

# Albany County

## Solar PV Analysis

### Summary

Albany County (“County”) has expressed an interest in clean energy technologies such as solar PV. The County provided the New York Power Authority (“NYPA”) with locations to incorporate ground and rooftop solar arrays as well as a potential location at the Albany County Sheriff’s Department where parking lot canopies would be installed. For the ground applications, the New York State Environmental Resource Mapper was used to determine if any of these locations are in possible wetland or wetland buffer zones as well as if there are any rare wildlife implications. For all proposed locations, National Grid’s hosting capacity map was used to locate 3-phase power nearby and determine if there is sufficient interconnection capacity for a new solar PV system to connect to.

The following preliminary designs summarize site characteristics and depict scenarios for potential baseline capacities for the solar PV systems. The NYS Public Service Commission (“PSC”) limits the solar PV system size on any individual land parcel to 5 MWac to receive the Value Distributed Energy Resource (“VDER”) credits.

Facility	System Type	Capacity	Application	Roof Age	Roof Type
<b>Radar Tower</b>	Ground mount	1600 kWdc	In-front of the meter	-	-
<b>Albany County Heath Complex</b>					
260 S. Pearl St. Building	Rooftop	176 kWdc	Behind-the-meter	~12 years	Johns Manville Adhered EPDM
175 Greene St Building	Rooftop	Not recommended	Behind-the-meter	~12 years	Johns Manville Adhered EPDM
<b>Albany County Cornell Coop</b>	Ground mount	370 kWdc	In-front of the meter	-	-
<b>Albany County DPW Headquarters Property</b>					
	Rooftop	242 kWdc	Behind-the-meter	-	-
	Ground mount	200 kWdc	Behind-the-meter	-	-
<b>Albany County Sheriff's Clarksville Station</b>					
Roof 1	Rooftop	60 kWdc	Behind-the-meter	~10 years	
Roof 2	Rooftop	20 kWdc	Behind-the-meter	~10 years	
Roof 3	Rooftop	25 kWdc	Behind-the-meter	~10 years	
Roof 4	Rooftop	66 kWdc	Behind-the-meter	~10 years	
New Structure	Rooftop	105 kWdc* <small>based on current renderings of the building</small>	-	New	-
<b>Albany County Correctional Facility</b>	Carport	748 kWdc	In-front of the meter	-	-

## Interconnection

Based on the array capacities within this portfolio some project sites will be interconnected behind-the-meter to the existing building electrical system and will offset the electrical usage at the site. Other project locations will be connected in-front of the meter and inject energy directly into the respective utility's grid. The County will receive credits on their utility bills for the injected energy. In-front of the meter system connections may warrant additional protection requirements such as 3VO based on the system capacity. This is determined by the respective utility during the interconnection process.

## VDER & the Value Stack

The Value of Distributed Energy Resources ("VDER") compensation mechanism is designed to provide Distributed Energy Resources with value based on the benefit they directly provide to the utility grid. These values are based on several price indices listed below, and are collectively referred to as the Value Stack.

- Location Based Marginal Price ("LBMP")
- ICAP – Averted costs of installed capacity.
- Environmental Value ("E") – Clean Energy Standard Tier 1 Renewable Energy Credits or the Social Cost of Carbon, whichever is higher.
- Demand Reduction Value ("DRV") and Locational System Relief Value ("LSRV") – Averted costs base on the utility's marginal cost of service; LSRV is only available in certain areas.

The largest drivers of Value Stack revenue are LBMP and ICAP, which fluctuate with the cost of wholesale power, and vary by location. Although the future of wholesale electricity markets is uncertain, there is widespread belief that costs will continue to increase over time, to some degree. The DRV and LSRV values compensate for the benefit these systems provide to the distribution grid, and are locked in at the time of interconnection for a period of 3 and 10 years, respectively. Due to the locations of Albany County's facilities currently under consideration, these values are not expected to provide significant value to the project portfolio. The second largest revenue driver in the Value Stack is the E value, which is currently set to the Social Cost of Carbon (\$27.41/MWh). This is locked in at the time of interconnection for 25 years, and represents a significant guaranteed revenue stream for the projects.

