ENERGY SERVICES Bulletin
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July 2017
WESTERN AREA POWER ADMINISTRATION

CIPCO builds Iowa's largest utility-scale solar project

Consumers Energy representatives celebrate the opening of the Marshalltown Gateway Centre solar array. (Photo by Central Iowa Power Cooperative)

In Iowa, where renewable energy is often synonymous with wind, one generation-and-transmission (G&T) cooperative is making a big investment in utility-scale solar generation. Over the last year, Central Iowa Power Cooperative (CIPCO) built the state's largest photovoltaic (PV) project across five sites in its service delivery territory.

The member cooperatives involved in the project are Clarke Electric Cooperative, Consumers Energy, Eastern Iowa Light & Power Cooperative, East-Central Iowa REC and Pella Cooperative Electric. The 5.5-megawatt (MW) project will provide electricity to all CIPCO members of all income levels. "It is our mission as a cooperative to support all our members equally," noted Communications and Public Affairs

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The completed Urbana Solar Acres development from a drone's-eye view. (Photo by Central Iowa Power Cooperative)

Construction workers install solar racks at Urbana Solar Acres on East-Central Iowa REC's site. (Photo by Central Iowa Power Cooperative)

Manager Kerry Koonce. "Choosing the utility-scale model for the project rather than community solar accomplishes that."

Becoming solar leader

In late 2015, CIPCO issued a request for proposals (RFP) for the development of the first of what is intended to be a two-phase utility-scale solar project.

Several of CIPCO's 13 members showed interest in hosting a site. Then followed the hard work of determining which sites would be appropriate. "Some potential sites didn't have sufficient resources, others had leasing issues," recalled Koonce. "It is so important to make sure to get the correct layout, especially with a first-time project."

CIPCO had help from the National Renewables Cooperative (NRCO), a trade group formed by cooperatives to facilitate the development and deployment of renewable energy resources. NRCO managed the RFP process and supplied engineering expertise for the project. CIPCO has used NRCO resources in the past to review wind-purchase contracts as well.

To install the arrays, CIPCO selected Azimuth Energy LLC of St. Louis, Missouri, an engineering, construction and development-support service company for renewable energy and energy efficient projects. The design of the ground-mounted arrays included features like fixed-axis racking and transformerless string inverters to reduce installation cost, improve performance and simplify maintenance. The projects were completed on schedule by the end of 2016.

Sun keeps rising

The new solar generation is part of a portfolio that includes 199 MW of wind power, 14 MW of WAPA hydropower and 1.6 MW of waste-to-energy generation. In all, CIPCO gets nearly 60 percent of its power supply from low-carbon resources. Koonce observed that clean energy has always been important to CIPCO's members and with the decline in solar panel prices, the time was right to add solar to the mix.

According to Koonce, the solar site will eventually pay for itself in the energy it produces, although the exact payback period is not known. The $9 million cost of all five solar sites, spread over 20 years to take advantage of some federal solar tax credits, is significantly less than the cost of building a new coal-fired plant, she added.

CIPCO's overall resource plan focuses on natural gas, wind and more solar, with a second phase of solar development planned for this year. Battery storage is not part of the conversation at this point, Koonce noted, because the cost of storage systems is still very high compared to CIPCO's stable rates. For now, "Our members won't be seeing an increase due to adding solar," Koonce says. "The resource is very cost effective for us."

But members can be sure that CIPCO will be watching battery storage and other new technologies, as the G&T continues to build its diverse, affordable and environmentally friendly power supply. ■

Roseville Electric program takes home efficiency to next level

Even the most successful energy-efficiency program, like Roseville Electric Utility's high-performing BEST Homes partnership, needs a periodic renovation if it is to continue its success. To keep up with the changing times—and codes—the municipal utility recently unveiled its new Roseville Advanced Homes Program (RAHP).

RAHP is the next step in market evolution that Roseville began with BEST Homes, explained Program Manager Mark Riffey. "When we launched BEST Homes, Roseville builders weren't installing solar and energy efficiency was nothing more than doing what was required," he recalled. "But [California Building Standard] code has caught up with the program and will pass it soon."

Title 24 now requires new homes to be solar ready to meet requirements, making incentives for solar unnecessary. By 2020, the code will require all new homes to meet the net-zero energy standard. RAHP encourages builders to meet that requirement proactively, building efficiency into homes before they even think about solar.

