Integrated Solutions for Affordable Energy Management

Improve operational performance and reduce energy consumption for multistory offices and multi-building chains with cloud-based building energy management through the Internet of Things and building-wide integration

Executive Summary

Reducing energy consumption and improving operational performance can be challenging for owners and managers of multistory offices, schools, or multi-building chains. These buildings need energy management solutions that do not require enormous capital investment and operating expenditures. Data analytics is critical to understanding how energy is consumed and where it is wasted, but many building management systems are designed for complex buildings with extensive mechanical, heating, ventilation, air conditioning (HVAC), and electrical systems, which are not practical for smaller real estate portfolios.

Third-party solution providers are developing building energy management systems solutions based on Intel® technology that use Internet of Things (IoT) innovations for deeper business insights through advanced analytics. Data collected and integrated from various energy-consuming systems, such as HVAC, power, and lighting, help building owners achieve the following:

- **Lower energy consumption.** Understanding optimal performance for energy-consuming systems allows operators to define policies that control consumption and eliminate waste, as well as define benchmarks and determine performance.
- **Greater operational performance.** IoT data provides important insights into the health of energy-consuming systems and equipment, alerting operators to issues. Predictive maintenance—or condition-based maintenance—offers the ability to prevent equipment failure and unexpected downtime, which helps reduce costs.

Affordable Energy Management

Figure 1. With Internet of Things (IoT) technology, stand-alone systems can be connected, resulting in clear insights that reduce energy consumption and improve building performance.
Business Challenge: Building Data is Costly and Difficult to Access

Building owners, managers, facilities engineers, and real estate investors continuously seek ways to decrease energy consumption and optimize spending while also improving occupancy comfort. Data analytics is the key to understanding how energy is consumed and where it is wasted. But collecting and analyzing data from various stand-alone systems can be challenging. Building data is complex, fragmented, and difficult and costly to access, presenting significant barriers to integration. Building management systems can help with this, but they are typically designed for large, complex buildings with extensive mechanical, heating, ventilation, air conditioning (HVAC), and electrical systems. Building management systems are also expensive and often too costly for multi-story offices, schools and institutions, or multi-building chains. For these types of buildings, owners and managers need affordable solutions.

Over the past several decades a class of solutions has emerged that is focused on monitoring and controlling specific energy-related building equipment. Using data collected from connected systems, building managers can now understand which systems and buildings are performing as expected and which are not. Some building energy management systems include advanced controls that automatically adjust to changing environmental conditions, such as the Comfy* app—running on an open source operating system—that lets occupants request immediate temperature changes. Requests are also captured and analyzed to better understand patterns and preferences by location. With open, IT-friendly architecture from Intel, third-party solution providers are making energy efficiency an affordable and attainable option.

IoT Solutions Right Size HVAC Usage for Multisite Operations

Managing operational costs across multiple buildings, such as restaurant chains, can be challenging, especially for HVAC systems. HVAC is one of the largest operating costs for building owners, accounting for approximately 40 percent of business energy usage. Using IoT-based solutions, multisite operators can achieve the following:

- **Optimize capital expenditures.** Using analytics from data collected on existing sites, operators can determine the number of HVAC units necessary for occupancy comfort. With these newly established benchmarks, there is no more guesswork in new construction. Instead new sites are built using only what is necessary.

Independent Solutions Powered by Intel® Technology

With high-performance, security-focused, and IT-friendly Intel® technology, solution providers deliver cost-effective ways to increase energy efficiency and decrease costs.

**AVOB**
A leader in French IT power management. Simplifies building energy management so facility managers can control it end-to-end. AVOB has saved over 100 million KWh hours for its customers. [Learn More](#)

**Comfy**
An occupant-facing, smart building software app that delivers on-demand, personalized comfort and productivity in the workplace. Comfy plugs into existing building systems and uses machine learning to automatically tune the building based on personal patterns and preferences. Comfy eliminates hot/cold calls, improves worker productivity, and saves energy on the side. [Learn More](#)

**EnTouch Controls**
Provides wireless building energy management systems that are quick and easy to install. No additional wires or upgrade server installations are needed, and EnTouch Controls handles the whole installation and commissioning process, greatly easing deployment for its customers. EnTouch 360°** provides energy analysis and prompt resolution to greatly assist facility management teams while delivering savings. [Learn More](#)

**KMC Controls**
A comprehensive catalog of building system hardware, including networkable/communicating thermostats, analog electronic controls and actuators, and industry-standard pneumatic designs. KMC Commander* is one of the more advanced Internet of Things platforms for enterprise-level building automation and control. It offers cutting-edge integration, analytics, and visualization technology in real time, delivered on your mobile device. [Learn More](#)

**Lucid**
Intuitive solutions empower organizations to make smarter decisions that reduce costs, improve occupant comfort, and accelerate team productivity. BuildingOS*, a leading cloud-based building management platform, integrates and aggregates portfolio-wide building and metering systems data for simple, collaborative analysis. Its BuildingOS software is completely vendor-agnostic and natively connects to 175+ building technologies. [Learn More](#)

**Riptide**
A cloud-based building management solution that puts facilities management on autopilot. With Riptide, building operators can easily connect and control their most important building assets, including lighting, door locks, refrigeration, and heating and cooling. Riptide’s solution automates operations with preprogrammed business rules that take necessary action or alert on equipment issues. Riptide’s hub is based on the Intel® IoT Platform and connects to the equipment in the building. [Learn More](#)

**Small Box Energy**
A leading-edge supplier of integrated energy management solutions for restaurants and convenience stores. Its proven chameleon* energy management platform provides effective energy management through monitoring and controlling HVAC, lighting, and refrigeration equipment to reduce overall energy consumption. Early equipment diagnostics extends equipment life and reduces unexpected emergency repair costs. [Learn More](#)
• Remotely control systems. Analytics data can help define policies that are enforced and tracked remotely, with phone apps and desktop interfaces, across multiple sites. These policies include alerts about performance issues, eliminating the need to rely on local personnel.

