

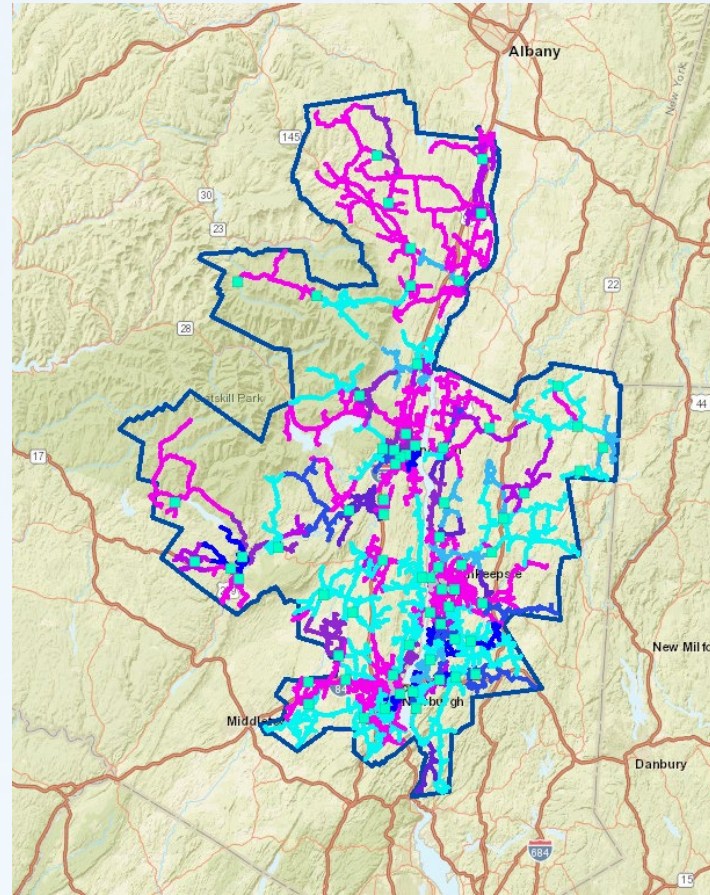
Central Hudson Hosting Capacity Maps

Dylan Piccorelli, Asst. Engineer

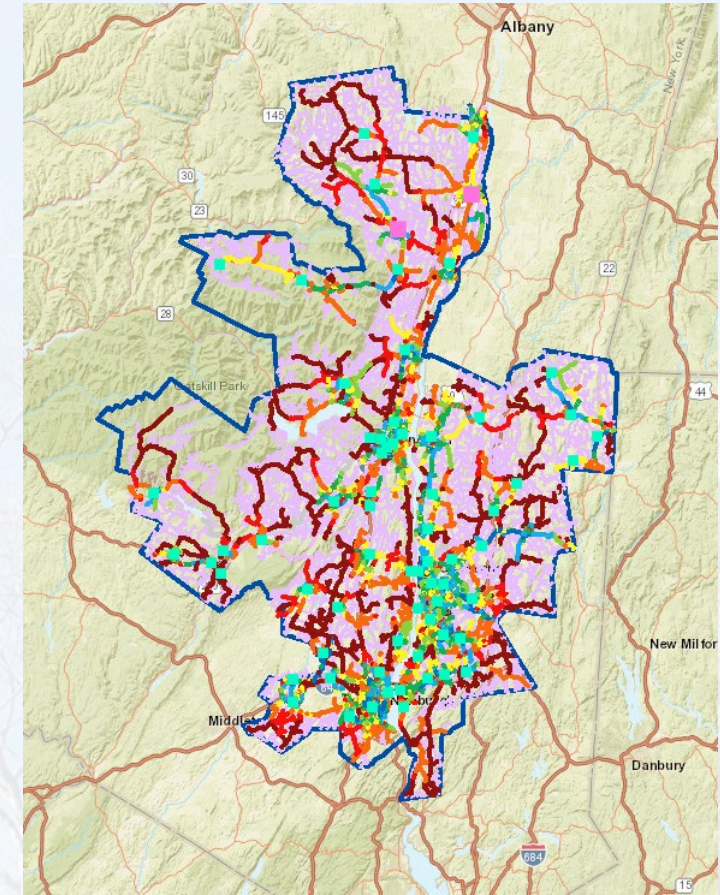
Central Hudson –Distribution Planning & Interconnections

