Northwest Public Power Association
BULLETIN

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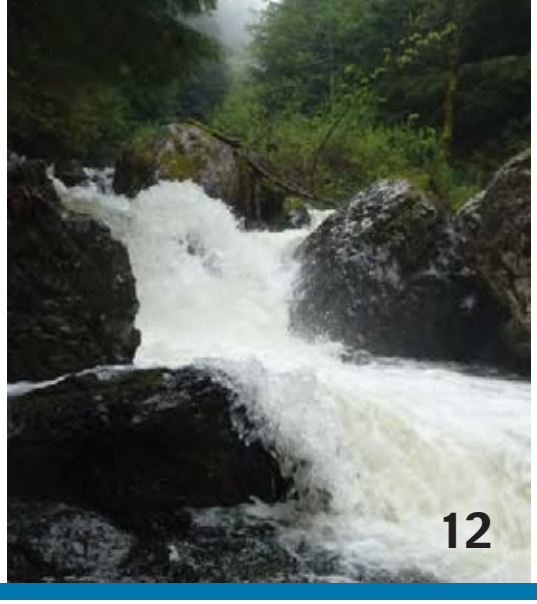
Nanogrids:
supreme threat or natural evolution for the future of energy?



On the cover: Peter Asmus of Navigant Research received high praise at our Annual Meeting in May so we invited him to write about nanogrids for the *Bulletin*. Nanogrids, according to Asmus, should grab the attention of public power entities because they are growing in importance due to major declines in technology costs. Read more about what he has to say about nanogrids and decide for yourself if they are a threat or an evolution.

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Coming in the next issue:
Idaho Falls Power's successes with the Pacific Northwest Smart Grid Demonstration Project.

Women in Public Power returns to Portland in November

Attendees of last year's Women in Public Power Workshop raved about the event and asked us to bring it back again — so we have! And we have brought it back bigger and better with the intent of continuing to build on last year's development. Geared toward women in the power industry, NWPPA's Women in Public Power Conference will be back in Portland, Ore., November 8-10. For attendees of last year's Women in Public Power, this year's conference will expand on last year's objective: bringing women in the industry together to learn, develop, and connect. However, if you didn't attend last year's Women in Public Power, don't let that stop you from attending this one! Women at all levels in the public power industry are welcome and encouraged to attend.

For those who attended the first Women in Public Power, you will recognize some of the popular aspects of last year's event: Hogan Assessment results and analysis to help develop a better understanding of individual strengths, tendencies under stress, motivations, and values; a focus on communication, confidence, networking, and resilience; more "speed dating;" violin virtuoso Kai Kight to again entertain and inspire everyone; and a networking reception on Wednesday evening.

However, we want to keep it fresh and new in 2017, so we have added several new program activities such as a special breakout session for those who attended last year; StrengthFinders results and analysis; a "man panel" made up of male utility GMs and CEOs moderated by Roseville Electric Utilities General Manager Michelle Bertolino; and a "woman panel" made up of female industry leaders, also moderated by Bertolino.

Other sessions will address key success factors for women in public power (communication, confidence, connection, and resilience); communicating who you are by linking the content of our message, body language, and delivery; and developing and honing leadership skills in your community and outside of your day job.

Come to the conference and spend time with colleagues to make connections, start mentoring relationships, and share stories that support individual and collective development within the public power community. While there, create an action plan that connects individual professional growth with business and industry needs.

Registration for the conference is now open at www.nwppa.org. In order to fully participate in the course and discuss your Hogan and StrengthFinders Assessments at the event, please register before October 15; this will allow you time to complete the assessments prior to the event starting so you will have the results to discuss at the event itself. The conference will be held at the Embassy Suites at the Portland Airport so it is convenient for out-of-town attendees. Register for your hotel room before October 11 to receive the $159 room rate for a single/double, which includes Embassy Suites' complimentary hot breakfast buffet.

For more information, contact Elaine Dixon at Elaine@nwppa.org. NWPPA

Coming soon!

Keep an eye out for the new and improved 2017 NWPPA Event Catalog in early September. This year's catalog will have expanded content and a fresh new look.

Stay tuned!

NWPPA to host FEMA ICS classes in 2017

Last month's cover story, "Cascadia Rising," outlined the importance of being prepared for our darkest days, as well as why it's important for your utility to be prepared and be part of the Incident Command System (ICS) process. With that in mind, NWPPA has partnered with FEMA to bring ICS-300 and ICS-400 certification classes to our members in early 2017. The instructors for both classes are certified Department of Homeland Security NIMS/ICS instructors and meet/exceed all requirements needed to teach the courses.

We will be offering ICS-300 twice in the first quarter of 2017: January 25-27 in Portland, Ore., and March 28-30 in Anchorage, Alaska. During this 2.5-day course, participants will enhance Incident Command skills with a special focus on new concepts of the ICS. The training and resources provided in this course will assist personnel who require advanced application of the ICS. The course will also benefit any person who has responsibility managing an expanding incident in a command post. Attendees will participate in group activities that introduce the development of the Incident Action Plan (IAP) and demonstrate the interactions between the command and general staff sections of the ICS. Attendees will gain a deeper understanding of how the National Incident Management System (NIMS) Command Management component supports the management of expanding incidents; incident/event management processes for supervisors and expanding incidents as prescribed by the Incident Command System (ICS); how to implement management process at a simulated incident; and how to develop an Incident Action Plan (IAP) for simulated incident.

Prerequisites for ICS-300 include:

- *IS-100.b, FEMA Introduction to the Incident Command System, ICS-100*
- *IS-200.b, FEMA Incident Command System for Single Resources and Initial Action Incidents, ICS-200*
- *IS-700.a, Introduction to the National Incident Management System (NIMS)*
- *IS-800.b, National Response Framework (NRF), An Introduction*

Attendees who have not completed the prerequisites will be allowed to attend the course, but they will not be issued a certificate of course completion until they successfully complete the prerequisite portions of the course.

ICS-400 is a two-day class where participants will further their ICS skills; this class is scheduled for March 22-23, 2017, in Portland, Ore. The ICS-400 course builds on the information covered in the ICS-100, ICS-200, and ICS-300 courses, and explains the roles and responsibilities of local, county, state, and federal agencies involved in managing an expanding incident. Group activities that introduce the use of an Incident Complex and Area Command, and the interactions between Multi-Agency Coordination (MAC) are a part of this course. At the end of the two days, participants will understand the special management challenges for major incidents/events, area command, and Multi-Agency Coordination Systems (MACS). Please bring your SID login information to this class.

Prerequisites for ICS-400 include:

- *IS-100.b, FEMA Introduction to the Incident Command System, ICS-100*
- *IS-200.b, FEMA Incident Command System for Single Resources and Initial Action Incidents, ICS-200*
- *ICS-300, Intermediate Incident Command System for Expanding Incidents*
- *IS-700.a, Introduction to the National Incident Management System (NIMS)*
- *IS-800.b, National Response Framework (NRF), An Introduction*

For more information or to register, please visit our website at www.nwppa.org or contact Jenny Keesey at jennifer@nwppa.org. NWPPA

Special note

If you are not a United States citizen, there is additional documentation that needs to be completed and submitted to the U.S. Department of Homeland Security before you can take the courses; the approval process takes four to six weeks. Please contact Jenny Keesey at jennifer@nwppa.org or (360) 901-3131 for help with the documentation. NWPPA

The 2017 resolutions process has begun!

During the recent Government Relations Committee (GRC) meeting on September 8 in Santa Clara, Calif., the 2017 NWPPA resolutions process formally began. The GRC solicited new 2017 resolutions, sought comments on current resolutions for consideration by GRC members, and asked committee members to volunteer for the Resolutions Committee.

All utility members have until January 19, 2017, to submit comments on the new and revised resolutions; comments should be sent to Nicole Case at Nicole@nwppa.org. The January deadline allows time for changes to be considered by the Resolutions Committee and for resolutions to be sent to all GRC members prior to the March Government Relations Committee meeting in Missoula, Mont. Below is a timeline of Resolutions Committee milestones for your reference:

- **January 5 –** All authorized representatives will be noticed of the opportunity to submit new resolutions or revisions/amendments to existing resolutions. This memo also serves as a preliminary notice and resolutions will be accepted until January 19.
- **January 19 –** Newly proposed and revised/amended resolutions are due from the membership.
- **January 19 –** All authorized representatives will be noticed with copies of all resolutions submitted for consideration by the GRC, asked for input prior to the GRC meeting, and invited to participate in a conference call of the Resolutions Committee to discuss the resolutions; verbiage changes; staff recommendations for resolutions to be archived or removed from archive; and other matters related to the resolutions under consideration.
- **February 2 –** All comments on noticed resolutions are due, including archive status and recommended adoption process (en bloc or individually).
- **February 9 –** On or about this date, the Resolutions Committee will convene by conference call or other electronic means to discuss and resolve all outstanding issues related to resolutions under consideration and review by the GRC. An additional conference call may be scheduled.
- **February 16 –** On or about this date, presentation-ready resolutions prepared by the Resolutions Committee will be noticed to all authorized representatives with recommendations as to whether they should be considered en bloc or individually.
- **March 9 (at the March GRC Meeting) –** The presentation-ready resolutions will be presented to the GRC by a representative of the Resolutions Committee who will summarize the reasoning behind the wording of each new or revised resolution. Authorized representatives may make one of four motions related to the presentation-ready resolutions:
  - Option A: Move to accept a resolution or a set of resolutions as presented;
  - Option B: Move to refer a resolution back to the GRC Resolutions Committee by requesting further refinement in specific areas;
  - Option C: Move, by two-thirds majority vote of those present, to re-open a resolution for modifications at the GRC Meeting; or
  - Option D: Take no action or vote to reject the resolution.

This is your opportunity to define where NWPPA stands on crucial policy issues. We encourage your input and participation to help direct the Association's legislative activities for 2017. Additionally, please contact Case if you are interested in serving on the Resolutions Committee. NWPPA

Share your upcoming #PublicPowerWeek activities

October 2-8, 2016, will mark the 30th anniversary of Public Power Week, an annual country-wide program developed by the American Public Power Association (APPA). APPA represents not-for-profit, community-owned electric utilities that power homes, businesses, and streets in nearly 2,000 towns and cities, serving 47 million Americans.

Again this year, use the hashtag #PublicPowerWeek on social media outlets. If you do so, APPA may share and retweet your activities on its social media pages for extra exposure. Also, you can tag @NWPPAssoc and we will retweet/share your posts on our pages, too.

For ideas and resources for celebrating Public Power Week, visit www.publicpower.org to download the Public Power Week Toolkit that includes a variety of communication materials continuing the ongoing theme, *Public Power: An American Tradition that Works*. This year, APPA has added some terrific short videos titled, "Did You Know You Get Your Electricity from a Public Power Utility?" Download these to share with your customers and members during this week — or any time!

If your utility does have plans to celebrate Public Power Week, let NWPPA know so we can highlight your activities in the November 2016 issue of the *Bulletin*. Send Public Power Week news releases and photos to Brenda Dunn at brenda@nwppa.org before October 20. NWPPA

Two more utilities join NWPPA

We are excited to announce that Seattle City Light has re-joined NWPPA after a short hiatus and the District of Summerland has joined the Association. The addition of these two newest members brings the utility membership up to 147 entities.

Seattle City Light (Wash.)

Seattle City Light is the public utility providing electrical power to Seattle, Wash., and parts of its metropolitan area. Established in 1910, Seattle City Light is the 10th largest public utility in the United States and the first municipal utility in the U.S. to own and operate a hydroelectric facility. Seattle City Light was also the first electric utility in the nation to become greenhouse gas neutral (2005) and has the longest running energy conservation program in the country.

Seattle City Light's hydroelectric projects on the Skagit and Pend Oreille Rivers provide about half of the power customers need. The remainder comes from a mix of power sources, including wind, small hydro, and landfill gas, as well as long-term contracts with BPA and others. Since 2001, City Light increased and diversified its resource mix to minimize future dependence on market purchases to meet Seattle's needs. An increased amount of BPA power and a 20-year wind contract from the Stateline Wind project are among City Light's new resources.

Seattle City Light is a department of the City of Seattle and is governed by Seattle City Council. General Manager and CEO Larry Weis (a former NWPPA Board of Trustee member) helms the staff of 1,842 employees that serve over 430,000 meters. Along with its various generation sources, Seattle City Light also owns 2,336 miles of distribution line.

For more information, visit www.seattle.gov/light/.

