EcoStruxure™
Innovation At Every Level

PERFORMANCE

Realizing ongoing energy and cost savings

Research Lab – Massachusetts, USA

Fault detection in a research laboratory ventilation system with EcoStruxure™ Building Advisor*.

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Overview

In the fall of 2010, monitoring services were provided for a 450,000 square-foot (137,160 sq m) research laboratory in the greater Boston area. The five-year-old facility was equipped with state-of-the-art energy efficient HVAC systems, including 10 ventilation units with capacity exceeding 50,000 CFM and several hundred variable air volume (VAV) boxes, to serve a mix of laboratory, office, and educational space.

EcoStruxure™ Building Advisor provides facility teams with continuous system fault detection to automatically evaluate and organize the condition of equipment. This information enables proactive building maintenance while ensuring persistent energy efficiency, which could result in significant ongoing energy and cost savings.

The challenges and solutions

Leaking Cooling Coil Valves in Air Handlers

Challenge: One air handler was found to have a leaking cooling valve resulting in a loss of approximately $2,200 (€1,700) per week during the heating season due to simultaneous heating and cooling of air supplied to the building.

Solution: The air handler was repaired and produced annual savings of $61,400 (€47,000).

Goal

Provide and alert building facility teams with faults to enable proactive building maintenance.

Story

The state-of-art laboratory was equipped with latest monitoring services to create an environment that was conducive for research.

Solution

EcoStruxure™ Building Advisor* leading to:

- 84 VAV boxes were recommissioned
- 52 VAV box reheat valves were replaced
- 12 VAV box actuators were replaced
- 1 air handler chilled water valve was rebuilt

Results

- Assurance that system maintenance achieves desired objectives
- Digital history of building performance
- Consolidate building data and make it accessible to all vendors
- Projected annual savings of $300,000

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Overridden Valve in Air Handler

Challenge: One preheating coil valve that also functions as a heat recovery coil valve was put into manual override during the summer months. Once heating season began, the overriden valve began to cause simultaneous heating and cooling.

Solution: The valve controls were corrected, resulting in savings of $137,000/year (€105,000/year).

Leaking Reheat Coil Valves in Terminal Units

Challenge: Nearly 200 of the building's terminal unit reheat valves were found to be leaking, caused by unfiltered hot water during the building startup. EcoStruxure™ Building Advisor* prioritized the most wasteful leaking valves to fix and confirm the success of these repairs, rather than rely on hot/cold calls to identify problems.

Solution: Eighty-four VAV boxes with the highest losses were recommissioned, resulting in the replacement of 52 reheat valves and 12 actuators as well as some controls changes. The total savings due to repairs was $77,100 per year (€59,000 per year).

The bottom line

Through the Building Analytics diagnostics and reporting, several major problems were identified, including leaking and malfunctioning cooling coil valves in three air handlers and leaking heating coil valves in almost 200 VAV boxes. Based on the recommendations provided, the operations team was able to schedule repairs by prioritizing the most wasteful leaks first. Repairs resulting in $286,000 (€219,000) in annual savings have already been completed with additional repair work ongoing.

Due to repaired VAVs, two Air Handling Units also contributed to savings with reduced energy for $10,500/year (€8,040/year). Additional opportunities, including optimizing economizer controls, reducing air handler static pressure setpoints, or adjusting energy recovery control sequences, were identified and are under review for implementation. The building is still being monitored using Building Analytics, and the service is being used to discover faults, to accelerate retro-commissioning activities, and to automate verification of energy investments.

$300,000

Projected yearly savings in repair costs

450,000 sq ft.

Area of research laboratory

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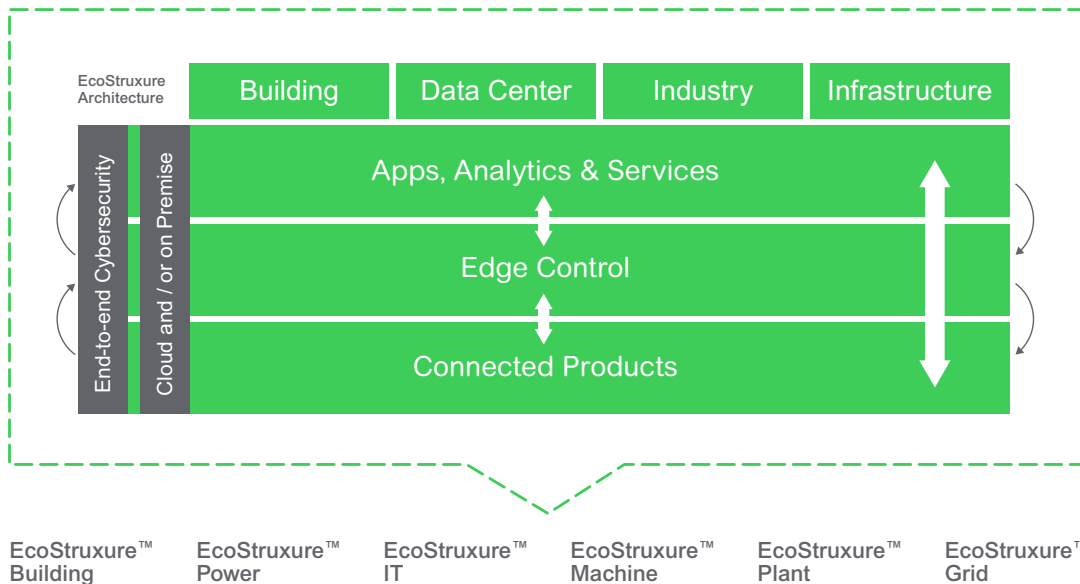# EcoStruxure™
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IoT-enabled solutions that drive operational and energy efficiency

EcoStruxure is Schneider Electric's open, interoperable, IoT-enabled system architecture and platform.

EcoStruxure delivers enhanced value around safety, reliability, efficiency, sustainability, and connectivity for our customers.

EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver Innovation at Every Level including Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure™ has been deployed in 480,000+ sites, with the support of 20,000+ system integrators and developers, connecting over 1.6 million assets under management through 40+ digital services.

One EcoStruxure architecture, serving 4 End Markets with 6 Domains of Expertise

EcoStruxure Architecture	Building	Data Center	Industry	Infrastructure

End-to-end Cybersecurity | Cloud and / or on Premise

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Edge Control

Connected Products

EcoStruxure™ Building   EcoStruxure™ Power   EcoStruxure™ IT   EcoStruxure™ Machine   EcoStruxure™ Plant   EcoStruxure™ Grid

Connected Products

The Internet of Things starts with the best things. Our IoT-enabled best-in-class connected products include breakers, drives, UPSs, relays, sensors, and more. Devices with embedded intelligence drive better decision-making throughout operations.

Edge Control

Mission-critical scenarios can be unpredictable, so control of devices at the edge of the IoT network is a must. This essential capability provides real-time solutions that enable local control at the edge, protecting safety and uptime.

Apps, Analytics & Services

Interoperability is imperative to supporting the diverse hardware and systems in building, data center, industry, and grid environments. EcoStruxure enables a breadth of agnostic Applications, Analytics, & Services for seamless enterprise integration.

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