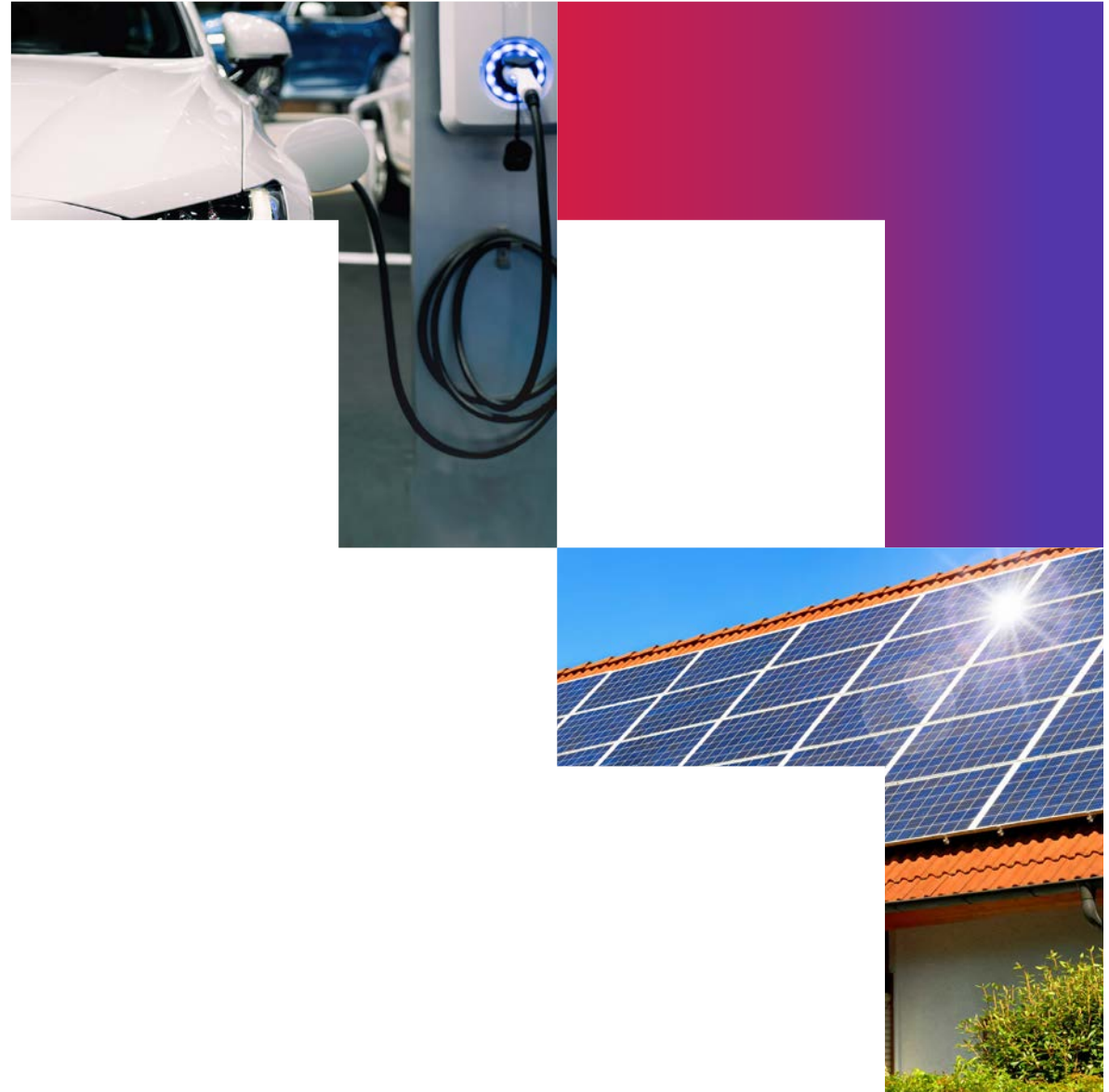


Ready to invest in DERMS?

Strategies to support your
grid modernization journey

Viewpoint

CGI





Embracing the energy transition

Utilities are in the midst of unprecedented transformational change. The rapid adoption of distributed energy resources (DERs), evolving regulatory mandates, and growing expectations from customers participating in the energy ecosystem are driving this evolution at scale and pace.

