



Accelerating microgrid projects: From start to finish

EcoStruxure™ Microgrid Flex



Life Is On

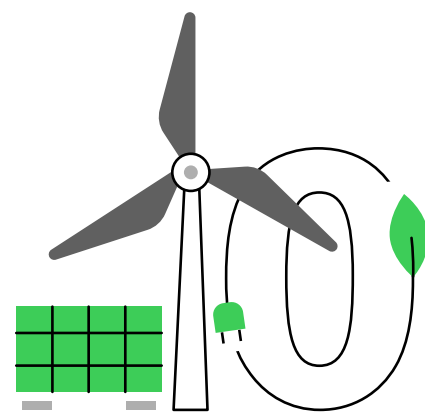
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Microgrid Basics

Microgrids for the New Energy Landscape

Energy transition drivers



Net zero
by 2050

Decarbonization

Achieving net zero CO₂ emissions globally in the early 2050 is **required to stay under 1.5°C** and technologies exist today to achieve this.

IPCC, April 2022

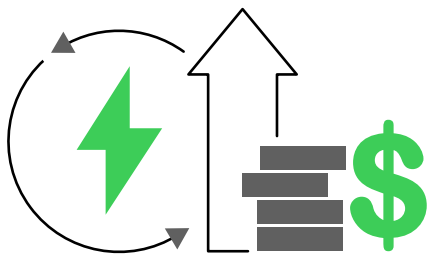


+80%
demand

Electrification

Electricity demand is projected to almost 80% above today's level due to **fleet electrification, heat pump adoption, and electrification of processes.**

IEA, World Energy Outlook 2021



x3 Renewable
investment

Renewables

Investment in variable renewable worldwide will need to more than triple by 2030.

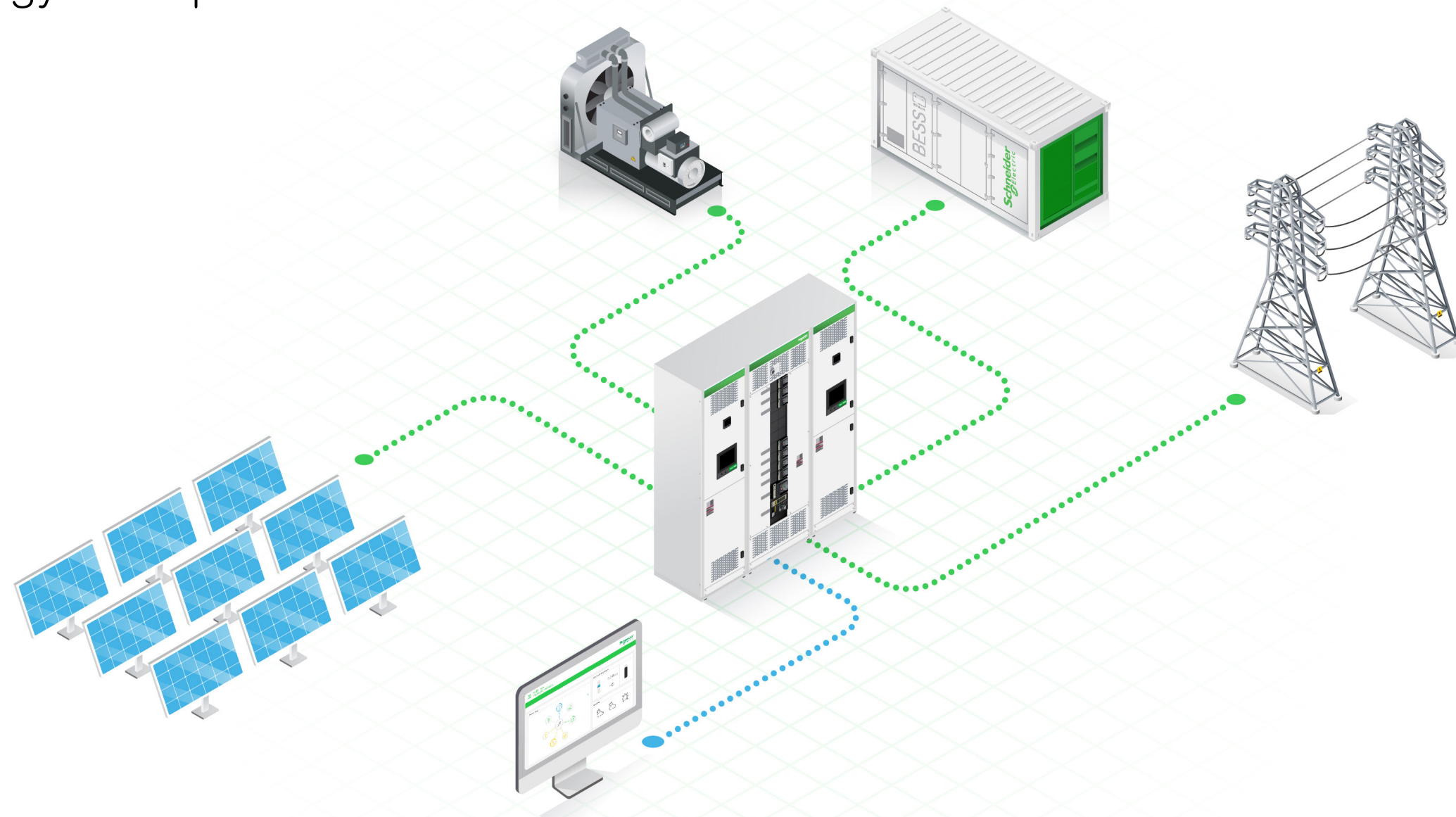
IEA "net zero by 2050" report 2021

Microgrids are poised to play an important role in the world's energy future. They increase resilience and access to energy, reduce carbon emissions, and enable us to meet the extremely high electricity demand of the future. They also reduce energy costs and lead to grid decentralization to provide self-reliant access to electricity.

