Solar Energy Considerations For Iowa School Districts

Iowa School Finance Information Services

Overview

- Benefits of solar
- Why don't more schools use solar?
- Economics of Solar
- Evaluating Options
- Questions

School Solar Benefits – 30,000 ft

- Reduce Electricity Expense, relieve pressure on the General Fund.
- Reduce Carbon Footprint.
- Tangible teaching tool for students studying business, science, and economics.
- “Easier” than wind. No moving parts. Virtually no maintenance. Steady production.

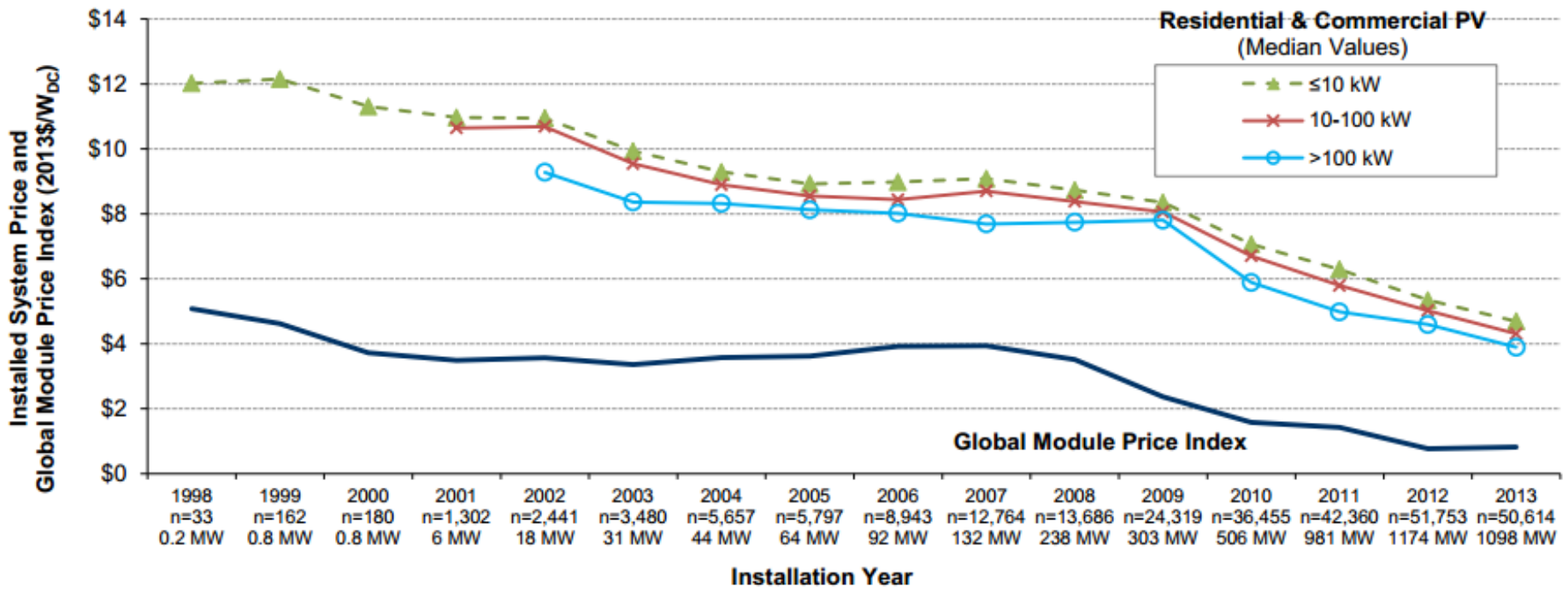
Why Don't More Schools Use Solar?

- Return on Investment Very Long – As long as 40 years to pay for itself, on a system with a 30 year lifespan. And that assumes zero percent interest (or 0% opportunity cost)

- Schools Don't Make Profit
  - Federal and State tax credits useless for a traditional school project.
  - Commercial facilities can also take advantage of accelerated depreciation in some cases.