The projected Year 1 VDER rate range for the projects in this portfolio is \$0.742 - \$0.0793

## Clarifying Questions

- Does the County pay National Grid, Central Hudson, OGS, and Direct Energy directly to each respective entity?
- Is the County interested in hosting a CDG project and be an off-taker?
- For the ground mount locations is the County okay with tree clearing? If yes, will the County be responsible for clearing the trees?

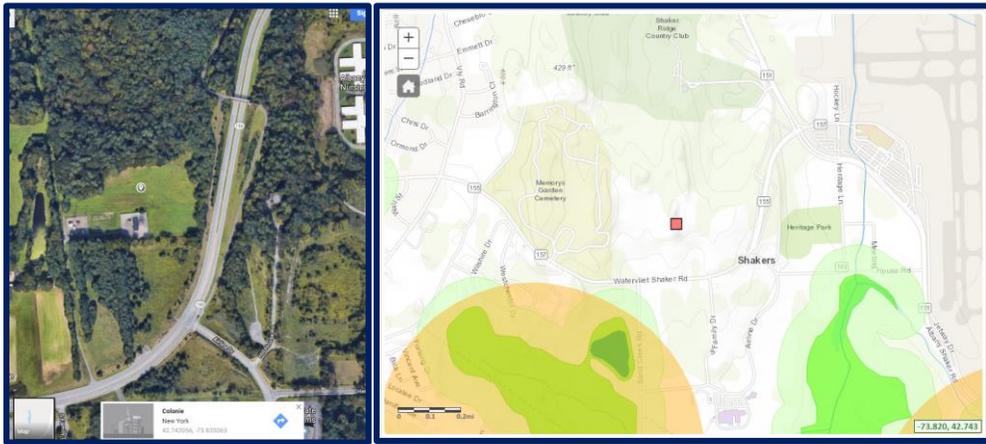
## Recommendation

Based on the preliminary analysis, it is recommended that 6 of the project sites, as well as the carports, move forward with a Request for Proposal (**RFP**) that NYPA will develop, and issue as a solicitation, and assist in the evaluation of proposals. NYPA also recommends including an option for bidders to propose favorable energy storage applications. A sensitivity analysis to verify the financial viability will be performed based on the responses received for both behind-the-meter and front of the meter interconnection methods.

## Radar Tower

Ground mounted array; 925 Watervliet Shaker Rd, Albany, NY 12211

This location will require tree clearing. The County may choose to remove or relocate the current trees at this location. Also, if desired by the County, the solar developer may remove the trees and do a 1-for-1 replacement or relocate the current trees. Note there are two prospective layouts. This is based on the currently available NYSERDA incentives. At this time systems under 750kW yield a higher incentive than a system over 750kW. However, a larger system yields higher production compensating for the lower incentive. It is recommended to provide both system footprints for vendors to provide a design and pricing. NYPA will evaluate the most economical value once pricing is received.



\* Project location

\*the photo on the right depicts the DEC wetland mapper

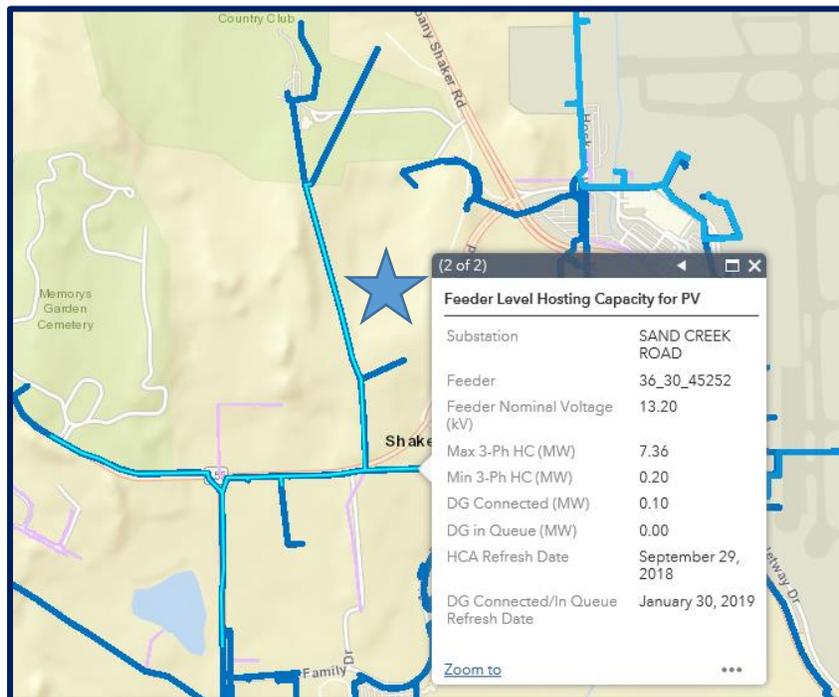
## Proposed System Size 1.6MW DC (1.3MW AC)



