Andover R&D Center

The Future of Microgrids: A Virtual Visit

June 22, 2020

NARUC
National Association of Regulatory Utility Commissioners

AEE INSTITUTE

Life Is On Schneider Electric

Welcome

- July (TODAY), Summer NARUC:
  - **Microgrids @ Schneider Electric's Global R&D Center**
- September:
  - **Renewable Natural Gas**
- November, Annual NARUC:
  - **Grid-Interactive Efficient Buildings**
- February, Winter NARUC:
  - **Electric Vehicles**

Presenters

Gregg Morasca

Vice President,
Strategic Customers,
Schneider Electric

Lance Haines

Chief Technology Officer,
Microgrids
Schneider Electric

Life Is On Schneider Electric

Life Is On Schneider Electric

Life Is On | Schneider Electric

Schneider Electric provides energy and automation digital solutions for efficiency and sustainability

Key figures for 2019

5% of revenues devoted to R&D

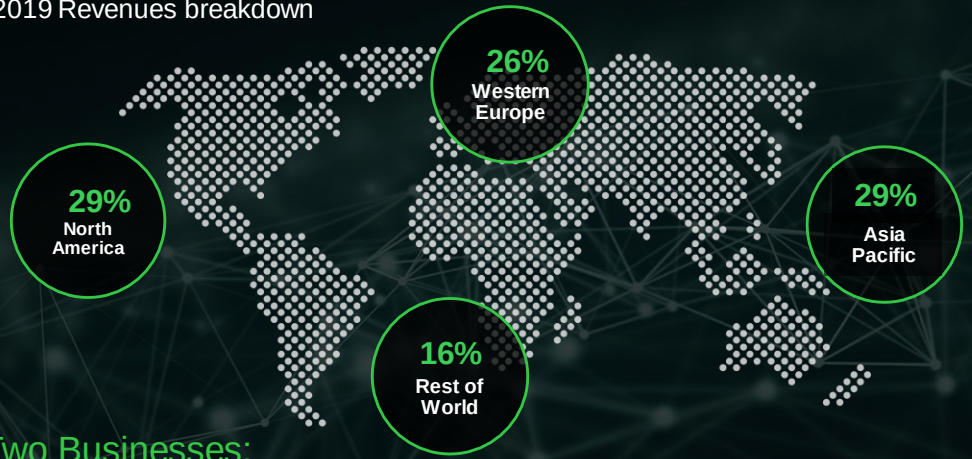
€27.2 billion
2019 revenues

41%
of revenues in new economies

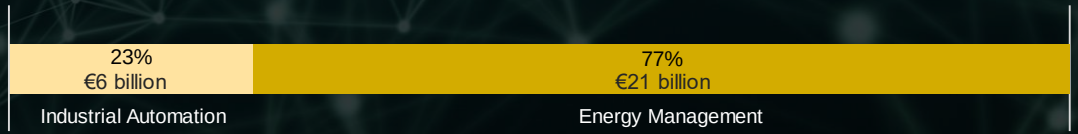
135,000+
Employees in over 100 countries