More appropriately, the question will soon become "Why *didn't* schools install solar projects?"

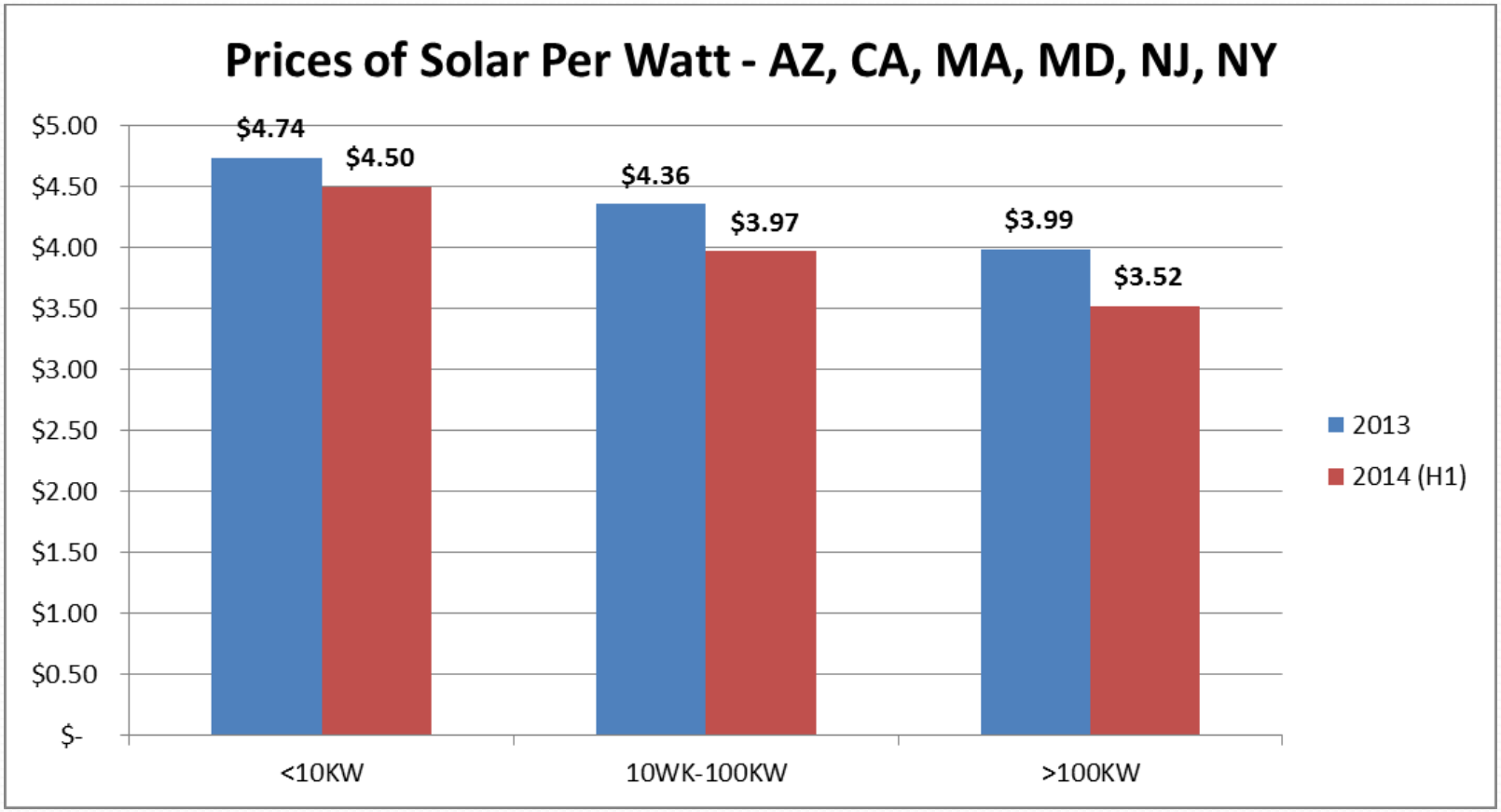
Why ***Didn't*** More Schools Use Solar?



