



Grid-tie Sizing Practice

1. Client uses 600kWh per month. Design a system to offset 80% of their usage.

$$600\text{kWh} * 12 = 7200\text{kWh/yr} * 80\% = 5760\text{kWh/yr} / 1.120\text{sh} = 5.14 \text{ kW Array}$$

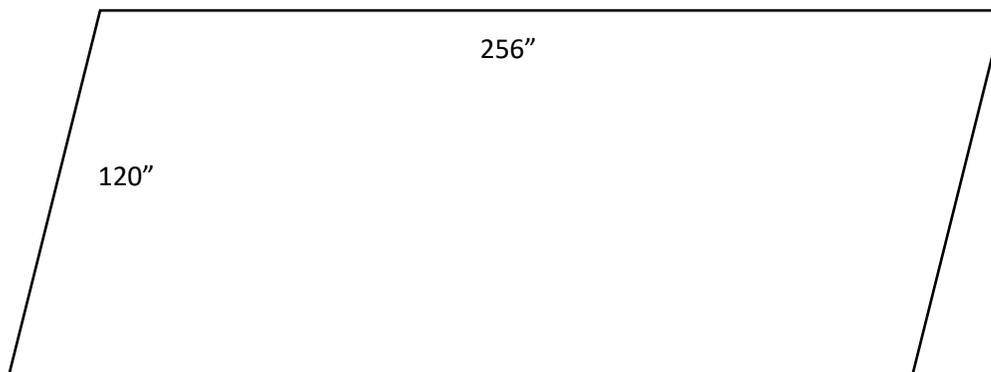
2. A client pays an average of \$54 in electricity usage each month. Their rate is locked in at \$0.05/kWh. Build a system to offset 75% of their usage.

$$\$54 / \$0.05 = 1080 \text{ kWh/mo} * 12 = 12,960\text{kWh/yr} * 75\% = 9720\text{kWh/yr} / 1.120\text{sh} = 8.68 \text{ kW Array}$$

3. How much would a system cost for a client that uses 8750kWh per year?

$$8750\text{kWh/yr} / 1.120\text{sh} = 7291.67\text{kW} * \$3/\text{Watt} = \$21,875.00$$

4. After completing your site assessment, you have the following roof dimensions:



Design a system to offset 40% of the client's usage. The total of their bills last year came to 10.3Mw.

- a. How much rail do you need?
- b. How many mid clamps will you order?
- c. What will your system topology be? Micro or string?

- This is a subjective question. It depends on which modules are selected to determine the array dimensions.

- Once the array size is determined, it must be laid out to determine how many modules will fit on the roof and which orientation they will be installed.

- The rail may then be calculated by dividing the array width by common rail lengths (10'2", 13'6", 20'). Try to calculate for the least amount of wasted off-cuts.

- Mid clamps will then be counted as two between each module.

- Micro vs String is also subjective with a system of this size. You are encouraged to research different micro-inverters, string inverters, optimisers, and modules. Read the spec sheets and determine what the minimum number of modules are for each inverter and see if your design meets these minimums.