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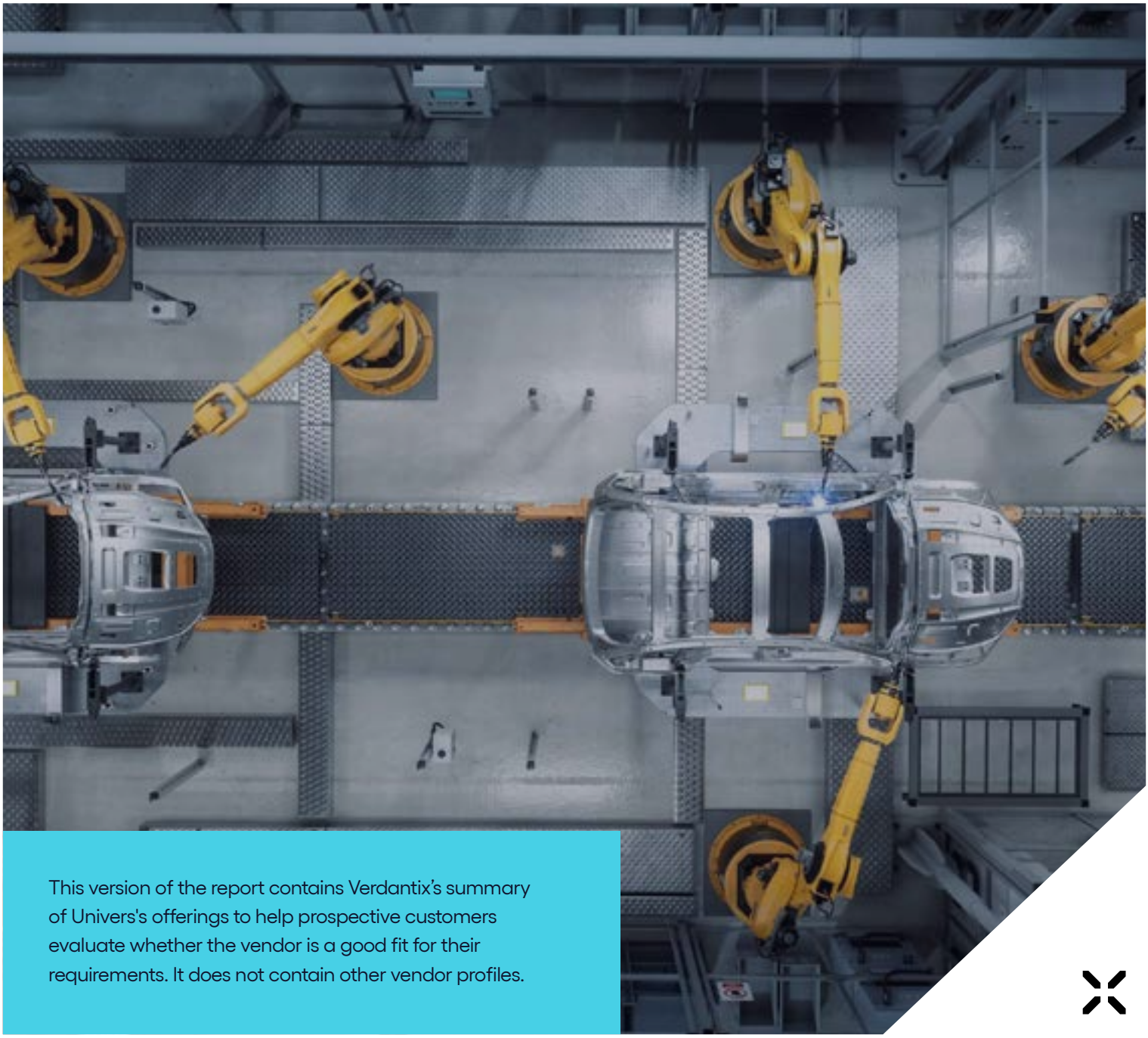
Microgrids, BESS, EV

# Buyer's Guide: Microgrid Management Solutions (MGMS) (2025)

By Isobel McPartlin
With Ryan Skinner

September 2025



This version of the report contains Verdantix's summary of Univers's offerings to help prospective customers evaluate whether the vendor is a good fit for their requirements. It does not contain other vendor profiles.

Microgrids, BESS, EV

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Microgrid management solutions (MGMS) are gaining in strategic importance as firms target greater energy resilience, cost efficiency and sustainability. While the market is still maturing, the diversity of offerings – from standalone software platforms to integrated systems – can make vendor selection complex. This guide profiles 19 providers and offers detailed analysis of nine key vendors, to help buyers navigate the landscape. Energy and utility professionals can use this report to align their microgrid strategies with the most suitable MGMS solution, ensuring their investments support long-term operational goals.

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# Organizations mentioned

Ageto, Albert Heijn, Amond World, Arizona State University, AspenTech, Bimbo Bakeries, Bloom Energy, City of Dublin (CA, US), Clarke Energy, ComAp, Consumers Energy, Domaine Carneros, Eastern Cape Province (South Africa), Eaton, EQT, Evolve, Generac, GE Vernova, Hark Systems, Honeywell, Hotel Marcel (New Haven), JTC, Mitsubishi Electric, MultiSpeak, North Carolina EMC, OATI, Onamba, OpenADR, Pacific Aquafarms, Performance Team, PowerSecure, Princeton University, Quality Custom Distribution, Renewable Energy Partners, S&C Electric Company, Santa Margarita Water District, Scale Microgrids, Schneider Electric, SECO Energy, SEL, Siemens, Smarter Grid Solutions, SolarEdge, Southern California Edison (SCE), Tesla Energy, Univers, University of California, Riverside, US Department of Defense, Valley Wide Beverage, World Bank.