District of Summerland (B.C.)

Summerland is a town on the west side of Okanagan Lake in the interior of British Columbia, Canada. The district, with a population near 12,000 people, is famous for Bottleneck Drive, a system of roads connecting a large number of wineries.

In 2006, the District of Summerland celebrated its centennial as an incorporated municipality. Summerland's first inhabitants were the Okanagan Salish with the Nation's boundaries extending from Kamloops to southern Washington State. The area known as Nicola Prairie was notably named after the Grand Chief Nicola.

Summerland is located within the Thompson-Okanagan Plateau ecoregion. This is one of the warmest and driest ecoregions in Canada. In the summer of 2003, a severe drought nearly rendered the town's reservoir incapable of ensuring a water supply through to the beginning of the next annual replenishment cycle. Since then, awareness of the real need for water conservation measures has begun to be taken seriously, and permanent water use restrictions are now in place.

The Summerland Works and Utilities Department is the largest department within the corporation with 45 employees. Responsibilities of the Works and Utilities Department include electrical (substations and distribution system), solid waste, wastewater, and water. The five full-time electric utility employees, led by Devon van der Meulen, manager of utilities, serve approximately 5,300 meters.

For more information, visit www.summerland.ca. NWPPA

A look back at public power

50 years ago — 1966

Grays Harbor PUD acquired Quinault Light Company (Wash.) … Sacramento Municipal Utility District paid $350,000 for a 2,100-acre site on which it will build a 500,000-kilowatt nuclear-powered, steam-generating plant (Calif.) … Central Lincoln PUD accepted a bid for construction of a new branch office in Coos Bay, Ore. … NWPPA's 1966 wage survey indicated a 4.4-percent in lineman wages … Franklin PUD purchased a folder and bill stuffer, and began using window envelopes (Wash.) … Russell Dorran, the assistant manager of the Umatilla Electric Cooperative, was appointed chairman of the Board of Blue Mountain Community College (Ore.).

25 years ago — 1991

Chelan County PUD announced that work on its two new recreation facilities (Chelan Falls Park and Beebe Bridge Park) were about 45-percent complete and slated to be completed in the spring of 1992 (Wash.) … Oregon Trail Electric Cooperative reached a settlement with a cogeneration facility that could save the utility millions in power costs over the next 20-year contract term … A customer of Chugach Electric Association was sentenced to nine months in jail for stealing power from the Alaska utility … Craig Thompson, director of water and facilities at Snohomish County PUD, received the 1991 American Water Works Association's George Warren Fuller Award (Wash.).

5 years ago — 2011

Joe Jarvis was hired to fill the general manager position at Blachly-Lane Electric Cooperative after Bud Tracy retired (Ore.) … The Trinity Public Utilities District Board of Directors hired Paul Hauser as the new general manager (Calif.) … 17 successful finishers of OPALCO's 2011 Move It! & Lose It! lost a total of 208.6 pounds during the 16-week challenge (Wash.) … Ninkasi Brewing presented a check for more than $10,000 — with the funds representing all profits from the sale of Conservation Ale — to the McKenzie River Trust; Ninkasi, the Trust, and the Eugene Water & Electric Board had partnered to commemorate the utility's century of service to the community (Ore.). NWPPA

NWPPA Fall Training and Event Lineup

October, November, and December

Please go to our website (www.nwppa.org) to view the full descriptions for these and other courses.

ADMINISTRATIVE PROFESSIONAL CERTIFICATE LEVEL 2: DAY 1 — CRITICAL THINKING AND DECISION-MAKING SKILLS
Who Should Attend: Executive secretaries, administrative assistants, and secretaries.
OCTOBER 4, 2016 — ANCHORAGE, ALASKA

ADMINISTRATIVE PROFESSIONAL CERTIFICATE LEVEL 2: DAY 2 — POSITIVE ASSERTIVENESS
Who Should Attend: Executive secretaries, administrative assistants, and secretaries.
OCTOBER 5, 2016 — ANCHORAGE, ALASKA

SENIOR LEADERSHIP SKILLS #4, SERIES 4: LEAD YOUR ORGANIZATION
Who Should Attend: Directors, managers, graduates of the Leadership Skills series, and newly appointed senior leaders.
OCTOBER 5-6, 2016 — VANCOUVER, WASH.

ADMINISTRATIVE PROFESSIONAL CERTIFICATE LEVEL 2: DAY 3 — ORGANIZATIONAL SKILLS; TIME & STRESS MANAGEMENT
Who Should Attend: Executive secretaries, administrative assistants, and secretaries.
OCTOBER 6, 2016 — ANCHORAGE, ALASKA

ADMINISTRATIVE PROFESSIONAL CERTIFICATE LEVEL 2: DAY 4 — PERSONAL STRATEGIES FOR NAVIGATING CHANGE
Who Should Attend: Executive secretaries, administrative assistants, and secretaries.
OCTOBER 7, 2016 — ANCHORAGE, ALASKA

ONLINE — DISTRIBUTION ENGINEERING SERIES: SESSION 3 — OVERVOLTAGE PROTECTION WEBINAR
Who Should Attend: Engineers and senior technical personnel involved in the selection and location of lightning arrestors and proper system grounding.
OCTOBER 11, 2016 — ONLINE PRESENTATION

2600 – DIRECTOR DUTIES AND LIABILITIES — CREDENTIALED COOPERATIVE DIRECTOR (CCD) CERTIFICATE
Who Should Attend: Directors, policy makers, and general managers.
OCTOBER 12, 2016 — LAKEWOOD, WASH.

DISTRIBUTED ENERGY RESOURCE CONFERENCE
Who Should Attend: Utility personnel, including engineering managers; system engineers; system planners; transmission, distribution, and generation engineers; operations managers and superintendents; system operators; and general managers. For more information, see page 4.
OCTOBER 12-13, 2016 — SPOKANE, WASH.

PROJECT MANAGEMENT
Who Should Attend: Administrative assistants, executive assistants, and anyone new to project management.
OCTOBER 12-13, 2016 — RICHLAND, WASH.

LABOR AND EMPLOYEE RELATIONS GROUP ANNUAL MEETING
Who Should Attend: Members of the NWPPA Labor and Employee Relations Group, which includes general managers, operations managers, labor relations professionals, and human resources professionals. Non-members may attend if they are part of a utility and are members of NWPPA.
OCTOBER 12-14, 2016 — COEUR D'ALENE, IDAHO

2620 – BOARD OPERATIONS AND PROCESS – CREDENTIALED COOPERATIVE DIRECTOR (CCD) CERTIFICATE
Who Should Attend: Directors, policy makers, and general managers.
OCTOBER 13, 2016 — LAKEWOOD, WASH.

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.
OCTOBER 18-19, 2016 — SALT LAKE CITY, UTAH

KEY TOPICS IN UTILITY ACCOUNTING
Who Should Attend: Employees who are new to utility accounting; employees in the industry who need to understand the special requirements of utility accounting; and employees who would like a more in-depth understanding of utility accounting systems.
OCTOBER 19-20, 2016 — SALT LAKE CITY, UTAH

LEADERSHIP SKILLS #2: LEADERSHIP CHALLENGES
Who Should Attend: Supervisors and managers, and employees who will be transitioning to a supervisory or managerial role in the future.
OCTOBER 20-21, 2016 — SALT LAKE CITY, UTAH

3 Cs PRE-CONFERENCE CLASS: GROW ME! A MANAGER'S ROADMAP TO DEVELOPING AND ENGAGING EMPLOYEES
Who Should Attend: Managers and supervisors within all areas of the utility.
OCTOBER 25, 2016 — TULALIP, WASH.

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.
OCTOBER 25-27, 2016 — SEA-TAC, WASH.

3 Cs CONFERENCE: CREDIT, COLLECTIONS, AND CUSTOMER SERVICE
Who Should Attend: Customer service, credit, and collections managers, supervisors, and employees.
OCTOBER 26-28, 2016 — TULALIP, WASH.

STAKING TECHNICIAN CERTIFICATION PROGRAM — NESC & UTILITY SPECIFICATIONS
Who Should Attend: Staking technicians.
OCTOBER 31-NOVEMBER 2, 2016 — PORTLAND, ORE.

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.
NOVEMBER 2-3, 2016 — ANCHORAGE, ALASKA

LINEMAN SKILLS SERIES: AC TRANSFORMERS, ADVANCED THEORY, AND PRACTICAL APPLICATION
Who Should Attend: Journeyman linemen, foremen/supervisors, engineers, and those involved in planning, scheduling, and engineering operations for a utility.
NOVEMBER 2-3, 2016 — ANCHORAGE, ALASKA

WORKPLACE INVESTIGATIONS FOR MANAGERS: RESPONDING TO EMPLOYEE COMPLAINTS
Who Should Attend: Managers, supervisors, and human resources professionals.
NOVEMBER 2-3, 2016 — VANCOUVER, WASH.

MAJOR CHANGES AND GENERAL OVERVIEW OF THE 2017 NESC
Who Should Attend: Engineers, staking engineers, operations supervisors, foremen, technicians, linemen, safety personnel, and inspectors. Prior knowledge of the National Electrical Safety Code (NESC) is not required.
NOVEMBER 3, 2016 — VANCOUVER, WASH.

STAKING TECHNICIAN CERTIFICATION PROGRAM – OBTAINING PERMITS
Who Should Attend: Staking technicians.
NOVEMBER 3-4, 2016 — PORTLAND, ORE.

OUTLOOK AND ONENOTE: DYNAMIC DUO
Who Should Attend: Anyone who uses Outlook and would like to increase efficiency organizing electronic communication; and anyone who could benefit from OneNote's function as a simple, quick storage and reference system.
NOVEMBER 8, 2016 — VANCOUVER, WASH.

FOREMAN LEADERSHIP SKILLS #3 – REDUCING CONFLICTS; COMMUNICATION AND CUSTOMER SERVICE
Who Should Attend: Foremen and crew leaders.
NOVEMBER 8-9, 2016 — RICHLAND, WASH.

WOMEN IN PUBLIC POWER CONFERENCE
Who Should Attend: Women in the power industry. For more information, see page 3.
NOVEMBER 8-10, 2016 — PORTLAND, ORE.

MASTERING WORD
Who Should Attend: Anyone who currently uses Word and would like to increase knowledge and efficiency utilizing simple automation and styles.
NOVEMBER 9, 2016 — VANCOUVER, WASH.

MASTERING ROBERT'S 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.
NOVEMBER 9-10, 2016 — PORTLAND, ORE.

MONITORING BUDGETS AND FINANCIAL ANALYSIS
Who Should Attend: Finance and accounting employees; senior management or policy makers; or any employee seeking to increase his or her knowledge of the budgeting process that takes place at electric utilities.
NOVEMBER 15, 2016 — SEATTLE, WASH.

QUALIFIED WORKER TRAINING – OSHA 1910.269
Who Should Attend: Individuals who do not hold an electrical journeyman certificate, but as a part of their duties must enter or open secured areas such as substations, padmounted transformers, switchgear, vaults, and metering cabinets.
NOVEMBER 15, 2016 — VANCOUVER, WASH.

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.
NOVEMBER 15-16, 2016 — SPOKANE, WASH.

LINEMAN SKILLS SERIES: AC TRANSFORMER THEORY AND APPLICATION; REGULATORS AND CAPACITORS
Who Should Attend: Linemen, linecrew foremen, substation personnel, electrical engineers, safety managers, and all personnel that would benefit from a theoretical and practical knowledge of AC transformers, regulators, capacitors, and grounding.
NOVEMBER 15-17, 2016 — SPOKANE, WASH.

GROUNDING AND POWER QUALITY
Who Should Attend: Engineers, engineering technicians, and engineering supervisors and managers, as well as personnel in operations that

would benefit from an understanding of grounding and power quality.
November 16, 2016 — Vancouver, Wash.

LEADERSHIP SKILLS #3: PERSONALITIES AND ATTITUDES IN THE WORKPLACE

Who Should Attend: Supervisors and managers, and employees who will be transitioning to a supervisory or managerial role in the future and have completed *Leadership Skills Session #1: Situational Leadership*.
November 16-17, 2016 — Seattle, Wash.

POWER FACTOR AND HARMONIC ANALYSIS

Who Should Attend: Engineers, engineering technicians, and engineering supervisors and managers, as well as personnel in operations that would benefit from an understanding of power factor and harmonic analysis.
November 17, 2016 — Vancouver, Wash.

