Our foray into solar energy

- Rooftop, grid-tied solar system
- First 12-months on the system analysis
- Changes to utility billing to optimize system
- Battery backup system build
- Review and results of system use

5kW Rooftop System and Cost

- 6.8kW array with 17, 400W, QCELLS Q.Peak Duo BLK ML-G10+ solar panels
- 5kW Fronius Primo inverter
  - 1.8kW over-paneled
  - Annual production estimate = 8,238kWh
- Went online mid-April 2025
- Location: Northwest Illinois
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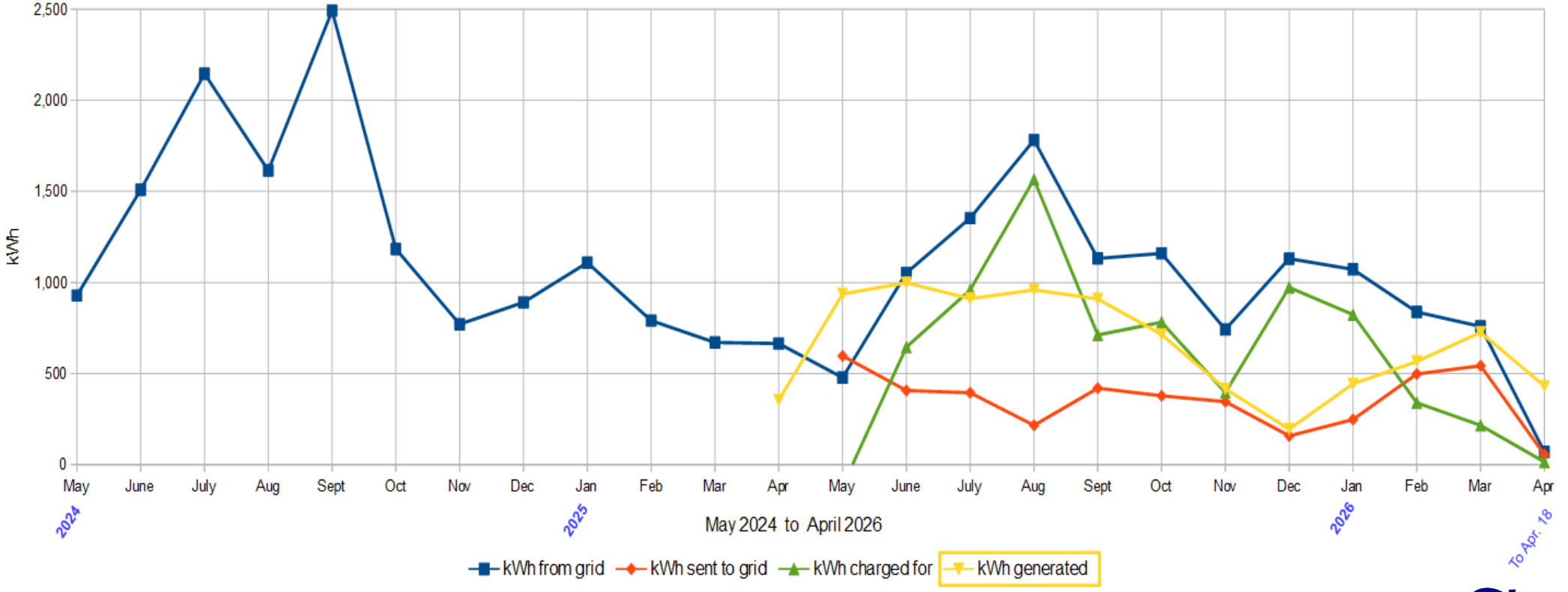
First 12 months results with rooftop solar and net metering plan details

