



# PERFORMANCE

## EcoStruxure Building Operation 2023

# The world of **your building**



~40%

of the world's  
CO<sub>2</sub> emission comes  
from buildings<sup>1</sup>

>350

natural + man-made  
disasters in the world  
in 2019<sup>2</sup>

>30%

of the energy is  
wasted in buildings<sup>3</sup>

~90%

of our time  
is spent indoors<sup>4</sup>

Source:

<sup>1</sup> Architecture 2030, 2020

<sup>2</sup> Facts + Statistics: Global catastrophes, Insurance Information Institute, 2020

<sup>3</sup> U.S. Environmental Protection Agency, 2020

<sup>4</sup> Joseph G. Allen, Healthy Buildings Program, Harvard University, 2019



# The Foundation of Buildings of the Future



## Hyper-efficient

Maximize performance by optimizing system and workflow



## Resilient

Recover quickly and bounce back



## Sustainable

Consume less, extend life of assets, and spend wisely



## People-centric

Ensure a comfortable and productive setting for all people

# Building Operation **enables** the Buildings of the Future



## Hyper-efficient

Maximize performance by optimizing system and workflow

- Automate Operations
- Monitor and Analyze Performance in Real-Time
- Integrate Data Across Platforms and Systems



## Resilient

Recover quickly and bounce back

- Operate Remotely
- Visualize Entire Building OT
- Reduce Risk with Cybersecure Platform



## Sustainable

Consume less, extend life of assets, and spend wisely

- Maximize Electrification
- Drive Energy Efficiency Building Certifications
- Integrate EV Charging & Renewable Energy Sources



## People-centric

Ensure a comfortable and productive setting for all people

- Ensure Comfort
- Improve Service Level Response
- Make Buildings More Healthy



# Hyper-efficient

## Automate operations

- Advanced alarms and SMS notifications
- Integration with analytics and third-party data
- IP-based and easy to manage

## Achieve better insights

- Flexible, easy to create and use dashboard
- Advanced trend logs, alarms, and alerts
- Access to historical data and graphics

## Open integration

- Truly open, vendor-neutral, bi-directional system
- Scalable, flexible integrations via API
- Open platform structure means your data isn't locked into a proprietary format
- Multiple database options for external log storage



Life Is On

**Schneider**  
Electric





# People-centric

## Drive comfort and productivity

- Tighter control of assets for comfort
- Needs-based HVAC and advanced scheduling
- Scalable to fit evolving occupant needs

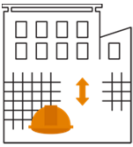
## Improve service levels and response time

- Advanced, proactive alarms
- Rich graphics
- Integrates with analytics platforms

## Optimize building health

- Indoor environmental quality management
- Accurate people-counting sensor for fine-tuned, precise HVAC control
- Integration with SE and 3<sup>rd</sup> party sensors and Occupant Well-Being software





# Resilient

## Faster deployment

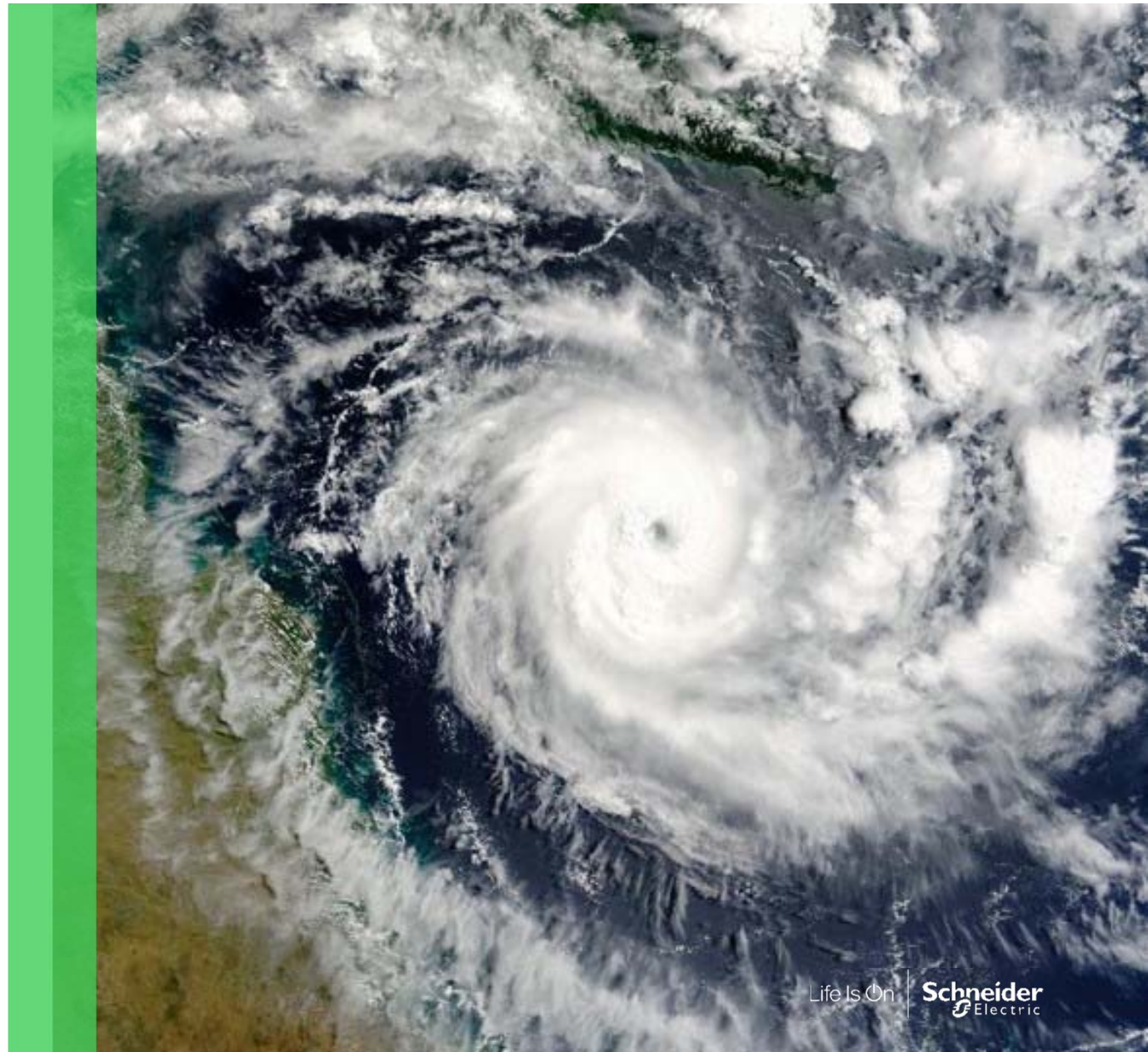
- Scale up projects faster than ever with software-only Edge Server
- Increased resilience and security

## Remote operations

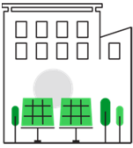
- Secure and web-based remote login
- Mobile-friendly access from any device
- Leverage cloud-based infrastructure
- Centralize remote monitoring across portfolio with scalable architecture

## Power reliability

- Easy to use dashboards with reporting and trend analysis for simple use cases
- Integration with Power Monitoring Expert for complex use cases







# Sustainable

## Maximize electrification

- Monitor your electrical system
- EBO data can be fed into anything from dashboards to complex power monitoring
- Insights & real-time usage on EV charging points

