# Nexant, ASU, and APS Awarded Department of Energy ARPA-E Grant

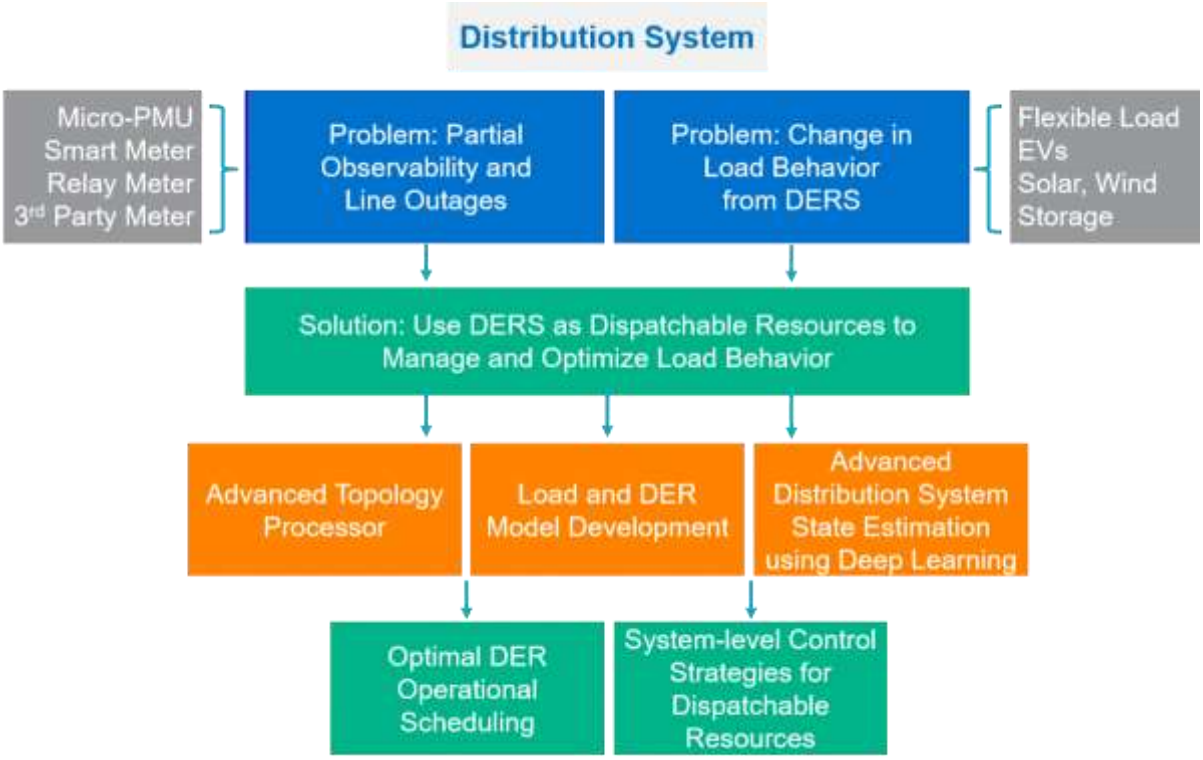
DEC 19, 2018

**SAN FRANCISCO, CA, December 19, 2018—** Nexant, Arizona State University (ASU), and Arizona Public Service (APS) are pleased to announce that they have been awarded a U.S. Department of Energy (DOE) Advanced Research Projects Agency-Energy (ARPA-E) grant entitled “Sensor Enabled Modeling of Future Distribution Systems with Distributed Energy Resources” for the amount of $2,800,000.

Receiving this grant is instrumental and allows for the development of a collaborative, innovative project that will revolutionize distribution system operations. Today’s reactive, load-serving, and outage-mitigation focused methods are insufficient because they do not effectively manage or optimize various dispatchable resources within the distribution network. This joint project will transform these methods via an active dispatchable resource, load, and outage-managed, market-ready methodology. The project will include an integrated approach to develop sensor-rich and learning-ready system models, state estimation, optimal scheduling, and system-level control strategies for dispatchable resources: photovoltaics (PV) with smart inverters, storage, capacitor banks, and regulators within distribution networks, allowing utilities to better manage and leverage these assets.

The primary objectives of this project begin with the development of accurate, sensor-driven mathematical models of APS distribution feeders, loads, and dispatchable resource assets. The team, led by ASU, will next develop enhanced topology error processing for meshed and looped primary distribution systems as well as fast, accurate, and scalable distribution system state estimators with advanced security and bad data detection and correction capabilities. The project will provide optimal scheduling of dispatchable resources to facilitate both active and reactive power control on distribution feeders.

The team will then design, tune, and validate the dispatchable resource controllers through hardware in the loop (HIL) simulation utilizing Nexant’s Grid360 to determine control capabilities, range, resilience, and robustness. The final stage of the project will be demonstration of the developed technology on an APS feeder with a high penetration of dispatchable resources.




“Nexant’s decades of experience and expertise managing and optimizing dispatchable grid edge resources provides a very strong foundation for validating the modeling, topology processing, state estimation, optimization, and scheduling developed during this innovative and exciting project” said John Gustafson, CEO of Nexant.

“This unique collaboration between ASU, Nexant, and APS will facilitate the development of advanced distribution modeling and analysis tools enabling the seamless control of a range of active controllers on distribution feeders including smart inverters, capacitor banks, and voltage regulators to achieve desired operating objectives” said Vijay Vittal, Ira A. Fulton Chair Professor at ASU.

"Real-world deployment of distributed energy resources and advanced grid technologies requires thoughtful and innovative solutions to leverage the capabilities of these technologies to positively impact the grid” said Daniel Haughton, Manager of Distribution Engineering at APS.

Contact us to join our mission to reimagine the world we live in and realize a more productive and sustainable energy future. For more information about Nexant's products and services, please contact John Dirkman, Vice President of Product Management, at jdirkman@nexant.com or +1-509-209-1766. For more information about ASU’s advanced research capabilities, please contact Vijay Vittal, Ira A. Fulton Chair Professor, School of Electrical, Computer and Energy Engineering, at vijay.vittal@asu.edu or +1-480-965-1879. For more information on APS please contact Daniel Haughton, Manager of Distribution Engineering at daniel.haughton@aps.com or +1-602-250-1620.

## ABOUT NEXANT

Nexant is a premier provider of technology enabled solutions to the Utility and Energy Industry focused on the next generation intellegent grid, distributed energy resources, and the digital customer experience. Operating from 20 offices in the U.S., Europe, Middle East, and Asia, the company's team of industry professionals has completed more than 5,000 engagements in over 70 countries. Nexant's clients include over 200 utility and software services customers. We work with over 300 chemical and petroleum majors, financial institutions, and Fortune 500 companies.

## ABOUT ASU

The Ira A. Fulton Schools of Engineering at Arizona State University (ASU) is one of the largest engineering programs in the United States with more than 22,300 students. The Ira A. Fulton Schools of Engineering offers 25 undergraduate programs and 41 graduate programs in its six schools. The Fulton Schools had $104 million in research expenditures in 2018, driving faculty, graduate and undergraduate research in core research themes: energy, health, sustainability, education and security.

## ABOUT APS

For more than 130 years, Arizona Public Service (APS) has powered Arizona’s growth, prosperity and innovation. Today, we provide 2.7 million people with safe, reliable and increasingly clean energy. Our 6,400 employees are dedicated to ensuring a bright energy future for Arizona.