

FEBRUARY 2020 EDITION

DEED *n*digest

American Public Power Association

Celebrate 40 years of R&D!



BioTrans™: Soy-based, Biodegradable Transformer Oil

Log into the DEED Project Database for details on this and nearly 800 other industry-changing projects DEED has funded.



IMPACTING THE INDUSTRY SINCE 1999

Celebrating 40 Years of DEED R&D Innovation – BioTrans™: Soy-based, Biodegradable Transformer Oil

Developed with a 1999 Demonstration of Energy & Efficiency Developments (DEED) program grant, BioTrans™, a soy-based transformer oil, was a safe, environmentally benign, affordable alternative to standard petroleum-based transformer oil. Now known as FR3, the oil surpassed 1 million successful transformer uses in 2015. Many U.S. utilities, including Austin Energy and several municipals in Minnesota, switched to FR3, as did the largest utilities in China, South Africa, and Brazil.

[Learn more about the February Spotlight Project.](#)

3 Upcoming DEED Webinars in March

March 4th: Renewable Cost Calculators **Answer your Cost/Benefit Questions**

In this webinar, you will learn how Heartland Consumers Power District (HCPD) and its intern created a pair of Renewable Cost Calculators that

This webinar's speaker's include:

are assisting multiple audiences (residents, small utilities, and wholesale power providers/Joint Action Agencies) in determining the costs and benefits of installing a renewable energy facility, particularly a solar array.

The calculators serve as a valuable tool for evaluating the feasibility of renewable installations as well as the cost to the utility. The calculators provide quick and easy assessments of the impact installations will have on the electric system as well as provide end-users accurate estimates of costs and benefits.

Join us for this tutorial, where you will hear directly from HCPD staff on how to use and apply the calculators at your own utility as well as common use cases, and lessons learned from the internship. DEED members may preview the tools and project information in the [DEED Project Database, Project ID S-261](#).

Joins us 2:00 - 3:00 pm EST on March 4th.

[View this Webinar's Webpage](#)

Registration will go live tomorrow, February 14th.

Our National Labs, a Treasure of Resources & Opportunities for Utility Partnership

In this webinar, you will learn more about the Department of Energy's National Laboratories' technology transfer mission and how engagement with the labs can benefit your utility and community. We will explore some common ways utilities can work with the labs, review the DOE's Lab Partnering website, and hear how to partner with the labs and leverage your DEED membership to support projects to improve the operations and services of public power utilities, their communities, and customers.

Join us for this unique opportunity to learn from a panel of experts from DOE and your utility peers. This conversation is sure to unleash a storm of untapped R&D potential within the public power community.

This webinar is upcoming in March with specific time and registration information coming soon.

- Adam Graff, Director of Power Supply, Heartland Consumers Power District
- Ann Hyland, Chief Communications Officer, Heartland Consumers Power District



DEED Webinars

A chronological listing of DEED webinars is posted for DEED member only access [here](#). DEED webinars are provided free to DEED members. To find out if you are a DEED member, click [here](#).

New Social Media Playbook Offers Blueprint for Successful Customer Engagement

In this webinar, you will learn how Illinois Municipal Electric Agency (IMEA) worked with its intern to create a valuable resource to assist its member utilities in connecting with their customers via social media.

If you are looking for a social media shortcut, this is your tool. It was designed to aid utilities "where they are," regardless of their size or social media experience level.

Join us for this tutorial to hear directly from those who developed the Social Media Playbook, as well as utilities' who are using it. Learn how to put this resource to work at your utility and apply the pre-loaded calendar posts and sample content. DEED members may preview the Playbook and other materials developed during this internship in the [DEED Project Database, Project ID S-259](#).

This webinar is upcoming in March with specific time and registration information coming soon.

How did DEED do in 2019?

Thank you to all of our DEED members who participated in making the program great in 2019! In the 40 years that DEED has been a program, we have grown immensely. We wanted to take this

opportunity to highlight some of DEED's accomplishments of 2019.

