SWARM LOGIC®

POWERED BY DATA. DRIVEN BY SUSTAINABILITY.

With Emerging IoT, Big Data, and Cloud Computing Technologies, Commercial and Industrial Multi-Site Facilities are Unlocking a Significant Source of New HVAC Energy Savings

By Chris Hensley, Executive Vice President of Sales and Marketing, Encycle Corporation
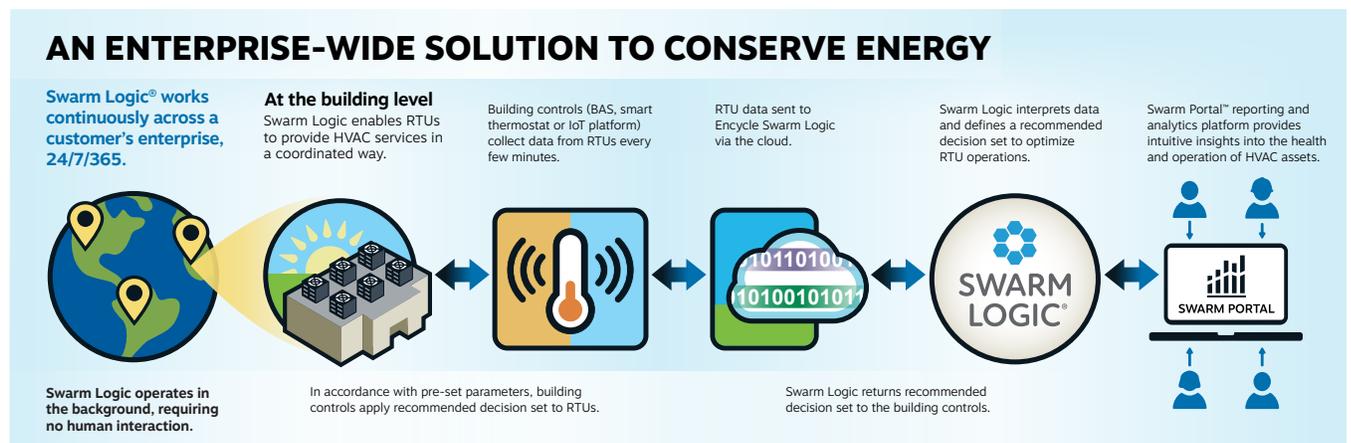
WHITE PAPER

ENCYCLE

INTELLIGENT BUILDINGS MADE EASY

Heavily burdened energy and facility managers are challenged with finding new and affordable ways to reduce electrical spend. While HVAC is a typical commercial building's biggest energy consumer, the lack of financially attractive options has hindered efficiency efforts in recent years. The design of HVAC rooftop units (RTUs) and building controls pose inherent limitations that result in energy waste and excessive peak demand due to various sources of "slack" regarding how the RTUs are operated.

To handle extreme weather temperatures, architects / engineers usually oversize the RTU capacity. This results in the RTUs being operated well below their maximum cooling capacity for all but a few hours each year. This overcapacity is often coupled with static business rules such as set points and schedule configurations that don't adapt to changes in variables such as exterior temperature and facility operations. Moreover, traditional building controls, such as building automation systems (BAS) or programmable thermostats, typically control each HVAC unit independently with little to no ability to adjust RTU activity in response to the operational status of other RTUs. **A more effective way to maximize the efficiency of a multi-RTU system, especially across multiple locations, is to create a network of smart RTUs to coordinate their activity. By doing this, coincident operation is minimized and excessive RTU runtime is reduced.** The shared challenge of reducing HVAC-related electricity cost and consumption has multi-site commercial and industrial customers collaborating with industry partners like Encycle to achieve dramatic savings through the adoption of new IoT-enabled technologies and services.

AN ENTERPRISE-WIDE SOLUTION TO CONSERVE ENERGY

Swarm Logic® works continuously across a customer's enterprise, 24/7/365.

At the building level Swarm Logic enables RTUs to provide HVAC services in a coordinated way.

Building controls (BAS, smart thermostat or IoT platform) collect data from RTUs every few minutes.

RTU data sent to Encycle Swarm Logic via the cloud.

Swarm Logic interprets data and defines a recommended decision set to optimize RTU operations.

Swarm Portal™ reporting and analytics platform provides intuitive insights into the health and operation of HVAC assets.

Swarm Logic operates in the background, requiring no human interaction.

In accordance with pre-set parameters, building controls apply recommended decision set to RTUs.

Swarm Logic returns recommended decision set to the building controls.

SWARM LOGIC®

SWARM PORTAL

Leveraging the Internet of Things for Greater Efficiency of RTUs

With capabilities that leverage the Internet of Things (IoT) and big data, cloud-based software is allowing facility managers to control all their HVAC "things" from multiple locations in ways not previously available. This allows for real-time capture of large amounts of operational data that can be analyzed and interpreted to inform improvements in HVAC energy performance and efficiency.

