

AEP Energy Customer Insights

Market Overview

May 2017

Provided by AEP Energy Trading and Managing Director of Energy Solutions

Natural Gas

- During the month of April, natural gas held relatively steady throughout the curve, while power was mixed as prices declined in the front of the curve, yet showed strength in the back.
- Prompt month (May 2017) natural gas gained \$0.086/MMBtu to close at \$3.276/MMBtu.
- Balance of the year, June through December 2017, was up \$0.048/MMBtu to \$3.392/MMBtu.
- In the calendar years, 2018 was up \$0.092/MMBtu to \$3.123/MMBtu, while 2019 followed the same pattern, up \$0.075/MMBtu closing at \$2.907/MMBtu.

Power: PJM – Ohio

- Weak liquidations put pressure on prices in the front of the curve, while utility auction activity and higher gas prices contributed to gains in the back of the curve.
- May 2017 On-peak power at AEP-Dayton Hub dropped \$3.05/MWh, closing at the end of April to \$32.85/MWh.
- Balance of the year, June through December 2017 was off \$0.06/MWh to \$36.96/MWh.
- Meanwhile, further out in the curve, calendar 2018 AEP-Dayton Hub was up \$0.32/MWh to \$36.24/MWh, while 2019 was up \$0.47/MWh to \$34.13/MWh.

Power: Illinois

- MISO Illinois.Hub Day-ahead On-peak closed April 2017 at \$30.20/MWh, up \$1.85/MWh from the close of March.
- On the other hand, PJM ComEd zone On-peak closed April 2017 at \$31.50/MWh, down \$0.60/MWh from March.
- In the, traditionally, lower MISO capacity market, the 2017/18 auction cleared at \$1.50/MW-Day in Zone 4 Illinois benefitting end users from a cost perspective. This creates major headwinds in the future for the value of coal fired generation in the region. It will be interesting to watch if generators will look to accelerate sale or retirement of coal generation. For more information regarding MISO capacity market, click [here](#).



- As a result of low capacity clearing prices, Dynegy is considering departing from Illinois market. Click [here](#) to read more about Dynegy, "Pressed by nuke subsidies, Dynegy to decide by year-end whether to leave Illinois market" via Utility Dive.

PJM Capacity

- With the PJM capacity auction for 2020/21 clearing below expectations at \$76.53/MW-Day for RTO, this puts additional pressure on owners of baseload coal and nuclear power plants in Ohio and Western Pennsylvania while end users are benefitting. In contrast, EMAAC (\$187.87/MW-Day) and ComEd (\$188.12/MW-Day) were constrained enough to break out and resulted in higher prices to the benefit of generators in these regions while end users will pay prices almost 1.5 times that of RTO.
- Visit PJM Planning Year 2020/21 RPM Auction Clears/BRA results for more details by clicking [here](#).

Important Topics:

- End Users will need to keep abreast of the Illinois and Ohio Nuclear subsidies which will have significant cost impacts on your supply cost.
- Read more about "Exelon court brief argues Illinois ZEC program is legal" via Utility Dive by clicking [here](#).

Any references made to prompt month natural gas will normally be associated with a range starting the first day of the month through the final settlement of the respective prompt month natural gas contract. Other references to forward natural gas prices and all power prices will be based on a range starting the first day of the month through the final day of the month. This report made by AEP Energy contains projections and future expectations that are based on reasonable assumptions, but any such statements may be influenced by innumerable factors that could cause actual outcomes and results to be materially different from those anticipated, including (without limitation) changes in utility regulation and the allocation of costs within regional transmission organizations, including ERCOT, PJM, MISO and SPP.

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On-Site Solar: Is it for you?

May 2017

Commercial and industrial organizations are looking beyond energy efficiency measures to save on their energy bills. Businesses who own their building or land are turning to on-site solar to reduce their costs and secure energy prices for the future. If you are considering solar, now might be the right time. To help you get started, we have provided an overview of solar system options, factors to consider when siting your solar array and understanding your savings potential.

Solar System Options

There are several common system options, including roof top arrays, carport canopy arrays, and ground-mounted arrays. While each of these share common panel and inverter systems, they differ by installation costs and production. There are several factors you should consider to ensure your system generates the best solar panel efficiency:

- Location – If your business location has space constraints, roof and/or parking canopy mounted systems are good options. Otherwise, a ground-mounted system will be the most economical solution and will likely incorporate single-axis tracking. If you choose a roof-mounted system, you also need to consider the condition of your roof and whether upgrades are needed to support the system.
- Land – Consider how suitable your land is and how long access will be available.
- Shade – Shade can have a huge impact on the production of your solar panels. Conduct a shading analysis to make sure the location you are considering has no shadows that will fall on the panel during peak sunlight hours.

Once a location is determined, a solar potential analysis should be conducted to determine how much you can benefit from installing solar at your site.