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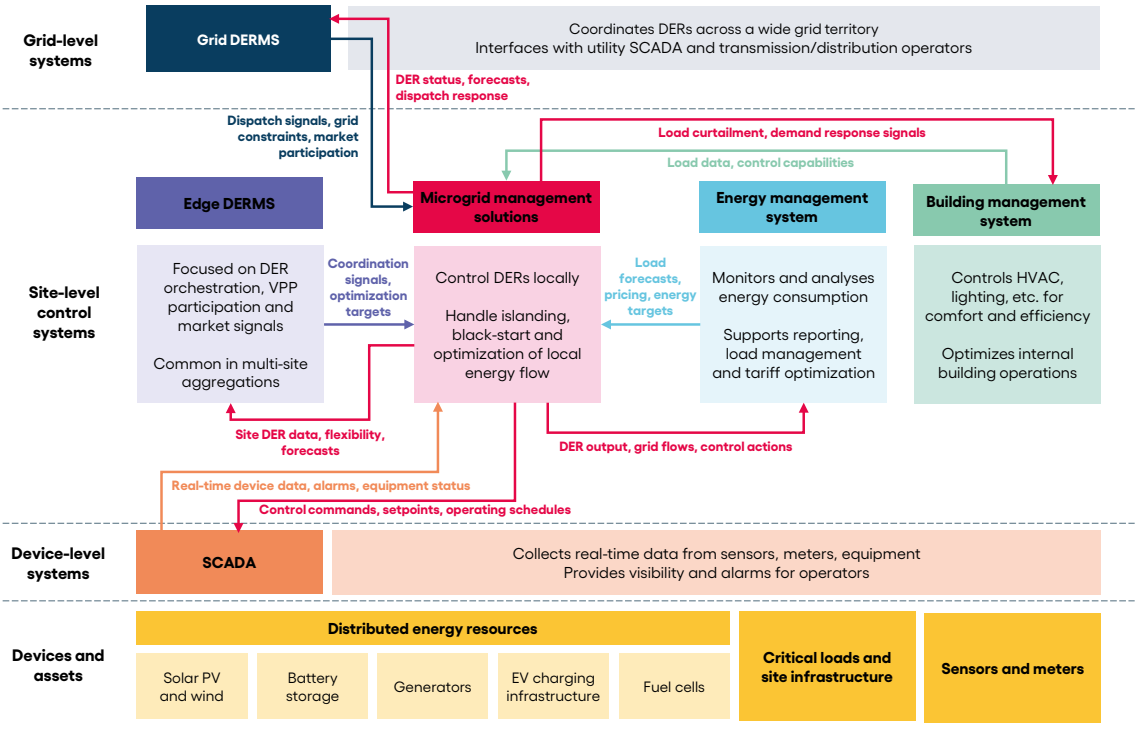
# Summary for decision-makers

- To achieve resilient, cost-effective and sustainable energy operations, organizations must manage increasingly complex DERs, while meeting strategic goals such as reliability, decarbonization and grid independence. This is driving demand for MGMS, which combine software and services to monitor, control and optimize microgrid performance across diverse use cases.
- This report helps buyers in roles that manage energy, resilience, sustainability or operations to understand the value proposition of MGMS and identify vendors that best fit their unique use cases and strategic objectives.
- The report identifies 19 providers of MGMS, offering detailed analysis of the capabilities of nine of these, based on questionnaires, research interviews, publicly available data and existing Verdantix research.
- MGMS offerings span a broad spectrum, from comprehensive turnkey solutions to fragmented offerings of design, hardware, software and maintenance. A range of deployment models, from capital investment to Energy-as-a-Service, bring additional complexity.
- To harness MGMS benefits, buyers should start by clearly defining their microgrid use case and strategic objectives – whether focused on resilience, cost savings or sustainability – to ensure alignment with the most suitable MGMS solution.

Figure 2

Situating MGMS in the broader energy management landscape




Note: Figure is illustrative only and not comprehensive.
Source: Verdantix analysis

# The Verdantix Buyer's Guide to microgrid management solutions (MGMS)

As commercial and industrial sites pursue greater energy resilience, sustainability and cost control, microgrids are emerging as a key component – and effective management solutions are critical to unlocking their full value. This report provides executives and decision-makers in commercial and industrial energy management with a comprehensive analysis of 19 microgrid management solution (MGMS) vendors available on the market today, with detailed profiles of nine of the most comprehensive offerings. The report draws on data collected via technical questionnaires from MGMS vendors, supplemented by desk-based research, interviews and other Verdantix reports.