Along with the energy transition comes a significant change in how utilities operate. The grid control model has shifted from a one-way power flow to a distributed two-way power flow, where both utility and non-utility resources generate power. The increase in customer-owned DERs and electric vehicles (EVs) generates variable and unpredictable energy, making it difficult for utilities to forecast their available load for optimized grid reliability.

What's more, utility executives need to provide safe, reliable and affordable energy supplies and achieve decarbonization, as mitigating climate change has become a top priority. This requires a comprehensive approach to managing network infrastructure, specifically DERs and their impact on a utility's systems. Yet, the collection, integration and analysis of data from grid assets are increasingly complex and challenging to manage.

How can utilities continue to deliver resilient, reliable and secure power in the face of this transition? The answer lies in modernizing their grid with newer systems to derive maximum value from grid assets all the way to the grid edge, including those behind the meter.

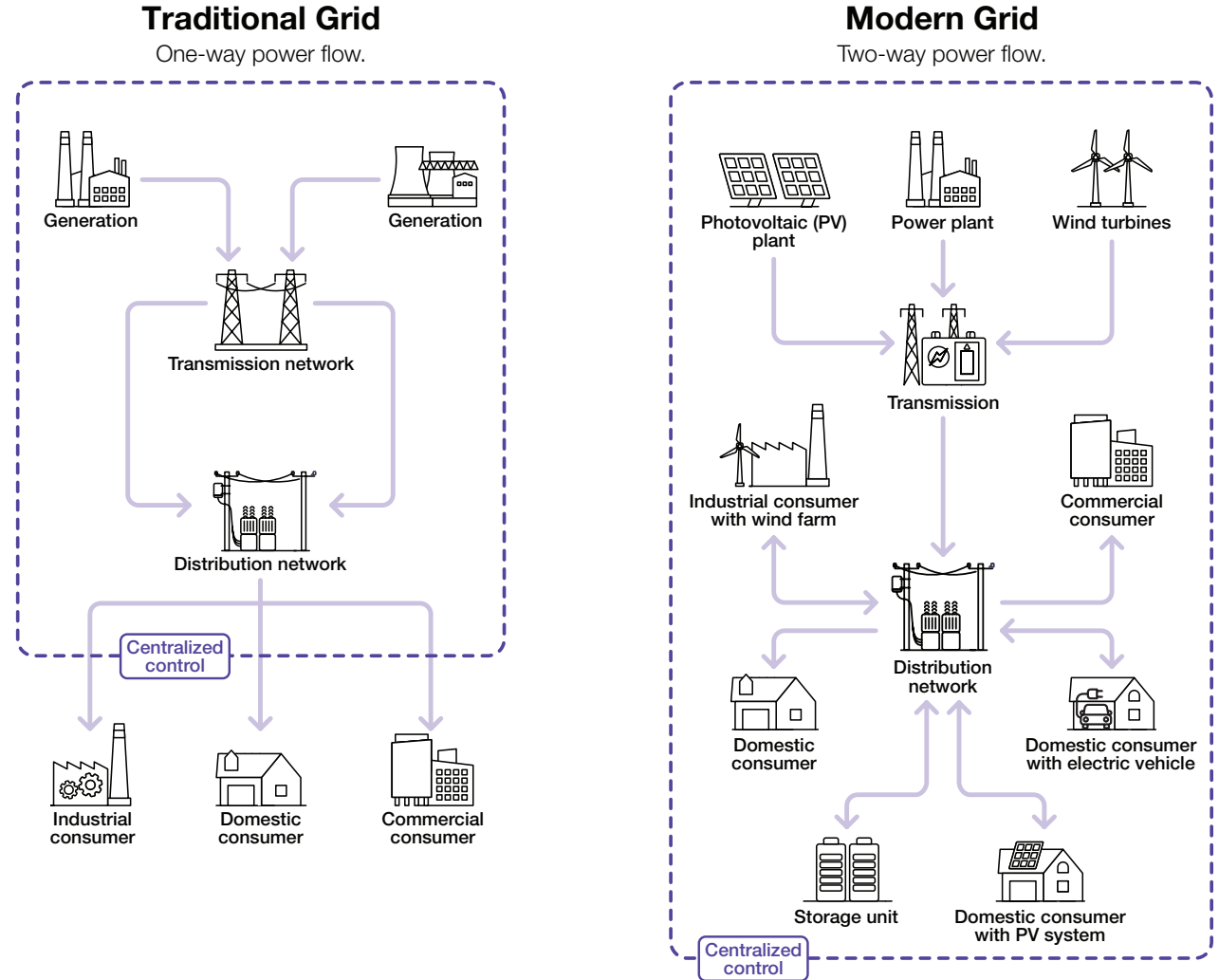
Grid modernization is fueling increased investment in distributed energy resource management systems (DERMS) software, which helps orchestrate and optimize the data and operational activity of DERs across the utility network.

