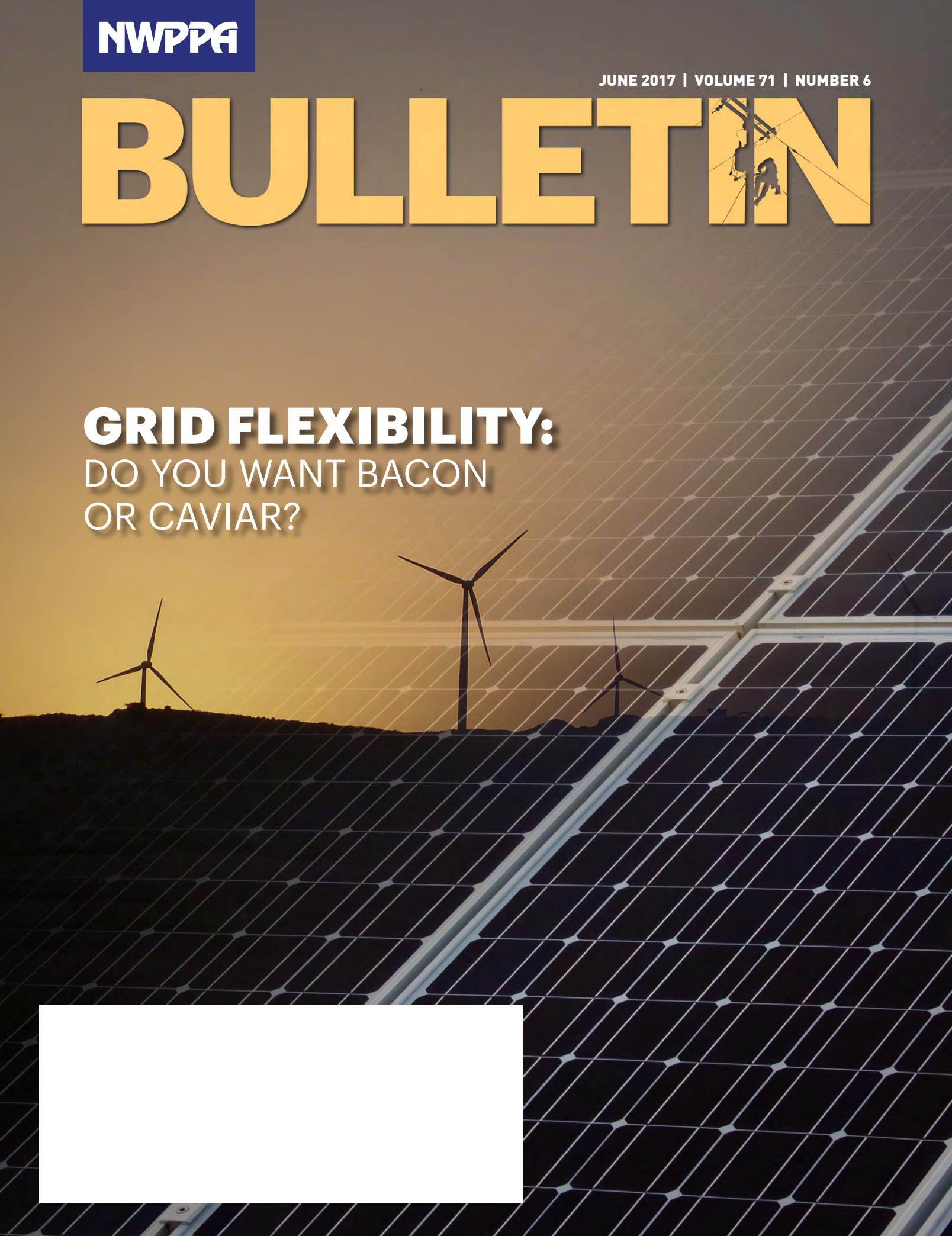
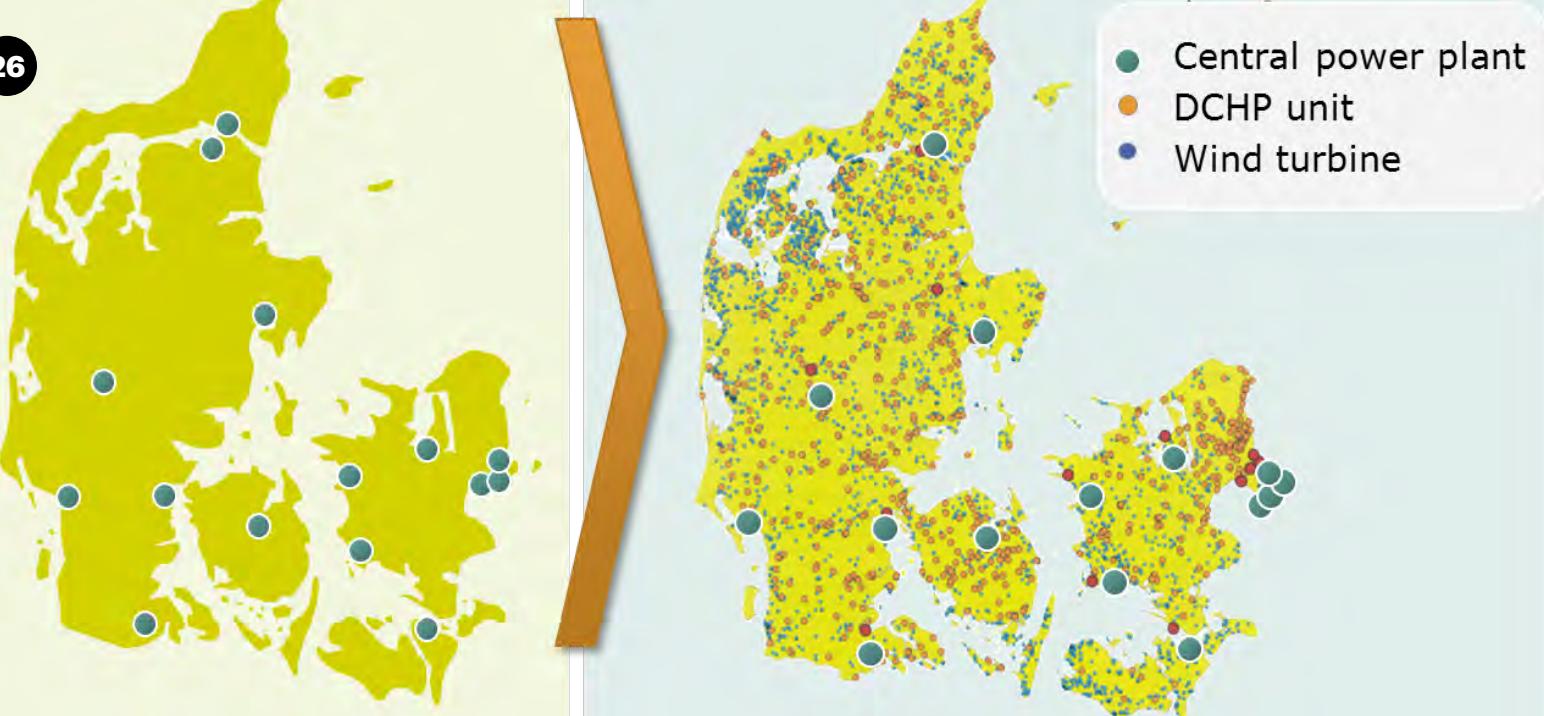


BULLETIN



GRID FLEXIBILITY: DO YOU WANT BACON OR CAVIAR?





On the cover: Distributed energy resources hold great potential to modernize the grid by providing flexibility and avoiding traditional infrastructure investment; however, innovation is needed in the sharing and communication of grid data and automating the response of DER to grid conditions.

Opinions expressed in single articles are not necessarily policies of the Association. For permission to reprint articles, write or call the associate editor.

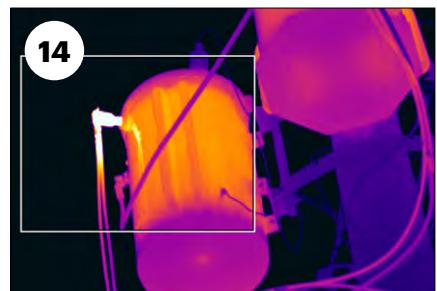
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UPGRADE YOUR CAREER

with an Online Energy Management Degree
from Lane Community College



As projected, the energy efficiency industry is increasingly experiencing a shortage of practitioners. Fortunately, the Northwest has the nation's model energy education degree program at Lane Community College, which is preparing students to fill these vacant positions. Many second-career and non-traditional students are interested in the energy industry, however they lack the local educational resources which provide the academic qualifications needed to enter the workforce. The National Science Foundation has recognized this shortfall in practitioners and available trainings, and has awarded LCC a grant to expand its current Energy Management Technician Program to provide an online degree. The two-year degree program includes online courses in addition to providing hands-on skills with real-world field projects and cultivating employment opportunities with regional employers.

The development of a robust online program enables energy efficiency education to be available to a wider Northwest geographic population. Specifically, LCC is reaching out to potential students and current energy professionals in Oregon, Washington, Idaho, and Montana. The aim of the program is to produce highly qualified energy management technicians for the region's residential and commercial building sector and provide access to high-wage, high-skill jobs to students in rural areas or students who are not able to attend traditional classes at LCC.

"This is not just taking a program online," said Roger Ebbage, Energy and Water Education Program coordinator. "Rather, we have the potential to revolutionize how career technical programs serve underserved populations. Utilizing proven

online instructional methods and innovative partnerships, we expect to increase the Energy Management Program's enrollment and consequently that of Lane Community College."

The objectives of the expanded program are not just limited to generating course content for online classes. The program is piloting a methodology for students to be able to accomplish technical hands-on activities remotely. This means that students will not be required to travel to Eugene, Ore., for training. Instead, LCC is working with utilities to connect students to fieldwork mentors in their area (through the assistance of Northwest Water and Education Institute). The field work mentors are industry experts who will guide training activities specific to the student's coursework. They will facilitate aspects such as access to tools, mechanical equipment, and/or tactile experiences. Additionally, they provide an invaluable direct student-to-industry connection that cultivates immersion into the energy industry along with potential employment opportunities.

With this model of higher education and industry partnership, online energy management students will have more convenient access to education and training by completing online courses and working with fieldwork mentors independently of their geographic location, work schedule, or family obligations. This opens opportunities for diversifying student demographics that are unavailable in current classes and absent within the energy industry.

Applications for the expanded online Energy Management Technician Program are currently being accepted for Fall 2017 enrollment at lanecc.edu/nweei. For more information, contact Ebbage at either (541) 463-6160 or ebbager@lanecc.edu. **NWPPA**

COMMUNICATION ENTRIES DUE THIS MONTH!

Calling all member utility communicators! If you have not yet submitted your entries for the 24th Annual NWPPA Excellence in Communication Competition, please be aware that you only have a few weeks left to do so. All submissions must be postmarked by the end of this month, on Friday, June 30, to be eligible for the contest. Please remember that the 2017 competition honors communication pieces created and distributed last year in 2016; communication materials from 2017 will be disqualified.

The winning Excellence in Communication entries will be honored at the awards banquet at the Northwest Communications & Energy Innovations Conference (NIC) on Tuesday

evening, September 19, at the Embassy Suites Sacramento in California. In addition, one utility will come away with the prestigious Tom Hougan Award for Overall Excellence in Communication. Tuesday evening's banquet is also where the winner of the People's Choice Award for Photography, which all attendees get to vote for, will be announced.

If you have not received a Call for Entries brochure, you can download a PDF of the brochure from our website under the Members Only Resources tab. If you have questions about the brochure or contest, please contact Brenda Dunn at brenda@nwppa.org. **NWPPA**

77th Annual Meeting Inspired Members in Sunriver

With an impressive 268 utility attendees, the 77th Annual Conference and Membership Meeting in Sunriver, Ore., May 7-10, saw its second-highest attendance ever for an NWPPA annual meeting. The sunshine-filled high desert of Sunriver proved to be the perfect place for attendees, speakers, and sponsors to find Inspiration, Innovation, and Information.

"It was a perfect blend of information, humor, and entertainment," said Bob Wiggins of Clatskanie PUD. "Picking out the one most useful portion is too tough to call."

"There were great topics for this year's annual meeting," said Dave Kelsey of Yellowstone Valley Electric Cooperative. "Congratulations, NWPPA, for a job well done."

Stephen Shedletzky of Start With Why kicked off the conference talking about the importance of knowing your why (importance) and received rave reviews!

"After attending many, many conferences in this field and others, I think a keynote speaker can make or break an event because it sets the tone and expectations," said Wiggins. "Stephen was a very good choice."

Dee Dee Isaacs of Tongue River Electric agreed about the opening presentation. "I will be using the Golden Circle—why, how, what—at our upcoming meeting," she said.

Other topics on Tuesday included DER partnerships and an innovative discussion on rates. Later in the afternoon, a Consumers in Control panel, made up of a consumer, a utility executive, and a consultant, had a lively discussion about home technologies and energy management. Talking about the new technology and showing how consumers are managing it—and how that affects our members—proved to be very useful for many.

"I very much enjoyed the style of dialogue during the Consumers in Control session," said Chuck Thurman of the City of Monmouth Power & Light. "More of this style promotes discussion at the session and beyond."

The speakers on the second day delivered five-star-rated presentations and brought the conference to a close with passionate discussions and lots of food for thought.

A three-person panel on workforce trends and futures kicked off the conference on Wednesday. The diversity of the panel provided several vantage points on the topic and generated a lot of discussion from the audience.

"I like the panel discussions, especially when they take the Q&A from everyone," said Molly Simpson of Douglas County PUD.

Panel discussions always serve as an effective vehicle to have many different voices heard regarding a single topic, and they were also very popular with attendees. On Wednesday, a CEO panel moderated by PPC's Scott Corwin did just that and did so to rave reviews. Panelists included Michelle Bertolino of Roseville Electric, Mark Johnston of Anchorage Municipal Light & Power, Matt Michel of Lane Electric Cooperative, and Steve Wright of Chelan County PUD.

"The panel was great!" said Ann Congdon of Chelan PUD. "The more interactive the better."

The final speaker of the conference, Eric Meyer, closed the day with some surprise opera! He also talked about a new generation of nuclear, and who and what it was. The lively Q&A session that followed his presentation left some energized at the end of the day and others still debating the topic.

"Eric Meyer was awesome!" said Mark Platt of Benton REA. "It was a great presentation and message."

However, the time at Sunriver wasn't all work. On Wednesday evening, attendees enjoyed the President's Reception honoring outgoing president Alex Love, music by the Lost Sierra Ramblers, local Northwest fare at the banquet dinner, and a presidential hand-off to Steve Taylor of Mason County PUD No. 1, NWPPA's 2017-18 president.

