



Guidehouse
INSIGHTS

Research Report

Guidehouse Insights Leaderboard: DERMS Providers

Assessment of Strategy and Execution for 10 Grid DERMS and 15 Grid-Edge DERMS
Platform Providers

Published 1Q 2024

Dan Power
Senior Research Analyst

Jared Feuer
Research Analyst

Roberto Rodriguez Labastida
Principal Research Analyst

Section 1

Executive Summary

1.1 Market Introduction

The market for distributed energy resources (DER) management systems, or DERMS, is rapidly evolving as DER adoption continues to increase worldwide. Market operators and regulators are working to adjust frameworks and regulations to further integrate DER aggregations into wholesale market activities. Distribution utilities and grid operators are also looking to reap the operational benefits of aggregated DER to aid in daily grid operations. Advanced software platforms like DERMS are essential to ensuring that grid stability is not compromised from DER operation and to utilizing DER capacity to provide essential grid services.

The term DERMS is increasingly used as a catchall for any software platform used to manage or control aggregated portfolios of DER. Within the DERMS market, disparities exist around required functionalities, as legacy advanced distribution management system (ADMS) providers and newer energy technology companies take different approaches to DERMS development. Various stakeholders in the energy industry, including independent power producers (IPPs), DER aggregators, and distribution utilities, are aiming to capitalize on DER capacity to provide grid services to wholesale and retail markets. While IPPs, DER aggregators, and utilities may have different end goals for aggregated DER, the underlying functionalities of a DERMS platform can serve each of those stakeholders. This version of the *Guidehouse Insights Leaderboard* defines a DERMS platform as a software platform capable of intelligently managing, controlling, and optimizing DER aggregations to provide grid services and differentiates between grid DERMS platforms and grid-edge DERMS platforms.

The criteria by which vendors are compared in this *Guidehouse Insights Leaderboard* include:

- Vision
- Go-to-Market Strategy
- Partners/Acquisitions/Investors
- Product Integration Strategy
- Technology
- Geographic Reach
- Sales, Marketing, and Distribution
- Platform Performance

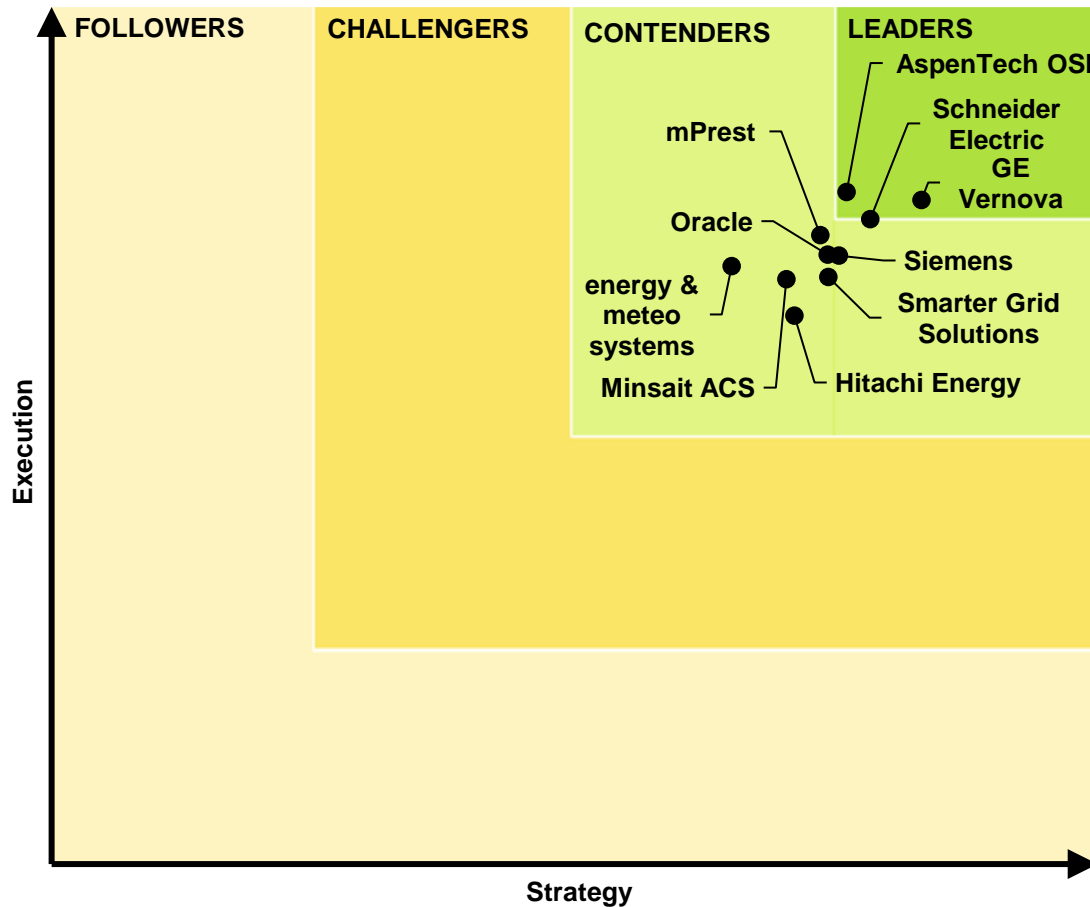
- Platform Quality and Reliability
- Project Portfolio
- Pricing
- Staying Power

Detailed descriptions of each criterion are provided in the Criteria Definitions section of this report.