Rooftop Solar performance

Month	kWh PV Generated	kWh Sent to grid
From Apr 18, 2025	354.53	0
May 2025	937.49	597
Jun 2025	998.58	407
Jul 2025	911.26	395
Aug 2025	959.53	216
Sep 2025	910.02	420
Oct 2025	714.42	378
Nov 2025	416.34	346
Dec 2025	194.70	158
Jan 2026	443.32	248
Feb 2026	566.68	498
Mar 2026	726.42	543
To Apr 18, 2026	431.38	55
TOTALS	**8,565 kWh ***	**4,261 kWh**
	* 327 kWh better than the production estimate at installation	

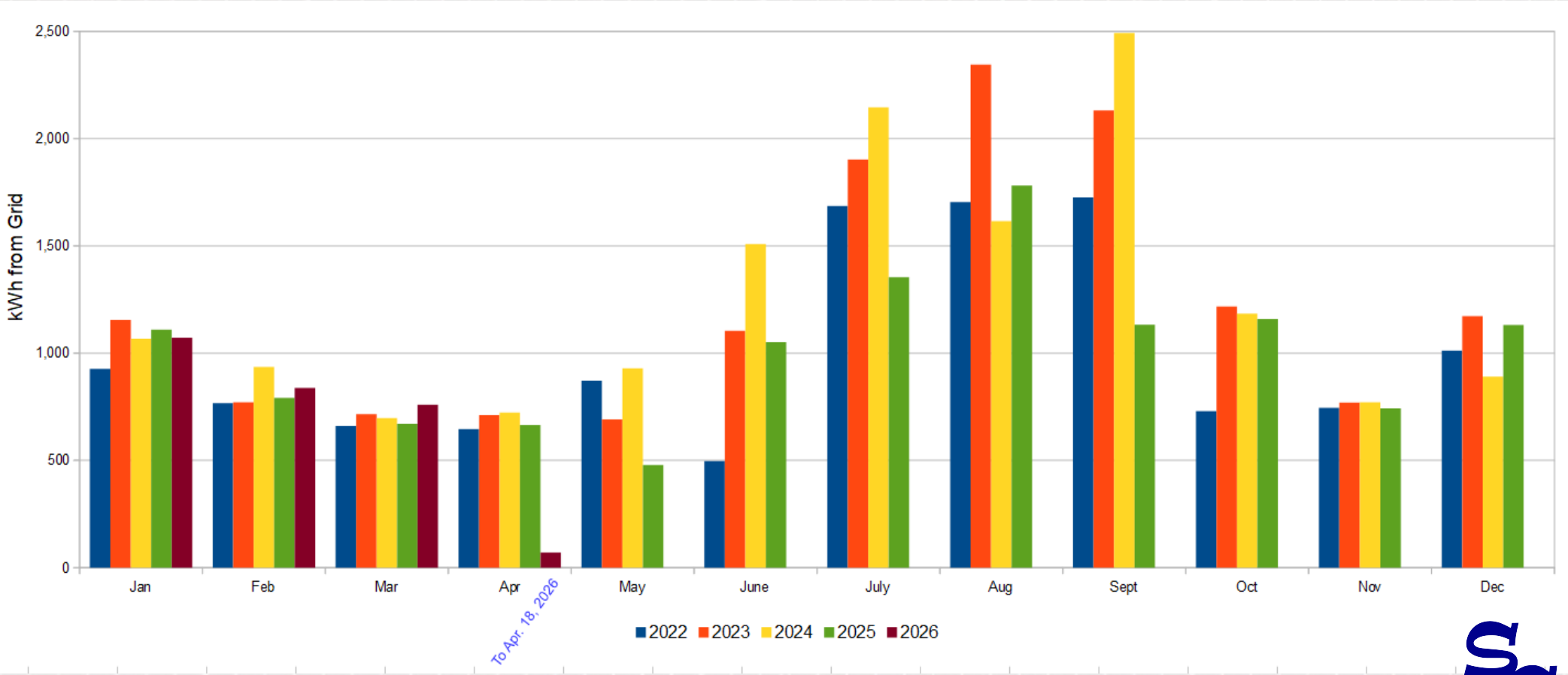
Rooftop Solar performance

The below chart shows the kWh per month from the grid for the 12 months prior to solar activation and 12 months post solar activation with the performance of the system



Rooftop Solar performance

The below chart shows the kWh per month from the grid starting in January 2022 through April 2026. The solar array went live mid-April 2025



Rooftop Solar performance

Prior to Jan. 2025, the net metering program was a credit for electricity generated plus a credit on the delivery fees.

