

# A LaGrange Park Solar Story

A LaGrange Park family was interested in installing a solar energy system to reduce energy consumption (and associated environmental pollution) and eventually adding battery storage to serve as a back-up generator in the event of a power outage. After researching a variety of solar power options a contract was signed with Tesla for the installation of 12 Solar Panels, in May of 2018.

The panels and related equipment was estimated to generate 3.7 kilowatts of Direct Current (DC), which would supply approximately half of the household power. The initial purchase price of the system was \$12,517.20; however an immediate credit for the Illinois Shines Program of \$4,099.20 was applied, resulting in the final cost of the project being \$8,418 (a \$500 deposit, \$3959 at the beginning of installation, and \$3,959 at completion of the system.)

After the deposit was paid, Tesla checked the roof integrity to ensure it could support the panels for 20 years (the length of the panel warranties). A solar array design was developed with input from the resident and the installation permits were obtained. The installation started on December 10 and ended on December 14.



A net meter was provided by ComEd and the final solar panel array and associated equipment were inspected and approved on December 28. The solar panels started generating DC power that was converted to Alternating Current (AC), by an inverter that supplied the power to the household electrical system to power electrical appliances and lighting. Excess power is directed into the ComEd electrical grid. (U.S. power grids are generally AC).



The net meter tracks household consumption by spinning in one direction when the household power consumption exceeds the solar generation (typically in evenings and overnight) and spinning in the opposite direction when the system generates more power than the household consumes. ComEd is required to pay residents for excess power generated.

Tesla has an “App” that you can download onto your computer and phone, which provides instantaneous power generation information as well as cumulative power generation information. This first picture shows 2 minutes captured by the “Instantaneous” screen of the app. The upper blue line conveys the amount of solar power generated, while the lower gray line conveys the amount of electricity used. The power generated in the 2 minutes totaled 702 watts, while the amount consumed in the home was 275 watts, which means 427 watts were supplied to the ComEd grid during that period.

While Com Ed pays for the excess electricity that households generate, the power distribution fee that supports the power lines in the grid and other related charges, continue to be billed to the customer even if they are generating more power than they use over the month long billing period. The second picture summarizes a longer period of time (the last day of



February through mid-April). The amount of power used during this month and a half is conveyed by the gray line and shading, while the amount of power generated is summarized by the blue bars. Overall the system generated 165% more power than the household used. A total of 543 kilowatts were produced and 330 kilowatts were used. The excess 213 kilowatts went into the ComEd grid. (It is important to note that there was no use of air conditioning during this timeframe.)

The environmental benefits of the renewable energy system were avoidance of half a ton of CO2 and other air pollutants emissions during the one and a half months of operation. This amount of pollution is equivalent to the amount a car would generate when driven 1,200 miles. A year of operation of the system at the current rate of electricity generation would reduce pollutant emissions equivalent to the amount a car would generate when driven approximately 9,600 miles.

## Total Cost and Payback Period

The cost of the solar system was reported for tax purposes and a Federal tax credit of \$4,668 dollars for 2018 was provided. Given all the credits the payback period was calculated to be 7 years and 8 months.

- Total Cost                      \$ 12,517
- Il Shines Credit                (4,099)
- Federal Tax Credit             (3,750)
- 
- **Final System Cost        \$ 4,668**
- Electricity Cost Savings total approximately \$50/mo
- **Payback Period 7 years and 8 months**

## Next Step

Procurement of battery storage unit that detects power outages, disconnects from grid, and restores power to home within a second, without interruption of power. Lights and appliances continue to run uninterrupted for multiple days, without additional sun shining on the solar panels. Costs vary according to storage potential, but start at approximately \$6500. Currently there is a federal tax credit potential up of to 30% for a residential battery. (The size and shape of the battery can be seen in the picture.)

## Questions

Please post questions on the Lagrange Park Sustainability Committee facebook page at <https://www.facebook.com/LGPSustainability>.