Hosting Capacity Map

- Interactive online maps
- Estimates amount of DER that can be accommodated at locations across Central Hudson's service territory.
- Currently offered for PV and ESS based DER



Energy Storage Map

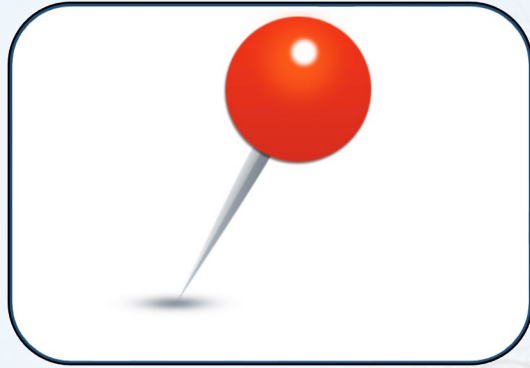


Photovoltaic Map

What Factors Affect Hosting Capacity?



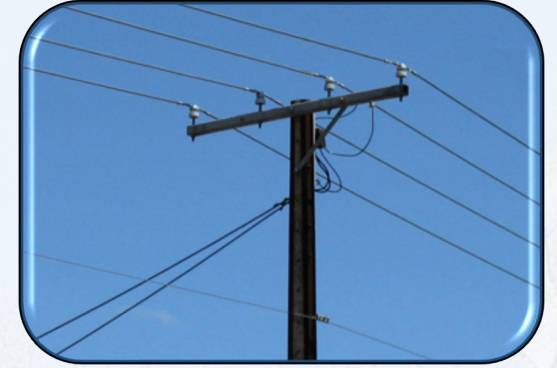
Circuit Loading



Location



Existing DG



Conductor Size



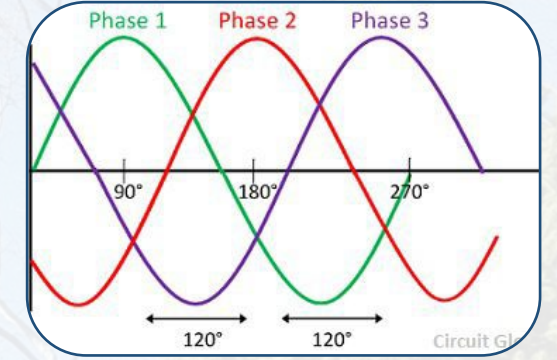