As of Jan. 2025, credit is only given for generated electricity. There is no credit on delivery fees.

Examples below:

After Jan. 2025 (our plan)	
Electricity Supply Charge	838 kWh x Rate1
Net Metering Credit – Supply	498 kWh x Rate2
Total charge for Supply	**340 kWh x Rate3**
Distribution/Delivery Charge	**838 kWh x Rate4**

Prior to Jan. 2025	
Electricity Supply Charge	838 kWh x Rate1
Net Metering Credit – Supply	498 kWh x Rate2
Total charge for Supply	**340 kWh x Rate3**
Distribution/Delivery Charge	838 kWh x Rate4
Net Metering Credit – Delivery	498 kWh x Rate5
Total charge for Delivery	**340 kWh x Rate6**

Rooftop Solar performance

- Changing to Supply Time Of Day pricing, at this time, doesn't save much money.
- Changing to Delivery Time Of Day pricing should lead to some additional savings.
  - Below is from our March and April 2026 bills showing the supply and DTOD charges
  - I charge all the Bluettis up to 100% after 9pm

March 2026

Electricity Supply Charge	759 kWh x Rate1
Net Metering Credit – Supply	543 kWh x Rate2
Total charge for Supply	**216 kWh x Rate3**
Distribution/Delivery Charge	**759 kWh** billed at:
Morning DFC (6am-1pm)	95 kWh X 0.044
Mid-Day Peak DFC (1pm-7pm)	21 kWh X 0.116
Evening DFC (7pm-9pm)	26 kWh X 0.041
Overnight DFC (9pm-6am)	617 kWh X 0.033

April 2026

Electricity Supply Charge	830 kWh x Rate1
Net Metering Credit – Supply	732 kWh x Rate2
Total charge for Supply	**98 kWh x Rate3**
Distribution/Delivery Charge	**830 kWh** billed at:
Morning DFC (6am-1pm)	83 kWh X 0.044
Mid-Day Peak DFC (1pm-7pm)	38 kWh X 0.117
Evening DFC (7pm-9pm)	40 kWh X 0.041
Overnight DFC (9pm-6am)	669 kWh X 0.033