## Actively manage energy

- Proactive energy reduction with demand response system integration

## Move towards decarbonization

- Optimize how and when you use energy
- Achieve energy certifications like LEED
- Software only (no hardware) new Edge Server
- Reduce embodied carbon with Green Premium connected devices





EcoStruxure Building Operation achieves outcomes that deliver **more value to owners and facility managers** and **drive better experiences for occupants**



### Access More Information

Enable better, more informed decision making to reduce energy use



### Performance & Efficiency

Faster engineering, better software performance, and easier upgrades



### Cybersecurity & Compliance

Protect your infrastructure and stay current with standards



### Occupant Comfort & Satisfaction

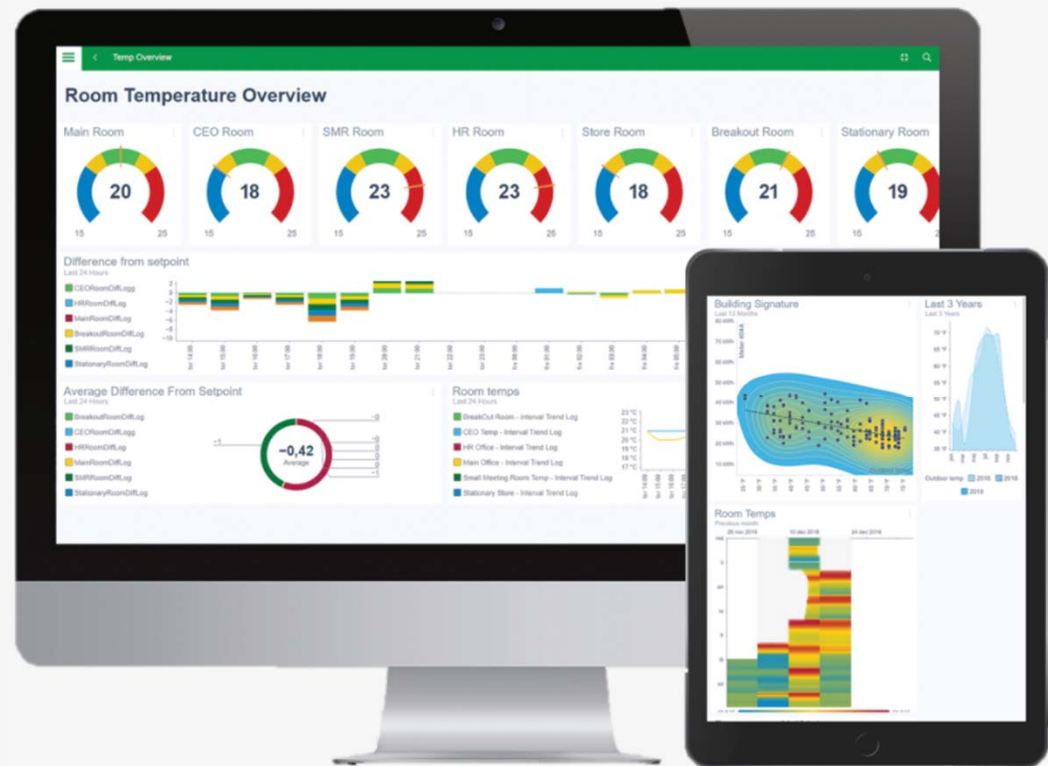
Create productive, comfortable, healthy spaces for tenants

How do you solve this today, what is your strategy?

# EcoStruxure Building Operation improves building performance with **connected, real-time tools** that are **purpose-built** for your needs

EBO is a modern building management system with unmatched power to:

- **Provide better data visibility** with customizable dashboards and rich graphics
- **View more data in one place** with Building Operation's open integration approach
- **Increase energy and operational efficiency** by monitoring, maintaining & controlling building ops in one network
- **Achieve visibility at scale** with views at the device, floor, building, campus & portfolio level
- **Enable on the go and remote viewing** with mobile friendly design
- **Better serve occupants** with custom kiosk displays and occupant app integrations



# EcoStruxure Building Operation

Optimize buildings, reduce energy use, and move towards net-zero carbon



## Dashboards

Role-specific personalized dashboards providing data visualization and increased understanding



## Reporting and Trends

Create powerful custom reports sharing building trends and performance directly from EBO

## Webstation UI

Gain secure full building system access from a PC browser on the go from tablets and mobile devices



## Alarm Management

Best in class alarm management to keep you on top of building issues

## Tools

System tools designed for the Integrator maximizing engineering efficiency



## Cybersecure

Reduce cyber threat risk as technology evolves

## Open

Diverse integration possibilities driving complete single control center experiences



## Upgradeable

System flexibility to upgrade and expand on your terms

## Scalable

Fully modular and scalable architecture to meet buildings of any size and complexity



## Semantic Tagging

Access to information and insights in human-readable form

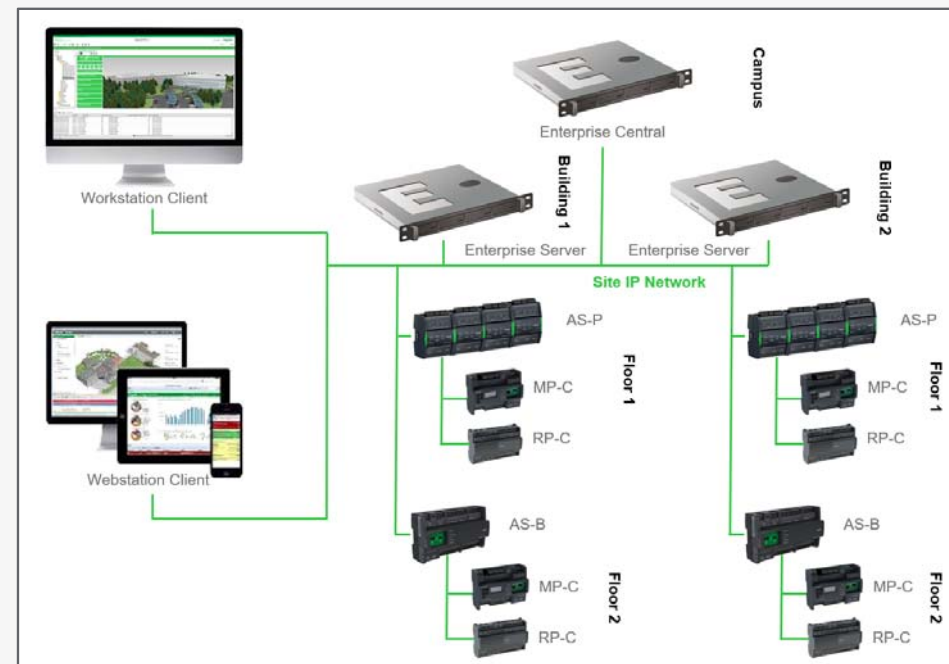




# EcoStruxure Building Operation: Flexibility with Scalability

Fully modular and scalable architecture to meet buildings of any size and complexity

- **Edge Level Servers for Buildings of Any Size**  
Enterprise Central, Enterprise Server, and Automation Servers for scalable, configurable system deployments
- **Web Based Clients**  
View any system level with customizable persona-based views on PC, tablet, or phone through the web-based browser, Webstation
- **Powerful Engineering Clients**  
Engineer, configure and view any level of the system on a PC with the Workstation client
- **IP Based Architecture**  
Robust, secure, and flexible IP connectivity down to the room level
- **Multi-version Support**  
Run servers at different version numbers for improved expansion and upgrade possibilities on your schedule