1.2 The Guidehouse Insights Leaderboard Grid

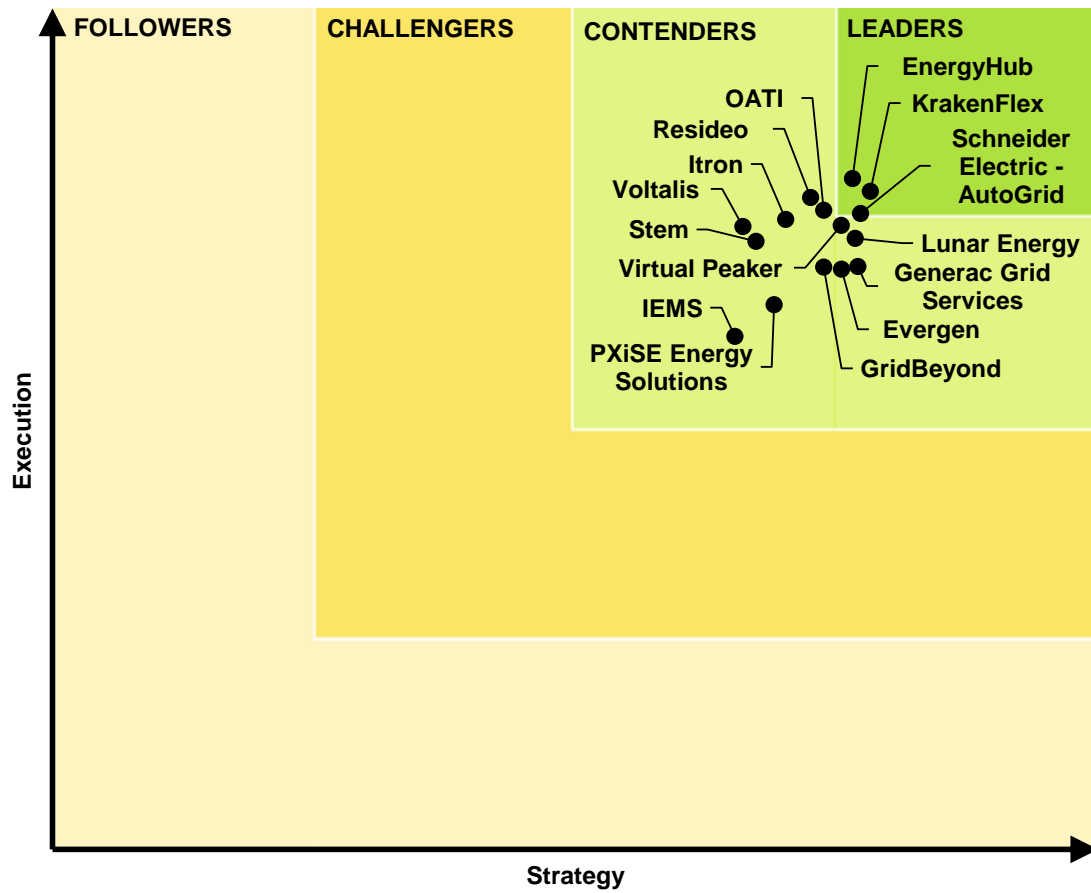
The Guidehouse Insights Leaderboard Grid provides an overall view of the companies profiled for this report. To account for the varying approaches to DERMS development and acknowledge the different use cases for each platform type, this *Leaderboard* includes separate grids and rankings for grid DERMS providers and grid-edge DERMS providers.

Chart 1-1. The Guidehouse Insights Leaderboard Grid: Grid DERMS



(Source: Guidehouse Insights)

Chart 1-2. The Guidehouse Insights Leaderboard Grid: Grid-Edge DERMS



(Source: Guidehouse Insights)

Section 2

Market Overview

2.1 Market Definition

This iteration of the *Guidehouse Insights Leaderboard* for providers of distributed energy resources (DER) management systems, or DERMS, adjusts the definition of a DERMS platform compared with previous versions. In the past, a distinction was made between DERMS and virtual power plant (VPP) platforms, with VPP platforms offering a module enabling wholesale market participation and generally not being grid aware. The VPP platform market has seen less movement in recent years as asset owners, aggregators, and grid operators look to implement new use cases for DER that require some level of locational awareness and grid management capability. Within the DERMS space, two distinct paths to development have emerged. Legacy advanced distribution management system (ADMS) providers are adding functionalities related to DER management, control, and optimization while maintaining their distribution system-centric focus, whereas newer energy technology companies are building advanced grid-edge DER management, control, and optimization platforms from the bottom up.

