

## SCHOOL DISTRICT ALERT

## Proper planning is essential to maximize energy cost savings

### Why are we issuing this alert?

Solar power system contracts can provide benefits, including cost savings. However, Arizona school districts need to proceed cautiously and prudently when entering into these contracts. To maximize the benefits of solar power system contracts, districts need proper planning and attention to detail. This alert outlines best practices districts should take in:

- (1) weighing whether a solar power system contract may be cost effective;
- (2) negotiating a contract with a solar power vendor; and
- (3) monitoring results after a contract is signed and the system is operational.

Not using these practices can adversely impact expected cost savings.

Typically, school districts have entered into solar power system contracts to reduce energy costs. These contracts have generally involved (1) a third-party vendor installing solar power panels on school district property at the vendor's expense and (2) a district's agreeing to purchase all of the power generated by the panels at a specified rate for a substantial period of time, such as 15 to 25 years.

In the course of conducting performance audits in 2011, we reviewed 21 solar power system contracts and found that some districts may not attain the cost savings they initially expected.

Contributing factors include:

- Districts unaware of the extent of continued demand and transmission charges from the electric utility.
- Unexpected losses when the amount of power generated by the solar power system exceeds a district's needs.
- Cost escalation clauses that may raise rates faster than they have historically risen.

## Best practices to employ when exploring the feasibility of a solar power system contract

**Perform a cost/benefit analysis**—A district should analyze the costs and benefits of entering into a solar power system contract to ensure that it will obtain the solar power at a price that makes the best use of taxpayer monies.

This evaluation may include analyzing other ways to reduce electricity rates. For example, at least one electric utility in Arizona offers reduced or fixed electricity rates in exchange for installing solar panels on district property. This type of agreement is generally less complicated and may involve fewer risks than a solar power system contract, but also may not provide the lowest rate.

**Perform energy upgrades first**—To minimize a solar power system's costs, districts should make any energy upgrades, such as installing energy-efficient heating and cooling systems and lighting fixtures, before entering into a solar power system contract. Doing these upgrades first will not only reduce the system's initial cost but it will also reduce the potential that the system will produce excess power that the district will not consume. Producing excess power can be costly for a district because it will usually incur a loss when selling it to its electric utility.

**Learn from other districts' experiences**—A district should network with other school districts that have already entered into solar power contracts by talking to them about the rates they have agreed to in their contracts, the provisions they have agreed to for fixed versus increasing rates over time, their experience with the vendor(s), and their actual cost savings since entering into the contract. Further, a district should ask vendors for references, especially school district references.



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## Best practices to employ when negotiating a solar power system contract

**Avoid purchasing an oversized solar power system**—Each solar power contract we reviewed (1) required the district to purchase all electricity produced by the solar power system regardless of whether the district consumes it and (2) did not include a means to store the generated electricity, such as battery banks. As a result, a district's only alternative is usually to sell its excess solar power to the electric utility, but at a lower rate than the rate the district is paying the solar power system vendor for the solar power. Therefore, the district can incur a considerable loss when it sells the excess power. Several districts that had signed contracts with vendors were unaware of this potential for loss when they signed their contracts. Other districts should learn from this experience and ensure they agree to systems sized small enough to avoid producing too much excess power.

Systems that generate more power than a district uses can be costly because excess power is sold back to the electric utility at a loss.

**Clarify key provisions of your electric utility's policies**—Although a solar power contract is between a school district and a vendor, certain aspects of the district's ongoing relationship with its electric utility are important in evaluating the solar power system's benefits. A district should ensure it can answer the following questions about how its utility charges for electricity and how solar power will affect these charges.

- **What is the electric utility's buyback policy?** Electric utilities generally buy back a district's excess solar power. How often and when a district's utility nets the district's excess solar power production with its use of electricity from the utility will have a dramatic impact on the district's overall costs. We noted wide differences in this regard. For example, some utilities did so as often as every hour, while others did so only once a year. The more frequently netting occurs, the greater the likelihood a district will incur a loss. Losses can also occur if netting happens soon after an extended time period in which solar power production is higher than electricity usage but before an extended time period in which electricity usage is higher than solar production. A district needs to clarify how often and when solar power production will be netted against its use of electricity from the utility.
- **What charges will the utility continue to impose for demand and transmission?** A district's electricity costs generally consist of three main items: electricity generation, demand, and transmission. Although generation charges make up the majority of an electricity bill, demand and transmission charges can make up 30 percent or more of total electricity charges. In most situations, installing a solar power system will considerably reduce the costs a district pays its utility for electricity generation because it will use considerably

The electric utility's buyback policy will dramatically impact solar savings or losses.

Utility demand and transmission charges may not decrease after solar installation.

less electricity from its utility. However, our audits have found that charges for demand and transmission often remain—and can

**Generation costs:** Charges for the electricity itself or the cost of production.

**Demand costs:** Charges based on the end user's demand for electricity as recorded on a demand meter. Demand meters record the highest average kilowatts reached and maintained in a specific time interval during a billing period, such as 15 or 30 minutes.