## Proposed System Size 817kW DC (720kW AC)



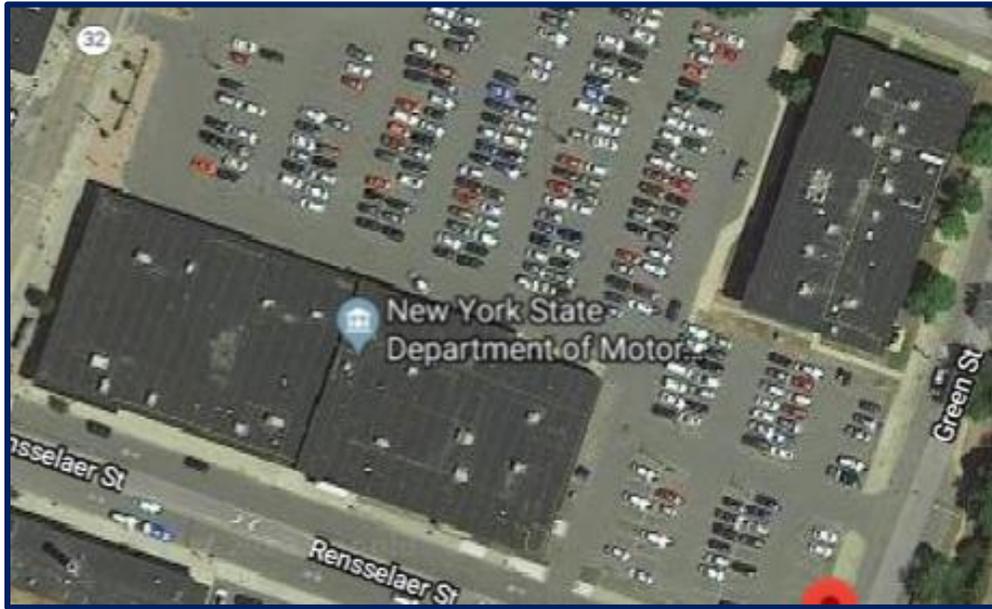
The image below is of National Grid's hosting capacity map, the blue star represents the location of the solar array. At this time there is capacity to connect the solar array to National Grid's infrastructure. Note, there is no 3V0 protection at this substation, which may be required.