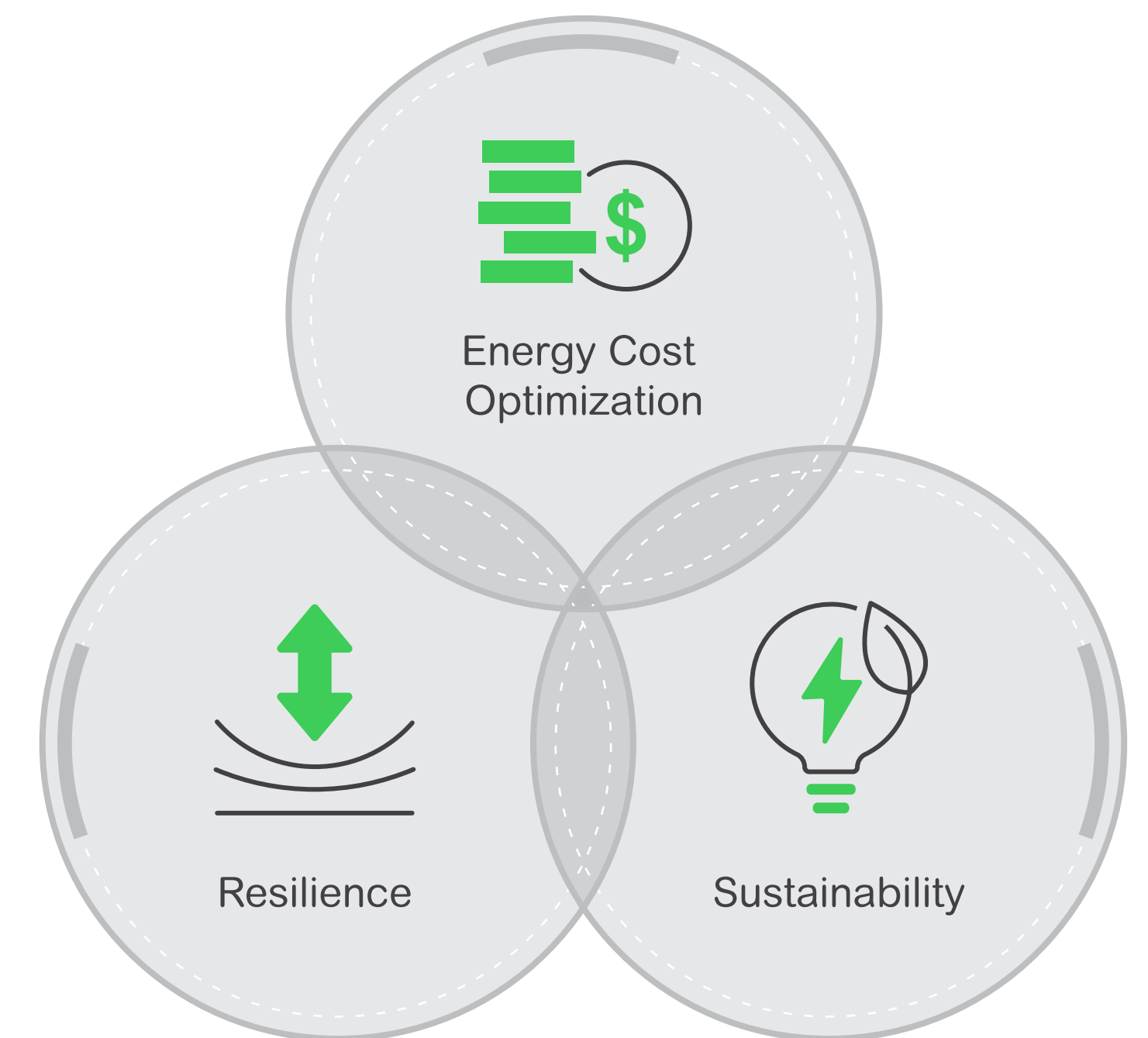
Multiple Benefits of Microgrids

A microgrid provides a decentralized, digitized & decarbonized alternative...

Using distributed energy resources, such as solar panels, batteries, and generators, microgrids are designed to meet energy demands to deliver resilience, sustainability and energy cost optimization.



...delivering integrated outcomes.