Note: Median installed prices are shown only if 15 or more observations are available for the individual size range. The Global Module Price Index is SPV Market Research's average module selling price for the first buyer (P. Mints).

NREL: Solar Photovoltaic System Pricing Trends, September 2014

Solar Prices Continue to Decline



NREL: Solar Photovoltaic System Pricing Trends, September 2014

Other Recent Anecdotal Evidence

- Projects typically going for $2.80/watt to $3.50 in Iowa
- Large market for hog confinement facilities – Washington County farmers alone received 20% of state tax credits last year – Most at or above $3.00/watt
- “SolarCity's costs today, including sales and general costs, are $2.90 per watt, down 26 percent from just two years ago.” Daily Finance, Dec. 31, 2014
- Recent bid activity, as low as $2.50 per watt on cash basis, and deals in progress as low as $2.00.

Persistent Issues

- Even though solar prices have declined, the cost of the cells themselves becomes a smaller and smaller share of the total project cost.
- Schools remain disadvantaged from not being able to utilize the tax credit.
- Many schools have utilized geothermal – but rate changes may be increasing burden on General Fund.

Recommended Process for "Going Solar"

- What are your objectives?
  - What defines your breakeven?
  - Do you need 100% payback, or are general fund pressures such that smaller payback works?

- Work with EPC, consultant, or ISFIS to:
  - Analyze your electricity requirements

  - Analyze your tariffs
    - Net Metering?
    - Investor Owned Utilities – Alliant almost always works, Midam is a trick
    - REC's generally receptive, but Municipal utilities can be a challenge.

  - Go or No Go? – Find out the Price/Watt required to make your project work. If it's below $2.00 or so, it probably isn't worth pursuing.

Go or No/Go Application – Determine System Capacity
The 1400 Rule

	KWH	Price/KWH	Cost
January	56300	0.07	$ 3,941
February	49980	0.07	3,499
March	43180	0.07	3,023
April	43290	0.07	3,030
May	50130	0.07	3,509
June	57520	0.07	4,026
July	45000	0.07	3,150
August	33360	0.07	2,335
Septembe	50130	0.07	3,509
October	43290	0.07	3,030
Novembe	43180	0.07	3,023
Decembe	49980	0.07	3,499
Total KWH	565,340		$ 39,574
DIVIDE BY	1,400	KWH/Watt	
Max Capacity	400	KW	

Go or No/Go Application
Future Electricity Costs Vs. Future Savings

	Annual Electricity Bills	Maximum Savings
2016	39,574	39,574
2017	40,761	40,563
2018	41,984	41,577
2019	43,243	42,617
2020	44,541	43,682
2021	45,877	44,774
2022	47,253	45,893
2023	48,671	47,041
2024	50,131	48,217
2025	51,635	49,422
2026	53,184	50,658
2027	54,779	51,924
2028	56,423	53,222
2029	58,115	54,553
2030	59,859	55,917

Inflation Increases Costs, and Degradation Decreases Output

Go or No/Go Application
What Price Will You Pay To Break Even

	The Most You Can Save	Cost/ Watt to Break Even
5 Year	208,013	0.52
10 Year	443,360	1.11
15 Year	709,634	1.77
20 Year	1,010,899	2.53
25 Year	1,351,753	3.38

Go / No-Go Sensitivity

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Recommended Process for "Going Solar"

- Determine how you will pay for it – Cash, Loan, Power Purchase Agreements, combination?

- Issue an RFP – Get wide circulation and as many bidders as possible. Invite respondents to visit your facilities, determine feasibility of rooftop vs. ground arrays, and determine interconnection arrangements.