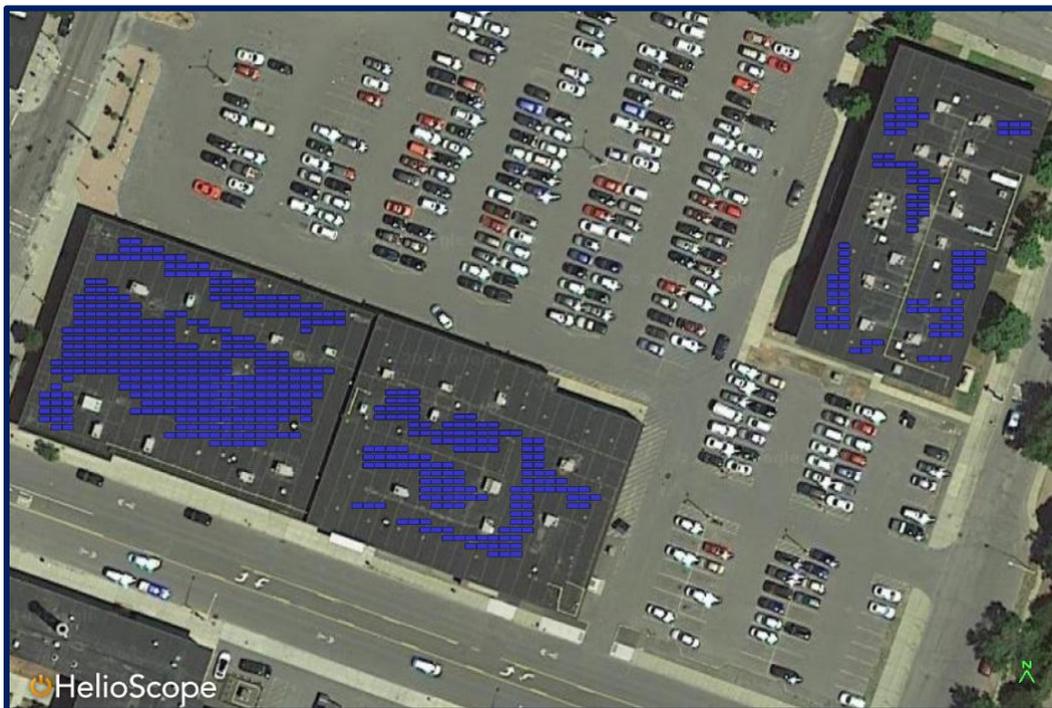
# Albany County Health Complex

Roof top arrays; 175 Green Street and 260 South Pearl Street

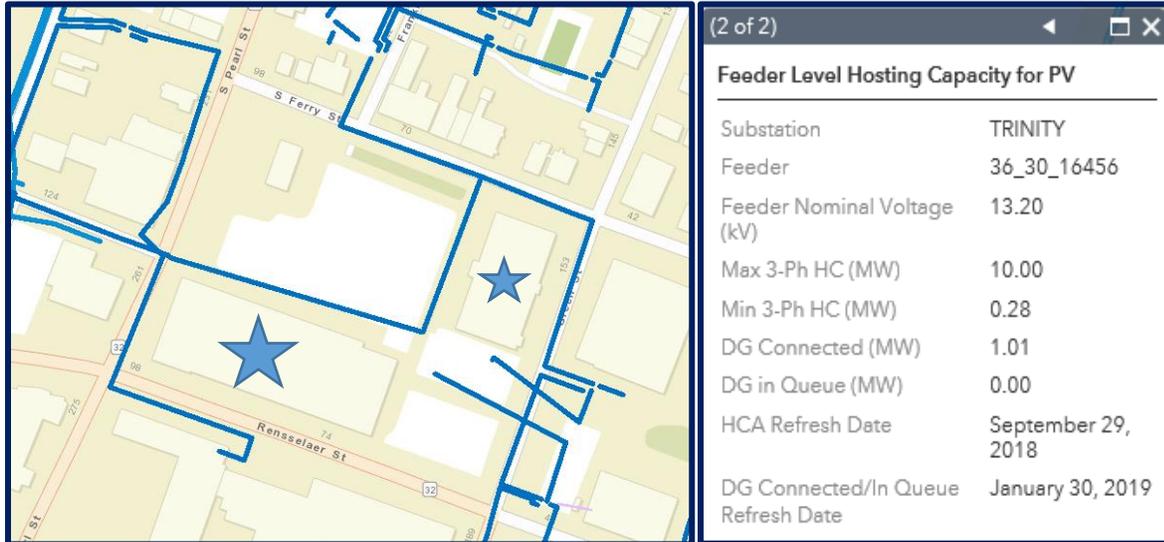
It is not recommended to incorporate solar PV on 175 Green Street due to the limited space on the roof.



Proposed System Size: 176 kW DC (171 kW AC) and 34 kW DC (30 kW AC)



The photo below is of National Grid’s hosting capacity map, the blue stars represent the location of each solar array. At this time there is capacity to connect the solar arrays to National Grid’s infrastructure without triggering major upgrades. Based on the location of the 3-phase power as well as the available capacity, interconnection costs may be favorable for this location. Note, there is 3V0 protection at this substation.



## Albany County Cornell Coop

Ground mount; 24 Martin Road, Voorheesville, NY 12156

Please see the environmental photo below, per the NYS DEC Environmental Resource Mapper, this location is within a wetland buffer zone. It is also within the vicinity of bats listed as endangered or threatened.