Standardization for Speed & Simplicity

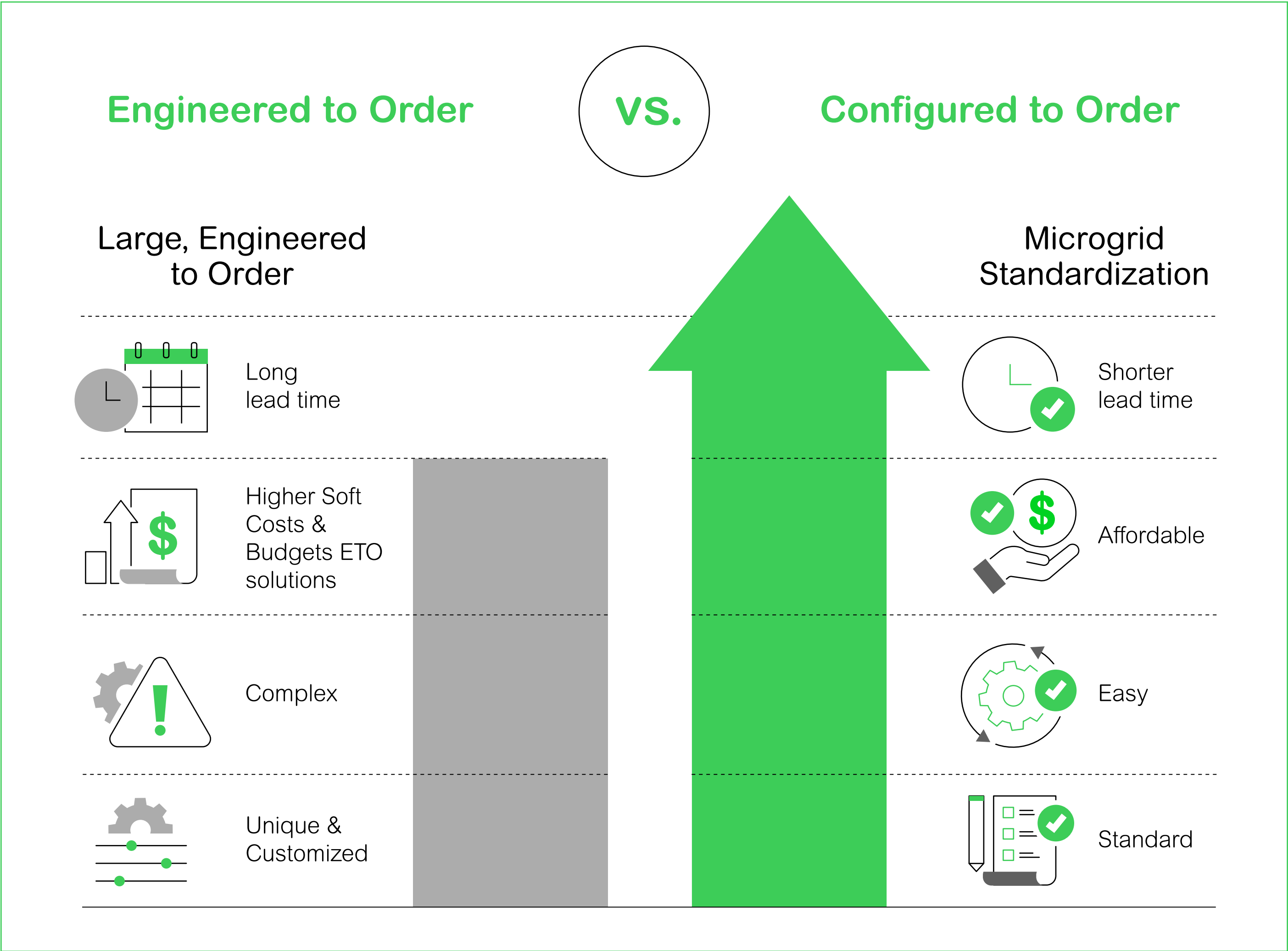
Standardization

Changing the Game

For large projects, a customized and engineered-to-order microgrid might make economic sense. But for behind the meter commercial and industrial microgrids to be widely adopted, there needs to be a simpler approach, one that leverages standardized and repeatable architecture to cut time and costs.

EcoStruxure Microgrid Flex delivers that architecture in a comprehensive and cost-effective platform for planning, designing, building, operating and maintaining microgrids. The Configured-to-Order (CTO), standardized approach fast-tracks implementation and makes microgrids more achievable for buildings and facilities, due to standardized and repeatable architectures.

On the following pages, we'll look at the components of Microgrid Flex, and how they standardize and accelerate every stage of installation and operation.



EcoStruxure Microgrid Flex

What is EcoStruxure Microgrid Flex?

Unlike conventional, engineered-to-order systems, EcoStruxure Microgrid Flex is a faster, simpler, standardized microgrid system designed to meet resilience, efficiency, and sustainability needs. It is a configured-to-order system that includes battery energy storage, capability to work with multiple DERs, and an integrated electrical infrastructure platform. It provides a power and energy management system which balances power in real time for reliance, and optimizes energy for sustainability and economic performance.

