



Ushering in a new era of dynamic, data-driven power

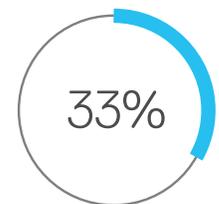
The electric utility industry is undergoing a period of significant disruption. With growing policy and public demand to offset utilization of nonrenewable resources, energy consumers can now rely on smart systems to completely monitor and control their customer experiences and consumption models. Producing their own distributed energy resources has become a reality for these prosumers through microgrids, solar photovoltaic installations, and small wind turbines. Enhanced consumption models are being further augmented with electricity-storage devices like large lithium batteries and the utilization of grid-connected electric vehicles (EVs). At the center of this period of change are regulated electric utility companies which must consistently manage energy production and distribution in real time while offering new types of customer-centric applications and services. These companies are also being challenged to “keep the lights on” amidst changing business models, competitive pressures, and increased volatility from natural, operational, and man-made interruptions.

To move forward with their digital transformation strategies, utility companies must consider the supporting technologies needed to rapidly respond to changing market dynamics, including:

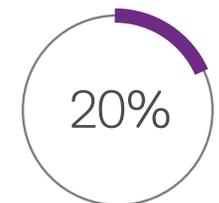
- **A modern infrastructure:** Delivering more effective and efficient services that are directly related to cost-to-serve customers starts with an agile, scalable, and automated infrastructure—one that supports new customer applications, advanced analytics, boosting reliability and security, and driving agile innovation.
- **Intelligent operational systems:** Smart systems deliver measurable value that prevent outages via predictive maintenance to improve production optimization, monitor weather conditions, and forecast demand and delivery models to ensure proper energy-demand responses. To enable these intelligent operational systems to function as needed, data must be collected, collated, analyzed, and interpreted from a wide variety of heterogeneous sources. An extensive network of Internet of Things (IoT) that spans from electricity generation, transportation, and distribution to prosumer-installed solutions must be combined with sophisticated data analytics that leverage artificial intelligence (AI) and machine-learning automation to extract the greatest efficiencies and business value.
- **Integration across edge to core to cloud:** The rapid accumulation of data from heterogeneous systems on different platforms and from different vendors requires the right levels of integration across the edge to core to cloud ecosystem. Aggregation and normalization at the edge of the network help deliver real-time responses, while smarter compute at the core and deeper learning in the cloud help drive new levels of operational innovation.
- **No-compromise security:** The threat of sophisticated cyberattacks aimed at bringing down critical infrastructure like electrical grids is all too real. Electric utility companies require security that is both predictive and proactive across all touch points, including IoT and monitoring centers, to deal with threats as soon as they are identified and before they are exploited. A comprehensive backup and recovery strategy is also needed for overall business continuity.

Power your digital transformation with Dell Technologies

As the market continues to evolve, electric companies need to transform their business model from one that is based on a linear, one-way power flow to one that incorporates a multidirectional, real-time, interactive, and data-driven exchange between the consumer and the utility. Dell Technologies provides the comprehensive portfolio of products, solutions, services, and partnerships needed for electric utility companies to become agile and dynamic producers and suppliers of increasingly clean, efficient resources.



of global power capacity is based on renewable energy.¹



of cybersecurity incidents reported in the U.S. were in the energy sector, more than all others except critical manufacturing and communications.²



is the projected market size for IoT in the energy and utility sector by 2024. Experts say this is due to the rising demand for smart grids.³

1. <http://bit.ly/2lulE40>
2. <http://bit.ly/2ks2486>

3. <https://on.mktw.net/2ICNCKI>

Figure 1. The Dell Technologies compute ecosystem extends from edge to core to cloud for overall performance, availability, security, and automation.



