

PERFORMANCE

North American Research and Development Headquarters

Schneider Electric Boston One Campus - Andover, Massachusetts USA

How to bring microgrid innovation to a commercial building at no extra cost

schneider-electric.us/microgrid

In partnership with



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Schneider Electric, a global leader in microgrids, wanted to fully understand the experience of its customers by using its new microgrid technology and no-money down financial model. So the company decided to become its own customer. The Boston One Campus offered the perfect opportunity.

Designed as the North American Headquarters and one of five Global Research and Development Centers for the infrastructure and technology giant, the Boston One Campus has two buildings, totaling 240,000 square feet. Together, they serve as the workplace for 750 employees in Andover, Massachusetts.

The challenge: averting additional, costly power outages

Like many commercial building owners, Schneider Electric began thinking about installing a microgrid because of an electric reliability issue. Before the building was completed in 2014, the local utility installed two electrical feeds, a redundant approach that would typically offer an exceptional level of reliability. But to the company's surprise, service from the local utility was interrupted several times during the buildings' first 18 months. And in some cases, the outages were lengthy. The buildings have a back-up generator, but it was sized to serve only critical equipment, such as its data center, and not the buildings' entire 1.5 MW peak load.

One day an outage proved so lengthy that Schneider Electric had to send its employees home.

Goal

Experience microgrid services as a customer would.

Solution

With the help of partners, Schneider Electric built a microgrid at its North American Research and Development Headquarters.

Story

Schneider Electric's new headquarters experienced utility-related outages. In partnership with Duke Energy Renewables and REC Solar, the company installed a microgrid to power critical operations.

Results

Lessons Learned

- Pre-fabrication reduces downtime
- Renewables have economic benefit
- Microgrid offers efficiency and insights

All of this, plus reliable electricity was achieved with no upfront costs.

“There was a quantifiable loss in productivity. The outage cost us money,” said Lance Haines, Distributed Energy Resources Solution Architect.

At the time, the company was preparing to unveil to the marketplace its new EcoStruxure™ Microgrid Advisor, a cloud-connected microgrid control system, as well as its Microgrid-as-a-Service (MaaS). The MaaS business model spares customers any upfront costs for the microgrid and related upgrades, since it is owned by a third party.

Schneider Electric quickly realized that its reliability troubles at the Boston One Campus presented the perfect opportunity to demonstrate how a microgrid can keep the power flowing when the electrical grid goes down. The company decided to make the buildings a state-of-the-art living laboratory.

The solution: a no-down payment microgrid model

For Schneider Electric, the microgrid installation at the Boston One Campus also presented a unique chance to stand in the shoes of its customers, to experience Schneider Electric technology and services as they would. The company set up two teams for the project: one that would perform the company’s tasks and the other that would act as the customer, evaluating the product and process with a critical eye.

“By doing that, we gained a further understanding of how a MaaS model works during execution, the challenges associated with the arrangement, and lessons to improve the delivery,” said Mark Feasel, Vice President, Smart Grid and Electric Utility.

Schneider Electric worked with Duke Energy Renewables and its subsidiary REC Solar, two companies that it is teaming with on other microgrid projects.

REC Solar installed the solar roof and carport systems. Schneider Electric acted as the engineering, construction, and procurement contractor, handling modifications to the buildings’ electrical system and communications network. With the MaaS business model, Duke Energy Renewables owns the microgrid assets under a long-term power purchase agreement. As a result, Schneider Electric was spared any upfront capital costs.

“The integration of an advanced microgrid at the Schneider Electric campus reduces its energy costs, incorporates more sustainable energy, and delivers demand-side efficiency, while also offering resilience to the facility in the event of a loss of power from the grid,” said Chris Fallon, Vice President of Duke Energy Renewables and Commercial Portfolio. “Additionally, in partnership with Schneider, we can research and develop new microgrid technologies, solutions, and applications in a real-world environment.”

The technologies used included Schneider Electric’s:

- **Energy Control Center**, an intelligent, modular, and scalable self-contained control center designed to simplify and optimize the integration of distributed energy resources (DER).

For Schneider Electric, the microgrid installation at the Boston One Campus also presented a unique chance to experience the company’s technology and services as its customers would.

Client Vision

Develop, test, and refine delivery of microgrid technology and the new MaaS business model to commercial building owners.

Benefits

Greater electrical reliability, resilience, demand-side efficiency, and sustainability at no upfront cost.