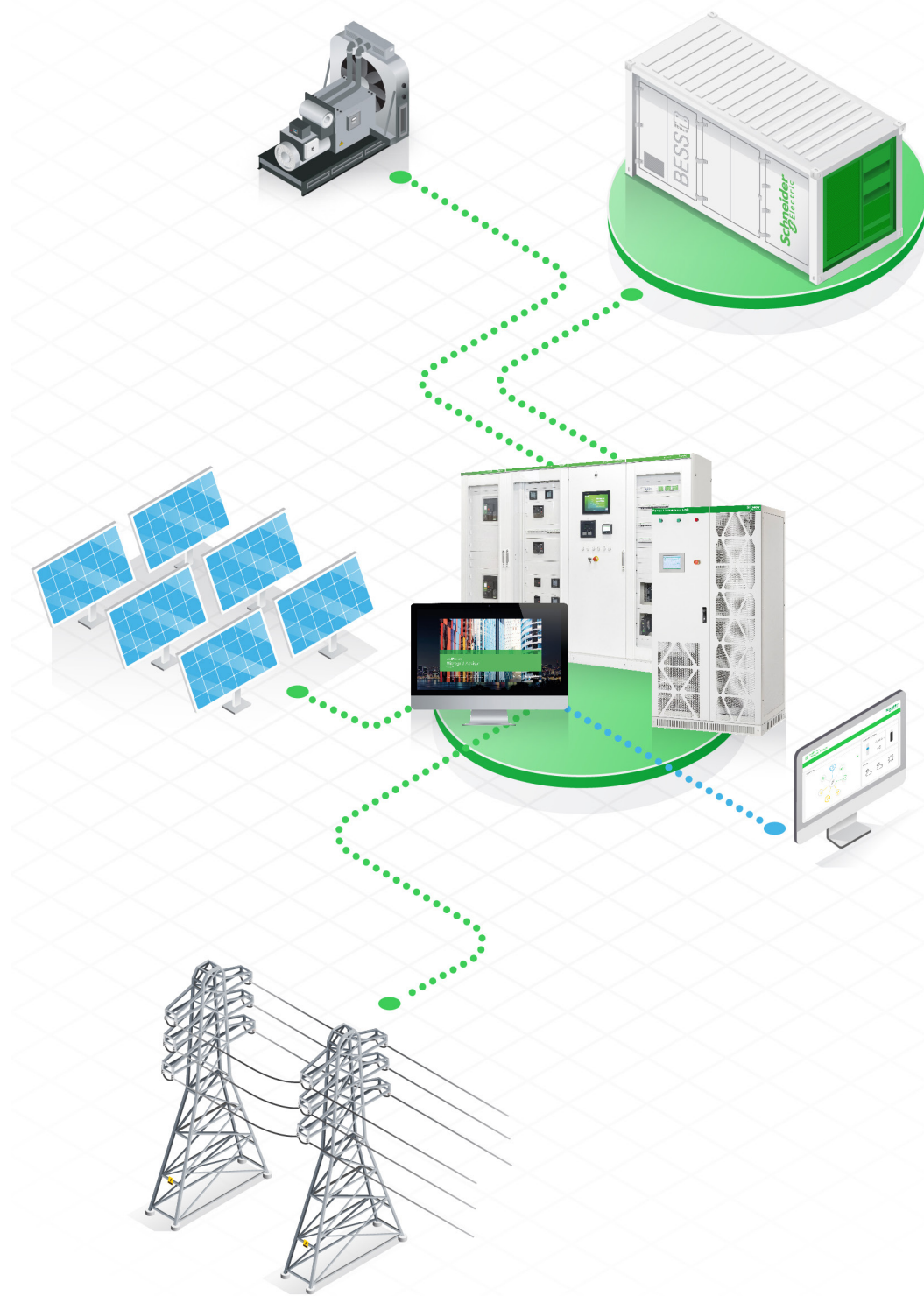
It is a standardized solution that accelerates every step of a microgrid project, from faster delivery to streamlined design and commission. It reduces costs, saves time during the building and installation stage, and simplifies commissioning and maintenance. After installation, automated operations management and cloud-based software ensures reliability, connectivity, and continuous performance.



EcoStruxure Microgrid Flex



TVDA



Tested, Validated Documented Architectures (TVDA)

TVDA is configured to order with pretested and standardized designs so your microgrid is completed faster than traditional custom engineered projects. With an extensive library of distributed energy resources, Microgrid Flex fits a wide variety of use cases and enables fast and easy commissioning, making it simple for users and engineers.

Standardized designs include:

- Complete drawings of architecture
- Programming of all control software is created by EcoStruxure Microgrid Build
- Commissioning is minimal due to pre-testing

EcoStruxure Microgrid Flex



**Advanced Tools
& Software**





A software-defined microgrid solution

Tools

EcoStruxure Microgrid Assessment

An an easy-to-use feasibility tool, with detailed KPIs on economics, resilience, and sustainability to determine the economic feasibility and optimal sizing of DERs.

EcoStruxure Microgrid Build

Microgrid Build eliminates the need to program and design complex control algorithms, allowing you to prepare a microgrid configuration quickly. Microgrid Build helps to configure site requirements, such as electrical loads, DERs, grid connections, and Time-of-Use rates.

Advanced Software

EcoStruxure Microgrid Operation

EcoStruxure Microgrid Operation is an efficient edge control solution power management system that ensures the transition from grid power to local energy production during a grid outage and back to the grid when the power from utility resumes thus ensuring energy resilience for the site.

EcoStruxure Microgrid Advisor

Enabling dynamic monitoring, dispatch & control of onsite energy resources to optimize energy costs and green energy consumption, Microgrid Advisor is a cloud-based energy management system that can automatically forecast and optimize when to consume, produce, and store energy. It also provides real-time & historical local energy production and full energy consumption at the site level with overall savings, and CO₂ emissions data.

