Software Tool Helps Manufacturers Manage Energy as a Product Cost

By Harry Forbes

Keywords

Analytics, Energy, ICONICS, HMI, Industrial Energy Management

Summary

Effective energy management in manufacturing is an ongoing challenge. Simply measuring energy consumption is helpful, but insufficient. Managers need granular energy data alongside production data from the same periods to support in-depth analytics. Thus, there is a need in energy management for wide connectivity, data collection, data historization, correlation, and analytics. That is the idea behind a product from ICONICS named "Energy AnalytiX." Perceiving that an effective toolset for energy has much in common with the capabilities of modern HMI/SCADA software, ICONICS has assembled an energy solution designed to serve as a "Swiss Army knife" for energy management.

> ICONICS has combined new energy analytics software with its existing HMI software platform and connectivity options to create a solution for energy management, targeting discrete manufacturing industries, process industries, and buildings.

Energy Management Challenges Persist

Financial turmoil and volatile energy prices have resulted in an on-again off-again situation for many energy management initiatives. Yet a sustained effort and a comprehensive approach are needed for effectiveness. In many industries, especially the most energy-intensive ones, energy practitioners have found that merely measuring, aggregating, and reporting energy consumption will usually result in a 2 percent savings. Why? Because much pure energy waste remains undetected as long as no measurements are made.

The grossest energy consumption measurements are at utility metering points. Even with this minimal information, plant personnel may identify

saving opportunities, since the various forms of purchased energy and utilities (electricity, natural gas, fuel oil, steam, water, etc.) have quite different costs and may be substitutable to some degree. The most obvious example is the spread between the prices of natural gas and liquid fuels in North America. Gas prices have dropped by roughly 75 percent from their 2008 peak. However, oil prices remain near all-time highs. As a result, a barrel of West Texas Intermediate (WTI) crude oil now costs as much as over 30 MMBTU of natural gas, versus a historical norm of 6-12 MMBTU (see chart). In this climate, fuel substitution programs can be highly attractive.
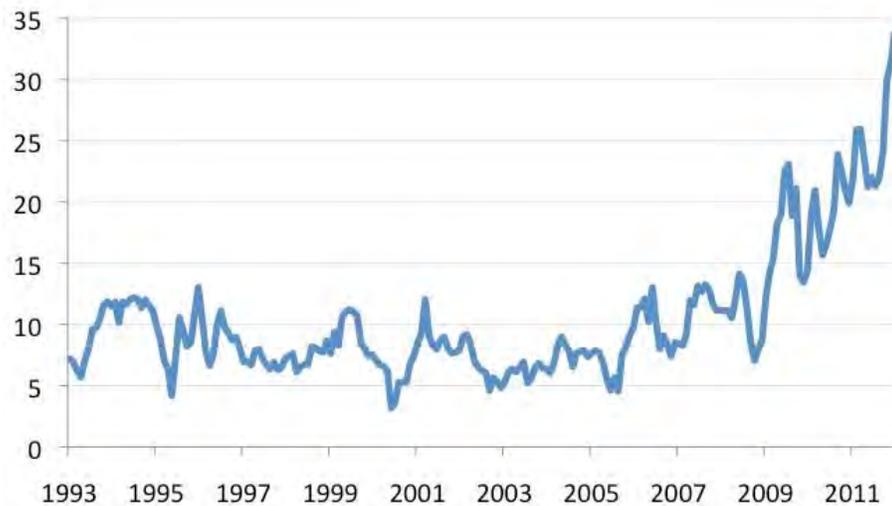
MMBtu of Natural Gas Purchased for the Cost of One Barrel of WTI Crude
Source: Wall Street Journal

Energy professionals in manufacturing also strive to improve the granularity of their energy measurements. This enables them to assign energy costs to specific accounting entities rather than allocate them as overhead expenses. Equally important is the ability to link energy and production information. When both are available it becomes possible to assign energy costs to specific activities and even to specific products, rather than allocate energy as an overhead. As an energy program becomes more mature, a smaller and smaller share of energy must be allocated as overhead.