*Did you know: 1 EC supports up to 50 ES servers, for a total of 2500 AS in one system*

# EcoStruxure Building Operation: Edge Server

Deliver projects faster with the new software-only automation server

- **Minimize Hardware & Cost with a Streamlined Approach**

Software-only version of AS-P deployed as a docker container, perfect for settings where hardware functions aren't needed, and minimal costs/equipment is desired

- **Reduce Embodied Carbon in a Building**

No hardware or power supplies means significantly less embodied carbon (Scope 3) vs a standard install

- **Faster Project Delivery**

Install in seconds instead of months; No need for electricians or waiting for hardware delivery

- **Increased Resilience**

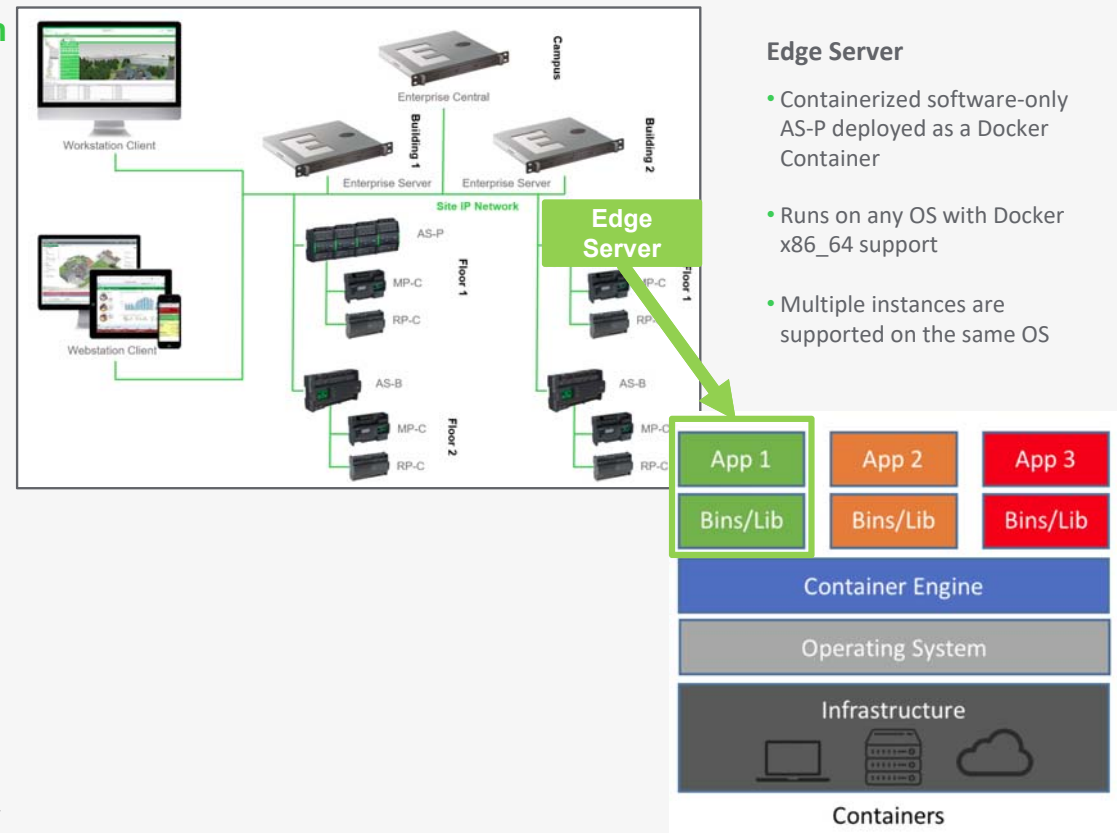
Faster disaster recovery, fewer physical components

- **Increased Availability**

Faster upgrades – less downtime, fewer components

- **Increase Resilience and Cybersecurity**

Better isolation, fewer ports, easier to orchestrate & monitor



# EcoStruxure Building Operation: Open Integration

Diverse integration possibilities driving complete single pane of glass experiences

- **Standard Protocols**

Native support for common standard protocols including BACnet, LonWorks, Modbus, and Web Services

- **Modbus Device Integration**

Speed up onboarding and integration with library of Modbus devices, including power meter data

- **MQTT**

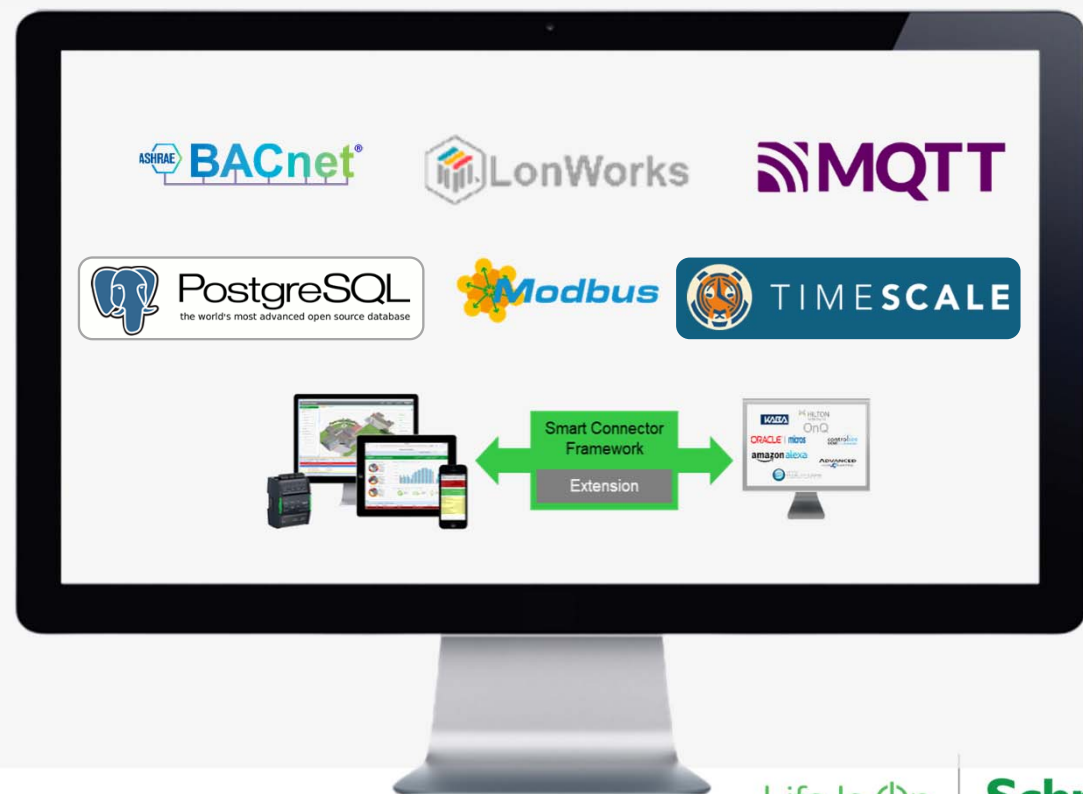
Native compatibility for publishing & subscribing to IoT sensors via MQTT protocols & brokers

- **Open Databases**

Open-source format databases with optional time-series database tools allow for database access from EBO as well as 3rd party tools

- **Smart Connector APIs**

Enable new capabilities, apps, and solutions with open-source developer framework for 3<sup>rd</sup> party integration