ENTERPRISE RISK MANAGEMENT: A SUCCESSFUL IMPLEMENTATION

Who Should Attend: Chief financial officers, senior-level accounting staff, auditors, general managers/CEOs, policymakers, and legal counsel. (Please note that *ERM: Adding Value to Your Organization* is not a prerequisite for this class.)
November 17-18, 2016 — Seattle, Wash.

EMPLOYER COLLECTIVE BARGAINING TEAM PREPARATIONS

Who Should Attend: General managers, operations managers, members of the employer bargaining team, and chief negotiators. We recommend that you send more than one team member to this class.
November 28-29, 2016 — Kennewick, Wash.

LEADERSHIP SKILLS SERIES SESSION #5: SUPERVISING UNION EMPLOYEES

Who Should Attend: Operations directors, managers, line superintendents, labor relations professionals, and human resource managers who supervise union employees and deal with stewards and officers of the union. This is an optional course in the Leadership Skill Series.
November 30-December 2, 2016 — Kennewick, Wash.

HACK ATTACK 2.0

Who Should Attend: CEOs, general managers, and board and commission members.
December 7, 2016 — Portland, Ore.

LINEMAN SKILLS SERIES: AC TRANSFORMERS, ADVANCED THEORY, AND PRACTICAL APPLICATION

Who Should Attend: Journeyman linemen, foremen/supervisors, engineers, and those involved in planning, scheduling, and engineering operations for a utility.
December 7-8, 2016 — Salt Lake City, Utah

FOREMAN LEADERSHIP SKILLS #4 – DEVELOPING MANAGEMENT SKILLS; BUILDING AN EFFECTIVE WORK GROUP

Who Should Attend: Foremen and crew leaders.
December 14-15, 2016 — Richland, Wash. NWPPA

by Ian Wright

Energy IQ Student Camp provides energy education for Idaho students

Idaho Falls Power's Matt Evans points out where the Idaho Falls Power Plant turbines are down in the dam. Photos provided by NEF.

Last summer, the National Energy Foundation (NEF) conducted and administered an Energy IQ Student Camp with a collaboration of partners: the City of Idaho Falls, Idaho Falls Power, Fluor, Idaho National Laboratory, Rocky Mountain Power, and Bechtel Marine Propulsion. The objective of the student camp was to give Idaho students and families the finest training and educational materials to support learning about energy-related issues, particularly within their unique communities.

The National Energy Foundation, a unique 501(c)(3) nonprofit educational organization, is committed to the development and implementation of supplementary educational materials and programs. NEF's resources for education relate primarily to energy, water, natural resources, science, math, technology, conservation, energy efficiency, safety, and the environment.

The two-day Energy IQ Student Camp provided an opportunity for Idaho middle and high school students to learn how to make education-based decisions regarding energy resources that are grounded in understanding. Considerations for students to understand and decide included where the energy resources come from; how they are gathered or produced; and how to use them most efficiently. Interactive lessons, hands-on activities, expert speakers, and field trips employed STEM education to build a foundational knowledge of energy, one of the most central and basic aspects of our lives.

NEF promoted and enrolled the program by working within the Idaho Falls and surrounding communities serviced by the sponsors. The student camp filled rapidly with 29 students on a wait list to join.

The morning sessions were held at the Idaho Falls Power facility and were was a great opportunity for the students and families to interact with their local energy provider. Morning sessions were filled with engaging activities and experiments such as the Get Your Motor Running activity, where students participated in a hands-on STEM activity building simple motors. Building on background knowledge of insulators, conductors, and circuits gained from the camp, groups of students adjusted types and amounts of metal coils to make their motor work more effectively.

For the Wind Experiments exercise, groups of students worked to design and test their own wind turbines. Blade length, shape, material, angle, and number of blades were all taken into account as turbines were attached to a multimeter and used to generate electricity. Students redesigned and retested to increase the amount of electricity that their project could produce. The end result was an appreciation for this energy source and the complexities of capturing wind for our use. These are only two examples of the many experiments taught in the student camp.

After each morning session, students were treated to Learning Lunches with community leaders who provided local energy information and served as career role models. The first Learning Lunch featured Mayor Rebecca Casper and Idaho Falls Power General Manager Jackie Flowers. Both leaders helped build an understanding of the importance of energy, energy policy, local resources, and electric generation. Students were able to interact one on one with the energy professionals; the objective being to help students see energy career opportunities available in their community.

"We were thrilled to partner with such talented and creative energy professionals to bring a very comprehensive Energy IQ camp to youth in Idaho Falls. This first camp was to test the market and gauge interest, and we found tremendous interest. Now we are working to find a way to make the camp bigger," said Flowers. "Our participation provided opportunity to put a local twist on energy learning — adding relevance for the students."

Afternoon sessions at the Energy IQ Student Camp allowed students to explore local energy production and research facilities. On these field trips, students interacted with specialists in energy fields to learn about career opportunities and experience the science of energy in the field.

Students were given the opportunity to tour the Idaho Falls Power hydroelectric facilities, and listen to guest engineer speakers and expert engineers from Bechtel Marine. Tours were provided at Idaho National Laboratories Center for Advanced Energy Studies (CAES), the CAVE/Bus Simulator, and the Human Systems Simulation Laboratory. Students who participated in the program also were given the opportunity to take action by entering the Energy IQ student video competition. Participants could choose to work in a team or individually to create a short video about innovative ways to save energy and water in their community. Once submitted, program sponsors reviewed and judged the submissions. Winners were honored and given an award by Mayor Casper at the Intermountain Energy Summit held in Idaho Falls. This provided students with additional opportunities to interact with energy professionals and leaders in their community. With the videos, students were able to apply the information they learned in the student camp and share it with their friends and family. One parent said, "My daughter already installed many of the energy-efficient tools she received, including the shower head, the faucet water saver, the light bulb, and the timer.

"We were thrilled to partner with such talented and creative energy professionals to bring a very comprehensive Energy IQ camp to youth in Idaho Falls."

Jackie Flowers, Idaho Falls Power general manager

Idaho Falls Power's Matt Evans took Energy IQ Camp students on a tour of Idaho Falls Power plant.

She taught her younger siblings about what she learned and is planning on making the video for the contest!"

Students were thrilled to receive energy education materials along with energy- and water-efficient technologies that went along with camp activities in their camp swag bag. The Energy IQ Student Camp provided engaging educational energy experiences to Idaho students and families in a fun and enthusiastic way. When asked what the most positive aspect of the program was, parents replied saying, "I liked that he was able to access our local experts and get excited about nuclear energy," and "I loved the idea of a summer science camp for kids! Most summer camps are sports related and this was an awesome idea for a day camp that focused on education." NWPPA

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by Neil Neroutsos

Heralding new hydro

SnoPUD develops latest Northwest projects

There's no doubt that Snohomish PUD understands the value of hydropower. With more than 80 percent of its energy supply already coming from this renewable resource, the utility is taking steps to add even more local hydropower to its energy portfolio.

In 2011, it brought online its Youngs Creek Project, a 7.5-megawatt facility located south of Sultan, Wash. This year, the utility moved forward on construction of two additional projects — rated at six megawatts each — at Hancock and Calligan creeks, both located above Snoqualmie Falls, about 30 miles east of Seattle. These three facilities are the only new utility-scale hydropower projects built in Washington state in the past 20 years. The utility expects to spend about $53 million on the two new projects.

"One of the benefits of these new projects is that their output can be maximized in the winter when we need it the most, limiting our exposure to higher-priced market purchases," said PUD Manager of Generation Engineering Scott Spahr. "We're also interested in renewable resources we can site in Western Washington and that complement intermittent resources such as wind and solar."

The two sites above Snoqualmie Falls were considered for development by area utilities as early as the 1950s. Hydro West, a subsidiary of Puget Sound Energy, obtained a FERC license in the 1990s; however, it never broke ground on the project and the license expired in 2004.

For Snohomish PUD, adding more hydropower is consistent with its climate change policy, adopted in 2007, which directs the utility to meet growth needs through cost-effective conservation and a diverse mix of renewable energy resources.

Construction and challenges

This summer, the utility started work on the intake structures, as well as the two powerhouses. The two penstocks will be installed throughout the fall. Once completed, each penstock will drop about 1,100 feet in elevation over a mile-long route. By changing the design of how the penstock is aligned, compared to the previously proposed project, the PUD will significantly reduce the amount of excavation work needed.

Building two facilities simultaneously has added another layer of complexity to a project that already is on a fast track for completion by 2017. Fortunately, weather has

Both Hancock Creek (shown here) and Calligan Creek hydropower projects are above Snoqualmie Falls, east of Seattle, which provides a natural barrier for salmon and minimizes any potential fish impacts. Photos provided by Snohomish PUD.

been near ideal. Had construction started in summer 2015, extremely dry conditions would have been problematic with fire levels at critical stages and limits on construction by the Department of Natural Resources.

Despite extensive geotechnical testing throughout the project sites, there are always a few surprises according to Spahr. For example, you often encounter more rock in places than the tests reveal, which can add work to the excavation process and penstock installation.

Protecting the natural environment

Consistent with other PUD hydropower projects, the Hancock and Calligan projects are guided by a resource plan that, among other things, ensures protections for fish and wildlife. Since both projects are above Snoqualmie Falls, there are no salmon present at the sites. The PUD will, however, build a fish ladder at the intake areas so resident trout can travel upstream to Hancock and Calligan lakes. Stream flows will be adjusted, as necessary, if surveys indicate any declines in fish populations. Similar to work at other hydropower projects, PUD environmental staff will conduct additional monitoring of wildlife and terrestrial areas to protect sensitive areas.

The PUD has proven success operating its hydropower projects in a way to balance energy production with a range of community needs. Its largest facility, the Jackson Hydropower Project, was relicensed in 2011. It's a key resource for the community, providing not only 4 percent of the utility's energy supply, but 80 percent of the public water in Snohomish County. The project also offers many recreational benefits to the public, such as hiking, boating, and picnicking.

As it develops its energy projects, Snohomish PUD carefully assesses them to ensure they're economically, technically, and environmentally viable — and that they're consistent with the values of the communities it serves. NWPPA

Neil Neroutsos is the media liaison at Snohomish County PUD in Everett, Wash. He can be contacted at NSNeroutsos@SNOPUD.com.

Praise for SnoPUD hydropower

Jackson Project

- Puget Sound Regional Council Vision 2040 Award
- Low Impact Hydropower Institute Certification

Youngs Creek

- Renewable Energy World Project of the Year
- American Society of Civil Engineers Outstanding Achievement Award NWPPA

The PUD's two powerhouses at Hancock and Calligan creeks will be similar to its Youngs Creek Project, shown here in 2011.

Project partners

- General contractor: Tapani (Battle Ground, Wash.)
- Subcontractor: Sturgeon Electrical (Seattle, Wash.)
- Penstock: NW Pipe (Portland, Ore.)
- Turbine and generator: Gilkes (Kendal, England) NWPPA

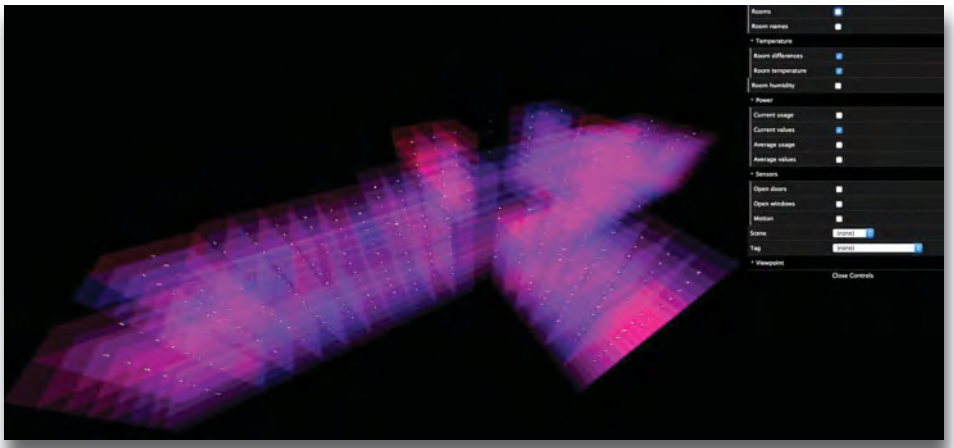
Penstocks for the PUD hydropower projects are being installed this fall.

by Rebecca Delmar

SMUD's Innovation Generator helps new energy technologies take shape

The word "innovation" is used a lot in economic development, startup, and placemaking circles. It suggests different things in different contexts, but its most basic meaning is to take something that is established and change it. While many organizations in technology, medicine, and other sectors innovate effectively or cease to exist, this standard has not always applied to utilities.

