


Life Is On

Schneider
Electric



Microgrid solutions for smart utilities

Benefit from behind-the-meter distributed energy business

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Tap into your prosumer potential

The energy market is undergoing some profound changes. Tomorrow's energy system will be one in which growing numbers of consumers produce and store their own energy. This heralds a significant shift in how energy will be generated, distributed and consumed. It also dramatically changes the relationship between utilities and their customers who will want to monetise their generation capability and their flexibility.

This new energy landscape can be seen already, with:

- Falling costs of photovoltaic and storage systems, making their electricity competitive with grids
- Changes in regulatory framework that endeavour local generation and use of renewable energy
- Higher expected prices for traditional energy from the grid

This will inevitably impact your business by changing the energy purchasing profile of customers but also opening the door to new services and offers. As an energy supplier you can build on your knowledge of your customers to enrich the relationship with new services around local generation and microgrid.

57%

of consumers would consider investing in becoming power self-sufficient

(Source: Accenture)

Get ready for energy market challenges

Taking full advantage of prosumers' distributed energy resources is a major challenge for energy professionals. Schneider Electric microgrid solutions let you integrate demand-side distributed energy resources into a greener, more efficient and reliable energy system.

Leverage demand-side distributed energy resources to balance supply and demand:

- Building systems (HVAC, lighting, electric vehicles, hot water, etc.)
- Machines and industrial processes
- Energy storage systems
- Dispatchable energy sources (CHP, genset)
- Locally-generated renewable energy (solar, wind)

Boost end users' capacity to:

- Generate electricity
- Store energy
- Tailor their energy usage habits to their changing needs
- Make smart energy decisions

Innovate with Schneider Electric

Schneider Electric works side-by-side with the professionals shaping tomorrow's energy ecosystem. Schneider Electric offers an innovative microgrid-as-a-service solution that lets you:

- Tap into prosumers' energy flexibility in a fast, reliable way
- Aggregate the capacity of several prosumers
- Package capabilities as an attractive offer to grid users
- Interface efficiently with prosumers

Prosumer

Proactive energy producer and consumer.

DER

Distributed energy resources: energy consuming, generating, or storing devices present at end users' premises; distributed generation (wind, solar, CHP); energy storage (electric, thermal); dispatchable loads (heating and cooling systems, electric vehicle charging infrastructures, etc.).

Microgrid

An integrated energy system with interconnected loads and generation assets, operating in parallel with the grid or in an islanded mode.