# EcoStruxure Building Operation: Tools

System tools designed for the Integrator maximizing engineering efficiency

- **Workstation**

Dedicated integrator platform for EBO system design and configuration customization while maintaining engineering workflows and efficiency

- **Modernized Programming**

Visual object-oriented system streamlines programming, and lowers personnel requirements and project costs while keeping customizability

- **Automated Engineering Tool (AET)**

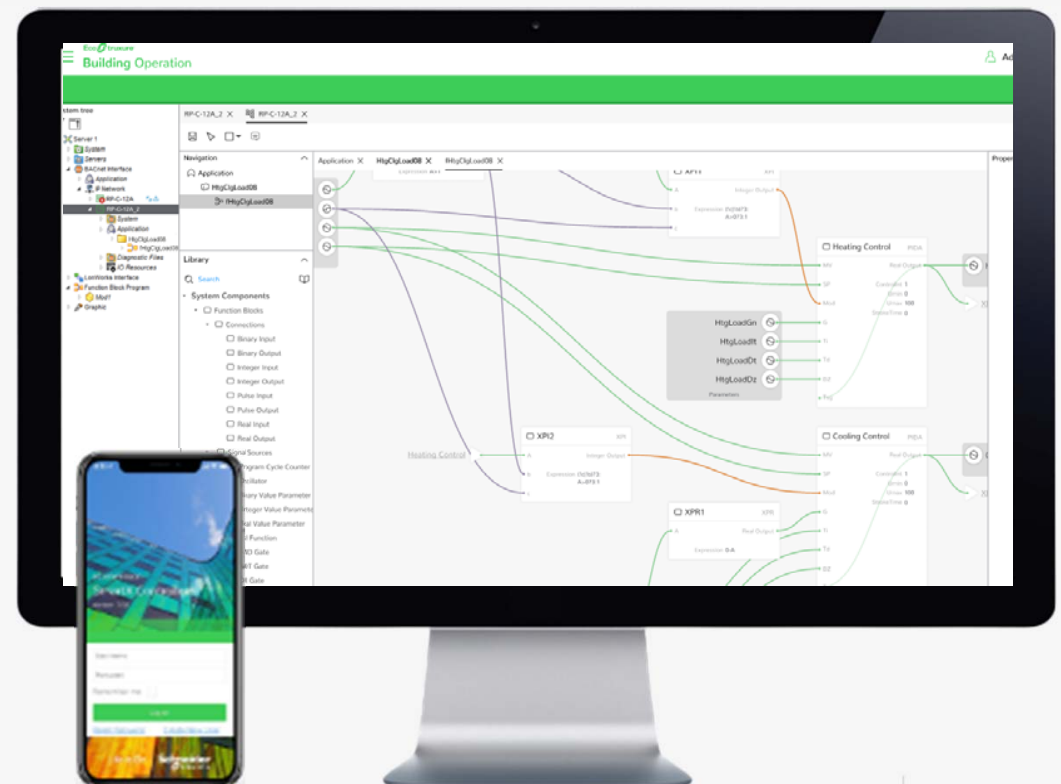
Streamline creation & deployment of reoccurring system elements via standards creation, duplication, configuration

- **Project Configuration Tool (PCT)**

Integrators can engineer and test entire solutions remotely prior to installation of HW on site

- **Building Commission Tool**

Commission SpaceLogic MP/RP controllers with your favorite Android, Apple iOS, or Windows 10/11 devices



# EcoStruxure Building Operation: WebStation

Gain secure, full-building system access from PC browsers, tablets, and mobile devices



## Mobile Friendly

Secure web-based access from any device providing complete system access for FM's and technicians working throughout the building



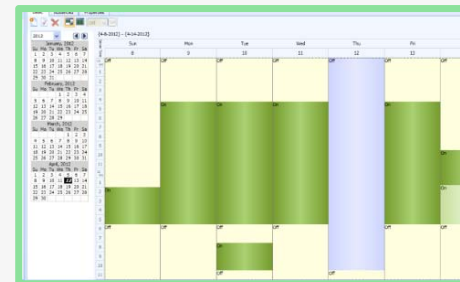
## Customizable Graphics

Scalable 2D and 3D vector graphics with live updating data overlays providing easy contextual views of equipment or spaces



## Alarm Management

Graphical alarms, integrated email & SNMP notifications, and management tools for acknowledgement, tracking, notes, and checklists



## Scheduling

Campus wide automation through calendar schedules and special event configurations pulled from Outlook or other external sources

# EcoStruxure Building Operation: Dashboards

Role specific personalized dashboards providing data visualization and deeper insights



- **Data Visualization**

Don't just collect data, understand it. Access and visualize building data to provide context, make it easy to digest, and understand what it is telling you.

- **Customizable**

Quickly and easily create dashboards with out of the box widgets or create custom dashboards with customer-specific graphics or chart types

- **Role Specific**

Show the right level of data to those that need to see it by creating user or role-specific views of dashboards with their preferences in mind

- **Mobile Friendly**

Browser-based logins and automatic scaling mean dashboards can be properly viewed from small screen smartphones to large screen network operation monitors



# EcoStruxure Building Operation: Trends & Reporting

Create powerful custom reports sharing building trends and performance directly from EBO



- **Trends – Historical Data**

Give context to live data by showing its relation to the past. Can be overlaid with other data on separate axis to show relations and processed within EBO before plotting (i.e., net variable energy usage)

- **Trends – Export Logs**

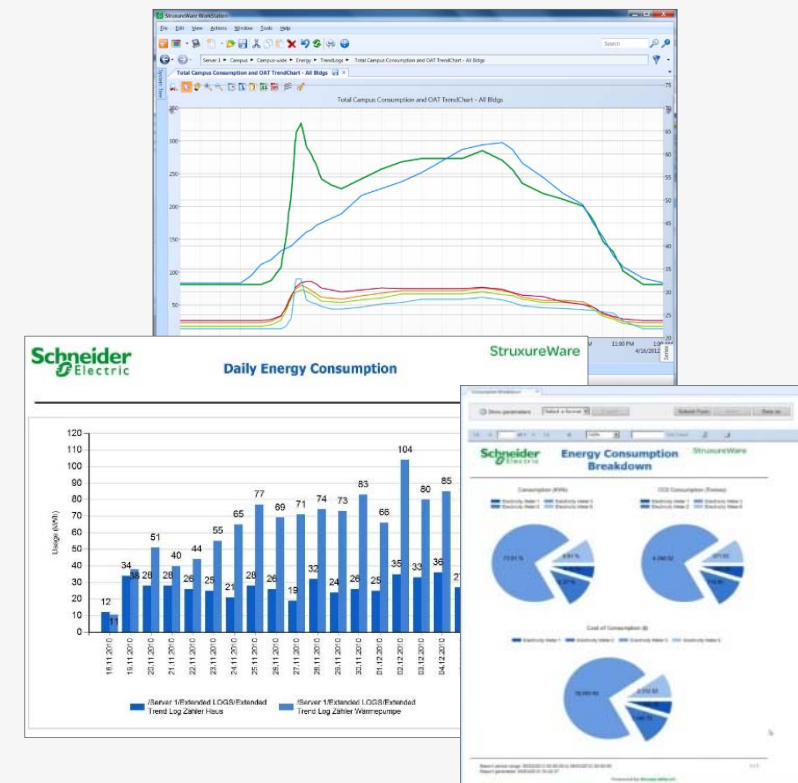
EBO databases are open and will allow for native exporting of the data itself as well as trend logs and other information into .csv and .xml

