IOTech

SHIFT ENERGY

IOTech & SHIFT Energy Case Study

Edge-Enabled Smart Building Optimization with SHIFT Energy EOS and IOTech Edge Central

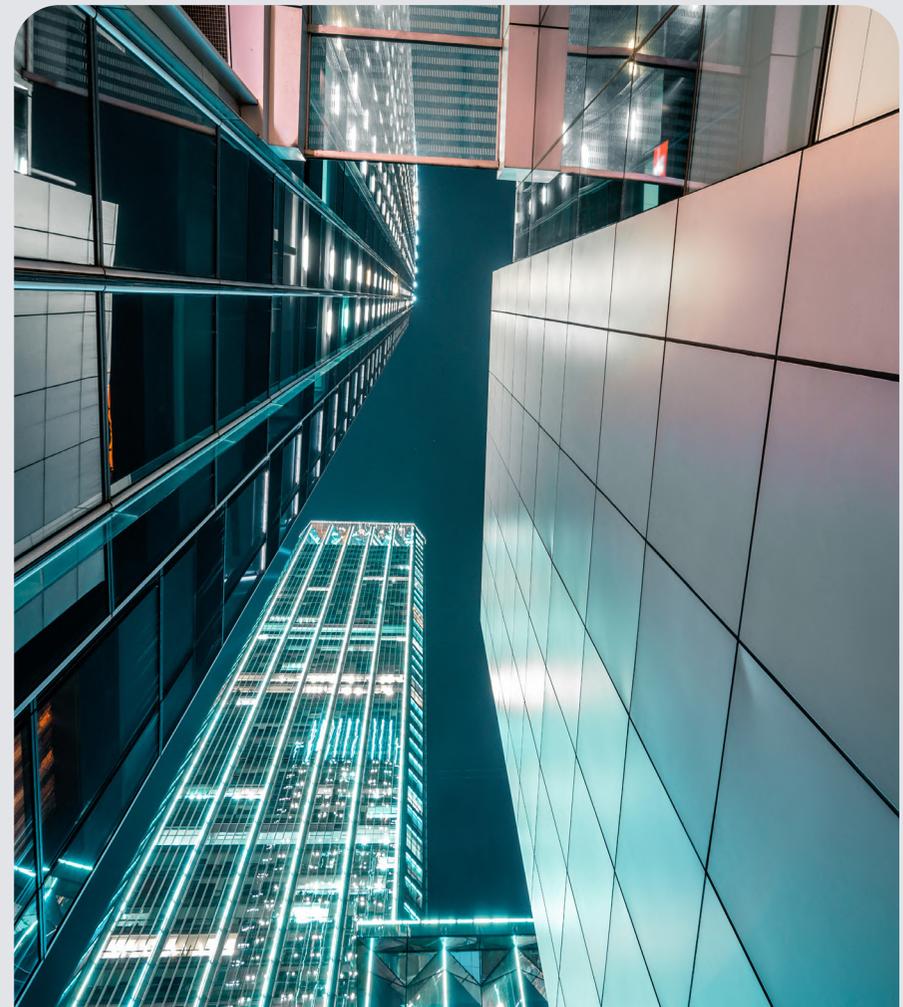# Case Study

Problem Statement

Modern commercial buildings are equipped with diverse and often siloed systems—HVAC, lighting, occupancy sensors, and more—each generating valuable data that is rarely unified. Traditional management solutions are slow to deploy, require extensive manual configuration, struggle to scale across large portfolios, and rarely optimize the biggest energy spenders – central plants and HVAC airside systems. This results in:

- High energy consumption and operational costs, increased carbon emissions and water loss
- Long deployment cycles and high integration overhead
- Unstable operations and inconsistent occupant comfort
- Limited real-time insights into buildings health, energy use, and operational efficiency

Objective

To deliver a scalable, secure, and automated energy optimization solution that integrates seamlessly with existing building systems, enabling real-time data collection, intelligent analysis, and closed-loop control to:

- Reduce energy consumption and costs
- Improve occupant comfort and satisfaction
- Accelerate deployment and time-to-value
- Maintain cybersecurity and compliance