In this version of the *DERMS Leaderboard*, Guidehouse Insights considers companies providing a software platform to third parties that is capable of intelligently managing, controlling, and optimizing a portfolio of aggregated DER such that the portfolio can provide grid services. These grid services may be provided through wholesale and ancillary markets or directly to a distribution utility (in some instances the distribution utility may be the portfolio operator). This adjusted market definition for DERMS is partially driven by the evolution of the stakeholders looking to control DER. Independent power producers (IPPs), DER aggregators, and distribution utilities are all interested in using a software platform to capitalize on aggregated DER to generate revenue and improve grid reliability.

The result of this bifurcated approach to DERMS platform development is some ambiguity around exactly which functionalities should be included in a DERMS. The functionalities required by a DERMS platform will vary depending on the stakeholder to which the DERMS provider is selling. IPPs may still prioritize economic optimization through direct wholesale market participation, whereas distribution utilities will look to balance grid physics with the deployment of low cost resources, meaning they would require real-time grid topology mapping and power flow optimization capabilities. DER aggregators may rely on both direct wholesale market participation and customer engagement tools for retail programs to deliver required capacity. Recent acquisitions and partnerships between grid DERMS and grid-edge DERMS providers have complicated the matter further. When determining rankings for companies included in this *Leaderboard*, Guidehouse

Insights evaluated platforms on the ability to support the technical functions listed in Table 2-1. Grid DERMS platforms are typically used by distribution grid operators to manage the impact of DER on their grids, almost acting as an extension of an ADMS. Grid-edge DERMS platforms are typically used by distribution grid operators or aggregators to manage DER programs or aggregated DER bidding into wholesale and ancillary markets.

Moving forward, an adaptable, end-to-end DERMS solution will likely become more attractive as DER adoption continues to grow and the need to reduce emissions from the power generation sector becomes more pressing. This type of solution would give distribution utilities visibility and control over DER assets located on customer premises. It would be configurable such that utilities can quickly deploy the platform to meet their current DER needs and then increase the platform’s capability as DER adoption in their territory increases. In cutting down deployment time, utilities would be able to start generating value from the DERMS platform much more quickly than has traditionally been the case. However, the actual development of such a platform is likely some years off, as the current needs of most utilities are served by existing grid DERMS and grid-edge DERMS solutions.

Table 2-1. DERMS Platform Functions

Capability	Description
Forecasting	Forecasts certain variables related to DER asset and aggregation availability
Local Optimization and Scheduling	Optimizes DER asset operational schedule (e.g., load shifting, peak shaving) based on customer load and retail tariffs
Grid-Level Optimization and Scheduling	Optimizes DER asset operational and grid service schedule based on grid constraints and/or wholesale prices
Portfolio Optimization and Scheduling	Optimizes DER aggregation operational and grid service schedule based on multiple factors
Communications	Enables communication between other utility or aggregator energy platforms and DER assets
Dispatch and Control	Adjusts and directly controls output of DER assets
Monitoring	Enables telemetry and monitoring of DER assets to track availability and performance
Market Interface and Settlement	Related to wholesale market participation, performance, and settlement (e.g., bidding, performance verification)
Program Management	Related to customer engagement functions (e.g., enrollment, event notification, incentive processing)

Capability	Description
Analytics and Reporting	Retains operational data for DER assets and aggregations and post-event analysis and summary
Grid Topology Mapping	Models and tracks locational connectivity of DER assets on the distribution grid
DER Modeling	Provides digital twin capabilities for the DER asset/portfolio to model performance to aid in future operational planning exercises

(Source: Guidehouse Insights)

2.2 Market Drivers

Perhaps the largest market driver for the development and deployment of DERMS is the continued adoption of DER across multiple customer segments coupled with more renewable energy capacity coming online. Increases in DER adoption are driven by technology cost declines (along with the development or extension of incentives), a greater need for energy resilience, and customer desires to reduce utility bills and reach sustainability objectives. Numerous factors drive demand for integrating DER into grid operations through wholesale markets and retail programs, both of which can be enabled by a DERMS platform.