Project

Project at a Glance

- Location: Schneider Electric Boston One Campus, Andover, Massachusetts
- Project type: microgrid for a commercial building

Project Details

- EcoStruxure Microgrid Advisor
- Energy Control Center
- 354 kW (AC) solar array
- 400 kW natural gas-fired back-up generator
- Electrical infrastructure upgrades within the building

- **EcoStruxure Microgrid Advisor**, a cloud-based, demand-side energy management software platform that uses predictive algorithms to collect, forecast, and automatically optimize DER to promote production and consumption of renewable energy and better control energy spend. The combination of the Energy Control Center with EcoStruxure Microgrid Advisor provides real-time analysis, synthesis, and predictions to maximize resilience and sustainability.

Using the new system, Schneider Electric reconfigured its existing equipment – a 400 kW back-up generator – to work in concert with the new rooftop and carport solar panels. If there is an outage, the building will use its solar panels to the maximum extent possible. But if it is night time or there is a cloud cover, it can turn to the generator, which has capacity to spare after powering the buildings' critical services.

As a result, the Boston One Campus can act as a shelter-in-place for company employees during a storm or other event that might cause a widespread outage. The company is able to keep the power flowing to its cafeteria and large conference room, where employees can bring their laptops and continue to work. For long-duration outages, which sometimes occur following ice and snow storms in the Boston area, employees may also rely on the facility as a place to get a hot meal.

Lessons learned: savings from renewable energy can pay for microgrid costs

Acting as the customer, the Boston One Campus offered some important insight to Schneider Electric.

For example, the team experienced first-hand the importance of minimizing corporate downtime as equipment is installed. Team members were pleased to see that the entire microgrid from start to finish took only four months because the Energy Control Center was built to spec and tested before leaving the factory. This averted the time-consuming task of customizing and testing the equipment on-site, a task that might have extended installation to 18 months.

“If a facility already has solar and generators, it can incorporate the microgrid – and gain its benefits – with no more than a few weekends worth of disruption,” said Haines.

Like any business, Schneider Electric wanted to secure the microgrid's benefits for as little cost as possible. Configuring the microgrid to use solar energy to the maximum extent helped reduce costs. The economics of solar vary based on location and incentives available. In general, more use of on-site solar means less need to purchase utility electricity or natural gas. For the Boston One Campus, savings from the solar offset the costs of the buildings' electrical upgrades.

“The sustainability aspects of the microgrid create savings, and equipment upgrades can be funded by those savings,” said Feasel.

Further, the microgrid itself can be programmed during normal operations to manage energy usage to optimize efficiency and economics. The EcoStruxure Microgrid Advisor platform automatically determines when the Boston One Campus should consume or produce energy for the highest levels of performance, reliability, and cost savings.



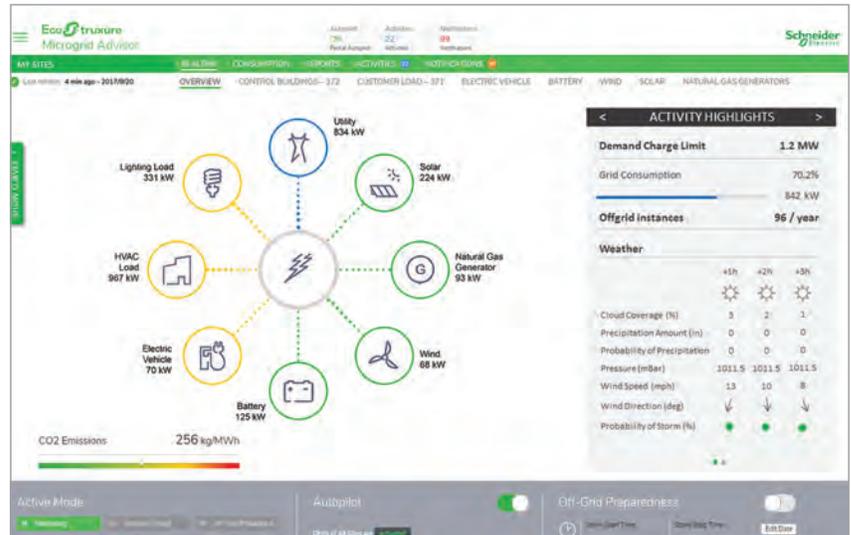
The team also found that the system offers a wealth of information for the buildings' energy managers, who are provided a constant view into the system's energy production and energy consumption. The EcoStruxure Microgrid Advisor platform offers weather forecasts to predict and manage storm hardening measures, demand response requests, and operating requests to enhance the facility's sustainability profile.

Just as Lego pieces might be reconfigured into an airplane, car or ship, the Boston One Campus solution can be customized for any building and delivered as a self-contained unit for quick and easy installation.

