

Learning the basics of solar energy generation

The solar energy trend continues throughout the United States as well as the trend of solar energy projects being developed at the local level, either by individual electric utility customers or by electric utilities and communities.

Rich Andrysik, distributed resources and generation specialist for the Municipal Energy Agency of Nebraska (MEAN), held an educational session on the “Basics of Solar Energy” for attendees of the MEAN committee and board meetings in August in Kearney, Neb.

The presentation covered how electricity is generated through solar photovoltaic (PV) cells, different types of solar panels available, typical daily solar generation electric load curve, some of the equipment needed for solar installations, considerations for residential and commercial projects as well as policy and procedure considerations for municipal utilities.

Typical characteristics

The size of a typical solar panel is approximately 3 feet by 6 feet. The panels, whether mounted on a residential roof or ground mounted, lose efficiency over time at a rate of about 0.5 percent per year, said Andrysik, which results in approximately a loss of 10 percent efficiency over 20 years. Solar panels can be at a fixed tilt or



Solar Energy Resources

Several solar energy resources are available on the NMPP Energy website (www.nmppenergy.org/mean), including a list of considerations for residents interested in installing solar panels.

rotate to track the sun’s movement during the day. Panels that track the sun produce about 9 percent more energy annually than fixed tilt systems, according to Andrysik. However, rotating solar panels do have higher maintenance requirements.

Lower capacity factor

The capacity factor of a typical solar panel varies depending on

location. Capacity factor is the ratio of energy produced over time to its maximum nameplate capacity. A typical capacity factor of a solar panel in Iowa is approximately 15 percent compared to around 21 percent in Eastern Colorado, said Andrysik. Compared to other energy sources, solar energy has a low capacity factor.

MEAN Board approves change in distributed generation policy

Change provides more flexibility for local renewable projects

The Municipal Energy Agency of Nebraska (MEAN) Board of Directors unanimously approved a change in the MEAN Renewable Distributed Generation Policy, allowing long-term MEAN wholesale electric participant communities to enter into power purchase agreements with private developers for local renewable energy projects.

The policy, initially adopted by the MEAN Board in 2016, accommodates for the integration of smaller, local renewable projects while still fulfilling obligations under MEAN's total requirements power supply contracts for long-term total requirements participants.

The change allows municipalities to benefit from partnering with private developers that are eligible to receive federal tax credits for installing solar projects. The developer could then pass the savings onto the municipality in the form of lower energy rates from the project.

The policy allows for community solar project production of up to two percent of each participant's three-year historical annual average electric load or 100 kilowatts, whichever is greater.

Metering/telemetry project ongoing

An update was provided regarding MEAN's three-year project of upgrading electric metering



equipment in MEAN participant communities.

MEAN uses this equipment to meter each community's monthly electric load, similar to a local electric utility metering residential/commercial customer usage. The project began this year and is expected to be completed in fiscal year 2020-21.

Economic development rate options discussed

The Board and Management Committee received information and discussed options for implementing a new economic development rate to offer new businesses with large electric loads and/or high load profiles or off-peak load profiles within MEAN participating communities.

Fitch affirms power supply bond rating

Fitch Ratings recently affirmed its 'A' rating on the Municipal Energy Agency of Nebraska's (MEAN) power supply revenue bonds. The rating outlook is stable.

Fitch noted long-term revenue stability due to MEAN's 54 long-term, total requirements participants that are served under MEAN's Schedule M contract. These participants, which generally exhibit solid credit quality, provide approximately 84 percent of MEAN's total revenue in fiscal year 2018, according to Fitch.

Other key drivers leading to the affirmation of MEAN's 'A' rating included:

- MEAN's stable financial metrics and overall healthy financial position.
- A diverse power resource portfolio as MEAN sets a target of no single generating unit contributing more than 15 percent of total capacity to limit the consequences of a plant outage.
- MEAN's competitive rates and rate structure, which includes a fixed cost recovery charge component that mitigates the impact of variable weather conditions and usage patterns.

MEAN's "participant distribution systems are small but appear to be in sound fiscal health," Fitch stated in its news release. "...Fitch anticipates participant performance will remain solid, with participants benefiting from competitive wholesale rates."