A well-balanced global presence

2019 Revenues breakdown



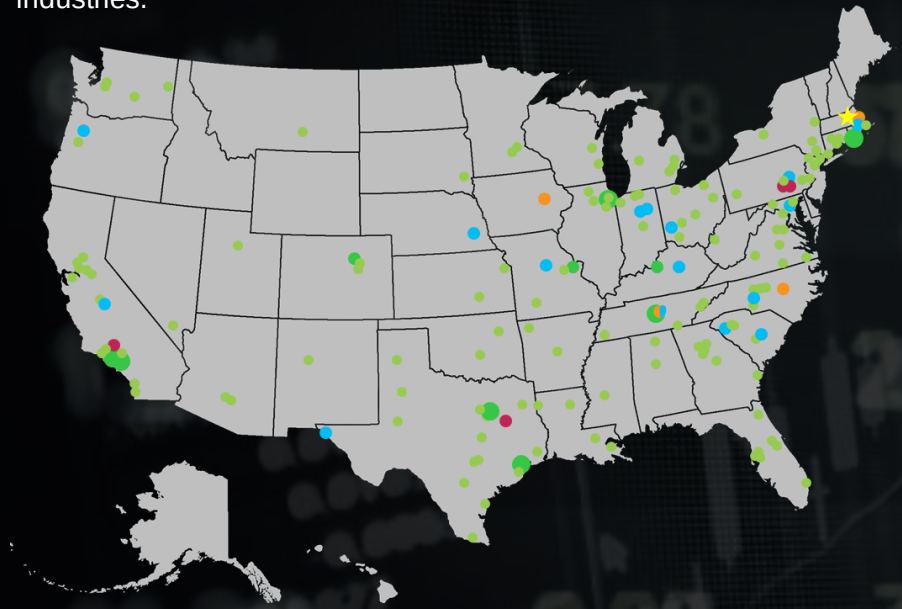
Two Businesses:



Life Is On Schneider Electric

Schneider Electric in the US

Leading the digital transformation of energy management and automation in homes, buildings, data centers, infrastructure, and industries.



Schneider Electric Andover R&D Center
800 Federal St.
Andover, MA 01810 se.com/us

$7.7B in revenues, 2018 ~19,000 employees

Major U.S. sites
Dallas, TX ; Boston, MA; Nashville, TN; West Kingston, RI; Lake Forest, CA; Lexington, KY; Columbia, SC; Welcome, NC

Global Recognition:
#9 of companies that are changing the world, Fortune 2019

#29 of Global 100 Most Sustainable Corporations, Corporate Knights

Acknowledged in CDP's "Global Climate 500 Performance Leadership Index" and "Dow Jones Sustainability Index"