## Defining MGMS

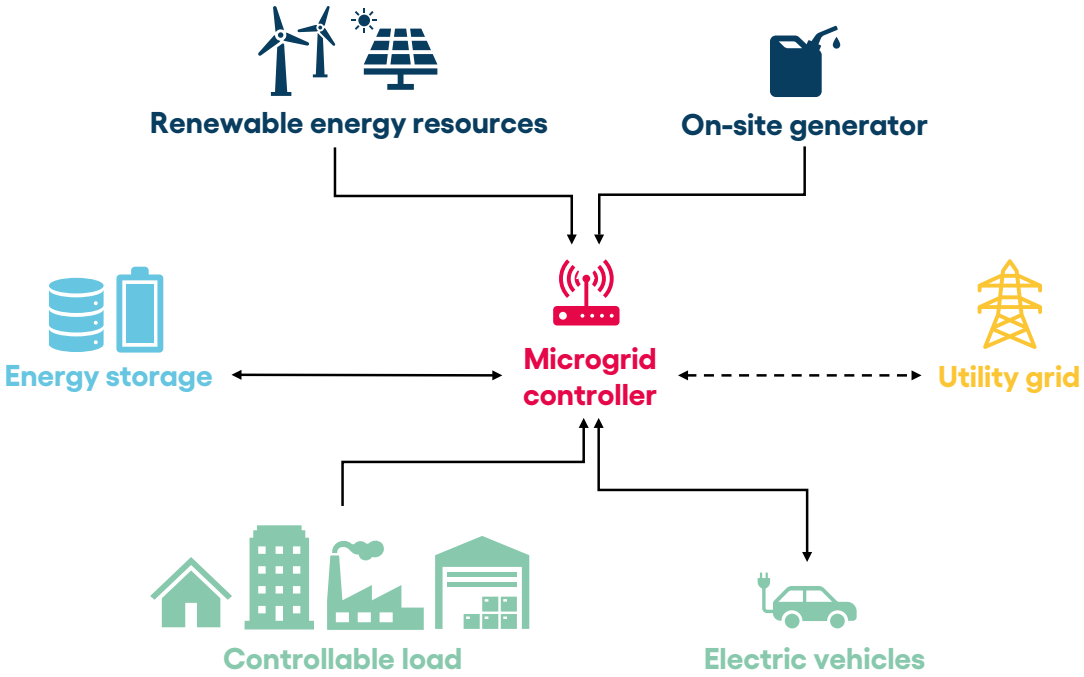
Verdantix defines a microgrid as:

> *"A localized electrical system of interconnected loads and distributed energy resources (DERs), with defined boundaries, that can operate as a single, controllable entity either connected to the main grid or independently in island mode."*

Microgrids differ from their 'macro' grid counterparts by being localized, often behind-the-meter, and by managing bi-directional power flows (as opposed to flows solely from generator to consumer). The key components of a microgrid are generation, load and storage, all of which must be coordinated. MGMS handle this coordination (see **Figure 1**). As microgrids become more complex, with fluctuating loads, diverse generation sources and growing autonomy needs, management solutions have emerged as critical infrastructure.