But that simple fact has changed — and the repercussions are far from simple. Many utilities are reeling from the pace of change in their industry, and most of them are trying to evolve into something other than capital-intense, legacy-oriented organizations. Utilities want and need to become something new — nimble organizations able to adapt, respond, and, yes, even innovate.



Smart Grid Billing's Grid Rabbit system provides visualizations of energy-use data from a variety of sensors throughout a building.

How is SMUD responding to this paradigm shift? In truth, we're coming at it from a number of angles. But one of the most interesting is our Innovation Generator — a program we launched in 2014. Through our Innovation Generator, we partner with startups, as well as established companies developing new products or programs, and provide them with a number of tools to help them succeed. These can include:

- Access to technology and energy experts in a range of fields, including energy efficiency, smart grid technology, distributed generation, electric vehicles, and much more
- The ability to test new products and services quickly or develop substantive pilot programs over longer periods
- Potential for shared technology development costs
- Regulatory and legislative expertise

Our agreements with partner companies are as unique as the company's themselves, but can include licensing fee agreements, revenue-sharing agreements, or other financial terms. As a community-owned electric service provider, we do not take equity stakes; however, we do believe that over the long term, investing time and resources in these partnerships will provide additional sources of revenue. This revenue can then be reinvested in a multitude of areas that will benefit our customers and our community.

One example of an Innovation Generator partner company is Smart Grid Billing, the creators of a product called Grid Rabbit™. Grid Rabbit is a technology platform designed to help hotels, schools, and other organizations control their energy costs. Grid Rabbit takes the data from thousands of smart, connected sensors (motion, door, temperature, lighting, and others) and allows the user to optimize a variety of energy-related functions across hundreds of rooms at the same time via an app-based interface.

We helped Smart Grid Billing complete their first Sacramento hotel installations of Grid Rabbit at the Hyatt Regency and Embassy Suites in downtown Sacramento. Preliminary results suggest both hotels will be able to lower their energy bills by reducing HVAC use and peak demand.

In addition to Grid Rabbit, our Innovation Generator has partnered with startups developing new data analytics tools; a company applying its cloud-based, in-the-field emergency services training tools to the utility sector; and an established technology company developing new services for international clients.

We've also made efforts to partner with local companies to help drive economic development in our region. Two of the companies we've partnered with so far are locally based.

So why are we so focused on helping companies succeed in bringing innovative energy products and services to market? There are a number of reasons:

1. We want to help create new and better ways for our residential customers to monitor and manage their energy use. This will help them adapt and save money under the new time-based pricing options we'll roll out over the next few years.

2. We want to help our business customers take more control of their energy use as well. All of our business customers have been on time-based rates for several years and we want them to have as much information as possible regarding their energy use patterns, demand requirements, and more. The more information they have, the more options they have when operating their businesses.
3. By providing all customers with better energy-use information, we can also help reduce peak demand in our region and mitigate the need to build new generation capacity. We also want to make it easier to integrate renewable energy sources, which can help reduce carbon emissions and improve air quality.
4. We want to help develop a smarter, more robust grid. We've been huge proponents of rolling out smart technology to the grid, and we want to continue to move that local and regional transformation forward.
5. With improved data analytics capabilities, we'll be able to better match our customers with the programs and services that make the most sense for them. We'll be able to improve the customer experience across a number of channels, including the Web, contact center, IVR, and more.
6. Over the long term, we want to diversify our revenue streams. As the energy industry evolves, we think there is opportunity to monetize our expertise in ways that will, ultimately, help us keep our rates as low as possible.

Our Innovation Generator program is continuing to engage with energy technology companies and will likely form a number of new partnerships over the coming months and years. We hope that the successes we've seen with the program so far continue, and that it can serve as a model for how energy utilities — while they are certainly steeped in history — will be able to thrive in the future as well.

NWPPA

Rebecca Delmar is the Innovation Generator program manager at SMUD in Sacramento, Calif. She can be contacted at rebecca.delmar@smud.org.

by Julie Ryan

Should your utility establish a risk tolerance?

The short answer to that question is yes, you really should establish a risk tolerance. It is an important tool for managing your utility.

A utility chief risk officer once said to me, "If we establish a risk tolerance, I am afraid that will be seen as a green light to take risks." In fact, the opposite is true. Setting a risk tolerance clearly articulates the amount of risk that will not be acceptable to the organization.

There is sometimes confusion between the terms risk appetite and risk tolerance, but in reality they represent opposite sides of the same coin, a definition of risk. A risk appetite defines what the organization is comfortable assuming. An organization generally assumes routine risks within its core business, with which it has expertise managing. In contrast, a risk tolerance defines the point beyond which the organization is unwilling to accept risk. In other words, a risk tolerance sets a boundary beyond which risks are not tolerated. Stakeholders see a risk tolerance as a measure of a well-run, disciplined utility.

Risk is theoretical, representing what might happen. Managing to a risk tolerance is therefore managing against unacceptable negative outcomes associated with potential future events. Further, risk events should be considered from several dimensions. The two most common measures are the probability of an event occurring and the impact of that event upon the organization. The probability relates to the likelihood of an event occurring. The impact or severity can be measured from several perspectives, such as reputation loss, financial loss, or scale of injury or physical harm. Risks can additionally be measured from other perspectives, such as the organization's preparedness, the speed of onset of the risk, or the amount of mitigation that can be achieved

There are a variety of risk tolerances that utilities can implement. Customer-owned utilities use financial risk tolerances to protect against rising customer rates and their ability to make debt payments and/or city transfer payments, and to ensure positive net income. Investor-owned utilities additionally focus on measures that are of importance to their shareholders, such as earnings and making dividend payments.

In terms of how to implement a risk tolerance, a customer-owned utility could establish a financial risk tolerance in the form of a debt coverage ratio to ensure it has an adequate buffer to make debt payments. A utility that supports its city through a city transfer tax could have a risk tolerance to ensure it can meet its city transfer tax obligation. And a utility could set a net income risk tolerance, monitoring risks that jeopardize its ability to meet a minimum net income target.

Utilities often have more than one risk tolerance in order to include other core principles. Some utilities develop a risk tolerance in the form of customer rate or bill impact. For example, a utility could commit that rates will not rise more than a set percentage. In an environment of increasing focus on protecting data, there is significant reputation risk associated with a breach of IT systems. A utility could establish a tolerance for security breaches to show its commitment to protect data and defend against hacking attempts. Another measure is a safety risk tolerance against injury and risk of life. Many organizations have a safety policy, but a safety risk tolerance goes farther. For example, setting a zero accidents or injuries tolerance clearly demonstrates the organization's strong commitment to safety for employees and the community.

So what is the right size of risk tolerance for any given utility? The simple answer is that it should be what the utility can weather without large negative impact on itself or its customers. For example, how serious would a credit rating downgrade be for the utility? If this is an unacceptable risk, then the utility would size its risk tolerance to maintain or improve its financial ratios (the metrics that rating agencies

monitor). If the utility wants to establish a customer rate tolerance, then the utility would need to manage the risks so that a risk event would not increase rates beyond an acceptable level for customers.

A risk tolerance has to be sized large enough to accommodate routine events. For example, a utility is going to face weather events that are outside of its control. A warmer-than-normal winter season could result in lower customer demand and lower revenues. Storms will add additional costs as the utility restores service to customers, and drier-than-normal weather conditions negatively impact hydro energy availability. Weather variability routinely occurs and should generally fit within the utility's risk tolerance.

There can also be extreme weather events that have a low probability of occurring, but have very serious impacts. In order to protect against the low probability extreme tail events, the utility will want to consider mitigation strategies. For example, to protect against weather events impacting revenues, it might adapt its rate structure to be less reliant on recovering its costs through volumetric sales of power during its peak season. To protect against storm damage, it might acquire outage insurance for power plants. To protect against very dry conditions, a hydro-based utility might consider buying incremental power supply or making fewer forward sales commitments in the event of extremely dry hydro events.

A risk tolerance becomes an important tool to help the utility examine potential risks and understand where risk mitigation efforts will be needed. It is not as challenging to implement as it seems and the benefits are significant. The risk tolerance provides a benchmark from which management can determine unacceptable risks. It spurs the development of risk mitigation strategies and demonstrates management's strong oversight of the utility. Lastly, it inspires confidence in the utility among its customers, employees, investors, and regulators. NWPPA

Julie Ryan is the managing partner at Aether Advisors LLC, advising clients on strategy and risk management. She is also the director of the Utility Management Certificate program at Willamette University in Portland, Ore., as well as an instructor for NWPPA. She can be contacted at (206) 329-0424 or jryan@aetheradvisors.com.

Thibert named to lead Chugach

Chugach Electric Association (Anchorage, Alaska) is under new leadership as longtime senior manager **Lee Thibert** has been named the new CEO. Thibert replaces **Brad Evans**, who retired as CEO in mid-July after serving eight years in that role.

"This is an exciting time in the Railbelt as we look for opportunities to work with other utilities to better serve all Alaskans with low-cost, reliable power," said Thibert. "From power pooling and economic dispatch, to utilizing new technologies and renewable integration, there are a number of important and interesting areas we will continue to focus on moving forward."

Thibert began working at Chugach in 1987 and has held a variety of senior management positions, most recently serving as senior vice president, strategic development and regulatory affairs. During his long career with the utility he has been responsible for a number of important divisions including regulatory, engineering, operations, telecommunications, power production, and power control & fuel supply.

"We are pleased to welcome Lee as the new CEO, and are confident Chugach remains in capable hands with his leadership," said Chugach Board Chair **Janet Reiser**. "This transition should be seamless, as Brad and Lee have worked together for several years. We are confident Lee will continue to advance the interests of Chugach members."

Born in Minnesota, Thibert has a Bachelor of Arts in organizational management from Alaska Pacific University. He is a member of the Anchorage Downtown Rotary, and a past board member for Junior Achievement. NWPPA

Five member utilities selected for Clean Energy Grant

On August 17, Washington **Governor Jay Inslee** announced that NWPPA members Seattle City Light, Snohomish County PUD (Everett), Avista Utilities (Wash.), Northwest Energy (Richland), and Orcas Power and Light (Eastsound) will share $12.6 million in state clean energy grants.

"With these awards, our leading utilities will demonstrate how to integrate battery storage with solar energy and stand-alone energy systems, train the workforce to build and maintain these systems, and lead the industry into the clean energy future," Gov. Inslee said.

A $3.5-million Seattle City Light microgrid is planned to include a utility-scale battery system, solar panels, and emergency generators located at a designated emergency shelter, such as a community center. The specific location has yet to be determined, but the utility intends to build the project where it can support more vulnerable members of the community in times of crisis.

The funding for Snohomish County PUD and its Arlington Microgrid and Clean Energy Technology Center will provide support for engineering and construction work to demonstrate new energy technologies, including energy storage, a microgrid system, small-scale renewable energy, and an electric "vehicle to grid" system. Design and construction is scheduled for the 2017-2019 timeframe.

Avista will pilot a "shared energy economy" model that allows various energy assets — from solar panels and battery storage to traditional utility assets — to be shared for multiple purposes, including system efficiency and grid resiliency. It will demonstrate how the consumer and utility can each benefit.

Energy Northwest will bring together its 28 utilities with labor leaders at IBEW Local 77, Quanta Services/Potelco, and the UW Clean Energy Institute to create a battery and solar competency training facility in the Tri-Cities. This facility will prepare workers for clean energy jobs of the future.

Orcas Power & Light will deploy a community solar system to extend the life of the island's underwater electricity supply cable. NWPPA

Grays fires up arc demo trailer

Grays Harbor's arc demo trailer is a working replica of a PUD electrical system.

The Grays Harbor PUD (Aberdeen, Wash.) arc demonstration trailer recently made its debut. Decked out in new signs and equipment, the trailer brought power lines and transformers down to eye level at the Grays Harbor County Fair and safety demonstrations around Grays Harbor. As a working replica of a PUD electrical system, the trailer allows PUD crews to show why caution and safety are needed when working around power lines.

"We can tell people to be safe around power lines but believe me, seeing what can happen when you're not careful is a much stronger message," said Safety and Environmental Director **Dale Benner**.