- **Reports – Flexible Reporting Tool**

Create out-of-the-box reports for common data such as energy consumption or alarms or create fully custom reports, complete with customer logos, based on imported templates

- **Reports – Configuration**

Highly customizable reports using pre-configured or ad hoc criteria including date range, cost, consumption, and CO2 emissions to ensure your data supports the message your reports are working to convey



# EcoStruxure Building Operation: Alarms

Best in class alarm management to keep you on top of building issues

- **Alarm and Event Management**

Integrated email & SNMP notifications with management tools for acknowledgement, tracking, notes, and checklists that make FM teams more productive and responsive

- **Alarm Recognition**

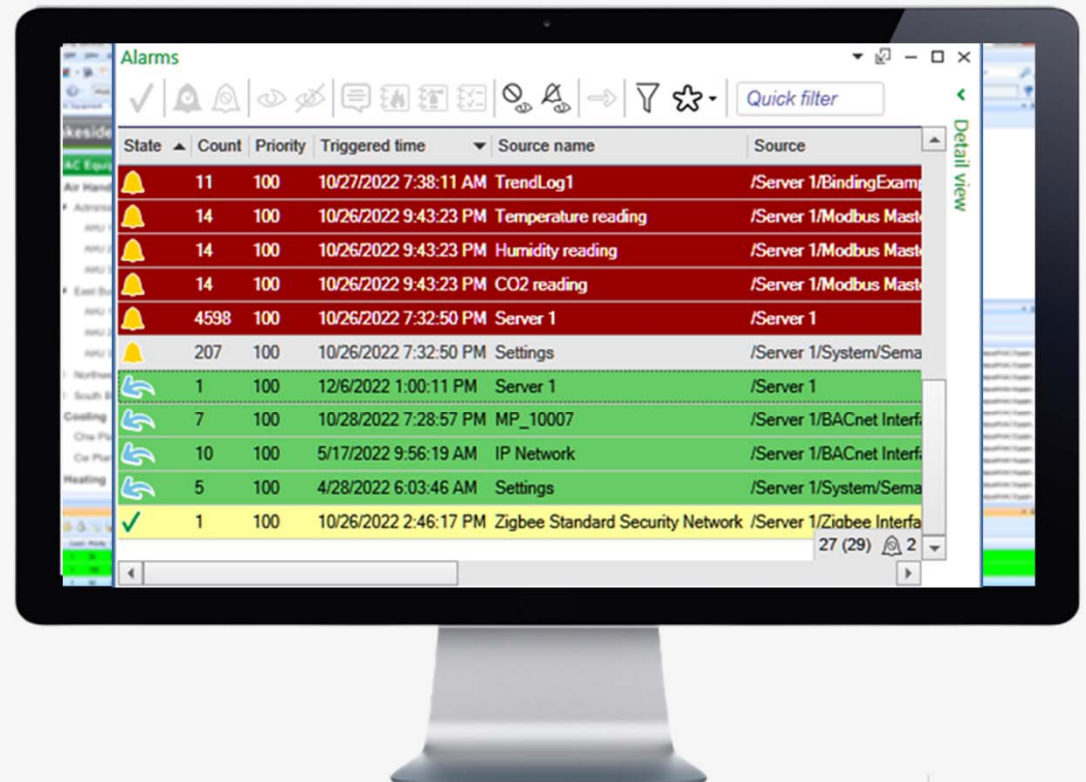
Flexible and configurable suite of “alarm decoration rules” allows users to change alarm presentation based on conditions or criticality. Parameter-based sorting and custom notifications enhance visibility on smaller issues.

- **Graphical Alarms**

Attach graphics to alarms for easy reading by the user for system status during and leading up to the alarm at hand

- **Alarm Protection**

Additional options to require single or double acknowledgment of alarms ensure specific critical scenarios are responded to according to company policy





# EcoStruxure Building Operation: Enhanced Cybersecurity

Reduce cyber threat risk as technology evolves



- **Secure Development Lifecycle (SDLV2) Policy**

Following IEC62443-4-1 and Schneider Electric policies, SDLV2 brings security awareness throughout the entire start to finish development lifecycle

- **IPv6 Support**

EBO servers support IPv6 for server-to-server & client-to-server communication, allowing IT personnel to meet application specifications & reduce costs

- **Advanced Encryption and Authentication and Secure by Default Features**

Secure communications via standard protocols alongside conservative default settings means instant protection and a high baseline for security

- **BACnet /SC (Secure Connect)**

ES, AS-P, and AS-B fully support BACnet /SC node, hub, and router functions, securing BACnet traffic over IP networks and devices on BACnet /SC networks

- **Secure Boot Automation Servers**

Available secure boot AS-PS mean only digitally signed trusted software will run protecting facilities against software alteration

## Technology highlights:

- SSO SAML 2.0 Compatible
- TLS 1.3 support
- CA Certificates
- Secure email
- Password policies
- Change password on first use
- Auto logoff timers
- Role-based access control (RBAC)
- Object level security
- Active Directory integration
- Audit logs
- System information and event monitoring (SIEM) integration
- Full system backup, recovery and reconstitution

# EcoStruxure Building Operation: Upgrade with Ease

System flexibility to upgrade and expand on your terms



- **Multi-version Support**

With the ability to run different versions of EBO on a single system, users can expand and upgrade systems over time or at once depending on what is most convenient for the site

- **Included Cybersecurity Patches and Updates**

All minor version upgrades and patches are included with the purchase of a major EBO version

- **Discounted Major Version Upgrades**

Chargeable major version upgrades enjoy significant discounts as an existing EBO site coming from older versions of EBO

## BUILDING MANAGEMENT SYSTEM



# EcoStruxure Building Operation: Semantic Tagging

Access to information and insights in human readable form



- **Semantic Tagging**

Standardized Brick Schema contextual modeling navigate, filter, edit, and search on tags. Smart Connector API accessible

- **Standardized Contextual Modeling**

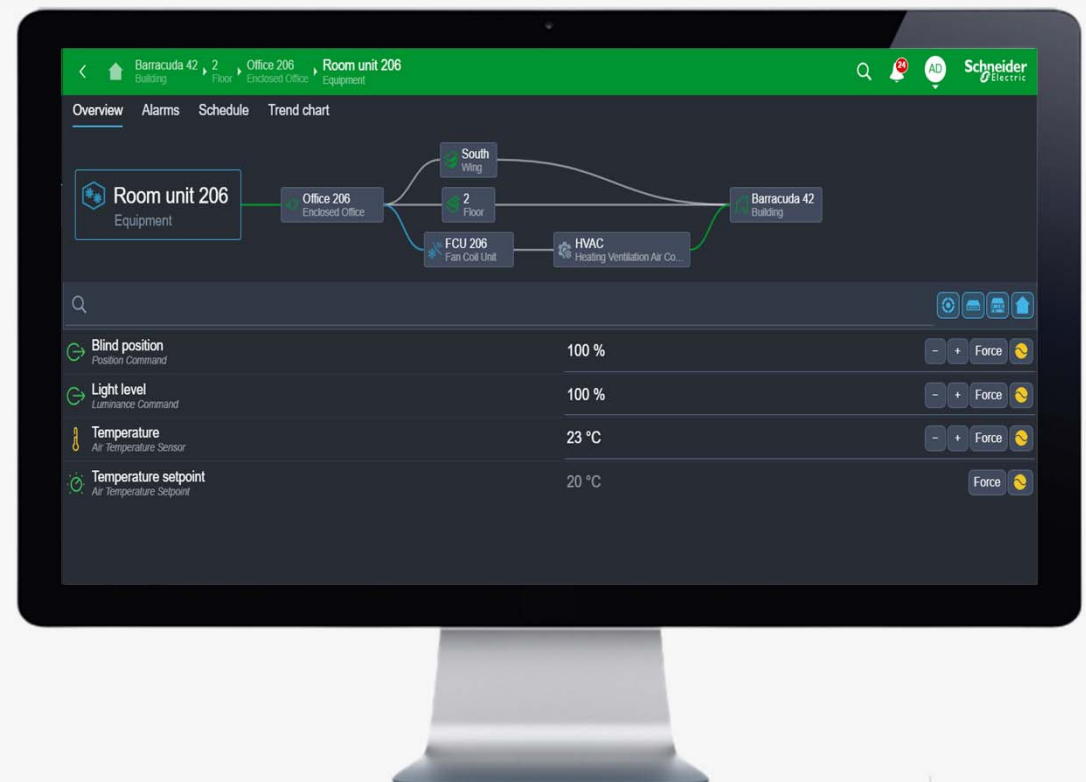
Brick Schema standardized modeling ontology helps apply consistency to object names and information across different installers and integrators