Microgrids

A Case Study

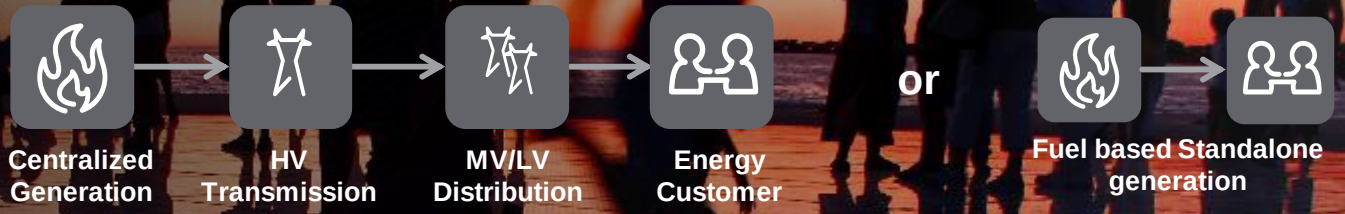
June 22, 2020

https://www.se.com/us/en/work/solutions/microgrids/

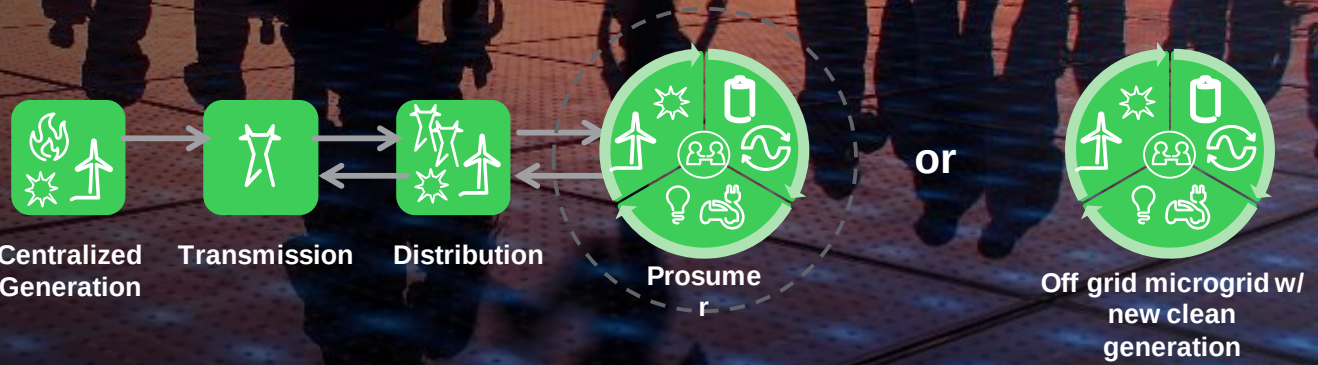
Life Is On Schneider Electric

The new energy landscape

Historical Energy Value Chain



The New Value Chain



Life Is On | Schneider Electric

What is critical infrastructure?

Now more than ever, we have to re-think who requires energy resilience.

Large electro-intensive Infrastructure

- Hospitals
- Water and Wastewater Facilities
- Data Centers
- Military Bases

Critical to local well-being

- Grocery Stores
- Distribution Centers
- Gas Stations
- Cell Phone Towers
- Banks/Co-ops

Life Is On | Schneider Electric

5 years ago…

Capital costs: too high

Interconnection: extremely complex

Energy storage: virtually non-existent

Life Is On Schneider Electric

The Path to Microgrids
Must be Simplified

Enabling Microgrids thru policy, technology, and business models will give energy resilience to facilities that are critical to local well-being.

Life Is On Schneider Electric

Around the U.S. in Six Microgrids

Life Is On Schneider Electric

MCAS Miramar

Innovative Resiliency Solution

Customer Challenge

- Ensure resilient power at the base to support over 100 mission critical buildings and the flight line

The Solution

- Construct a system to power mission-critical and support facilities throughout Marine Corps Air Station Miramar in the event of an outage.
- Manage electricity use at the base during peak times when the system is connected to a utility grid thru use of diverse energy sources including landfill gas, MW solar photovoltaic, and energy storage systems

Customer Benefits

- Provide support services to the central grid
- Manage overall energy load
- Enhance renewable energy deployment
- Bolster cybersecurity practices base-wide
- Help the installation reduce its utility demand charges
- Facilitate demand response programs

"Our microgrid delivers capabilities that will make MCAS Miramar one of the most energy-forward defense installations in the nation."

— Col. Charles B. Dockery, MCAS Miramar commanding officer

https://www.marines.mil/News/News-Display/Article/2242294/mcas-miramar-microgrid-passes-significant-milestone-in-microgrid-commissioning/

New system to **power mission-critical facilities** in the event of outage

EcoStruxure™
Innovation At Every Level

Apps, analytics, and services	EcoStruxure ADMS 
Edge control	OsSys SCADA  Power Control System Microgrid Control 
Connected products	  12Kv MV Metal Clad Switchgear Storage  Power Logic Meters

BLACK & VEATCH

Life Is On Schneider Electric

Montgomery County, Maryland

Public Safety HQ and Correctional Facility

Customer Challenge

Aging infrastructure, aggressive resiliency and sustainability goals.

The Solution

Microgrid-as-a-Service project at Duke Energy Renewables to improve reliable power supply for Montgomery County Public Safety HQ & Correction Facility.

Customer Benefits

- Secure resiliency of public services
- Infrastructure upgrade – reduced capex
- Protect critical operations during power outage
- Mitigate risk of escalating energy prices
- Reduce greenhouse gas and other emissions

The Results: Life is On with...

No-money down microgrid providing greater operational reliability and ensure resiliency during severe weather and other incidents.

"We're making significant strides in our key priorities—sustainability, safety and security. Upgrades to critical facilities improve the County's resiliency, so we can keep residents safe and provide needed services even in the event of prolonged power outages."

