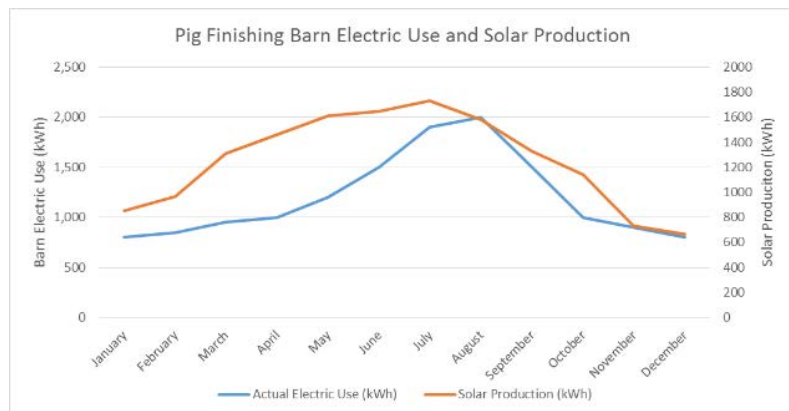


## Case Study- Design a Solar System for Your Barn

Go to <http://pvwatts.nrel.gov/> to complete this case study (example of final graph below)

- You own and operate a pig finishing barn in the zip code 56143. Your barn has a south facing, 4/12 pitched roof.
- The monthly electricity used by your barn is below.
- You will need to determine what size DC kW system you will need based on your barn’s electric needs before entering information into pvwatts (energy in kWh is equal to the power in kW times the time period in hours). Play around with the DC system size.
- The system losses are default in pvwatts.
- Use Google to help you if you need to.
- In the zip code that your pig barn is located in, you can only sell excess electricity produced by solar panels back to the grid if your solar pv system is under 40 kW (however, this doesn’t mean your system HAS to be under 40kW. That’s not always the determining factor when sizing a pv system).
- Design an adequately-sized solar pv system for your barn that will produce as much electricity as your barn requires.
- Graph your results using Microsoft Excel on a monthly basis
  - Month on x-axis, your barn’s kWh usage on left y-axis, your solar system’s kWh production on right y-axis (secondary axis)
- What size pv system did you go with?
- Describe how this solar system will provide adequate power to your barn in one paragraph. When writing your paragraph, discuss these things:
  - Electricity usage in the summer versus the winter
  - Loads that use the most electricity and how they coincide with the season and solar production
  - How solar production matches up with your barn’s electrical requirements
  - Are you able to sell any electricity back to the grid? If not, and if your system is under 40 kW, could you make your system bigger while still being economical and profiting from the system?

Actual Energy Used at Your Finishing Barn	
Month	Actual Electric Use (kWh)
January	6,370
February	5,750
March	6,462
April	6,880
May	7,001
June	8,012
July	10,720
August	9,905
September	9,062
October	6,360
November	6,209
December	6,558
<b>Total kWh:</b>	<b>89,287</b>



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