EcoStruxure Microgrid Flex



Hardware



Energy Control Center

The Energy Control Center (ECC) is a single, intelligent, pre-engineered and configurable microgrid smart electrical switchboard that interconnects the entire system's DERs to the facility. This allows for improved electrical control, energy monitoring and best-in-class electrical protection devices.

AC and DC Coupled Power Conversion Unit

- Modular design and wide power range in single cabinet
- Bi-directional power conversion unit
- Grid support functions

Battery System

Standardized and scalable battery racks and architectures allow for different storage capacities ranging from 1-4 hours of storage, with outstanding 30 min increment to fit storage system application requirements.

Accelerating the Journey

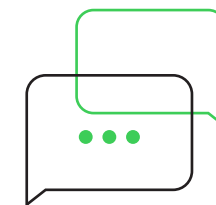
Consulting and Planning Made Simpler

EcoStruxure Microgrid Flex provides tools for accelerated projects right from the start. Standardization keeps costs and schedules predictable, so that decisions can be made to move microgrid projects forward and can be delivered on time and on budget.

Fast, comprehensive feasibility information

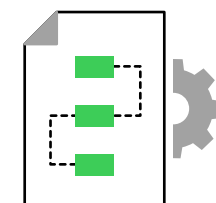
A simple assessment and pre-design tool provides simple, step-by-step user inputs to generate comprehensive financial feasibility information on-demand.

We use pre-design tools that embed the same algorithms used by EcoStruxure Microgrid Advisor, ensuring the study performed is aligned with the real microgrid deliverable. It provides output of financial feasibility of the microgrid installation at the facility or within the enterprise. You can also perform sensitivity studies based on resilience, sustainability, and energy optimization of the system design, including DER sizing.



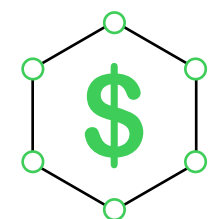
Consulting

The consultation stage provides an in-depth view of how a microgrid installation will unfold. Microgrid pre-design tools provides tools to evaluate and estimate load as part of energy analysis, size onsite generation and storage assets, and review electrical system topology to determine changes required to existing infrastructure for the microgrid installation. You can evaluate system protection and metering and assess existing control systems for compatibility with new microgrid controllers.



Planning and feasibility

Using Microgrid Assessment, Microgrid Flex allows for a much simpler process for developing a conceptual plan for implementing electrical system changes and adding DERs. Quickly determine rough order of magnitude pricing and create preliminary pro forma financial models to get a clear picture of the project.



Financial modeling

Answering the questions for feasibility of microgrid designs, advanced financial modeling helps customers see the upside potential and make informed decisions. These modeling abilities give a clear picture of the project from the start – and standardized architectures allow for a faster ability to deliver these models.