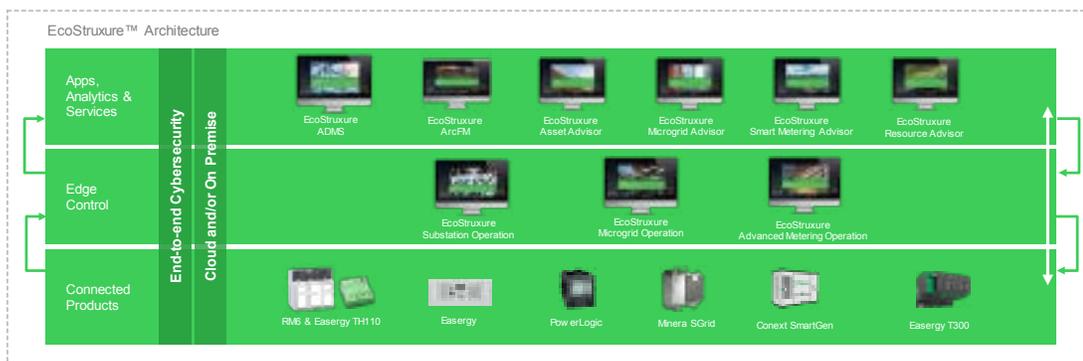
“Now Schneider Electric and its partners are bringing the Boston One Campus solution to other customers. Because it is pre-fabricated at the factory, Schneider Electric's microgrid solution is like a box of Legos,” said Haines. Just as Lego pieces might be reconfigured into an airplane, car or ship, the Boston One Campus solution can be customized for any building and delivered as a self-contained unit for quick and easy installation.

Bottom Line

The Boston One Campus stands out as a real-world demonstration of how the coming microgrid era will enhance electric reliability, boost the use of clean energy, and manage energy economically – all while sparing customers from paying any upfront capital costs.



Representation of EcoStruxure Microgrid Advisor



EcoStruxure™

Innovation At Every Level

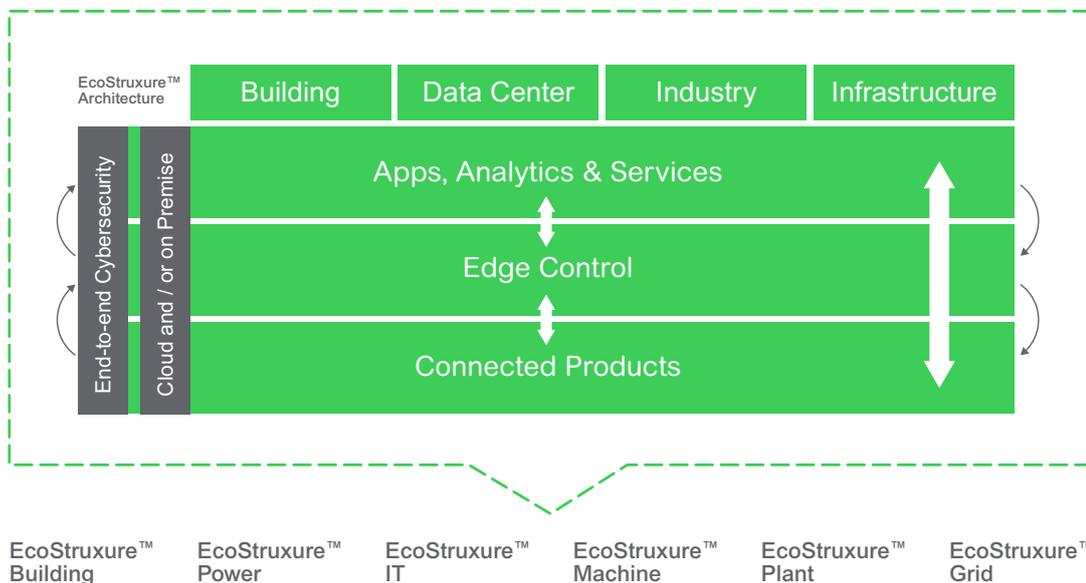
IoT-enabled solutions that drive operational and energy efficiency

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



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.

Find out more about EcoStruxure

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Learn More



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EcoStruxure™ solution for utilities



Contact us to start your journey



Boston One Microgrid at no extra cost



Digital technologies to optimize the grid

About REC Solar and Duke Energy Renewables

Duke Energy Renewables is a leader in developing innovative wind and solar energy generation projects for customers throughout the United States. The company's growing portfolio of commercial renewable assets includes 20 wind projects and 55 solar facilities in operation in more than a dozen states, totaling about 2,900 MW in electric-generating capacity.

Duke Energy purchased REC Solar, a provider of rooftop and ground-mounted solar systems for commercial-scale customers in the small-utility, commercial, and public sectors. Based in San Luis Obispo, Calif., REC Solar offers easy customer financing, including leases and power purchase agreements. With over 20 years of commercial solar experience, REC Solar has installed over 600 projects totaling more than 300 MW. REC Solar is managed as an independent business unit of Duke Energy Renewables.

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