Protective
Devices



Distribution
Equipment



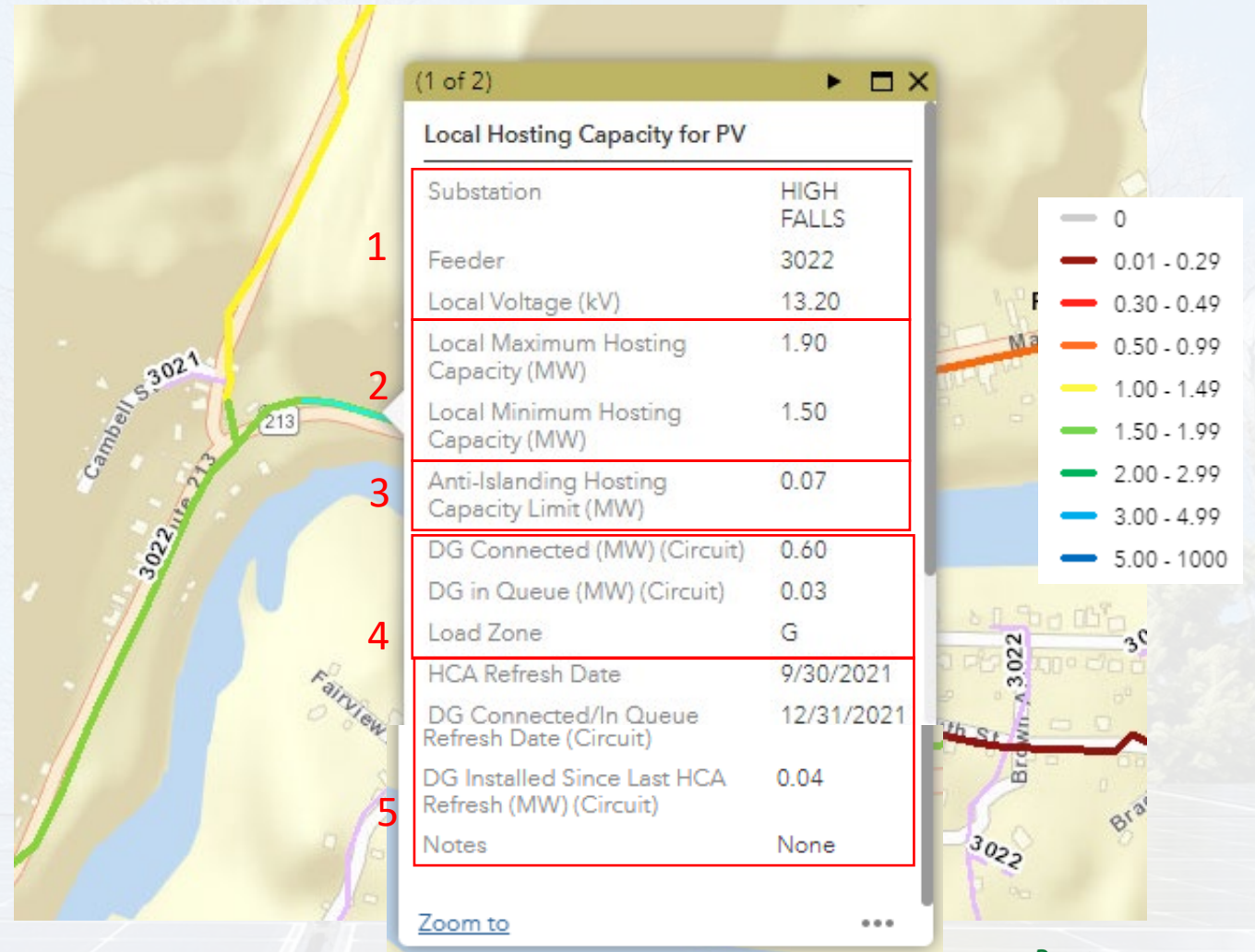
Voltage



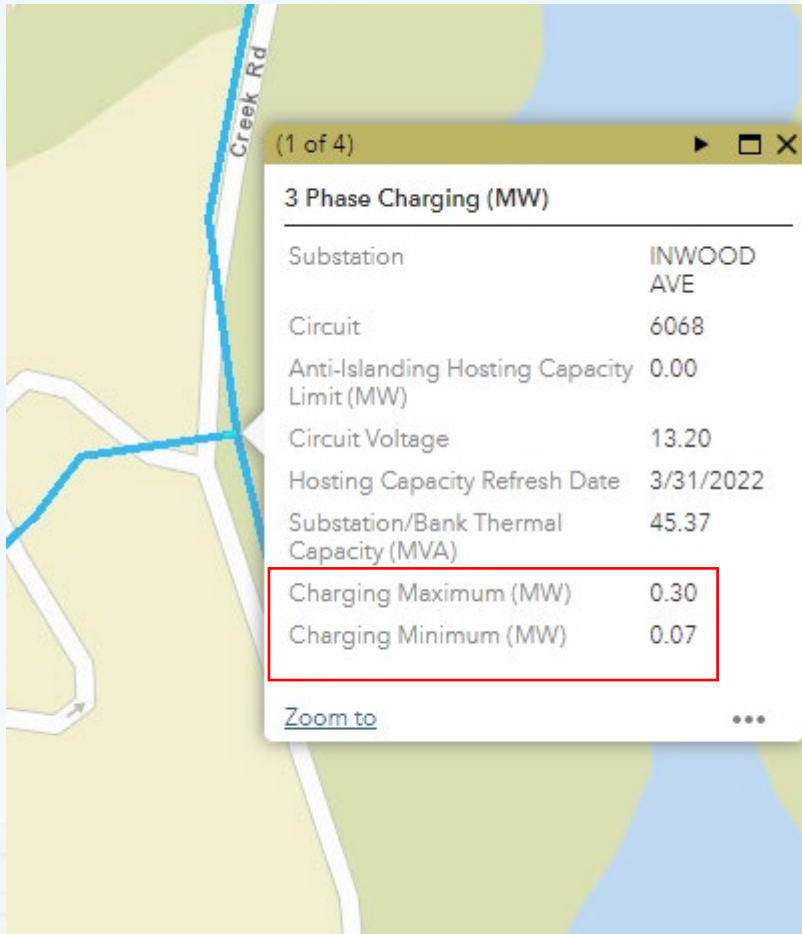
Phasing

PV Hosting Capacity Map Pop-Ups

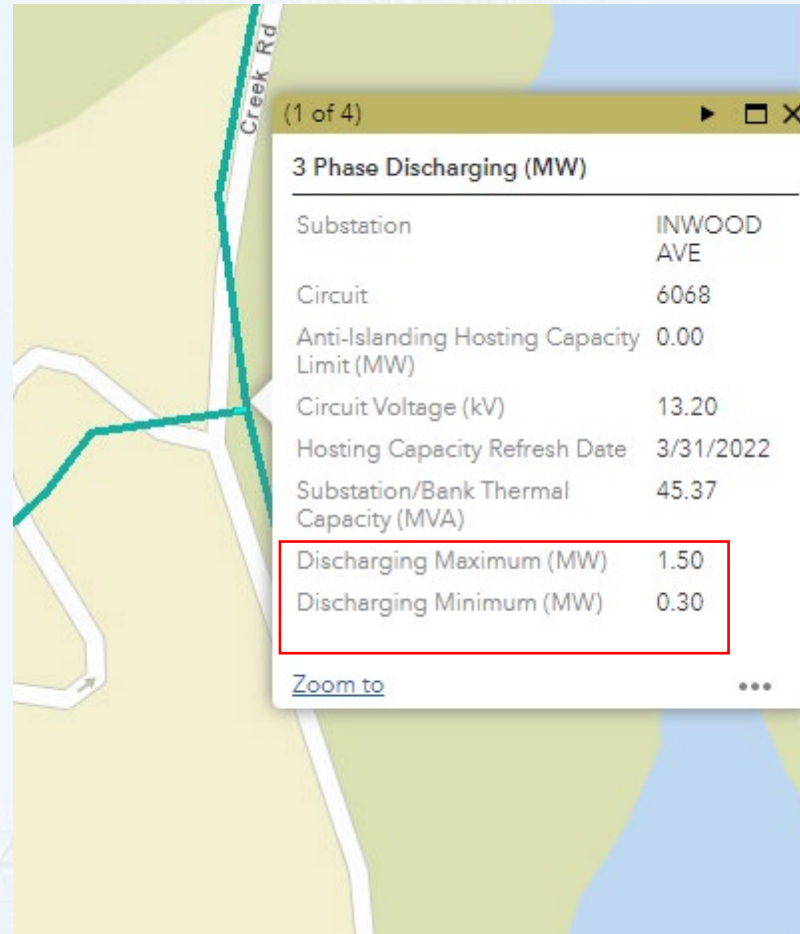
1. Substation Name, Feeder/Circuit #, Voltage
2. Local Hosting Capacity Max / Min
 - Range of Hosting Capacity across adjacent same-colored segments
3. Anti-Islanding Hosting Capacity Limit
 - 2/3 of Feeder Daytime Minimum Load
 - Exceeding value will likely result in need for Anti-Islanding mitigation
4. DG Circuit Information
 - DG Connected/In Queue =MW of DG connected and queued for the circuit
5. Hosting Capacity Analysis Information
 - HCA refresh date is the last time boxes 1, 2, and 3 were updated
 - DG Connected/In Queue refresh date is the last time box 4 was updated (monthly)
 - DG Installed Since Last HCA Refresh-High values can imply lower overall feeder hosting capacity than what is shown