- DEED membership increased to 947 utilities in 2019.
- \$1,534,705 in total funding was awarded in 2019: \$1,394,705 awarded to support 17 grants; \$140,000 awarded to support 37 scholarships
- Reports and resources from 18 grants and 24 scholarships that were completed in 2019 are available in the DEED Project Database. *(full list of these projects is available at the end of this newsletter.)*
- New products were created:
 - SafetySmart Videos: complementary download for DEED members; \$100 APPA/\$300 non-APPA [Available here](#)
 - EV Toolkit: complementary download for DEED members: \$75 APPA/\$150 non-APPA [Available here](#)



Don't Miss Out on Up to \$125,000 in Funding

DEED PUBLIC POWER
RESEARCH & DEVELOPMENT
40 Years of Innovation

DEED Members

Apply by February 15
for **innovative project grants**
and **student intern funding**

The banner features a dark blue background with various icons including a globe, gears, and a network diagram. The DEED logo is prominent at the top.

This week is your last chance for this cycle to take advantage of DEED opportunities and **apply for up to \$125,000 in [utility grants](#) or \$4,000 for an [intern](#) by February 15th**. So if you fail to finish your application by COB Friday, you're in luck, the applications will remain open through midnight on Saturday, February 15th. For more information, view [DEED's funding page](#). Email DEED@Public Power.org or call 202-467-2911 to start an application.

DEED's 40th Anniversary



DEED
PUBLIC
POWER
RESEARCH & DEVELOPMENT

4 0 Y e a r s o f I n n o v a t i o n

Please use our updated 40th Anniversary DEED logo! You can access the different formats of the new logo [here](#) and use it any time you promote your involvement with public power R&D.

Department of Energy Funding Opportunities

Transportation

U.S. DOE announced the investment of nearly \$300 million in funding for research and development of sustainable transportation resources and technologies. The funding intends to support DOE's goal of ensuring consumers and businesses have affordable, clean, efficient, and domestic energy options as the transportation industry evolves. The investment is split between three separate funding opportunity announcements (FOA) issued on behalf of the three transportation offices: Vehicle, Fuel Cells, and Bioenergy Technology Offices.

[Read more on the Energy.Gov announcement here.](#)

- Access the FOA and application instructions for each of the three offices: [Vehicle \(VTO\)](#), [Fuel Cells \(FCTO\)](#), and [Bioenergy Technology \(BETO\)](#)
- **Eligibility:** state, local, and tribal government entities (VTO, FCTO)
- **Cost sharing** depends on project and topic area within each office.
- **Due Dates:**
 - **VTO:** February 21 concept paper; April 14 full application
 - **FCTO:** February 25 concept paper; April 20 full application
 - **BETO:** March 5 concept paper; April 30 full application

Enhanced Geothermal Systems (EGS)

DOE also announced up to \$25 million for the advancement of Enhanced Geothermal Systems (EGS) technologies and techniques. The Funding Opportunity Announcement (FOA), entitled Wells of Opportunity (WOO), supports research and development that complements DOE's [Frontier Observatory for Research in Geothermal Energy \(FORGE\)](#) initiative and aligns with the goals of the recently released [GeoVision](#) study, which outlines a path to unlock the full potential of geothermal power.

[Read more on the Energy.Gov announcement here.](#)

- [Access the FOA and application instructions](#)
- **Informational Webinar:** February 25, 2020
- **Eligibility:** state, local, and tribal government entities
- **Cost sharing** is not required for the Pilot topic area. Cost sharing must be at least 20% for the Amplify topic area.
- **Due Date:** 5:00 pm EST on April 6, 2020

EPRI Explores the Benefits of Satellite-based Sensors



Electric Power Research Institute (EPRI)'s latest Technology Insights Brief explores how satellite-based sensors capture remote imagery which, when combined with data analytics, can be applied to perform observation, mapping, and inspection tasks to support electric utility planning, operations, and maintenance functions. They found that the use of satellite remote sensing and advanced analytics could deliver economic, safety, and other utility industry benefits in areas such as vegetation management, disaster response, and asset monitoring. Read the full report from EPRI, "[Eyes in the Sky: Satellite Remote Sensing and Data Analytics for Electric Utilities.](#)"



EPRI also developed an infographic that highlights satellites' growing presence in aerial data capture for electric utilities. It presents potential utility application benefits and drawbacks of all aerial systems currently in use. And it illustrates a variety of T&D use cases.

View the full infographic "[Seeing Utility Infrastructure from Different Viewpoints.](#)"

Recently Completed Projects

Two grants and two scholarships wrapped up in the month since our last newsletter. Visit the [DEED Project Database](#) for a repository of hundreds of outstanding research projects funded by DEED. Learn what other public power utilities like yours have done. Discover how you can replicate or improve on the success of projects completed by your peers. Get ideas for your own projects and apply for DEED co-funding with a DEED grant.

