



PARK DISTRICT of OAK PARK

Austin Garden Environmental Center Building and PV System Data

General Summary:

1. Reporting Period: June 2016 to April 2017 (May 2017 is estimated)
2. Lake and Forest Tower is complete and the PV generation is based on the existing shadows produced by the Lake and Forest tower.

ComEd Bill Data:

Total Metered Usage:	29,140 kWh
Building Usage:	15,846 kWh (Est.)
Park Lighting Usage:	13,294 kWh (15 Fixtures at 206 W each, 3,090 W Total)
	Control - Time clock: On/off sunset/sunrise, 4,302 Hrs. Annual
Shakespeare Theater Usage:	(?)

Photovoltaic System Data:

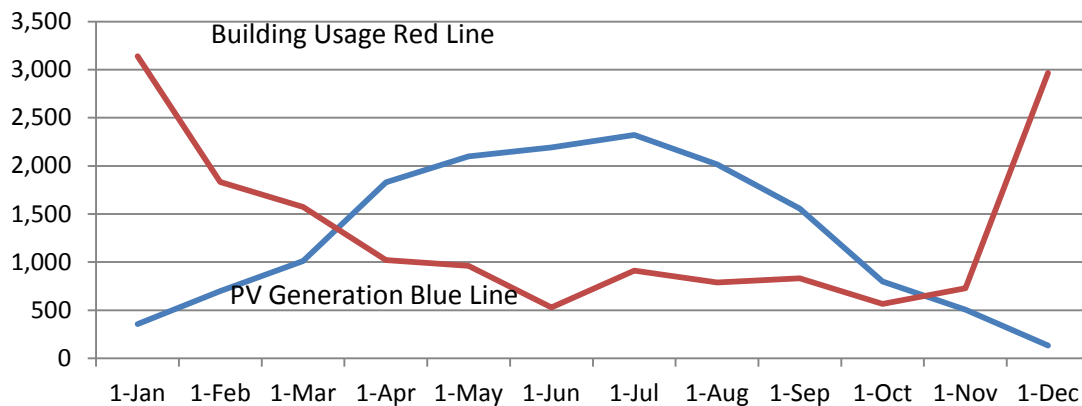
Total Generation:	15,519 kWh	
Generation by Month:		
	16-Jun	2,191
	16-Jul	2,322
	16-Aug	2,016
	16-Sep	1,556
	16-Oct	799
	16-Nov	506
	16-Dec	134
	17-Jan	357
	17-Feb	699
	17-Mar	1,010
	17-Apr	1,829
	<u>17-May</u>	<u>2,100</u>
	Totals	15,519

Summary:

- 85% (13,024 kWh) of the generation occurs during the months of March to September and between the hours:

Month	Morning	Afternoon
Mar	9:45	3:00
Apr	9:00	3:45
May	8:30	3:45
Jun	8:00	4:30
Jul	8:30	4:15
Aug	9:00	3:45
Sep	9:45	3:00

Current Building Usage/ PV System Generation Graph:



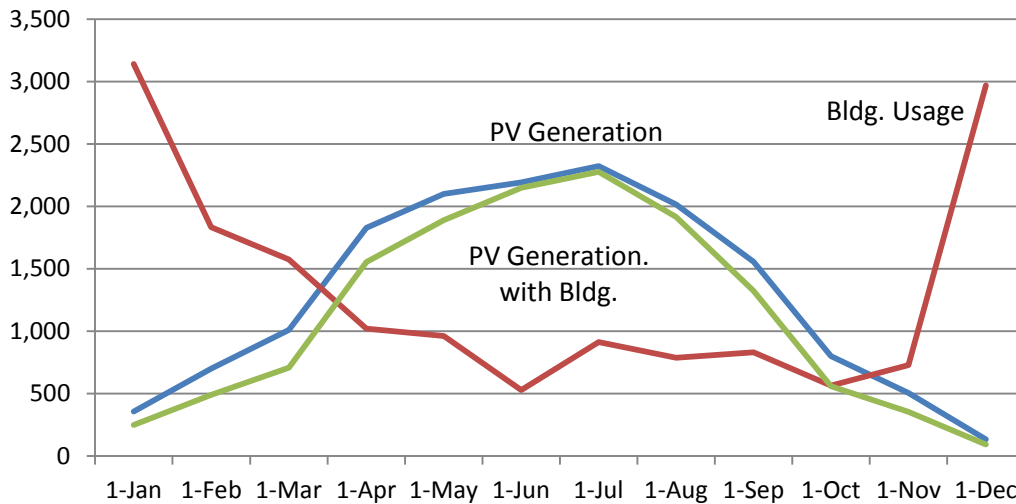
PV System Generation Losses Based on the Shadowing of the 196' Tower (Future):

- Current PV System Generation: 15,519 kWh (Blue Line)
- Predicted Generation Losses: 12%-14% Annually (Green Line)
- Predicted PV System Generation: 13,559 kWh

Summary

The predicted losses occur during the spring and fall periods:

Graph:



General Summary Notes:

- The building is targeting to be "Net Zero" energy (Usage/Generation).

Building (Est.)	15,846 kWh
PV System Generation	15,519 kWh
- HVAC system commissioning occurred during Jan/ Feb time period. The building's energy usage dropped after commission was completed, a reduction of 1,530 kWh of operating energy.

Dec	4,378 kWh
Jan	4,518 kWh
Feb	2,988 kWh
- The building summer hours of usage are low because of 2016 programming. The usage is predicted to increase in the future 2017.
- The Shakespeare Theater energy usage is not known or metered.
- The park lighting energy usage is based on 15-175 W fixtures (206 W each.) and controlled by a time clock that turns on the lights at sunset and off at sunrise. The period is 4,302 operating hours per year. Total estimate energy usage is 13,294 kWh.
- The future generation losses are based on the added effect of the new tower shadowing that occurs beyond the existing Lake and Forest shadowing. The majority of the lost generation hours occur during the middle to late morning in the spring and fall.
- If the new tower is built to the South at 196 feet, the AGEC will not be able to continue to pursue the target of being considered "Net Zero".