DER dispatch

Dispatch and control of all generation and storage assets to balance loads

Demand response

Control demand in real time to balance supply

Island mode

Reset all operational settings for stable operation while disconnected

Volt/VAR control

Control local devices to maintain voltages within operating limits

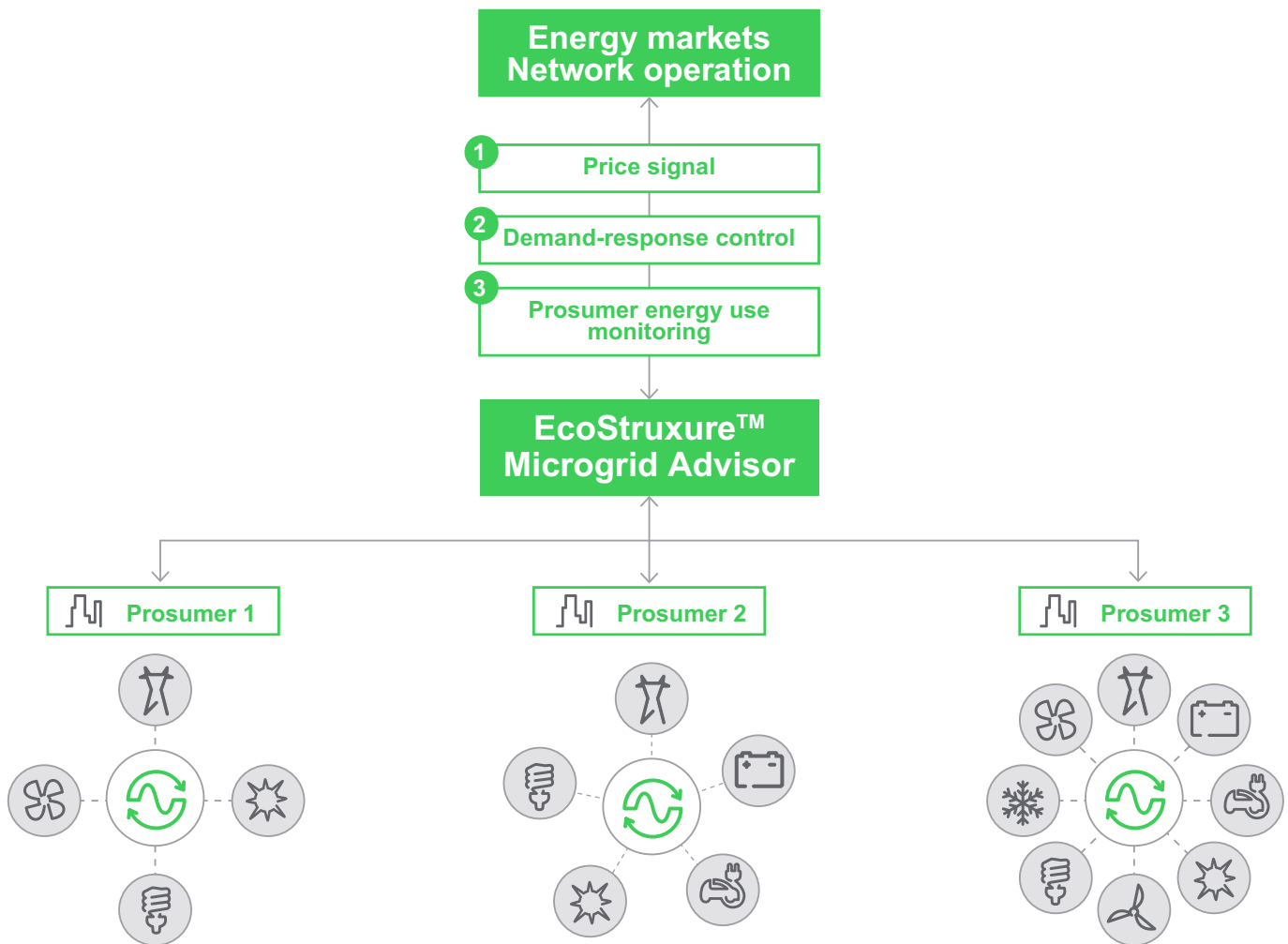
Up to **2** hours

of thermal inertia usable for load shifting when managing HVAC systems in buildings - without impacting comfort of occupants.

(Source: Schneider Electric, Greenlys)

Optimize for a smarter grid

The upcoming energy system is decentralized and interconnected, with two-way flows of data and energy. Digital technology also eases a local supply-demand optimisation with involvement of users.



Benefits

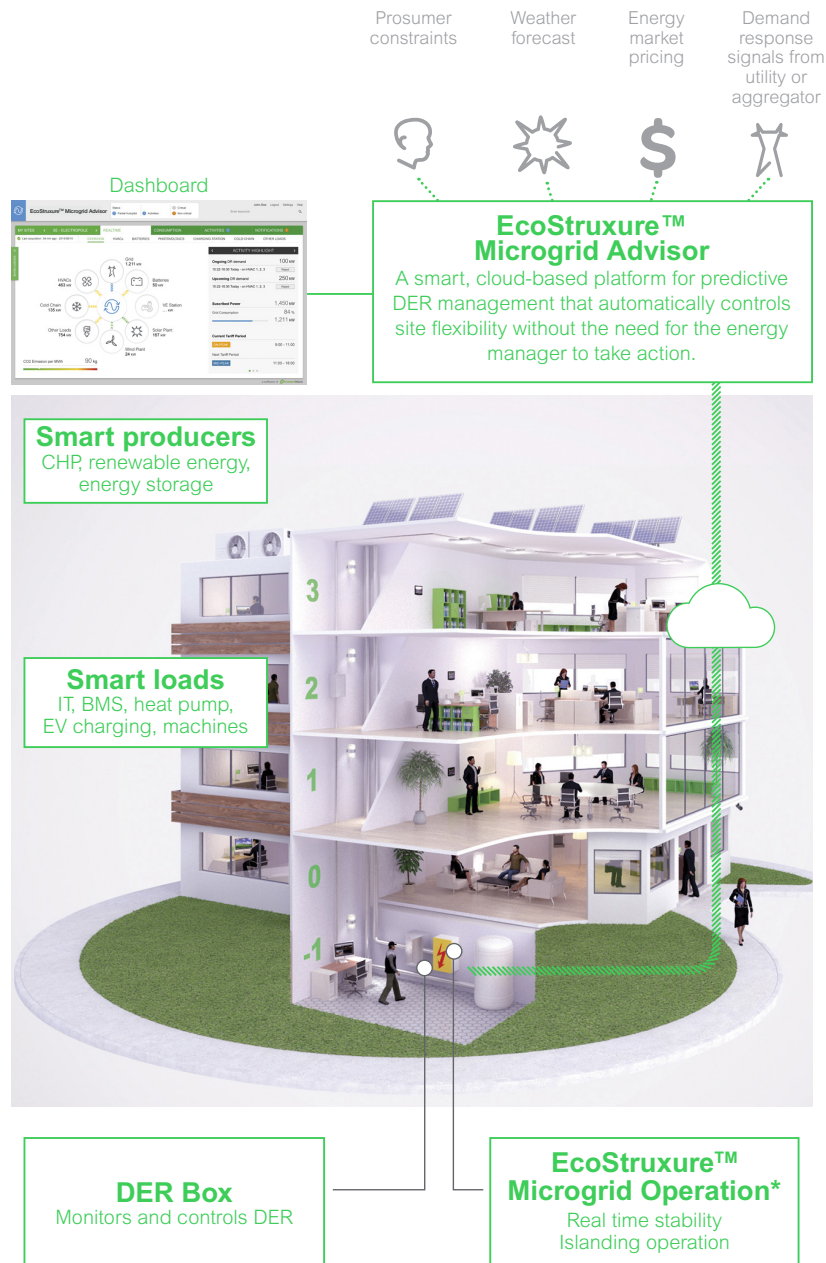
- Holistic energy management
- No additional investment in infrastructure needed to cope with peak load
- Increased resilience of prosumers in case of blackouts
- Better integration of renewables into the grid
- Ability to use prosumer DER to boost grid reliability
- Low-cost access to flexibility for a more balanced grid