Figure 1

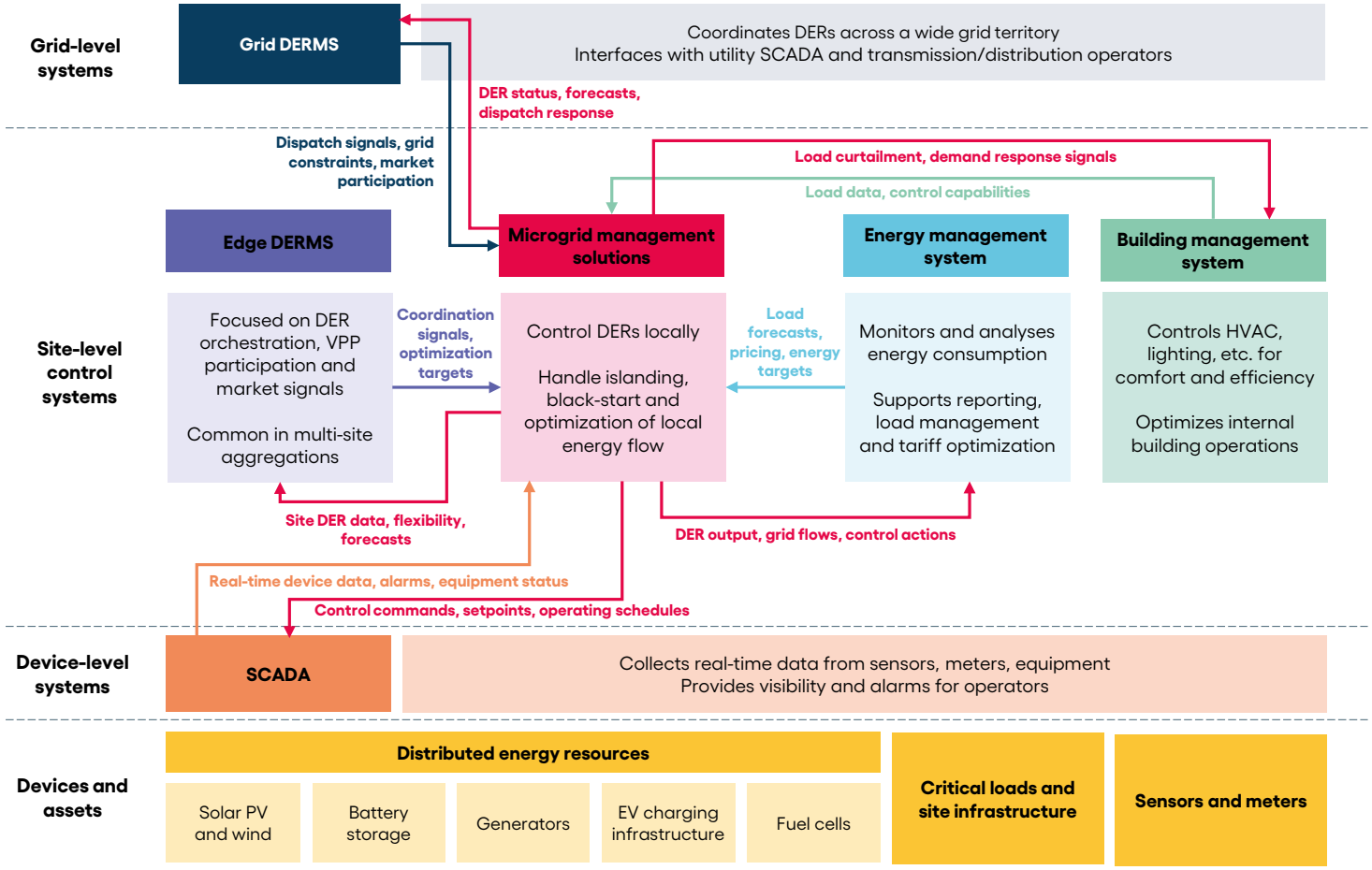
Key components of a microgrid




Source: Verdantix analysis

Figure 2

## Situating MGMS in the broader energy management landscape




Note: Figure is illustrative only and not comprehensive.
Source: Verdantix analysis

Verdantix defines MGMS as:

> *"Systems and technologies that coordinate and optimize microgrid operations by managing generation, storage and loads, to ensure reliable performance, efficient energy use and smooth transitions between grid-connected and islanded modes."*

MGMS are part of a broader stack of grid automation and energy control systems that help facilities teams manage DERs and optimize power use. These include energy management systems (EMS), building management systems (BMS), supervisory control and data acquisition (SCADA) systems and distributed energy resource management systems (DERMS) (see **Figure 2**). Understanding where MGMS fit within this stack is key to making informed investment decisions. A common confusion for buyers is the distinction between edge DERMS and MGMS; while these share some overlapping capabilities, they serve different scopes and stakeholders (see **Figure 3**).

Figure 3

## Distinguishing between DERMS and MGMS capabilities

| Feature | MGMS | DERMS |
|---|---|---|
| **Scope of control** | • Focus on local control of single microgrid or small set of assets<br>• Manages on-site resources such as solar, batteries, loads<br>• Includes islanding capability, load prioritization, optimization in grid outages/price spikes<br>• Goal is to ensure local reliability, resiliency and cost efficiency | • Focus on grid-wide coordination of many DERs across a utility or aggregator's service territory<br>• Manages thousands of distributed assets often owned by multiple parties<br>• Includes aggregation, visibility, control signals, etc.<br>• Can manage a microgrid by treating it as a single aggregated DER<br>• Maintains grid stability, manages congestion and provides grid services |
| **Typical users** | Microgrid owners and operators<br>Facility and energy managers | Utilities, grid operators, aggregators<br>Often integrated with utility ADMS |
| **System capabilities** | Islanding<br>CORE: local energy optimization<br>Grid services participation | CORE: multi-site DER coordination<br>CORE: utility-scale integration<br>Grid services participation |
| **Interoperability** | Typically operates independently, but can integrate with BMS or EMS on site | Requires high interoperability with utility grid operations, regulatory frameworks and communication standards |

Source: Verdantix analysis

# MGMS are still emerging, but rising in strategic importance

While still a budding segment of the energy landscape, the microgrid market is poised for significant growth. In the Verdantix 2025 commercial and industrial energy transition survey, only 1% of firms had the ability to run as an island disconnected from public grid infrastructure – but 18% of facilities saw this as a 'very important investment' over the next five years, and almost 50% deemed it 'somewhat important' (see **Figure 4**). Further, more than 60% of energy leaders expect to be investing in MGMS by 2030, with demand growing fastest in the US and amongst commercial energy buyers (see Verdantix Global Corporate Survey 2025: Leaders' Energy Transition Budgets, Priorities And Tech Preferences). This will be driven by macro-trends in continuing data centre development, cost-saving initiatives, and a recognition of the strategic importance of grid reliability, especially as extreme weather events increase in prevalence.

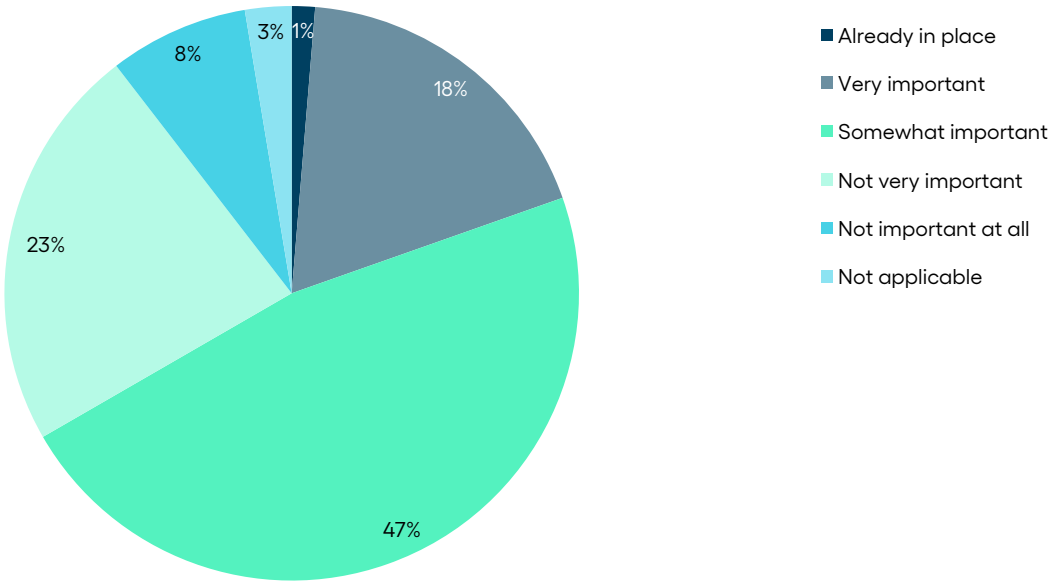
## Buyers turn to MGMS for resilience, optimization and decarbonization