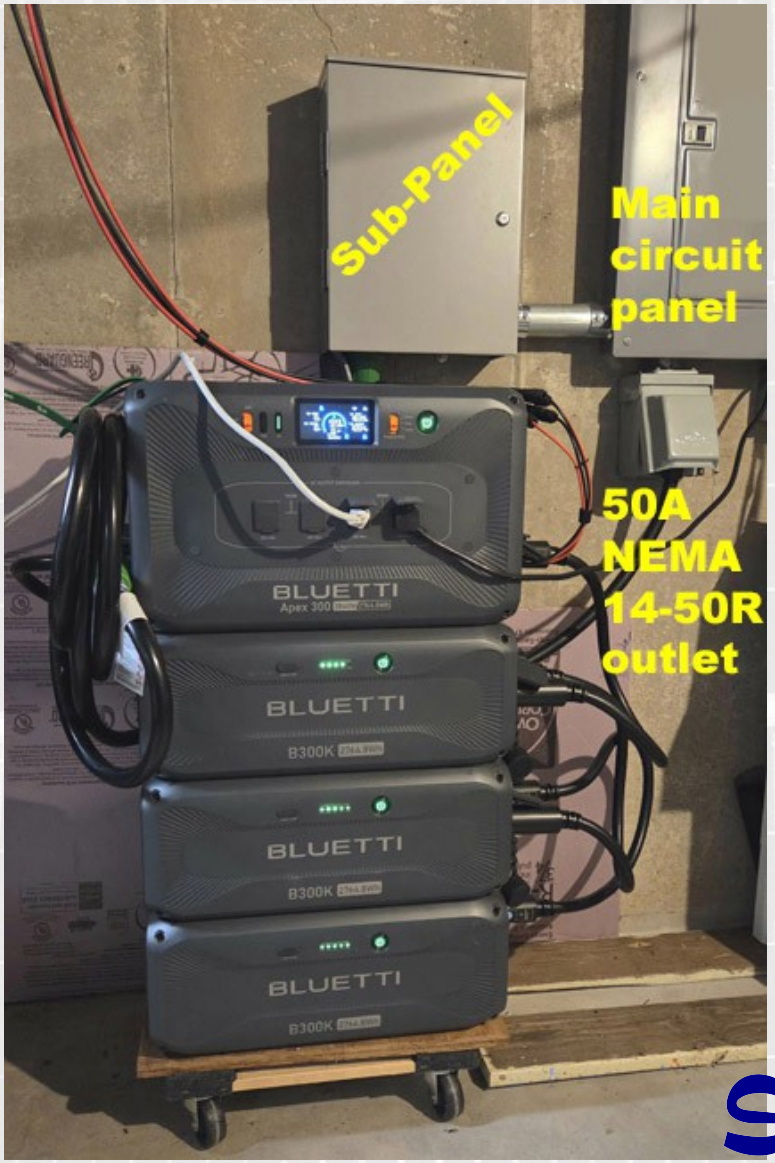
Home battery backup

Most-Of-Home Battery Backup

- Original system installed in Jan. 2025 was with the Bluetti AC500 and the three B300K batteries (as seen to the right).
- This system was 8.3kWh. The AC500 does not have a battery, it is strictly the inverter/control unit.
- The AC500 was traded in for the Apex 300 in Aug. 2025.