The arc trailer was a central part of the PUD's Grays Harbor County Fair booth with multiple demonstrations planned for each day of the fair. In the months that follow, the trailer will be available for displays at local schools and facilities to show children, contractors, and first responders what happens when everyday objects like kites, ladders, and saws come into contact with active power lines. NWPPA

PCWA Board authorizes sale of surplus water

The Placer County Water Agency (Auburn, Calif.) Board of Directors has approved a resolution that allows for the transfer and sale of up to 20,000 acre-feet of surplus water to the United States Bureau of Reclamation. The board took the action at its meeting on July 21.

Under the Reservoir Re-Operation Agreement with PCWA, the Bureau of Reclamation will pay $300 for each acre-foot delivered from PCWA storage to Folsom Reservoir. The water will support Central Valley Project operations, providing an environmental benefit to the delta.

"Normally, the ability to transfer surplus water is limited to dry years," General Manager **Einar Maisch** said. "However, as California continues to recover from drought conditions, federal and state reservoirs, which serve multiple purposes, remain strained. The sale and transfer of water will help alleviate some of the pressure on those systems."

The release of surplus water also means more hydroelectric generation for PCWA during the months of mid-July through September. NWPPA

John Nguyen's appointment extended

Following an August 16 vote by the Columbia River PUD (St. Helens, Ore.) Board of Directors, **John Nguyen** will continue to lead the PUD as interim general manager for another year.

"John has taken the PUD in a very positive direction after a period of turmoil," said PUD Board President **Jake Carter**. "By keeping him as interim general manager, we can provide stability for our customers and employees, and keep the momentum going."

Nguyen, who has worked for the PUD for more than 28 years, was originally appointed interim general manager in August 2015. Since his appointment, the PUD passed its first balanced budget since 2011, successfully responded to the largest outage in PUD history, refinanced its long-term debt for $353,000 in interest savings, instituted a new low-income senior discount, and conducted an employee survey that showed high morale and job satisfaction among PUD employees. A recent mid-year review forecasted 2016 operating expenses to fall well under budget, with major capital projects completed on or ahead of schedule.

"I appreciate the board's confidence in me," said Nguyen. "I look forward to continuing to work with our dedicated staff to build on the positive accomplishments we've had over the last year." NWPPA

Clallam refunds bonds, saves over $800K

The Clallam County PUD (Carlsborg, Wash.) was recently able to secure a cash flow savings of $808,520 over the next 12 years through the refunding of 2008 Electric Revenue Bonds.

Beau Brown, PUD treasurer/controller, said, "We were able to refund the Series 2008 Electric Revenue Bonds (ERB) at lower interest rates, which in turn helped us realize a significant cash flow savings."

The bond provisions of the Series 2008 allowed for the refunding, and with lower interest rates the decision to refund was clear. PUD General Manager **Doug Nass** said, "Commissioners and staff take great care in the management of public monies, so with the opportunity to refund bonds that results in a savings like this it only made sense to do so."

The Series 2008 ERB outstanding were $8,570,000 and are being refunded with a Series 2016 ERB issuance in the amount of $8,080,000. The cash flow savings to the District is $808,520 (or $770,201 when considering the time value of money) over the next 12 years. The refunding of the Series 2008 bonds does not impact the final principal payment date, which remains due in 2028. NWPPA

Mason 3 refunds bonds for $4.1M in savings

Mason County PUD No. 3 (Shelton, Wash.) will see a savings of $4.1 million in cash flow over the next 12 years with last month's commission decision to refund bonds issued in 2008.

"Refunding $9.95 million in these bonds and refinancing the debt with JPMorgan Chase Bank reduces our annual interest rate from an average of 5.35 percent to 1.86 percent," said **Sherry Speaks**, PUD 3 finance manager. "This means a significant savings through the next 12 years. This move helps us meet our mission of always providing safe, reliable, economical service, 24/7."

"This is going to save the district about $250,000 a year," said **Bruce Jorgenson**, PUD 3 commissioner. "I think our rate payers are going to love that."

Mason PUD 3 has 37 consecutive years of clean audits from the Washington State Auditor's Office. The PUD has also received 11 consecutive Certificates of Excellence in Financial Reporting from the International Government Finance Officers Association of the U.S. & Canada. NWPPA

Five Chelan employees recognized for their work

Intellect, expertise, initiative, and commitment are the words managers and industry peers used to describe five Chelan PUD (Wenatchee, Wash.) employees whose accomplishments were recognized on August 1 by Chelan County PUD commissioners.

(L-R) Managing Director of Energy Resources Gregg Carrington, Commissioner Dennis Bolz, Security Director Rich Hyatt, Commissioner Ann Congdon, Commissioner Garry Arseneault, Customer Relations Administrator Teka Sellers, Commissioner Randy Smith, Government Affairs Program Manager Suzanne Grassell, and Commissioner Carnan Bergren.

Terry McFadden, foreman materials specialist in the PUD's Wenatchee warehouse, celebrated his 40th anniversary with the District on August 2; he is the PUD's longest-tenured active employee. Managers praised him for his selfless commitment to coworkers and Chelan PUD. He is ninth on the PUD's all-time tenure list.

Suzanne Grassell, Government Affairs program manager, was named a Woman of Hydro Vision by Pennwell Hydro Group, host of HydroVision International and publisher of *HydroWorld* magazine. She is a 14-year employee who worked on the successful effort to secure new federal licenses for Lake Chelan and Rocky Reach Dam before moving to External Affairs in 2007.

Energy Resources Managing Director **Gregg Carrington** received recognition from the Hydro Research Association president for his 2014-2016 service to the organization. Carrington has worked for Chelan PUD since 1997.

Teka Parks Sellers, Customer Relations administrator, was named as one of the top 30 Under 35 business and community leaders by *The Wenatchee World's Business World* magazine. Sellers has been in her current job since 2013 when it was created. She has shaped the duties of the position to emphasize customer-owner discussion and engagement around PUD services.

Security Director **Rich Hyatt** is the new chairman of the Western Electricity Coordinating Council (WECC) Physical Security Working Group. In the elected volunteer position, he will lead about 100 utilities across the West in best practice efforts on compliance and security while he continues his efforts at the District. NWPPA

Boettger honored by Okanogan PUD

At last month's Okanogan PUD (Wash.) Board of Commissioners meeting, General Manager **John Grubich** presented service awards to **Jerry Day** and **Dan Boettger**.

Top: (L-R) General Manager John Grubich presents the 15-year award to Jerry Day.
Bottom: (L-R) General Manager John Grubich presents the 30-year award to Dan Boettger.

Day came to the PUD on August 6, 2001, as the information systems manager and 15 years later, he continues to hold that position. Previously he worked for Omak Wood Products for 13 years in various positions, but ultimately was the quality control supervisor prior to the mill shutting down.

Boettger joined the PUD 30 years ago on August 18, 1986, as a draftsman. Over the years, he has held several positions with the utility: he progressed to the position of distribution engineer in January 1990, he became the environmental/safety coordinator in May 1998, and then became the director of regulatory and environmental affairs in 2004, the position he currently holds. NWPPA

MEA's board approves 2016 rate adjustment

The Matanuska Electric Association (Palmer, Alaska) Board of Directors voted on August 8, 2016, to authorize an increase of 2.03 percent in base rates, effective the fourth quarter of 2016; this is 13 percent lower than originally budgeted for the fourth quarter.

The average MEA member uses just under 700 kilowatt-hours of electricity per month. These members can expect to see a total monthly increase of about $1.73 as a result of the base rate adjustment.

Due to the small fluctuations in both the base rate and the cost of power (COPA), in total, MEA members have seen only a 1.7-percent increase in rates since January 1, including this upcoming adjustment.

Under the terms of rules set by the Regulatory Commission of Alaska (RCA), MEA is allowed on a quarterly basis to file for limited increases or decreases in base rates, provided that the adjustments stay within certain financial parameters established by the RCA. The rate filing will take effect during the first week of October 2016, pending approval by the RCA. NWPPA

Beck honored for 25 years at Douglas PUD

(L-R) Commissioner Molly Simpson, General Foreman Tim Beck, and Commissioner Ron Skagen.

Douglas County PUD Commissioners **Jim Davis, Molly Simpson**, and **Ron Skagen** awarded General Foreman **Tim Beck** with his 25-year service award during the August 8, 2016, commission meeting held at the District's East Wenatchee, Wash., office.

Commissioner Davis thanked Beck on behalf of the citizens of Douglas County for his years of service.

"This is a great place to work," said Beck. "I enjoyed working on the line crews and never considered it work, it was always fun." NWPPA

EPUD awards 2016 EmPOWERing scholarships

Emerald People's Utility District EmPOWERing scholarship winners and EPUD directors.

The Emerald People's Utility District (Eugene, Ore.) Board of Directors recognized five recipients of the 2016 EmPOWERing scholarships at its June board meeting.

The scholarships are awarded to individuals interested in pursuing a rewarding career in the utility industry. They are available to high school seniors and adults interested in pursuing second-career training in the utility industry.

"These awards are investments in our communities. Winners have demonstrated their academic success and a commitment to their community. Achievements include learning multiple languages, raising funds for a local hospital, and participating in school sports or student government. We are pleased to support them as they continue their educational journey," said Emerald Board President **Katherine Schacht.**

The recipients and their families attended Emerald's June 28 board meeting to accept the $1,250 award and celebrate their accomplishments.

Emerald PUD has offered annual scholarship opportunities to its customer-owners and their family members since 1990. NWPPA

PNGC Power promotes Russell and Scott

Portland-based generation and transmission cooperative PNGC Power has named **Scott Russell** as vice president of Transmission and Contracts. In this role, Russell will be responsible for overseeing PNGC Power's transmission agreements for all of PNGC Power's members, 15 Northwest electric distribution cooperative utilities with service territory in seven western states. Russell will also represent PNGC Power members' interest in regional transmission issues.

"Scott comes to PNGC with a proven track record," said PNGC Power President and CEO **Beth Looney**. "He has the experience and background we were looking for in this highly demanding position."

Russell joined the PNGC Power team on August 1, 2016. Previously he worked for Portland General Electric in various capacities, including financial analysis, corporate planning, and contract negotiation. Russell received both his Bachelor of Science in economics and his Master of Science in economics from Oregon State University.

As part of PNGC Power's succession planning, **Aleka Scott** has been named the senior vice president of Transmission & Contracts and will be working with Russell. In this role, she will continue overseeing PNGC Power's transmission agreements for all of PNGC Power's members. NWPPA

We remember

Longtime Asotin County PUD Commissioner **Gary Hicks** passed away on August 5, 2016. He was 74 years old.

Hicks was born in Modesto, Calif., to Otis and Lubie Coker, though he was adopted and raised by Ray Hicks. Following an honorable discharge from the 101st Airborne Division of the U.S. Army, he began a successful career in sales and later set out on his own as a small business owner. Through his professional life, he owned several iterations of Hicks Furniture in Idaho and Washington.

Despite his busy life, Hicks was also a public servant, founding the Asotin County Public Utility District with his neighbors and friends in 1984. He served his constituents continuously, being re-elected without defeat until his time of death.

"The PUD community lost a strong advocate and leader," said WPUDA Executive Director George Caan. "Gary's vision and dedication to the foundational principals of PUDs was instrumental in the formation of Asotin PUD and his continued commitment was recognized by the Washington PUD Association when he was honored with the Lifetime Achievement Award [in 2014]."

Hicks leaves behind his wife of more than 50 years, Jan; daughter, Kristi (and Mike) Ottmar; son, Jayson (and Kari) Hicks; grandchildren, Savannah and Jacob; brothers, Dennis (and Thelma) Hicks and Clinton (and Betty) Hicks; and his beloved dogs, Lillie and Mylo. NWPPA

HDR employee uses CPR skills to save a life

On a warm May evening, **Dustin McBride**, an environmental scientist in HDR's Dallas office, was driving home after work when he approached the scene of a car accident in Grapevine, Texas. McBride and a few other commuters immediately pulled over to assist the victim who had been thrown from his truck.

Due to the man's condition, McBride recognized he was limited to performing hands-only CPR. After eight rounds of chest compressions, the victim began breathing on his own, but was unable to speak due to other injuries. McBride and others waited with the now-conscious man until first responders arrived, which was nearly 15 minutes after the initial 911 call. The following day, a police officer called McBride to report the man is expected to survive thanks to his life-saving CPR skills.

McBride has been CPR-certified for several years, but this was the first occasion he used his training to save a life. He urges his colleagues to contact their local safety coordinator for more information on First Aid/CPR/AED training.

