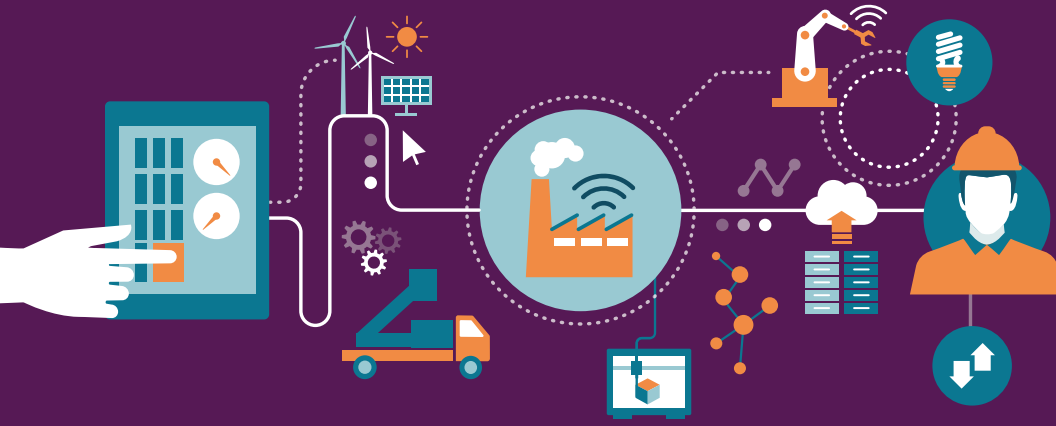


SUPPORTING INNOVATION

BY PUBLIC POWER UTILITIES OF ALL SIZES

DEED PUBLIC POWER™
RESEARCH & DEVELOPMENT

American Public Power Association

What is DEED?

The American Public Power Association's Demonstration of Energy & Efficiency Developments (DEED) is a research and demonstration program for public power utilities of all sizes.

Established in 1980, DEED spurs innovations that improve efficiency, reduce customer and operational costs, support adoption of new technologies, develop the workforce, or launch new products and services for public power communities.

Many public power utilities have used DEED funding to pilot new technologies and ideas before taking them to scale. They have also benefited from lessons learned and resources from projects completed by other DEED members.

Benefits of DEED membership

- Access up to $125,000 in funding for a single R&D project
- Get $5,000 for an internship or student research grant
- Get $2,000 for a scholarship
- Free access to webinars on DEED projects; 67 in archive, about 12 held each year
- Free and discounted access to DEED-funded publications and resources
- Networking, connections, and ideas through the DEED Innovation Exchange and listserv

Learn more about DEED membership at www.PublicPower.org/DEED or contact DEED@PublicPower.org or 202-467-2900.

In 2017, DEED...

$1.2 million

Awarded $1.2 million in grants and scholarships

21

Funded 21 new projects

23

Funded 23 scholarships technical projects, and student research grants

5

Recognized 4 utilities with an Energy Innovator Award and 1 utility with an Award of Continued Excellence

10

Funded 10 internships

13

Held 13 webinars

9

Released 9 projects through DSTAR

4

Released 2 publications, a power educational course, and new software

Key stats

In 2017, DEED members discovered …

… how schools can optimize learning environments with lighting temperature

Stoughton Utilities in Wisconsin researched different options for lighting in classrooms and the impact on students' learning and behaviors. Tunable lighting is an LED lighting system that allows a user to change the color temperature of a space's light. Stoughton retrofitted five high school and elementary school classrooms with tunable lighting and studied the effects reported by the students and teachers.

… the benefits of using drones

Researchers at North Carolina State University and ElectriCities of North Carolina explored the potential uses for unmanned aerial systems to support the operation and maintenance of public power distribution systems. The project estimated the cost savings and increased efficiency resulting from drone use, and took a deep dive into the capabilities offered.

… what services customers want from their utility

Fort Collins Utilities in Colorado explored ways to refine its customer adoption strategy for an efficiency program while putting the necessary infrastructure in place to install and manage accelerated levels of distributed renewable generation and energy efficiency. The project demonstrated an innovative utility business model that provides clean, reliable electricity to customers.

"A very good opportunity for new engineers to learn about Power Systems." **RONALD KREMMAN, LAKELAND ELECTRIC, FLORIDA**

… a way to get employees up to speed on the latest practices for power systems

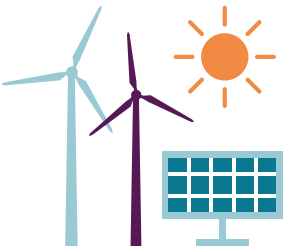
Memphis Gas, Light and Water in Tennessee developed a curriculum that public power utility employees can use to freshen up on the latest practices in power system engineering. The curriculum can also introduce non-power engineering staff to 23 topics, from distribution network modeling to relay coordination and reliability.

… how effectively a water heating system could double as a space heater for a building

Silicon Valley Power, along with Pacific Northwest National Labs, evaluated the energy efficiency and demand response performance of a new carbon dioxide combination heat pump unit relative to other technologies. The project reviewed the economics, performance, and demand response capability of the unit for a utility's use.

