



## Executive Summary

**COMPANY:** Environmental Systems Inc.

**PROJECT:** Global Headquarters

**FOCUS:** Sustainability & Energy

**CHALLENGE:** A growing system integrator needed more space. As a Niagara system integrator, ESI wanted a headquarters that reduced operating costs and had a positive impact on the environment.

**SOLUTION:** The Niagara Framework allowed for ESI to integrate best-in-class technology resulting in a highly energy efficient building.

### KEY RESULTS:

- 33% reduction in energy cost with 10,000 additional square feet
- Systems continuously monitored for fault detection with alerts tied to maintenance management system
- On track for LEED Platinum certification
- Continuous real-time information displayed in lobby

# Environmental Systems Inc. Headquarters

## The Client

Environmental Systems Inc. (ESI) is a building and facility system integrator headquartered in Brookfield, Wisconsin. Established in 1986, ESI provides solutions for control & automation, systems integration, security, life safety, energy services and building operations.

The new headquarters is a 34,100 square foot, Class A office building located in the Gateway West Commerce Center I. The building strategy consisted of improved building performance and an integrated security system that would reduce operating costs, improve productivity, and generate measureable return on investment.



## The Challenge

ESI needed additional space. They decided it would be beneficial on a number of fronts to be in a sustainable building and utilize the technologies they apply and use in a wide range of buildings for their business.

Goals for the facility also included achieving a LEED rating - the building is currently tracking the LEED Platinum level.

Design decisions were made based on a number of criteria - one of the most important being that every design decision had to provide a positive impact on the business. Where some design decisions were not the lowest initial cost, they would provide cost savings to the business over their life cycle and were justified in the final cost of the building.

## The Results

With impressive results to date, ESI's new corporate headquarters is operating 41% more efficiently than baseline design – ASHRAE 90.1-2004. The building is 10,000 square feet larger than their previous location; however, the utility costs in the new building are running at 33% less than what they were in the previous building.

Designed to reduce operating costs and environmental impact, the building was built to achieve LEED certification using innovative applications of cutting-edge building management systems and design. Visitors have been provided with a way to visualize the difference that a sustainable design can bring to a facility, as well as its overall profitability.

## The Solution

The Niagara Framework is integrating all the systems, equipment and devices in the building including:

**Lighting.** The system utilizes VYKON JACE Controllers with integrated I/O, outputting 0 to 10 V to adjust dimmable lighting ballasts to maintain 20 foot candles of lighting based on ambient light sensors. Fluorescent task lighting is used for desk and workstation areas. Building occupancy from the access control system is used as part of the lighting control strategy. If any employee enters the building in off hours, their task and egress lighting are enabled. VYKON Access Control integrates seamlessly with other building systems to control equipment and lights based on actual occupancy rather than a schedule, saving additional energy



“Considering the business impact of efficiency and sustainability efforts, I believe the interest in our new facility derives from executives wanting to understand how improved building performance reduces operating costs, improves productivity and generates a measureable return on investment.”

— Paul Oswald  
President,  
Environmental Systems Inc.



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**HVAC.** Mechanical system capacity requirements were reduced due to the high performance building envelope design. This resulted in a reduction of over 330,000 btu/hr of heating and 14 tons of cooling. Heating is provided by a 750 MBH, 88% efficient hot water boiler utilizing hydronic baseboard heating and VAV boxes with reheat coils.

The system also features a 5,000 cfm energy recovery unit. The HVAC equipment is located in the building to provide easy access for maintenance and keep the roof clear for solar arrays. The decision to use an air handling system, as opposed to the more common practice of using roof top units, is an example of a design decision with higher initial costs, but one that provides a 159% ROI over the equipment life cycle.

**Continuous Commissioning.** Unless occupants complain about the temperature being overly hot or cold, systems in light commercial buildings are often forgotten and energy is wasted. ESI’s systems are continuously monitored and employ fault detection and diagnostics to notify operators if equipment is drifting out of proper operating parameters. The alerts/alarms are linked to the maintenance management system via BACnet to generate necessary work orders.

**Security.** In addition to access control, the building incorporates eighteen cameras inside and outside the facility. Video history is stored for 30 days.

**Fire Monitoring & Alarm.** The building features a fire alarm system connected via BACnet to the Building Automation System to monitor all initiation and annunciation devices that are part of the fire alarm systems. In addition, the system monitors fire extinguishers for proper pressure that they are physically in place and are not obstructed.

**Information Display.** The lobby features a large flat-screen monitor displaying real-time information about the building’s performance. Many parameters are monitored and calculated, including energy metering, energy analysis, and sub-metering including HVAC, lighting and plug load.

Information on the lobby display includes:

- YTD savings over conventional design energy model
- YTD savings of Gateway’s actual energy consumption over design model
- Equivalent tons of CO<sup>2</sup> emissions eliminated
- Equivalent trees planted
- Equivalent cars removed from the road

**Additional Features.** Other design features include minimizing water usage and environmental impact through high efficiency water fixtures, sustainable landscape design, reducing heat island effect through less paved surface in the parking lot, and implementing the reuse of several construction materials within the overall building design.

## Summary

With the integration of Niagara, ESI’s new headquarters serves as an example of best-in-class technology, design, engineering and operation. They also have a very comfortable and efficient building. They have further made the commitment to maintain the efficient performance of the building by pursuing the LEED – EBOM certification that includes consistently measuring operations, making improvements and proactive maintenance, with the goal of maximizing operational efficiency while minimizing environmental impact.

## The Integrator

Since their beginning, ESI has evolved into energy management experts and an industry thought leader. At the forefront in creating practical sustainable solutions that generate a fast return on investment and increased profitability over the lifetime of a building, ESI is about making buildings smarter, both in how they’re designed and how they’re operated. ESI’s solutions reduce operating costs, improve sustainability and provide a positive return on investment. Visit [ThinkESI.com](http://ThinkESI.com) for more information.