As always, the conference wouldn't be as successful without the generous support of our sponsors. This year, nearly 20 businesses came forward to sponsor various events—such as breakfasts, refreshment breaks, and entertainment—throughout the conference. Thank you to all of them!

Mark your calendars now to join us for the 2018 Annual Conference and Membership Meeting in Boise, Idaho, May 20-23. We hope to see you there!

Visit our Facebook page for more photos from Sunriver!

NWPPA



Looking for a presentation you may have missed or would like to revisit? All available presentations from the annual meeting can be found on www.nwppa.org under View Conference Presentation Materials in the Member Resources dropdown menu.

NWPPA Honors 2017's Annual Award Winners

On May 10, NWPPA presented the following awards to individuals within the public power community at our 77th Annual Conference and Membership Meeting in Sunriver, Ore.

Homer T. Bone Award

Senator Patty Murray has been a tireless advocate for reliable, affordable, clean energy. She has fought to protect low-cost power in the Pacific Northwest, particularly with respect to maintaining the public power principles that underpin low-cost rates from Bonneville Power Administration. She has pushed back on federal overreach in the region; fought for oversight over energy markets to prevent manipulation that landed Washington state PUDs with unfair rate agreements during the California energy crisis; and has been a bold supporter of nuclear power.

Paul J. Raver Community Service Award

NWPPA honored both Silicon Valley Power (Santa Clara, Calif.) and Tom Tymchuk of Central Lincoln PUD (Newport, Ore.).

Silicon Valley Power has been committed to providing the community with highly reliable power at low rates and has worked hard to diversify its resources and continually invest in renewable energy to further reduce its carbon footprint. The utility was the charter member forming the Northern California Power Agency in 1968, which worked with other municipal electric utilities in Northern California to gain access to wholesale transmission markets and jointly develop cost-effective generation resources.

Tom Tymchuk has made public service to the City of Reedsport (Ore.) and the region a cornerstone of his life. His community service includes serving four terms as mayor of Reedsport (1969-1977), many years on the Lower Umpqua Hospital Board of Directors, and serving eight full terms on the board of directors of the Central Lincoln People's Utility District (serving that board as president, vice president, secretary, and treasurer multiple times).

NWPPA President's Award

Previously the manager of finance and administration, Heber Carpenter most recently served as general manager of Raft River Rural Electric Cooperative in Malta, Idaho. At PNGC Power, he served as secretary and treasurer until November 8, 2016, and as a director until January 24, 2017. Carpenter served on the NWPPA Board from 2011-2017 as a trustee, and served as Government Relations chair from 2016-2017 and as Resolutions Committee chair from 2015-2016.

John M. George Public Service Award

Former Snohomish PUD Commissioner David Aldrich was well regarded in Snohomish County (Wash.) for his unflagging commitment to public power and recognized as one of the strongest voices in the region for energy conservation for the past two decades. Aldrich began his first term in 2003 and was subsequently re-elected twice, until retiring from the board in December 2016. Under his direction, the PUD broke its own records for its highest energy savings—now enough to serve more than 75,000 homes annually. Aldrich passed away on January 16, 2017.

William "Bill" McCorie Distinguished Service Award

John Irwin Jr. is currently serving as director and has been on the Elmhurst Mutual Light & Power Board since 1976. He was born and raised in Tacoma, Wash., and has been an Elmhurst customer for nearly 37 years. He has worked in the electrical industry for 42 years and has been involved in community affairs, mainly with the scouting programs. Irwin has served on the board of the Washington Rural Electric Cooperative Association for 13 years, including three terms as president.

Life Membership Award

This year there were six recipients: Bradley G. Reeve of Kotzebue Electric Association, Inc. (Kotzebue, Alaska), Werner Buehler of Oregon Trail Electric Cooperative (OTEC) (Baker City, Ore.), Karl Denison of Mason County PUD No. 1 (Shelton, Wash.), Roger Sparks of Kittitas PUD No. 1 (Ellensburg, Wash.), T. James Davis of Douglas County PUD (East Wenatchee, Wash.), and Tom Tymchuk of Central Lincoln PUD (Newport, Ore.).

Congratulations to this year's award winners. Their work on behalf of the membership and the industry is greatly appreciated! **NWPPA**



John Irwin Jr. stands with his Distinguished Service Award surrounded by his Washington cooperative friends.

2017–2018 NWPPA BOARD OFFICERS, TRUSTEES ANNOUNCED

On May 9, the NWPPA Board of Trustees introduced Steven Taylor of Mason County PUD No. 1 (Shelton, Wash.) as the 2017-2018 NWPPA Board of Trustees president. Taylor will serve a one-year term as board president.

At the meeting, the board also announced the following officers:

- First Vice President Jackie Flowers of Idaho Falls Power (Idaho Falls, Idaho)
- Second Vice President Scott Egbert of Wells Rural Electric Company (Wells, Nev.)
- Secretary/Treasurer Ron Holmes of Wasco Electric Cooperative (The Dalles, Ore.)
- Immediate Past President Alex Love of Nelson Hydro (Nelson, B.C.)

Along with the officer announcements, the membership re-elected five trustees for second three-year terms: Brad Janorschke of Homer Electric Association (Homer, Alaska), Michelle Bertolino of Roseville Electric (Roseville, Calif.), Dave

Kelsey of Yellowstone Valley Electric Cooperative (Huntley, Mont.), Dale Walker of Grant County PUD (Ephrata, Wash.), and associate member representative Dave Anderson of Electrical Consultants Inc. (Billings, Mont.).

In addition to the above, eight others were elected by the membership to serve a first three-year term on the Board of Trustees: John Foutz of the City of Seward (Alaska), Delores Stegeman of Tacoma Power (Tacoma, Wash.), K. David Hagen of Clearwater Power (Lewiston, Idaho), J. Douglas Schmier of Fall River Electric Cooperative (Ashton, Idaho), Jason Norlen of Heber Light & Power (Heber City, Utah), Donald Smith of Wheatland Rural Electric Association (Wheatland, Wyo.), associate member representative Steve Mills of Evluma (Vancouver, Wash.), and associate member representative Ted Rampton of UAMPS (Salt Lake City, Utah).

Also, Susan Thraen of Missoula Electric Cooperative (Missoula, Mont.) and Dominic Ivanoff of Kotzebue Electric Association (Kotzebue, Alaska) were both re-elected for a first full three-year term.

NWPPA's Board of Trustees consists of 40 individuals from member utilities across the Western U.S. and Canada. **NWPPA**

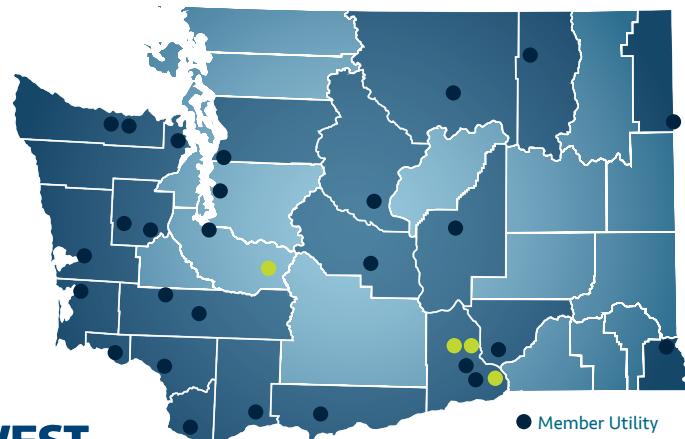
Celebrating 60 years as a public power partner!

Established in 1957 by the Washington state legislature to meet the collective needs and aggregate the resources of public utilities statewide and, through cooperative action, build and operate electrical generating facilities. We're marking 60 years as a joint action agency and honored to partner with our 27 members to serve more than 1.5 million customers.



ENERGY NORTHWEST

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Q&A with NWPPA's New President, Steve Taylor



The NWPPA Board of Trustees has elected Steve Taylor to be the 2017–18 NWPPA Board of Trustees president. Taylor will serve a one-year term as board president.

Taylor, who has over 25 years of utility experience, joined the NWPPA Board of Trustees in 2011. During that 25-year time frame, he has worked at four different utilities: Lower Valley Power and Light, now known as Lower Valley Energy, in Jackson Hole, Wyo.; Franklin PUD in Pasco, Wash.; Powder River Energy in Gillette, Wyo.; and currently at Mason PUD No.1 in Shelton, Wash., as its general manager for the past 10 years.

NWPPA: Since joining the board in 2011, how have you seen NWPPA grow and improve?

Taylor: When I first joined the board, there wasn't a clear onboarding process for new board members. NWPPA staff has been working on making sure that the board understands its role and duties to ensure that each of our three meetings is productive and effective.

NWPPA: How has public power changed in the last 10–20 years?

Taylor: The public has become more informed and concerned with where their power comes from and how it affects the world. This has caused the industry to look at alternative resources to not only provide the electricity that our customers need for reliability, but also the clean energy resources that they are starting to demand as part of our energy portfolios.

NWPPA: What have you learned from your experience as general manager of Mason PUD No. 1 that you will use as NWPPA Board president?

Taylor: Ask the tough questions. We need to be the recognized leaders and problem

solvers on energy issues and we need to be the ones that are deciding the best way to provide the energy services that our customers have come to expect. The younger generation is not afraid to challenge the status quo. The Association must be informing our associates of the challenges and changes that are on the horizon and offering guidance on solutions. The facts need to be presented so that all utilities can make informed decisions.

NWPPA: What do you see as the current challenges at Mason 1?

Taylor: Aging infrastructure and how we are going to replace it; educating the newer generations on the value of public power; and an aging workforce.

NWPPA: What do you see as the current challenges of the industry?

Taylor: As a whole, we are all facing the same issues, just in different capacities. For the Northwest, Bonneville continues to be an issue. They need to remain competitive and maintain their value, but they are also facing the need to upgrade infrastructure and navigate through energy market issues. They need to succeed if for no other reason than the enormous amount of public investment that would be stranded if the dams were to close and be removed. Federal regulation is another challenge for our area. That's why I feel the work that the Association does at our nation's capital every year is so important. Policy makers in Washington, D.C., need to recognize the value of our hydropower and hear our regional perspective on federal energy issues. I think we've been successful so far.

NWPPA: As president, what are your goals for NWPPA for the upcoming year?

Taylor: I feel that right now we are largely an unseen force and we need to be seen. As president, I would like to see us continue to tell the story of public power whenever possible. The Association has a role to perform and needs direction from

the whole board, not just the Executive Board. I represent all of you and your trustees. I would ask that we be more vocal and increase our visibility whenever the opportunity presents itself. We are an unseen force that needs to be heard and seen.

NWPPA: What is your fondest NWPPA memory/moment?

Taylor: The top of the list is our legislative rallies. At one such occasion I was with Deborah Sliz in a senate office. Deborah made a few clarifications on fire prevention and I gave her an interested look. At least that is what I thought it was—she took it as though I was not pleased with what she was saying so she cut short her comments. After we left the senator's office she turned to me and asked what she had said wrong. I looked at her in surprise and said, "Don't read anything into my facial expressions." We both laughed and every time we see each other now we remember that moment. I've made great friends and connections through my work with the Association and look forward to many more.

NWPPA: Any hobbies outside of the public power world?

Taylor: I was raised on a farm in Grant County, Washington, and so I enjoy the outdoors. I try to make a bi-annual elk hunt to Wyoming. I spend a lot of time with my wife, Julie, exploring, traveling, and visiting grandchildren whenever we can.

Is there anything else that you would like to add?

Taylor: I am grateful for the support of my board and for them nominating me back in the beginning. I am truly blessed to be around so many great friends. We all have common goals and desires that fit my values. I hold tight to my values and this industry doesn't ask me to compromise them. It is a pleasure to serve and believe in our industry. **NWPPA**

TRAINING OPPORTUNITIES

July, August, and September 2017

Please visit www.nwppa.org to view the full course descriptions for these and other courses.

NEW! ONLINE — ENGINEERING WEBINAR SERIES—SOLAR DESIGN

Who Should Attend: Engineering personnel and others who would benefit from an understanding of current electric utility engineering principles and practices.

July 11, 2017—Online

944.1—GIVING AND RECEIVING EFFECTIVE FEEDBACK

Who Should Attend: Directors, policy makers, and general managers.

July 11, 2017—Hood River, Ore.

SENIOR LEADERSHIP SKILLS SERIES SESSION 3, SERIES 5—INSIDEOUT COACHING

Who Should Attend: Directors, managers, graduates of the Leadership Skills Series, and newly appointed senior leaders.

July 12–13, 2017—Vancouver, Wash.

DISTRIBUTION ENGINEERING SERIES: SESSION 2—OVERCURRENT PROTECTION

Who Should Attend: Engineers and senior technical personnel involved in selecting and coordinating overcurrent protection devices.

July 12–13, 2017—Vancouver, Wash.

ADMINISTRATIVE PROFESSIONALS PRE-CONFERENCE WORKSHOP: ONENOTE AND LEAN OUTLOOK

Who Should Attend: Administrative assistants, executive assistants, and clerks to the board.

July 18, 2017—Leavenworth, Wash.

ADMINISTRATIVE PROFESSIONALS CONFERENCE

Who Should Attend: Administrative assistants, executive assistants, and clerks to the board.

July 19–20, 2017—Leavenworth, Wash.

INTRODUCTION TO ROBERTS RULES OF ORDER

Who Should Attend: Policymakers, general managers, clerks to the board, executive secretaries, administrative assistants, and any utility employee participating in board or commission meetings.

August 8, 2017—Boise, Idaho

ENGINEERING WEBINAR SERIES—DISTRIBUTED GENERATION INTERCONNECTION

Who Should Attend: Engineering personnel and others who would benefit from an understanding of current electric utility engineering principles and practices.

August 8, 2017—Online

HANDS-ON BASIC RECORDS MANAGEMENT

Who Should Attend: Administrative assistants, executive assistants, records coordinators, records managers, and any utility staff working with documents and records, both paper and electronic.

August 16–17, 2017—Newport, Ore.

COMMUNICATION ESSENTIALS FOR SUCCESS

Who Should Attend: Anyone who needs to communicate effectively with others in their utility as well as with customers and members.

August 22–23, 2017—Vancouver, Wash.

ENVIRONMENTAL TASK FORCE MEETING

Who Should Attend: Utility environmental professionals (new and experienced), government agency staff, vendors, and anyone who is tasked with or interested in environmental issues, regulatory compliance, or mitigation in the environmental arena of electric utilities.

September 12, 2017—Lake Tahoe, Nev.

NEW! ONLINE — ENGINEERING WEBINAR SERIES—TECHNIQUES FOR REDUCING SYSTEM LOSSES

Who Should Attend: Engineering personnel and others who would benefit from an understanding of current electric utility engineering principles and practices.

