

5) Recycle on Solar PV System Requirements – Add Heat Pump Power Requirements

It is recognized that the geothermal heat pump system does require some additional electrical power to transfer heat out of the ground and into the building. The thermal energy is free, but there is a new cost associated with running a heat pump compressor. The rationale for estimating this additional energy is described in Section 4.

(5.1)	Recall the Baseline Electric Power Usage based on last year's usage. See Line(3.3)	_____ kWh	72,040 kWh
(5.2)	Recall the Additional Electric Power Usage to operate the geothermal heating and cooling system. See Line(4.13)		9515 kWh
(5.2)	What is the total power required to operate the original facility and the new heat pumps? [Add lines (5.1) and Line (5.2)]	(5.1)+(5.2) = _____ kWh	72040 + 9515 = 81,555 kWh
(5.3)	Approximate Size of Solar including Heat pump power requirements. [Recall solar generation potential for 1 kW of solar PV]	(22) / 1485= _____ kW	81,555/1485= 55 kW (Rev.)
(5.4)	Approximate Number of Solar Modules/Panels Needed with heat pumps. [Divide line (23) by 0.3 kW / module]		55/0.3 = 184 modules (Rev.)
(5.5)	Surface Area required with heat pumps		184 x 18= 3312 ft²
(5.6)	Approximate Initial Cost of Your Solar System with heat pumps [Multiply line (5.3) by 1000 W/ kW x \$2.50]	(23) x 1000 x \$2.50 = \$ _____	55 x 1,000 x \$2.50 = \$ 137,500 (Rev.)