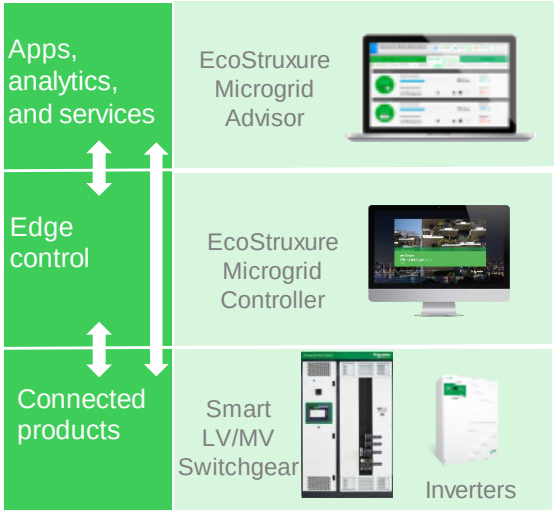
Isiah Leggett, MD County Executive, Montgomery County

Download Link
Video Link
Stakeholder Video Link
www.schneider-electric.us/microgrid

One of the first "No-Money Down" microgrids helping protecting Washington D.C. area citizens

First US GCI PEER Certified Campus microgrid

EcoStruxure™
Innovation At Every Level



Life Is On | Schneider Electric

Bubolz Nature Preserve

Customer Challenge

Integrate and easily manage multiple onsite distributed energy resources (DER) at the Bubolz Nature Preserve

The Solution

The configurable equipment combined with the autonomous and dynamic platform provides real-time tariff management, demand response requests, peak shaving, CO_2 tracking and storm hardening across numerous generation assets.

Customer Benefits

With microgrid solutions from Schneider Electric and installation support from Faith Technologies, the Bubolz Nature Center will optimize resources and maximize facility performance.

The Results: Life is On with...

- 100% savings in the Utility energy cost
- Reduced storm related outages by 100% (six / year)
- Microgrid generating net positive clean energy to the site

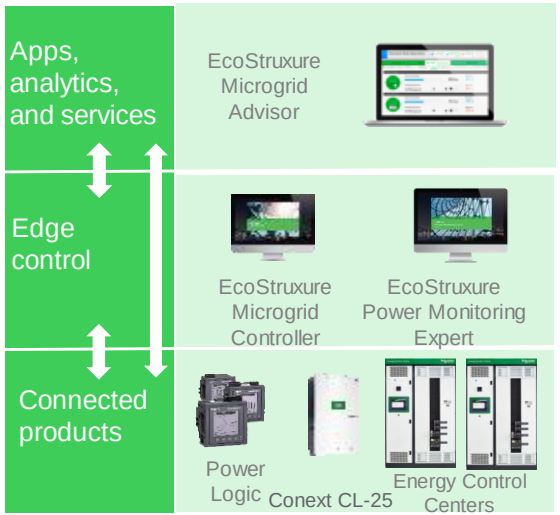
"We are going to take conservation and technology and build a sustainable, wonderful, long lasting piece of nature, and we do it without hooking to the grid. It literally runs on its own without polluting the air or the water,"
John Bergstrom, chairman of the Bubolz board.

Download Link
Video Link
www.schneider-electric.us/microgrid

One of the largest, most advanced microgrid in the Midwest

First DER Project of the Year from POWER Magazine

EcoStruxure
Innovation At Every Level



FAITH TECHNOLOGIES

Life Is On Schneider Electric

Dependable Hawaiian Express

Customer Challenge

- Build an environmentally friendly logistics facility.
- When the word 'Dependable" is in your name, your power system better be.
- Ensure business continuity even during a power outage, via an emissions-free solution.

The Solution

- The installation of 360 solar panels providing 133 kW of PV
- 222kW Hr battery energy storage system
- An Energy Control Center (ECC) that provides the microgrid controller and the power distribution in a factory tested solution.