HDR specializes in engineering, architecture, environmental, and construction services. For more information, visit www.HDRinc.com. NWPPA

Ruralite wins top design award

On August 9, *Ruralite* magazine won the gold award for best magazine design during the National Electric Cooperative Statewide Editors Association annual awards banquet at the National Press Club Building in Washington, D.C.

"This is the best of the best of the statewide publications," says Managing Editor **Curtis Condon** of the submissions. "This competition means a lot to us. It's a way for us to appreciate what all of us do, and look forward to what we can improve the next year."

Ruralite also received an award of merit for best editorial for Condon's January 2016 Voice Box column, "Taken for Granted."

Ruralite Services is a communications co-op for all consumer-owned utilities (municipals, public power, and electric cooperatives). For more information, visit www.ruraliteservices.org. NWPPA

Futura introduces Indigo platform

At Futura Systems' annual user conference, the innovative software company continued to demonstrate why they're an award-winning solutions provider with their introduction of the seamless software tool Indigo.

The utility-wide solutions tool will begin to bridge the gap between SEDC's CIS and accounting suite and Futura's field-to-office products. Indigo utilizes SEDC's UPN Integration, allowing for the capacity to create a work order and then sending instant notifications through email or text message that a work order has been created or updated.

Futura Systems, Inc., the engineering arm of utility software provider SEDC, delivers utility-centric enterprise GIS solutions to hundreds of distribution utilities across the U.S. Learn more at www.futuragis.com/about-futura/. NWPPA

Ed Wilson joins D'Ewart Reps

D'Ewart Representatives L.L.C. has announced that **Ed Wilson** has joined the company. Wilson will be directly involved with selling to key accounts as well as managing the operations. He will report to **Pete** and **Doug D'Ewart**, and will be based in the Bothell, Wash., office.

Wilson graduated from the University of New Mexico's Navy ROTC program and worked for five years as an engineering officer, beginning his career on the USS Bradley. He earned his M.B.A. at the University of New Mexico and then worked as a contracts manager at the Department of Energy Laboratory (Sandia Labs).

D'Ewart Representatives L.L.C. is a non-stocking manufacturers' representative agency serving end-users that have large communications and electrical power needs. For more information, visit www.dewart.com. NWPPA

EES hires three new employees

The EES Consulting team recently hired **Colin Cameron**, **Peter Kroll**, and **Steve Turi** to enhance the company's business offerings.

Cameron is a senior analyst with expertise in economic analysis and regulatory issues; benefit-cost analysis, regulatory research, and econometric analysis; and optimization techniques for cost-minimization studies.

Kroll is also a senior analyst. He has expertise in finance in electric, coal, liquid fuel, and natural gas markets; regulatory analysis, cost of service analysis, gas and electric rate design; and FERC reporting, transactional accounting, and budget development for power plants.

Turi has been hired as an analyst. He has expertise in economic impact analysis, econometrics, and managing large datasets; regression modeling, benefit-cost analysis, and industrial organization; and analytical support with cost of service, rate design, forecasting, and economic research.

EES is a multidisciplinary professional engineering and management consulting firm that provides a broad array of services to clients. For more information, visit www.eesconsulting.com. NWPPA

by Elizabeth Kelsey and Deborah Sliz

Party platforms offer differing visions for U.S. energy future

Although energy policy has not received much attention in the 2016 presidential campaigns, a look at the party platforms adopted by Democrats and Republicans at their respective conventions in July reveals starkly different visions for the energy future of the country.

The platforms are not binding on their respective nominees, but are "aspirational" policy statements that generally send a strong signal about the legislative and administrative policies the parties will pursue if their candidate wins in November.

Strong party differences remain on climate change

The platforms differ most sharply on the overall direction of U.S. energy policy: the Republican platform calls for increased production of fossil fuels to grow jobs and stimulate the economy, while the Democratic platform focuses on the need to address climate change and transition to cleaner fuels — a division that mirrors the Congressional debate in the 114th and prior Congresses. Not surprisingly, when it comes to environmental protection, the Democratic platform continues — and would build on — the Obama Administration's strong support for policies to reduce emissions of greenhouse gases (GHG). Among other things, it commits to defending, implementing, and extending carbon reduction goals in the Clean Power Plan.

In contrast, the GOP platform calls for repealing the Clean Power Plan, and transforming the Environmental Protection Agency (EPA) into an "independent, bipartisan" commission — similar to the structure of the Nuclear Regulatory Commission, rather than an administrative agency that reflects the President's priorities. Republicans would require future emissions standards to be set by Congress, rather than by executive action, and propose to shift more authority for environmental regulation from the federal government to the states (as pending coal ash disposal legislation would do). In all, environmental protection would be exposed to far more political scrutiny and negotiation under the Republican vision, and be more likely to incorporate considerations of cost-benefit analysis as a counterpoint to the scientific calculations required under current law.

With respect to international agreements, the Democratic platform recommits to meeting President Obama's pledge in the 2015 Paris Agreement to take action needed to keep global temperature increases "well below" two degrees Celsius, with a goal to limit increases to 1.5 degrees. Republicans would walk away from Obama's Paris GHG reduction pledge and from the predecessor Kyoto Protocol, a 2005 international GHG reduction treaty to which the United States is a signatory but was never ratified by Congress.

Republicans remain opposed to any carbon tax. The Democratic platform calls for "pricing carbon," but carefully avoids specifying the mechanism by which that might be achieved. Many believe the Democrats left the door for a carbon tax open so wide as to assume it was endorsed. However, nominee Hillary Clinton has said she would be open to a carbon tax if Congress sent her legislation authorizing one, but has also said that pushing for a carbon tax is "not part of her plan."

Democrats end support for natural gas

While the parties' overall positions on climate change were no surprise, the biggest shock to the energy community was how far the Democrats are willing to go to wipe fossil fuel use from the energy mix. After years of espousing an "all-of-the-above" policy toward fuel sources, the Democratic platform no longer includes support for use of natural gas as a "bridge" fuel — a necessity to transition from dirtier coal towards renewable energy. Instead, in what is likely a concession to Sen. Bernie Sanders (Vt.) and his supporters, the 2016 platform calls for the country to run "entirely on clean energy" by 2050, with an interim goal of 50 percent of electricity from clean energy sources within a decade.

Which resources qualify as "clean energy" is not defined, but the party intends to see "half a billion solar panels installed within four years and enough renewable energy to power every home in the country" if their nominee is elected. Nor does the Democratic platform discuss how the increase in variable resources would be firmed, if natural gas cannot be used for electric generation.

Republicans favor facilitating an "all-of-the-above" national energy strategy that would bolster domestic energy production (including from fossil fuels), and support cost-effective development of renewable resources — including wind, solar, biomass, geothermal, and tidal energy — with private capital instead of federal tax credits and other federal support.

Scant details and "known unknowns"

One area where Democrats and Republicans seem to be in sync — possibly due to lack of specificity — relates to "modernization" of the electric grid. While neither party provides details, Republicans state they would "build on House and Senate policies that modernize the electric grid and protect it from disruption." The Democratic platform states a similar commitment to "modernizing the grid." The positions, at a minimum, seem to express political awareness of the many changes occurring in the electric industry, including the boom in distributed generation and development of variable resources.

When these statements are fleshed out, Democrats would likely be more interested in federal standards or other actions to promote distributed generation and facilitate interconnec-

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Neither party platform provides the nuance needed to inform solid public policy. In communications with members of Congress and the Administration, NWPPA has articulated positions that respond to and improve the parties' policy proposals.

tions, while Republicans would be more likely to leave such decisions to state and local authorities.

What is entirely unknown is how quickly either party would push to achieve its energy vision. Energy and related environmental policy do not appear to be among the top priorities for either candidate, which perhaps contributed to the "aspirational" nature of some of the platform planks. Further, the post-election political environment is uncertain at best at this time, with divided government appearing to be the most likely outcome of the 2016 elections — conditions that do not lend themselves to major policy changes.

NWPPA positions focus on transcending political postures, focus on operations and costs

Neither party platform provides the nuance needed to inform solid public policy. In communications with members of Congress and the Administration, NWPPA has articulated positions that respond to and improve the parties' policy proposals.

For example, NWPPA is not flatly opposed to the Clean Power Plan, but would prefer legislation over executive action, and seeks credit for early action, adequate time, and assistance to mitigate reliability impacts and consideration of costs of compliance to consumers. NWPPA has also called for any emissions reduction program to allow consumer-owned utilities to maintain the right of local control by retaining the flexibility to meet GHG reduction targets in ways that best meet the needs of their communities, and do not mandate acquisition of called resources not needed for load growth.

In total, the party platforms miss the expanse of public opinion between their two positions, which acknowledges that public policy can and should encourage both energy production and emissions reductions. The 2016 platforms' insistence on marching headstrong in opposite directions results in both parties' visions going too far. In so doing, they make it more likely that we end up with the status quo. NWPPA

Elizabeth Kelsey and Deborah Sliz are with Morgan Meguire, NWPPA's Washington, D.C., consulting firm. They can be reached at either (202) 661-6196, or ekelsey@morganmeguire.com and dsliz@morganmeguire.com respectively.

Confusion in data sharing

by Bill Dearing

A hot topic for the past year has been what planning and operating data is considered critical and how to share it among utilities as well as with FERC. FERC recently issued a Notice of Proposed Rulemaking (NOPR) and, after a round of comments, a Final Order was issued requiring NERC to share its generator/transmission outage and relay misoperation databases with FERC. The rule came out despite pushback from all parts of the electric industry saying that requiring the sharing of this data from the various utilities with FERC would have a chilling effect on its collection. FERC did temper the final order to only require data to be shared that NERC ordered to be collected, not voluntary information.

Data sharing has also been a big issue with WECC and Peak Reliability. Peak collects large amounts of operating and planning data from all WECC-operating entities in the course of its function as the reliability coordinator. Peak just finished rewriting what they have called the Universal Data Sharing Agreement (UDSA), which allows the sharing of some of this data among utility signatories (and WECC). Just before it was scheduled to go into effect, Congress passed the FAST Act. Though it was really a highway bill, it also had Section 215A tacked on that amends the Federal Power Act to include new rules on Critical Electric Infrastructure Information (CEII) sharing which potentially conflict with the UDSA. Subsequently, FERC issued another NOPR on how it plans to implement the new Section 215A and it is currently out for comment. Initial reactions are that it may create more confusion rather than solve the problem, and many comments are expected while that process moves toward a Final Rule at FERC.

What is clearly needed is guidance from FERC on how data should be classified, what data is considered critical (or CEII), and how it should be protected. Currently, FERC and the state regulators are pushing for more data sharing to allow needed studies by universities and the National Labs on the rapidly changing generation mix and its challenges to operations. Utilities need to share information to have a clear view of current and potential system events that could create cascading outages. Unfortunately, without clear guidance, and especially in light of the undefined "sanctions" in the new Section 215A on Federal Agencies that do not comply, there will be less — not more — data sharing until this is resolved. NWPPA

Bill Dearing is the Bulk Electric System consultant for NWPPA. He can be contacted at either (509) 989-3889 or wdearing@nwi.net.

by Peter Asmus

Nanogrids: supreme threat or natural evolution for the future of energy?

The Pacific Northwest has long been blessed with some of the lowest energy costs in the United States. This regional driver for economic growth is largely a result of past investments in large centralized power generation facilities taking advantage of the enormous hydroelectric resources available throughout the region.

Concerns about the protection of fish habitat and the impacts of climate change on hydro resource availability throughout the West are stimulating a rethinking of what the future of energy might look like. Adding wind and natural gas to the resource mix at the wholesale level has served the public power entities in the region quite well. Nonetheless, decreasing reliance upon fossil fuels is creeping up on the priority list of utilities worldwide, and the variability of wind can create grid instability problems.

As regulators, investors, vendors, and utilities begin to rethink what the energy system of the future might look like, new smaller, cleaner, and more flexible resources are coming to the forefront. As a result, the stars appear aligned for distributed energy resources (DER) to play an increasingly important role in providing energy services to consumers. Pessimists see this growth in capacity from devices such as solar PV panels, fuel cells, advanced batteries, and other forms of DER as the supreme threat to incumbent distribution utilities, a part of the much-ballyhooed utility death spiral story line. A new report from the National Renewable Energy Laboratory (NREL) is fueling this fire. NREL has dramatically increased its estimate of the technical potential of rooftop solar PV in the United States to 1,118 GW, which represents the equivalent of 39 percent of current U.S. electricity sales.