EcoStruxure Microgrid Assessment & Microgrid Build

Microgrid Assessment

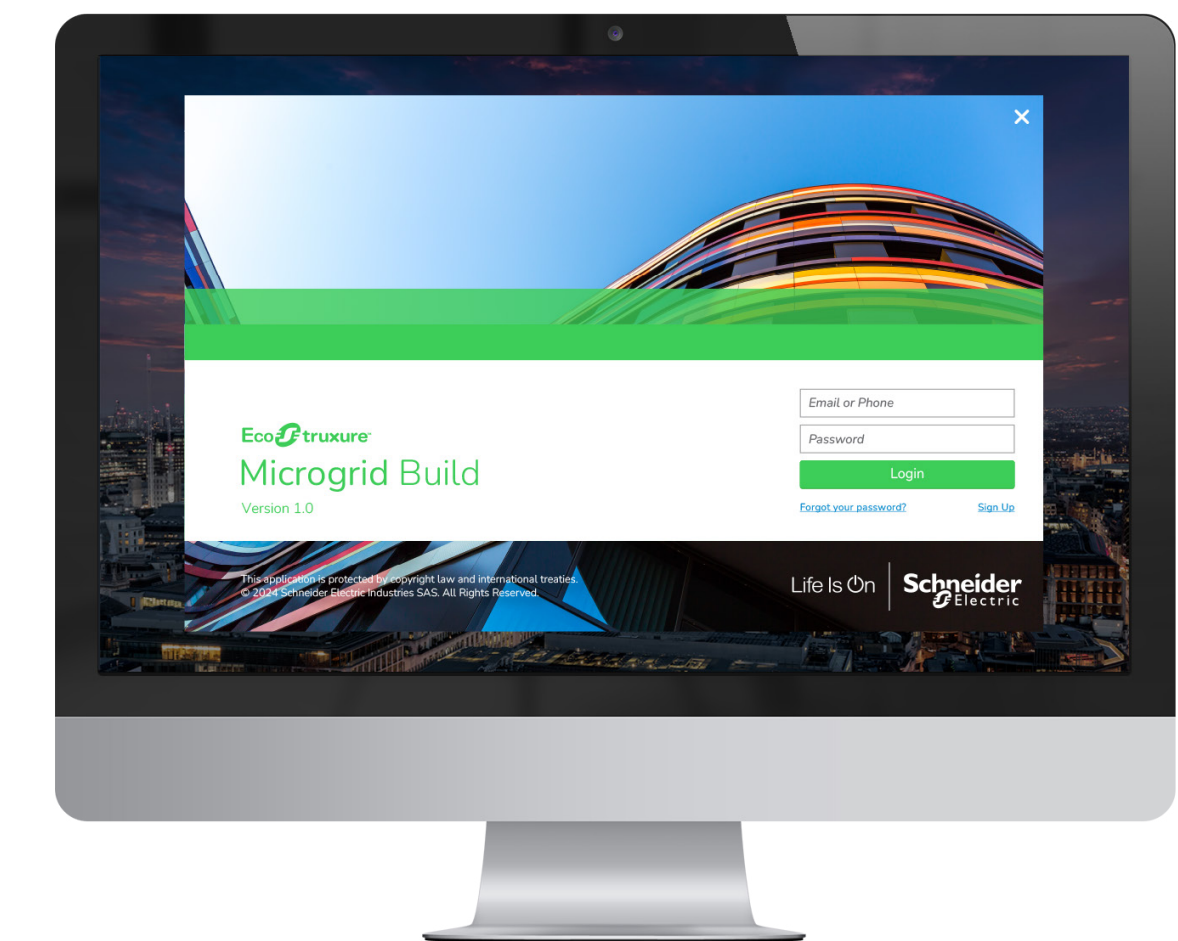
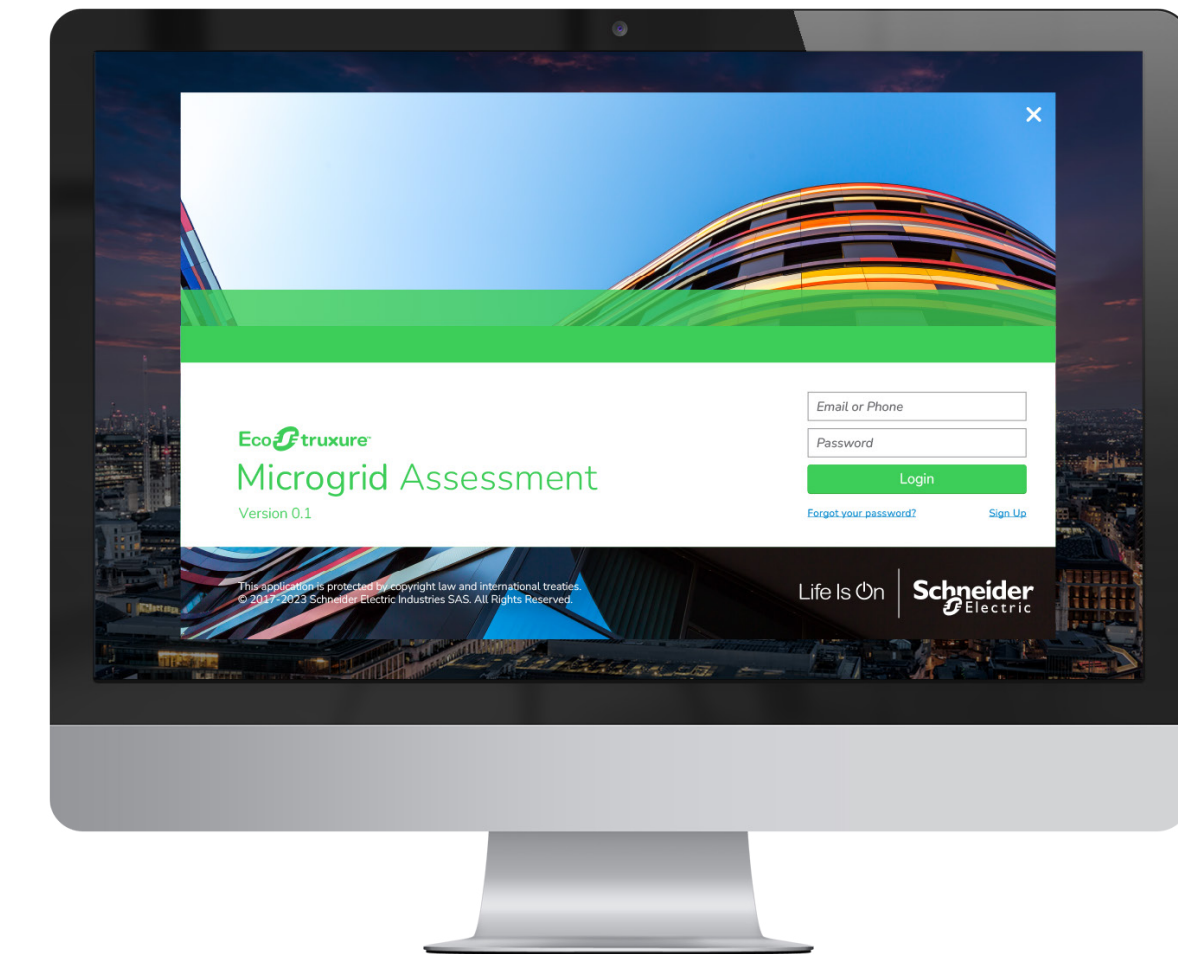
Prior to design, conceptually delivering financial feasibility of the project is a key first step. Microgrid Assessment provides a simple step-by-step journey by collecting data on factors that impact microgrid economics and computes the best-case scenario for the ROI of the project.

Results of studies done for a standardized architecture can be applied to multiple projects, thus eliminating the need for repeating the exercise for each and every microgrid.