September 12, 2017—Online

HAZWOPER 8-HOUR FIRST RESPONDER AWARENESS AND REFRESHER TRAINING FOR UTILITY PERSONNEL

Who Should Attend: This is required training for first responders who are likely to witness or discover a hazardous substance release and need to initiate an emergency response sequence by notifying the proper people; it is also for individuals who respond to releases of hazardous substances as part of the initial response for the purpose of protecting nearby persons, property, or the environment from the effects of the release.

September 13, 2017—Lake Tahoe, Nev.

ELECTRIC UTILITY SYSTEM OPERATIONS

Who Should Attend: Any electric utility industry employee (utility or vendor) whose job performance will benefit from a basic understanding of the operations side of the utility business, including engineering; operations; safety; purchasing; information technology; regulatory and rates; customer service; public relations; legal; accounting; as well as utility commissioners and board members.

September 13–14, 2017—Spokane, Wash.

NORTHWEST COMMUNICATIONS & ENERGY INNOVATIONS CONFERENCE (NIC)

Who Should Attend: Marketing, public relations, communications, energy services, renewable energy, and key accounts employees, as well as any employee and board member with an interest in these areas.

September 17–20, 2017—Sacramento, Calif.

OREGON ENGINEERING MEETING

Who Should Attend: Engineering managers and staff from public utility districts, cooperative utilities, and other public power utilities within Oregon. (Only utility employees may attend this event.)

September 19, 2017—Salem, Ore.

SHOOTING GREAT PORTRAITS WITH DAVE LABELLE

Who Should Attend: Anyone who shoots photos, especially portraits, for their job or for fun.

September 20, 2017—Sacramento, Calif.

UNBUNDLED COST OF SERVICE AND RATE DESIGN

Who Should Attend: Accounting and finance staff, policy makers, or any utility employee with an interest in ratemaking and/or cost of service analysis.

September 20–21, 2017—Roseville, Calif.

A Look Back at Public Power

50 YEARS AGO – 1967

On June 16, Secretary of the Interior Stewart L. Udall signed Order No. 2900, establishing the Alaska Power Administration ... Big Bend Electric Cooperative announced it would be building 81 miles of distribution line to serve 418 new consumers (Wash.) ... Milton Hunt McGuire was honored by the McMinnville Water and Light Department when the new \$1.2 million dam and water supply reservoir was named after him; he had been the general manager of the utility from 1920 to 1957 (Ore.) ... NWPPA Executive Secretary Gus Norwood received the Harold Kramer Award for Personal Service from the American Public Power Association.

25 YEARS AGO – 1992

Seattle City Light responded to employee needs and expectations for more flexible work schedules (Wash.) ... Umatilla Electric Cooperative, BPA, and several others hired two engineering firms to conduct a Columbia River canal feasibility study (Ore.) ... Kenneth Brown, Fall River REC president, was elected to serve on the NRECA Board of Directors (Idaho) ... Dick Borges was selected as the new manager of Canby Utility Board (Ore.) ... Anchorage Municipal Light and Power selected a poster from a fifth-grade student as the winner of its Fifth Annual Electrical Safety Poster Contest (Alaska).

5 YEARS AGO – 2012

Chelan PUD General Manager John Janney announced that External Affairs Director Jeff Smith agreed to join the PUD's Senior Management Team as managing director of District Services after Wayne Wright retired at the end of July (Wash.) ... Amid a backdrop of rolling wheat fields, SMUD commissioned 55 new turbines bringing the total number of turbines at the SMUD Solano Wind Project to 107 (Calif.) ... President Miles Lewis told Glacier Electric Cooperative members that "for the first time in Glacier Electric history, every one of our board members has earned the Credential Cooperative Director Program certification" (Mont.).

NWPPA

SAVE THE DATE!
LOCALLY GROWN.
LOCALLY OWNED.

September 17-20 Sacramento, Calif.



NORTHWEST COMMUNICATIONS AND
ENERGY INNOVATIONS CONFERENCE (NIC)



The Role of Cable Rejuvenation in Addressing the Maintenance of Aging Underground Cables

By Glen J. Bertini



Medium-voltage underground cable is designed to be used and not seen. Padmount electrical transformer boxes containing and connected by underground residential distribution (URD) cable are a ubiquitous sight throughout residential neighborhoods, spaced on average 330 feet apart. Consumers who live in the community are generally unaware of the jumble of cables that each box comprises, and they rarely need to consider whether the URD itself is in an adequate state of repair. Most utility providers, on the other hand, are in a constant state of responding to aging cable and the threats it represents.

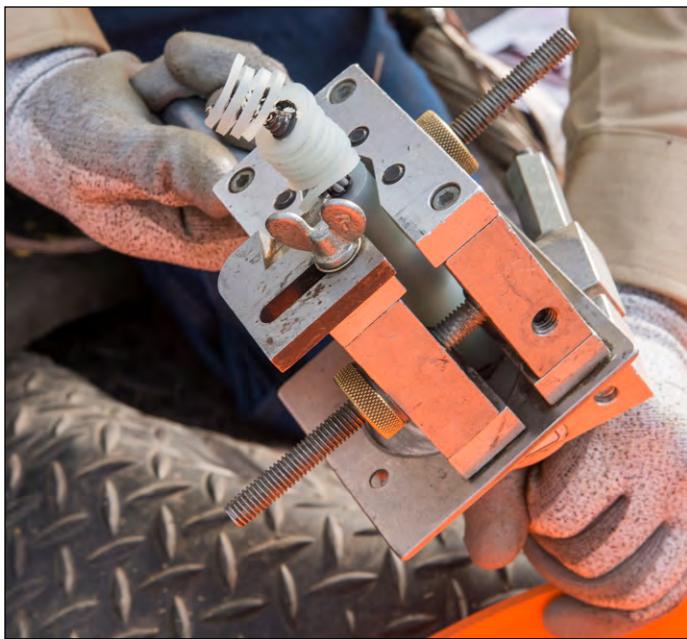
Over time, utility companies face significant challenges for addressing deteriorating URD conditions. URD cables are most commonly degraded when moisture diffuses into the cable's dielectric layer, gradually diminishing the cable's insulative properties. This condition, called water treeing because of the tree-shaped structure observed when the degraded cable is viewed microscopically, is the most common contributor to URD reliability issues. When the insulation on the cable connecting two transformers degrades to a point of failure, the lights go out in the entire neighborhood.

Aging URD cables are a growing problem in communities around the world, disrupting customers and causing business challenges for utility providers. But in most cases, the traditional remedy for URD cable failure—taking the impacted cable out of service and putting new cable in its place—has proven to be unfeasible. When cables fail, the resulting outages and the replacement work required to restore power create logistical problems that are usually unpredictable and expensive—costs that must be absorbed by the provider, the customer, or both. Meanwhile, customers often experience multiple outages as the providers install new cable, often disrupting the customers' property and landscaping in the process.

Cable rejuvenation: The modern go-to option for upgrading URD cable

When rehabilitating aging URD infrastructure, many utility providers forego cable replacement and opt for rejuvenation as the proven superior method for fixing damaged cable. With cable rejuvenation, the affected cables are left undisturbed and injected with compounds that restore each cable's dielectric strength, effectively adding the same value as a new cable but without the burden of time, cost, environmental disruption, and consumer downtime associated with cable replacement. This method was first developed in 1986 and its use has steadily gained adoption and popularity in the 30 years since.

Rejuvenation technology focuses on the injection of silane-based fluid into the strands of aging medium-voltage power cables. The fluid is injected by accessing cables through transformers or other cable termination points. Technicians typically open two adjacent transformers and de-energize cables in a way that generally does not impact power to customers. Then, specialty fittings are attached to each end of the cable to allow for fluid injection. As the fluid moves through the cable, it migrates into the conductor shield and insulation. The chemistry and the physics of the insulation are modified and the result is a cable that is returned to full dielectric strength in as little as seven days.



The use of cable injection is approved for capitalization by the Federal Energy Regulatory Commission and hence does not impact tight operation and management budgets.

Sustained vs. unsustained pressure

Engineers have developed a variety of injection fluids and techniques over the years, enabling technicians to deploy specific processes depending on a given cable type, circumstance, or environment. The technology is also easily adaptable to different cable configurations, including splices in the cable. In these cases, technicians create splice excavation pits measuring roughly six feet square and four feet deep. These pits have far less impact on landscaping than the trenching or tunneling typically required for cable replacement.

With sustained pressure rejuvenation (SPR), cables are restored to full dielectric strength in seven days, and injection can be completed in a single day. The steps are as follows:

1. Isolate, test, and ground the damaged cable.
2. Using a time-domain reflectometer (TDR) device, check each segment for splices, neutral corrosion, and overall length. If splices are present, technicians pinpoint their locations using a radio frequency locator and measuring wheel, then dig a pit to expose the splices and replace them with new splice connectors and injection adapters using templates to insure proper injection adapter placement.
3. Inject each segment at a moderate pressure. A 300-foot segment (100 meters) typically takes 30 minutes or less to inject. Following injection, technicians remove all equipment and install standard elbows at each end of the cable.
4. Re-energize the rejuvenated segment of cable, and then move on to the next segment.

Technicians typically apply the improved unsustained pressure rejuvenation (iUPR) process in areas that are difficult to access or cost prohibitive to replace. This process uses a low pressure, so fluid can flow through splices while the circuit is energized. The steps are as follows:

1. Isolate, test, and ground the damaged cable.
2. Using a TDR device, check each segment for splices, neutral corrosion, and overall length.
3. Perform air flow testing to confirm the rejuvenation fluid will flow properly.
4. Install new connectors and injection elbows.
5. Connect a feed tank to the injection elbow at one end of the cable and a vacuum tank at the other.
6. Re-energize the cable segment and, with the transformer closed, begin the injection process.

With iUPR, injection typically takes 24 hours or less to complete. The following day, technicians remove all equipment. Except for the initial installation of the injection components at the terminations, the cable remains energized throughout the process.

Benefits of rejuvenation

- **Cost savings.** On average, a rejuvenation program yields a 40-percent savings over abandon-and-replace programs. For utilities facing ever-increasing cable maintenance and management demand, rejuvenation helps address and repair more miles of cable for the same budget, compared to replacement.
- **Ecological impact.** Cable rejuvenation reduces new pollution: no resources are consumed to produce new cable, no diesel fuel is spent for installation, and the environment benefits when cables are not abandoned in the ground. For every 10-mile run of cable rejuvenated, cable injection provides at least a 3,000-metric ton reduction in CO₂ equivalent. Each meter of cable that is injected, rather than replaced, saves 195 grams of aluminum, 484 grams of copper, 963 grams of plastic, and 1.09 gallons of diesel fuel.
- **Fewer outages.** Because utilities can perform rejuvenation proactively rather than waiting for an emergency, there are fewer occasions when customers will be without power. Even during injection, customers experience a relative continuity of service, as opposed to tolerating planned outages as required for replacement.
- **Low failure rate.** In the past 30 years, more than 131 million feet of cable have been rejuvenated and more than 300 utilities on five continents across the globe have used cable rejuvenation. In that time, the overall post-injection failure rate is less than 1 percent.

With these benefits all in mind, utilities are best served to consider rejuvenation first when developing reliability programs for the URD cable they manage. [NWPPA](#)

Glen Bertini, the president, CEO, and chairman of Novinium, has more than two decades of working with cable-rejuvenation technology beginning with its development at Dow Corning in 1986. He has published more than 45 articles and 31 patents on cable rejuvenation and related technologies. Bertini is a senior member of the American Institute of Chemical Engineers, an Institute of Electrical and Electronics Engineers fellow, a voting member of the Insulated Conductors Committee, and a licensed professional engineer. He can be contacted at the Novinium headquarters at (253) 395-0200

POWER GRAB

Administration Budget Targets PMAs

By Scott Corwin and Bill Drummond

Almost every administration of both parties in the last four decades has landed on the idea of targeting the federal power marketing agencies to raise money for the federal budget. The current administration arrived there quickly with a proposal in May to sell off the high-voltage transmission systems of these agencies, including the Bonneville Power Administration and the Western Area Power Administration. It is a tired idea, is harmful to residents of the West, and should be put to rest one more time.

The power marketing agencies such as BPA and WAPA were created to serve the public by providing electricity to millions of Americans receiving electric service from not-for-profit public power, rural cooperatives, and tribal utilities. Charging only cost-based rates, these utilities deliver the emissions-free electricity produced at dams managed by the U.S. Army Corps of Engineers, the Bureau of Reclamation, and the International Boundary and Water Commission. Not supported by tax dollars like most federal agencies, BPA and WAPA operate more like utilities, covering all of their costs by charging those who buy federal power or move other power across the transmission system.

The BPA system plays a critical role in the Northwest. Its facilities now make up 75 percent of all transmission in the region, and it is increasingly called upon to move other renewable sources such as wind and solar power, as well as to balance an array of challenges to maintain a reliable and safe power supply. And WAPA, which has over 17,000 miles of transmission lines across the West, wheels federal hydropower to preference customers and serves as the backbone of the grid.

Thankfully, negative reaction to this administration's budget attempt to raise \$5.5 billion on the backs of electricity ratepayers has been fast and strong from a bipartisan array of House and Senate members from the West. They understand that BPA and WAPA already pay their own way, repaying the principal with interest to the U.S. Treasury for any amounts borrowed.

Privatizing these assets would be a tax on customers with no increase in efficiency or reliability. It would needlessly tie up private capital to send money to the Treasury now at the expense of the long-term revenue stream for Treasury already in place.

Another risk of the proposal to consumers is that, as regional control is lessened, the remote areas of the system may be neglected. This could harm the very rural communities that grew up with, and paid for, the vast system of transmission lines and substations that reach every corner of the western United States. Of course, there will also be the consequences of the rate increases that will be necessary as these assets shift into new ownership that will expect repayment of the inflated sales price and a return on their investment.

Finally, opposition to this particular budget proposal should not be read as promoting the status quo for the transmission system across the West. The energy sector is among the most dynamic in our economy, and the PMAs will need to continue to evolve and streamline their operations to stay competitive. Electric utilities are already working on modernization of the system as generation and usage patterns bring new challenges; but transforming a complex and integrated system is best handled in region, where the expertise lies with the parties who pay for the system, not driven by a federal budget proposal that grabs once again for the hard-earned investments of the people of the West. **NWPPA**

Scott Corwin is executive director of the Public Power Council representing consumer-owned utilities throughout the Northwest. Bill Drummond is executive director of the Mid-West Electric Consumers Association representing the Pick-Sloan Missouri Basin Program customers of WAPA across the Upper Great Plains. They can be reached at scorwin@ppcpdx.org and WKDrummond@meconsumers.com respectively.