There is no 'one-size-fits-all' MGMS buyer. Buyer personas vary, depending on whether they sit in commercial or industrial industries; further, their key drivers to seek out MGMS may range from managing on-site DERs, to cost-saving, to meeting corporate sustainability goals (see **Figure 5**). Maturity levels also differ widely. Mark Peng, Global Head of Microgrid at Univers, noted that buyers who have already invested in battery energy storage tend to be more attuned to financing and return on investment (ROI) considerations. Wendy Gumb from Schneider Electric highlighted that many small and medium-sized enterprises (SMEs) and mid-tier players still lack a clear understanding of what a microgrid is.

Figure 4

The ability to island from the grid is a 'very important' investment priority for about 1 in 5 enterprises

**How important an investment area is the ability to run as an island unconnected from public grid infrastructure for your facility over the next five years?**




Note: Data labels are rounded to zero decimal places.
Source: Verdantix Commercial And Industrial Energy Transition Survey 2025

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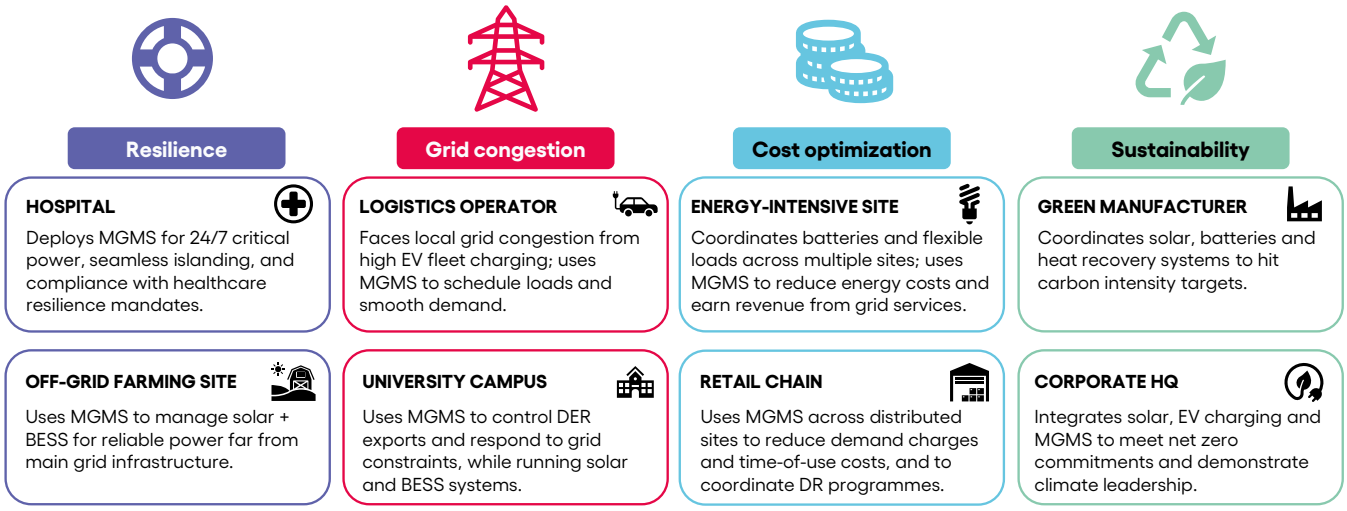
Figure 5

Examples of different buyer types and use cases for MGMS




Source: Verdantix analysis

This diversity of needs and awareness means that MGMS must serve a broad range of functions. Caitlin Bonney from Schnieder Electric described MGMS as a 'pocketknife' solution, capable of addressing multiple problems with a single tool. Key use cases for the technology are:

- **Resilience.**
  Operational resilience and independence is a rising concern for many energy leaders, with 24% of firms in the Verdantix survey deeming it the 'most important' consideration in making a business case to support the energy transition. The unique islanding capabilities microgrids offer provide a key safeguard against grid outages, ensuring uninterrupted power for essential loads and minimizing the financial and operational impacts of downtime. Recent high-profile grid failures, such as the Iberian blackout in April 2025 and the Heathrow substation fire in March 2025, have highlighted the level of disruption presented by grid failures and the subsequent need for energy resilience. Increasing extreme weather events, such as heatwaves and hurricanes, also pose risks to the stability of power grids, raising the desirability of microgrids in hazard-prone areas.

- **Cost optimization.**
  Cost efficiency remains a top priority for energy leaders, who are continually seeking ways to optimize energy use and minimize spend across their operations. MGMS functionality encompasses energy management and demand optimization capabilities that can help firms meet these aims, through actions such as peak shaving, fuel switching and load balancing. In addition to boosting efficiency, the effective management of load demand helps firms avoid exceeding their capacity charges. For example, the University of California, Riverside implemented a microgrid to support electric vehicle (EV) charging infrastructure with load-following controls, enabling it to accommodate additional fast chargers, while achieving around $24,000 in annual electricity cost savings and reducing $CO_2$ emissions by up to 84%. Additionally, MGMS help buyers enter the new energy economy as producers of energy. Many MGMS also have market participation features, in which excess energy generated can be sold back to the market, with the MGMS able to aggregate and trade.