Microgrid Build

EcoStruxure Microgrid Build helps to configure Microgrid control system by providing a simple, easy-to-navigate, web-based user experience capitalizing on standardized TVDAs and library of DERs from multiple brands, to help accelerate project timelines.

Microgrid Build provides recommendations and instructions to efficiently assemble microgrid systems using a library of modular, pre-validated components. This simplification diminishes the design time by half, leading to a faster turnaround rate.



Accelerating the Microgrid Journey

Using EcoStruxure Microgrid Assessment and Microgrid Build can accelerate the journey and deliver speed and simplicity.

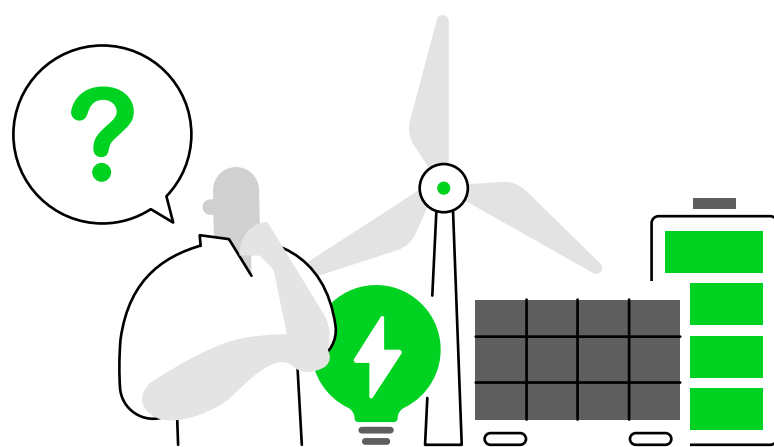
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Feasibility Assessment

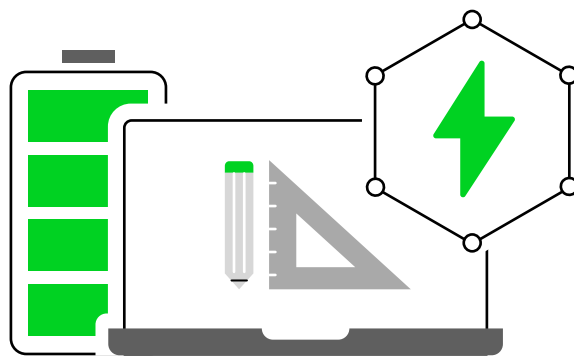
Specify any constraints or preferences for your microgrid system, such as budget limitations, maximum allowed carbon emissions, desired energy independence level, and reliability requirements. Microgrid Assessment then conducts thousands of simulations, analyzing project parameters to determine the economic feasibility of installing a microgrid.

Outputs include optimal sizes of solar panels, battery storage systems, and backup generators, empowering you to make data-driven decisions and achieve desired impact.



Design the Microgrid

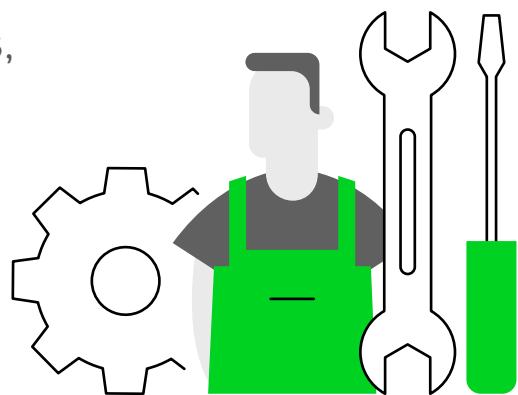
Leveraging the outputs of the feasibility assessment, the software automatically generates the Bill of Materials (BOM) for your system. Following TVDAs, it identifies and lists the necessary components, including energy management controllers, power inverters, energy storage systems, and smart meters. This simplification saves time, ensures accuracy, and facilitates the seamless procurement of essential components for your microgrid power & energy management system.



Build Microgrid Control System

Based on standardized architectures & pre-defined configurations, Microgrid Build will automatically generate the parameters for your microgrid power & energy management system. It recommends settings for energy management algorithms, load shedding strategies, grid connection parameters, and communication protocols, ensuring seamless compatibility and optimization.

Simplifying the configuration process, saves time and enables efficient implementation of your microgrid power & energy management system, aligned with industry-standard architecture.



Delivering the Solution

EcoStruxure Microgrid Flex’s standardized use of tested and validated architecture designs combined with comprehensive software and hardware components provide a smooth delivery process all the way to commissioning.

Installing and commissioning is faster with pre-validated components that are connected through the EcoStruxure cloud platform. After installation, little time is spent with ongoing on-site testing and commissioning. Automation and smart connectivity drastically reduce the need for human intervention, resulting in a smooth installation without surprises.

Standardized ordering process with many options

We include standard part numbers for BESSes, EcoStruxure Microgrid software, and services.

Streamlined installation and commissioning

EcoStruxure Microgrid Flex offers faster lead time compared to custom-engineered solutions ensuring a smooth and faster installation. Microgrid Flex provides a defined way of commissioning solutions from one project to the next. With Microgrid Flex, the commissioning process is also standardized, and guides and documents are provided proving an easier, faster project and more reliable, by limiting human errors.