Despite these large numbers, optimists see future growth in solar PV as an opportunity for utilities — especially publicly owned utilities — to reinvent themselves, aligning their business strategy with the emerging digital economy and creating new two-way and mutually beneficial relationships with customers.

Either way, it is going to be a bumpy ride into the future. Yet there are signs that by leveraging the diverse services that energy storage can provide when coupled with rooftop solar PV (bundled together into what is being called nanogrids), it is possible to design win-win scenarios. Advances in the software that can optimize nanogrids to provide bidirectional value along with the bridging capabilities energy storage brings to the market can create order out of what would otherwise be chaos.

Is there a way for everyone to come out winners? The key is intelligent distribution networks, an ecosystem of solutions that spans concepts such as nanogrids, microgrids, and virtual power plants (VPPs.)

The SMUD/Sunverge Energy project at 2500 R Street in Midtown Sacramento includes elements of nanogrids, a microgrid, and a VPP.

Why nanogrids? Why now?

Navigant Research estimates that between 2014 and 2023, different forms of distributed generation (DG) will displace the need for more than 320 GW of new large-scale power plants globally. Navigant Research's *Global Distributed Generation Deployment Forecast* report estimates that new DG capacity additions will exceed new centralized generation capacity additions by as early as 2018. These forecasts should be a wake-up call for the public power entities that have relied upon such centralized forms of power generation for decades. Though many of these facilities still have long useful lives, relicensing and required upgrades will be challenged in regulatory proceedings in the future as costs for DG and DER continue to come down.

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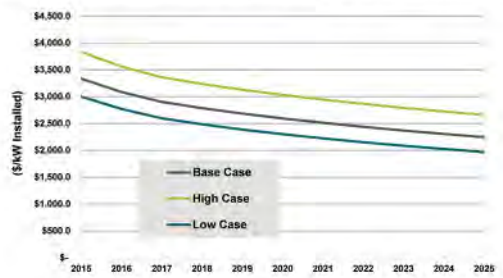
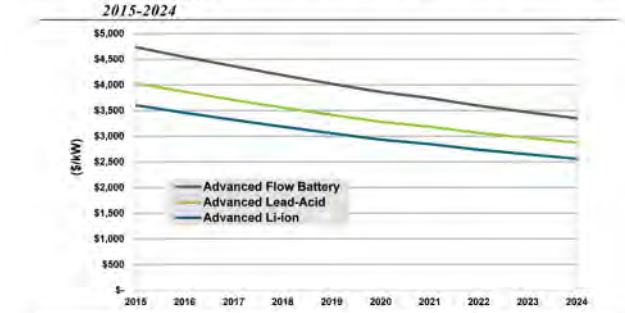
Nanogrids take the concept of a bottom-up energy paradigm to extreme heights. In some cases, the networks articulate a business case even more radical than that of a microgrid; in other cases, nanogrids peacefully coexist with the status quo.

Chart 1.1 Residential Solar PV Price Range, All Scenarios, United States: 2015-2025



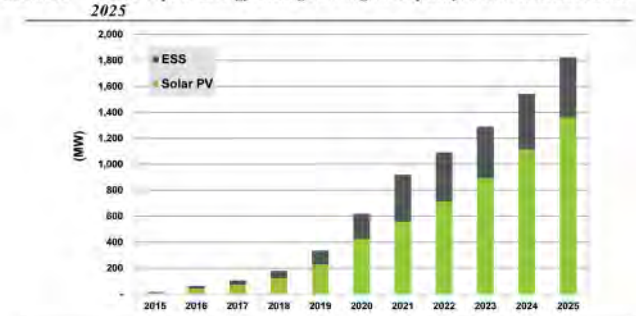
(Source: Navigant Research)

Chart 1.2 Average Installed ESS Cost for Distributed Applications by Technology, World Markets: 2015-2024



(Source: Navigant Research)

Chart 1.3 Solar PV plus Energy Storage Nanogrid Capacity, North America: 2015-2025



(Source: Navigant Research)

The business case for nanogrids echoes many of the same arguments used on behalf of microgrids. These smaller, modular, and flexible distribution networks are the antithesis of the bigger-is-better economies of scale thinking that has guided energy resource planning over much of the past century. Nanogrids take the concept of a bottom-up energy paradigm to extreme heights. In some cases, the networks articulate a business case even more radical than that of a microgrid; in other cases, nanogrids peacefully coexist with the status quo.

The reason nanogrids should grab the attention of public power entities is that they are growing in importance due to major declines in technology costs. While a nanogrid may incorporate diverse DER ranging from a diesel generator to a wind turbine, the market is tilting heavily toward solar PV and lithium ion batteries. The charts to the left illustrate why.

Chart 1.1 shows three different scenarios for distributed solar PV systems sized at no more than 5 kW. Note that by 2025, the base case shows solar PV costs dropping to approximately $2,250/kW.

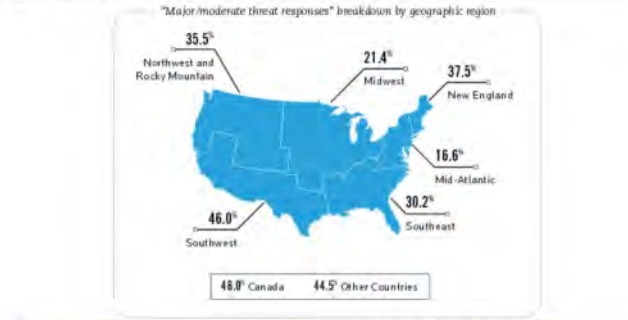
Solar PV technologies are not the only DER technology showing rapid declines in cost. Chart 1.2 comes from Navigant Research's *Energy Storage for Renewables Integration* report published in 2015 and highlights the energy storage system (ESS) cost data underlying Navigant Research's market forecasts. More recent cost data from commercial and industrial (C&I) applications shows a much more pronounced cost decline.

Navigant Research has developed market forecasts for nanogrids, microgrids, and VPPs. However, the key common thread between all three of these distribution networks is energy storage in the form of batteries. Zeroing in on just the market for residential solar PV plus energy storage nanogrids in North America, the scale of forecast future growth is dramatic, expected to reach over 1.8 GW by 2025. (Chart 1.3)

It is safe to say the majority of these systems will not be deployed in the Pacific Northwest due to the already low energy costs in the region. But as costs increase in wholesale markets and costs for DER continue to decline, there will come a point where these nanogrids will reach grid parity; many expect that time will come as soon as 2020 across most of the United States.

While this solar PV plus energy storage market is led by non-utility third parties and in many ways represents the epitome of the overhyped utility death spiral concept, it is also important to note that growing numbers of utilities are exploring what role they can play. A recent Black & Veatch survey highlights an important finding: 74 percent of utilities are exploring market opportunities in this DER landscape. In the United States, perceptions vary widely in regard to whether or not these new networking platforms are a threat. Globally, close to 50 percent of utilities are at least moderately alarmed by the recent growth in DER, such as solar PV and energy storage nanogrids. (Figure 1.1)

Figure 1.1 Does Growth in DER Represent a Threat to Utilities?



(Source: Black & Veatch)

Nanogrids versus microgrids

The business case for nanogrids is the antithesis of the bigger-is-better mentality that has been pervasive in the energy industry since the time Thomas Edison abandoned his original microgrid model in the late 19th century and shifted to the concept of large monopolies that would take advantage of centralized power plants that were lower cost because of economies of scale.

- Since nanogrids are confined to single buildings or single loads, they avoid many of the regulatory challenges that stand in the way of power-sharing microgrids, such as prohibitions regarding the sending of power over public right-of-ways (if one is not a utility).
- Whereas microgrids are based on the efficiency that comes about when DER are optimized on the basis of clusters of loads, nanogrids boost efficiency by limiting supply to a single building or load, thereby further reducing any possible line losses and extolling simplicity.
- Nanogrids foster a more radical shift to direct current (DC) power than microgrids, since their small scale can accommodate low-voltage networking, setting the stage for medium-voltage extensions.

For public utilities, the microgrid has been the preferred distribution network opportunity, since these larger systems align more closely with the bigger-is-better mindset of utilities. In fact, Navigant Research sees public power utilities moving forward with microgrids faster than their investor-owned utility counterparts.

Nanogrids and VPPs

One benefit for utilities is that the VPP model that aggregates up customer nanogrids presents an opportunity — especially for utilities that missed opportunities to be at the forefront of the distributed PV market — to approach energy storage as an opportunity instead of a threat. When customers adopted distributed solar PV, most revenue was

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Drawing lines between distribution networks

Navigant Research has been sizing and forecasting aggregation and optimization platforms for DER since 2009. It has come up with the following definitions of three approaches to organizing DER technologies so that they provide the most possible value.

The most established of distribution network concepts is the microgrid. Borrowing largely from a U.S. Department of Energy definition, here is the Navigant Research definition of a microgrid:

A microgrid is a distribution network that incorporates a variety of possible DER that can be optimized and aggregated into a single system that can balance loads and generation with or without energy storage and is capable of islanding whether connected or not connected to a traditional utility power grid.

There is much less consensus about what differentiates a nanogrid from a microgrid, or even a nanogrid from a relatively simple distributed generation (DG) installation. Here is the Navigant Research definition of a nanogrid:

A small electrical domain connected to the grid of no greater than 100 kW and limited to a single building structure or primary load or a network of off-grid loads not exceeding 5 kW, both categories representing devices (such as DG, batteries, EVs, and smart loads) capable of islanding and/or energy self-sufficiency through some level of intelligent DER management or controls.

And last but not least is the VPP. Closely related to both nanogrids and microgrids, here is the Navigant Research definition of a VPP:

A system that relies upon software and a smart grid to remotely and automatically dispatch and optimize DER via an aggregation and optimization platform linking retail to wholesale markets.

VPPs can be viewed as one manifestation of the concept of transactive energy, transforming formerly passive consumers into active prosumers. In essence, prosumers are active participants in delivering services tailored to their own needs and preferences that also serve the larger grid. Another way to describe the VPP vision of the future is the Energy Cloud, a term Navigant Research uses to describe how DER can be managed virtually via software that can deploy hardware in a dispersed network. Table 1.1 puts these related networking platforms into context based on key market characteristics. NWPPA

Table 1.1 Lexicon of DER Business Models

Capabilities	Nanogrids	Microgrids	VPPs
Grid-Tied	Sometimes	Sometimes	Always
Islanding	Usually	Yes	No
Storage	Most of the time	Often	Sometimes
Geographic Range	Confined to load	Confined to network	Wide and variable
Resource Mix	Static	Static	Mix and match
Grid Connection	Mostly behind the meter	Mostly behind the meter	Mostly transmission node
Market Impact	Retail	Retail first, then wholesale	Wholesale first, then retail

(Source: Navigant Research)

accrued by third-party installers instead of utilities, often in spite of some utilities' efforts to limit adoption. In contrast, utilities that embrace the VPP-led strategy are positioning themselves to sell hardware and services to retail customers in addition to electricity. Many utilities are also offering solar PV plus energy storage products to customers, which gives these utilities a second chance to jump into the solar PV market. These utilities are in a position to optimize their own grids by deferring investment in distribution equipment and lowering fuel costs by using VPPs to deliver ancillary services, shave peaks, shift load, and deliver flexible capacity to the grid.

Utilities face increased demands to reduce the stress that DER installations can place on the grid. At the same time, consumer adoption of solar PV (and now energy storage) is driven largely by the promise of realizing bill savings by generating their own power or storing low-cost energy for use during peak times.

These two forces might seem to be in opposition, yet public power entities are uniquely situated to leverage value from nanogrids. Their self-governing structure, scale, and lack of conflicts between shareholders and ratepayers create opportunities to explore new energy service delivery models. While all three distribution networks profiled in this article — nanogrids, microgrids, and VPPs — deliver DER synergies, it is the nanogrid-to-VPP model that holds the most promise in terms of systemwide benefits. NWPPA

Peter Asmus is an associate director of energy at Navigant Research in San Francisco, Calif., a firm that provides in-depth analysis of global clean technology markets. He can be contacted at either (415) 399-2137 or peter.asmus@navigant.com.