Explore more findings on the DEED Project Database, www.PublicPower.org/DEED-Project-Database

DEED MEMBERS COMPLETED 18 PROJECTS IN 2017.



In 2017, utilities recognized with an Energy Innovator Award shared how to:

- Use video to do home inspections
- Convert to an evaporative cooling system
- Increase participation in efficiency audits
- Establish a solar plus storage system

… an effective, alternative way to monitor diesel emissions through SCADA systems

Waverly Utilities in Iowa developed a replicable custom emissions monitoring system from a programmable automation controller and SCADA system. The report details how the system can be developed, maintained by staff, and meet national standards.

… what works in engaging commercial customers in energy efficiency

The Omaha Public Power District, along with four other public power utilities in a variety of climate zones, explored the elements of implementing a cost-effective and practical building management system to improve energy efficiency for commercial and industry customers. The project installed systems at 27 buildings and tracked energy savings and customer response.

Through DEED, public power utilities can collaborate with colleges and universities, research institutions, and businesses to expand the scope of R&D projects.

Similar to DEED, Distribution Systems Testing, Application, and Research (DSTAR) is a consortium of electric distribution utilities and utility organizations that collaboratively fund innovative electric industry research and development.

DEED joined DSTAR in 2010 to allow Association members access to DSTAR research and reports. In 2017, these reports included…

- mobile applications to test transformers and do load calculations.
- an analysis of the impact of solar PV on feeder voltage.
- considerations for using LED street lights.
- guidance for preventing and fixing motor problems.
- updates to cable pulling assistant software and analysis.

Learn more and access projects at
www.PublicPower.org/DSTAR-DEED.

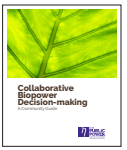
Even more to explore — with DSTAR

Sharing best practices

All DEED grants result in tools and information utilities can use to stay up-to-date and innovate. Join a DEED webinar to discuss the project details with the researchers, or access manuals, guidebooks, and other resources to review the latest practices on your own time.

In 2017, grantees shared how to…

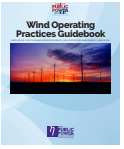
…have a meaningful discussion about biopower



Biopower projects can help to diversify a utility's power-supply mix and bring a variety of economic and environmental benefits to a community. Review the guidebook from the Florida Municipal Electric Association to learn how you can make decisions that reflect the interests of the entire community.

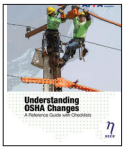
"[The webinar] did a very good job explaining the pros and cons of biopower and also the positions of all parties in the process for approval." — **JERRY FOGLEMAN, CITY OF ANDERSON, INDIANA**

…maintain excellent wind power operations



The Wind Operating Practices Guidebook, from the Utility Variable Integration Group, is a useful reference and training resource for technicians, managers, and engineers that covers the variety of considerations for wind power projects, from staffing and financing to maintenance and regulatory compliance.

…keep workers safe



Use the handy checklists in the Understanding OSHA Changes guide to verify if your practices are following the latest guidance from OSHA 29 CFR Parts 1910.269 and 1926 Supbart V.

…measure energy efficiency and demand response programs

Evaluating your Utility's Energy Services Programs, updated by Lansing Board of Water and Light, offers a comprehensive step-by-step plan for evaluating the efficacy of energy efficiency and demand response programs.

…educate communities about rooftop solar

Hudson Public Power in Ohio shared how they developed a solar initiative in the city, from educating community members about solar PVs to training the fire department about electrical safety with PVs.

"Excellent program. This seems like a great way to introduce solar to a community and learn how to interact with it safely." – **MARK MUSTAIN, MISSOURI PUBLIC UTILITY ALLIANCE**

Research grants and internships allow students to innovate, bring new perspectives to the utilities they work with, and explore future career options.

In 2017, research grants allowed students to work with utilities to:

Be better prepared for cyber attacks.
An intern with the Northern California Power Agency worked to develop a cybersecurity incident response toolkit.

Keep the bees and butterflies happy.
A student researched and planted pollinator-friendly vegetation that could thrive under solar panels in Wisconsin's River Falls Municipal Utilities community solar garden.

Predict and stay on top of weather-related outages.
Students worked with Bryan Texas Utilities on two separate projects: one to maintain control of certain systems in extreme weather events, and another to estimate where storm-related outages are likely.

What can students do with a DEED research grant?

Who participates in DEED?

930

930 DEED members

67%

67% of Association members are DEED members

278

Projects funded for 278 public power utilities in 45 states, the District of Columbia, Guam, American Samoa, and the US Virgin Islands

The DEED board, comprising public power representatives from each Association member region, reviews funding applications twice a year to make sure projects funded are relevant and applicable to public power utilities nationwide.

Dates to remember

February 15
Spring grant and scholarship application deadline

August 15
Fall grant application deadline

October 15
Fall scholarship and internship deadline

Learn more and apply at www.PublicPower.org/DEED.

AMERICAN PUBLIC POWER ASSOCIATION™
Powering Strong Communities