G-414 Downtown Moorhead Community Geothermal System Pilot Project

The **Moorhead Public Service (MPS)** set out to understand the benefits of geothermal systems, or ground source heat pumps (GSHPs) as a form of efficient electrification and the potential of eventually creating a utility-owned District Geothermal Well Field System. MPS is looking at the possibility of implementing a new and innovative utility service that makes it affordable for customers to install ground source heat pumps, which bring significant savings and high satisfaction. This innovation would increase the affordability of an

underutilized renewable energy. Public utilities could bring the full benefit of geothermal to their customers as they are not profit-driven, making it a true community geothermal system. Learn more about the project and read the final report here: [READ MORE](#)

G-413 Using Dynamic Blockchain Market Incentives to Reduce Capacity and Energy Costs for Utilities

Burlington Electric Department sought out to explore the benefits of a blockchain based demand response program. The hypothesis was that lower cost and faster settlement of transactions enabled by a block-chain based system would lower the cost to implement a demand response system and enable a greater diversity of customers and devices to participate. APPA held a webinar ([slides and recording available here](#)) with the leaders of this project to discuss the lessons learned and conclusions of the effectiveness of a blockchain-based system. Learn more about the project and read the final report here: [READ MORE](#)

S-265 Common Web-based Communication Platform for Joint Action Agencies for HCI Products and Services

Northern California Power Agency sponsored a student intern, Jack Ta, from the University of California-Davis to explore the potential for increased operational efficiencies through collaboration among APPA Joint Action Agencies. The student developed a web-based marketing and communication platform that can be used by JAAs as a medium to provide information to public power entities about products and services offered through Hometown Connections, Inc. This technology-agnostic platform provides a plug-and-play ability for highlighting various content managed in a central location and available to public power entities. Learn more about the project and read the final report and abstract here: [READ MORE](#)

S-266 Combined Stochastic Wind and Solar Power Bidding in the Southwest Power Pool Market

Lincoln Electric System sponsored a student research grant for Josue Campos do Prado, a PHD student at the University of Nebraska-Lincoln to develop a stochastic-optimization-based dynamic decision-making tool to generate the optimal bidding strategies for wind and solar energy facilities in the electricity market. An electric utility with wind and solar energy facilities participating in the Southwest Power Pool (SPP) market was studied. The model generates day-ahead optimal bidding curves for the utility while considering its operations in the real-time market. The tools can be easily adapted to any utility with wind and/or solar power generation, and other U.S. wholesale electricity markets. The Octave tool is a cost-free option that was specially developed for utilities that do not have a MATLAB license. Learn more about the project and read the final report here: [READ MORE](#)

List of completed projects in 2019

Grants

1. G-395 Landlord Connection Series; River Falls Municipal Utilities, WI
2. G-396 Power Career Workshop 101; ElectricCities of North Carolina, Inc., NC
3. G-397 Leveraging Experience from Stanford and EDF to Develop Information and Tools for Thermal Microgrid Feasibility Assessments; Palo Alto, CA
4. G-398 Utilizing Smart Meters and Smart Load Management Switches to Update Peak Load Saving Estimates for Modern Residential Appliances; ElectricCities of North Carolina Inc., NC
5. G-399 Battery Energy Storage System And Micro-Grid Demonstration of an Optimization-Based Control Strategy; Rancho Cucamonga Municipal Utility, CA
6. G-400 Using Consumer Engagement Tools to Build Better Relationships Between the Customer and Utility; Cleveland Public Power, OH
7. G-401 ERMU Partners with City of Elk River and Local Businesses to Provide Fast EV Charging as Part of Green Step Cities Initiative, Elk River Municipal Utilities, MN
8. G-402 Small System Maintenance Manager, Massena Electric Dept., NY
9. G-403 Non-Communicating Automatic Feeder Restoration; Kerrville Public Utility Board, TX
10. G-404 Multi-Family Energy Efficiency Pilot Project; Lincoln Electric System, NE
11. G-405 SafetySmart Video Series, 2nd Edition; Minnesota Municipal Utilities Association, MN
12. G-406 Energy-Savings Potential in Commercial Food Service Plug Load Equipment; Silicon Valley Power, CA
13. G-407 Public Power EV Planning Toolkit; American Municipal Power, Inc., OH
14. G-408 Discovering Ferroresonance in Your Utility; Tillamook People's Utility District, OR
15. G-409 Analytics Using StorageVET; New York Power Authority, NY

