



Reliability, Resiliency, and Sustainability Demands Provide Utilities Opportunity

Paul A. DeCotis

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ONCE-IN-A-GENERATION CHOICE

The availability of supply and certainty of delivery is more important now than ever, particularly for electricity and natural gas, as larger segments of our economy, including transportation, become electrified.

Natural gas is a dominant fuel in power generation due to its low cost and plentiful supplies. When used to generate electricity in natural gas combined-cycle facilities, generation can be ramped

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up quickly to meet loads as more intermittent and distributed renewable energy resources are added to the grid. The electric transmission and distribution infrastructure needs to remain equally reliable and resilient as it is transformed into a multidirectional power flow and two-way communications system to deliver electricity to customers. Given the age and state of our electric and gas industries, the United States has a once-in-a-generation opportunity to redefine the how and where infrastructure investments are made, and how equipment and materials are procured.

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Utilities have infrastructure investment needs that, if met with commercially available technologies that are sustainably sourced and strategically located, will lay the foundation for meeting customer demands in a reliable, resilient, and sustainable manner well into the twenty-first century. Given the opportunity presented, there is a very good chance that the life-cycle costs associated with meeting these demands can be lower than they might be otherwise if utilities wait too long to act or do not sustainably source or locate such assets. Investing in transmission and distribution systems, together with necessary information and operations technology as the grid is becoming more dynamic, can be done in a way that si-

multaneously improves reliability, resiliency, and sustainability. These investments will support the mobile, dynamic, and customer-centric twenty-first-century economy.

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Utilities are confronting challenges today, the least of which is navigating the rapidly changing political and regulatory landscape. In some regions of the country, state policy-makers are demanding greater investment in cleaner and domestic energy supplies, greater customer choice, and less utility ownership of assets. The administration in Washington is signaling intent to retreat back to greater reliance on fossil fuels.

ROLE OF UTILITIES CHALLENGED BY NEW TECHNOLOGY

The economic landscape is changing.

Such changes include the commercialization and rapid deployment of renewable energy technologies located closer to loads with the expanded functionality of smart inverters to provide ancillary services and control. Additionally, demand response resources can be called at a moment's notice to clip peaks, thereby eliminating the need for peak power generation, or in the case of gas, to heat and cool buildings. Add to this the fact that the economy is more dependent on electricity than ever and that customers are demanding greater choice and power when they need it where they need it (e.g., electric vehicle charging stations).

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utilities for the customer. In these areas, the customer relationship, which had historically been the domain of the local utility, is now splintering. Unless utilities are able to maintain a direct and dynamic relationship with customers, siting and building new backbone infrastructure to maintain reliability and resiliency will be jeopardized. Utilities might be the key to delivering services—particularly reliability and resiliency—at a low cost, because without scale, cost of delivery will increase for all customers.

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Once bypassed, if a customer is provided electricity or gas from a nonutility provider, the exclusivity of the utility-customer relationship is severed. A whole new suite of products and services can be accessed by customers through the new service providers. Utilities are currently precluded from providing products or services other than electricity and gas. In many parts of the country, utilities are also precluded from owning generation or renewable energy or demand management resources, which nonutility providers can offer.

Utilities will be forced to decide which business they want to be in—retail energy services or provider of the infrastructure backbone—leaving it to others to serve retail loads.

UTILITIES MUST RESPOND TO STAY RELEVANT—AN OPPORTUNITY

How utilities and regulators address these challenges will determine the future of the industry. Soon we will know if utilities will become the victim of technological innovations that they fail to take advantage of and be left behind.

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Cogent examples are presented by the rail and communications industries. Sectors of the rail in-

dustry were greatly affected by the development of the interstate highway system, personal passenger vehicles, and trucking. Other effects from the development of the transportation industry were urban sprawl and small towns bypassed by highways. Similarly, one can look at the communication industry, often an example used, and the impact that cellular technology had on landline telephone service. While these examples are not a perfect corollary, they do point to the scale of the disruption that can occur.

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Let's look at the changing industry landscape and the political and economic realities of the day as an opportunity rather than a challenge. Utility infrastructure is aging out, with post-World War II industrial-era transmission, distribution, and generation assets nearing the end of their lives. Many of these assets will be replaced in the coming decade, and they will not be replaced with in-kind technology. Physical assets being replaced will reflect current state-of-the-art technology and require new IT and OT systems to operate in a dynamic two-way communications system, and in the case of electricity, two-way power flows.

BEST MANAGEMENT TECHNIQUES WILL ENABLE SUPPORT

Investing in new physical assets and IT and OT systems will require large amounts of capital and support of regulators, host communities, and, ultimately, customers impacted by the siting of physical assets.

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efficiently with the future in mind. For utilities to have the support and backing of customers, communities, and regulators for making the investments needed, utilities need to be trusted and respected, as well as responsible stewards of the environment. Building new infrastructure using existing rights-of-way, without further obstructing view-sheds and sourcing materials responsibly, while protecting—and potentially even enhancing—local environments, will help build support for such investments. Building this support requires streamlining supply chains, using sustainable sourcing practices, ensuring quality and integrity of materials, and reducing energy and water use and waste.

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Advanced planning, good project design, and improving local communities and environments are key to sustainable energy infrastructure development. Many federal, state, and local planning agencies have adopted strategies to enhance local ecosystems taking full account of a project's impact on the environment and local communities through which a project traverses.

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If utilities are irresponsible in their planning and design and materials sourcing and negligent in addressing local community and environmental concerns, chances are high that such projects will not be supported or built—thereby inhibiting the utilities' ability to be the twenty-first-century utilities we all need and are desiring. 