APPA webinar series focuses on public power

The American Public Power Association (APPA) recently began a public power awareness campaign.

Materials are available to assist utilities in promoting the benefits of public power on APPA's website (www.publicpower.org) by clicking on

"Members" and then "Awareness Campaign". Also, a series of webinars are scheduled over the next few months. Webinar topics include: Stop Scams: Alerting and Educating Customers; Outage Communications: Stepping Up Your Game; Rallying the Troops: Internal Communications Best

Practices and Community Outreach. All webinars start at 1 p.m. Central time.

Cost for individual webinars is \$99 for APPA members and \$199 for non-members. Call (202) 467-2965 or EducationInfo@PublicPower.org with any questions.

Solar basics

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Most of today's wind farms have a capacity factor above 40 percent and baseload electric generation from a nuclear, coal or natural gas power plant have capacity factors near 90 percent. Obviously, solar energy is subject to the availability of sunlight, so weather and time of day/night significantly impacts capacity factor.

Residential/commercial solar considerations

Considerations for residential and commercial solar installations include:

- Location of the panels to maximize efficiency. It's best to place the panels in areas of full sunlight away from trees and tall structures. Also, panels should be directionally oriented to capture the most sunlight.
- Ensure the structure of the roof is adequate if the solar panels will be mounted to a commercial or residential roof.
- Bi-directional meters are needed to meter and bill individual customers for the energy produced.
- Disconnect switches are needed for the safety of electric

line technicians working around local distributed generation systems.

Being proactively prepared

From a municipal utility standpoint, it's important to be proactively prepared to handle requests from customers seeking to install solar panels for their home or business. This includes having policies and procedures in place to handle customer requests. MEAN assists its participating wholesale electric participants by having an interconnection policy available to use and Andrysik has made presentations to MEAN participants regarding local solar projects. Other considerations for the municipal electric utility include determining your net metering limit and what rate to pay customers for the excess energy generated from local solar projects.

Community solar projects

Community solar projects, unlike individual resident and commercial projects, benefit from economies of scale. More area is needed for these projects with

about seven acres of land needed for one megawatt of energy. Location is important for community projects with the best sites being on level ground, free from shade trees and tall structures and near a high capacity power line.

MEAN's Renewable Distributed Generation Policy allows long-term MEAN participants to install renewable electric generation up to two percent of the community's annual energy needs or 100 kilowatts, whichever is greater.

As far as the cost of solar energy, it varies by location and facility. Typically, larger projects benefit from economies of scale resulting in lower costs. The federal Solar Investment Tax Credit helps lower costs, providing private developers a tax credit for the installation of a solar project, which can allow the savings to be passed onto a municipal utility in the form of a lower energy rate. The federal tax credit is 30 percent off installation costs through 2019 and steps down each year as part of a phase-out plan.

EPA proposes Affordable Clean Energy Rule

The U.S. Environmental Protection Agency (EPA) in late August proposed a new rule to reduce greenhouse gas (GHG) emissions from existing coal-fired electric utility generating units and power plants across the country.

The proposal, entitled the Affordable Clean Energy (ACE) Rule, establishes emission guidelines for states to use when developing plans to limit GHGs at their power plants. The ACE Rule was developed to replace the Clean Power Plan (CPP), which was proposed by the former EPA administration under President Barack Obama. The plan ran into strong opposition with many states believing it exceeded the EPA's authority under the Clean Air Act.

The proposed ACE rule places more empowerment with individual states to reduce greenhouse gas emissions through four main actions:

1. ACE defines the "best system of emission reduction" (BSER) for existing power plants as on-site, heat-rate efficiency improvements;
2. ACE provides states with a list of "candidate technologies" that can be used to establish standards of performance and be incorporated into their state plans;
3. ACE updates the New Source Review (NSR) permitting program to further encourage efficiency improvements at existing power plants; and

Online Resources

Information on the proposed Affordable Clean Energy Rule, including several fact sheets, is online at epa.gov.

4. ACE aligns regulations under Clean Air Act section 111(d) to give states adequate time and flexibility to develop their state plans.