Nanogrid case study: SMUD and Sunverge

The Sacramento Municipal Utility District (SMUD) is the sixth largest municipal utility in the nation. SMUD has been looking to evolve beyond traditional business models when addressing higher penetrations of solar PV on its distribution grid. Building upon past research that demonstrated the benefits of coupling residential storage with customer rooftop solar PV, SMUD partnered with Sunverge Energy to demonstrate the ability of solar PV integrated with energy storage and DR to help create win-win distribution network benefits for the utility and customer. The project includes elements of nanogrids, a microgrid, and a VPP.

The site chosen was 2500 R Street in Midtown Sacramento, a 34-home single-family housing project developed by affordable housing specialist Pacific Housing, Inc. It seemed like the perfect site to prove the benefits of solar PV plus Li-ion energy storage because of its reputation as a progressive development seeking net zero energy and the likely prospect of attracting sustainability-minded buyers and financiers alike.

Planning began in earnest in 2010 with construction commencing in 2013 and homes selling out in less than a year's time. Each residence at 2500 R Street Midtown included an energy storage platform bundle made up of a 2.25-kW solar array, the Sunverge Solar Integration System (SIS) ESS, smart plug load controllers, and smart thermostats. Sunverge's results from this pilot program are impressive, validating many of the assumptions behind this approach to utility management of DER:

- During DR events, 100 percent of target stored capacity (60 percent of storage nameplate) was dispatched during each DR event.
- Under peak load reduction scenarios, stored energy was dispatched and net peak load was reduced to zero in residences with integrated energy storage.
- Customers with energy storage realized an incremental 33-percent reduction in their bills relative to customers with solar PV alone; those on dynamic time-of-use rates with critical peak pricing saved on average more than $50 per month on electricity bills.
- During grid outages, the Sunverge SIS platforms were available to dispatch up to 100 percent of reserve storage capacity and satisfied critical loads until power was restored in all cases.

Sunverge found electric bills for homes on this single block in urban Sacramento to be 85 percent lower than comparable homes without solar PV or ESSs. NWPPA

Job Opportunities

The Job Opportunities is a service provided to NWPPA member systems and associate members. Member price is **$110 per listing for a 30-day period**.

- Job Opportunities ads are also accepted from non-members. Ads are **$330 per listing for a 30-day period.**
- ***Copy must be received before the 25th of the month prior to the month of publication*** (for example, February 25 for March issue).
- The *Bulletin* is mailed by the 15th of each month.
- 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: Journeyman Meterman or Journeyman Relay/Meter Technician
COMPANY: Central Lincoln PUD (Newport, Ore.)
SALARY: $45.93 per hour.
DEADLINE TO APPLY: September 17, 2016.
TO APPLY: Apply online at http://clpud.org/employment/.

POSITION: Electrical Line Worker
COMPANY: City of Lompoc (Lompoc, Calif.)
SALARY: $31.13-$39.73 per hour.
DEADLINE TO APPLY: September 19, 2016.
TO APPLY: Apply online at http://agency.governmentjobs.com/lompocca/default.cfm.

POSITION: Journeyman Lineman
COMPANY: Kodiak Electric Association, Inc. (Kodiak, Alaska)
SALARY: $46.95 per hour.
DEADLINE TO APPLY: September 19, 2016.
TO APPLY: Apply online at www.kodiakelectric.com.

POSITION: Journeyman Meterman
COMPANY: Mason County PUD No. 3 (Shelton, Wash.)
SALARY: $43.29 per hour.
DEADLINE TO APPLY: September 19, 2016.
TO APPLY: Complete application found at http://www.pud3.org/service/about-us/employment-opportunities. Applications may be submitted via email to thedraf@masonpud3.org or mailed to Mason County PUD 3, P.O. Box 2148, Shelton, WA 98584, Attn: Human Resources.

POSITION: Utility Services Specialist
COMPANY: City of Tacoma (Tacoma, Wash.)
SALARY: $35.74-$47.90 per hour.
DEADLINE TO APPLY: September 19, 2016.
TO APPLY: Apply online and attach a resumé and cover letter.

POSITION: System Analyst
COMPANY: McMinnville Water & Light (McMinnville, Ore.)
SALARY: $27.93-$35.32 per hour.
DEADLINE TO APPLY: September 21, 2016.
TO APPLY: Submit application and resumé to: Human Resources, McMinnville Water & Light, P.O. Box 638, McMinnville, OR 97128. Application available at www.mc-power.com.

POSITION: Journeyman Lineman
COMPANY: Lassen Municipal Utility District (Susanville, Calif.)
SALARY: $48.53 per hour.
DEADLINE TO APPLY: September 21, 2016.
TO APPLY: Interested individuals must submit an LMUD Employment Application and a current resumé to Human Resources. Application may be found at www.lmud.org/about/jobs/.

POSITION: Engineer - Gas Division
COMPANY: City of Ellensburg (Ellensburg, Wash.)
SALARY: $6,353-$8,471 monthly.
DEADLINE TO APPLY: September 21, 2016.
TO APPLY: Resumés will not be accepted in lieu of a completed City of Ellensburg employment application. Additional information on the duties and requirements of this position along with our application form can be found at www.ci.ellensburg.wa.us or by calling (509) 962-7220.

POSITION: Key Account Representative
COMPANY: City of Roseville (Roseville, Calif.)
SALARY: $99,056-$132,744 annually.
DEADLINE TO APPLY: September 24, 2016.
TO APPLY: Apply online at www.roseville.ca.us/jobs.

POSITION: General Manager
COMPANY: Tillamook People's Utility District (Tillamook, Ore.)
SALARY: DOE.
DEADLINE TO APPLY: September 25, 2016.
TO APPLY: The required fillable application is located on our website at www.tpud.org, or contact Tillamook PUD at 1115 Pacific Avenue, P.O. Box 433, Tillamook, OR 97141, or email jobs@tpud.org. One letter of recommendation is required. Resumés are encouraged, but do not replace the required PUD job application.

POSITION: Utility Asset Coordinator
COMPANY: Tillamook People's Utility District (Tillamook, Ore.)
SALARY: $4,175 monthly.
DEADLINE TO APPLY: September 26, 2016.
TO APPLY: Apply online at www.tpud.org, or contact Tillamook PUD at 1115 Pacific Avenue, P.O. Box 433, Tillamook, OR 97141, or email to jobs@tpud.org. One letter of recommendation, a resumé, and a cover letter are also required.

POSITION: Journeyman Meterman
COMPANY: Anchorage Municipal Light & Power (Anchorage, Alaska)
SALARY: $48.63 per hour.
DEADLINE TO APPLY: September 29, 2016.
TO APPLY: Apply online at www.muni.org/job.

POSITION: Manager of Administration and Finance
COMPANY: Cordova Electric Cooperative, Inc. (Cordova, Alaska)
SALARY: DOE.
DEADLINE TO APPLY: September 30, 2016.
TO APPLY: Submit resumé with references to Cordova Electric Cooperative, P.O. Box 20, Cordova, AK 99574, or email to info@cordovaelectric.com. Complete the application located at www.cordovaelectric.com on the Career Opportunities page.

POSITION: Power Generation Technician - Terror Lake Hydroelectric Facility
COMPANY: Kodiak Electric Association, Inc. (Kodiak, Alaska)
SALARY: $46.95 per hour.
DEADLINE TO APPLY: October 10, 2016.
TO APPLY: For a complete job description and application documents, go to www.kodiakelectric.com. Contact Nancy B. Sweeney, Human Resources, Kodiak Electric Association, Inc. by email nbsweeney@kodiak.coop or call (907) 486-7709 for more information.

POSITION: Power Systems Manager
COMPANY: Golden Valley Electric Association (Fairbanks, Alaska)
SALARY: $144,118 annually.
DEADLINE TO APPLY: October 10, 2016.
TO APPLY: Applicants must complete a GVEA employment application as resumés alone will not be considered. A full job description and application can be found at http://www.gvea.com.

POSITION: Journeyman Lineman (U16-101)
COMPANY: Portland General Electric (Portland, Ore.)
SALARY: $42.74 per hour.
DEADLINE TO APPLY: Open until filled.
TO APPLY: Apply online at https://PGN.igreentree.com/CSS_External/CSSPage_Referred.ASP?Req=U16-101.

POSITION: Operations Manager
COMPANY: Canby Utility Board (Canby, Ore.)
SALARY: DOE.

DEADLINE TO APPLY: Open until filled.
TO APPLY: To apply, visit our website at www.canbyutility.org/dept/jobs/ and download our employment application. Submit completed application, along with a current resumé and cover letter, to Canby Utility, Attn: General Manager, P.O. Box 1070, Canby, OR 97013. For questions, please contact Barb Benson at (503) 263-4312 or bbenson@canbyutility.org.

POSITION: Light Operations Manager
COMPANY: City of Port Angeles (Port Angeles, Wash.)
SALARY: $86,190-$103,006 annually.
DEADLINE TO APPLY: Open until filled.
TO APPLY: To apply online, visit Prothman at http://www.prothman.com/ and click on "Submit Your Application" and follow the directions provided. Application materials will only be accepted electronically via the website. For questions, please call (206) 368-0050.

POSITION: Dispatcher
COMPANY: Consumers Power, Inc. (Philomath, Ore.)
SALARY: Commensurate with experience.
DEADLINE TO APPLY: Open until filled.
TO APPLY: A complete job description is available at www.cpi.coop. Interested candidates should submit cover letter, resumé, and salary history to debg@cpi.coop.

POSITION: Journeyman Lineman
COMPANY: Grant County PUD (Ephrata, Wash.)
SALARY: $41.79 per hour.
DEADLINE TO APPLY: Open until filled.
TO APPLY: Apply online at http://www.appone.com/applinkportal.asp?R_ID=1216658&AdCode=NW00494890.

POSITION: Electrical Engineer, PE
COMPANY: Alaska Village Electric Cooperative (Anchorage, Alaska)
SALARY: $79,612 annually.
DEADLINE TO APPLY: Open until filled.
TO APPLY: A completed company application is required and may be submitted to applications@avec.org or mailed to Human Resources Department, Alaska Village Electric Cooperative, Inc., 4831 Eagle St., Anchorage, Alaska 99503. An application can be downloaded from our website at http://avec.org/. Interviews by appointment only.

POSITION: Journeyman Meterman (U16-123)
COMPANY: Portland General Electric (Portland, Ore.)
SALARY: $42.74 per hour.
DEADLINE TO APPLY: Open until filled.
TO APPLY: Apply online at https://PGN.igreentree.com/CSS_External/CSSPage_Referred.ASP?Req=U16-123.

POSITION: Engineer Assistant
COMPANY: Chelan County PUD (Wenatchee, Wash.)
SALARY: $38.46 per hour.
DEADLINE TO APPLY: Open until filled.
TO APPLY: See full job description and apply online (job number 11046) under Careers at www.chelanpud.org.

POSITION: Information Technology System Administrator
COMPANY: Alaska Village Electric Cooperative, Inc. (Anchorage, Alaska)
SALARY: $84,107 annually.
DEADLINE TO APPLY: Open until filled.
TO APPLY: A completed company application is required and may be submitted to applications@avec.org or mailed to Human Resources Department, Alaska Village Electric Cooperative, Inc., 4831 Eagle St., Anchorage, Alaska 99503. An application can be downloaded from www.avec.org or you may call (907) 561-1818.

POSITION: Account Services Manager
COMPANY: Silicon Valley Clean Energy Authority (Sunnyvalle, Calif.)
SALARY: $100,800-$158,400 annually.
DEADLINE TO APPLY: Open until filled.
TO APPLY: Submit an SVCE application, detailed resumé, cover letter, and three professional references to Shellie Anderson, Bryce Consulting, Inc., 3436 American River Dr., Ste. 7A, Sacramento, CA 955864, email to sanderson@bryceconsulting.com, fax to (916) 974-0224, or call (916) 974-0199.

POSITION: Community Outreach Specialist
COMPANY: Silicon Valley Clean Energy Authority (Sunnyvalle, Calif.)
SALARY: $4,550-$7,150 monthly.
DEADLINE TO APPLY: Open until filled.
TO APPLY: Submit an SVCE application, detailed resumé, cover letter, and three professional references to Shellie Anderson, Bryce Consulting, Inc., 3436 American River Dr., Ste. 7A, Sacramento, CA 955864, email to sanderson@bryceconsulting.com, fax (916) 974-0224, or call (916) 974-0199.

POSITION: Electrical Distribution Engineer I
COMPANY: City of Richland (Richland, Wash.)
SALARY: $32.05 per hour.
DEADLINE TO APPLY: Open until filled.
TO APPLY: Apply online at www.ci.richland.wa.us. NWPPA

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