment individually, which has allowed us to tweak our set-points for greatest efficiency.” Mary Beth Weidenfeller, Manager of Administrative Services for WPPI Energy, hailed the i-Vu’s user-friendly interface. “The i-Vu® system is easy to learn and easy to use. Some other control systems are like learning to program a rocket ship, but the i-Vu® control system is simple and flexible.” When you take a look at benefits such as these, it’s easy to understand how i-Vu® helped them to conserve energy and capture energy savings for the entire facility.

The i-Vu® user interface also provided many additional benefits that they weren’t necessarily expecting. Remote troubleshooting capabilities allowed them to deal with issues at all hours – not just working hours. Also, built-in trends and reports helped with maintenance, allowing them to tweak the geothermal system easily in order to increase efficiency in the system. “Because a geothermal system is so efficient, it would appear as if nothing needs to be tweaked. But i-Vu® allows us to tweak temperatures, let things run for a couple of days, and then find out if the system provided additional efficiencies. Before installing the i-Vu® control system, we would have to go to all of the individual thermostats to make tweaks”, explained Jake Oelke.

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When asked if BACnet® provided the flexibility desired for this project, Shane remarked, "There is equipment from nine manufacturers installed at the WPPI Energy facility, and thanks to the integration capabilities of BACnet® and i-Vu®, they all work great together." Because of this high level of functionality, WPPI Energy is considering the future integration of their lighting system into the i-Vu® control system.

WPPI Energy's sustainability efforts resulted in a LEED Gold rating for their Sun Prairie facility, with full points for energy efficiency. What's more, the company doubled the size of their almost completely electric-powered headquarters without increasing their electrical usage. As WPPI Energy then-President and CEO Roy Thilly said, "We are telling our customers every day that the most important thing they can do is to conserve electricity and eliminate waste. But it's hard to convince people if you don't do it yourself!"

## BACnet Integrated Equipment on this Project

Building Controls Front End	Carrier, i-Vu®	UPSs	Liebert
Water Source Heat Pumps	ClimateMaster	kWh Meters	Veris Industries
Water Source Heat Pumps	Carrier	BTU Meters	Onicon
Domestic Water Heater	Florida Heat Pump	Central Plant Control	Carel
Heat Recovery Unit	AAON		

## Additional Project Statistics

Green:	LEED Gold facility
System Points:	2,300
Owner / Occupier:	WPPI Energy Office & Operations Facility
Controls Contractor:	Temperature Systems, Inc. (TSI) (Carrier Controls)
Engineering Firm:	Iconica
Consultants:	Iconica
System Integrator:	Temperature Systems, Inc. (TSI) (Carrier Controls)



## BACnet® International

BACnet International is an industry association that facilitates the successful use of the BACnet protocol in building automation and control systems through interoperability testing, educational programs, and promotional activities. The BACnet standard was developed by ASHRAE and has been made publicly available so that manufacturers can create interoperable systems of products. BACnet International complements the work of the ASHRAE standards committee and BACnet-related interest groups around the world. BACnet International members include building owners, consulting engineers and facility managers, as well as companies involved in the design, manufacturing installation, commissioning, and maintenance of control equipment that uses BACnet for communication. For more information visit BACnet International.