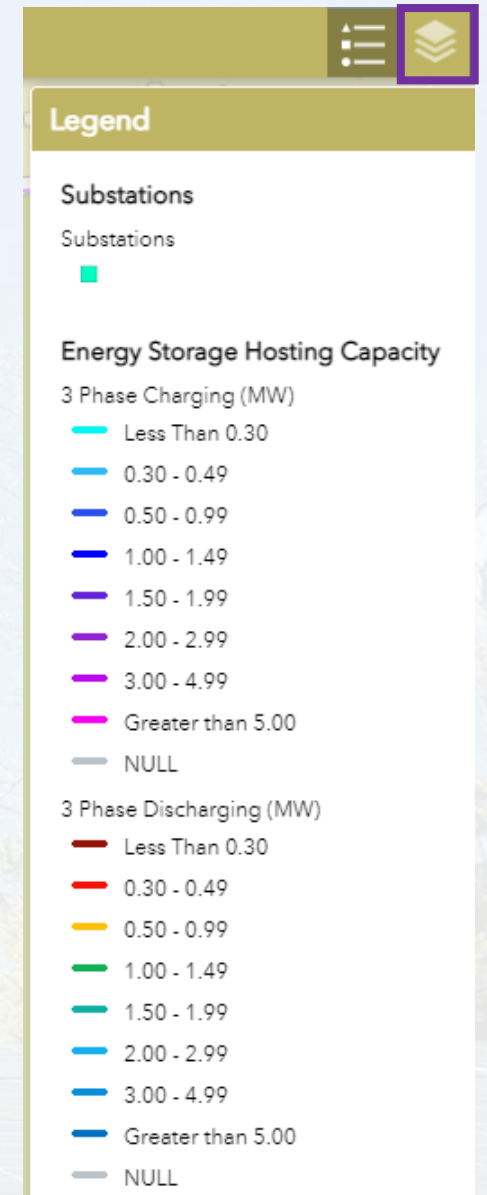
ESS Hosting Capacity Map Pop-Ups



Charging Layer



Discharging Layer



PV Hosting Capacity Substation Pop-Ups

1. DER Information on **Substation Bank**

2. Substation/Bank Peak Load and Substation Bank Thermal Capacity

3. Estimated 3VO Protection

- This is the estimated amount of DER that can interconnect prior to the installation of 3VO protection. If N/A is displayed, then the station would not require a 3VO protection installation.

4. CIP Project Window

- Currently planned substation work that has an impact on hosting capacity

(3 of 5)

Substation Level System Data: SOUTH CAIRO

1	Substation/Bank Installed DG (MW)	2.68
	Substation/Bank Queued DG (MW)	2.03
	Substation/Bank Total DG (MW)	4.71
2	2021 Substation/Bank Peak (MW)	14.08
	Substation/Bank Thermal Capacity (MVA)	19.90
3	Estimated 3VO Protection Threshold (MVA)	N/A
	Substation Backfeed Protection	Yes
	DG Connected/In Queue Refresh Date	2/5/2023
	HCA Refresh Date	9/30/2022

[Zoom to](#) ...

4 (5 of 5)