- Regulators developing interest in new market frameworks:** Regulators are gradually becoming more invested in expanding the value proposition for DER. In places like Europe, new wholesale market products are being developed that lend themselves to DER participation. In the US, regional wholesale market operators continue to work on updating their frameworks to enable and induce wholesale market participation of aggregated DER in response to Federal Energy Regulatory Commission Order No. 2222. Though the realization of transactive markets is a long way off, movements like these have started a significant policy conversation around enabling distribution-level resources to provide services to the bulk power system.
- Operational benefits and avoided costs:** One key benefit of DER for many utilities is the ability to offset both centralized generation costs and capital investment for the grid. When managed and controlled in a targeted manner, aggregated DER can accomplish the same load relief as traditional grid infrastructure upgrades, often at a lower cost. Many utilities in the US, and in other regions of the world, deploy these non-wires alternatives projects to make use of customer-sited DER like behind-the-meter (BTM) energy storage systems (ESS) and flexible loads. More broadly, utilities are capitalizing on aggregated BTM DER capacity through retail programs to reduce their system peaks, thereby offsetting the amount of energy they must procure on the wholesale market or the amount of new generation capacity they must build or acquire to maintain balance. Aggregated DER portfolios are also inherently

flexible, meaning their capacity and ability to provide grid services can be adjusted over time.

- **Growing role of digitalization in the energy sector:** Digitalization has been employed by utilities and other parts of the energy industry for years but has accelerated because of smart meter data availability and the rise of internet-connected devices. Utilities are increasingly thinking about enterprisewide digitalization as the value of advanced software systems becomes more widely understood. IPPs and DER aggregators are also embracing digitalization so they can more easily manage and view their portfolios. As the interaction of customer-sited resources becomes more essential to grid operations, customer engagement strategies and tools, like digital software platforms, also become more valuable to IPPs, aggregators, and utilities.

2.3 Market Barriers

Factors inhibiting more widespread and faster growth in the DERMS market are related to outdated energy policies and unclear technology definitions, as well as the cost and complexity associated with DERMS deployments. Although some regulators and market operators around the world are expressing interest in incorporating DER into grid and market operations, many legacy regulations persist that favor centralized fossil fuel power plants. Furthermore, DERMS deployments can be costly and require complex integrations that may dissuade some stakeholders from pursuing them.

- **Outdated energy regulations:** Portfolios of aggregated DER controlled by a DERMS platform can only show their true value to the grid if given the opportunity to do so through innovative market frameworks or retail programs. While there has been movement in the regulatory space, some existing regulations, like utility revenue structures favoring kilowatt-hour sales and CAPEX, work against the implementation of low cost solutions like aggregated DER portfolios. Furthermore, transmission-level market operators have generally only had visibility down to the transmission/distribution interface. As DER look to provide grid services at both the distribution and transmission levels, metering, telemetry, and other data and visibility requirements for assets providing grid services will need to be updated.
- **Lack of universal DERMS definition:** The wide variety of management tools that have emerged because of technology advances in the DER software space has created some confusion around how each software tool is defined. Though some tools can accomplish similar objectives, this confusion has convoluted the procurement process for DER management tools for potential stakeholders—which can leave prospective buyers frustrated and distrustful of potential vendor and integration partners.

- **Cost and complexity of DERMS deployment:** While activating aggregated DER portfolios can come at a lower cost than conventional fossil fuel power plants, DERMS platforms themselves are still advanced software systems that can require extensive product investments and integration efforts. Integration efforts may be required in both software and communications, as well as in organizational restructuring and human capital investment. DERMS platforms can be expensive because of the control capabilities and required number of integration points. High deployment costs and complex system integration processes may prevent some resource-constrained stakeholders from pursuing a DERMS.

