

Solar summary

32 solar panels each with its own Enphase micro-inverter. Install Mar 2018.

Expected useful lifespan; 25 years

Array can be expanded, limiting factor is the utility transformer size that supplies the local area. (I don't know what size it is, but a very large array may need a larger transformer).

Could expand till the amount of electricity used is offset by the amount that is produced, however it would never make the electricity bill \$0 as the utility charges for delivery as well as supply of electricity.

The house uses about 18.5 MWh a year (from use prior to solar installation) and the solar panels provide about 12.5 MWh (see chart below). There is substantial savings on electricity but as the utility charges for electricity delivery as well as supply, it is not balanced savings). Saving money is not the only purpose, as the solar and battery combination is used to power the house when the grid goes down.

There is no routine maintenance cost for either solar panels or the solar batteries. Both systems can be monitored online.

2 Tesla solar batteries connected in series: install Sep 2021,

Expected useful lifespan; 25years

Each battery holds 14 KWh. The solar panels charge the batteries at the same time they are supplying electricity to the rest of the house. When the batteries are fully charged and there is excess solar generated power (more than what the house is using) it is sent to the grid and you are credited for the electricity sent into the grid (there is a separate meter that tracks this). Any solar generated electricity that the house uses or that goes into the batteries is free electricity. The batteries energize an electrical panel that services the essential electric demands for the house; heat (Boiler), well pump, septic pumps, refrigeration, most light and outlets, (but not the central cooling, pool pumps, washer/dryer). The batteries are currently set to run down to 50 % capacity each day leaving 14 KWh as backup for when the electric grid goes down. 50% is usually the amount of electricity that this panel uses overnight, so you are using solar supplied energy to power this panel almost all the time (this is adjustable from 0 to 100%). The batteries are being used as primary grid backup power. The battery charge will last about 1 ½ days, but will

recharge during the day if there is sunlight. Of note Tesla monitors the system (online) and will recharge the batteries from the grid to 100% if a storm is forecasted for the area. We went 3 days without power one winter as the batteries were able to keep recharging during the day. There is a secondary backup propane generator that energizes the same panel. It has never had to provide power since the batteries were installed (though it does come on every week for 20 min to recharge its starter battery).

12 months electric bill and solar production

Date	Electric bill	House use in kwh	Solar to grid KWh	Solar Production in Kwh
9/24	198.41	1005	192	1110
10/24	183.43	867	116	853
11/24	267.80	1251	151	659
12/24	151.92	759	160	557
1/25	253.13	1138	80	675
2/25	272.29	1281	135	734
3/25	168.78	1050	335	1010
4/25	77.54	643	371	1280
5/25	122.78	975	485	1150
6/25	352.47	1772	138	1320
7/25	369.00	1823	106	1450
8/25	434.15	2093	88	1570
Total	2851.70	14,657	2,357	12,368