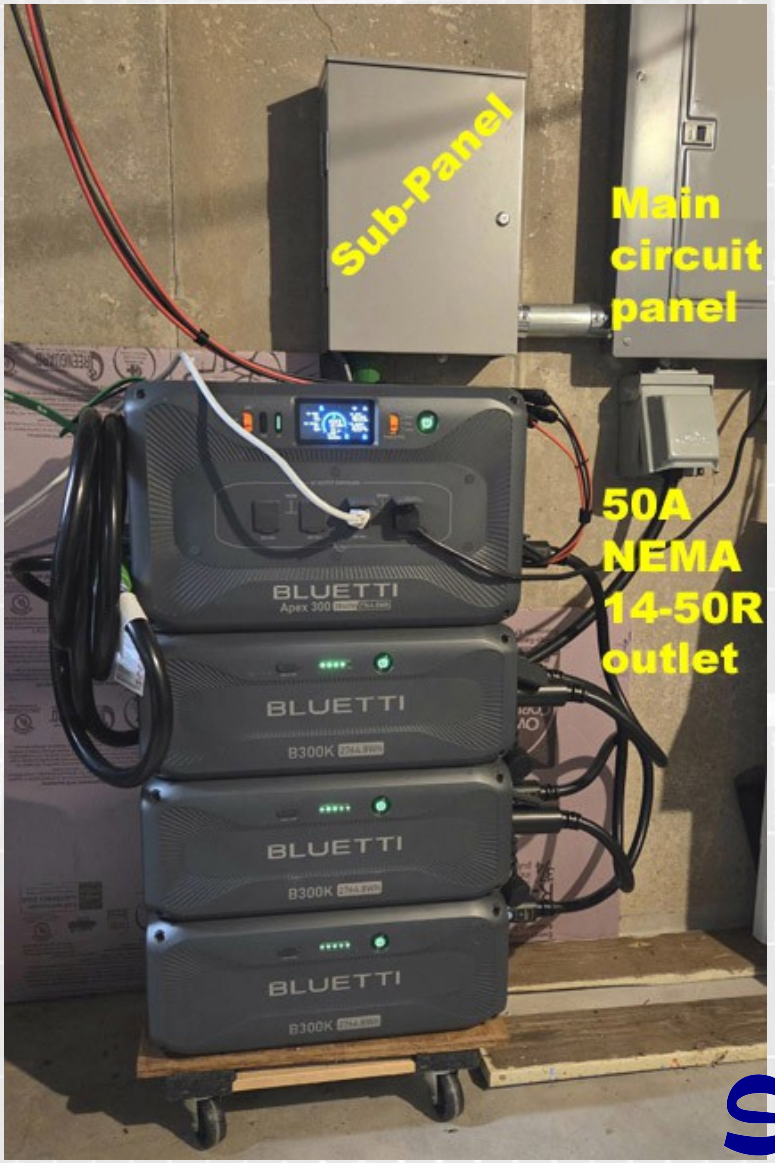
Most-Of-Home Battery Backup

- Bluetti Apex 300 Power Station (Aug. 2025)
  - 2764.8Wh capacity
- Three (3) Bluetti B300K expansion batteries (Jan. 2025)
  - 2764.8Wh capacity each
- One (1) Bluetti B500K expansion battery (not shown) (Nov. 2025)
  - 5120Wh capacity



Most-Of-Home Battery Backup

- Total rated capacity is 16.2kWh (it was 11.2kWh before the B500K battery)
  - 14kWh if you assume 86% usable capacity of the total
- Integrated into home electrical panel through a sub-panel
- Charges from separate solar and a 50A household outlet