Recommended Process for "Going Solar"

- RFP Considerations
  - Broad enough to encourage lots of bidders
  - Narrow enough to dissuade cheaper products that will cause trouble.
    - Minimum 20 year warranty on solar panel production levels.
    - Minimum 10 year warranty on inverters.
    - Consider if 3rd Party warranties are needed, or if the companies are large enough/strong enough to honor long term commitment.
    - Installers with experience on commercial facilities.
    - All electrical services can be bundled into the RFP.
    - Make sure EPC/Installer is responsible for getting the interconnection agreement in place.
    - Ask for education applications, real time web-based reporting systems.

Recommended Process for “Going Solar”

- RFP Considerations
  - Multiple Options Preferable
    - Require a cash price per watt if possible
    - Provide opportunity to vendors to provide a bundled financing solution
    - Disclose that options will be scored on a Net Present Value basis using a defined discount rate (say, 4%)

Discussion of Financing

- Options
  - Outright Purchase
  - Standard bank loan or bond
  - Traditional Leases
  - Power Purchase Agreements (PPAs)

Direct Purchase or Loan

- Positives
  - Economics are easy to determine.
  - Absolute price certainty.
  - Interest rates still historically low.
  - Lots of RFP interest.
  - No questions about capital projects eligibility.

- Negatives
  - Potentially leaving money on the table. Federal and state tax credits will not be in play.
  - School takes risk of future value (small risk).

Traditional Equipment Leasing

- Generally are considered a “disqualified lease”, so lessor will not receive federal and state tax credits.
- Less risk of technology advances making you wish you’d waited – after some years you can keep them or return them.
- Maximizes General Fund benefit – costs related to energy conversation are payable from PPEL or Sales Tax. Every dollar of electricity saved is a direct General Fund savings.
- IN GENERAL: Compare a leasing alternative to the cost of simply borrowing the money. Your cost of capital will generally be preferable, and this structure typically will not be efficient for schools.

Power Purchase Agreements

- Power Purchase Agreements (PPAs)
  - Lease rooftop to company that owns and installs panels.
  - Allows for Lessor to use federal and state tax credits.
  - Lease payments are typically crafted in terms of the power you receive from the panels, at a rate less than you pay now.

- PPAs ready for prime time?
  - Distinction between buying electricity and leasing equipment. Is it a ***distinction without a difference***?
  - Competes with direct instructional funds that benefit kids…teachers, books, aids, broadband.
  - Department of Education is reviewing documentation and issuing guidance.
  - PPAs may still work regardless for schools wanting to pay from General Fund.

Power Purchase Agreements

- Other Considerations
  - PPA providers might make the following pitch.

    "We will put panels on your roof. In 20 years, you'll own them. Until then, you will pay less than you pay now!"

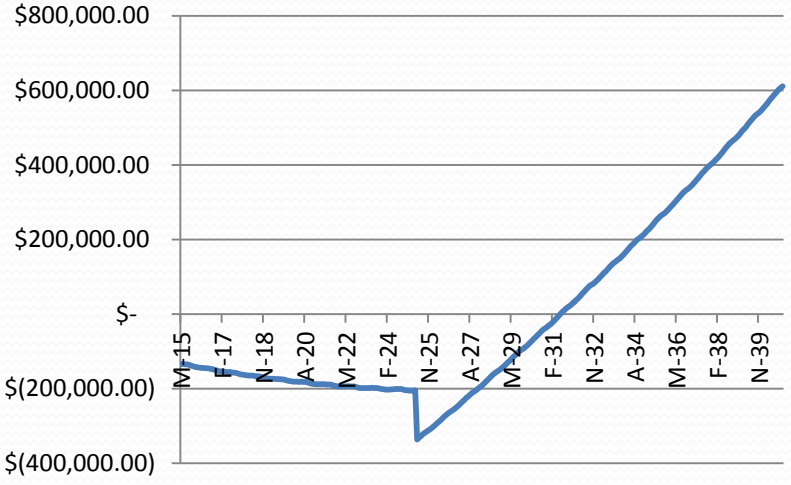
  - What's wrong with the pitch?
    - Do not compare the cost of solar with your current electricity price.
    - Compare solar with your next best purchase option.