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Roseville Electric Utility's updated residential efficiency program is built around the principle that the best time to install high-efficiency features is in early construction. (Photo by California Advanced Homes Program)

Students competing in the Solar Car Race all start with the same kit and then add custom touches. (Photo by SMUD)

SMUD sponsors solar model car competition

Electric vehicles (EVs) hold a lot of promise for greening the transportation sector, and could do even more if the electricity that powers them comes from the sun. To encourage the next generation of consumers to think about automotive innovation, SMUD sponsors an annual Solar Car Race for high school students.

More than 300 high school students competed in this year's event, held at Cosumnes River College on April 19, as part of Earth Week. The competition is open to any high school in SMUD's service territory.

Community comes together

The race took place in the college's quad, and the construction department designed and built the wooden race track used by the racers. The event also gives students an excellent opportunity to visit a community college campus and experience what it has to offer.

The Sacramento Electric Vehicle Association and EV owners were also on hand to exhibit many models of available EVs and to discuss the technology and benefits of driving a plug-in hybrid electric vehicle.

Tools for students, teachers

SMUD provides each school registered with up to six solar car kits, which contain a 12-watt solar module

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Solar model car competition *from Page 4*

from PITSCO and car accessories from Solar Made. You are leaving WAPA.gov. Using the same solar panels, motors and gear sets as a jumping-off point, the students choose their own materials and design the car they are going to race. The entries compete for not only the fastest car, but also for best design, most sustainable, best engineering and most creative design. Each participating student receives an event t-shirt, also provided by SMUD.

In addition to the kits, SMUD also offers professional development workshops for teachers interested in using the solar-powered cars in their science or physics curriculums. A variety of workshops and training, exhibits and online resources are available to both teachers and students through SMUD's Energy Education & Technology Center.

Racing toward future

Participation in the solar car race has doubled since it began 13 years ago, which is not surprising in a territory that has around 8,000 electric vehicles. The Solar Car Race is loosely based on the Department of Energy's Junior Solar Sprint, a classroom-based national competition of solar-powered model cars for students, grades six through eight.

As a community-owned, not-for-profit utility, SMUD is focused on balancing its commitment to low rates with the goal of supporting regional vitality, and education is central to that effort. Through events like the race, the Solar Regatta and an Energy Fair, SMUD gives back to its community, while helping to develop the professionals who will create the energy solutions of the future. ■

Roseville Electric program *from Page 3*

Starting on right foot

The program aims to get builders involved well in advance of submitting plans to the city, said Riffey. "The earlier they enter the conversation, the better chance of success."

Any residential builder planning a development in Roseville may participate in RAHP by signing a prerequisite agreement confirming that their homes will include:

- 75-percent high-efficacy lighting
- HERS verification of Quality Insulation Installation
- Electric vehicle charging station pre-wiring

These measures were chosen to provide a solid energy-efficiency foundation and because they are easy and relatively inexpensive to install early in construction. "The time to make sure a house is insulated correctly or to put in a dedicated breaker and conduit for an electric vehicle charger is when you are in the design phase or early in construction," Riffy pointed out. "You can add those things later, but it is much more expensive."

Once the prerequisites are in place, builders can earn incentives up to $3,500 per house for adding bonus measures such as whole-house fans, high-performance attics and LED lighting. Roseville is considering adding battery storage and triple-pane windows to RAHP in the future to move homes closer to the net-zero energy goal.

The completed home, with its tight shell and efficient systems and equipment, is then ready for a solar array. The homeowner can size the photovoltaic system for a load that has been reduced up front by best construction practices. "RAHP leads builders down the path to be aware of the measures that will get them to the 2020 requirement of zero-energy homes," explained Riffey.

Or, to put it another way, it is going to take an integrated approach to meet the ambitious clean energy goals California has set for itself.

Working together

That focus on integration may be one of the biggest changes Roseville has made in its updated residential construction program. Where BEST Homes was a local effort guided by local stakeholders, RAHP was designed with the help of a third-party administrator to align with Pacific Gas and Electric Company's (PG&E) California Advanced Home Program (CAHP).

TRC, an engineering and construction management consultant, has administered CAHP for PG&E since 2011. "It was the best use of our resources," observed Riffey. "TRC has spent years working with Title 24, and they can tell us measures that get the most bang for our buck."

Coordinating with PG&E made sense, as well, because many Roseville residents are PG&E natural gas customers. After all, a well-insulated home is going to cut both heating and cooling costs. "Builders need to turn in only one set of papers for both programs," said Riffey. "Anything that streamlines the program for the builder/customer improves its chance for success."

