

Mini Project

The team building project will begin with a short assignment due in 1 week (Friday Sept. 16th). The objective is to get the team used to its members (teams as reported for Sr. Design lab use), assign leadership roles (these may change).

You are now the proud owner of a solar farm in New Mexico. Where in New Mexico is up to you, but, considering the amount of land you need, choose an inexpensive place, but not too far from a city. If any information is missing to answer questions, make a reasonable estimate and defend it in your report.

Your solar farm is located on 1236 acres of mostly flat land, well suited for installing solar modules.

How many solar modules can you put on this land and based on “readily available” solar modules for power generation, what is the “name plate” total power you can produce. How much energy is this if they operate 100% of the time?

Obtain a best estimate for the solar radiation available on your farm and determine what optimal radiation you would select for your solar operation.

1. How much of the time will you be producing power during the year?
2. Estimate the number of kwh you will produce during the year.
3. Determine the Capability Factor and Capacity Factor for your farm for the year.

Your agreement to earn a return on your farm (\$0.02 per kwh delivered) is that you must provide your Capacity Factor amount of power every quarter, or you must purchase Natural Gas produced power at \$0.05 per kwh to replace the power shortfall. You also must have 2 technicians working for you (\$75k per year each, they provide their own tools and truck for this price). Are you making money?

Assume that you owe 15% of all monies that come in (gross revenue) as business and other taxes and insurance. Are you still making money?

You purchased the land at \$2500 per acre at 5% interest with 20% down. Your solar modules cost \$5,000 per kw, at 10% interest with no money down. Can you make the payments?

If instead of mostly flat land you were close to a lake and a mountain, how could that be exploited, and what would be the economic, social and ecological impacts?

Reference: <http://www.withouthotair.com/>

Your report will be impressive, complete, and all teams will produce identically formatted reports, in a format

that you agree upon. You will not consult on any of the technical details of the report.