According to EPA, its analysis found that coal-fired power plants can reduce CO₂ emissions by making on-site efficiency upgrades, or heat rate improvements. Efficiency upgrades reduce the amount of CO₂ that is released per unit of electricity generated.

"The ACE Rule would restore the rule of law and empower states to reduce greenhouse gas emissions and provide modern, reliable, and affordable energy for all Americans," said EPA Acting Administrator Andrew Wheeler. "(The) proposal provides the states and regulated community the certainty they need to continue environmental progress while fulfilling President Trump's goal of energy dominance."

EPA is taking comments on the proposal for 60 days after publication in the Federal Register and will hold a public hearing.

Lower your local businesses' electric bill through MEAN's LED Commercial Lighting Program

The Municipal Energy Agency of Nebraska, in partnership with its long-term wholesale power participants, is continuing its LED Commercial Lighting Program for 2018-19. The program provides a cash incentive to commercial businesses of MEAN long-term power participants to replace less-efficient lighting with higher-efficient LED lighting. The program year began April 1 and runs through March 31, 2019 or until funding lasts.

Visit www.nmppenergy.org/mean to download a brochure and application.

For more information contact:

Mandy Hansen

800-234-2595 • AHansen@nmppenergy.org



Kimball uses ACE funds for Veteran's Memorial project

The City of Kimball, Neb., recently used funds from its ACE (Public Alliance for Community Energy) distribution to purchase flag poles for a new memorial tribute to veterans in Gotte Park.



Member News

The project, according to the Kimball Western Observer, has been two years in planning. Approximately \$8,000 in ACE funds were used for the flag poles.

A dedication ceremony held in late August included speakers Keith Prunty, mayor of Kimball, an ACE representative and military dignitaries.

ACE is the not-for-profit, community-owned retail natural gas supply organization of NMPP Energy. Through its revenue return program, funds are returned to ACE member communities to be used at the discretion of each community's local government.

Since forming in 1998, more than \$2 million has been returned to ACE communities, including returning \$250,000 earlier this year. These funds have been used for a variety of projects, including for parks, playgrounds, public transportation, youth programs and infrastructure improvements.



Photo by Kimball Western Observer

Local veterans attended the recent dedication ceremony of the Kimball Veteran's Memorial in Gotte Park. ACE funds were used to purchase the flag poles.

How did your community use its ACE funds?

Let us know how your community used its ACE distribution funds by emailing info@nmppenergy.org so we can share your positive news!

Auburn voltage conversion project progressing

The Auburn, Neb., Board of Public Works is continuing work on its voltage conversion project, which includes converting the majority of the city to a 7,200 volt circuit. The project was approved by the board in November 2017 and continued through the summer, according to the Nemaha County Herald. It is part of a three-phase project which includes rebuilding electric lines and substation improvements. The voltage conversion project is expected to be completed in about a year.

Imperial to digitalize utility maps

The City of Imperial, Neb., is contracting with a company to digitalize its utility maps and other assets, according to the Imperial Republican. The City currently has its utility infrastructure on paper maps. Like a lot of municipal utilities, many of the City's utility employees are nearing retirement age so transitioning to digital maps will make the transition easier for new employees.

THIS MONTH'S FEATURED CHAMPION BUSINESS



PDS provides diverse line of equipment, services for utilities

PDS, Inc. appreciates the opportunity to be a Champion of NMPP Energy. It provides utilities and their customers with a diversified grouping of equipment and services that were developed to assist utilities with all aspects of operation; from the meter to customer houses, to deep inside power plants. PDS provides products and services to expand, maintain, upgrade, and repair your system.

NMPP Members can call upon PDS for all aspects of their utility operation. Old substations and the related equipment can be put on a testing and maintenance program that uses state-of-the-art equipment and techniques to find problems before the cause of failure. This testing and maintenance program extends the life of the substation, reducing costs and improving the reliability of service to your customers. An evaluation can be made of the current condition of the existing equipment with recommendations on what repairs, replacements, or upgrades are required to maximize the usable life

of these assets.

A grounding system is the foundation of the electrical system; from individual equipment grounds to substation ground grids. PDS can test, maintain, and uprate these grounds to meet today's standards for high frequency, high voltage transient protection for electronic devices.