Scott Corwin



Bill Drummond



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By Asia Cline



CHRIS JORGENSEN

Uses Infrared Technology to Keep the Lights on for Mason 3 Customers

Preventive maintenance is the least expensive way to ensure safe and reliable electricity for customers of an electrical utility. Fortunately for Mason PUD 3 in Shelton, Wash., vigilance is a key characteristic of Chris Jorgenson, lead engineering designer for the utility.

Jorgenson has worked at PUD 3 for nearly 19 years. He held several positions in the PUD's engineering department before moving into his current assignment. Throughout his PUD 3 career, he has specialized in the health and maintenance of the utility's electrical system. In his work, he demonstrates a commitment to the PUD's core values of safety, community engagement, and reliability.

Infrared inspections

Preventative maintenance is a big part of Jorgenson's job. During winter months, from November through March, Jorgenson, along with other PUD 3 engineers, works 5-6 hours every night (when it isn't raining) using an infrared camera to take thermal images of power lines, connections, and other equipment to locate and repair items suspected of running hot. Using an infrared camera, the thermal temperature readings identify hotspots on the electrical system, preventing damage before it occurs.

"My infrared work is like hunting, we scan every line and every piece of equipment looking for potential problems with our system," said Jorgenson. "It is great satisfaction when imminent equipment failure is found and repaired before it ever causes an outage."

The enemies to electrical components are increased resistance and heat. Among the problems that generate heat in an electrical distribution system are loose or weakened connections, overloaded circuits, and defective equipment. Heat generated by these flaws are easily detected by infrared inspections.

The benefits of catching hot spots early include extending the life of otherwise well-functioning equipment; prevention of equipment failures that could lead to widespread outages; and, reduction of costs through maintenance as opposed to replacement of damaged equipment.

The infrared inspection program helps make the PUD 3 electrical system safe, reliable, and can save thousands of dollars every year for its customers.

Safety demos

Jorgenson takes pride in his work and is proud to be involved in several committees within PUD 3, including his involvement with the PUD's electrical safety demonstration. The safety demonstration educates PUD 3 customers on how to be aware of the dangers of electricity and how the electrical system works. The demonstration is flexible enough so that it can be tailored for audiences ranging from kindergarten to high school. Jorgenson and his fellow engineers educate firefighters, law enforcement, public works, school bus drivers, and transit bus drivers, along with various other agencies and community groups. The safety demonstration is a hit at community festivals throughout the summer around Mason County.

Background

Jorgenson grew up in Wyoming and graduated from Worland High School in 1994. During high school and his early college years, he worked on a survey crew in Wyoming and planned to be a civil engineer. Jorgenson moved to Shelton in 1998 and became a temporary meter reader with PUD 3. He learned how awesome electricity was in 1999 when he accepted a job as a service engineer. He changed his focus, returned to school, and earned an associate of technical arts degree in electrical engineering from Bismarck College. In 2001, Jorgenson became a maintenance engineer.

"I love my job because of the sense of pride it gives me. Knowing that I am playing an important part within a big team is so satisfying and rewarding," he said. "Every day is like a different puzzle, problem solving, thinking, and engineering how to make all the parts fit together to keep the lights on."

The lights of his life are his two beautiful girls, Courtney and Cassidy. Together, Jorgenson and his girls like to be outdoors hiking, fishing, riding bikes, and swimming in the many local lakes.

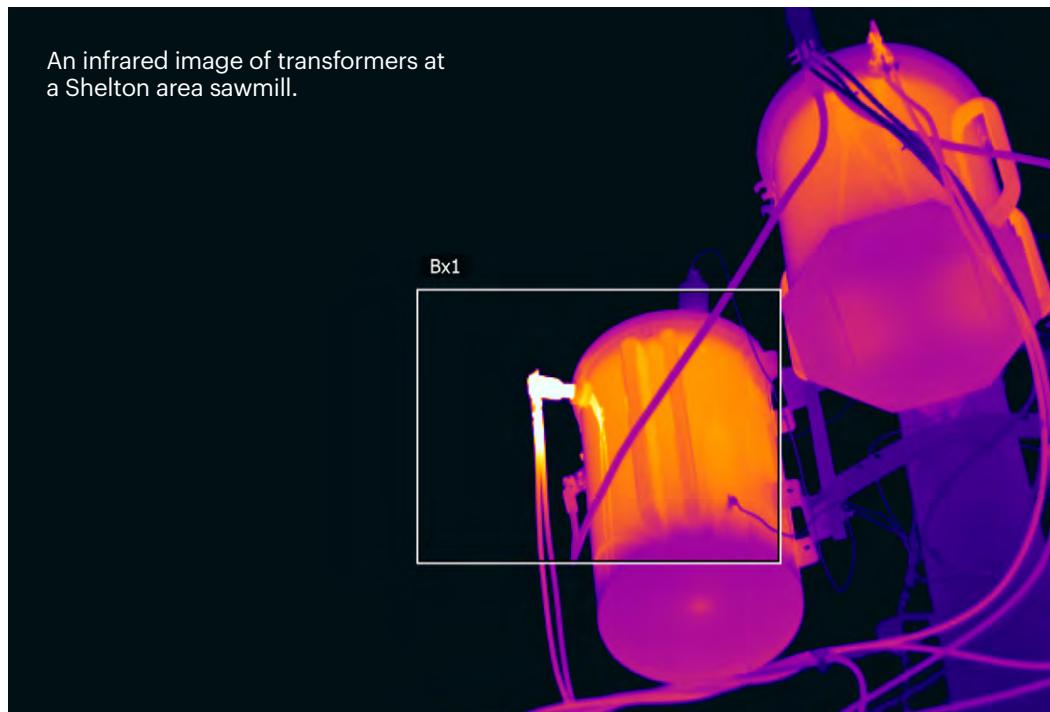
Mason PUD 3 is proud to call Jorgenson a member of its team. [NWPPA](#)

Asia Cline is the communications and community relations coordinator at Mason PUD 3 in Shelton, Wash. She can be contacted at asia.cline@masonpud3.org.

A Mason 3 employee stands in front of a substation transformer.



An infrared image of transformers at a Shelton area sawmill.



Infrared shots of an owl taken during a cold winter night.



WHAT'S IN YOUR WALLET?

Cash Transaction Reporting Obligation under Federal Law

By Richard Lorenz

The legalization of marijuana for recreational purposes in Oregon and Washington has introduced electric utilities to a new issue: cash management. As I have written previously, marijuana growers are substantial power consumers. It has been estimated that a marijuana grow operation uses as much electricity per square foot as a data center. Growing just four pot plants requires as much electricity as operating 29 refrigerators. This means that marijuana production facilities can, and often do, incur substantial start-up and recurring monthly charges for electricity service.

Because marijuana remains classified as a Schedule 1 drug for purposes of the federal Controlled Substances Act, however, most federally regulated or chartered financial institutions will not hold or handle money for marijuana growers. Without access to basic banking services, many marijuana growers are forced to pay their electric bills in cash. There are stories, perhaps the stuff of urban legend, of marijuana growers showing up in the lobby of the local electric utility with a backpack full of cash. While most utilities have already adapted to this risky payment method by adopting procedures and policies for safely receiving, storing, counting, and depositing large amounts of cash, this article focuses on the utility's regulatory obligations with respect to its receipt of cash payments.

The Bank Secrecy Act of 1970 requires any person who receives a cash payment (or payments) for goods or services in the course of their business for the same or related transactions in the amount of \$10,000 or more to report such payment or payments to the Internal Revenue Service and the Financial Crimes Enforcement Network (FinCEN) within 15 days. The purpose of this rule is to detect and combat the laundering of money by illegal enterprises through otherwise legitimate business transaction. The cash transaction is reported to the IRS and FinCEN by timely filing a Form 8300. In addition to filing the Form 8300, the person reporting must also provide written notice to the payer that a Form 8300 has been filed naming them as a cash payer.

The penalty for inadvertently failing to file a Form 8300 or to provide written notification of such filing is \$250 per instance. If the failure to file is intentional, however, then the penalty is the greater of \$25,000 or the amount of the cash transaction up to \$100,000. Criminal penalties may apply to any person who willfully violates their reporting obligations.

The basic reporting rule raises two important questions of interpretation: What is a cash payment and when might multiple cash payments be aggregated together? For purposes of this reporting obligation, a cash payment includes any payment made in U.S or foreign currency. It also includes total payments in excess of \$10,000 made by money orders, cashier's checks, or traveler's checks in increments of \$10,000 or less. It does not include, however, payments made by money order, cashier's check, or traveler's check in increments greater than \$10,000 because the financial institution issuing such instruments would have already reported the transaction to the IRS and FinCEN. It also does not include any payments made by personal check or by wire transfer.

It is unclear at this time whether payments made in digital currency such as bitcoin would count as cash payments for purposes of filing Form 8300. In recent guidance, the IRS has viewed digital currency more as property than, say, a type of foreign currency. This would counsel against the requirement to file a Form 8300 for payments received in bitcoin. Nevertheless, given that there are potentially substantial penalties for failing to file and no penalties for voluntarily filing when not otherwise required, it may be prudent to report any such digital currency transactions in excess of \$10,000 as if they are cash unless and until the IRS and FinCEN affirmatively indicate that it is not necessary.

The other question arises when multiple cash payments from a single payer are individually less than \$10,000 but exceed \$10,000 in the aggregate. The IRS guidance is clear that the reporting obligation cannot be evaded simply by breaking a single cash payment into multiple smaller cash payments. The IRS guidance is also clear that multiple payments that form a single or related transaction all count together. The basic rule is that the reporting obligation is triggered if the total cash payments made by a single payer on a single transaction during any 12-month period exceeds \$10,000. For example, if someone pays \$9,000 in cash for a car, the reporting obligation would not be triggered. If that same person returned to the same car dealer a week later and paid another \$1,000 in cash for the protective undercoating for the car, then the reporting requirement would be triggered. This principle also applies to installment or lease payments that are individually below the reporting threshold but that together exceed \$10,000 over the course of a year.

The issue that this raises for electric utilities is whether monthly cash payments from a single retail customer that are less than \$10,000 have to be aggregated for purposes of Form 8300. Assume, for example, a single cash-paying customer whose average monthly electric bill is \$1,000. While that customer's payments may not trigger the reporting obligation in any single month, the aggregate amount of payments could trigger a reporting obligation every 10 months or so if the provision retail electric service is considered by the IRS to be a single transaction. At this time, it is not yet clear whether the IRS would consider this a single, ongoing transaction with multiple installment payments, or a series of independent transactions. Again, in the face of this ambiguity a reasonable utility might conclude that it is preferable to over-report than to under-report.

Utilities seeking to avoid Form 8300 reporting requirements by adopting policies limiting the amount of cash payments would do well to incorporate these two nuances into their policies. It may not be sufficient, for example, to adopt a policy that simply limits one-time cash payments to \$9,999 or less. The more careful approach would prohibit cash payments from a single customer during any 12-month period that, in the aggregate, would exceed \$9,999. A well-crafted policy would also broadly define terms such as "cash" and "transaction" to include anything that the IRS deems to be cash or a single or related transaction.

Putting this all together, electric utilities need to be aware of and comply with their obligation to timely report cash payments in excess of \$10,000—whether from marijuana growers or otherwise—to the

IRS and FinCEN using Form 8300. In this context, cash can include other forms of negotiable instruments such as foreign currency, money orders, and cashier's checks. Cash may or may not include digital currencies such as bitcoin. Utilities should also be aware that the reporting obligation may be triggered by multiple smaller cash payments from a single customer over the course of a year that, when taken together, exceed \$10,000 in the aggregate. Finally, a good way for utilities to mitigate their reporting requirements is by adopting cash-payment policies that address the potential loopholes in the IRS rules. [NWPPA](#)

Richard Lorenz is a partner at Cable Huston LLP, a full-service law firm located in Portland, Ore. He can be contacted at rlorenz@cablehuston.com.



MEMBER NEWS

Cowlitz PUD Wins Two Safety Awards

Cowlitz PUD (Longview, Wash.) has earned both the APPA and NWPPA First-Place Safety Awards for safe operating practices for the year of 2016.

In 2016, Cowlitz PUD increased their safety efforts by adopting the "Alert Today, Alive Tomorrow" campaign that encourages safety throughout the District. Cowlitz's safety committee is made up of representatives from all business units who are committed to the safety and security of the District's employees and customers. [NWPPA](#)



Cowlitz Operations Supervisor Ben Morrow (center) accepts the APPA safety award.

Members Announce Election Results

Matanuska Electric Association (Palmer, Alaska) held its 2017 Annual Membership Meeting and Board Election on April 25. Over 250 members and their families joined for the business meeting, totaling over 500 attendees. Members received updates on their cooperative, learned about future projects, and voted in this year's election. This year's ballot included board seats for the Eagle River and Matanuska Districts. All votes were tallied by the election overseer and results are as follows: David Glines (incumbent) won the Eagle River District seat and Mark Masteller won the Matanuska District seat.

OPALCO (Eastsound, Wash.) members boarded the ferry on May 6 to participate in the 2017 Annual Meeting and learn the results of the board of directors' election. Voter participation was lower than 2016 with 1,992 total ballots (1,114 online, 878 by mail) representing about 17 percent of the membership. The successful candidates were Vince Dauciunas and Mark Madsen. Guests joined the 173 members present aboard the WSF Yakima for a total of 269 people in attendance.

Midstate Electric Cooperative's 65th annual meeting held on May 6 at La Pine Middle School (Ore.) was well attended with 471 registered members. The members and their guests enjoyed a barbecue lunch, health fair, displays, safety demonstrations, and door prizes. Incumbents Ken Wilson, Alan Parks, and Lee Smith all ran unopposed and were re-elected to serve members for another three-year term. Officers for 2017–2018 are Smith, president; Parks, vice president; and Diana Cox, secretary treasurer.

At Salem Electric's (Ore.) Annual Membership Meeting on May 11, Dave Bauer and Alicia Bonesteel were re-elected to three-year terms, and Cindy Condon was newly elected to fill an open seat when incumbent Carl Beach elected not to rerun for his board position. At the director's Organizational Meeting, the following officers were elected to serve for 2017–2018: Joe Van Meter, president; Jeff Anderson, vice president; and Bonesteel, secretary-treasurer. Other members of the board include: Dave Bauer, Jerry Berger, and Paul Ennor. [NWPPA](#)

Salem Electric's Belleque Retires

On April 5, Jack Belleque, Salem Electric's (Ore.) administrative services manager since 1990, retired. Belleque was hired in December 1981 as an accountant; he was promoted to senior accountant in 1987, then to accounting and finance manager in 1988.

