

Leveraging Real-Time Energy Data to Improve Decision-Making Reduce Costs, Mitigate Risk, and Accomplish Sustainability Objectives

The Growing Importance of Data

Utilities are one of the highest controllable expenses in real estate. Due to advancements in technology, the management of these costs has evolved significantly, starting with accounting processes and leading to more intelligent access to and use of data. Most companies start by paying their utility bills with automated invoice processing. They group utility invoices with other MRO (maintenance, repair, and operations) invoices and focus on improving efficiency, assuming that an improved accounts payable process is sufficient. Greener companies have started to collect and leverage historical cost and consumption data from their monthly utility bills to make important decisions about their building operations. However, relying solely on static, historical data means that these companies can only react to problems after being billed, which can often take more than 30 days.

Therefore, while access to some of your energy data is common, timing is even more important. Imagine monitoring the real-time performance of your buildings and addressing performance issues as they occur: You could save money, keep your systems working, and improve tenant comfort in real time – not months after you get billed. Real-time data allows you to measure the specific impact of building efficiency improvements and use it to track progress easily, justify future projects, and establish long-term energy goals.

Whether this data comes from building automation systems, smart utility meters, or the growing number of Internet of Things devices, it is becoming increasingly important to make data-driven decisions, if you wish to optimize efficiency. Having the tools for accurately collecting and analyzing data is also becoming more essential as algorithms become more sophisticated and their use more widespread. Furthermore, data analysis tools enable you to reduce overall consumption using actionable insights. Companies wishing to maintain their competitive advantage need to implement tools that can integrate a growing amount of data across many different platforms and buildings to optimize decision-making.

What Are Energy Information Systems?

As a result of technological advancements and industry trends, many real estate managers are incorporating real-time data into their decision-making process by implementing Energy Information Systems (EIS). These systems are unique because they are very affordable tools that can have an immediate impact on your buildings. An EIS consists of a combination of software, data acquisition hardware, and communication systems that collect, analyze, and deliver real-time energy data to facility managers, building engineers, portfolio managers, and building occupants.

The most critical component of an EIS is its ability to make baseline comparisons. Baselines use sophisticated consumption modeling to predict how much energy any particular load should consume. While loads such as lighting are easy to predict, others can be more challenging; for example, multiple factors drive how hard the HVAC system works and how much energy it consumes. Weather, occupancy, humidity, and other factors are additional consumption drivers that are incorporated into these baselines.

By comparing real-time consumption to established baselines, an EIS provides increased cost control measures and empowers facility managers to identify and monitor performance issues proactively as they occur and before they become costly or impact occupant comfort. At the same time, the single user interface enables energy managers to increase building efficiency by identifying areas of waste across a portfolio and validating implemented energy conservation measures.

Your Best Data Collection Options Vary Across Buildings

Public API with Utility Providers

The most basic method for collecting data is through your utility provider, who can provide your EIS vendor with whole-building meter data through a public API (application programming interface). The Green Button initiative, an industry-led effort inspired by a White House challenge in 2012 to provide easy access to utility data, is a commonly implemented example. While no additional hardware is required, the major downside with this approach is that data is often only available once per day, usually around midnight, so you do not have immediate access to data or be able to implement real-time alerts. If your goal is to manage peak demand and associated costs, this may not be your best approach.

Pulse-Enabled Building-Level Meters

One of the primary ways for collecting real-time data is through pulse-enabled smart utility meters, which send frequent pulses that correlate to a defined amount of energy consumption. Your existing meters may already have pulse outputs in place; if not, your utility provider can install compatible meters. Once meters are installed, your EIS vendor can configure a data logger to collect data from the pulse output and push it to the cloud. Since meters are typically installed at the building level, this approach is recommended for properties with tenants who consume a similar amount of energy.

Submetering & BAS Infrastructure

If your property has a variety of tenants consuming a wider range of energy, it is a best practice to implement a submetering infrastructure for measuring energy consumption at your points of interest, such as the floor or tenant level. For tracking electricity consumption, electricians typically install submeters with connected current transmitters (CTs) that measure transmitted currents. Submeters can be configured to pass data directly to your EIS provider's cloud or through a data logger. Submetering also allows you to provide tenants with an additional incentive to conserve, because you may be able to pass through charges to them based on their actual consumption, depending on your lease terms.

Meters attached to your building automation systems (BAS) are another potential source of data. If these are available, your EIS vendor can explore options for collecting this data; you may need to install an inexpensive piece of hardware to pass data from the building automation system to the EIS vendor's cloud servers. Collecting real-time data from your building automation systems empowers you to define more accurate baselines for your buildings. Your building automation systems also consume other data related to critical building loads, such as lighting, HVAC, water heating, and equipment.

Portfolio-Wide Collection

Since your savings potential is largely determined by how effectively you collect data from each unique building, you need to analyze the unique building needs across your portfolio. Because your best approach depends on the unique needs of each building and how space is being used by tenants, you should carefully evaluate the needs of each building with your EIS provider – both from a financial and data analysis perspective. In most cases, a combination of data collection options across your portfolio produces the most cost-effective and comprehensive solution.

