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Solar Energy Top 10: What Schools Need to Know



Solar Energy Top 10: What Schools Need to Know

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Why go solar?

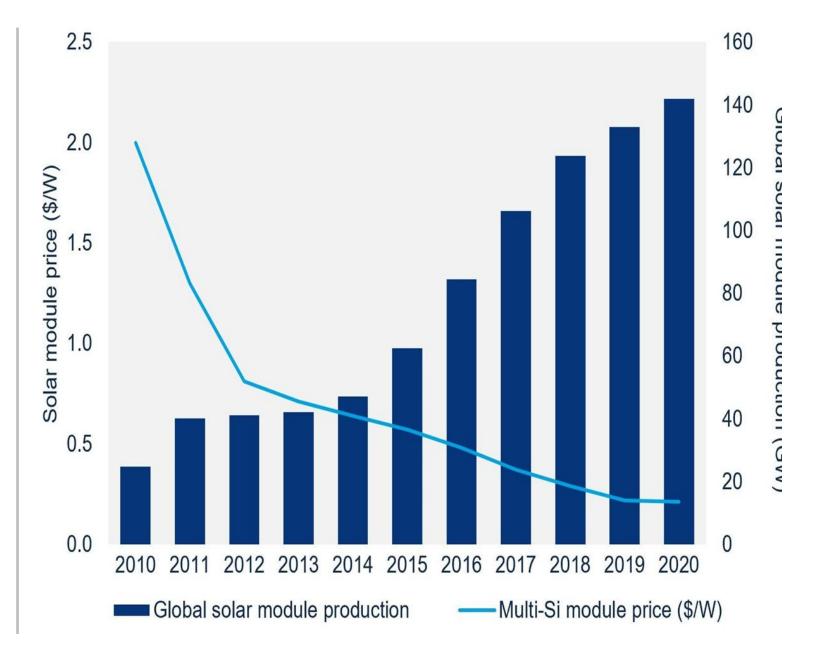


Growth of solar development

- Deregulation of electricity industry
- Advancements in solar technology/falling solar panel costs
- Increased attention on on-site generation; resiliency and reliability
- Increased attention on climate change

Price of solar panels over the past decade

Dramatic fall in solar casts



Top Ten List



Solar Top Ten



- 1. Utility territory
- 2. Assessment of energy usage/needs
- 3. How PPA works/alternatives
- 4. Selecting provider
- 5. Selecting location

- 6. Interconnection/net-metering
- 7. Easement/land rights
- 8. Common contract issues
- 9. Operation and maintenance
- 10. Buy-out/purchase of array

Adrian Ashtabula Lake Lucas Fulton Ottawa, Geauga Sandusky Williams Guyahoga Wood Sandusky Erie Henry Trumbull Lorain Portage Huron Medina Summit Seneca Paulding Putnam Mahoning Hancock van Went Crawford Wyandot Ashland Stank Allen Richland Columbiana Hardin Marion Auglaize Holmes Morrow Jefferson Tuscarawas Knox Logan Shelby Union Coshocton Harrison Delaware Champaign Licking Guernsey Miami Belmont Franklin Muskingumi Clark Madison Noble Fairfield Perry Montgomeny Monroe Greene Pickaway Morgan Hocking Washington Wanten Bossi Athens Winton Highland Hamilton Clermont

1. Utility territory

Map of Ohio's various electric utilities

1. Utility Territory



- Three types of electric utility territories
 - PUCO regulated electric utilities
 - Electric cooperatives
 - Municipal utilities
- Important differences
 - PUCO interconnection/net metering better defined; legal rights clearer
 - Municipal/Cooperatives depends on utility

2. Assessment of usage/energy needs



2. Assessment of usage/energy needs



- Consideration of other energy savings opportunities
 - Energy efficiency measures?
 - Energy procurement options?
- Assessment of usage
 - Working with potential developer to determine usage patterns
 - Cost-benefit analysis



How a PPA works/alternatives

- PPA
- Direct purchase
- Leasing

3. How a PPA works/alternatives



- What is a PPA (purchase power agreement)?
 - Positive
 - No upfront costs
 - No responsibility for operation and maintenance
 - Obtain guaranteed savings
 - Negative
 - Typically don't own renewable energy credits ("RECs")
 - PPA model may cause potential hurdles in municipal or cooperative territories

3. How a PPA works/alternatives



- Direct purchase
 - Upside
 - Potential to maximize value of self-generation
 - Downside
 - Responsible for maximizing tax benefits, renewable energy credit value
 - Responsible for operation and maintenance
 - Tax-exempt entities cannot take advantage of the Investment Tax Credit
- Leasing
 - Similar to PPA but no purchase option

