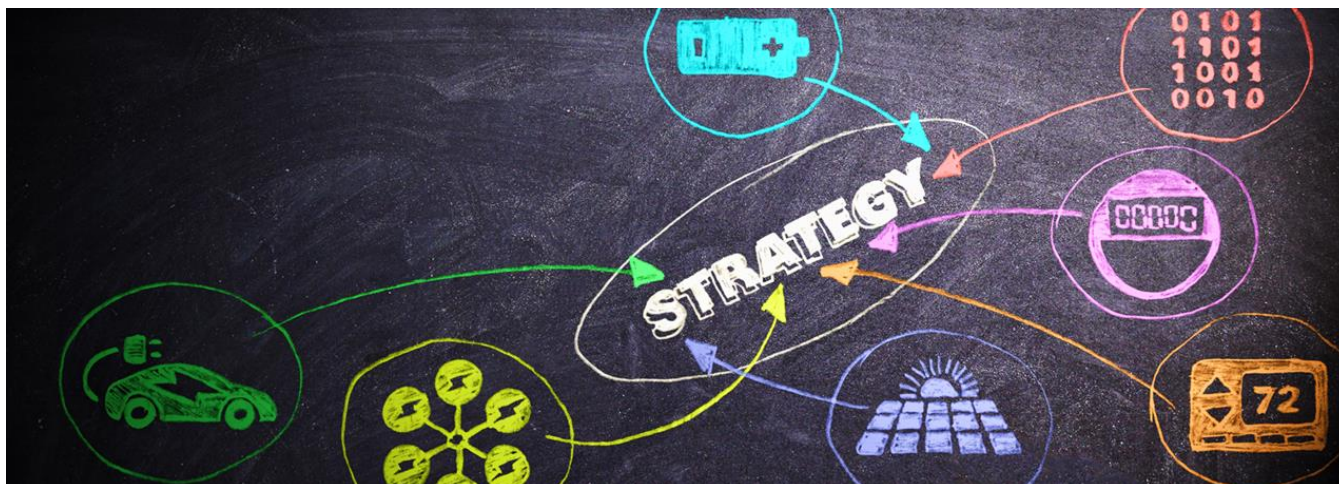


## Perspectives—Technology R&D: At the Heart of 21st Century Business Strategy



Significant changes are redefining the role of technology in electric power companies. To name just a few: Smart meters are providing more data that can enhance operations and reduce outage times. Distributed energy resources, batteries, and electric vehicles are reshaping the grid. Technology is revolutionizing basic functions such as dispatching, maintenance, and asset management. Improvements in voltage regulation are increasing grid efficiency. These and other changes span the full range of grid-related technologies. To play a critical role in any company's success, its technology strategies must align closely with business needs. Robust technology programs must be actively managed and agile if they are to deliver results in response to emerging needs.

How can this be achieved? In a [2002 study](#), EPRI and several member utilities, including Exelon, identified the most successful technology management practices of 11 leading non-utility companies, such as Norfolk Southern, BP Chemicals, UPS, General Electric, and Williams Energy. These practices included:

- Technology integral to business strategy
- A supportive corporate culture and senior management
- Teamwork between central and business-unit organizations
- Clear accountabilities and results focus
- Strategic collaboration with external partners
- Projects that focus on customer and market needs

At Exelon Utilities, these findings are particularly relevant today, and we have integrated them into daily business operations. Our three utilities—Baltimore Gas & Electric, ComEd, and PECO—cooperated to establish common technology R&D policies and frameworks. These assign accountabilities and define how R&D activities



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are identified, reviewed, and executed. We have also established R&D groups at the corporate level and in each of the three utilities. These groups manage R&D on a broad range of technologies spanning all utility functions. We track the utilities' R&D performance with clearly defined metrics related to technology gaps, investment management, advisor engagement, and technology transfer.

To ensure that we align our technology pursuits and business needs, we assembled key managers to assess technology gaps across 18 core functions, such as customer solutions, billing and payment processing, corrective and preventive maintenance, safety, human performance, and electric operations. They identified 118 technology gaps.

EPRI staff reviewed these gaps and identified EPRI R&D programs to address them. This helped us determine which programs to fund in 2016, including two areas not previously part of our R&D portfolio.

Through this rigorous approach, Exelon Utilities has significantly improved its R&D engagement, its alignment with business strategy, and the delivery of meaningful, timely results. In 2015, for example, we worked with EPRI and its [Energy Storage Valuation Tool](#) to determine the value and financial benefits of energy storage for seven applications. The analysis factors in the possibility that regulated utilities may not be able to sell energy from batteries into unregulated energy markets—a scenario that could limit battery storage application unless new legislative or regulatory models are adopted.

Another example: Some electrical equipment that was manufactured before the U.S. Environmental Protection Agency banned polychlorinated biphenyls (PCB) in 1978 may contain low levels of PCBs. When ComEd and PECO wanted to evaluate potential PCB contamination in about 650 distribution transformers, our utility R&D oversight group reached out to EPRI to develop a suitable project. The ComEd and PECO analyses relied on EPRI's nationwide U.S. [database](#) encompassing more than 345,000 data points, including manufacturer, size, date of manufacture, type of transformer, and transformer oil PCB content. The evaluation helped ComEd and PECO better manage PCB-related risks by removing from service transformers with greater contamination potential.

Our utility R&D oversight group helps the utility operating companies identify the best strategy for each R&D need. This requires a deep understanding of the capabilities of many public, private, and collaborative R&D organizations. Indeed, Exelon's technology gap analysis has led to work with other research organizations besides EPRI, such as the National Electric Energy Testing Research and Applications Center (NEETRAC), Power Systems Engineering Research Center (PSERC), and the Centre for Energy Advancement through Technological Innovation (CEATI), as well as directly with manufacturers. Aligning with these and other strategic technology partners is important in helping us shape and adapt to the future business environment.