While some utility solution providers have limited DERMS offerings, utilities urgently need a comprehensive, enterprise-caliber solution with broader functional coverage to enable complete visibility of the grid. However, according to leading industry analysts, currently, no vendor can meet all requirements in a single DERMS suite. As a result, the role of a strategic partner is ever more critical to help utilities navigate market dynamics and position for the energy transition, wherever they are on their grid modernization journey.

This paper discusses the tools and capabilities required for successful DERMS deployment for grid modernization. Selecting the right strategic partner is important to best position a utility to embrace the energy transition in alignment with its business goals—regardless of where the utility is today in its grid modernization journey.

As new regulatory mandates such as the U.S. Federal Energy Regulatory Commission (FERC) 2222, New York State’s Reforming the Energy Vision (REV) initiative and the European Union’s Renewable Energy Directive accelerate the deployment of DERs and remove barriers to entry for new market participants, a significant influx of entities will enter the market and sell power across the grid. Utilities need to gain critical insights into all assets providing power to ensure grid resiliency, safety and security.

The energy transition – a visual guide.



Utilities need to embrace the energy transition through grid modernization efforts to provide safe, reliable, affordable and sustainable energy to their customers. According to CGI's Voice of Our Clients findings, 77% of C-level energy and utility executives rank the impact of sustainability on future value creation as high.

Components of grid modernization



The urgent need for utilities to integrate and orchestrate DERs to retain network safety, security and reliability is a significant driver for technology optimization and grid modernization. Modernizing the grid entails upgrading the hardware and

software elements that make up the electricity network. Starting with the software can reduce the overall cost of hardware investments, helping to keep grid modernization efforts affordable, reliable and secure.

The components for successful grid modernization include:

- Deploying an enterprise-level DERMS to securely monitor and control remote devices at the grid edge as well as manage device and market data to support market transactions;
- Bridging the gap between the DERMS and the outage management, mobile workforce management and billing and fulfillment systems through an enterprise-wide data initiative and comprehensive network data model;
- Enhancing customer engagement systems with data-led insights to improve the overall customer experience.

Focusing on the first component of deploying an enterprise-level DERMS, utilities need to consider how this system will not only help them manage near-term requirements, but also how it can be flexible, secure and scalable for evolving needs in the future. For example, a key goal may be to decarbonize the existing grid along with future electricity demand as new regulatory mandates roll out and the adoption of renewable assets increases.