Roseville Electric Utilities aims to succeed. Over its ten-year run, BEST Homes succeeded beyond expectations. A very high percentage of homes recently built in Roseville are solar ready, and California has made that requirement part of its building code. If RAHP enjoys the same kind of success, Roseville's housing stock may set a zero-energy example for the whole state. ■

AESP launches on-demand webcast series

For utility program managers and customer service representatives, keeping up with the latest in program design, implementation and evaluation has become a constant challenge. A new continuing education series from the Association for Energy Services Professionals (AESP) can help them find time for professional development. The new webcast series explores topics like pilot programs, new technologies, changing customer behavior and distributed generation.

The on-demand format provides the convenience of a webinar, but with more depth on the subject matter. Participants can benefit from a customized agenda featuring multiple expert speakers and presentations. You can choose a convenient time and listen to all the presentations at once (3-4 hours) or split up over a couple of days. With AESP's learning management system, you can pick up right where you left off, and even start over at any point. And, when you pay for a webcast, it is available to you for a full year.

AESP presented the first webcast in the series, *All About Pilots – Program Design, Best Practices & Results*, on May 15. The three-hour webcast features nine different presentations and 11 speakers covering the essentials of designing and implementing pilots including:

- Key considerations in program design
- Pitfalls to avoid
- Previews of new concepts currently being piloted, including a Zero Net Energy home pilot, a demand management pilot, geotargeting for the agricultural market pilot, and an in-house Ecoconcierge pilot
- Challenges faced and how to overcome them

All About Pilots is available now, however the Q&A board closes after two weeks after the webcast. Upcoming webcasts will focus on:

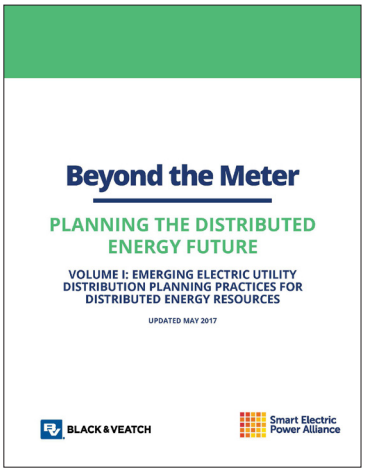
1. Emerging Technologies, coming in July
2. Behavior Change, coming in September
3. Distributed Energy Resources & Storage, coming in November

It is not necessary to be a member of AESP to use the webcast, but the cost is discounted for AESP members. If you have any questions, please contact the AESP E-Learning Center. ■

SEPA report offers guidance on planning for distributed energy resources

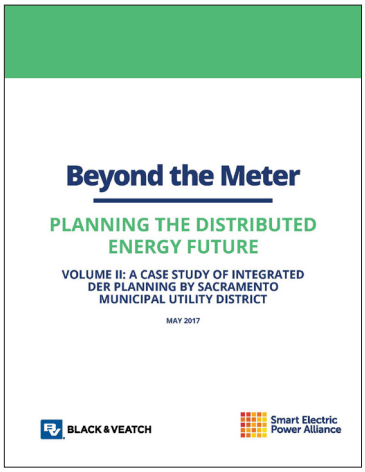
As tempting as it may be for utilities to ignore the growth of distributed energy resources (DER), they must plan for integration of this form of generation. To help power providers develop a strategy to accommodate increasing DER penetration, Smart Electric Power Alliance (SEPA) has published a two-volume report, Beyond the Meter: Planning the Distributed Energy Future.

The utility industry is changing and many of the changes are being driven by consumers seeking new energy choices, technology advances leading to lower costs and better performance and new policies. Both utilities and their customers will have to work together to ensure grid reliability as distributed energy resource (DER) penetration increases. Engineering consultants Black and Veatch collaborated with SEPA to provide a new strategy to become a proactive distribution planning utility.



Volume I: Emerging electric utility distribution planning practices for distributed energy resources outlines why traditional distribution system planning framework does not meet the needs of today's grid. Five investor-owned and public power utilities shared their drive, progress and challenges when planning and proactively integrating distributed energy resources within their distribution system. The report covers:

- Practical framework for distribution planning utilities
- Insight from sector leaders on challenges and successes
- Tools to better understand customer needs



Volume II: A case study of integrated DER planning by Sacramento Municipal Utility District details how SMUD used the findings of Volume I to forecast DER growth and plan for distribution challenges. Through the lens of SMUD, the report looks at the broader scenarios the electric utility industry can expect to encounter. The report covers:

- Results of the new utility planning strategies
- Risks and opportunities of new DER systems
- More on the new distribution system planning framework

Beyond the Meter is free to download for both SEPA members and non-members.

Western Area Power Administration

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