Customer Benefits

- Greater reliability and business continuity
- Elimination of 152 metric tons of CO_2 emissions annually.
- Remote manufacturer commissioning of the microgrid that allowed the project to proceed through COVID-19

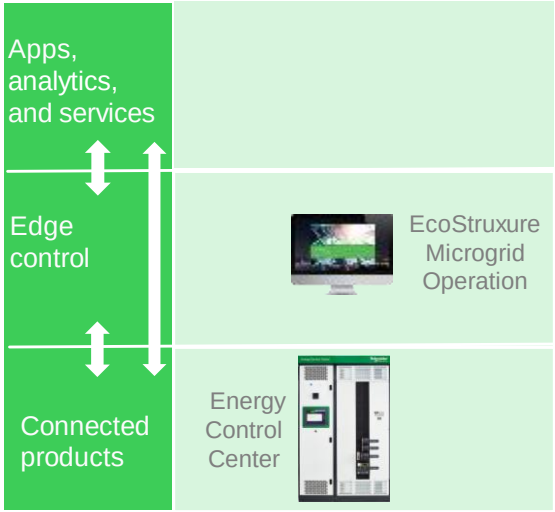
"Still, my commitment to going green isn't just about reliable energy and saving money. I have a granddaughter who is seven, and it's as much about saving the planet for her future.."

— Brad Dechter, President of DHX

www.schneider-electric.us/microgrid

A Microgrid that makes Solar Smarter in Hawaii. Emission free reliability.

EcoStruxure™ Innovation At Every Level



Life Is On Schneider Electric

CamuyCoop

Customer Challenge

Local credit unions challenged with providing critical financial services to Puerto Rico customers during and after storms impact reliable power supply.

Current diesel generator provided limited resilience when long term outages impacted both supply and cost of fuel.

The Solution

Build an integrated solar, battery (XW+ inverter), generator and Energy Control Center microgrid solution that prioritizes critical loads to support the credit unions operations. Smart onsite control enables prioritized loads to solve customer needs.

Customer Benefits

- Empowered to ride thru power loss leveraging no cost, abundant renewable energy sources first (extending supply of onsite diesel).
- Ability to directly consume and store onsite solar produced.

The Results: Life is On with...

- Resilient, sustainable and efficient onsite microgrids.

CamuyCoop

HATICOOP ¡contigo en mente SIEMPRE!

GENESIS green systems

EcoStruxure™ Innovation At Every Level

Apps, analytics, and services	EcoStruxure Microgrid Advisor	
Edge control	EcoStruxure Microgrid Operation	
Connected products	 Energy Control Center	 XW+ Inverter

Life Is On Schneider Electric

www.schneider-electric.us/microgrid

Andover R&D Center

Customer Challenge

Schneider Electric's new headquarters experienced utility-related outages.

The Solution

Pre-configured microgrid solutions with site optimization platform owned and operated by third-party capital partners.

Customer Benefits

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

The Results: Life is On with...

When we collaborate with partners to develop real-world solutions that enhance the electric reliability, boost use of clean energy, and manage energy economically—all while sparing customers from paying any upfront capital costs.

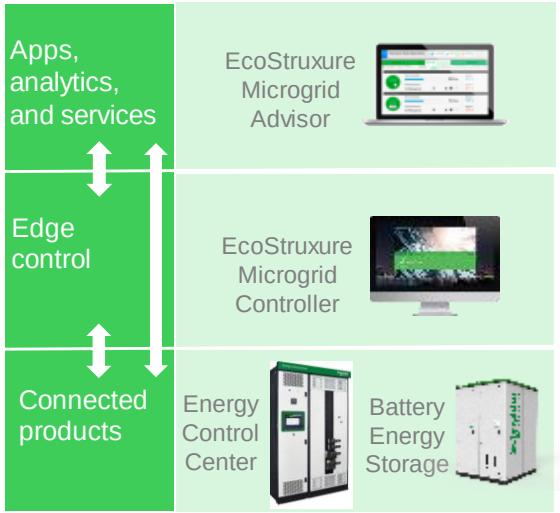
""The sustainability aspects of the microgrid create savings, and equipment upgrades can be funded by those savings,."

Mark Feasel,
President Smart Grid, Schneider Electric

www.schneider-electric.us/microgrid

In **partnership** with Duke Energy Renewables and REC Solar, Schneider Electric built a **microgrid to power critical operations.**

EcoStruxure
Innovation At Every Level



Life Is On | Schneider Electric

https://www.se.com/us/en/work/solutions/microgrids/

Life Is On | Schneider Electric