"Jack has always been a numbers guy. Whether it's sports statistics, budgeting, or financial reports, he has always worked with numbers," said General Manager Terry Kelly. "He's been a key part of our success throughout his career."

In retirement, Belleque plans to spend time with family, golf, and share his love of sports with the next generation as a coach.

As Belleque finished his 35-year career, Chris F. Krieck, CMA became Salem Electric's new administrative services manager. Krieck, hired as an accountant in August 1990, was promoted to controller in 2005.

Krieck has been part of Accounting and Finance throughout his career and was integral when Salem Electric implemented the NISC customer service and accounting software systems. In his spare time, Krieck enjoys working on his small farm in Silverton where he and his family live. [NWPPA](#)



Jack Belleque

CGS Begins Biennial Refueling, Maintenance Outage

Columbia Generating Station disconnected from the Northwest power grid on May 13 to begin its 23rd refueling and maintenance outage. Columbia is scheduled to be offline for 40 days.

Energy Northwest and the Bonneville Power Administration time the biennial outage to coincide with spring time snow melt and runoff that maximizes power output from the region's hydroelectric system and minimizes the impact of taking the nuclear station offline.

"During this outage, we'll install upgrades and do overhauls and refurbishments that, taken together, will ensure continued reliability and efficiency from Columbia," said Brad Sawatzke, Energy Northwest chief nuclear officer. "That translates into a decreasing cost of power for customers from a tremendous carbon-free resource."

Work crews will focus on replacing 272 of the 764 nuclear fuel assemblies in the reactor core during the outage. Outage work also includes about 1,450 work orders involving approximately 10,300 separate tasks.

"The team has spent more than a year in planning and preparing work activities to make this a successful outage, which means a safe outage," said Sawatzke.

Columbia, located 10 miles north of Richland, is scheduled to restart and reconnect to the Northwest power grid in mid-June. [NWPPA](#)

Tacoma, Snohomish Win National Hydropower Awards

Tacoma Power (Wash.) and Snohomish County PUD (Everett, Wash.) both received Outstanding Stewards of America's Waters Award from the National Hydropower Association on May 2. Tacoma's award, its sixth-straight one, for Recreational, Environmental & Historical Enhancement honors two new hatcheries at the Cushman Hydroelectric Project in Mason County. Snohomish received the award for its success in providing access to additional fish habitat in the Sultan River Basin, site of the PUD's Jackson Hydroelectric Project.

Tacoma's hatcheries have been recognized for their incorporation of pioneering fish management approaches, such as circular tanks for rearing fish, an exceptional incubation system, an ultramodern chiller system for thermally marking fish, and cutting-edge computer monitoring and alarm systems.

Completing the hatcheries is one of the final pieces in Tacoma Power's recent expansion of its Cushman fisheries programs and facilities, which are part of its federal license to operate its dams. This is the fourth OSAW Award in a row awarded to Cushman-related projects.

The utility worked in conjunction with the Skokomish Indian Tribe, natural resource agencies, and other stakeholders to design and build them.

In late 2016, Snohomish PUD opened up six miles of additional fish habitat on the Sultan River by modifying a diversion dam on the upper reach of the river. The dam historically has been used in connection with the local water supply. Within weeks of the project's completion, coho salmon were detected upstream—for the first time in nearly 100 years! The utility also documented steelhead spawning in the river's upper reach in spring 2017.

"We're extremely proud of the way this project came together and happy to see the fish respond so quickly in the way they have," said PUD Natural Resources Manager Keith Binkley. "This builds on other fish-focused projects we have undertaken under a new federal license, issued in 2011 for the Jackson Project."

The awards were presented as part of the NHA's annual Waterpower Week in Washington Conference in Washington, D.C. [NWPPA](#)



New Substation Named for Betsy Johnson

Columbia River PUD (Deer Island, Ore.) will honor Sen. Betsy Johnson with a new substation to be built near the Scappoose Industrial Airpark. The PUD Board of Directors voted unanimously in favor of the name "Betsy Johnson Substation" at their May 16 meeting.

Sen. Johnson is a driving force behind the development slated for the airpark area. She helped secure \$7.5 million in funding from the Oregon Legislature for the Oregon Manufacturing Innovation Center.

"I'm honored by the PUD's gesture to recognize my contributions to the economic well-being of Columbia County," Johnson said.

Since the 1980s, Johnson has recognized the economic development potential of the airpark. She worked to protect the land for future development, and helped identify the OMIC opportunity.

"Betsy is a big reason we are seeing economic growth in the Scappoose area today," said PUD General Manager John Nguyen. "There is not a more deserving person to name our new substation after."

Johnson has also been a longtime advocate of Columbia River PUD. Her legislative efforts have supported community-owned utilities like the PUD. In 2013, the Oregon People's Utility District Association honored her with its Rock Solid Award.

This will be Columbia River PUD's ninth substation. Construction will begin later this year, and the PUD anticipates energizing the substation by early 2019. [NWPPA](#)

75 Years of Service Honored at Okanogan

Okanogan County PUD (Okanogan, Wash.) had the privilege of honoring five dedicated employees for their cumulative 75 years of service at the regular board meeting on May 15. The five recipients were JJ Boettger, information systems technician, 10 years; Nick Christoph, construction permit coordinator, 10 years; Ryan Lafferty, senior distribution engineer, 10 years; Jim Hensarling, senior distribution engineer, 20 years; and Mark Pritchard, operations manager, 25 years. [NWPPA](#)



MEMBER NEWS

Hamilton Promoted at City Light

Seattle City Light has named Sephir Hamilton as engineering and technology innovation officer for the utility, which serves over 430,000 electric customers in Seattle, Wash., and its surrounding communities. Hamilton will lead a team of nearly 250 professional engineers, project managers, and staff who plan and manage the electric transmission and distribution system.

Hamilton has served as interim officer in this role for the past year, and served as chief of staff for the three years prior. He joined Seattle City Light after 10 years of utility leadership at Central Hudson Gas & Electric in Poughkeepsie, N.Y.

"Sephir has a clear vision that will help us move forward in our changing industry," General Manager and CEO Larry Weis said. "With 15 years in the industry, Sephir combines expertise with a bias for action and innovative thinking that will be critical as utilities rethink the way we design the electric grid."

Over the past year, Hamilton created a new Technology Innovation team at Seattle City Light and will be starting a nationwide search for a director to lead that team.

Hamilton holds a Master of Business Administration degree from Cornell University, a Master of Mechanical Engineering degree from the Massachusetts Institute of Technology, and a Bachelor of Mechanical Engineering degree from Clarkson University. **NWPPA**



Douglas PUD Rolls out New Billing System

Douglas PUD (East Wenatchee, Wash.) customers may notice a change in the look of their May bills. Over the past several months, Douglas PUD has been gearing up to transition to a new utility-wide software solution. This included changing to monthly billing in January.

"Monthly billing is a disruption to customers and staff workload," said General Manager Bill Dobbins. "Unfortunately, our old software was unreliable and support was not meeting our expectations. In order to gain the efficiency benefits of integrated utility-wide software some compromises, such as the switch to monthly billing, are necessary."

The new system includes SmartHub, an online service for customers. SmartHub features allow customers to make payments; set-up paperless billing; sign-up for email and text alerts; and track usage using their personal computer, tablet, or smartphone.

"We are very excited to be able to offer SmartHub to our customers. It's convenient and easy to use. We encourage our customers to get online and check it out," said Public Information Officer Meaghan Vibbert. "We understand when there is a change, customers may prefer some assistance. Customers are welcome to call, email, or stop by if they have any questions."

NWPPA

Columbia REA Announces Restructuring

On May 16, Les Teel, CEO of Columbia REA (Walla Walla, Wash.), announced a change in the company structure. Following extensive work with the board of directors over the last few months, Teel announced that Scott Peters is moving from the role of marketing and member services manager to that of chief operating officer. Peters has been with Columbia REA for nine years, having come from Golden Valley Electric in Fairbanks, Alaska, where he was the member relations manager. This move aligns Peters to work with Teel and the Columbia REA board of directors to help set the direction of the cooperative.

Doug Case, formerly the energy efficiency and marketing specialist, will become the marketing and member services manager. Case has been with Columbia REA for seven years and brings a network of solid relationships with regional farmers and irrigators as well as the greater business community.

Taking on portions of Case's previous responsibilities, Dan Andrews will now be the cooperative's energy information and member service supervisor. Andrews began with Columbia REA 19 years ago in the Engineering Department and later transitioned into Member Services as the member services and billing supervisor. Andrews brings an in-depth knowledge of member services and energy efficiency to his new role.

Manager of Engineering and Operations Dave Reller becomes the manager of operations, and Grant Glaus, formerly the cooperative's system engineer, steps into the role of manager of engineering. Reller celebrated his 31st year with Columbia REA last month. He started his career as an engineer, working his way up the ranks to manage that department. Glaus has been an engineer for 18 years and has been with Columbia REA for the last eight years. Glaus and Case are both graduates of NWPPA's Senior Leadership Program. **NWPPA**

Chelan PUD Finances Are Better than Budget

Higher electric revenue due to colder weather combined with lower costs than expected resulted in positive bottom line results that are \$6.5 million better than budget for the first quarter of 2017 for Chelan PUD (Wenatchee, Wash.).

Based on first-quarter results, Kelly Boyd, chief financial/risk officer, said the District is forecasting to finish the year with positive bottom line results of \$93.5 million, about \$8 million better than budget. That's while it continues to invest in valuable assets such as modernizing hydro units and to reduce debt by an additional \$52 million this year.

Looking ahead, the district is on track to achieve the debt ratio target of less than 35 percent by 2019, as well as all other financial objectives, Boyd reported. She noted, however, that long-term, bottom line results are forecast to decline to about \$44 million a year by 2021 as market prices for power are moving lower. Reserves are forecasted to be lower, but still strong, as cash is used to reduce debt and to pay for major projects, she said. **NWPPA**

BPA Selects Cook as New Senior VP

The Bonneville Power Administration has chosen Joel D. Cook to be its senior vice president of Power Services. Cook begins his new position at BPA's Portland headquarters on June 12.

"Joel is a talented and results-driven leader with 25 years of experience in the energy industry," said BPA Administrator Elliot Mainzer. "His expertise will help BPA continue to meet our statutory obligations and deliver value to our preference customers while adapting to the rapidly changing wholesale electricity market. Joel grew up in Montana, so he is also looking forward to returning to his Northwest roots."

As senior vice president of Power Services, Cook will be responsible for BPA's power scheduling functions; energy efficiency; generation asset management; power contracts and rates; power purchases and acquisitions; as well as business relationships with 142 retail utility customers. BPA sells about 30 percent of the electricity consumed in the Northwest.

Cook comes to BPA from Talen Energy in Allentown, Pa., where he served as vice president of Retail Marketing and Western Trading. While at Talen Energy, Cook also led the company's Energy Specialty Contractors and Renewable Energy business units. Talen Energy is the largest independent power producer in the U.S. **NWPPA**



SMUD Partners with GRID Alternatives

SMUD (Sacramento, Calif.), in partnership with GRID Alternatives, is working to help customers in underserved neighborhoods save money and energy.

GRID Alternatives is a national nonprofit focused on making renewable energy technology and job training accessible to underserved communities. SMUD has worked closely with GRID Alternatives to help them find candidates eligible to receive free solar electricity systems in SMUD's service territory. SMUD reaches out directly to customers who are currently enrolled in SMUD's Energy Assistance Program Rate. Interested customers contact GRID Alternatives directly to continue the process and potentially receive a free solar electricity system. The systems are funded by California Climate Investments, a statewide program that puts billions of cap-and-trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment—particularly in disadvantaged communities.

"We're committed to helping all of our customers save energy and money," said SMUD Chief Customer Officer Nicole Howard. "Partnering with GRID Alternatives to provide free solar electricity systems along with energy efficiency upgrades is a win-win for our underserved communities."

SMUD and GRID Alternatives have completed upgrades to approximately 50 homes in Sacramento County to date. SMUD expects to complete upgrades to another approximately 150 homes over the next 18 months. **NWPPA**

Clallam PUD, Mason 3 among RP₃ Designees

Clallam PUD (Carlsborg, Wash.) has earned a Reliable Public Power Provider (RP₃)[®] designation from the American Public Power Association for providing reliable and safe electric service. This is the second consecutive time the PUD has earned the RP₃ designation. Mason PUD 3 (Shelton, Wash.) also received its second consecutive designation as a diamond-level utility in the RP₃ program.

The RP₃ designation, which lasts for three years, recognizes public power utilities that demonstrate proficiency in four key disciplines: reliability, safety, workforce development, and system improvement. Criteria include sound business practices and a utility-wide commitment to safe and reliable delivery of electricity. Clallam PUD and Mason PUD 3 join more than 220 public power utilities out of over 2,000 nationwide that hold the RP₃ designation.

"We're honored to be recognized once again as a Reliable Public Power Provider," said Clallam PUD General Manager Doug Nass. "Our staff works hard to provide reliable service and RP₃ recognizes our commitment to serving the community."

"We're honored to receive the RP₃ designation," said Annette Creekpaum, PUD 3 manager. "Our utility staff works hard to serve this community with safe, reliable, and cost-based service. RP₃ represents a much-appreciated recognition of this effort. We're pleased that along with the consistent recognition of the excellence of our financial management, we can now celebrate the independent certification of the excellence of our operational reliability."

A full list of the designees is available at www.publicpower.org.
NWPPA

Alameda PUB Updates Solar Program's Credit Rate

The city of Alameda's Public Utilities Board unanimously approved an updated credit rate for an Alameda Municipal Power solar program on May 15. The board's decision means that AMP's Eligible Renewable Generation plan will offer a credit rate of \$0.06447 per kilowatt-hour in fiscal year 2018.

New renewable generation customers can sign up for the voluntary ERG plan, which went into effect in December 2016.

The fiscal year 2018 ERG credit rate was calculated using methods and formulas approved by the board. The rate is the avoided cost of excess renewable energy from the previous calendar year's actual data.

The ERG program will not impact customers who participate in the net energy metering program. They will remain in the original program for 20 years from their interconnect date.

The ERG program minimizes cost shifting to non-participant customers. Under the program, annual netting of energy generation and usage does not occur. Instead, actual meter reads record usage and generation at normal meter interval periods. **NWPPA**

ASSOCIATE MEMBER NEWS

Burns & McDonnell Retains No. 1 Power Ranking

A continued surge of electric transmission and distribution projects to improve reliability and resiliency of the power grid has helped Burns & McDonnell stay as the No. 1 ranked firm in the Power category on the widely watched *Engineering News-Record* Top 500 Design Firms rankings. Burns & McDonnell ranked No. 16 overall among the Top 500 firms on design revenue of \$1.3 billion.