An integrated, scalable approach to advance in this new digital energy economy

Dell Technologies solutions for electric utilities are helping companies implement forward-thinking business models and operational processes across the energy continuum—including energy production, maintenance, transportation, and consumption. Our right-sized platforms bring together the latest in IoT gateways, cloud-ready hyperconverged infrastructure, powerful analytics engines, automation, partner solutions, and multi-cloud services, all backed by comprehensive security. This integrated approach (Figure 1) delivers the highest levels of performance, availability, security, automation, total cost of ownership, and scale across your grid to your monitoring centers and beyond.

Agility at the edge: Dell Technologies is ready today with powerful edge computing solutions from operational smart systems to IoT to workforce devices, enabling electric utility companies to respond to changing market demands in real time. Deploy and manage data-driven processes such as predictive maintenance of wind turbines, drone-based surveys and inspection, outage prediction and analysis, and demand response. Our [Dell Technologies Edge Gateways for IoT](#) make grids and sensors more responsive, automated, and interconnected through data aggregation at the edge. [EdgeX Foundry](#) provides a vendor-neutral, open-source framework for IoT edge computing to enable the use of plug-and-play components that unify the marketplace and accelerate deployment of services. For those on the front lines, equip them with Dell client devices like the [Dell Latitude Rugged Tablets](#) designed to withstand the most extreme environments.

Power at the core: A modern infrastructure is needed to support innovation. [Scale-Out All-Flash Storage](#) from the number one in enterprise storage,⁴ Dell EMC, provides fast, expandable capacity to respond to the rapidly evolving data demands of the electric utility industry. [Dell PowerEdge Servers](#) are optimized for data analytics and machine-learning performance to deliver real-time responses in the physical environment. Deploy advanced security across your entire network with [VMware NSX](#) and micro-segmentation. With

[Dell EMC VxRail](#) hyperconverged infrastructure, you can reduce operational overhead while delivering the core performance, reliability, and automation needed.

Seamless migration to a multi-cloud environment: Although traditional utility regulation has preferred the use of CapEx models to date, experts are forecasting a shift to cloud over the coming years.⁵ Data proliferation coupled with the need for digital customer engagement through mobile-friendly websites and real-time data accessibility is underscoring this requirement. [Dell Technologies Multi-Cloud Solutions](#) enable utility companies to reduce multi-cloud chaos with a consistent hybrid cloud approach. [VMware Cloud Foundation](#), for example, extends familiar VMware tools across a multi-cloud environment to help companies provision, monitor, manage, secure, and move data and applications back and forth among different types of clouds using a single management console.

End-to-end integration, support, and security: [Dell Boomi](#) provides powerful data and application integration across your heterogeneous IT environment, while [Pivotal](#) helps technical and strategy teams dynamically validate corporate strategies and continuously drive innovation with insights from rapid feedback loops. [VMware Pulse IoT](#) helps you build and support an edge ecosystem and automates IoT device management at scale. For no-compromise security across platforms, consider [RSA](#) for managed cybersecurity, [RSA Iris](#) for IoT security, and [Secureworks](#) threat-intelligence services to help protect sensitive customer information while preventing intrusion and disruption to critical services. Maintain business continuity for your monitoring centers with [Dell EMC Data Protection and Management Solutions](#), including backup and recovery.

Accelerate time to value with Dell Technologies

Utilities have become a two-way street. Gone are the days of unidirectional grid-to-consumer energy delivery. Today, consumers are demanding interactivity from their electric supplier while regulatory bodies are requiring the use of cleaner, more sustainable energy sources. Dell Technologies helps electric utility companies transform their businesses to stay ahead of these evolving market demands. Our global reach and single point of integration, service, and support mean that you can have the confidence to improve outcomes across the value chain. Dell Technologies helps you manage and scale next-generation energy systems and operational processes to deliver reliability, security, affordability, and individualized customer services.



[Learn more](#) about our solutions for utilities



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4. <https://dell.to/2YKdkQ8> 5. https://www.idc.com/getdoc.jsp?containerId=IDC_P29127
Figure 1: Home Electricity Icon by ProSymbols from the Noun Project.