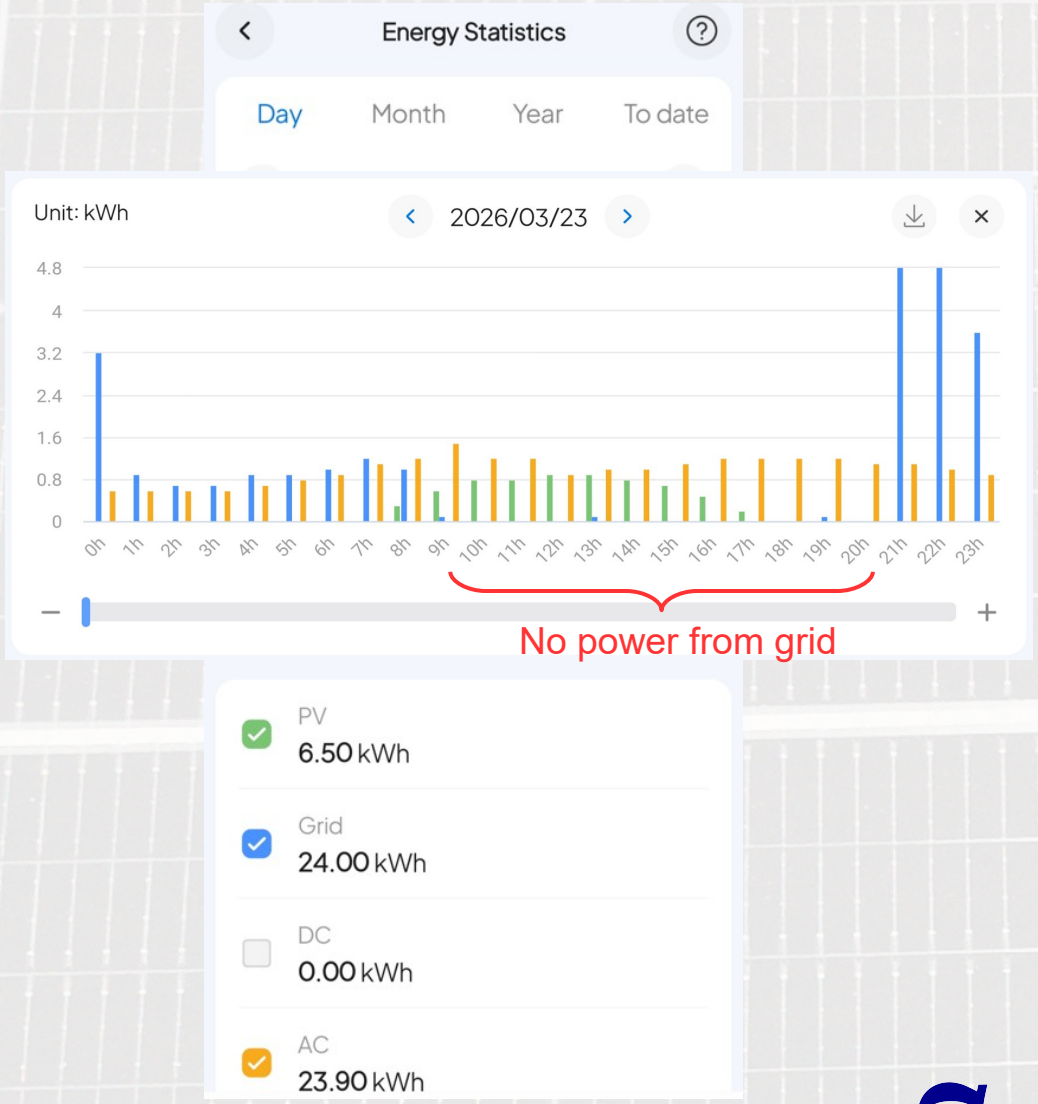


Battery Backup configuration

The Apex 300 is programmed for "Time of Use" as follows:

00:00 to 09:00 = Grid charging
09:01 to 21:00 = Battery/Solar
21:01 to 23:59 = Grid charging

The "State of Charge" is set to 15% - 100% meaning, during the "Battery/Solar" time of day, there is no Grid power unless the SOC drops to 15%, then the Grid maintains a 15% SOC on the system.
During the "Grid Charging" times, the battery system is charged to and maintained at 100% SOC

