Leveraging DER’s with Prosumer Microgrids

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Schneider Electric Microgrids Business

We have an opportunity to co-create the future as *The New Energy Landscape* becomes…

**Historical Energy Value Chain vs. “The New Energy Landscape”**

- **Centralized Generation** → Transmission → Distribution → Retail → Consumer

- **Centralized Generation** → Transmission → Distribution → Retail → **Prosumer**
Prosumers come in many shapes and sizes

Microgrids are suitable for most every application, from industrial/commercial buildings to campuses

• Commercial Buildings
• Healthcare Facilities
• Data Centers
• Municipal Services
• Military Installations
• Transportation

Distributed energy resources are often already existing on site.
Prosumer Microgrids and the “Treble Triplets”

“Its about making wise choices at the intersection between energy smartly acquired, locally produced and efficiently consumed!”

The “Prosumer”
Integrated Energy Outcomes

Power System Automation
Operating Modes & Architecture

Energy Management
Flexibilities & Optimization

Cost
Resilience
Sustainability

Grid Tied
Island
Transition

Sources
Loads
Storage

PV Sol ...
721 kW

Galaxy ...
13 kW

Genset
7 kW

Other ...
400 kW

HVAC
567 kW
Advances in Microgrid Control and DER integration are enabled by IT/OT Convergence

- Predictive DER management
- Interfaces with energy markets
- Integrate weather forecasts (DTN)
- Forecast when to produce & store
- Cloud based access anywhere

- Reactive DER management
- Ensures real time power stability & reliability
- Manage connect/disconnect from the grid
- Facilitate energy production & use

Energy Management Software

Microgrid Controller

Client Constraints
Weather forecast (DTN)
Energy market pricing
Demand response requests

Cloud
IT
AUTOMATION CONVERGENCE
OT

Edge/Client site

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Confidential Property of Schneider Electric
Automated peak demand and tariff management

Avoid or minimize costs by shaving peak demand and leveraging off-peak pricing.

- Total Site Consumption
- Grid Supply
- Demand Charge Limit set to 780KW

Schneider Electric's BESS coupled with EcoStruxure Microgrid Advisor

Source: Oncor Electric Delivery Company
Microgrid Resiliency Benefits: **Storm Hardening**

Optimize DER’s for resiliency when severe weather threatens site operations

Weather prediction and power quality monitoring can proactively trigger resiliency optimization measures including:

- Charge the battery to full capacity
- Warm and pre-lube emergency generation
- Adjust protective relay settings
- Proactively island the site
- Shed non essential load
- Electrically isolate sensitive equipment
The 3rd IEEE ICDCM
(International Conference on DC Microgrids)
May 20-23, 2019 Kunibiki Messe (Shimane Prefectural Convention Center)


* FREEDM Center Supported
Critical Power supported by DER Microgrid Solution

Hybrid AC/DC infrastructure enhances DER resiliency
Energy Control Center
Simplifying implementation of microgrids and integrating DER's

“Microgrid in a Box”

Utility 621 kW
PV Solar 154 kW
Genset 0 kW
Electric Vehicle 19.1 kW
HVAC 350 kW
Other Loads 406 kW
Battery Energy Storage System (BESS)

Schneider Electric’s BESS hardware solution is best-in-class in terms of energy density, footprint and efficiency.

Coupled with Schneider Electric’s intelligent and dynamic control system, EcoStruxure Microgrid Advisor (EMA), Schneider Electric’s storage solution and power distribution can meet all your storage needs for commercial and industrial applications.

250KW/500KWH
UPS with Peak Shaving Capability

High-performance uninterruptible power supply including li-ion storage and dispatch flexibility

With the right UPS…

- Software adjusts UPS input power limit to maximize ROI
- Load power beyond input power limit is drawn from batteries
- Only a portion of battery capacity is used for peak shaving to ensure reserve for full backup time

Higher resiliency ➔ Battery issues can be detected BEFORE backup needed
Financing Partners can simplify these energy investments

**Dynamic Energy Networks, backed by the Carlyle Group,** is a global independent energy infrastructure platform that owns and operates microgrids and distributed energy resources (DER). We are leading the energy industry’s revolutionary shift from one-way static power grids to two-way dynamic power infrastructure to deliver:

- Resilience - business continuity, community hub during natural disasters, and cyber security
- Cost efficiency - more predictable costs, flexibility, and ancillary services allowing companies the freedom to reinvest in their own business
- Sustainability - reduce carbon footprint, and enhance brand image
- Ability to scale - projects can start smaller then be added on and expanded as your company grows

**Best-In-Class Alliances**

“We are committed to forging long-term reliable partnerships to exceed our customers’ objectives. Working with select industry leaders to ensure the most cost-effective, efficient, and resilient outcomes.”
ARE YOU READY?
Reference Cases Studies
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,
Vice President Smart Grid, Schneider Electric

www.schneider-electric.us/microgrid
Client Requirements:
- Deliver Two Advanced Microgrids
- Increase resiliency and sustainability at Public Safety HQ and Correctional Facilities
- Incorporate solar and high-efficiency combined heat and power into off-grid operation
- Deliver via innovative, public-private Microgrid-as-a-Service model eliminating host up-front costs

Details:
- Include clean on-site power generation through solar energy systems and natural gas generators
- Schneider to play comprehensive role designing & implementing solution
- Project includes protection control & optimization, electrical equipment, DER management, electrical design services, cybersecurity and network design.

https://www.youtube.com/watch?v=aCPjb4x3eGQ
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, CO2 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 easily optimize resources and maximize facility performance.

The Results: Life is On with...
The potential to have zero carbon emissions and to achieve 50 percent lifetime power savings. The microgrid will provide power to Bubolz’s main facility, as well as the smaller buildings on the property, while achieving net-zero energy consumption

“This microgrid was designed and engineered by Faith’s team of energy experts and utilizes specialized equipment and technology made possible through our collaboration with a very forward-thinking partner; Schneider Electric,”
Mike Jansen, CEO of Faith Technologies
Life Is On

Schneider Electric