Solution Overview

SHIFT Energy's **EOS platform**—a hybrid-cloud energy optimization suite—leverages **IOTech's Edge Central** as the core engine within the **EOS Gateway**, an on-site device that closes the loop between on-prem control and cloud optimization.
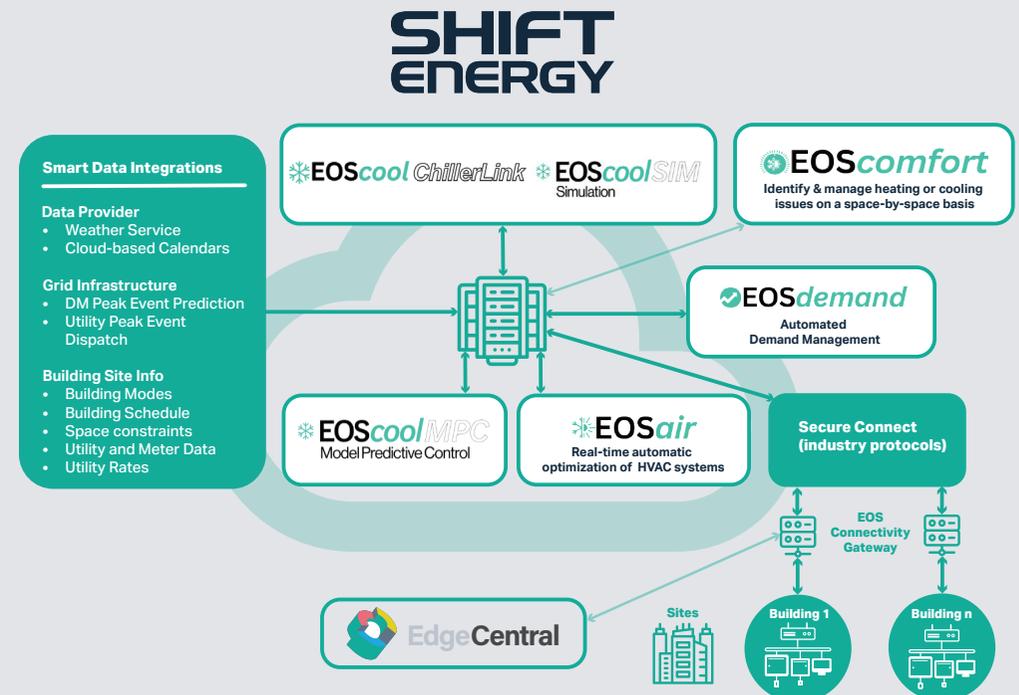
Key Components:

- **EOS Gateway:** Installed at the building site, connects to HVAC/ BAS systems via standard protocols (BACnet, Modbus, OPC UA, and MQTT)
- **Edge Central:** A key component of EOS Gateway that provides secure, containerized southbound connectors and plug-and-play device profiles for rapid device onboarding and data normalization
- **EOS Cloud:** Centralized platform for data processing, analytics, and control logic execution

EOS Application Suite:

- **EOScool:** Model predictive controls that improve central plant efficiency, stability, and reliability
- **EOSair:** ASHRAE-G36+ controls that balance ventilation, air quality and energy consumption
- **EOSdemand:** Automated, tariff-aware controls that cut peak consumption and energy costs
- **EOScomfort:** Maintains 95% occupant comfort targets

Data & Control Flow:

1. Edge Central discovers and connects to building devices
2. Data is normalized and streamed to the EOS Cloud
3. Smart algorithms analyze data and generate control commands
4. Commands are securely sent back to building systems for automated adjustment

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Smart Data Integrations

Data Provider
- Weather Service
- Cloud-based Calendars

Grid Infrastructure
- DM Peak Event Prediction
- Utility Peak Event Dispatch

Building Site Info
- Building Modes
- Building Schedule
- Space constraints
- Utility and Meter Data
- Utility Rates

EOScool ChillerLink **EOScool SIM** Simulation

EOScomfort
Identify & manage heating or cooling issues on a space-by-space basis

EOSdemand
Automated Demand Management

EOScool MPC
Model Predictive Control

EOSair
Real-time automatic optimization of HVAC systems

Secure Connect (industry protocols)

EOS Connectivity Gateway

EdgeCentral

Sites

Building 1

Building n

Solution Benefits

Operational Efficiency

- **Deployment Time:** Reduced from days to hours via automated device discovery and plug-and-play building system onboarding
- **Automation:** 99% of operations are fully automated, minimizing human error
- **Scalability:** Easily replicable across campuses, hospitals, and commercial portfolios

Energy & Cost Savings

- **Optimized central plants** reduce electricity and water usage, and cut carbon emissions
- **Optimized HVAC and ventilation** reduce electricity and gas usage
- **Real-time demand response** lowers peak demand charges

Occupant Experience

- **EOScomfort** ensures consistent indoor comfort across zones
- **EOSair** maintains healthy air quality while minimizing energy waste

Security & Compliance

- **Secure containers** and VLAN segmentation ensure data integrity and regulatory compliance
- **Bidirectional encrypted communication** supports safe remote control

Stakeholders

- **Building Owners, Facility Managers & Plant Operators:** Gain efficient central plants, lower costs, improved comfort, and simplified operations
- **System Integrators & IoT Solution Providers:** Deploy faster using connectors and templates
- **Energy and Sustainability Teams:** Use automated M&V and dashboards for savings analysis, reporting, and budgeting

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