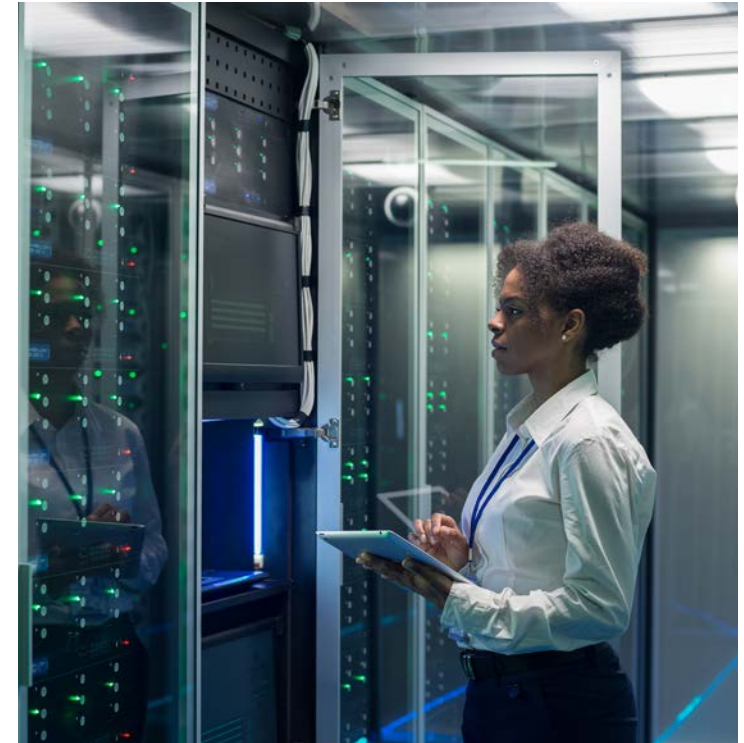
Data and enterprise-level DERMS

When it comes to technology platforms in the utility ecosystem, data is the essential component. Without access to quality structured data, new systems are not able to generate insights and add value. Specifically for DERs, as the number of distributed assets on the grid increases, the volume of data from those assets also grows exponentially, making it even more critical to manage. While data today is often buried in technology silos and overlooked, an enterprise-level DERMS with a comprehensive network model is able to interface and exchange data with other enterprise and legacy systems—breaking data silos across the distribution utility network.

A DERMS can be considered the system of record for all asset data related to DERs and their operations, providing a potential goldmine of information. As there is vast intelligence to uncover, pivoting to treat data as an asset will be game-changing, helping utilities facilitate their transformation and also better enable the integration of other systems, including advanced distribution management system (ADMS) and customer information systems (CIS).

For instance, an ADMS implementation is far more likely to deliver benefits if there is an underlying network model to deliver the quality data needed to support automation, providing intelligence to forecast, predict and achieve higher levels of resiliency and operational optimization. Data also allows utilities to engage in a meaningful two-way relationship with customers by providing better insight to understand their needs and expectations for more personalized service.

The components of grid modernization enable utilities to adapt to the rapid pace of change as the industry shifts toward a distributed energy model. All of this needs to be executed in a secure environment as more and more computerized controls and assets need to be protected from cyber infrastructure attacks and breaches. Thus, solutions with built-in security measures will be vital in strengthening safeguards and helping protect against cyber risks to enable safe network operations.



Grid modernization is critical for utilities preparing for the energy transition. The implications of DERs, how they will change the industry and the expected business outcomes will be top of mind for executives as their journey progresses.

Essential partner tools and capabilities

Successful DERMS implementation requires utilities to have a strategic partner with deep industry, technology and domain expertise. An ideal partner has an established track record of helping utilities advance in markets globally, which reduces risk by leveraging best practices and proven approaches for utilities seeking to take the next step toward grid modernization.

It is also important for the right partner to provide a holistic approach so utilities can view their network infrastructure from end-to-end, enabling the visibility needed to maintain network resilience and successfully manage and integrate renewable assets into the grid. To navigate the increased complexity of DERMS deployment, the partner must have the expertise required to address the volume of data generation and consumption and the dual nature of central and distributed system architectures.

The following pages highlight three essential tools and capabilities that a strategic partner should provide for successful DERMS deployment.

Utilities are more likely to successfully modernize their grid if they have a strategic partner with the tools and capabilities needed to gain greater insight and control of various distributed assets operating on the grid—making sense of the increasingly complex electricity network.





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A robust network data model that integrates both utility and non-utility-owned assets into an ecosystem

A DERMS solution will generate and consume significant volumes of data, which can be used for critical business insights or potentially turned into revenue streams. Comprehensive data management capabilities that enable secure data governance and focus on data quality will support advanced analytics and holistic orchestration to maximize value from grid assets. A strategic partner needs to provide a robust data network model that can collect, store, manage and uncover insights from assets on the grid all the way to the grid edge.

Case study: Unlocking data insights for a sustainable future grid

In the U.K., Western Power Distribution, now National Grid, partnered with CGI to build a digital network data model for the future. It puts network data at the heart of the solution by providing a data integration platform that presents a digital reference model of the utility's network at any point in time. As the company transitions from a distribution network operator (DNO) to a distribution system operator (DSO), the data platform helps drive performance and efficiency from the electricity network and meet future energy demands of customers by managing real-time energy flows and leveraging data insights to optimize existing network capacity.