• Cut maintenance expenses. Energy management solutions can monitor HVAC performance and determine the overall health of the equipment. Instead of traditional preventative maintenance, data-driven predictive maintenance can alert operators to imminent failure before it happens.

Managing HVAC systems is a critical component in reducing energy consumption. With IoT-based solutions from Intel and proven solution providers, this is easier to achieve and offers an affordable way to optimize energy usage.

**Solution Value:**
**Flexible, Affordable Building Management**

Solutions from third-party providers, powered by Intel® technology, offer tested, affordable energy management that does not require investing enormous amounts of capital to achieve energy efficiency. With proven, market-ready IoT-based solutions that integrate operating technology with IT, building owners can realize the following cost-cutting benefits:

- **Lower energy consumption.** Understanding optimal performance for energy-consuming systems allows operators to define policies and control systems remotely. IoT data helps define benchmarks for specific types of systems and alert operators when systems are not performing within established ranges. This results in predictable and consistent energy consumption and eliminates waste.

- **Greater operational performance.** IoT data from various energy-consuming systems provides important information about the health of equipment, alerting operators to issues. Predictive maintenance prevents equipment failure and costly unexpected downtime.

Intel technology provides the foundation for solutions that offer high performance, security-focused, and open, IT-friendly systems, including wireless, edge-to-cloud, and IoT innovations. Data can be collected from islands of information, such as lighting, plug load, and HVAC systems, and then standardized and integrated to provide a clear view of energy consumption throughout the building. With its open architecture, Intel technology also makes it easier for solution providers to connect legacy systems and protocols, encouraging information sharing that can also help customers take advantage of utility programs and better rates.

**Solution Architecture:**
**Smart, Energy-Efficient Buildings**

Intel provides the foundation for proven solutions that integrate stand-alone building systems and provide a clear view into energy consumption. The Intel® IoT Platform is an end-to-end reference model for a family of products that securely connect systems and devices, delivering trusted data to the cloud and value through analytics (see Figure 2).

**End-to-End Security with Intel**

Connecting new and legacy systems through the Internet of Things technology for greater energy management can create new security concerns. Robust hardware- and software-level protection is essential for helping to ensure security. The Intel® IoT Platform includes McAfee’s security solutions. These interoperable and scalable solutions span every level of the IoT, including:

- **Device.** McAfee solutions help protect device and user identities, help ensure device integrity, and help protect operational and personal data.

- **Network.** Application, traffic, and data security is enabled through every type of wired and wireless network connection.

- **Cloud.** The Intel IoT Platform helps protect data and ensure privacy while delivering the necessary trust for data centers and multitenant public cloud environments.

**Better Decision Making and Control**

![Figure 2. The Intel® IoT Platform is the backbone for integrating stand-alone building systems for better decision making.](image-url)
Third-party solution providers are using Intel technology to deliver market-ready solutions that offer the following benefits:

- **Security.** Quality, trusted data is more securely transmitted to the cloud or data center through the Intel® IoT Gateway.
- **Power efficiency.** The Intel® Quark™ SoC X1000 series and Intel® Atom™ processor E3800 product family perform in small form factors with thermal efficiency and low power consumption.
- **Open platform.** With Intel’s open, scalable products, solution providers can develop a vast array of solutions that connect disparate data sources for exceptional data analytics.

**Conclusion**

Energy efficiency is one of the primary cost-saving opportunities for building owners. But it can be challenging for owners and managers of multistory offices, schools, or multi-building chains who need energy management solutions that do not require enormous capital investment and operating expenditures. In recent years, however, third-party solution providers have begun developing IoT-based energy management solutions using Intel technology at an affordable price.

Achieving energy efficiency, understanding equipment health, and saving money is within reach of nearly any building owner, manager, or real estate investment group with IoT-based energy management solutions from a variety of third-party providers.

**Find the solution that is right for your organization.** Contact your Intel representative or visit intel.com/iot/smartbuilding.

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Solutions Proven By Your Peers

Intel Solution Architects are technology experts who work with the world’s largest and most successful companies to design business solutions that solve pressing business challenges. These solutions are based on real-world experience gathered from customers who have successfully tested, piloted, and/or deployed these solutions in specific business use cases.

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Learn More

You may also find the following resources useful:

- Designing More Affordable Smart Building Solutions
- Making Buildings Smarter
- An Open, Secure, and Scalable Smart Building Solution That is Easy to Deploy
- Addressing HVAC Pain Points for Multisite Operators