4. Selecting a provider



- Experience with school projects
- Parent company
- Experience with your electric utility
- Use RFP process



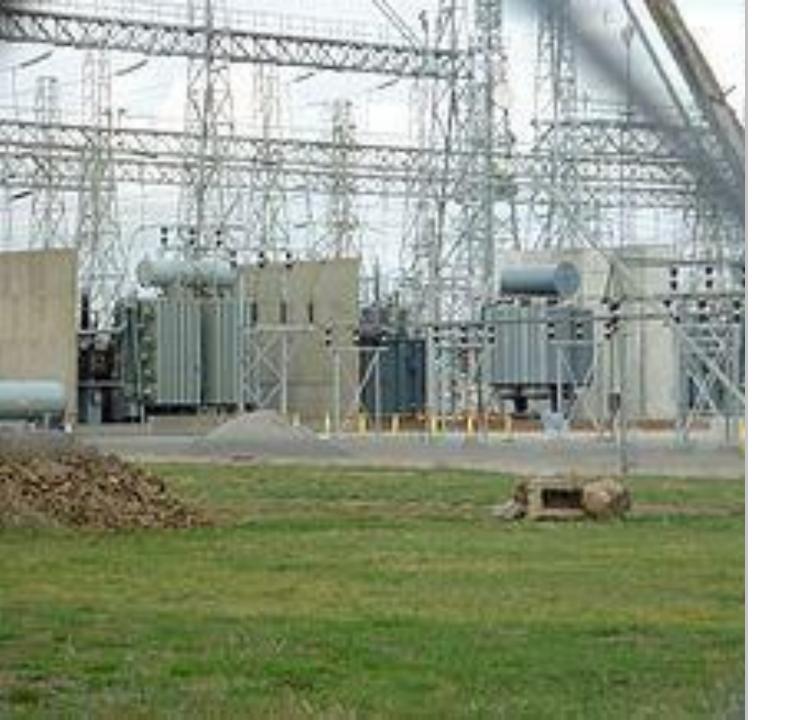
5. Selecting a location

- Long-term commitment (10-25 years), so select wisely
- Choosing site with no shading; optimal sun exposure
- Installer should help determine optimal location

5. Selecting location



- Schools often have benefit of having open land to site solar facility
- If solar facility is located on the roof, may raise certain construction considerations (e.g., does the project need to be competitively bid?)



- How will you connect the solar generation facility to utility's grid?
- Will you be compensated for any extra electricity you generate but don't use?



Interconnection process

- PUCO regulated electric utilities
 - Ohio Adm. Code 4901:1-22-04 Interconnection Services
 - Establishes uniformity for the process of requesting interconnection,
 performing necessary upgrades, and entering interconnection agreements
 - Process also governed by utilities tariff
- Municipal utilities and electric cooperatives
 - Depends on particular utility
 - May be limitations on 3rd party ownership; limits on system size



Net-metering

- Net-metering is a billing mechanism that credits solar energy system owners for the electricity they add to the grid.
- Goal of solar system is to reduce or completely off-set electricity purchases from utility with self-generation
- Net-metering addresses the potential value of excess electricity generated by the solar system





Net-metering

- PUCO regulated utilities
 - Ohio Adm. Code 4901:1-10-28 Net-metering
 - Uniform rules
 - Clarity in utility tariffs
 - Limit on excess generation
- Municipal utilities and cooperatives
 - Depends on particular utility

7. Easement/land rights



- Developer will need access to school's property to operate and maintain the solar facility
- Potential negotiation of real estate documents to allow for construction, operation, and maintenance of facility
 - Ground lease
 - Easement
 - License agreement

8. Common contract issues



- Indemnity clauses
 - Schools shouldn't indemnify provider, but needs to be indemnified
- Assignment provisions
 - Approval needed before assigned; assignee qualified to operate provision
- Environmental issues
- Insurance coverage



8. Common contract issues



- System performance guarantees
- Confidentiality provisions
 - Remember public record requirements
- Dispute resolution provisions
 - Avoid mandatory arbitration
- Buyout provisions

9. Operation and maintenance



- Need clear terms on ongoing operation and maintenance responsibilities
- Reports regarding ongoing operation of facility
- Terms of contract should address any required coordination for maintenance
- Are background checks needed for individuals working on the solar facility?
- Inclusion of term addressing shut-off in cases of emergency

10. Buy-out/purchase of array



- Clause defines the process for selling at the end of term
 - How will value be determined?
 - Independent appraiser determine fair-market value?
- Some contracts allow for potential purchase at different periods during the term
 - E.g., the contract has 20 year term; provided opportunity to purchase every five years
 - Important to analyze economic benefit of buying out the contract; requires consideration of solar PPA payment prices, current utility rates, and current costs of solar

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