Why utilities should care about microgrids

- Consumers can unlock and monetise their flexibility potential with their existing assets, such as industrial processes, heating, ventilation, or cooling, and on-site energy sources
- Retailers can offer new services to their customers, such as dynamic price plans, to improve their satisfaction and loyalty
- DSOs/TSOs can provide flexible capacity for its operating reserve to avoid imbalance and congestion issues, and to smoothly integrate variable renewable generation
- Suppliers can avoid investing in peaker plants that operate just a few hours a year with these alternative source of power
- Generators can swap stand-by reserve with demand response, and sell the freed up output capacity

Profit from comprehensive microgrid management

Our microgrid solutions extend the smart grid to within end users' premises. As a leader in smart grid technologies, you can trust that Schneider Electric will deliver a complete solution that is tailored to the needs of your customers, and ensures that they will know exactly when and how to store, self-consume, sell back energy, or participate to ancillary services.



Savings and energy control benefits

Two layers of energy management:

- Predictive with EcoStruxure™ Microgrid Advisor
- Reactive (real-time) with the EcoStruxure™ Microgrid Operation (optional)

Monitoring, forecasting and managing flexible resources

- Flexible loads such HVAC or thermal processes (using thermal inertia)
- Smart charging of electrical vehicles
- Electrical storage systems
- Dispatchable generation (CHP, gensets, etc.)

Monitoring and forecasting of other resources

- Variable renewable generation (PV, wind)
- Non flexible loads

Energy storage addresses the challenges of a rapid switchover to an alternative power source when a power disturbance occurs, and the stable delivery of power to the load until the disturbance is resolved.

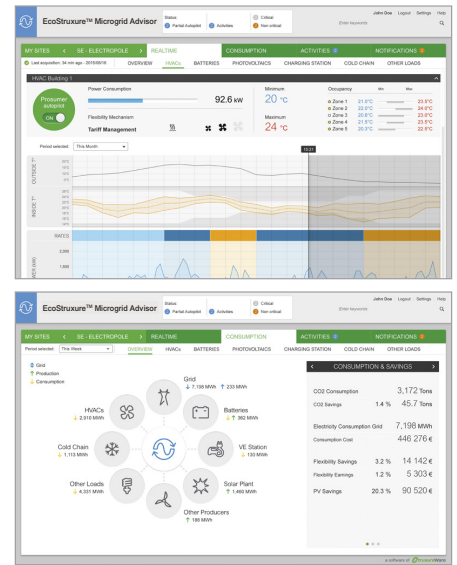
The components of our solution

EcoStruxure™ Microgrid Advisor

An advanced Software as a Service and seamless interface optimizes your facilities energy performance

Features:

- Autonomous operation of end-user's DER – 24/7/365
- DER optimization across evolving use cases: tariff management, demand charge optimization, demand response, self consumption, islanding
- Proprietary predictive algorithms using weather forecast information, historical DER energy data, real-time electricity tariff rates, site specific operating constraints, etc.
- Operating schedules of all involved DER updated every 15 minutes
- 72 hours ahead and automatic default operation mode schedules guarantee
- User interface for PC, tablet, or smart Schneider or white label
- Native OpenADR to exchange information with third party utility platform and custom (Custom Web Services can be developed on demand)



DER Box

Enabling hardware for EcoStruxure™ Microgrid Advisor

Features:

- Easy to install wall mounted cabinet, standard power supply and network connectivity
- Compatible with most DER – production sources (Solar PV, CHP, etc.), controllable loads (HVAC, EV charging stations, etc.), and energy storage systems
- Control and/or monitor your DER directly or through existing systems (e.g.: BMS)
- IT friendly – multiple connectivity options (3G/4G, proxy, ASSM)
- On device storage: for up to 7 days DER's and 3 days of DER's schedule
- Fully compatible with Schneider Electric EcoStruxure™ Microgrid Operation (islanding capability, real-time DER management)

