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Breakthroughs Possible

ESTABLISH A GRID RESILIENCE TECHNOLOGY TEST NETWORK

Background

Our electrical grid's resilience is a major concern for national security and a stable civilian society. The 2015 Ukrainian grid assault, which cut power for six hours in the dead of winter, was widely seen by industry professionals as a wake-up call for the risks to the grid. Today's U.S. grid is built off a blue print that never imagined an internet or widescale adoption of renewable energy. Much progress in security and renewable integration could be achieved through the development of a nationwide advanced resilience technology (ART) test bed.

Proposal

Establish a national scale test facility that can help drive the Nation toward a more robust and resilient backbone for our clean energy future. The advance resilience technology (ART) test could evaluate and deploy technologies needed for a more resilient grid, establish a network comprised of existing microgrids on federal installations and other relevant facilities that can be managed and operated as a national user facility. The ART test beds should be run by a private entity (industry or other management organization) through a public-private partnership, and should be run like a user facility to allow industry, universities, and others to

propose and test technologies. The network would be composed of elements that could test individual components in situ all the way up to full end-to-end tests.

The effort would be a joint effort between the Department of Defense and the Department of Energy. Many of the existing elements that could be the base of such a network are currently at DoD and DOE sites. It could be managed by either agency (most likely the DOE) or under the auspices of a neutral agency. A possibility is to have the network run by the National Resilient Grid Authority (NRGA) as conceptualized in the [National Commission on Grid Resilience 2020 report](#).

Proposed Funding

Setting up and managing the ART network could range from \$25-50M/yr at the low end to perhaps \$200-300M/yr at the high end (the latter would include, for example, helping to develop national standards and protocols, pursuing collaborative technologies that would benefit niche applications, providing all of the funding to allow the in-situ testing so that there are no barriers to testing innovative ideas, and providing certifications for technologies).

This would build upon resilience and modernization efforts that were established and have been pursued in both DoD and DOE. Modernizing the grid and making it more resilient is a huge effort that will cost between somewhere north of \$500B and most likely in the \$1-2T range (most of it funded by grid operators, utilities, and rate payers at some level of pass through and perhaps <10% funded directly by the federal government). The ART network would be a critical part of the larger grid modernization effort.

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