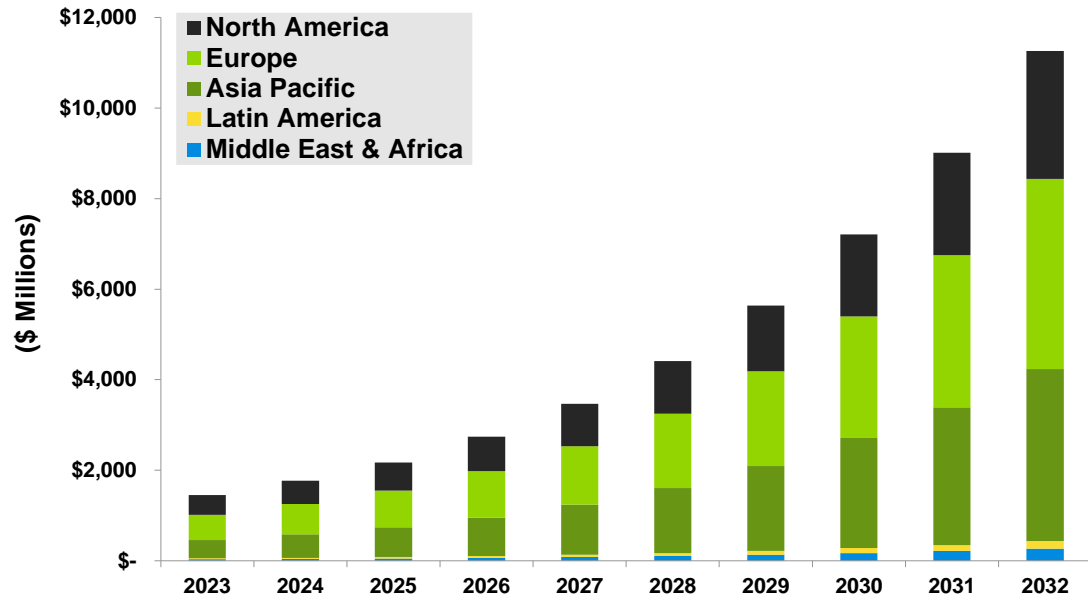
2.4 Market Trends

Grid and DER software advances in recent years have pushed the functionalities of various DER management platforms closer together. The need for an end-to-end DERMS platform is arising as DER adoption continues to increase and more renewable energy capacity comes online. Large, established players in the energy technology market have started partnering with or acquiring newer energy technology companies to keep pace with the changing energy landscape. The types of DER assets registered, managed, and controlled by DERMS platforms are also becoming more mixed as controllable loads (e.g., smart thermostats, EVs, electric water heaters, commercial and industrial [C&I] processes), distributed generation, and distributed ESS are adopted by consumers. This has forced DERMS providers to adjust their platforms to make them more scalable and capable of interfacing with a variety of hardware types and vendors.

All companies considered in this report have made significant advances in the functionalities of their DERMS platforms since the last iteration of the *Leaderboard*. Most companies profiled for this report also expressed interest in further developing automation, AI, and machine learning capabilities as part of their product roadmaps. The deployment of DERMS platforms by utilities, IPPs, and DER aggregators varies by region and will depend on the rate of DER adoption, the regulatory landscape, and grid constraints.

Chart 2-1 shows estimated revenue for DERMS platform providers in world markets from 2023 to 2032. Globally, revenue for DERMS providers is projected to grow from just under \$1.5 billion in 2023 to nearly \$11.3 billion in 2032 at an average compound annual growth rate of 25.6%. Europe is anticipated to lead in terms of total annual revenue throughout the forecast period, while the Asia Pacific region is expected to have the fastest growth rate.

Chart 2-1. DERMS Revenue by Region, World Markets: 2023-2032



(Source: Guidehouse Insights)

Section 3

The Guidehouse Insights Leaderboard

3.1 The Guidehouse Insights Leaderboard Categories

Guidehouse Insights scored the vendors in this *Guidehouse Insights Leaderboard* according to four categories: Leaders, Contenders, Challengers, and Followers. These categories are defined here.

3.1.1 Leaders

Leaders are vendors that scored 75 or above in both Strategy and Execution. These companies have clearly differentiated themselves from the competition through exceptional development, strong supplier relationships, and a sustainable business model. Leaders are currently in the strongest position for long-term success in the DERMS market.

3.1.2 Contenders

Contenders are vendors that scored between 50 and 75 in both Strategy and Execution. While these companies have a solid foundation for growth and long-term success, they have not attained a superior position in the market. They are well positioned to become Leaders but have not yet fully executed their product launches, need to differentiate themselves via a more comprehensive DERMS solution or cost breakthroughs, are seeing weaker than expected demand, or have limited market penetration.

3.1.3 Challengers

Challengers are vendors that scored higher than 25 in Strategy and Execution but are not yet contenders for market leadership. While the vendors are fundamentally sound, they face significant challenges stemming from a lack of strategic vision or investments, or risks to successful potential execution. Challengers may also be early in their arc of DERMS launch, meaning their solution offers more limited capabilities, therefore resulting in Execution scores that are based on a small number of deployments. No vendors ranked as Challengers in this *Leaderboard*.