  - Local Investor Groups
    - May be your best chance for maximizing benefits of tax credits.
    - PR Risk with using local investors.

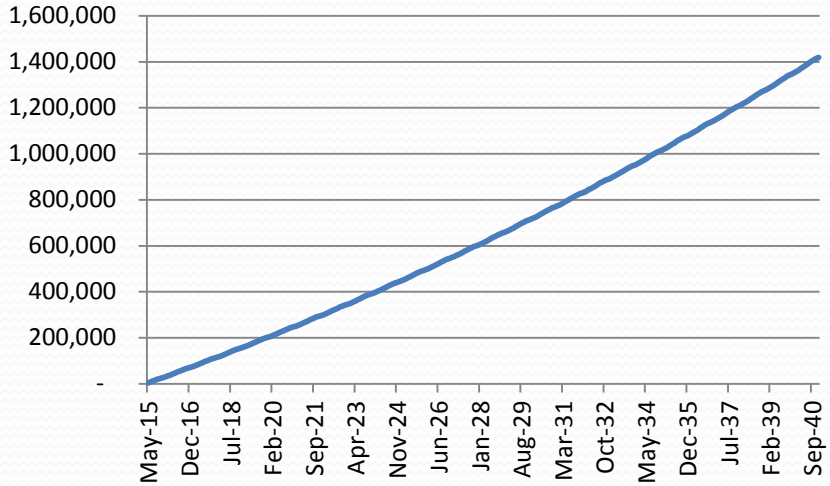
Budget Impact General Fund Vs. All Funds

(Illustration Purposes Only)

25 Year Cumulative Cash Flow (All Funds)



25 Year Cumulative Cash Flow General Fund



Realtime Online Information Typically Available

SOLAR.WEB

My PV systems | PV system comparison

CB Solar - UNI

Overview | Realtime | Archive | Reports | Service messages | Administration

88.12 kW
Current power

Online

1,289.95 kWh
Energy today

03/05/2015 03:53 PM

154.79 USD
Yield today

Month
583.53 USD

Year
4,636.75 USD

Total
38,303.49 USD

683.67 kg
CO_2 savings today

Corresponds to car kilometers...
Today: 4,559 km
Total: 1,127,827 km

Corresponds to trees planted...
Today: 18
Total: 4,338

Messages

#	Device name	Date
516	IG Plus 10.0-1 UNI#9 (# 10)	03/04/2015 01:19 PM
102	IG Plus 10.0-1 UNI#9 (# 10)	03/04/2015 01:16 PM
516	IG Plus 10.0-1 UNI#7 (# 8)	03/04/2015 12:29 PM
102	IG Plus 10.0-1 UNI#7 (# 8)	03/04/2015 12:28 PM
102	IG Plus 10.0-1 UNI#8 (# 9)	03/01/2015 12:55 PM
516	IG Plus 10.0-1 UNI#8 (# 9)	03/01/2015 12:54 PM
516	IG Plus 10.0-1 UNI#9 (# 10)	03/01/2015 12:34 PM

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Factors Affecting Viability

- Size of Facility
  - Bigger => Lower capital cost per watt
  - Smaller => Greater savings per watt
- Status of Sales Tax/PPEL
  - Stressed => Short term lease has higher financing costs, but still viable
  - Surplus => Perfectly marries the schools ability to produce General Fund savings by saving energy costs.
- System Type
  - Flat roof => Longer term PPAs and Leases viable
  - Sloped roof and Ground Arrays => Property tax implications make it tricky

ISFIS Will Help Evaluate Project

- Regardless of where you are in the process.
- Regardless of whether you choose a leasing arrangement, PPA, or outright purchase.
- At a minimum, please send us your RFP if you go out to bid.

Questions?

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