

Manufacturing Plants Tell Tales of Sustainability at Automation Fair

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Seems everybody who's anybody is waking up to energy—wide awake, cold-bucket-of-water-in-the-face awake. Of course, they've always known the basic consumption details, but with prices rising and growing awareness of the environmental effects of greenhouse gas emissions, they're digging into the details, seeking every possible path to manage their energy effectively and reach new levels of optimization.

Not surprisingly, many are relying on Rockwell Automation to guide them to this new energy nirvana. Several acolytes presented their experiences during the Energy and Environmental Industry Forum at this week's 20th annual Automation Fair in Chicago.

"We've achieved 15% savings." Energenic's Steve Poniatowicz explained how his company has cut fuel costs and increased efficiency at the company's combined heat-and-power plants.

For instance, Steve Poniatowicz, senior vice president at Energenic, reported that his company designs, owns and operates mid-sized combined heat and power (CHP) plants fueled by natural gas, biomass, renewable and other sources. It and its parent, Marina Energy, began an ongoing partnership with Rockwell Automation in 2000 when they built a chilled and hot water facility enabled by variable-frequency drives (VFDs) for the \$1 billion Borgata Hotel and Casino in Atlantic City, N.J. The facility started up in 2003 and was updated in 2006 and 2010.

"Last year, we added a CHP project at the casino and integrated it into the existing system. We also included some new equipment, such as solar turbines, heat-recovery boilers and absorption chillers. Rockwell Automation helped us integrate all of it," said Poniatowicz. The latest update includes VFDs and motor control centers (MCCs) for the cooling towers, chilled water pumps, condenser water pumps and hot water pumps. These devices are managed by the recently bundled FactoryTalk VantagePoint software and RSEnergyMetrix software for real-time monitoring, alarming and control, process data logging and reporting, real-time web page displays and utility data logging and reporting for 14 individual sites.

In fact, FactoryTalk VantagePoint's visualization capabilities and RSEnergyMetrix energy data repository functions will soon be tied closely enough that they will be jointly renamed as FactoryTalk EnergyManager. "This is the first bundled software that we're doing, but we may add more software functions to this umbrella in the future," added Philip Kaufman, business manager for Rockwell Automation's industrial energy management business.

"These new controls have provided us with real-time monitoring of business-critical parameters to minimize energy costs and access to information for billing and

operational analysis—all on one platform from the executive floor to the plant floor," explained Poniatowicz. "We've achieved 15% savings with this highly efficient CHP system. We can even get key alarms via cell phone and real-time, web-based analytics, which show us how efficiently we're running in each facility."

In the future, Poniatowicz reported that Energenic plans to use Rockwell Software's Pavilion8 for data mining, performance modeling and capacity forecasting to secure more efficiencies and savings. "We'll do model performance assessments of each boiler, turbine and chiller, and combine these with load forecasts and current energy pricing to decide, for example, which combination of chillers to run for the most cost-effective operations," he explained.

Similarly, George Paterson, utility systems specialist at the University of Iowa, reported that the 129 buildings on his campus, including a teaching hospital, spend about \$30 million per year on energy. The university operates a primary co-generation plant and two substations that are powered by a combination of coal, natural gas, biomass, purchased electricity and some internally generated power. It also has three chilled water plants with 16 total chillers. About 90 of the buildings also use steam for heating, so the plant also runs three steam turbines. As a result, the university's utilities have more than 100,000 live data points, including building and plant automation systems, DCSs, PLCs and external sources. Fortunately, the university recently finished 10 years of infrastructure improvements, which gave it real-time steam, electric and chilled water metering on a campus-wide private network.

"We just needed to turn data into information and make it available to all," said Paterson. Also, we presently use 15% renewable energy by burning oat hulls, but we were recently assigned to use 40% renewable energy by 2020. And we also need to have zero net energy growth from 2010 to 2020, even though the campus is growing by more than 250,000 square feet per year. To achieve these goals, we need easy, reliable access to energy consumption data and flexible analysis tools."

As a result, Paterson and his fellow Hawkeyes implemented Rockwell Software's FactoryTalk VantagePoint Enterprise Energy Management in a pilot project at nine buildings about three years ago and then deployed it over the whole campus. "We now have a web-based energy dashboard for individual buildings, which becomes a very powerful tool when people can see that it costs \$300 per hour to energize one building or \$14,000 to \$16,000 per hour to energize the whole campus," added Paterson. "We can also compare actual dollars per thousand square feet of space to predicted energy costs, and then show what we're really saving by changing fume hoods or ventilation methods."

Meanwhile, Evan Hand, electrical and controls director for supply chain engineering at ConAgra Foods, added that his firm is using Rockwell Automation's solutions to pursue its sustainability goals. These include reducing greenhouse gas emissions by

reducing the energy and water used to make its products, while still meeting financial targets.

"We're really using Rockwell Automation's solutions as a second set of eyes to save energy and reduce our carbon footprint," said Hand. "We first identified a pilot plant for each of our four main product platforms—snack foods, frozen foods, shelf-stable foods and refrigerated products—and performed an energy assessment for each one. The pilot project was completed this past May, and it found 34 potential improvement projects for the four facilities. Of the 34 projects that potentially met the hurdle rate, 10 have gone on to execution after agreement by the plant on the total scope and cost reductions. The average payback period was 2.9 years."

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