CARLO GAVAZZI
Automation Components

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TECH TIPS

Maximizing energy efficiency through ISO 50001 measurement and verification

Energy costs are a significant expense for companies in industries from manufacturing to commercial, transportation to retail, and even for businesses like marinas and campgrounds.

But where do you begin the process of maximizing your operation's energy efficiency?

An investment in developing a sound energy master plan, based on guidance in the ISO 50001 standard, will quickly pay for itself.

Read on for some helpful tips on implementing energy metering devices.

01 "IF YOU CAN'T MEASURE IT, YOU CAN'T IMPROVE IT"

These words from noted management thinker Peter Drucker ring true when it comes to energy management and efficiency improvement.

That is why the "Plan-Do-Check-Act" cycle of continuous improvement is an integral part of the ISO 50001 recommendations.

The Check step requires accurate measurement and verification of key electrical variables and is an integral part of managing energy consumption.

02 STATE YOUR MAIN OBJECTIVES

The outcomes you wish to see from implementing an energy master plan will inform your choices about the system and components you implement. In fact, you may have more than one objective. This is fine because it may provide focus when you choose a potential vendor or partner.

The most common objectives are to reduce energy costs or have better allocation of energy costs, such as among various departments in a manufacturing facility or even among tenants in a building. Other objectives focus on improving predictive machine maintenance, increasing manufacturing and operational efficiencies, or documenting power quality issues to earn rebates from the local utility.

03 CHOOSE WHICH VARIABLES TO MEASURE

Energy meters, transducers, and current transformers can measure a variety of electrical variables. Most energy meters will measure basic variables, such as voltage (V), current (A), apparent power (VA), power (W) and energy (kWh).

Depending on your master plan objectives, you may require energy meters that can measure more advanced variables such as power factor (PF), reactive power (kVArh), and phase characteristics like sequence, asymmetry, loss, and harmonics. The most advanced meters on the market today can also measure non-electrical variables concerning water, gas, and steam.

04 DETERMINE YOUR BILLING OR COST ALLOCATION REQUIREMENTS

To bill external customers for their energy consumption, you will need an energy meter that meets revenue-grade standards.
A meter tested and certified to ANSI C12.20.5S A/V, or a similar specification by third-party testing agency, assures everyone that the energy consumption measurement and subsequent billing are fair and accurate.

If your objective is internal, the options expand to include nonrevenue-grade energy meters. Rather than attempting to lower the overall energy bill for a factory, such meters are often used to help management assign energy costs to appropriate departments. Data from these meters also helps identify the best areas within the facility to direct energy efficiency initiatives.

05 PICK A COMMUNICATIONS PROTOCOL

Like most modern industrial equipment, each energy meter comes with its own communications options. Your industry and applications will often dictate the communications protocol that will be required in your energy meter. This can be helpful in choosing your energy management system since all communication protocols will not be offered by every energy meter supplier.

Some applications require the simple RS485/232 communication protocol, but others use Modbus-RTU and Modbus-TCP/IP. Data shared with or communicated directly to a building management system (BMS) will most likely require BACnet. Manufacturing plant floors in the U.S. commonly communicate by Ethernet-IP, though Profibus-DP and Profinet can be found in manufacturing plants with European ties.

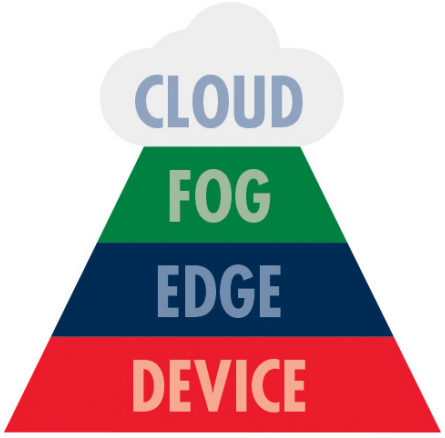
06 PLAN WHERE YOUR DATA WILL LIVE: LOCALLY OR IN THE CLOUD?

Your data is extremely valuable, so you must carefully consider who should have access to the data and where it should be stored and accessed.

These two questions are intertwined, so consider them together. Your answers will narrow your choices for a vendor partner and even a system integrator.

For the plant engineers, electrical engineers, and facilities managers working with the data, local access may be sufficient. In some cases, upper management, such as the company's CEO, CFO, or COO, may require access. Also consider whether you are monitoring multiple facilities or locations.

The Automation Pyramid helps illustrate where data may be stored and accessed. At the Device level, data is stored and accessed locally. As facilities become more automated, Edge level devices gather data from several energy meters and devices for a specific application. At the Fog level, data is aggregated from larger areas, even plantwide. Data that is moved offsite for remote storage and access via the internet is at the Cloud level.



07 TURN TO EXPERTS FOR HELP

CARLO GAVAZZI can provide expert insight and advice on specifying and implementing energy metering devices and related accessories, which will help you maximize energy efficiency through ISO 50001 measurement and verification.

With CARLO GAVAZZI, you have a partner with an international distribution network and experienced personnel who can assist you by email, phone, web conference, or in person.