For All Asset Classes

While many energy management programs and data collection options can help you recover utility costs through submetering or tenant billing, these methods are not possible in some cases. Regulations and ordinances in certain jurisdictions can limit the options for residential and commercial building owners to recover individual costs, and asset classes that limit recapture (like affordable housing, tax credit, and social housing) are still responsible for utility costs in the entire building.

Nevertheless, real-time metering points are an inexpensive way to reduce consumption and lower costs, even when you cannot pass through the charges. This makes buildings of all asset classes more energy sustainable and helps increase asset value. In addition to creating financial benefits for tenants, property managers, and property owners, this solution can lead to other forms of incentives, such as green financing.

Getting the Most Impact from Your Energy Information System

Once you have identified how best to collect your energy data and installed cost-efficient, real-time metering points, you can further maximize savings by engaging your portfolio managers, facility managers, and building engineers to analyze your building data effectively and optimize data-driven decision-making.

Increase Efficiency with Real-Time Alerts & Dashboards

Use your EIS to configure real-time alerts on your energy data that highlight performance issues that need attention. Alerts should be triggered by specific thresholds, such as new peak electric demand values or unusually high energy consumption in a building. With weather normalized baseline comparisons, you can evaluate the severity of performance issues across your portfolio and prioritize your management time effectively. Load profile analyses and heat maps also allow you to identify outliers easily. An intuitive EIS can make it simple to identify areas of waste by providing drilldown functionality from the portfolio region to a building, tenant, or even equipment submeter level.

Optimize Decision-Making with a Portfolio-Wide View

With a unified and portfolio-wide system, corporate facility and asset managers can more easily make important business decisions that consider the needs of the entire portfolio across multiple BASs and building infrastructures. With an EIS, users can quickly navigate through any level of the portfolio and view interval, daily, weekly, and monthly energy consumption data normalized for weather, day of the week, operating hours, or other consumption drivers. They can also validate any high utility bills and easily determine contributing factors.

Improve Your Overall Strategy by Evaluating Long-Term Trends

Portfolio-level benchmarking, tracking, and reporting help you identify and prioritize the most impactful energy savings opportunities. By measuring the long-term impact of building-specific efficiency projects, you can also calculate payback periods and justify future efficiency projects. For example, real-time data from a BAS controlling your HVAC can often create a business case for more advanced building performance applications, such as fault detection and diagnostics or active optimization using artificial intelligence for continuous commissioning. You can easily evaluate long-term trends at the building or portfolio level and push reports to executives and other audiences, enhancing visibility for all stakeholders.

Reduce Consumption by Engaging Building Occupants

Another way to reduce energy consumption is to provide building occupants and stakeholders with real-time energy information directly, often through a link on your website or through an LCD marquee in common areas. Displaying graphs of energy consumption over time effectively engages tenants to analyze their energy use. Measuring consumption against a baseline can encourage occupants to conserve energy through persistent behavioral changes, such as turning off lights at lunch or reducing heating or cooling loads. Some systems feature energy contests with social media tie-ins that encourage friendly competition and inspire occupants to save even more energy.

What to Look for in an EIS Provider?

Since many cost efficiencies are driven by how you choose to collect data and engage users, evaluating the capabilities of your EIS provider is critical. You must carefully consider an EIS provider's expertise and capabilities to partner with one who truly understands your business needs.

Start with These Questions:

- What is their experience integrating multiple systems into one common user interface?
- What capabilities do they have to integrate real-time data with utility bill data in cases where interval metering is not possible?
- For what end user is their platform built to be most useful? (E.g., building occupants, facilities staff, management)
- What level of support do they offer, and will they commit to a response turnaround time for questions and requests?
- Do they have an active development team; if so, how regularly do they update the system?
- Do they have a formal process for incorporating customer feedback into their roadmap?
- Do they have staff with experience handling metering deployment or issues?
- Who is responsible for maintaining connectivity?
- What alerting and proactive management capabilities do they provide?

While there are many factors to consider when implementing technology to improve building performance and energy efficiency, getting access to real-time data is vital. An in-depth view of building performance in real time can prompt you to leverage more sophisticated building control systems, such as remote thermostats and HVAC optimization solutions that allow your users to adjust the performance of building systems remotely.

Overall, an EIS is an affordable tool that can have an immediate impact on your buildings and influence your long-term energy efficiency strategy. In addition to reducing your operational costs, its adoption can make your properties more desirable to tenants and investors, which increases your service levels and asset values.

For more information about the Yardi Pulse Suite of EIS and other energy solutions, visit Yardi.com/Pulse or call us at 1-800-866-1144.

Copyright Notice: This document is protected by copyright, trademark, and other intellectual property laws. Use of this document is subject to the terms and conditions of an authorized Yardi Systems, Inc. software license or other agreement including, but not limited to, restrictions on its use, copying, disclosure, distribution, and decompilation. No part of this document may be disclosed or reproduced in any form by any means without the prior written authorization of Yardi Systems, Inc. This document contains proprietary information about software processes, algorithms, and data models which are confidential and constitute trade secrets. This document is intended solely for the specific purpose for which it was made available and not for any other purpose. Yardi®, Pulse® and Voyager® are registered trademarks of Yardi Systems, Inc.