Grid Modernization Road Map

Strategic Planning for a Changing Environment

The ways in which you plan, operate, and maintain the electric system, as well as interact with your customers, are rapidly changing. Across the industry, shifts in customer expectations, advances in technology, and changes to the generation mix are driving the need to modernize the grid. Each jurisdiction is approaching these changes differently, proposing divergent views of how the modernized grid should function, with many areas of complexity and uncertainty.

ScottMadden is ready to help you face these uncertainties and challenges with confidence. Our Grid Modernization Road Map will help you identify, prioritize, and justify the necessary investments to operate your electric system in an increasingly dynamic environment.

ScottMadden's Grid Modernization Road Map is a tailored combination of the following elements:

- Strategic-planning support for determining grid modernization goals and desired capabilities
- Current state assessment and gap analysis against desired capabilities
- Benchmarking against leading utilities based on ScottMadden's hands-on experience
- A prioritization construct to rationalize investments against your organization's capabilities, resources, and deployment timeframe
- Cost-benefit analysis modeling
- Regulatory-filing support
- Implementation project management and governance

These industry-wide changes to technology, customer preferences, infrastructure, and policy can be disruptive if unaddressed. Using these tools helps you proactively meet these challenges for long-term success.

GRID MODERNIZATION INVESTMENTS ROAD MAP (20-YEAR VIEW)

Areas	Definition	Example Investments	2020–2024	2025–2029	2030–2034	2035–2039
Foundational Systems and Infrastructure	Foundational IT and OT systems, equipment, and capabilities required to support other grid modernization technologies and use cases	▪ Advanced metering infrastructure (AMI) ▪ Geographic information system ▪ Advanced distribution management system (ADMS) ▪ Communications infrastructure	▪ ADMS ▪ AMI ▪ DSCADA ▪ Communications infrastructure ▪ Data management hardware ▪ IT/OT integration	▪ AMI ▪ Communications infrastructure ▪ Data management hardware	▪ Communications infrastructure	▪ Communications infrastructure
Distribution Automation	Distribution automation uses digital sensors and switches with advanced control and communication technologies to automate feeder switching, voltage and equipment health monitoring, and outage, voltage, and reactive power management	▪ Smart switches ▪ Load tap controllers automatically managed with Volt-VAr optimization (VVO) ▪ SCADA-capable voltage regulators	▪ SCADA switches ▪ Power flow controllers ▪ Breakers ▪ VVO	▪ SCADA switches ▪ Power flow controllers ▪ VVO	▪ SCADA switches ▪ Power flow controllers	▪ SCADA switches ▪ Power flow controllers
Grid Edge Sensing	Smart devices deployed across the grid that communicate with central operations and provide better visibility and situational awareness of the system	▪ Environmental sensors ▪ AMI edge devices	▪ Line sensors ▪ Transformer health sensors ▪ Environmental sensors	▪ Line sensors ▪ Transformer health sensors ▪ Environmental sensors	▪ Environmental sensors	
Tools and Analytics	Collection and analysis of a large quantity of data to provide meaningful information to support real-time and predictive decision making	▪ Analytics platform ▪ Data management hardware ▪ Asset health monitoring ▪ Power quality monitoring ▪ Outage impact analysis ▪ Work management optimization	▪ Asset health analytics ▪ Work management analytics	▪ Outage analytics ▪ Power quality analytics		
Flexible Resources	Resources that allow a system operator to better manage the grid while sourcing electricity from a more diverse supply mix, including distributed energy resources and intermittent generation	▪ Distributed energy resource management system (DERMS) ▪ Energy storage ▪ Microgrids ▪ Electric vehicle (EV) infrastructure	▪ EV supply equipment ▪ DERMS ▪ Energy storage ▪ Community solar	▪ EV supply equipment ▪ Energy storage ▪ BTM storage controls ▪ Community solar	▪ DERMS market functionality ▪ EV supply equipment ▪ Energy storage	▪ EV supply equipment ▪ Energy storage
Costs	Note: Orange shading represents relative magnitude of investment over time.					

By working with ScottMadden and using the Grid Modernization Road Map, you will:

- Gain insight into how peer utilities have responded to similar challenges
- Synthesize the diverse viewpoints of your organization into a comprehensive and cohesive solution
- Understand the benefits of each investment and its impact on customers
- Justify your grid modernization investments with cost-benefit analysis
- Maximize your investments by testing them through use cases
- Sequence and prioritize your grid modernization investments, establishing a strong foundation from which to build advanced capabilities
- Approach the regulatory process with a clearly articulated story and supporting exhibits
- Craft your grid modernization story with the help of a dedicated team of specialists
- Transition smoothly to project implementation, with the right metrics in place to monitor progress

ScottMadden can walk you through our process from start to finish. We combine proven strategic planning with practical implementation planning, providing you with a complete road map of your grid modernization investments and the support needed to hit the ground running. We can meet your needs wherever you are in the grid modernization journey. Choosing to work with ScottMadden means you are leveraging more than 35 years of unmatched industry expertise. Our experts have worked with hundreds of utilities, and we have hands-on experience implementing grid modernization efforts across the industry. Let ScottMadden help you plan for grid modernization to ensure that you continue to deliver for your customers and maintain safety and reliability in an increasingly dynamic environment.

Contact info@scottmadden.com to get started with your Grid Modernization Road Map.

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