For areas that are prime for lightning events, protection systems can be supplied to dramatically reduce and eliminate lightning strikes to critical facilities, jails, data processors, and computer sites, as well as specific equipment.

From the equipment supply perspective; PDS offers smart grid support, which includes AMI projects, metering, metering translation systems, communications backhaul and head-end infrastructure for either hosted or fully managed systems. PDS's product offerings include substations, power transformers, secondary oil containment,

power circuit breakers, reclosers, padmount transformers, overhead transformers, cutouts, arresters, instrument transformers, metal-clad switchgear, relays, advanced high efficiency conductor, transmission towers and structures, automation and control power factor measurement, analysis and correction, lightning analysis and mitigation, testing and measurement.

PDS also provides installation of equipment and systems, start-up services, maintenance services, maintenance programs, repair and testing of new and existing equipment.

PDS can provide NMPP members with electrical power equipment and systems, as well as cradle-to-grave support for all active parts of the electrical system. We look forward to continue being a 'Champion of NMPP Energy'.

For more information, visit our website at www.pdsinc.biz, or call our office at (402) 596-1991.

www.pdsinc.biz

For a complete listing of NMPP Energy Champion Businesses, see page 7

Employment Opportunities

Part-time Clerk/Treasurer

The Village of **Palmer, Neb.**, is seeking applicants for the part-time position of village clerk/treasurer. Applicants must be able to attend monthly evening board meetings. Call (308) 894-8665 for details. Stop by the Palmer Village Office for an application or to turn in resume, located at 802 Commercial Street in Palmer, Neb.

Utility Employee

The Village of **Utica, Neb.**, is accepting applications for a full-time utility employee. Individual is to assist in the maintenance and upgrade of all the departments, to include the pool, parks, auditorium, street, water, sewer, and solid waste. Duties include but not limited to operating

heavy equipment, snow removal, street maintenance, mowing and general upkeep of all city-owned properties. Certification in wastewater and water are desired but the Village is willing to train. Wage is based on experience. Please contact the Village of Utica, P.O. Box 158, Utica, NE 68456; (402) 534-4237; uticavillage1@gmail.com for an application, job description and list of benefits. Resume and references must be attached to the application. Position will be open until filled. EOE.

Electrical Lineman

The City of **Burwell, Neb.**, is accepting applications for a full-time electrical lineman. Applicants must be a U.S. citizen, possess a

valid driver's license with the ability to attain CDL within six months of hire. Benefits include vacation, sick time, retirement, family medical and holidays. Salary is negotiable based upon experience and qualifications. Interested candidates should contact the City Office at 404 Grand Avenue (P O Box 604), Burwell, NE 68823 or phone (308) 346-4509. The application and job description are also available on the City's website at www.burwellonline.com. Completed application along with a cover letter and resume should be mailed or delivered to the City Office address above or emailed to cityofburwell@nctc.net and will be accepted until the position is filled. The City of Burwell is an EOE.

See 'EMPLOYMENT' on page 8

Support NMPP member communities through the Champions Business Program

Champions are businesses and organizations that support NMPP Energy’s effort to provide products and services to members. Consider these businesses when your utility or municipality has a business need. If your business is interested in becoming an NMPP Energy Champion, call Andrew Ross at (800) 234-2595.



Champions Business Directory of Services

Financial

Ameritas Investment Corp. (Ameritas.com)	Omaha, Neb.
D.A. Davidson & Co. (dadavidson.com/ficm)	Omaha, Neb.
First National Bank (Firstnational.com)	Omaha, Neb.
UNICO Group, Inc. and Midlands Financial Benefits (unicogroup.com)	Lincoln, Neb.
Nebraska Energy Federal Credit Union (ne-fcu.org)	Columbus, Neb.
RBC Capital Markets (rbc.com)	Denver, Colo.

Regulatory/Compliance

Air Regulations Consulting (airregconsulting.com)	Lincoln, Neb.
Power Plant Compliance (Powplant.com)	Oketo, Kan.
NAQS Environmental Experts (naqs.com)	Lincoln, Neb.