- **Leverage Tags for Immediate Efficiency Gains**

Navigate, filter, edit, and search on tags to quickly access information, make mass changes, or perform other functions based on tagged information

- **Smart Connector Accessible**

Smart Connector APIs also have open access to model data and relations providing additional possibilities for smart connector extensions



# SpaceLogic Insight-Sensor\*: People Counting

The most efficient way to balance comfort and energy consumption in a building



- The **all-in-one** SpaceLogic Insight-Sensor combines people counting, sound, light, presence, temp, and humidity in a single sensor
- The Insight-Sensor is part of the **Connected Room Solutions**, powered through the Room Controller, and can integrate with **light, blinds, and HVAC**
- Enables a **proactive** way of sensing and controlling the well-being and comfort of occupants in an energy efficient way to meet the future of digital smart buildings
- **Why** – To be able to meet **digital smart buildings' requirements** of well-being, comfort, and energy efficiency
- **How** – By empowering building owners, tenants, and occupants with **customized indoor air quality** and **optimized energy footprint** covering all occupancy levels
- **What** – The Insight-Sensor provides **sensor data** through integration with CRS and EBO, to be converted into customized indoor climate with perfect adaption to occupancy level and optimized energy footprint



\* Part of SpaceLogic Connected Room Solution



# EcoStruxure Building Operation

## The heart of the building management system



**Scalable, open integration** platform that integrates, manages, and optimizes multiple building systems in a single control center



Integrates multiple systems and devices to **collect, analyze, and manage data** across the enterprise



**Monitors, manages, and controls** building operations on one network to increase efficiency



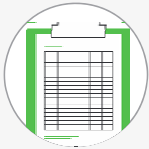
Turns system data into **actionable intelligence** to **optimize building performance** and **create more efficient and sustainable buildings**

# Hilton Garden Inn Dubai



## Situation

- Bring an affordable, 4-star option to a saturated market
- Navigate rising energy prices and shifting subsidies
- Control cost without compromising high standards
- Keep operations lean and efficient being sustainable



## Solution

- EcoStruxure™ Building Operation
- EcoStruxure Guest Room Expert
- Automation servers, Room Controllers



## Results

- Increased energy and operational efficiency, guest comfort
- Occupancy-based energy use created savings of 25-44%
- Excellent guest satisfaction – far above benchmark
- LEED Gold Certification for New Construction



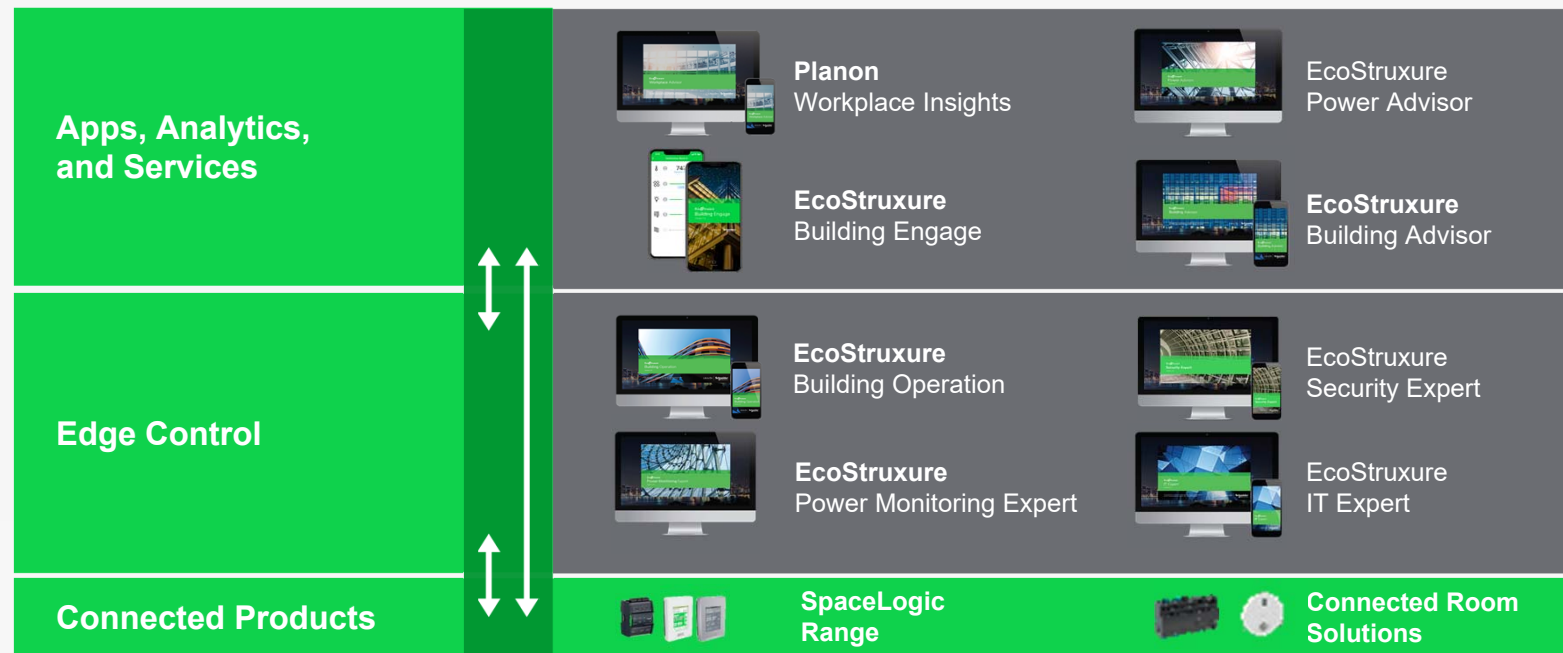
“Schneider has brought in a whole range of equipment to this property that allows us to operate the hotel very energy efficiently. Profitable, but without sacrificing guest comfort.”