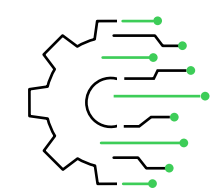
Tested Validated Documented Architecture (TVDA)

Testing and validation occurs in our labs, leveraging high fidelity simulation and full operational systems and DERs.



Lead time:

Supply chain is accelerated thanks to standard architecture. Microgrid controls procurement, programming and integration is made fast and simple.



Engineering and Build time:

Standard architectures provide predefined electrical and mechanical drawings that can save weeks of work and reiterations for engineers and customers.



Commissioning time:

Step-by-step guides during standardized commissioning phases are significantly faster than previous engineered-to-order methods. Pre-tested and validated programs are expected to be error-proof with vastly reduced overall commissioning time.

Servicing the Microgrid

EcoStruxure Microgrid Flex does more than fast-track microgrid projects. It ensures performance and continued success down the road. It gives you full control to monitor and manage economic performance, sustainability, and resilience on the site. EcoStruxure Microgrid Advisor and system-wide data connects, monitors, and controls all DERs in order to communicate real-time energy use, cost savings, and carbon emissions data.

Flexible service plans

Upon completion and commissioning, services from remote and/or on-site teams help operational and financial outcomes to be fully realized. Like the microgrid itself, service plans can be flexible to suit its individual needs. Categories of services can include troubleshooting, diagnostics, emergency support, repair services, monitoring & alarming, and preventive maintenance.

Sustainable success



Take control of energy

Connect, monitor, and control all DERs including PV, EV charging, batteries or back-up generators from one interface that ingrates onsite renewables optimized by battery storage while offsetting grid-sourced power for a lower CO₂ impact and usage. A cutting-edge web-based user interface communicates your real-time energy use, savings and CO₂ emissions data.



Evaluate and optimize

EcoStruxure Microgrid Advisor enables you to dynamically control on-site energy resources. The software seamlessly connects to your distributed energy resources to automatically forecast and optimize how and when to consume, produce, and store energy. The web-based user interface makes it easy to understand your real-time savings, earnings, and CO₂ emissions data.



Monitor and manage from anywhere

Cloud-based software enables seamless exchange of data of site conditions and usage with third-party platforms, including utility information systems.



Expert partners for success

Certified Expertise through a Network of EcoXpert Partners

Unique in its industry, the EcoXpert™ program cultivates collaboration and innovation across Schneider Electric's local and global network of trained and certified partners. The program's Microgrid certification is granted to partners such as power system integrators and electrical contractors that have successfully completed a rigorous training path designed and taught by Schneider Electric experts.

EcoStruxure Microgrid Flex is delivered through these trusted partners who have demonstrated proven expertise. Together with our EcoXpert partners, our mission is to deliver smarter, more efficient, and more sustainable solutions to our shared customers.

Microgrid Flex delivered through a network of expert and certified partners.



Delivering Value with Microgrid Flex

EcoStruxure Microgrid Flex provides impact and value to partners looking to expand their business. With Microgrid Flex, partners will experience:

Simpler and faster

- Design and commission using software, AI, and tested, validated, documented and standardized architecture (TVDAAs).
- Reduce time and efforts from design to commissioning compared to engineered to order projects.

A cost-efficient solution

- Spending less time on design, configuration and commissioning phases will reduce Engineering cost and frees up time to focus on accelerating business growth.

Ease of operation and maintenance

- Standardization of the architectures allows simpler and faster track to issue resolution & maintenance.
- Fleet management solution, allows for partner access, and to update and maintain remotely.

Reliability

- Tested, Validated, Documented Architectures ensures reliability and performance of the solution.
- Certified architectures ensure local grid code and regulation compliance.
- End-to-end native Cyber Secure solution to provide peace of mind.



Showcase your expertise through the EcoXpert microgrid certification



Schneider Electric's EcoXpert program is designed to help you – our partners – differentiate yourself in the market, increase profitability, and grow your business. By becoming an EcoXpert partner, you gain the strength behind our global brand, our expertise in energy and automation digital solutions for efficiency and sustainability, and exclusive benefits.

EcoStruxure Microgrid Flex, offers time and cost savings, scalability, and peace of mind through simplification of installation and commissioning process, reduced rework and lead time, lower life cycle cost, and interoperability of pre-tested and validated architectures.

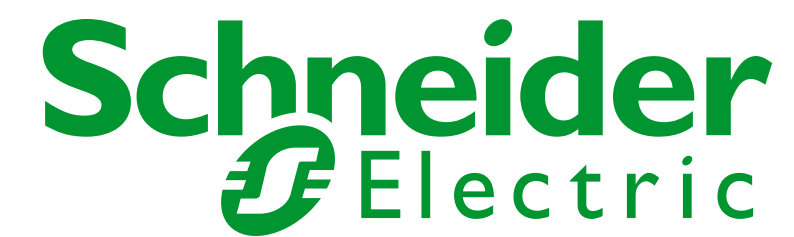
EcoXperts with Microgrid badge certification opens doors to target projects that require advanced and complex microgrid needs in a more efficient way. And, EcoXpert partners share our vision to become the world's leading cross-ecosystem of expertise in our industry, pioneering digitization and electrification solutions that drive sustainability for all.

Upskill and grow your business with EcoStruxure Microgrid Flex

Learn more at

se.com/ecoxpert

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To learn more information about the Schneider Electric
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