Utility/Community

EnergySolutions, Inc. (energysolutions-inc.com)	Omaha, Neb.
Hometown Connections, LLC (Hometownconnections.com)	Lakewood, Colo.
Hubbell Power Systems (Hubbellpowersystems.com)	Bellevue, Neb.
Foundation for Educational Services (fes.org)	Lincoln, Neb.
JK Energy Consulting, LLC (JKenergyconsulting.com)	Lincoln, Neb.
Border States (borderstates.com)	Fargo, N.D.
NovaTech (Novatechweb.com)	Lenexa, Kan.
PDS, Inc. (PDSinc.biz)	Omaha, Neb.
Protective Equipment Testing Laboratory (petl.com)	Great Bend, Kan.
REM Electric, Inc. (Davidsoncompanies.com)	Nebraska City, Neb.
RESCO (Rural Electric Supply Cooperative) (resco1.com)	Ankeny, Iowa
Solomon Corporation (Solomoncorp.com)	Solomon, Kan.

Computer/Technology

Proteus (Proteus.co)	Lincoln, Neb.
Salt Creek Software, Inc. (Saltcreek.com)	Lincoln, Neb.

Engineering

EPSIM Corporation (epsim.us)	Boulder, Colo.
Exponential Engineering Company (exponentialengineering.com)	Fort Collins, Colo.
JEO Consulting Group, Inc. (jeo.com)	Wahoo, Neb.
Lutz, Daily & Brain, LLC (ldbeng.com)	Overland Park, Kan.
Olsson Associates (Olssonassociates.com)	Lincoln, Neb.
Power Engineers (powereng.com)	Overland Park, Kan.

Insurance

League Association of Risk Management (larmpool.org)	Lincoln, Neb.
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Legal

Chapman and Cutler, LLP (chapman.com)	Salt Lake City, Utah
Spiegel & McDiarmid (spiegelmc.com)	Washington, D.C.

Telecommunication

River Oaks Communications Corp. (rivoaks.com)	Centennial, Colo.
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Employment (cont.)

Water/Wastewater Worker

The Town of **Julesburg**, Colo. (pop. 1,200) is located in the northeastern corner of Colorado and is known as the "Gateway to Colorado". The Town of Julesburg is accepting resumes for the water/wastewater department worker. Under the general direction of the Town Manager, this full-time position is responsible for the water and wastewater operations and functions of both systems for the Town. The position requires Colorado Class B Water, Class B Wastewater and Class 1 Distribution and Collection certification, or the ability to obtain such certification within three to four years. Salary negotiable DOE, DOQ along with excellent health benefits and 401/457 retirement plan. Position will remain open until filled. Email your resume and cover

letter to jsbgclerk@gmail.com, or mail to 100 West 2nd Street, Julesburg CO 80737. For more information, contact Carrie Hartwell, Town Clerk, at (970) 474-3344 or visit the town's website (www.townofjulesburg.com) to see the detailed job duties listing. EOE.

Town Manager

The Town of **Julesburg**, Colo. (pop. 1,200) is located in the northeastern corner of Colorado and is known as the "Gateway to Colorado". Julesburg is a statutory town and operates under a mayor/board/town manager form of government. The board consists of six board members elected at-large to four-year overlapping terms, and a mayor to a four-year term. Municipal elections are held in April of even-numbered years. The town board appoints a town manager, who is responsible for preparing an annual budget and overseeing the

basic operation and assets of the Town. The Town employs 10 full-time employees. A bachelor's degree in public administration is preferred, but not required, along with managerial experience. The Town of Julesburg desires the following professional and personal skills for the town's next manager: self-motivated, ambitious individual, good communication skills, knowledge of grant writing and administration of grants, basic computer skills, and an understanding of the dynamics of smaller rural communities. Salary negotiable, DOE, DOQ along with excellent health benefits and 401/457 retirement plan. Position will remain open until filled. Email your resume and cover letter to jsbgclerk@gmail.com, or mail to 100 West 2nd Street, Julesburg CO 80737. For more information, contact Carrie Hartwell, Town Clerk, at (970) 474-3344 or visit the town's website (www.townofjulesburg.com) to see the detailed job duties listing. EOE.

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