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Organization, Collection, Analysis, and Visualization

Energy dashboards are quite common in industry today. ARC asked ICONICS about the differentiation of Energy AnalytiX. The company points to several areas it believes are important differentiators from other energy dashboard devices and solutions. First is wide-ranging and built-in connectivity. Like a production plant's HMI system, Energy AnalytiX has built-in support for a number of protocols (OPC, OPC-UA, BACnet, Modbus, SNMP, IEC web services, etc.) that enable data capture from utilities, buildings, and plants. The value is quick connectivity to energy and production measurements from sources such as building sensors, production machines, utility metering, submetering, public web services for weather data and energy rates, and production accounting and ERP systems.
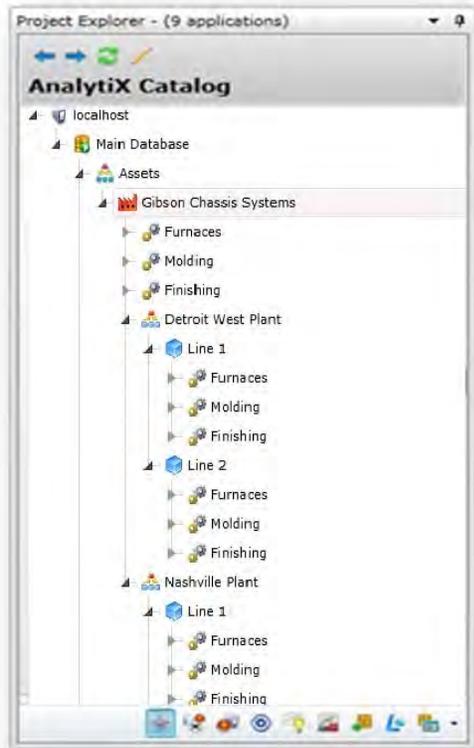
**Energy Streams Are Mapped
into a Tree Hierarchy**

Energy AnalytiX organizes measurement data streams into classes and forms these into a tree hierarchy representing the flow of energy through the facility. This aggregation enables meaningful energy rollups and historization. A second key feature is a library of analytic functions that can be applied to the energy information at any point in this hierarchy. These analytics add value to the information by creating correlated and normalized metrics that can be reported and used to trigger action alerts. For example, kwh/lb produced, kwh/barrel collected, BTU/sheet produced, are typical derived correlations.

In addition to a library of prebuilt analytic equations, users can also add analytics specific to their own applications and easily apply these to any item in the hierarchy.

Platform Benefits

Energy management capability provided by Energy AnalytiX, is built upon components from the company's GENESIS64 platform services (e.g., data services, web services, security) and application services (historian, workflow, reporting, alarming, etc.). It can serve all ICONICS client platforms

such as PortalWorX (for Microsoft Sharepoint), WebHMI (for web browsers), or MobileHMI (for iPhone, Windows 7 phone, Android, iPad, etc.). The user advantage here is that the product employs a mature platform that is already used in a large number of plants to help manage production operations. Energy management thus can become an extension of an existing ICONICS production system, as well as a bolt-on application that can be added to most any existing automation, electrical, or energy monitoring system.

Targets for this product are production factories and plants running systems that can serve data via OPC, Modbus, SNMP, and BACnet interfaces. ICONICS believes energy management of multi-building campuses and distributed facilities represent another class of potential customers that can benefit from the scalability and flexible visualization of the solution.

Conclusion

Energy AnalytiX represents a natural application-specific extension of the ICONICS manufacturing solution. The simplified connectivity, analysis, visualization, and scalability demanded of a modern HMI/SCADA system are all assets in energy management. The company has designed this product to be a standalone scalable energy solution, using its platform connectivity options (especially OPC) to integrate the tool with most any type of facility. It appears to be an obvious technology fit for plants and factories that already use ICONICS solutions to manage their production operations. But as industrial energy managers know, any energy tool needs to be part of a focused, structured and ongoing energy initiative to deliver meaningful and sustained results.

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