– Director of Engineering Operations, Hilton Middle East

# Deep domain expertise

*Driving increased **building value** and better **occupant experiences***

EcoStruxure™  
Innovation At Every Level



Life Is On

Schneider  
Electric

# Resources

## Learn more



Guidehouse Insights:  
Intelligent Building Software

[Read report](#)



Building Resiliency in  
Unprecedented Times

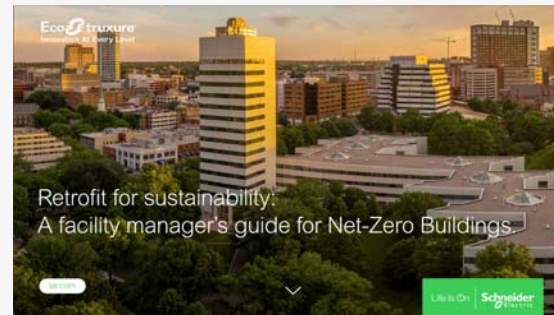
[Read article](#)

## Explore solutions

EcoStruxure Building Operation Website | [LINK](#)

IoT & EcoStruxure Building Video | [LINK](#)

EBO and Insight-Sensor Video | [LINK](#)



Retrofit for Sustainability: A facility  
manager's guide for Net-Zero Buildings

[Read eGuide](#)

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# Shaping the next-generation of digital hospitals

Example of a  
case study slide



## Mersin Integrated Healthcare Mersin, Turkey

**Software and Applications:**  
EcoStruxure Building Operation  
EcoStruxure Power

**Goal:** To build a hospital that is equipped with integrated solutions, can be run efficiently and safely and can meet all daily requirements.

**Story:** At MESK, human life always comes first. This was put into practice when the hospital was opened around one year before the contract period had even started.

**Solution:** The digital hospital architecture is IoT-enabled and ensures that all engineering functions are clearly visible. Schneider Electric's master EcoXpert partner, Mas Otomasyon, was responsible for implementing this EcoStruxure architecture in the field. Realtime management has helped boost energy management and productivity

### Result

- Awarded EMRAM Stage 6 "Digital Hospital" status following the HIMSS assessment
- Hospital infrastructure compatible with the technology of tomorrow
- 25% potential energy savings

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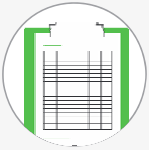
**Schneider**  
Electric

# Perdana Putra Malaysia



## Situation

- Achieve greater energy efficiency
- Improve overall asset performance
- Achieve Green Building Index (GBI) certified platinum status



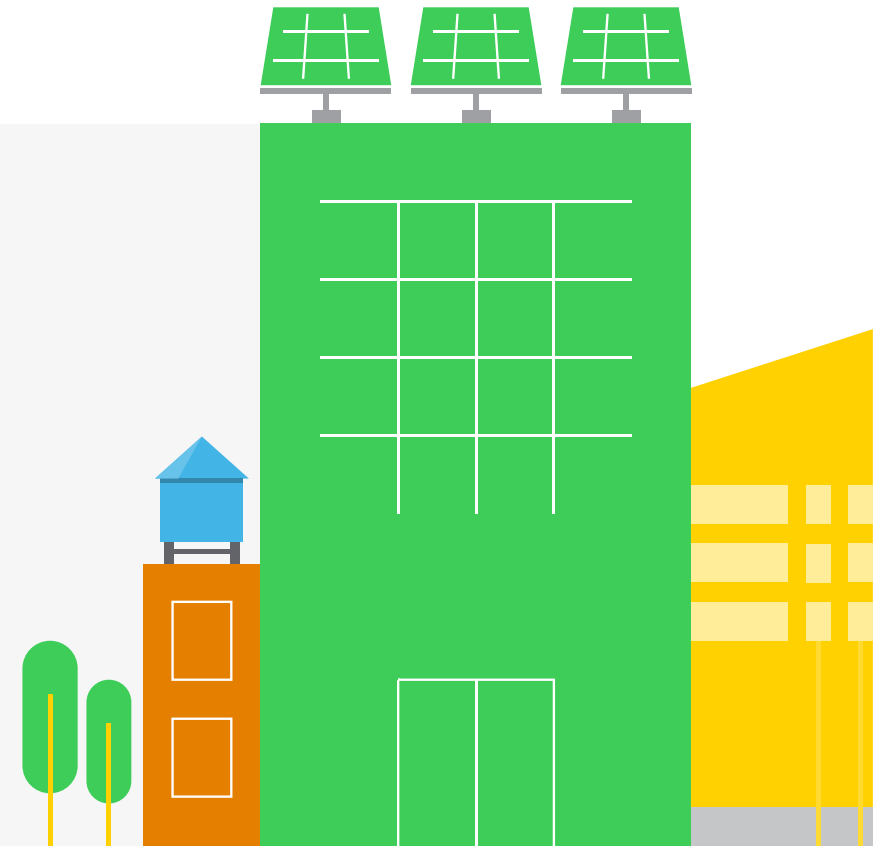
## Solution

- EcoStruxure™ building operation\*
- Automation servers
- Installed by an EcoXpert™



## Results

- Attainment of 40% energy savings
- Receive Green Building Index (GBI) platinum certification
- Control and monitor mechanical and electrical equipment

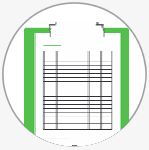


# GwangHwaMun D-tower Korea



## Situation

- Seeking highly optimized building management to:
  - Increase performance and occupant comfort
  - Ensure energy efficiency



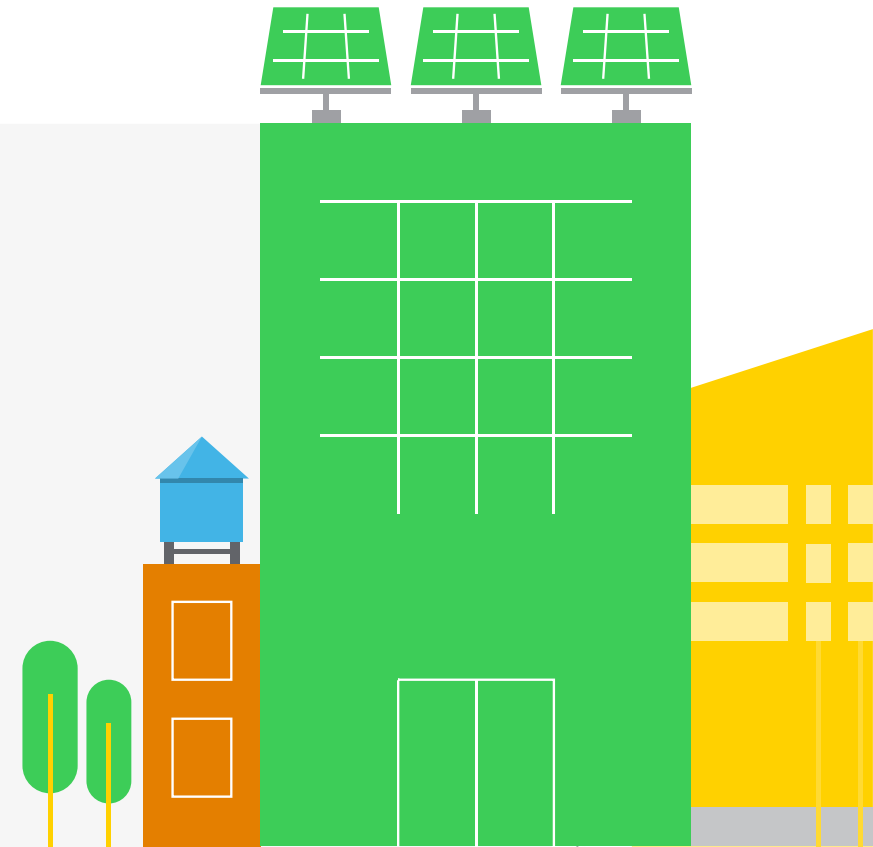
## Solution

- EcoStruxure™ building operation\*
- Automation servers
- Installed by an EcoXpert™