3.1.4 Followers

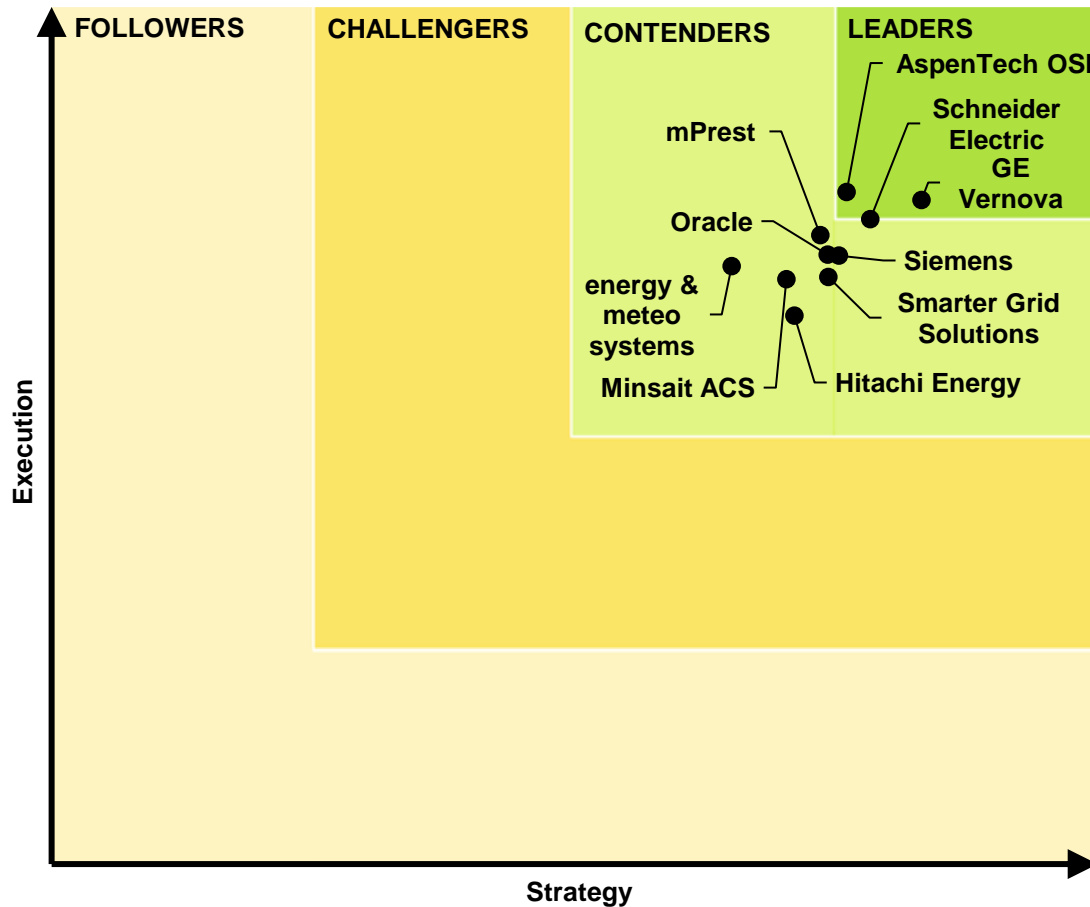
Followers are vendors that have failed to distinguish themselves and scored below 25 in Strategy and Execution. These companies are not currently expected to challenge the Leaders unless they can substantially alter their strategic vision and expand their resources. Their long-term viability is in doubt unless systemic changes are made within the organization. No vendors ranked as Followers in this *Leaderboard*.

3.2 The Guidehouse Insights Leaderboard Grid

The Guidehouse Insights Leaderboard Grid is a tool to help evaluate the relative strengths and weaknesses of vendors active in any major market. The DERMS market is highly competitive, and selecting the list of ranked vendors was challenging. Segmenting the DERMS space is becoming increasingly difficult as functionalities continue to converge and discrepancies remain around the exact role each platform plays. Many vendors came in just shy of *Leaderboard* inclusion, and there is potential for significant change in these rankings in the coming years.