This location will require some tree clearing. The County may choose to remove or relocate the current trees at this location. Also, if desired by the County, the solar developer may remove the trees and do a 1-for-1 replacement or relocate the current trees.

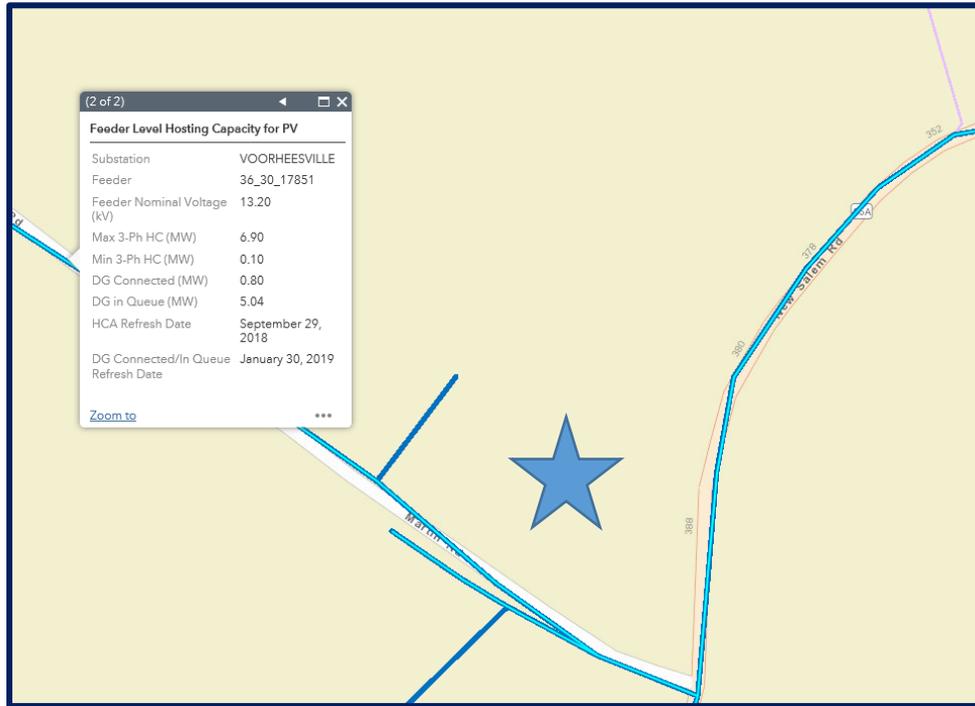


\*DEC Environmental Resource Mapper

Proposed System Size: 370 kW DC (310 kW AC)



The photo below is of National Grid's hosting capacity map, the blue star represents the location of the solar array. At this time there is capacity to connect the solar arrays to National Grid's infrastructure. Note, there is no 3V0 protection at this substation, which may be required.



## Albany County DPW Headquarters

Roof and ground mount; 449 New Salem Road, Voorheesville, NY

This location is near wetlands and wetland buffer zone. This location is in the vicinity of bats listed as endangered or threatened. This location should need a little tree/plant clearing. The County may choose to remove or relocate the current trees at this location. Also, if desired by the County, the solar developer may remove the trees and do a 1-for-1 replacement or relocate the current trees.



\*DEC Environmental Resource Mapper

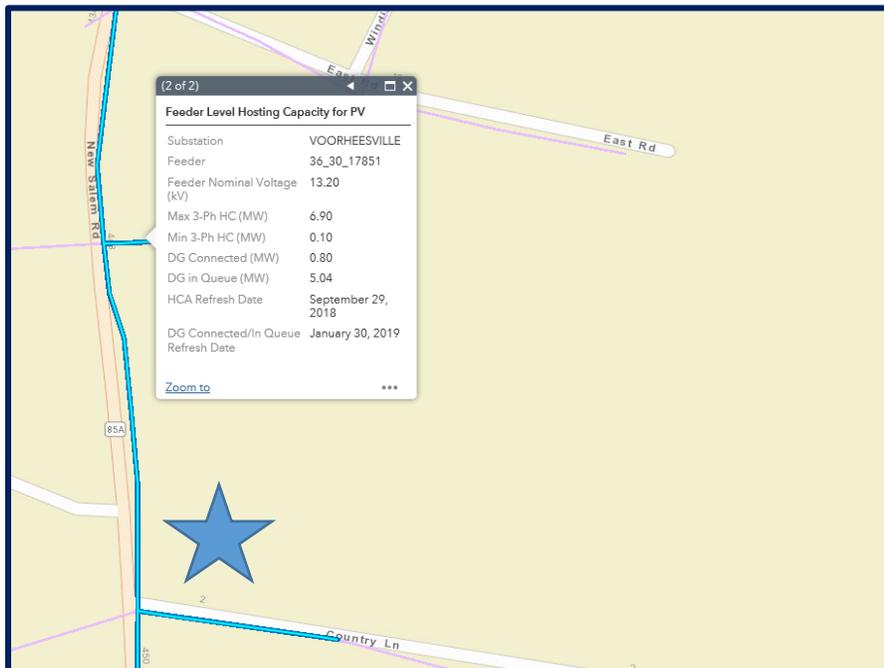
242 kW DC (215 kW AC)