- **Decarbonization and renewable energy integration.**
  Some MGMS buyers are motivated by sustainability goals and regulatory requirements. However, while decarbonization is an important aim for many organizations, it is often viewed as a secondary benefit of microgrid adoption, rather than a primary driver. Microgrids can manage and coordinate on-site renewable energy DERs such as solar photovoltaic (PV) or wind turbines, to help firms achieve low-carbon energy self-sufficiency. Domaine Carneros, a winery, installed a Schneider Electric microgrid that manages solar and storage. This now generates 70% to 80% of the winery's energy, saving it over $70,000 annually on energy costs, while reducing carbon emissions by 375Mt$CO_2$ each year. Additionally, MGMS are used not only to optimize operational efficiency, thereby reducing emissions alongside costs, but also to maximize the use of on-site renewables and lower overall carbon footprints for a site.

- **Grid congestion and load growth management.**
  As more firms continue to electrify, they risk congesting their local grids by both adding new electric assets and by increasing the level of demand. For example, congestion related to the installation of an EV fleet can risk a facility going over capacity and thereby receiving a grid penalty – acting as a key roadblock in that facility's energy transition. MGMS can alleviate this issue by managing the addition of new electric loads locally and coordinating on-site generation and storage to reduce dependency on constrained grid infrastructure. For example, US-based warehousing and distribution business Performance Team built a 9MW EV truck charging depot supported by an on-site microgrid to speed up the project time to get electric trucks operational – instead of waiting two years for utility grid upgrades.

## Buyers should select MGMS based on operating profile and in-house capabilities

The current MGMS vendor landscape is fragmented and evolving, shaped by the convergence of software, hardware and services in delivering operational microgrids. Vendors span a broad range of go-to-market strategies: some operate as part of vertically integrated microgrid developers, embedding their MGMS platforms within turnkey projects they design, build and often own. Others provide standalone MGMS solutions designed to integrate flexibly with third-party hardware, engineering, procurement and construction (EPC), or financing partners. This spectrum – from fully integrated to modular software – reflects the variety of buyer preferences around project scope, ownership and operational control.

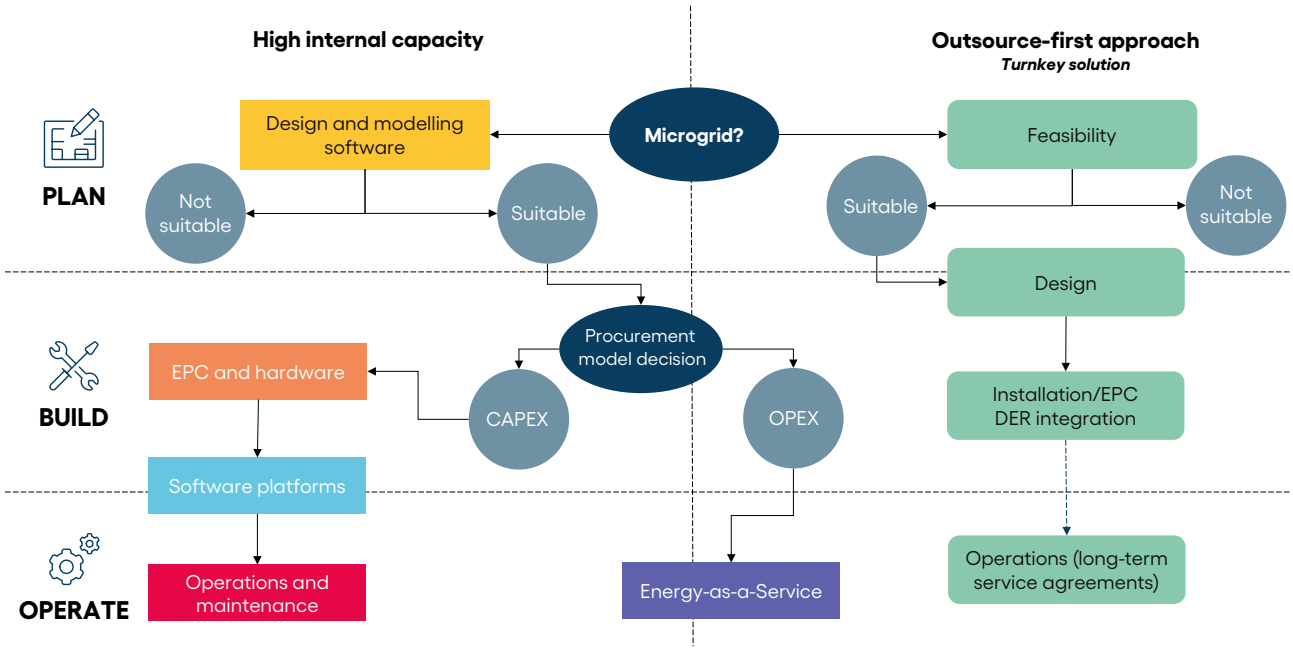
### MGMS vendors differ widely in integration, service and delivery models

Buyer engagement, internal expertise and organizational capacity vary significantly across the market, meaning that the best-fit microgrid solution depends on where buyers are in their journey, and their specific needs (see **Figure 6**). Key categories of microgrid vendor offerings can be linked to buyer objectives, notably:

- **'Build and deliver me a microgrid from scratch'.**
  Turnkey – or full stack integration – MGMS offerings involve vendors managing the entire microgrid project life cycle. Buyers engage these vendors to deliver a functioning microgrid, typically with minimal in-house technical involvement. Offerings often include feasibility studies, EPC, DER integration, and software set-up or integration. They are often paired with financing models or long-term service agreements. For example, Schneider Electric provides an end-to-end service by delivering integrated microgrid systems from design to installation and management, while its EcoStruxure platform is used for real-time operations.