"Burns & McDonnell has always been a broadly diversified firm but our power business has seen tremendous growth and momentum for several consecutive years," said Burns & McDonnell Chairman and CEO Ray Kowalik.

"The entire power industry is going through a real transformation and we're excited to have our clients turning to us as partners to navigate through changes and discover new opportunities for growth," added John Olander, president of the T&D Group at Burns & McDonnell.

In addition to the Power ranking, Burns & McDonnell continued to climb among the top 20 rankings in these categories: No. 14 in Manufacturing, No. 17 in Sewer & Water, and No. 18 in Industrial Process/Petroleum.

Burns & McDonnell is a company made up of more than 5,700 engineers, architects, construction professionals, scientists, consultants, and entrepreneurs with offices across the country and throughout the world. For more information, visit www.burnsmcd.com. **NWPPA**

ECI Announces Major Promotion

Electrical Consultants, Inc. (ECI) announced that long-time employee David Maehl, P.E., has been elevated to the role of corporate vice president of power supply. With nearly 20 years at ECI, Maehl's background encompasses all facets of power engineering design, including experience with renewable energy projects; relay and protective device settings; substation physical and electrical design; and system studies.

In addition to high-level project responsibilities, Maehl is a member of the ECI Board of Directors and plays an integral part in business development and power supply planning for ECI. In his corporate role, he facilitates the firm's strategic goals and organizational functions, as well as provides executive-level leadership to help ensure the profitability and success of the company.

Maehl received both his bachelor's degree and master's degree in electrical engineering from Montana State University in Bozeman, Mont. He maintains professional licensure in Montana, Washington, Texas, and Nebraska, as well as Saskatchewan, Canada.

Electrical Consultants, Inc. is a U.S. top 10 T&D power delivery consultant. For more information, visit www.electricalconsultantsinc.com. **NWPPA**



Espinosa Named New Inner-Tite Manager

Inner-Tite Corp., manufacturers of security devices for utilities, announced the appointment of Michael Espinosa, district sales manager for the West Coast region. Espinosa will be serving utility customers in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming.



Espinosa has spent the last 12 years focused on building market share and brand recognition for a nationwide retail company. He has grown through multiple positions, including new market facilitator, district trainer, and district sales manager. His track record and can-do attitude have brought him to this opportunity with Inner-Tite; having now successfully completed the comprehensive six-week Inner-Tite Product Knowledge Training Program, he joins the team as West Coast district sales manager. Espinosa resides in southern California.

Inner-Tite Corp. is a privately held company that is the leading manufacturer of meter locking devices, meter seals, and a host of other mechanical accessories. For more information, contact INNER-TITE at (508) 829-6361 or visit www.inner-tite.com. **NWPPA**

Novinium Adds Sidney Hinton to Board

On May 23, Novinium, an end-to-end safety and reliability solutions provider for electrical utilities, announced the addition of Sidney Hinton to its board of directors.

Hinton serves as the president and CEO of PowerSecure, a distributed infrastructure business that focuses on distributed generation, energy efficiency, and utility infrastructure, which he founded in 2000. In 2016, PowerSecure was acquired by Southern Company and today is a wholly owned subsidiary of Southern. Before founding PowerSecure, Hinton held roles in finance, marketing, energy efficiency, and product/solution development at Southern Company and Progress Energy.

"We are excited that Sidney Hinton is bringing his extensive utility experience to the Novinium Board of Directors," said Glen Bertini, CEO, president, and chairman of Novinium. "As utility infrastructure continues to age across the country, Novinium is leading the way as the only full-service power cable expert that partners with utility companies of all sizes to keep their networks operating at peak reliability. Sidney's expertise and support is going to be invaluable in this pursuit."

Novinium invented the revolutionary technology behind underground cable rejuvenation more than 30 years ago, and the company continues to champion new technologies to keep power flowing to commercial and residential customers. Further information is available at www.novinium.com. **NWPPA**

McLaren Hires Nelmar and Boatwright

Two new outside sales professionals have recently joined team McLaren, filling the voids left by their retired predecessors.

Daniel Nelmar is the road warrior, driving his car on the long roads of Montana, Northern Idaho, and Eastern Washington, with his home base being in Post Falls, Idaho. Though he started his sales career in a Harley Davidson dealership, Nelmar brings experience in utility sales having worked for a manufacturers' representative company in a previous career.

Clayton Boatwright has recently moved to Salt Lake City and he covers McLaren's Utah, Southern Idaho, Wyoming, Nevada, and Colorado territory. He originally comes from Colorado, but his previous work was in the fields of oil and gas exploration in Texas. Boatwright's background is in mechanical engineering.

Both men bring with them integrity, dedication to customer service, and enthusiasm, which are the qualities customers have come to expect from McLaren Inc.

McLaren Inc. is a manufacturers' representative that has been serving the Pacific Northwest since 1961. For more information, contact (425) 827-9400 or micheleh@mclareninc.com.

NWPPA

Ruralite Managing Editor Sets Retirement

For the first time in more than 25 years, *Ruralite* soon will have a new hand at the helm of its editorial team. That's because the company's managing editor, **Curtis Condon**, last month announced his retirement, effective at the end of July. Condon will leave the company as its longest-tenured current employee—and one of its most respected and beloved.



Condon joined *Ruralite* as an editor in 1990 and within two years had been tapped to lead the magazine staff as managing editor. He's stepping down to pursue some long-delayed projects and spend some quality time with his family.

He puts *Ruralite* winning the National Rural Electric Cooperative Association's George W. Haggard memorial journalism award in 2015 at the top of his list of professional highlights; the award is annually given to the nation's top cooperative magazine. Condon also proudly notes that the number of utilities using the magazine brands has grown by nearly 20 percent during his tenure, while technology and efficiency efforts have allowed the company to keep staffing levels flat over those years. He oversaw the expansion of magazine brands under the company's umbrella from one (*Ruralite*) to four, and total circulation of the magazines went from just over 250,000 to more than 440,000 today.

Ruralite Services is a communications cooperative for all consumer-owned utilities. For more information, visit www.ruraliteservices.org. NWPPA

EPC Services Promotes John Ott

EPC Services Company announced the promotion of **John Ott** to vice president – business management. Ott started with EPC in 2012, mostly recently serving as general manager of the Salt Lake City office. He is an accomplished project executive and manager: his 20-year background in the electrical industry ranges from large substations to industrial process control projects in water treatment, geothermal power generation, mining, biotech facilities, critical power systems in data centers, and medium-voltage power distribution.



In his new position, Ott's primary focus will be on managing and directing major EPC execution portfolios, as well as facilitating high-level operational objectives and promoting the company vision to employees and clients. He has also been named to the firm's board of directors.

EPC Services Company is the nation's premier EPC contractor dedicated to the T&D power industry and is a wholly owned subsidiary of Electrical Consultants, Inc. For more information, visit www.electricalconsultantsinc.com. NWPPA

Senstar Announces Extended Range Detection

On May 9, Senstar, the world's largest manufacturer of perimeter intrusion detection systems (PIDS), announced that FiberPatrol-PR, its fiber-optic fence-mounted sensor for perimeter applications, now provides up to 31 miles of protection per processor, more than doubling the system's previous detection range capability of 14.9 miles. The intrusion-locating accuracy of the system has also improved to within 13 feet from the previous 26 feet.

"This is the second time in just over a year we have implemented extended range capabilities for FiberPatrol-PR," said Product Manager **Stewart Dewar**. "By enhancing the system, we are able to provide customers greater protection and more accurate locating with less infrastructure. This results in more economical deployments for long perimeter sites, including borders."

FiberPatrol-PR uses proven fiber-optic technology to detect and locate intrusions. The system has a reduced nuisance alarm rate because it can differentiate between disturbances caused by real intrusions and environmental disturbances such as wind and rain. FiberPatrol-PR can detect and accurately locate intrusions even when there are multiple simultaneous intrusions or in the presence of spatially distributed environmental noise that would mask the detection capability of other long-range fiber-optic sensors.

Senstar has been manufacturing, selling, and supporting the world's largest portfolio of perimeter intrusion detection sensor technologies for 35 years. For more information, visit www.senstar.com or www.YouTube.com/SenstarCorp, or follow @SenstarCorp on Twitter. NWPPA

Thank You to This Year's D.C. Ralliers

By Nicole Case

Spring is federal rally time for NWPPA's Legislative & Regulatory program. Each year, a delegation of NWPPA's member representatives joins the Northern California Power Agency for a federal policy conference and rally. This annual trip to D.C. is the cornerstone of NWPPA's L&R program. It is NWPPA's opportunity to meet with key members of the Senate, House, and congressional and administration staff to bring our unique western message to Washington, D.C., policymakers.

"NWPPA's annual Federal Policy Conference and Rally is our opportunity to meet one on one with key members of Congress and other policymakers to explain what is important to our constituency—153 consumer-owned utility members across nine Western states—whose shared goal of providing reliable, low-cost electricity to our communities is worthy of their support," said Marc Farmer, general manager of Clatskanie People's Utility District and the past chairman of NWPPA's Government Relations Committee. "While the Federal Rally tends to be a long week away from home and work, it is well worth the effort to make those personal connections and convey our unique western positions with our federal representatives and administration staff."

The week begins with a policy conference where we hear the latest on legislative and regulatory policy from congressional staff, administration officials, and policy experts. As in past years, we heard from a panel of Congressional staff working on key committees with jurisdiction over energy policy and the power marketing administrations. The panel provided an update on plans for an infrastructure bill; no longer are the committees looking to draft a comprehensive energy bill. Instead, the Senate and the House are looking at issues and concerns related to infrastructure. During the first few months of the legislative year, the Senate Energy Committee and the House Energy & Commerce committee held several hearings on energy issues that relate to infrastructure, including hydroelectric power, rights of way on federal lands, grid modernization, and cybersecurity—all key issues for NWPPA.

With congressional hearings underway, the energy staff panel said to expect a package of infrastructure legislation sometime this summer. A couple of key pieces of legislation,

however, are first up on the congressional agenda and may push back the timing of an infrastructure bill. Those issues—health care and tax reform—are priorities for President Trump and Congressional Republicans. While the House has now acted on health care, tax reform legislation remains in the works and is expected to be as controversial as health care, which may delay work on an infrastructure bill.

The Congressional energy panel and other discussions by experts and administration officials on tax reform, cyber-security, and the Federal Energy Regulatory Commission agenda prepared NWPPA's delegation for the next two days of congressional and administration meetings. During these two days, NWPPA's delegation breaks into smaller teams in order to accomplish over 40 meetings.

As Farmer said, it can be a long week. Jackie Flowers, general manager of Idaho Falls Power and first vice president of the NWPPA Board of Trustees, describes the week as "NWPPA's Death March." Flowers tongue-in-cheek description is not far off the mark. Multiple trips across the Capitol complex and down miles of marble-floored halls of the House and Senate office buildings definitely kill your feet. It takes dedication and a certain amount of stamina to survive two days and 40 meetings.

Key issues during our meetings included the infrastructure topics mentioned above as well as delivering messages about the importance of all hydro generation being recognized as renewable and that the hydro licensing process needs to be modernized. NWPPA also urged support for a fix to wildfire budgeting, legislation to reform the Endangered Species Act, preservation of the tax-exempt status of municipal bonds, and funding for the rural utility service. Our support for these issues were well known by our delegation and well received.

Conveying our message is just one important aspect of meetings with members of Congress and administration staff. NWPPA members also gather important intelligence on the status of pending legislation and policy issues. As expected, we learned that Congress is very supportive of fixing budgeting for wildfire prevention and suppression, but that disagreement over including changes to forest management practices may continue to hold up action on legislation. Legislation to reform the ESA is a priority for Republican leaders of both committees with jurisdiction over the act, but opposition by environmental advocates and others in the Congress is high. Any legislative proposal will need to be very targeted and well-reasoned.

Greg Walden (R-Ore.), chairman of the House Energy & Commerce Committee, intends to include legislative provisions on hydroelectric power licensing and grid modernization in his committee's infrastructure bill. It is likely that an infrastructure bill will also include language on vegetation management in and near utility rights of way similar to what was in the House energy bill last Congress and was introduced this year by Representatives Doug LaMalfa (R-Calif.) and Kurt Schrader (D-Ore.).





2017 NWPPA FEDERAL RALLY PARTICIPANTS

Brad Janorschke, Homer Electric Association (Alaska)

Brent Ridge, Energy Northwest (Wash.)

Clay Koplin, Cordova Electric Cooperative (Alaska)

Dave Kelsey, Yellowstone Valley Electric Cooperative (Mont.)

Debra Smith, Central Lincoln PUD (Ore.)

Doug Hardy, Central Montana Electric Power Cooperative (Mont.)

Doug Schmier, Fall River Electric Cooperative (Idaho)

Gary Soiseth, Modesto Irrigation District (Calif.)

Jackie Flowers, Idaho Falls Power (Idaho)

Marc Farmer, Clatskanie PUD (Ore.)

Molly Simpson, Douglas County PUD (Wash.)

Norman Tebay, Vigilante Electric Cooperative (Mont.)

Paul Hauser, Trinity PUD (Calif.)

Ron Holmes, Wasco Electric Cooperative (Ore.)

Scott Egbert, Wells Rural Electric Cooperative (Nev.)

