**REopt – Home Location** (Suburbs of Philadelphia)

None of the Financial models were economical, so REopt suggested 0 kW installation.

For the Resilience models, the PV/Battery did produce a suggested installation size of 7kW.

Below are a few observations based on the output from this Resilience model:

* The annualized energy production in REopt was 7,488 kWh / year. The PVWatts output for the same location/size was 8,999 kwH/year.

REopt includes degradation - 1.5% per year - over the 25-year lifespan of the system while PVWatts does not. Applying the degradation rate to the energy production over 25 years, the output in its final year would be ~6,621 kWh/year. I calculated an annualized average of 7,437 kWh/year.

This is very close – but not equal – to the annualized 7,488 kWh/year from REopt. I wasn’t able to find the source of the 51 kWh / yr discrepancy between REopt’s calculation and my own.

* The battery was rarely discharged in the Resilience model

The battery was charged at 100% for the vast majority of the year, with the exceptions of Jan 1, Dec 31, and the simulated outage on June 1. The purpose of the model is resilience, so this would make sense why, but I wonder if/how much the economics would change if the battery was discharged to serve the load at regular intervals throughout the year.

* The sum of *Annualized PV Energy Production*and *Energy Supplied From Grid in Year 1* rows in the **Resilience** column add up to ~14,500 kWh, or ~3,500 kWh more than consumption (screenshot below).

The “Dispatch Spreadsheet” downloaded from the *System Performance Year One* section of the REopt output specifies that the extra 3,500 kWh were exported to the grid. I couldn’t find the price of electricity exported *to* the grid. In the PVWatts output, the retail price is $0.129/kWh. Applying this to the surplus energy exported to the grid in the REopt model results in ~$450. This assumes the retail price to buy electricity from the grid is the same as the price the grid pays to buy electricity from the IPP, which may or may not be an appropriate assumption.