Figure 6

Microgrid buyer decision pathways mapped by project stage and internal capacity




Note: Figure is illustrative only and not comprehensive.
Source: Verdantix analysis

- **'Help me model, size and justify this project'.**
  For buyers at the beginning of their MGMS journey, design and modelling platforms help developers, facilities managers and consultants simulate and evaluate microgrid scenarios before committing capital. The focus for these vendor offerings is on pre-building decision-making, instead of active management generation, storage and loads. However, they can also be used to model optimized microgrid operating scenarios after installation. The core capabilities of these platforms are load and resource forecasting, financial modelling, resilience scenario analysis and DER and hybrid system simulations. A key example is UL Solutions's HOMER Pro – a tool that allows for the techno-economic modelling of microgrids, with thousands of possible system configurations. The software has been used by several high-profile buyers, such as the US Department of Defence for military bases and the World Bank for off-grid communities in rural Africa and East Asia.
- **'Help me optimize and control my microgrid'.**
  For buyers who already have DERs, or are integrating them in stages, vendors who lead with software platforms that help to control, automate and optimize their operations in real time are the most appealing. Typically hardware-agnostic, they provide key MGMS functionality such as real-time dispatch of DERs, islanding controls, energy cost optimization and integration with various DERs and other platforms, such as BMS or EMS. For example, AspenTech – whose heritage is in industrial software – provides an MGMS software-first offering that focuses on optimizing generation, demand and storage, while being purpose-built to integrate with a wide range of intelligent electronic devices (IEDs) and third-party systems.

- **'Operate and maintain the microgrid for me'.**
  Operations and maintenance providers take on ongoing monitoring, operations and maintenance – and occasionally ownership – of a microgrid. This type of vendor solution is ideal for buyers who either lack in-house energy management expertise or capacity or prefer an operating expenditure (OPEX) 'as-a-service' model. Buyers will outsource performance and operations to third-party vendors, who provide services such as 24/7 remote monitoring and dispatch, preventative maintenance, performance analytics and energy performance guarantees. Some vendors offer an Energy-as-a-Service solution, where a vendor finances, owns and operates the entire system. For example, Scale Microgrids offers microgrid service agreements (MSAs), through which it retains ownership of the microgrid, charging a flat fee for energy services and system maintenance, including remote monitoring and 24-hour customer support.

- **'Provide me with controllers and DER hardware'.**
  Buyers who have established project plans but need to purchase the hardware to bring them to fruition will turn to this vendor category. Controller + DER hardware original equipment manufacturers (OEMs) specialize in devices that enable microgrid control or deliver core DER capabilities – such as inverter, switchgear and microgrid controllers. This hardware will often have MGMS integration interfaces built in, alongside capabilities such as local control logic and integrated communication protocols. For example, while Siemens provides a complete hardware and software MGMS offering through its SICAM Microgrid Controller, its dedicated power control subsidiary, Russelectric, delivers the specific critical hardware such as switchgear and transfer switches.

## MGMS vendors are evolving, with AI, data integration and grid innovations

As MGMS use cases diversify, and demand for microgrids accelerates, vendors are adapting, to stay ahead of technologies, regulations and customer expectations. Innovative vendors are:

- **Taking an AI-first approach to MGMS.**
  Many vendors have already incorporated AI-powered capabilities into their MGMS offerings, to streamline operations, improve forecasting accuracy and enhance system responsiveness. For example, many firms have integrated AI load forecasting and optimized dispatches into their solutions. GE Vernova has AI- and machine learning (ML)-based predictive load (renewable forecasting), anomaly detection and outage prediction as part of its product roadmap, while Univers is continuing to develop and improve its AI capabilities around forecast, control, simulation and onboarding.

- **Enhancing grid market participation.**
  As the new energy economy makes more buyers into energy producers, enhanced grid flexibility to allow for energy trading becomes a key feature of MGMS. Honeywell met this challenge by enhancing its grid interaction module in early 2025 to offer improved interactivity with the main power grid for smarter energy trading. Univers is working to connect buyers to local markets, releasing its Japan and Australian Energy Market Operator market adaptors in early 2025.

- **Designing microgrid controls suited to a more diverse range of DERs and loads.**
  As more firms adopt a variety of DERs, from established renewables to newer technologies, MGMS providers are working to ensure their solutions can support buyers in this respect. Both Schneider Electric and Univers provide support for group control and smart charging, to integrate EVs as a flexible load. GE Vernova has plans to provide foundation support for hydrogen storage integration, including dispatch logic for electrolyzer scheduling and energy-to-hydrogen conversion planning.

# Inclusion criteria for the 2025 MGMS Buyer's Guide

The MGMS vendor landscape is continuing to evolve, with diverse vendor offerings, heritages and go-to-market strategies. To provide clarity for buyers, Verdantix has compiled a list of 19 prominent vendors with MGMS offerings (see **Figure 7**). We selected these providers based on their alignment with specific criteria. In summary, we required them to:

- **Have an MGMS product separate from any other solution or module.**
  Each provider featured in this Buyer's Guide has an MGMS offering that is a standalone solution, rather than embedded within a broader product suite.
- **Offer a minimum of three of the four core aspects of MGMS functionality.**
  The providers' MGMS offer at least three of the following four capabilities: DER integration; energy optimization and load management; grid interaction and islanding; and real-time monitoring and demand response.
- **Employ over 100 members of staff.**
  For inclusion in this study, we required vendors to demonstrate a minimum scale and level of organizational maturity that suggested sufficient market presence, resource depth and operational capacity.