## 200 kW DC (168 kW AC)



The photo below is of National Grid's hosting capacity map, the blue star represents the location of the solar array. At this time there is capacity to connect the solar arrays to National Grid's infrastructure. For this location there is ~960kW available at this time. Note, there is no 3V0 protection at this substation.



## Albany County Sheriff's Clarksville Station

Rooftop arrays; 58 Verda Ave, Voorheesville, NY 12186

This location is undergoing a capital project which entails roof replacements. At this time based on the current structure we can leave this project in the portfolio where in the RFP it will be made aware that this site will be undergoing roof replacements and potentially be removed from this phase of projects. This site is also incorporating another building in which the roof may be utilized to implement solar PV.



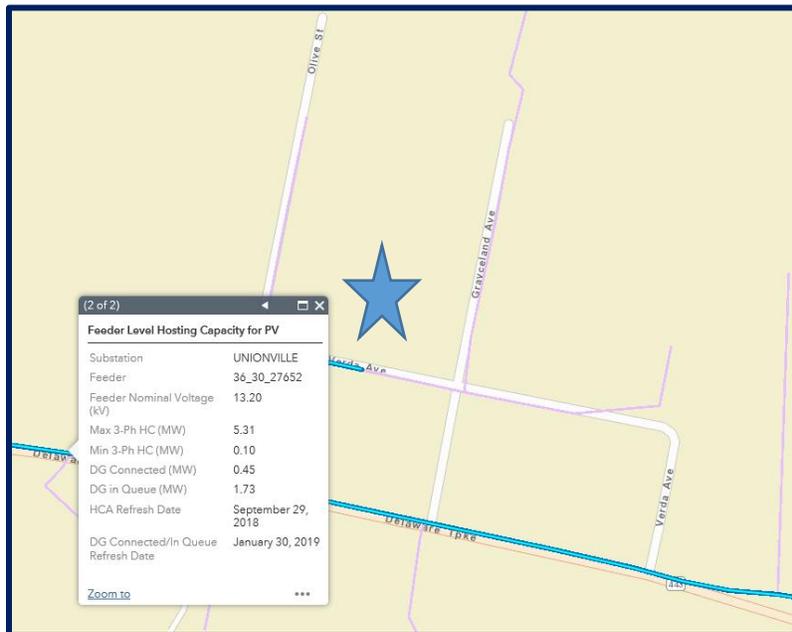
Proposed System Size 171 kW DC (168 kW AC)



## Proposed System Size 105 kW DC (96 kW AC)



The photo below is of National Grid's hosting capacity map, the blue star represents the location of the solar arrays. At this time there is capacity to connect the solar arrays to National Grid's infrastructure. Note, there is no 3V0 protection at this substation, which may be required.



## Albany County Correctional Facilities

Carport; 840 Albany Shaker Rd, Albany, NY 12211

This location only would be carports, compared to ground and rooftop applications, this would be a greater cost. Note, this is near an airport, will the FAA require a glare analysis for this site?



Projected System Size 748 kW DC (625 kW AC)



The photo below is of National Grid's hosting capacity map, the blue star represents the location of the solar array. At this time there is capacity to connect the solar arrays to National Grid's infrastructure. Note, there is no 3V0 protection at this substation, which may be required.