## Results

- Integrate disparate systems
- Increased operational efficiency
- CAPEX and space savings
- LEED Gold certified
- 20% reduction in HVAC energy consumption



Life Is On

**Schneider**  
Electric



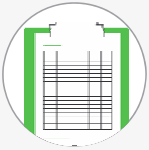
# Tour Majunga

## France



### Situation

- 45 floor office building serves 5000 employees in Paris business district seeking to:
  - Create a comfortable and productive work environment
  - Reduce energy consumption and carbon footprint



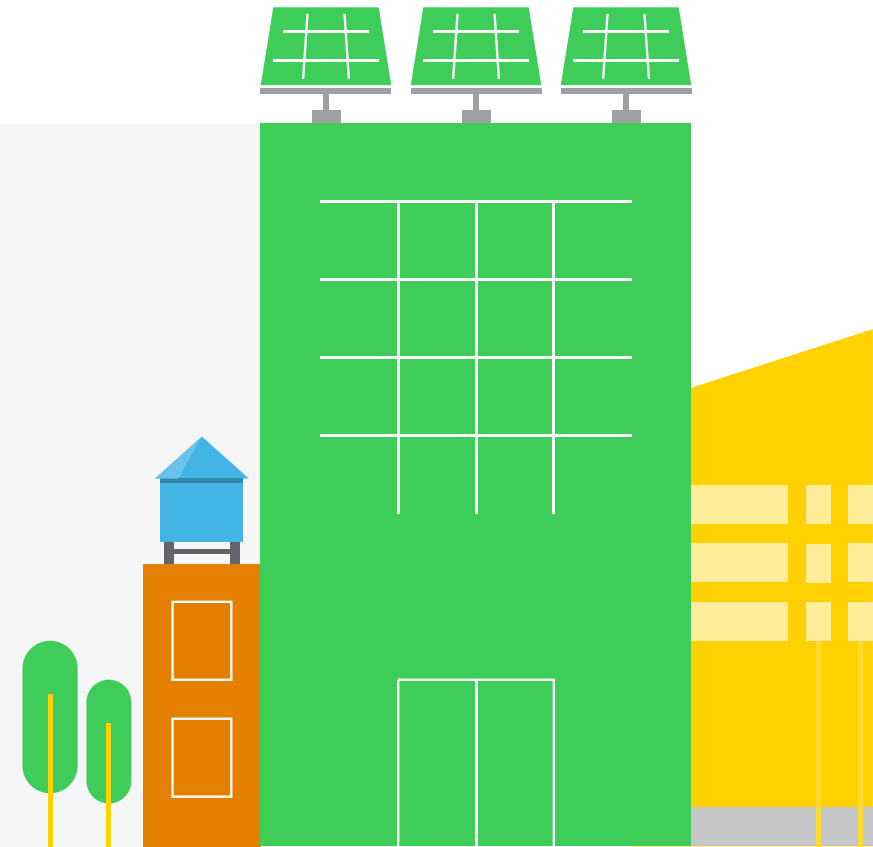
### Solution

- EcoStruxure™ workplace advisor\*
- EcoStruxure™ building operation\*\*
- Smart panels



### Results

- Energy consumption of less than 80 kWh/PE/m2/year, 5 times more efficient than other office buildings
- Attainment of BREEAM Award
- Ability to control and manage energy usage
- Enhanced user experience with ability to remotely control lighting, temperature and blinds of rooms

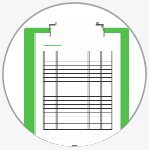


# Schneider Electric Netherlands



## Situation

- Reduce energy consumption at its office building
- Ensure reporting on energy consumption is consolidated at one place instead of various sources



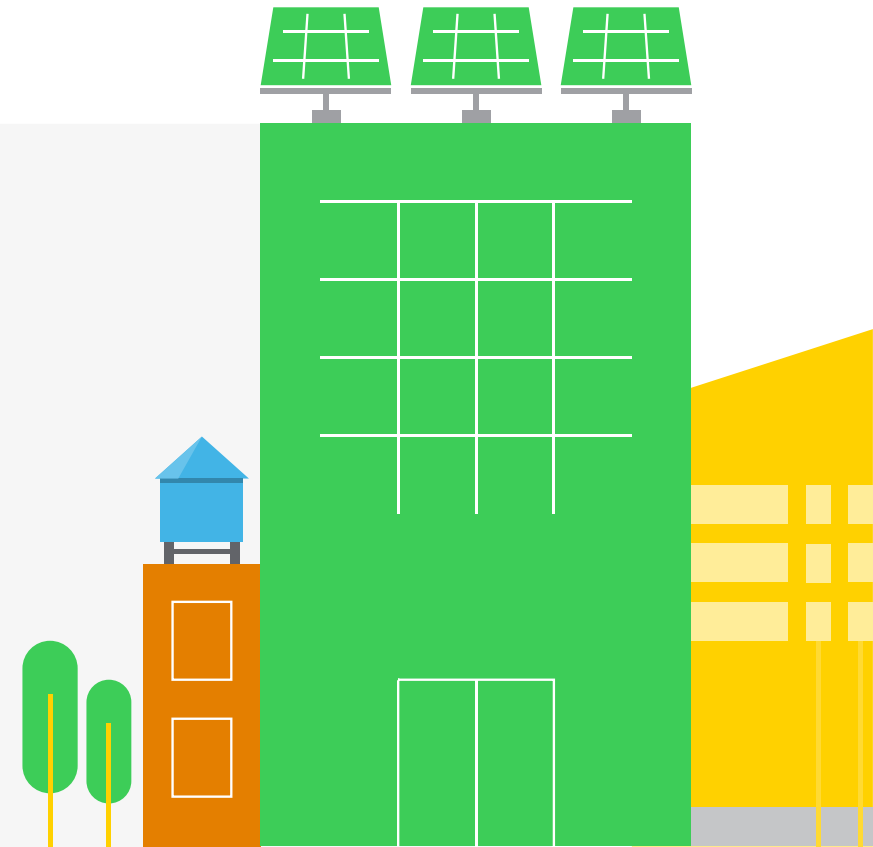
## Solution

- EcoStruxure™ building operation\*
- Power meters
- Pelco cameras



## Results

- 37.5% savings in energy which is equal to 156kWh/m2
- Real-time reporting on all energy metrics in one consolidated dashboard
- Significant reduction in energy consumption
- Ability to make better energy saving decisions based on input from dashboards

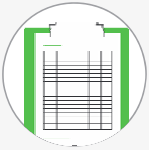


# Schneider Electric Canada



## Situation

- Renovation of a two-story mill into a three-story office and R&D center with state-of-the-art BMS technology and energy efficiency solutions



## Solution

- EcoStruxure™ building operation\*
- EcoStruxure® building expert\* with integrated:
  - SE8000 room controllers
  - EnOcean® wireless devices
  - LED lighting and daylight harvesting
  - On-demand ventilation
  - Power metering



## Results

- 30% savings in energy
- Reduced energy wastage
- Improved comfort
- Sustainable and green building performance