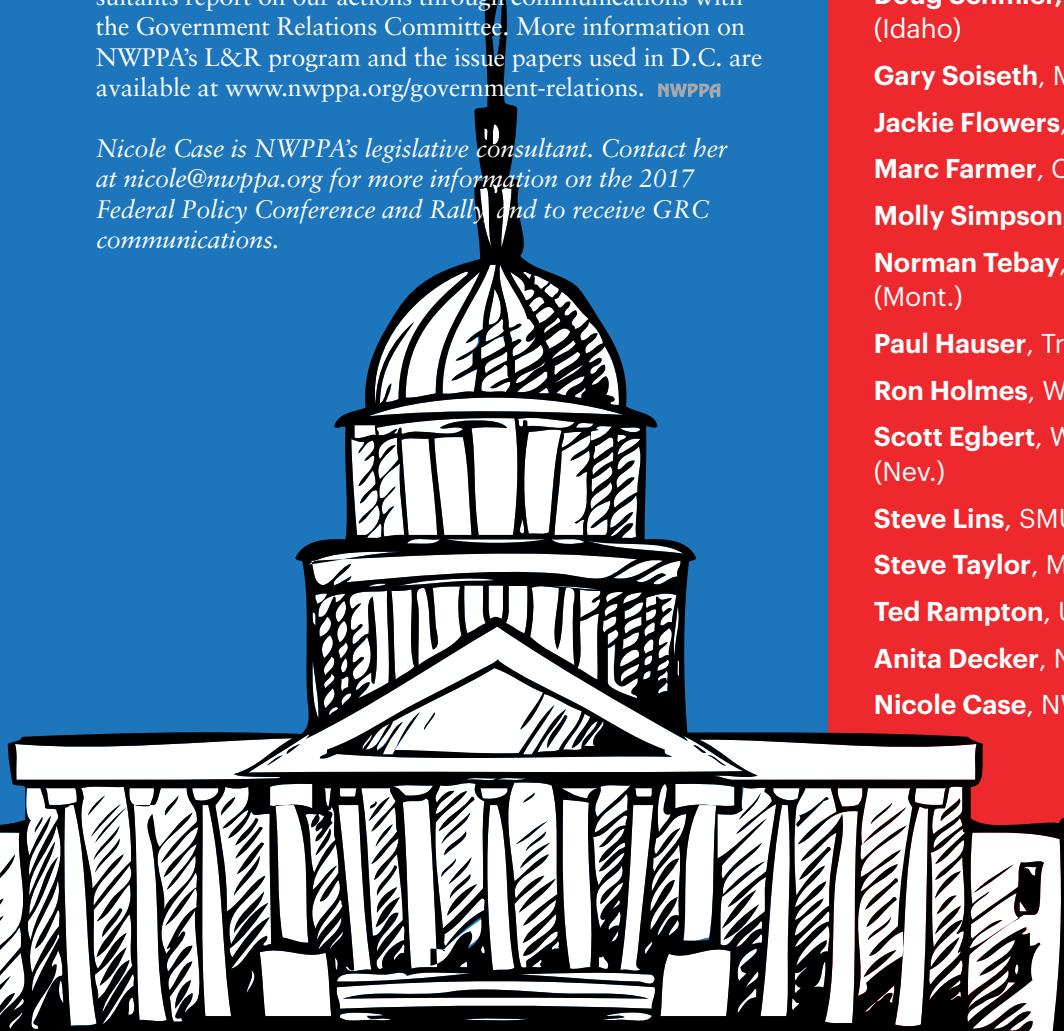
Steve Lins, SMUD (Calif.)

Steve Taylor, Mason PUD No. 1 (Wash.)

Ted Rampton, UAMPS (Utah)

Anita Decker, NWPPA Executive Director

Nicole Case, NWPPA Legislative Consultant



GRID FLEXIBILITY:

Do You Want Bacon or Caviar?

By Alison Mason and Andy Marshall

The very nature of electricity requires that grid infrastructure include provisions for flexibility to accommodate variability. Variability on the demand side is driven by weather, work schedules, holidays, consumer habits, and end use efficiency. Understanding these drivers helps us predict demand and plan for it. It also allows us to design incentives that reward increased end use efficiency and shift use away from natural peaks. Supply varies, too, and is affected by maintenance of power generation equipment; emergency outages; weather; the cost and availability of fuel; and (increasingly) consumer self-generation.

We place high value on having power available at the plug whenever we want it, so we have designed our grid to meet demand with extremely high reliability. Consumers want clean, affordable, and reliable power. This means we are installing more and more variable sources of clean renewable energy, such as wind and solar, and these require the grid to operate more flexibly. Grids become more flexible and reliable when they incorporate demand response; enlarge power trading and balancing boundaries; and invest in more flexible generation equipment and physical means to store energy. These strategies require coordination between grid conditions and asset capabilities.

Distributed energy resources are power assets connected to the distribution, rather than the transmission system. DER includes controllable loads, energy storage, and generation such as combined heat and power, solar, and wind. DER holds great potential to modernize the grid by providing flexibility and avoiding traditional infrastructure investment; however, innovation is needed in the sharing and communication of grid data and automating the response of DER to grid conditions.

Variable renewable energy

Figure 1 depicts a system with a high penetration of wind power. In this picture, yellow is the load, green is wind production, and orange is the load minus the wind, or net load. The addition of the variability in wind to the load pattern results

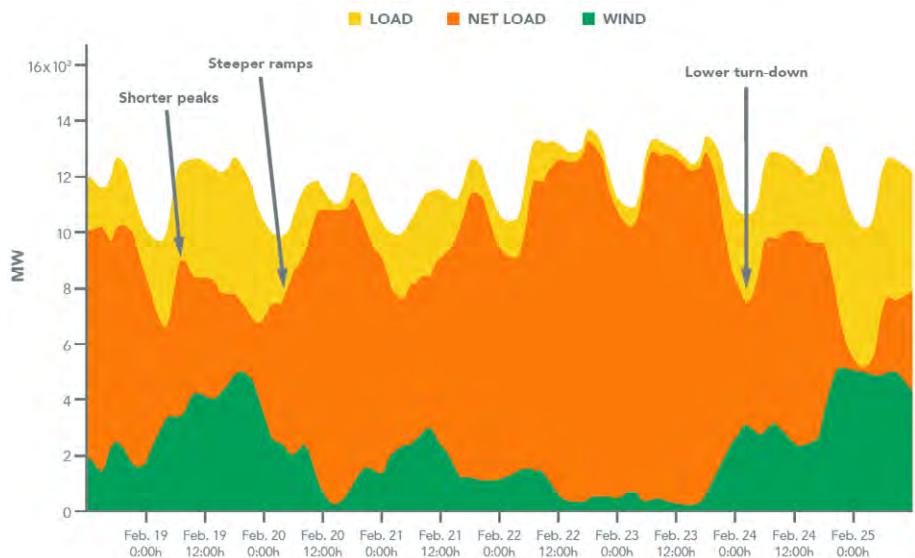


Figure 1. Variable wind generation [Flexibility in 21st Century Power Systems, Cochran et al., 2014].

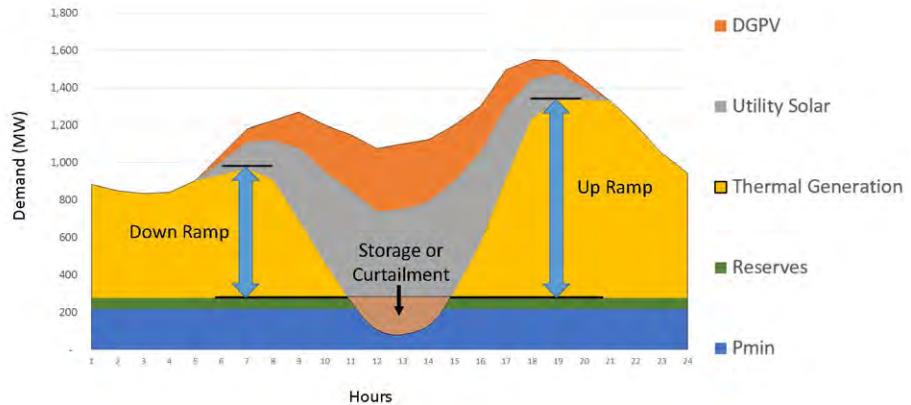


Figure 2. Variable solar generation [www.energy.hawaii.gov/electric-sector].

in shorter peaks (the conventional generation is needed less); steeper ramps (the generation must increase or decrease output more quickly); and lower turn-down (the generation must turn down to a lower minimum than without wind). The generation must also be able to stay on for shorter periods. This set of requirements is challenging to conventional generation equipment; however, DER is well-suited to fill these needs.

Figure 2 depicts a system with a high penetration of solar power. In the middle of the day, the solar is producing more than the minimum level of the thermal generation. In this

situation, the system operator can curtail solar but this may violate contracts and erodes the capacity factor of the solar resource which is providing zero marginal cost, emission-free power. Better solutions include charging a battery or increasing load to soak up the excess solar or exporting power to a neighboring area. This system also experiences a steep ramp when the sun goes down while the load is increasing.

Coordinating DER to provide flexibility

In the Northwest, a lot of wind energy has been installed to reduce carbon emissions; however, the Northwest already has significant carbon-free hydropower. The chart in Figure 3 illustrates the case where wind generation at a time of low demand, when conventional generation is already at its minimum, causes hydro to be curtailed to make room for carbon-free wind and there is no net carbon benefit. In a 2013 study, Spirae contributed to an Ecofys study demonstrating that residential and commercial HVAC loads could be controlled to provide the needed flexibility to accommodate wind energy in the Northwest, thus realizing the anticipated carbon emissions reduction.

The Danish power system, which has undergone a major transition since the 1980s, see Figure 4, provides a rich example of how DER can be coordinated to integrate variable renewables and increase reliability. More than half of all electricity in Denmark is generated locally rather than in central stations. Combined heat and power units and wind turbines make up most of the local generation.

The Danish transmission operator, Energinet, launched the cell controller pilot project in 2005 to prepare for higher penetration of renewables; ensure grid reliability through intentional islanding of local cells; and enable additional value streams for asset owners and distribution utilities in the form of ancillary services. The area chosen for the study is centered around the town of Holsted. The Holsted cell, which occupies an area of roughly 1,000 square kilometers and serves 28,000 customer meters, includes 5 CHP plants, 47 induction wind turbines, and 13 load-serving substations. When overproduction of wind and subsequent tripping caused a general blackout, the local resources were of no use because they were not able to run islanded.

The wind turbines are induction type. The combined heat and power plants are driven by local demand for heat. Each one has a natural gas engine, generator, and hot water storage for district heating. To make them useful participants in the cell controller project, controls were added so they could run

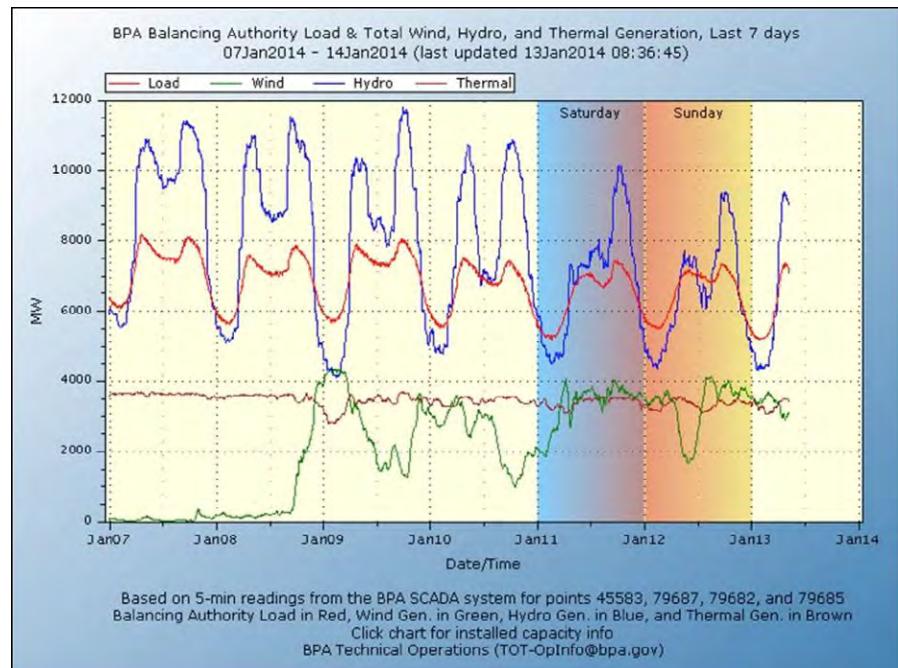


Figure 3. Curtailing Hydro to Produce Wind [www.bpa.gov].

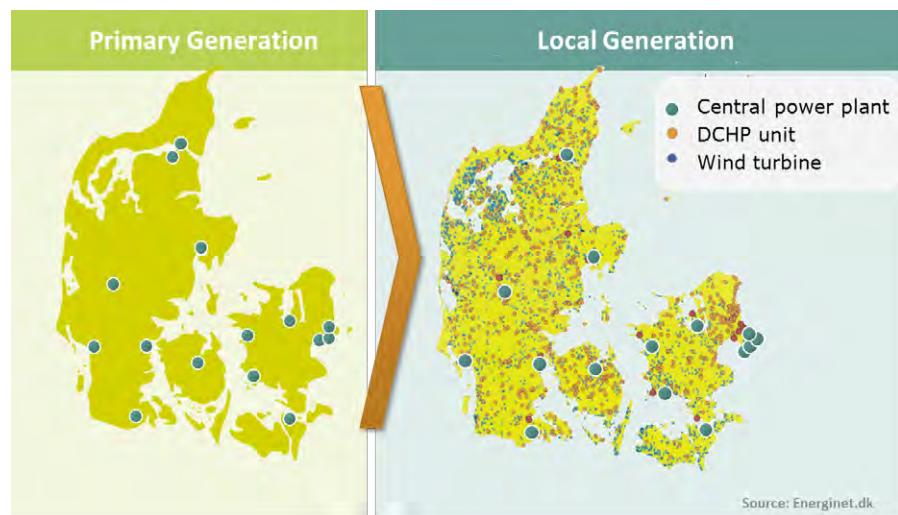


Figure 4. Danish power system transforms from centralized to distributed generation [Energinet.dk].

islanded from the grid.

Denmark's cell controller project demonstrated the ability of power assets connected at the distribution level to provide grid services such as capacity, voltage support, renewable firming, islanding, blackstart, virtual asset aggregation, and market participation.

Energy storage: the bacon or caviar of the grid

With grid awareness and intelligent control, many kinds of DER can provide flexibility to the grid. Energy storage, because of its multiple operating modes, is one of the most versatile single assets that a utility can deploy. For instance, an energy storage asset can look like generation by either increasing its discharge or decreasing its charge, and vice versa when considered as a load. When coupled with power electronics, energy storage can also act to source or sink VARs.

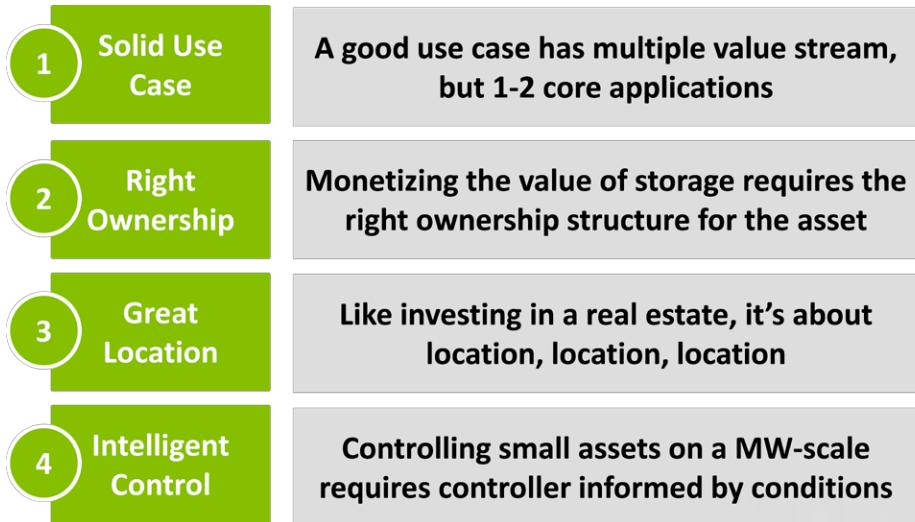


Figure 5: Key factors to consider when screening potential energy storage projects.