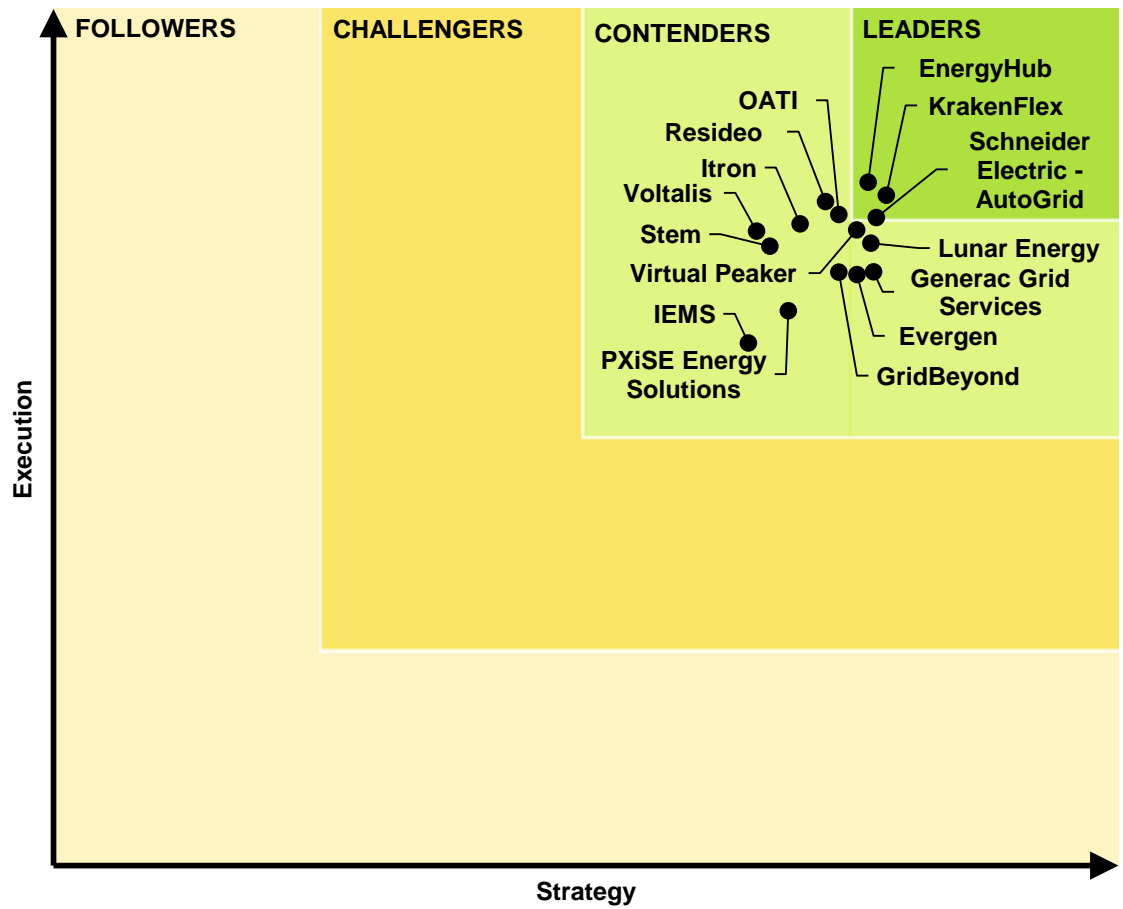
To accurately compare platform capabilities, vendors were segmented according to their platform’s primary use case (grid versus grid edge) and scored according to their competitors in that space, with each group of companies shown on a separate Leaderboard Grid. These platform types are closely linked, and many of the providers’ platforms can perform functions in both realms, but typically, the platforms were designed for one use case more than the other.

Chart 3-1. The Guidehouse Insights Leaderboard Grid: Grid DERMS



(Source: Guidehouse Insights)

Chart 3-2. The Guidehouse Insights Leaderboard Grid: Grid-Edge DERMS



(Source: Guidehouse Insights)

The process for ranking these providers is becoming more complicated as additional stakeholders look to utilize DER capacity for grid services through a variety of channels. Furthermore, ranking vendors in the DERMS market is challenging due to the lack of available transparent data on the performance of software products after they are initially deployed for utilities or other stakeholders. These rankings reflect the competitive nature of the DERMS market.

Table 3-1. The Guidehouse Insights Leaderboard Overall Scores

Rank	Company, Grid DERMS	Score	Company, Grid-Edge DERMS	Score
1	GE Vernova	80.4	KrakenFlex	78.2
2	AspenTech OSI	77.2	EnergyHub	78.1
3	Schneider Electric	76.8	Schneider Electric – AutoGrid	76.4
4	mPrest	73.5	Resideo	75.0
5	Siemens	73.2	OATI	74.9
6	Oracle	72.7	Virtual Peaker	74.8
7	Smarter Grid Solutions	71.4	Lunar Energy	74.7
8	Minsait ACS	69.3	Generac Grid Services	73.3
9	Hitachi Energy	67.6	Itron	72.5
10	energy & meteo systems	67.4	Evergen	72.3
11			GridBeyond	71.5
12			Voltalis	70.1
13			Stem	69.8
14			PXiSE Energy Solutions	66.9
15			IEMS	63.2

(Source: Guidehouse Insights)

Section 4

4.1.1 GE Vernova

Overall Score: 80.4

Strategy: 83.2

Execution: 77.5

In November 2021, General Electric (GE) announced it would be restructuring to form three separate, publicly traded companies, each with a different focus area: renewable energy, healthcare, and aviation. The company focusing on renewable energy, named GE Vernova, was formed through the combination of legacy GE business areas: power, renewables, digital, and energy financial services. The company is planning to execute the tax-free spin-off of GE Vernova in early 2024, to be headquartered in Cambridge, Massachusetts. In December 2021, GE acquired Opus One Solutions, allowing the companies to integrate their two DERMS technologies.

GE Vernova's GridOS DERMS platform primarily focuses on grid DERMS use cases to determine where flexibility is needed because of DER operations. The microservices-based platform offers deployment flexibility and interoperability with existing systems and vendors. The solution provides a comprehensive set of functionalities, offered through a modular architecture, with a focus on optimizing the use of DER to help manage the grid. Use cases include DER optimization, real-time operations, interconnections management, planning, scheduling, modeling, forecasting, and simulations. The GridOS DERMS offering utilizes power flow-based optimization to determine flexibility requirements, how to best meet them, and what level of coordination between transmission and distribution (T&D) systems is required. The platform offers a fully grid-aware network model and can create dynamic operating envelopes for DER that allow flexible operation of the assets while still respecting grid physics constraints.