16. G-410 Data-Driven Customer Segmentation for Reducing Peak Power Energy Consumption; New River Light & Power Co., NC
17. G-411 Increasing Low-to-Moderate Income Household's Access to the Benefits of Rural Public Power Community Solar Programs; WPPI Energy, WI
18. G-412 Surveying the Potential of Electrifying the Navajo Nation Navajo Tribal Utility Authority, AR

Scholarships

1. S-243 Energy Efficiency Intern to Work with Existing Weatherization Education Outreach Program (WEOP); Fort Pierce Utilities Authority, FL; Gabriela Rangel; Indian River State College
2. S-244 Investigation of a High Voltage Electric Field on the Soiling Rate of PV Panels; City of Moreno Valley, CA; Ryo Huntamer, University of California, Riverside
3. S-245 Improve High Temperature Reliability of Gallium Nitride (GaN & Trap Density in Novel Gallium Oxide); Faisal Azam Freedom System Center; NC State University
4. S-246 Energy Storage Intern; Austin Energy, TX; Julia Conger; University of Texas at Austin
5. S-247 Cost and Energy Implications of Energy Sector Transformation on Water Heating Systems; Salt River Project, AZ; Naushita Sharma; Arizona State University
6. S-248 Transmission, Substation and Distribution Infrared Inspection Program for BES Intern A; Beaches Energy Services, FL; Mason Hardee, University of North Florida
7. S-249 Generating Power from Rainfall; Silicon Valley Power, CA, Shreyes Nallan; Santa Clara University
8. S-250 System Mapping Intern; Indiana Municipal Power Agency, IN; Elijah Diehr, Trine University
9. S-251 Engineering Intern-A; Independence Power & Light, IA; Max Anderson, University of MO, Kansas City
10. S-252 Engineering Intern-B; Independence Power & Light, IA; Steven Lee, University of Kansas
11. S-253 Developing and Testing Algorithms for Optimizing VAR Support Using an 8760 Hour Load Model; Silicon Valley Power, CA; James Wang; Santa Clara University
12. S-254 Austin SHINES Project Student Intern; Austin Energy, TX; Cydnie Golson; University of VA
13. S-255 GIS Enhancement; Florence Utilities, WI; Shayla McLain; University of Wisconsin La Crosse
14. S-256 CDE Lightband Internship Summer 2019; CDE Lightband, Luke Daniel; Tennessee Technological University
15. S-257 Electric Vehicle Load Prediction and Charging Scheduling for Grid Services and Cost Reduction; Burbank Water and Power; Behnam Khaki; University of California at Los Angeles
16. S-258 Infrared Inspection, GIS Data Processing and Asset Management, Beaches Energy Services; Nahum Michel; University of North Florida
17. S-259 Energy Efficiency Services Outreach Coordinator for Retail Customer Relations; Illinois Municipal Electric Agency; Lexi Yoggerst; University of Illinois
18. S-260 Electrical Engineering Intern; Kaukauna Utilities; John Vanderwyst; Northern Michigan University
19. S-261 Renewable Cost Calculator; Heartland Consumers Power District; Peter Choudek, St. Cloud State University, Sioux Falls, SD
20. S-262 Event Detection and Classification in Power Grid Using Machine Learning and Synchrophasor Technology; Municipal Electric Power Association of Virginia; Shiyuan Wang; George Washington University
21. S-263 Advanced Artificial Intelligence for Online Power System Stability Surveillance; City of Manassas; Bhavesh Shinde; George Washington University
22. S-264 ElectriCities of NC Economic Development Intern; ElectriCities of North Carolina Inc.; Laquell Harris; Shaw University in Raleigh, NC
23. S-265 Common Web-based Communication Platform for Joint Aciton Agencies for HCI Products and Services, Northern California Power Agency; Jack Ta; University of California, Davis
24. S-266 Combined Stochastic Wind and Solar Power Bidding in the Southwest Power Pool Market; Lincoln Electric System; Josue Campos do Prado; University of Nebraska, Lincoln

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