Distributed Energy Resource Lifecycle Management
Oracle Utilities Grid Edge Solutions

Residential and business customers are adopting distributed energy resources (DER) at a historic pace. At the same time, data produced by the proliferation of connected devices—the Internet of Things (IoT)—is creating new pressure on utilities as these devices are added to the grid. In combination, these challenges are leading utilities to transform their business models by evolving distribution operations. Oracle Utilities Grid Edge Solutions provide end-to-end capabilities to manage this transformation, enabling utilities new pathways to business health.

Turn market challenges into business opportunities
With so much distribution grid innovation now being driven by consumers and policy, utilities need to quickly understand how to turn it into business opportunity. They can do so by evolving aspects of their business model, which can open up innovative ways of gaining revenue, improving asset performance and lowering operating cost, such as:

» Increasing customer choice to participate in demand response, load shifting, and the sale of excess and stored DER generation into other markets.

» Minimizing asset risk by identifying and managing negative performance patterns via cloud-based analysis and network modeling of DER sensor data.

» Alleviating utility constraint via demand response by leveraging both utility and consumer assets to dynamically shift output among generation resources.

The systems required to deliver this innovation must support new approaches to processes, such as automating device connection. Additionally, continuous communication from these resources to the utility and other devices needs to be enabled. And depending on the utility’s business model, third party service providers might also be part of the processes. As well, complex programs, billing, and load shifting must be reconciled with customers to ensure revenue. Oracle Utilities Grid Edge

KEY BENEFITS
• Gain new revenue streams from a value-based business model
• Meet renewable mandates and improve ability to serve customers
• Provide DER lifecycle management, connection through customer
• Use new data sources to optimize asset performance and reduce risk
• Defer capital expenditure by reducing the need for additional generation
• Reduce customer minutes of interruption via improved load profiling
• Plan for the cost of utility resources needed to support DER growth

ORACLE GRID EDGE SOLUTIONS
• Oracle Utilities Distributed Energy Resource Management Solution (DERMS)
• Oracle Utilities Customer Care and Billing
• Oracle DataRaker
Solutions delivers a platform for utilities to manage the entire connection-through-customer service process lifecycle for DER and connected devices.

**Quickly gain visibility to DER to leverage their value**

**Maintain an asset registry for all DER**

Much like sensor-based field devices and smart meters, DER create high volumes of very complex data, often real time, and though they are decentralized, they are still part of the grid infrastructure. Extracting value from that data—for demand response, innovative programs, outage management, load shifting and other benefits—begins by treating DER as assets so the work of integrating them into the network model—where they are visible—can be expedited.

Similarly to a traditional asset management system, Oracle Utilities Grid Edge Solutions provide an asset registry for all DER data. The registry is designed specifically for DER and their high-volume, real-time data, accelerating visibility to DER by speeding the connection of these resources via automation. The results are:

- A system of truth for information connecting DER to a customer record
- A real-time data source to improve visibility to the network for capacity planning and outages
- Historic and time stamp DER data for analytics to predict patterns leading to asset risk

**Model load and forecast growth to improve grid performance**

**Profile DER load impact by location and condition of use**

Rooftop solar, wind turbines, fuel, and storage—each DER asset type is different. Oracle Grid Edge Solution enables utilities to model the load profile of each and every distributed energy resource, accounting for location and condition of use.

By more accurately modeling load profiles and forecasting where and how DER growth will impact the grid, utilities can realize a number of mission-critical benefits, including:

- Reducing disruption and safety issues due to intermittency
- Eliminating the need to bring additional, costly generation resources online
- Minimizing customer minutes of interruption (CMI) via improved load profiling
- Improving resource planning to support DER growth

![Figure 2. Model DER load and aggregate for reliability, outages, and growth planning](image)
Connect consumers with the choices and providers they value

Increase program uptake and revenue opportunity

Once DER are visible to the utility and managed within the context of the network model, it’s all about delivering value-based service to customers. To do so, Oracle Utilities Grid Edge Solutions provide an interface for bulk power systems, retail markets, customers and the services they desire.

Oracle Utilities Grid Edge Solutions deliver industry-leading customer management needed for a utility to support a consumer energy marketplace so utilities can:

» Create rate structures for any level of program complexity and dynamically communicate to DER
» Directly connect customers with the 3rd party energy services they value
» Support residential, commercial and industrial customers
» Reach and communicate to customers when and how they prefer

Communicate in real-time to support customer choice and reliability

Manage beyond the meter through to the DER

As DER are integrated into the distribution grid, utilities will need communication channels that permit many different systems and devices to send commands based on customer choices. In certain instances, the utility will need to communicate beyond the meter and directly into DER to ensure these choices are effectively executed.

Additionally, data and commands must also flow among DER, operational systems, equipment like grid sensors, and load control devices to maintain reliability and meet peak demand.

Oracle Utilities Grid Edge Solutions provide the communication and data structure to serve as a single point of connection among DER, systems, and devices. Oracle Utilities Grid Edge Solutions handle all data gathering and command delivery for utilities to:

» Ensure efficient and timely flow of data to appropriate applications
» Provide data accuracy across utility and customer processes and minimize duplication
» Assist in outage detection and verification as well as restoration confirmation

Leading innovation at the grid edge

Oracle Utilities is the world’s expert in data management, enabling utilities to be at the leading edge of innovation. Combine that with the industry’s most complete suite of customer-through-grid solutions, and Oracle Utilities is uniquely positioned to help you turn the challenges of DER into opportunities—every step of the way.

To find out more about Oracle Utilities Grid Edge Solutions visit: http://oracle.com/industries/utilies.