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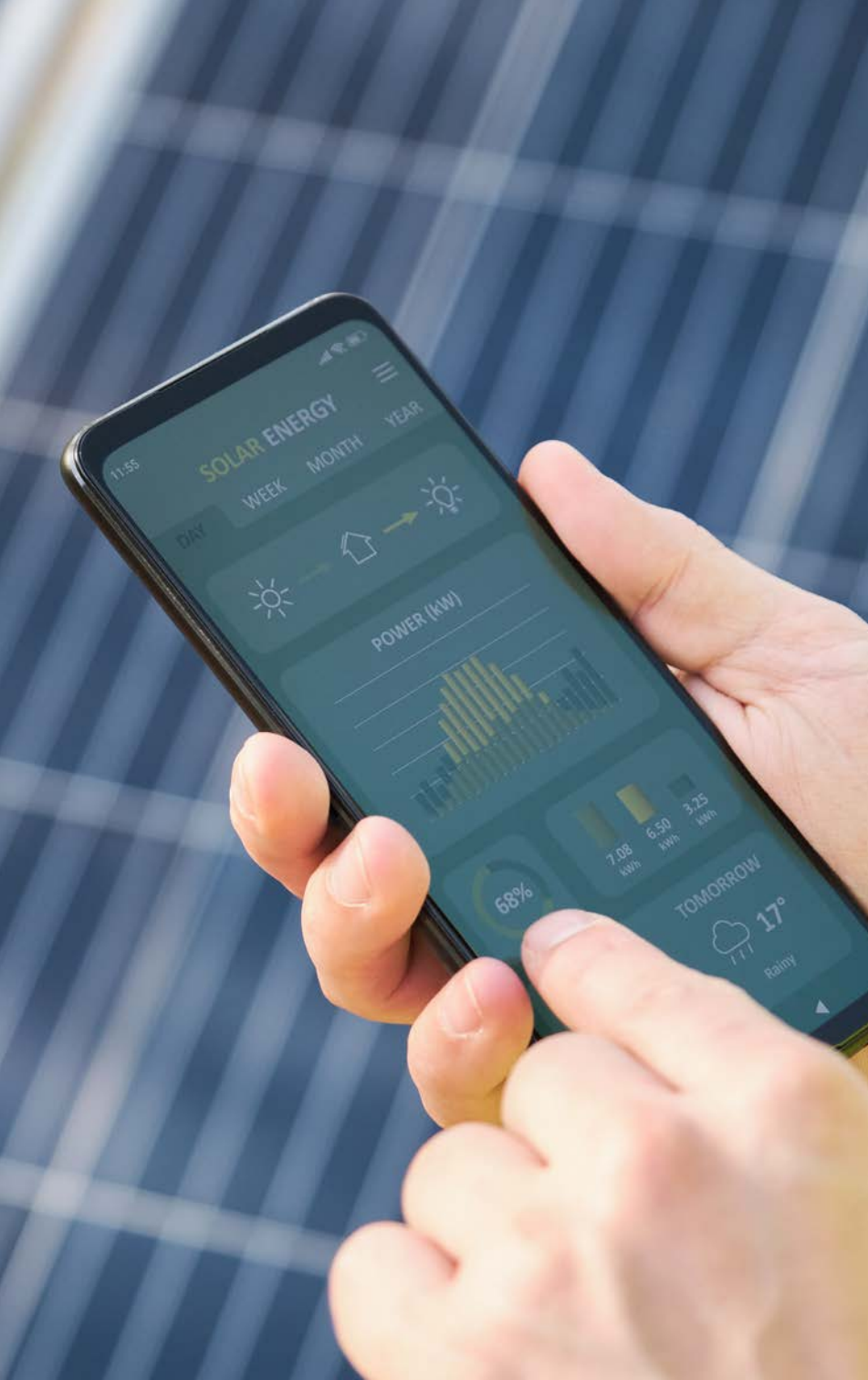
A technology roadmap that meets a utility where it is today and helps drive future releases in partnership

Utilities need a flexible and agile approach, which in turn means having a strategic partner that can architect, anticipate and navigate internal and external changes. It is vital to establish a relevant roadmap that aligns with a utility's business objectives and is regularly reviewed across the business and IT groups, along with other functions. A strategic partner can help focus on what data and information a utility needs to incorporate into its roadmap to support network operations, provide insight and information to key stakeholders, and drive greater expectations for more personalized customer service. Additionally, the technology roadmap should be phased to deliver value in bite-sized chunks, making it realistically attainable.