Taking things one step further, Encycle's Swarm Logic® patented cloud-based system not only monitors the activity of multiple HVAC units, but uses proprietary algorithms to dynamically synchronize the operations of RTUs every five minutes, optimizing their ability to respond to changing outdoor temperatures and facility operations. Instead of operating in isolation, Swarm Logic integrates the RTUs into an IoT-based, closed-loop system that apportions energy consumption more logically. The Swarm Logic energy management software platform integrates with existing BAS, connected thermostats, or IoT platforms via an application programming interface (API) to lower electricity costs, maximize efficiency, and reduce environmental impact while maintaining desired building comfort levels. Swarm Logic acts in near-real time based on changing zone temperatures, RTU load levels, and facility operations, thereby converting the power-hungry RTUs from stand-alone operation into a cloud-based network of smart IoT-connected devices. **Swarm Logic has proven to reduce annual HVAC electricity costs and consumption for typical Encycle customers by 10% to 20%.** The proprietary cloud-based technology works with enterprise-level buildings and packaged HVAC units of any age and in all climate zones in North America.

A Big Box Retailer Saves Big with Web-Based Energy-Efficiency Service

An example of how the Swarm Logic platform creates significant savings for customers is exemplified by the recent case study of a Fortune 500 big box retailer who is recognized as a leader in energy management. In November of 2017, Encycle deployed Swarm Logic at a number of this customer's retail locations. For a 12-month period, the reductions in HVAC-related electricity consumption and peak demand were 15.5% and 7.8%, respectively. Adjusting for seasonal variations, **these percentages translate in annual dollar savings of over $9,800 per store and reach millions of dollars in savings on an enterprise level**. All of these savings are on top of the value already realized by the retail chain's BAS and third-party energy monitoring service, meaning Swarm technology™ enhances a variety of prior energy-saving initiatives to help companies achieve greater results. It is noteworthy to mention that Swarm Logic was virtually invisible to the day-to-day operation of the retailer's BAS and its monitoring service provider. There was no negative impact on building comfort; in fact, there were fewer HVAC-related "hot" calls from these facilities versus the prior year even though, according to U.S. Weather Service records, there were more cooling degree days in 2018 than for the same months in 2017.

Before Swarm Logic is applied

After Swarm Logic is applied

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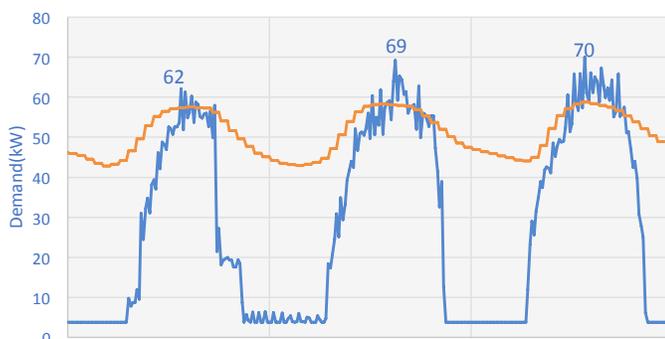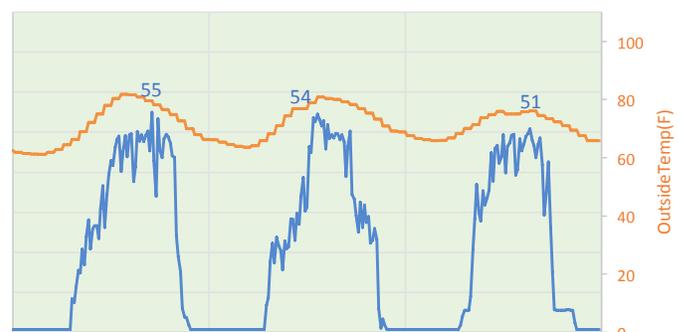
Realizing New Value Doesn't Have to be a Challenge

According to recent research conducted by the independent analyst firm Verdantix, 70% of facilities departments have not fully realized value of the technologies in which they have invested. This is mainly due to companies taking a fragmented approach to energy savings, challenges in integrating data, and having limited staff bandwidth to effectively monitor and control their operations. Compared to other energy-efficiency technologies, the HVAC industry has made little progress in delivering cost-effective improvements in efficiency. With scalable web-based SaaS platforms, companies can now achieve dramatic HVAC energy savings with impressive returns on investment and swift deployment, all while avoiding the need for large capital expenses or hiring additional personnel.

As Executive Vice President of Sales and Marketing at Encycle, Chris Hensley has more than 20 years of experience in the energy management market. In his current role, Chris is responsible for all revenue growth, development of commercial strategy and market execution, as well as client facing activities including sales, client management, marketing, and strategic alliances.

Before joining Encycle, Chris served as Senior Director of Sales for Ecova, an ENGIE subsidiary and provider of technology-enabled energy management solutions to 25% of Fortune 500 companies. While at Ecova, Chris was most recently responsible for leading the team focused on helping new clients design and implement integrated energy and sustainability programs. Prior to joining Ecova, Chris held various sales, strategy, and product management roles with Novar (a Honeywell company) and FirstEnergy Solutions with a focus on bringing energy technologies and services to market through focused strategy, execution, and growth.

Chris holds a bachelor's degree in Electrical Engineering from the University of Cincinnati and a master's degree in Business Administration from the University of Michigan.

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