NY-Sun Solar Photovoltaic Program Impact Evaluation for May 1, 2016 through March 31, 2018

Executive Summary

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Executive Summary

This report presents the impact evaluation of solar photovoltaic (PV) projects installed under NYSERDA's NY-Sun program from May 1, 2016 through March 31, 2018. A subset of solar PV installations under the NY-Sun program benefitted from support by NY Green Bank (NYGB), a division of NYSERDA. Previous installations under the NY-Sun and predecessor programs were evaluated in the NYSERDA Solar Photovoltaic Program Impact Evaluation for 2008 and 2011-2016.

The NY-Sun and NYGB overlap program populations and the achieved sample of first-year production data[1] collection are shown in Table 1. The evaluated sample is below the target sample count, however the acquired data was successful in meeting precision criteria for all segments of the sample design. Data collection for greater than 200 kW sites through the DG integrated database was lower than expected.

- Many sites expected to be enrolled in the Large C&I program (due to capacity size) were enrolled in the Small Commercial program instead, which did not require DG Integrated Database data reporting.
- 25 of 114 sites in the persistence sample discontinued reporting of production to the DG Integrated database after the required 3-year post-installation period expired.

[1] First-year production data collection was for the first 13 months of production after system interconnection/ inception of system production. The first, potentially incomplete, month of production data is dropped from the analysis to utilize the first 12 months of complete, consecutive production data.

Table 1: NY-Sun and NYGB Evaluation Data Collection Results

Region	System Size (kW)	Purchase Type	NY-Sun Population Size (N)[a]	NYGB Overlap Population Size (N_{NYGB})	Target Sample	Evaluated Sample (n)	NYGB Overlap Evaluated Sample (n_{NYGB})
Con Ed	Below 200 kW	Lease	2751	1200	33	22	17
		PPA	723	577	22	21	19
		Purchase	1851	420	37	39	26
	Above 200 kW	All	12	0	12	10	0
Upstate	Below 200 kW	Lease	3914	2653	21	18	12
		PPA	1977	1654	33	34	19
		Purchase	6546	482	35	41	21
	Above 200 kW	All	103	0	103	60	0
Long Island	Below 200 kW	Lease	4817	2864	28	23	18
		PPA	1991	1607	23	22	19
		Purchase	4279	233	36	46	16
	Above 200 kW	All	36	0	36	23	0
Overall			**29,000**	**11,690**	**419**	**359**	**167**

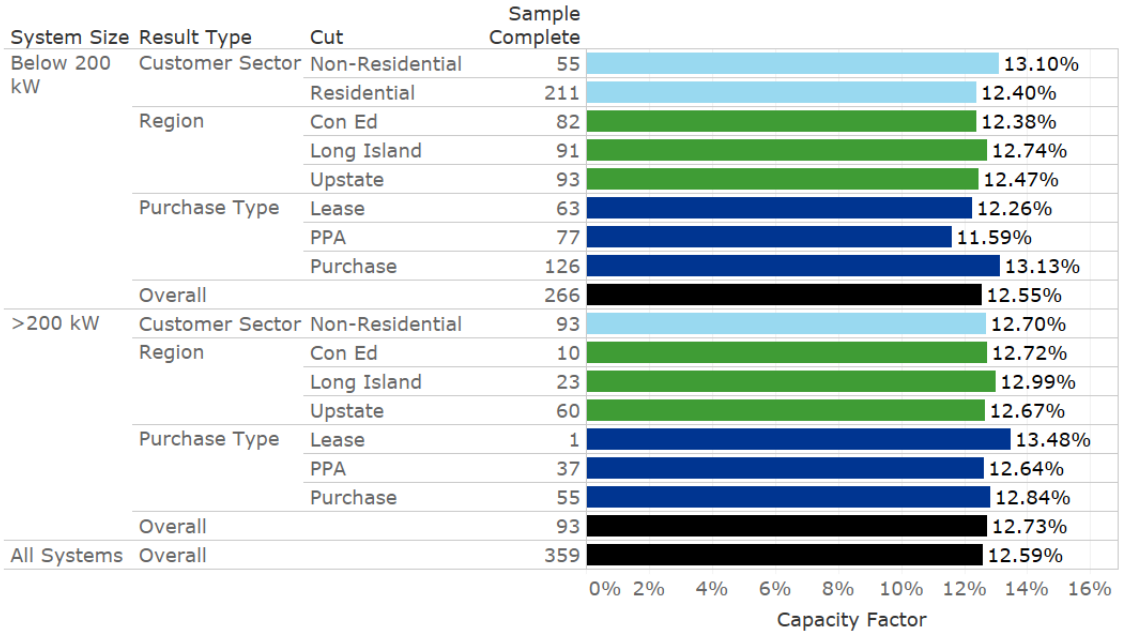
Weather normalized capacity factor[2] results by region, size, purchase type, and overall are presented in Figure 1. Each result type is a different aggregation of the data collected. For example, the total sample completes for the two strata within the customer sector category below 200 kW is 266, as is the total of the three region strata results for the category below 200 kW. Key capacity factor findings shown in the figure include:

- The program realized an overall 12.6% capacity factor during the evaluation period, which is slightly higher than that of the 2008/2011-2016 evaluation result of 12.4%. Capacity factors for all groups but Long Island small purchase sites are below the planned capacity factor of 13.4% for the program.
- The residential capacity factor of 12.4% is higher than the 2011-2016 NY-Sun residential impact of 12.1%. Small non-residential sites show an increased capacity factor of 13.1% (previously 12.1%), while the overall non-residential group performance has decreased from 13.2% to 12.7%.
- Among small units, the evaluation found high capacity factors for purchased units and low capacity factors for PPAs. Breaking these results down by region, the purchased model is consistently higher than other ownership models in all regions, while the overall

[2] Capacity factor is ratio of actual output over a period of time (including variations due to weather), to potential output if it were possible for the system to operate at full nameplate capacity continuously over the same period of time.

low capacity factor for PPAs is predominantly due to extremely low values on Long Island.

Figure 1: Capacity Factor Results



The Application-specific realization rate is the ratio of actual evaluated system production to the estimated system production (referred to as "Application-specific" production), as received on NY-Sun application documents and NYSERDA database inputs. This rate assesses how well individual system estimates based on contractor provided information is predicting the production of PV systems. Application-specific realization rate results are presented in Figure 2. Key findings from these results include:

- Application-specific realization rates are 99% for the program overall, for small systems overall, and for most segments within the small group (excluding PPA and non-residential sites). All other segments (excluding PPA) show application-specific realization rates in the mid-90s. These results are consistent with the prior (2011-2016) evaluation result, demonstrating high application-specific realization rates for nearly seven (7) years of the NY-Sun program.
- Application-specific realization rates for most results categories, especially small systems (less than 200 kW) are more accurate than reporting estimates. This finding is consistent with prior evaluation results. The application-specific realization rates for small systems (excluding PPA and non-residential sites) are near 100%, reflecting that the slightly lower verified capacity factor (due to less optimal physical characteristics, such as

orientation and shading) for this segment is effectively captured in residential system planning models.

Figure 2: Application-specific Realization Rate Results

System Size	Result Type	Cut	Sample Complete	
Below 200 kW	Customer Sector	Non-Residential	55	95.70%
		Residential	211	101.60%
	Region	Con Ed	82	101.83%
		Long Island	91	102.31%
		Upstate	93	99.06%
	Purchase Type	Lease	63	103.89%
		PPA	77	90.84%
		Purchase	126	102.49%
	Overall		266	100.63%
>200 kW	Customer Sector	Non-Residential	93	94.60%
	Region	Con Ed	10	94.90%
		Long Island	23	96.85%
		Upstate	60	94.11%
	Purchase Type	Lease	1	100.60%
		PPA	37	93.84%
		Purchase	55	95.71%
	Overall		93	94.68%
All Systems	Overall		359	99.19%