Case study: Next-generation electricity information exchange supports new energy communities

As Finland moves closer toward a smarter, cleaner and more flexible energy system, Fingrid partnered with CGI to implement Datahub, a new centralized information exchange system for the retail electricity market. Powered by CGI's Central Market Solutions, Datahub centralizes approximately 3.8 million energy data points on a single platform—providing a foundation for smart grids and smart meters and new services for energy efficiency monitoring, electric vehicle charging, demand-side energy management, and distributed electricity generation. New retailers and suppliers can quickly enter the market, and customers have increased visibility to compare services and change suppliers efficiently. Leveraging real-time data for market transparency, monitoring and collaboration, Datahub aligns with Fingrid's technology roadmap, providing the flexibility to adjust for future needs and support the Finnish society with new, more sustainable energy production models.





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The ability to implement large-scale, complex IT solutions

The IT effort required for DERMS deployment is significant. It should not be underestimated as it requires integration with multiple IT and OT applications, including ADMS, demand response management systems (DRMS), virtual power plant (VPP), geospatial information systems (GIS), meter data management (MDM) and supervisory control and data acquisition (SCADA) systems. New IT and OT mindsets are required, and buyers of DERMS must recognize that the culture, mindset and technology will evolve as a utility aims to maintain a resilient energy system. Thus, a strategic partner with deep systems integration expertise, as well as culture and change management experience, will be a critical enabler for success.

Case study: Modernizing through merged IT platform transformation

Alectra Utilities, North America's second-largest municipally-owned electric utility serving nearly one million customers in Ontario, sought to align and transform its IT and business operations following the merger of PowerStream, Enersource, Horizon Utilities and Brampton Hydro. The company chose CGI to provide business transformation consulting, assembling best-fit partners and providing overall project governance and systems integration services of multiple platforms to deliver a single digital customer information system. To modernize and transform its services, Alectra relies on CGI's industry expertise and experience—ensuring that its systems provide innovative energy solutions to families and businesses across Ontario today and into the future.

Benefits of the right partnership model

From being able to better forecast, predict, balance and optimize the available energy load to protecting their position as the energy advisor in the eyes of their customers, the potential for utilities to drive unprecedented levels of performance has become a reality. Working with the right strategic partner is the most efficient way for utilities to capitalize on the power of their assets across the electricity network infrastructure—ultimately delivering higher levels of energy resiliency.

Here are the key benefits of working with the right strategic partner:

- Flexible support and evolving roadmap – ensures that a utility manages and adheres to changing regulations and can adjust to meet future needs.
- Access to a comprehensive data model – delivers capabilities that enable a utility to manage and analyze data from assets across the enterprise, regardless of ownership.
- Expertise and experience – provides a utility with a proven approach to transformation that considers the client's unique environment and aligns a solution to its goals while reducing risks.



Successfully deploying DERMS with the right partner



Utilities are in a period of transformational change. The opportunity to unlock the power of a modernized grid has never been greater, or more within reach, by using the latest digital technologies. Choosing the right partner to help deploy a holistic DERMS approach is an important decision that utilities must carefully consider as they pursue the energy transition.

The investments made now can position utilities for success today, and into the future, driving how they deliver reliable energy for customers while also employing modern business models that support new products and revenue streams. Combining deep domain and systems integration expertise with a robust and proven technology roadmap through partnerships will be essential for success.

With the right partner, today's comprehensive and innovative capabilities empower utilities to gain a holistic view of data, from underlying systems across the enterprise to the grid edge, to accelerate grid modernization and support a sustainable energy supply.

About CGI

Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

*Source for all statistics: 2022 CGI Voice of Our Clients

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