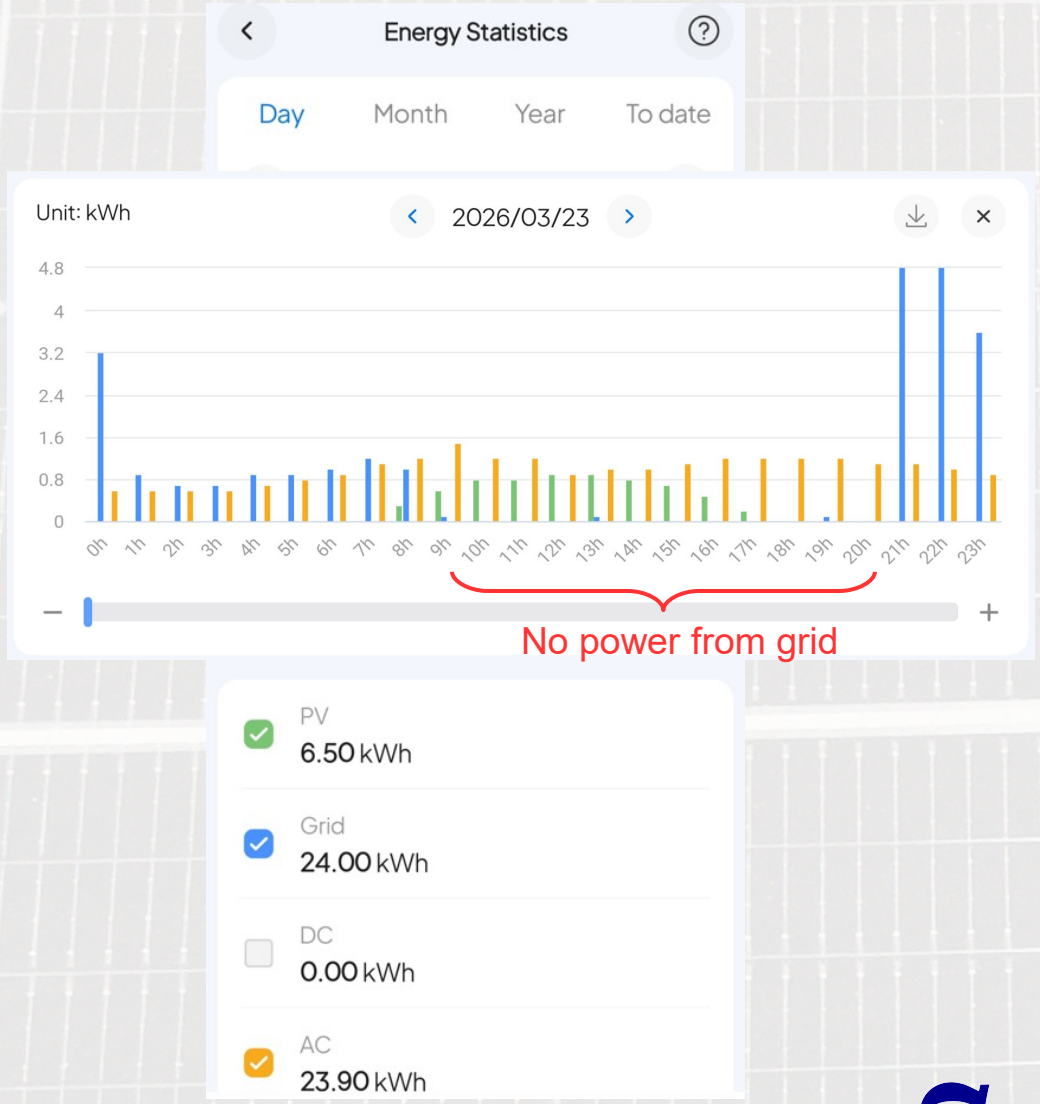


Battery Backup performance

Image to the right shows energy stats from the app of the Apex 300 Grid charging, PV input and AC use

On this day it was a high temp of 47°F, it was sunny and I was also using the 400W Renogy portable panel*

* *A good day without the Renogy is 3 to 4 kWh PV*



Battery Backup performance

Table shows data directly from the Apex 300 battery backup.

Prior to Jan. 1, 2026, I only had 3 B300K batteries, then I added the B500K battery.

Month	PV kWh	AC kWh	Grid kWh	Diff. Grid to AC
Oct 18, 2025	17.80	347.90	376.60	*28.70*
Nov 2025	35.30	779.30	835.50	*56.20*
Dec 2025	15.10	900.10	966.20	*66.10*
Jan 2026	31.50	886.90	964.20	*77.30*
Feb 2026	63.50	660.80	701.70	*40.90*
Mar 2026	71.30	718.00	758.00	*40.00*

PV shows the solar coming into the Apex 300 from the 600W array and the Renogy, when used.
AC shows the total power going out of the system.
Grid shows how much AC went into and through the system from the grid.

Battery Backup performance

The 11 circuits in the sub-panel that runs off of the Apex 300 system used an average of 26kWh per day between mid-Oct. 2025 and end of Mar. 2026.

Usage was highest in the coldest months due to the furnace fan running often.

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For some reason, I lost the data from Aug. 2025 to Oct. 18, 2025 for the Apex 300.
I also did not save the AC500 data from Jan. 2025 to Aug. 2025 before trading it in.

Battery Backup performance

Contributing to the average of 26kWh per day, the furnace fan used 500W to start then 300W running. When we got rain instead of snow, the Sump Pump would use 1,100W for a few seconds.

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In normal daytime use, I saw around 1,000W to 1,300W without furnace fan or sump pump running