From these 19 vendors, we developed in-depth profiles of nine providers, to offer a better understanding of the capabilities, innovations and backgrounds of some of the foremost players in this space. The nine providers are AspenTech, Generac, GE Vernova, Honeywell, OATI, Scale Microgrids, Schneider Electric, Siemens and Univers.

-

Figure 7
List of MGMS providers

| Vendor | Solution name | Employee count | Headquarters |
|---|---|---|---|
| AspenTech | Microgrid Management System (MMS) | ~3,500 | Bedford, MA, US |
| Bloom Energy | Microgrid Advanced Solutions | ~2,000 | San Jose, CA, US |
| Clarke Energy | Heila Microgrid Controller | ~1,200 | Liverpool, UK |
| ComAp | InteliNeo; InteliGen 500 Microgrid; InteliSys Hybrid | ~580 | Prague, Czech Republic |
| Eaton | Power Xpert | ~54,000 | Dublin, Ireland |
| Generac | ARC Microgrid Controller | ~4,000 | Waukesha, WI, US |
| GE Vernova | GridNode Microgrid Solution | ~75,000 | Cambridge, MA, US |
| Honeywell | Microgrid Controls Solutions | ~110,000 | Charlotte, NC, US |
| OATI | GridMind | ~ 1,200 | Bloomington, MN, US |
| PowerSecure | Advanced Microgrids | ~821 | Durham, NC, US |
| S&C Electric Company | GridMaster Microgrid Control System | ~2,600 | Chicago, IL, US |
| Scale Microgrids | Scale Microgrid Solutions | ~120 | Ridgewood, NJ, US |
| Schneider Electric | EcoStruxure Microgrid Operation; EcoStruxure Microgrid Advisor | ~160,000 | Paris, France |
| SEL | powerMAX Microgrid Control Systems | ~6,600 | Pullman, WA, US |
| Siemens | SICAM Microgrid Controller (MC) | ~317,000 | Munich, Germany; Berlin, Germany |
| Smarter Grid Solutions (Mitsubishi Electric) | Strata Grid | ~188 | Glasgow, UK |
| SolarEdge (Hark Systems) | Hark Microgrid Energy Control | ~3,000 (~50) | Tel Aviv, Israel (Leeds, UK) |
| Tesla Energy | Microgrid Controller | ~10,000 | Austin, TX, US |
| Univers | EnOS AI Microgrid | ~830 | Singapore |

Source: Verdantix analysis

## Univers's AI-powered platform enables scalable, market-integrated microgrid control and optimization

Univers is a Singapore-based energy technology firm with a central platform, EnOS, that provides applications spanning renewable asset management, smart grid orchestration and energy optimization. Univers launched a microgrid-focused application, EnOS AI Microgrid, in 2023, to enable real-time data integration from diverse hardware and software systems, for on-site control, optimization and analytics.

Verdantix finds that Univers offers:

- **Modular integration and scalable architecture.**
  The Edge EnOS microgrid controller has onboarding templates to integrate with supervisory control and data acquisition (SCADA) systems, original equipment manufacturer (OEM) energy management systems (EMSs) and building management systems (BMSs), and other systems. It can operate as a standalone controller or be deployed as part of the broader EnOS suite, enabling scalability from basic control to full distributed energy resource management system (DERMS) integration. The suite also enables data sharing and remote control via standard protocols with cloud platforms and third-party systems. A project undertaken by Univers for Albert Heijn saw the integration of on-site solar, energy storage systems and energy-consuming assets, to help the firm meet its sustainability targets while enhancing energy independence.
- **Centralized, data-driven microgrid management.**
  EnOS AI Microgrid centralizes energy management across multiple sites, offering real-time monitoring and visibility at the fleet, site and device level. The platform is designed for market integration, supporting participation in electricity markets, virtual power plants (VPPs), aggregator programmes and trading platforms. EnOS AI Microgrid can also receive grid instructions and optimize dispatch. The firm is integrating its solution with international markets; for example, it released Japan and Australian Energy Market Operator market adaptors in early 2025.
- **AI-driven optimization, onboarding and forecasting.**
  EnOS AI Microgrid leverages advanced AI and Internet of Things (IoT) capabilities to forecast demand, optimize dispatch across assets, and maximize renewable utilization, with three built-in AI agents. The first forecasts renewable energy production and load demand, using historical data and AI algorithms. The second draws on these forecasts to determine look-ahead schedules and real-time closed-loop controls, supporting asset optimization and helping to minimize curtailment (it may also prevent penalties for over-capacity charges). The platform's AI onboarding tools constitute the third; they automatically determine device model mapping, typically saving 30% to 50% of system deployment and integration time.

Figure 16

Univers MGMS solution overview

| Category | Attributes | Details | |
|---|---|---|---|
| Vendor overview | Name | Univers | |
| | HQ | Singapore | |
| | Date founded | 2018 | |
| | Employees | 830 | |
| Solution overview | Solution name(s) | EnOS AI Microgrid | |
| | Client locations | Americas | 10% |
| | | EMEA | 45% |
| | | APAC | 45% |
| | Examples of named clients | Albert Heijn; JTC; Onamba | |
| | Core client industries | Wholesale and retail trade; public administration; transportation | |

Sources: Verdantix analysis; Univers, via questionnaire

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