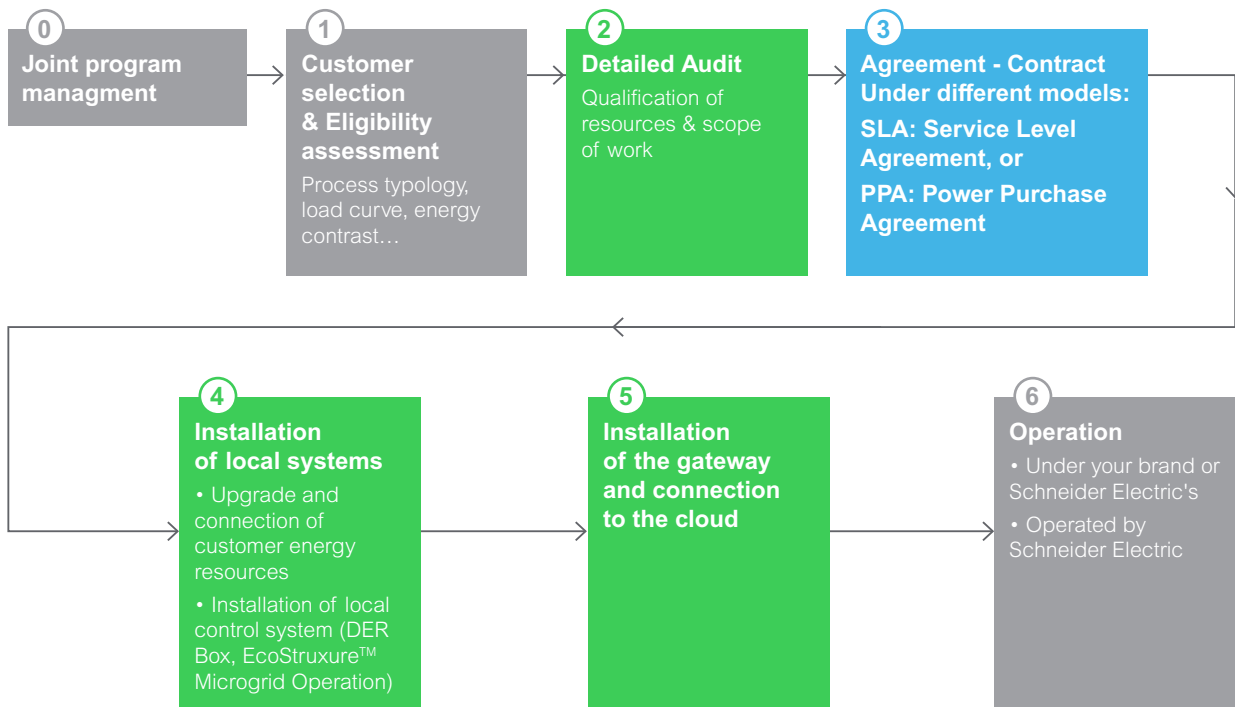


Optional components

EcoStruxure™ Microgrid Operation – mandatory in case of islanding requirements

- Manage reconfiguration of electrical network under different conditions, including load shedding management
- Ensure real-time microgrid stability, including load sharing logic
- Open Ethernet I/O architecture
- Dual ports and redundancy for high reliability operation
- Microgrid software applications built on standard reliable platform

Craft your win-win partnership!



Possible operational model with utility partner

- Energy supplier and Schneider Electric
- Schneider Electric and/or qualified partner
- Energy supplier

Deploying our Microgrid-as-a-service solution

1. We work with you to set the project objectives, the implementation, and the end users to target.
2. We meet with end users to assess feasibility and potential of their sites.
3. We (or a certified Schneider Electric dealer) install the system and get it up and running.
4. The end user enters into a service agreement with energy supplier to use the platform.
5. The platform runs 24/7, optimizing the usage of different loads, distributed energy resources, and supply from utilities and other energy traders.

Benefits for all stakeholders

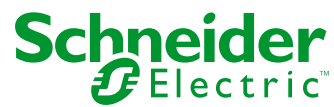
Our open solutions allow:

- Smart utilities to develop innovative business models (PPA, lease, EPC, etc.)
- End-user to grab benefits of new energies: reduce energy costs, reduce dependency from the grid, be greener
- System operators to leverage demand-side flexibility on a fast, easy and cost-effective way

Take advantage of Schneider Electric's proven experience

- Hands-on knowledge of your customers' business-specific energy needs that positions us to accurately predict their consumption
- Expert know-how in electrical distribution systems from design to operation
- Targeted energy-market experience in areas like compensation and aggregation, ensuring that end users' energy resources are used most efficiently

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