Does Solar Fit My Ag Operation?

- Dr. John Worley

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Why Solar on Poultry (and other) Farms

- They are agricultural operations and thus eligible for grants that not everyone can get.
- They use a lot of electrical energy, especially in summer when solar production is maximum.
- Existing buildings are usually properly oriented for solar panels.

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Can I get "Off the Grid" by using solar to power my poultry houses

- Is it possible? Yes.
- Is it practical? No.
- Requires battery backup, which adds tremendously to the cost
- Requires enough panels to supply energy in Worst Case Scenarios
- Makes much more sense to use net metering to produce power when you can
- Produce enough power during daylight hours to run operation most of the time
- Recommendation is to always install LESS than the maximum you need due to Georgia net-metering agreements

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Can I get "Off the Grid" by using solar to power my poultry houses

Think of solar energy as a separate enterprise from the poultry operation

The enterprise must make a profit on its own

Talk with Power Supplier!

- Programs are different for GA Power and each EMC **and they vary with time**

Consider the following:

- Investment Cost (- help from grants)
- Income = reduced power cost + possible tax incentives
- Life of the System (25-30 years)
- Maintenance
- Tax and Insurance

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Where to Install Panels on a Poultry Farm

- Roof Mount
  - Generally oriented the right way, but angle not optimal
  - Expensive panels on a roof that is questionable structurally
  - Accessibility for service

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Where to Install Panels on a Poultry Farm

- Ground Mount (preferred)
  - Vegetation must be controlled (Mowing or Goats/sheep - not cattle)
  - Better orientation can use exact angle and azimuth ~40°/South. (Poultry House roof typically 22º)
  - Cooler thus more efficient
  - More accessible for service

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Cost of the System - Choosing panels

- Efficiency
  - Ranges from ~10-20% most are around 15% efficient
  - Higher efficiency means fewer panels needed
  - https://news.energysage.com/what-are-the-most-efficient-solar-panels-on-the-market/
- Reputation of the company

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Expenses

- Investment Cost (- help from grants)
- Life of the System (25-30 years)
- Maintenance
- Tax and Insurance
- Will there be decommissioning expenses at the end?

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Taxes and Insurance

- This is an investment that is worth a significant amount of money
- You need Insurance to cover possible losses (tornado, fire)
  - Industrial use .25-.50% of total capital investment annually
  - Rooftop installations may be covered under homeowner policy
    - Need to talk to insurance company to make sure
- Is it going to be taxable?
  - It will most likely add to the value of the property, and will thus increase property taxes

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Annual Maintenance

- Controlling Vegetation
- Cleaning
- Repair/replace damaged or defective equipment
- Figure on $15 per year per kW

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Income

Talk with Power Company

- Depends on your power company
- What they offer varies with time

- Can you utilize Tax Credits?
  - 26% of investment (through 2022, then 22%, then 10% after 2024)
  - Carries back 1 year and forward 20 years
  - If you can't utilize them, can the installer own the equipment so that they can utilize them and pass savings on?

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Solar Project Economics - Income

- Accelerated depreciation
- 100% first year bonus depreciation (Federal only)
- Eliminates all future depreciation
- Some owners sell this depreciation
  - Talk to your accountant. A good accountant is absolutely your best friend in making these decisions.

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Investment Cost

- About $1850/ kW of power
- Auburn reported a 50-kW system will come in at an installed cost of $100,000 to $115,000 (2016)
- Our calculations for 2020 put this same system at around $86,000

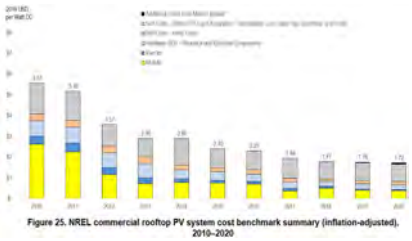

Figure 25. NREL commercial rooftop PV system cost benchmark summary (inflation-adjusted), 2010–2020

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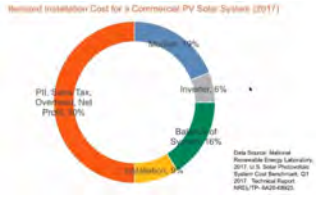
Solar Trade Case

- Tariff was predicted to have small impact on panel cost
- Modules are approx. 20% of total cost of project
- Prices were expected to increase ~$.15/watt (5.6%)



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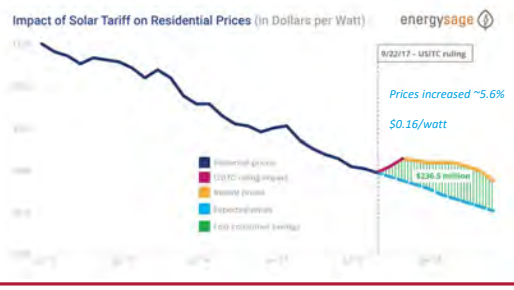
Solar Tariffs and Cost Increases



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Financing Help

- USDA Rural Development REAP grants and loans (see concurrent session)
  - 25% grant, up to 75% combination grant and loan
  - Grants are taxable (reduce the amount of your deductible investment)
  - See Concurrent Session for Details
- DSIRE web site. (www.dsireusa.org)
  - Comprehensive list of available Federal, State, and Local incentives for all types of renewables and energy efficiency improvements

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Thank You!

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