**Transmission costs:** Charges for transmitting electricity from the point of production to the end user.

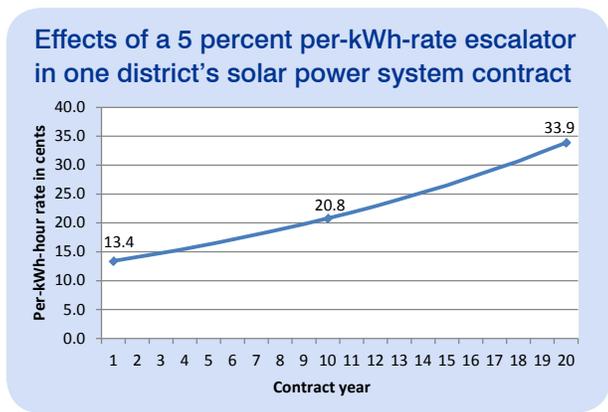
actually increase—after the district begins using solar power. Using solar power may not reduce demand and transmission charges from a district's electric utility because these charges can be based on the single highest 15-minute period of utility electricity usage in a billing period, which may occur simply by having a 15-minute cloudy period one afternoon during the month. A district needs to clarify with its electric utility how having a solar power system contract will affect these other costs.

**Ensure rates paid for solar power are competitive with rates paid by other districts**—The 21 contracts we reviewed contained solar power rates that varied from 7 cents to over 16 cents per kilowatt hour (kWh).

Lack of awareness of what other districts are paying can result in a district's agreeing to a rate that is not a good bargain for taxpayers. A district should ensure it:

- Has properly sought bids to ensure as much competition as possible.
- Has compared the per-kWh rate being offered by its vendor to rates other districts are paying for similar solar power systems. To help determine the likelihood of cost savings, a district should also compare this offered rate to its electric utility's current rate for electricity generation only, excluding costs for demand and transmission.

**Avoid contracts with cost escalators if possible**—Although 10 of the 21 solar power contracts we reviewed had fixed per-kWh rates, 11 of the 21 contracts included cost escalators of 2 to 5 percent each contract year. Cost escalators can increase a district's rates considerably over the contract term.



If a vendor's cost escalator is based on the local utility's annual percentage increase, a district should check with that utility to obtain an actual history of commercial rate increases for a time period similar to the proposed contract term. Using a shorter term, which some districts have done in negotiating their contracts, is potentially misleading because commercial rate increases can vary greatly from year to year.

**Ensure that statutory requirements are met**—A district should ensure that its contracting process meets all requirements of Arizona Revised Statutes (A.R.S.) §15-213.01, as amended by Laws 2012, Ch. 230, Sec. 3. These requirements include conducting a study to establish the scope of the contract, the guaranteed cost savings amount, and the methodology for determining the cost savings. The contract should also include provisions for collecting baseline energy usage and cost data and obtaining an independent third-party validation of the cost savings calculation by a licensed, registered professional engineer. Districts should note that A.R.S. §15-213.01 states that the cost savings are computed by comparing the energy baseline before installation with the energy consumed after installation. This statute also requires that the solar provider reimburse the district for any shortfall of guaranteed savings on an annual basis.

**Consider other operational issues when entering long-term contracts**—Although a solar power contract may lock in a district's electricity costs for many years, a district should also consider how entering into such a long-term contract could affect its operations. For example, if the district signed a solar power system contract but later experienced enrollment decreases, how might the contract—and the provisions it contains to purchase a certain amount of power—affect the district's ability to close schools? Additionally, a district should consider the role that improvements in technology could play over the length of the contract and the likelihood of its system becoming outdated or obsolete during the life of the contract.

**Per-kWh rates for 21 reviewed solar power system contracts**

Contract	Per-kWh rate in cents
1	7.0
2	7.0
3	7.4
4	8.5
5	9.0
6	9.6
7	10.4
8	10.4
9	10.5
10	10.7
11	10.7
12	10.7
13	10.7
14	11.0
15	11.8
16	12.0
17	12.5
18	13.0
19	13.1
20	14.4
21	16.3

**Best practices to employ after entering into a solar power system contract**

**Track electricity costs closely**—A district should track and compare total electricity costs after the solar power system installation to estimates of what electricity costs would have been without the solar power system. It is important to include the costs of all district electricity needs, including the amount and cost of electricity from the electric utility plus the cost of the solar power, when making this comparison.

**Ensure the solar power system is connected to the most appropriate meters**—A district should ensure that its solar power system is connected to the appropriate electricity meter(s) at the district. Generally, these should be the meters that were used in the feasibility study and initially included in the baseline energy usage and cost data. However, in making the decision about which meters to use, it is also important that the system is attached to the meters that best match power generation and power usage at a level that will result in its best cost savings without resulting in too much excess solar power production. Throughout the contract period, a district should also monitor its electricity usage on the solar power system's connected meters and, if there are considerable changes in usage, conduct a cost/benefit analysis to determine if it is feasible to change the meters that the solar power system is connected to.