



Distributed energy
resource management
systems (*DERMS*)
optimization



Sustainably monitor distributed energy resources with awareness, forecasting, and control

Energy demands are pushing power grids to the limit, making grid stability and reliability growing areas of concern. Aging infrastructure also poses a significant threat to the reliability, efficiency, and quality of power. Older infrastructure is prone to failure, and that can jeopardize customer satisfaction, cause disruptions in service, and create safety concerns for customers and employees.

Complex market structures are also driving the need for utilities to adapt, especially as they experience increased government regulation, forecasting deficiencies, and demand variability. This creates a constant need for utilities to ensure that their processes are compliant and makes it difficult for them to predict demand and allocate their resources. These pressures are pushing utilities to evolve their operations.

As electrification and clean energy initiatives become more prominent and distributed renewable energy production becomes more common, utilities are also increasingly challenged by the increased presence of small-scale distributed energy resources (DERs) within their grids.

But utilities can optimize the demand and flow of energy on their grid to keep costs low, protect equipment, and offer new value to customers. Capgemini's expertise in distributed energy resource management systems (DERMSs) can help utilities efficiently manage DER throughout the grid.

Our approach focuses on three primary areas:

01



Awareness

Operators require the capability to monitor resources and equipment to obtain a 360-degree view of the grid.

02



Forecasting

Operators must be able to use data to forecast future energy demands and equipment requirements and strategize effectively.

03



Control / influence

As intermittent resources continue to impact the grid, utilities need to optimize the demand and flow of energy.



Creating a 360-degree view of the grid

Capgemini works directly with your business to plan and implement DERMS within the grid infrastructure. Our DERMS solutions incorporate the following capabilities:

DER device management	DER visibility and analysis	DER control	Grid services	Market interaction
Registration Asset configuration/ modeling Aggregator data exchange	Monitoring/ estimating Forecasting Aggregation Measurement and verification Planning	Scheduling and dispatch Optimization Curtailment Demand response	Energy management Capacity management Constraint management Power quality management Renewable smoothing Resilience/ microgrids Volt/VAR optimization	Bidding Settlement Transactive energy





Load monitoring and forecasting

DERMS platforms enable utility providers to monitor the impact of DER on the grid, and forecast operating state, voltage, frequency, and other key metrics. DERMS solutions are integrated to existing systems like advanced distribution management systems (ADMS), supervisory control and data acquisition (SCADA), geographic information systems (GIS), advanced metering infrastructure (AMI), and weather systems to collect and analyze historical data and forecast network conditions. These insights assist network operators in creating strategies for planning, operations, and energy trading.



Dynamic power curtailment

The increased deployment of DERs can lead to backups on the grid when improperly managed. This influx of energy must be accommodated by distribution networks. However, legacy systems are not always equipped to handle these new sources of power. This additional energy may subsequently be pushed back to the grid, resulting in increased voltage levels on feeder lines and backflows. This creates hazardous conditions that can potentially harm equipment, lead to uncontrolled power outputs, and place people in harm's way. DERMS platforms monitor and control the power output from renewable energy projects to protect people and equipment, while enabling more DER to be utilized across the grid.



FERC 2222 compliance

In 2020, the Federal Energy Regulatory Commission (FERC) issued [Order 2222](#) which requires utilities and wholesale markets to enable aggregated DER to participate in wholesale markets. Our DERMS solutions work with interconnection and planning tools to facilitate the use of DERs in the market, meeting FERC regulations.



Virtual power plants

Virtual power plants (VPPs) are networks of aggregated DERs that work similarly to traditional, dispatchable power plants. VPPs leverage aggregations of DER to provide local power to the grid, alleviate capacity constraints, offset power purchased in wholesale markets, and mitigate voltage and frequency issues.



Creating a clean energy future with Capgemini

Capgemini focuses on integrating technology and DERMS to create processes that offer real value to utilities and their customers. We are strategically positioned to help utilities navigate the pressures from customers and regulators to integrate clean energy into their operations.

We build clear business models that facilitate the adoption of renewable energy and DER, and help utilities adopt a DERMS platform that can help them incorporate clean energy in a safe, responsible, and profitable manner. Capgemini's technologies and industry expertise enable utilities to monitor, forecast, and control their energy initiatives, and realize the vast potential of renewable energy.

Contact us to realize the vast potential of renewable energy.





About Capgemini

Capgemini is a global business and technology transformation partner, helping organizations to accelerate their dual transition to a digital and sustainable world, while creating tangible impact for enterprises and society. It is a responsible and diverse group of 340,000 team members in more than 50 countries. With its strong over 55-year heritage, Capgemini is trusted by its clients to unlock the value of technology to address the entire breadth of their business needs. It delivers end-to-end services and solutions leveraging strengths from strategy and design to engineering, all fueled by its market leading capabilities in AI, cloud and data, combined with its deep industry expertise and partner ecosystem. The Group reported 2023 global revenues of €22.5 billion.

Get the Future You Want | www.capgemini.com

The information contained herein is provided for general informational purposes only and does not create a professional or advisory relationship. It is provided without warranty or assurance of any kind.

Copyright © 2024 Capgemini. All rights reserved.