Siting your Solar Potential

If you are serious about solar, you'll want to understand your solar potential at your location. Consider conducting a site analysis to approximate the solar potential for the area and then compare that with your actual usage. It's important you do not oversize the system. In general, most solar panels are roughly 20 square foot (ft²) in size and nearly 330 watts (w) per panel or 0.16 kilowatts per square foot (kW/ ft²). These are estimated sizes and wattage for other types of systems:

- Roof-mounted systems – These systems utilize up to 60-70% of the total roof space after accounting for mechanical and other roof-mounted systems. One square foot of solar panel is capable of producing 16.5 watts per square foot.
- Ground- or parking canopy-mounted and fixed-tilt or single-axis tracking systems – These systems are designed to provide approximately 167 kilowatts (kW) per acre. Each location will have a different solar potential.

For further assistance in estimating the solar potential for nearly any site in the U.S., visit pvwatts.nrel.gov to use "PV Watts," a free tool from the U.S. Department of Energy (U.S. DOE) and the National Renewable Energy Laboratory (NREL).

Understanding your Energy Charges

It's important to understand how your actual electric usage impacts charges on your local utility's electric bill or your energy supply provider's bill. Behind-the-meter solar offsets both energy and demand-based charges. Because solar production coincides with high loads and peaks across the energy grid, each kilowatt-hour (kWh) of energy produced reduces not only your net peak energy use, but also coincident peak demand components of your bill. The resulting savings are on the energy portion of the bill and the demand portion of your bill, such as PJM capacity, transmission peaks, and to a lesser extent, distribution demand. Since your total energy costs include these different



Figure 1 Delran, NJ - AEP OnSite Partners
(Roof and Ground Mounted - 850kW-DC)

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components related to delivering electricity to your site, every solar kWh produced on site helps avoid those charges. Effectively, this decreases your average all-inclusive energy price on a per kWh basis. In many cases, the savings results in over a 50% effective reduction in your Power Purchase Agreement (PPA) \$/kWh cost. Fixing your rate (either through a PPA or by investing the capital directly) will provide savings for as long as solar is producing energy and will enable you to avoid upward movements in the market.

In some markets, the renewable attributes, such as Solar Renewable Energy Credits (SRECs), generated by the system can be sold. If your project is in a qualifying area, this provides additional value that can offset system cost and/or your all-inclusive energy price. AEP OnSite Partners will help you determine if your project meets qualifying criteria to receive SRECs.

Plotting your Path Towards Solar: Ownership Options

Once you determine solar is physically and financially viable at your site, you need to develop your solar implementation plan. This plan includes how you will procure and finance the system. Generally, there are two ownership structures that dominate the U.S. market for business customers; direct ownership or third-party ownership:

1. Direct Ownership

When you finance the system yourself, you reap benefits such as the energy offset and BTM savings, as well as from federal (and in rare cases, state) tax credits and tax depreciation benefits. These benefits reduce the overall cost of the system, however, they do not relieve the owner of engineering, procurement, construction, production, operations, and maintenance costs and risks. If you do not have enough taxable income to offset these incentives or do not have the risk tolerance on the other aspects, third-party ownership is a great option. To see what incentives might apply at your location, the U.S. DOE maintains a great resource for doing so at dsire.org.

2. Third-Party Ownership (Power Purchase Agreement - PPA)

Third-party ownership through a PPA requires the customer entering into a long-term agreement with a developer to purchase the energy produced by the solar array system. Some developers will also offer a lease option. In most cases, the developer will build, own, operate, and maintain the array for the term, as well as capture all the tax credits and depreciation

benefits. A 20-25 year-term is typical for most projects. The customer will retain all the BTM savings, and also benefit from reduced risk through a partner aligned with maximizing system production. It is important to consider the history and qualifications of your PPA partner and to ensure they will be the owner throughout the term. A strong PPA partner will be equipped with a proven safety record and resources to take on risk and operations for the life of the system. The PPA partner should also be a one-stop shop to absorb tax credits and depreciation benefits without a third-party financing the debt or equity. This will ensure direct alignment with your goals and allow that value to be passed directly to you as the end user.

Solar photovoltaics (PV) has assisted many business customers across the country with their energy positions and created stability for the future of their organizations. AEP OnSite Partners has developed over 50 MWs of on-site solar during 2016 alone through long term PPAs with business customers like you.

For more information on how AEP OnSite Partners can help you go solar at your site, please visit AEPenergy.com/commercial/request-a-quote. Select solar as the product and services you have an interest in.



About AEP OnSite Partners

AEP OnSite Partners provides behind the meter services and solutions to assist customers to reduce energy costs and risks. This is accomplished through collaboration with your team to understand specific operational needs and develop customized services and solutions to improve your physical and financial energy positions using our market knowledge, technical expertise and investment capital. We have a deep understanding of existing and emerging energy technologies and techniques that we use to develop, design, install, own, and operate customer-centric asset investments that reduce your overall energy spend and risk.

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