While these features are unique, what truly sets energy storage apart is the ability to react quickly and precisely to changes in grid conditions from a dead stop. It can also be sited both flexibly—because of its power density and modularity—and nearly anywhere—because it has no emissions during operation. These features set this asset class up well to perform multiple use cases for the distribution utility, which is timely as utilities are looking increasingly to deploy multi-purpose assets to improve the efficiency of their capital deployments.

The challenge for the utility is to cut through today's hype around storage and the myriad technologies to get projects which are prudent investments. Put another way, utilities must have a framework to support evaluation of storage that helps them to decide if a storage project will be the bacon (makes everything better) or caviar (an unnecessary luxury) of their grid. Taking the viewpoint of a utility, there are four key factors that must be considered in screening potential storage projects to assess the likelihood of success: use case, ownership structure, siting location, and control scheme (Figure 5). The next several sections explain these factors and why they have outsized impact on storage projects.

Use case

Most importantly, energy storage projects require a use case, or objectives against which the storage is dispatched, that typically has multiple applications which create value for the project stakeholders. The literature on energy storage is rife with application descriptions, and the recent framework developed by the Rocky Mountain Institute structures the applications with regard to their value and to which potential project stakeholders the value accrues.

What is clear from RMI's analysis is that 1) the values, both estimated and observed, for energy storage applications vary widely, 2) to create a simple payback on investment with a storage asset performing a single application is exceedingly long, assuming storage is priced in the \$1,200–\$1,500/kW range. Therefore, it is critical that multiple applications and

related value stream be combined, or stacked, on a single deployment to support the economic case for storage. Also critical, while not explicitly referenced in the RMI report, is the fact that choosing and sizing the battery storage technology is highly dependent on the mix of applications. Mixing applications which require both high power operation (short burst charges or discharges from the battery) and long dispatches, may increase the cost of a battery system and negatively impact project economics. On the other hand, storage asset cost can be minimized for use cases in which the battery dispatch requirements are well matched in terms of duration and intensity. Therefore, it is crucial to consider the application stack during project screening to ensure a battery system can be economically designed to meet the unique demands of the use case.

Ownership structure

The proposed ownership structure is the second critical factor for utilities to consider when screening energy storage project ideas. As previously stated, multiple applications can be stacked to improve the economics of an energy storage project, however, the values that accrue directly to a distribution utility are limited. According to RMI, the classic poles-and-wires distribution utility can only take advantage of the avoided cost streams related to maintaining resource adequacy; deferring transmission and/or distribution upgrades; and avoiding transmission congestions charges to justify an investment in energy storage. Therefore, utility asset ownership models have limited application stacking options. What is needed are structures that bridge multiple stakeholders and monetize the value from end user and/or market-facing applications. Multi-tenant models, where a third-party-owned asset is shared by two stakeholders, are particularly useful in bridging the gap. In fact, third-party ownership models where energy storage devices sited at the customer premise serve both the end customer and the utility have already begun to open up new opportunities. Southern California Edison's procurement of over 150MW of capacity contracts for C&I-sited energy storage for its 2014 Local Capacity Requirement, and the recent Solar-plus-Storage project deployed by the municipal utility in Minister, Ohio are good examples of utilities doing this at scale.

Siting location

Asset siting, while intimately tied to the use case and ownership model for storage, has its own critical importance in evaluating and preparing for an energy storage project. The analysis by RMI and others point to the applications that utilize storage spatially closer to load as having on average a greater value than those located closer to generation, and makes sense as there is considerable value add in the transmission and distribution of power and energy from centralized power stations and the grid edge. Additionally, assets at the grid edge have

the potential to participate in more applications across the utility value stream.

Furthermore, because of load pockets, congestion, aging infrastructure, and pockets of high penetration PV at the grid edge, the location of storage has a large determination on its value to the utility and other grid stakeholders. It is important for the utility to consider the locational value of storage, down to the location on a feeder for instance, to create a comprehensive assessment of its total value.

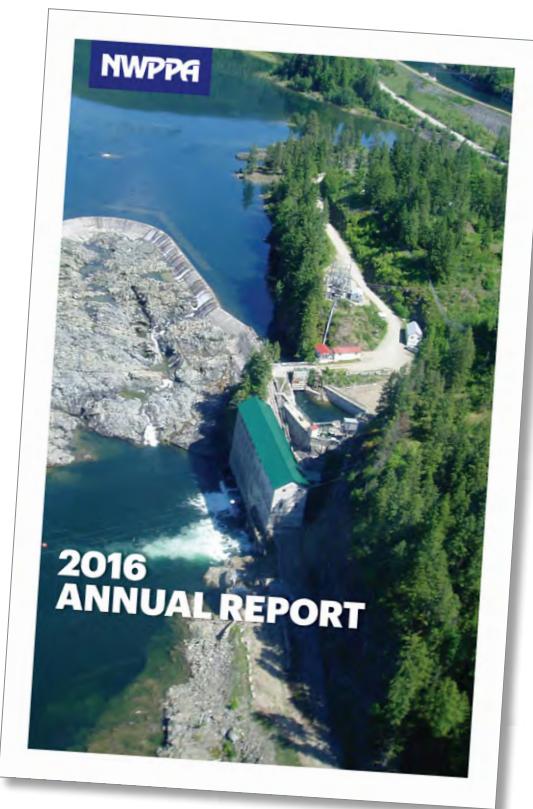
Control scheme

Lastly, the means by which storage is controlled during operations determines whether the value assessed during planning and pre-project analysis is met in the field. Typically, there are two macro drivers of storage asset underperformance: the first being the premature aging of the battery system components, most critically the battery modules, arising from overuse; and the second being grid operational schemes, such as distribution system switching states, which may limit the ability of the battery to discharge. Both of these can be addressed by asset control schemes determined during project design and planning. However, certain barriers to value capture cannot be fully assessed in pre-project planning or arise from unexpected changes to the conditions of the grid after the storage asset has been placed. Herein lies the importance of having an energy storage controller with the capability to sense and react in near real-time to changes in the conditions of the grid, commonly referred to as situational awareness. This requires both the ability to gather the appropriate data from a utility's secure, hardened communications networks and the intelligence to use this information to dispatch the battery most efficiently. Grid-aware storage controllers make it possible to improve value capture from storage and minimize the system's total cost of ownership, therefore making careful assessment of the capabilities of this system component central to a utility's due diligence on a potential energy storage project.

DER du jour

Energy storage, which today can seem like the most hyped DER that matters, is already having a marked impact on the grid and conversation around the continued modernization of the grid. By cutting through the hype, and focusing on use case development, the right ownership model, siting for value, and intelligent storage control systems, utilities can screen storage projects effectively and determine whether a particular idea will be bacon or caviar for their grid. Importantly, these same principles apply for controllable loads, smart inverters, and gensets, which, when intelligently coordinated as a portfolio, offer energy storage-like services to the grid. **NWPPA**

Alison Mason is director of channel sales at Spirae, and can be reached at amason@spirae.com. Andy Marshall, PhD. is a senior product manager at Landis+Gyr, and can be reached at andy_marshall@landisgyr.com.



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 - Complete the online Job Opportunities ad placement form at www.nwppa.org.
 - NWPPA reserves the right to edit all listings in order to fit size requirements in the publication.
-

POSITION: Cowlitz Falls—Project Biologist

COMPANY: Lewis County PUD (Chehalis, Wash.)

SALARY: DOE

DEADLINE TO APPLY: June 20, 2017

TO APPLY: Visit www.lcpud.org.

POSITION: Engineer III, System Protection & Automation Engineer

COMPANY: Portland General Electric (Portland, Ore.)

SALARY: DOE

DEADLINE TO APPLY: July 2, 2017

TO APPLY: Visit www.portlandgeneral.com/careers.

POSITION: Storekeeper

COMPANY: Consumers Power, Inc. (Philomath, Ore.)

SALARY: \$33 per hour

DEADLINE TO APPLY: June 30, 2017

TO APPLY: Visit www.cpi.coop.

POSITION: Resource Planner

COMPANY: City of Palo Alto Utilities (Palo Alto, Calif.)

SALARY: \$8,426 per month

DEADLINE TO APPLY: June 30, 2017

TO APPLY: Visit <https://goo.gl/XXFWxj>.

POSITION: Hydro Technician/Operator

COMPANY: Northern California Power Agency (Murphys, Calif.)

SALARY: \$42 per hour

DEADLINE TO APPLY: June 30, 2017

TO APPLY: Visit www.ncpa.com.

POSITION: Journeyman Tree Trimmer

COMPANY: PUD #1 of Clallam County (Carlsborg, Wash.)

SALARY: \$37 per hour

DEADLINE TO APPLY: June 29, 2017

TO APPLY: Visit www.clallampud.net.

POSITION: Fisheries Engineering Manager

COMPANY: City of Tacoma (Tacoma, Wash.)

SALARY: \$113,172.80 – \$145,080.00 per year

DEADLINE TO APPLY: June 21, 2017

TO APPLY: Visit <https://goo.gl/ORRZTM>.

POSITION: General Counsel

COMPANY: Energy Northwest (Richland, Wash.)

SALARY: \$350,000 per year

DEADLINE TO APPLY: June 29, 2017

TO APPLY: Visit www.energy-northwest.jobs to apply.

POSITION: Natural Gas Pipeline Safety Analyst

COMPANY: Oregon Public Utility Commission (Salem, Ore.)

SALARY: \$4,373 – \$6,389 per month

DEADLINE TO APPLY: June 23, 2017

TO APPLY: Visit <https://goo.gl/h6ZhXJ>.

POSITION: Compliance & Training Coordinator

COMPANY: Chelan County PUD (Wenatchee, Wash.)

SALARY: \$97,000 – \$121,300 per year

DEADLINE TO APPLY: June 25, 2017

TO APPLY: Visit www.chelanpud.org.

POSITION: Electrical Line Worker

COMPANY: City of Lompoc (Lompoc, Calif.)

SALARY: \$5,520.62 – \$7,011.32 per month

DEADLINE TO APPLY: June 26, 2017

TO APPLY: Visit www.cityoflompoc.com/humanresources.

POSITION: Specialist IV (Scada Testing & Energization)

COMPANY: Portland General Electric (Portland, Ore.)

SALARY: \$1,403 per week

DEADLINE TO APPLY: July 25, 2017

TO APPLY: Visit www.portlandgeneral.com/careers.

POSITION: Engineer I - Water & Wastewater Systems

COMPANY: PUD #1 of Clallam County (Carlsborg, Wash.)

SALARY: \$5,245 – \$7,439 per month

DEADLINE TO APPLY: June 23, 2017

TO APPLY: Visit www.clallampud.net.

POSITION: Limited Assignment Telecom Tech. 1

COMPANY: Okanogan PUD (Okanogan, Wash.)

SALARY: DOE

DEADLINE TO APPLY: June 23, 2017

TO APPLY: Visit www.okanoganpud.org.

POSITION: Operations Superintendent
COMPANY: Okanogan PUD (Okanogan, Wash.)
SALARY: DOE
DEADLINE TO APPLY: June 23, 2017
TO APPLY: Visit www.okanoganpud.org.

POSITION: Power Plant Operators
COMPANY: Chelan County PUD (Wenatchee, Wash.)
SALARY: \$44 per hour
DEADLINE TO APPLY: Open until filled
TO APPLY: Visit www.chelanpud.org.

POSITION: Distribution Manager
COMPANY: PacifiCorp (Crescent City, Calif.)
SALARY: \$91,700 – \$118,700 per year
DEADLINE TO APPLY: June 23, 2017
TO APPLY: Visit www.pacificorp.com/careers.

POSITION: Energy Analyst
COMPANY: Chelan County PUD (Wenatchee, Wash.)
SALARY: \$62,160 – \$92,100 per year
DEADLINE TO APPLY: June 22, 2017
TO APPLY: Visit www.chelanpud.org.

POSITION: Mechanic Operator III-V, Mechanic/Machinist
COMPANY: Northern California Power Agency (Roseville, Calif.)
SALARY: \$41 per hour
DEADLINE TO APPLY: June 23, 2017
TO APPLY: Visit www.ncpa.com/careers/job-listings.

POSITION: Specialist VI—Balancing Authority Operator
COMPANY: Portland General Electric (Portland, Ore.)
SALARY: DOE
DEADLINE TO APPLY: June 26, 2017
TO APPLY: Visit www.portlandgeneral.com/careers.

POSITION: Substation, Relay & Metering Electrician
COMPANY: Coos-Curry Electric Cooperative (Port Orford, Ore.)
SALARY: DOE
DEADLINE TO APPLY: June 21, 2017
TO APPLY: Visit www.ccec.coop/content/career-opportunities.

POSITION: Fill-In/On-Call Instructor
COMPANY: Northwest Lineman College (Edgewater, Fla.)
SALARY: \$40 per hour
DEADLINE TO APPLY: June 18, 2017
TO APPLY: Submit cover letter and résumé to nlcjobs@lineman.edu.

POSITION: Fill-In/On-Call Instructor
COMPANY: Northwest Lineman College (Denton, Texas)
SALARY: \$41 per hour
DEADLINE TO APPLY: July 18, 2017
TO APPLY: Submit cover letter and résumé to nlcjobs@lineman.edu.

POSITION: Principal Electric Utility Engineer - Distribution
COMPANY: City of Santa Clara (Santa Clara, Calif.)
SALARY: DOE
DEADLINE TO APPLY: July 7, 2017
TO APPLY: Visit www.santaclaraca.gov.

POSITION: Principal Electric Utility Engineer—Project Management and Maintenance Support
COMPANY: City of Santa Clara (Santa Clara, Calif.)
SALARY: DOE
DEADLINE TO APPLY: July 7, 2017
TO APPLY: Visit www.santaclaraca.gov.

POSITION: Journeyman Lineman
COMPANY: Kodiak Electric Association (Kodiak, Alaska)
SALARY: \$49 per hour
DEADLINE TO APPLY: July 29, 2017
TO APPLY: Visit www.kodiakelectric.com.

POSITION: Energy Conservation Engineer
COMPANY: Tacoma Power (Tacoma, Wash.)
SALARY: \$91,146 per year
DEADLINE TO APPLY: July 10, 2017
TO APPLY: Visit www.cityoftacoma.org/jobs.

POSITION: Regulatory Affairs Supervisor
COMPANY: Municipal Light & Power (Anchorage, Alaska)
SALARY: \$77,272 per year
DEADLINE TO APPLY: June 30, 2017
TO APPLY: Visit www.muni.org/jol.

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