

REDUCING ENERGY COSTS FOR A CALIFORNIA HOME



BACKGROUND

The study and design involved the use of the SDG&E rate structure and the optimization of user consumption to best accommodate the rate selected. The parameters are as follows:



- ✓ The home has **4.22 kWp** of solar. This results in average daily solar production of about **20 kWh**.
- ✓ The home has a **10 kWh** battery and a rectifier/inverter limited to **5 kW**.
- ✓ The homeowner owns an **electric vehicle** (EV) – a Tesla Model X.

As a result of owning an EV, the homeowner qualified for a variety of favorable EV rates for charging the vehicle. The homeowner also qualified to sell power back to the utility that depended on the time of production, with the most favorable time to sell the power back being the utility peak hours of 4-8 p.m.

OBJECTIVES

1. Study and recommend the best **UTILITY RATE** for the customer
2. Determine an **OPTIMAL SCHEDULE** for energy consumption and delivery
3. Reduce **UTILITY COSTS**

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ACTIONS AND RECOMMENDATIONS

We determined this homeowner could use a fixed time of day schedule instead of using our HomeOptimizer system, which is ideal for more complex scenarios. This approach, however, requires diligent behavior on the part of the homeowner to ensure that the EV only charges between the super off-peak hours of midnight - 6 a.m., and that any delivery of battery energy to the grid happens only between the peak hours of 4-8 p.m.

RESULTS

After following the fixed schedule, the home has seen a dramatic decrease in electricity costs, often yielding a **ZERO-DOLLAR BILL**.

Figure 1 illustrates the net consumption and production for the house in a single day. Most significantly, the entire energy from the battery was delivered back to the utility from 4-5 p.m. during peak hours, and the homeowner received about \$3 in compensation for that production.

Figure 2 shows a detailed breakdown of costs from May-June 2022.

Choosing the right rate structure, battery size and operation schedule resulted in significant benefits for both the homeowner and the utility.

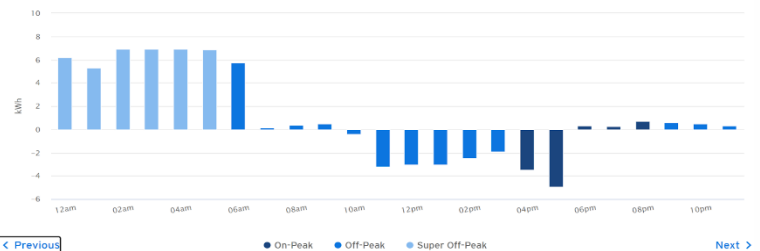


Figure 1: The net consumption and production for the house on June 20, 2022.

	Amount(\$)
State Surcharge Tax	.05
Generation On-Peak Summer -54 kWh X \$0.35776	-19.48
Generation On-Peak Winter -107 kWh X \$0.12985	-13.85
Generation Off-Peak Summer -67 kWh X \$0.10727	-7.19
Generation Off-Peak Winter -62 kWh X \$0.08219	-5.08
Generation Super Off-Peak Summer 215 kWh X \$0.02999	6.44
Generation Super Off-Peak Winter 243 kWh X \$0.02378	5.78
Clean Impact Plus 168 kWh X \$0.001	.17
Credited To Personal Impact Balance	33.16
Total CCA Electric Generation Charges	\$0.00

Figure 2: Electricity costs from May-June 2022 as provided by the Clean Energy Alliance Community Choice Aggregation program