GE Vernova's DERMS solution integrates with an array of utility software systems, including ADM, geographic information, energy management, market management, and SCADA systems. Furthermore, the platform interfaces with an array of DER hardware vendors and aggregators through industry standards including SCADA, IEEE 2030.5, and OpenADR Alliance. The company can deploy its GridOS platform through a hybrid cloud architecture, combining aspects of on-premises and cloud-hosted solutions. To tackle grid-edge use cases, GE Vernova partners with providers in that space. In 2023, the company announced a partnership with grid-edge DERMS provider EnergyHub, as well as flexibility market service providers EPEX SPOT and NODES, to help utilities streamline the management of DER. While these partnerships are not exclusive, they drive industry leadership in defining and standardizing the interaction between grid and

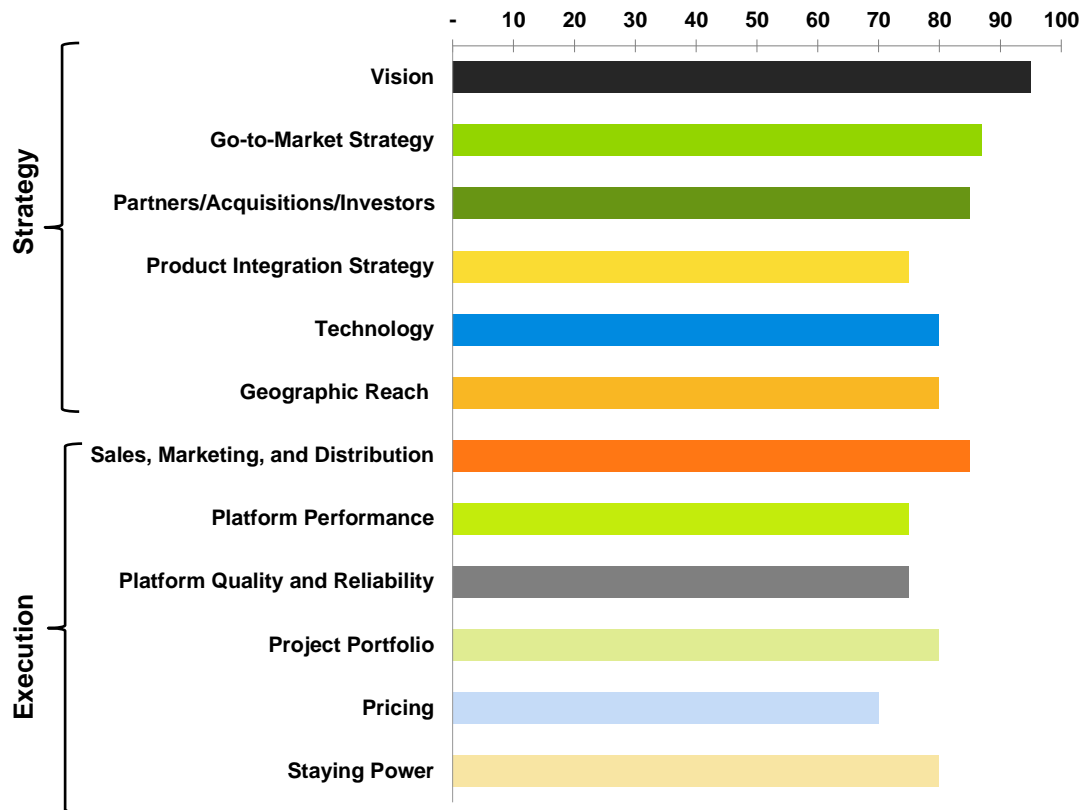
grid-edge DERMS and flexibility market platforms, laying the foundation for the wider adoption of VPPs at scale in all regulatory regimes.

GE Vernova tops the rankings because of the company’s technologically sophisticated platform (bolstered by its acquisition of Opus One Solutions), flexible deployment architecture, extensive partnership network that includes both DER vendors and grid-edge DERMS providers, and well-developed integration strategy. The company also has significant experience launching large-scale DERMS deployments for grid operators in a variety of geographies around the world.

GE Vernova earned a score of 95 in the Vision category due to its leadership in characterizing and normalizing the synergies between grid DERMS, grid-edge DERMS, and flexibility market platforms. The company earned an 85 in the Partners/Acquisitions/Investors category because of its strategic acquisitions and partnerships with other prominent technology companies in the DER management space, including EnergyHub, Opus One Solutions, and Greenbird.

governova.com

Chart 4-1. GE Vernova Strategy and Execution Scores



(Source: Guidehouse Insights)