Substations with CIP Project

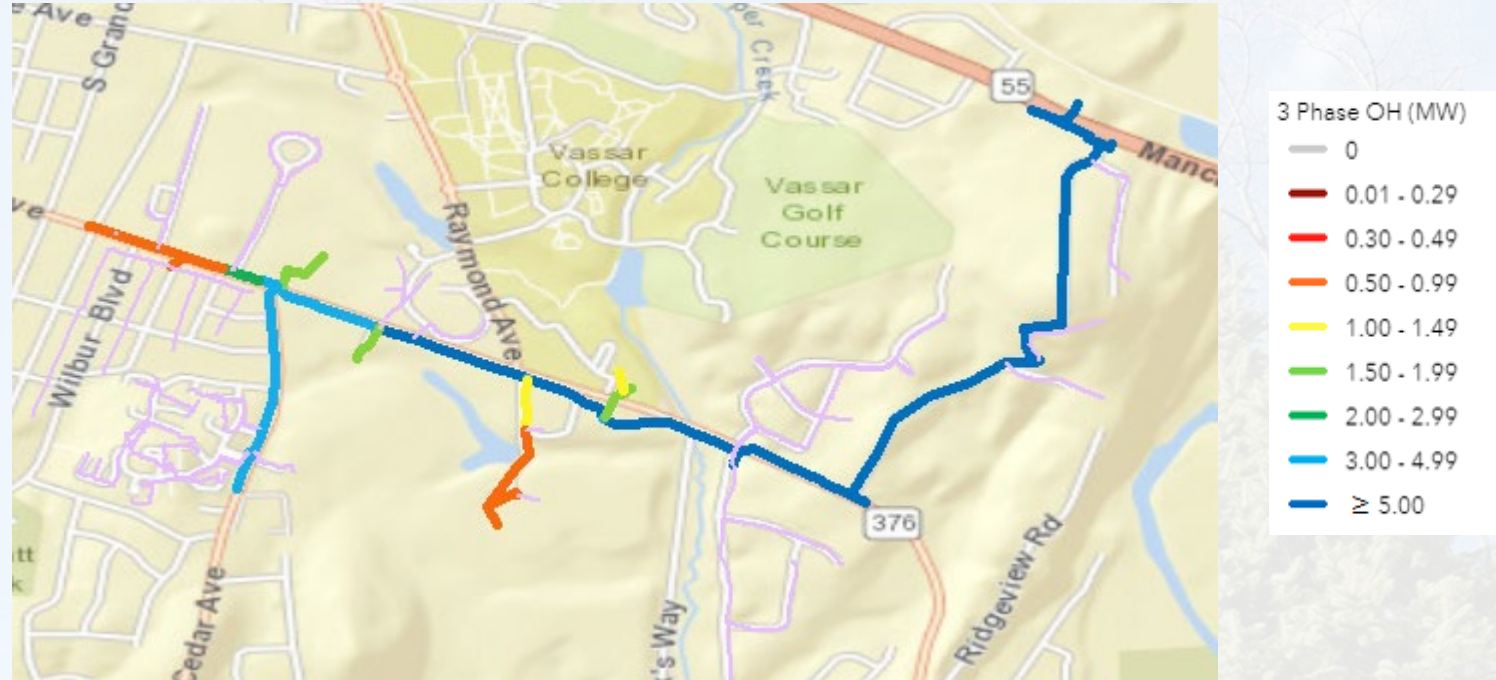
Substation	SOUTH CAIRO
Location	South Cairo
Estimated Incremental Impact in HC Availability at Substation	13.40
Anticipated In-Service Date	12/30/2024
Estimated Cost \$(000's)	7,844
Type of Project	Capital Investment Plan (CIP)
Notes	Install second transformer

[Zoom to](#) ...

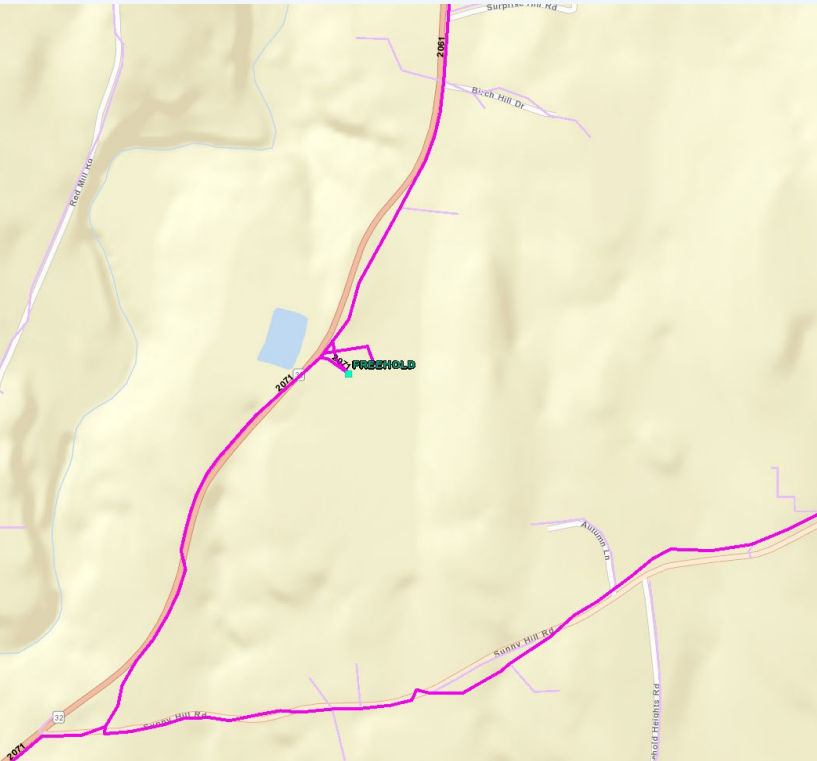
Example of a Strong PV Feeder

When looking for a “strong” feeder look for the following:

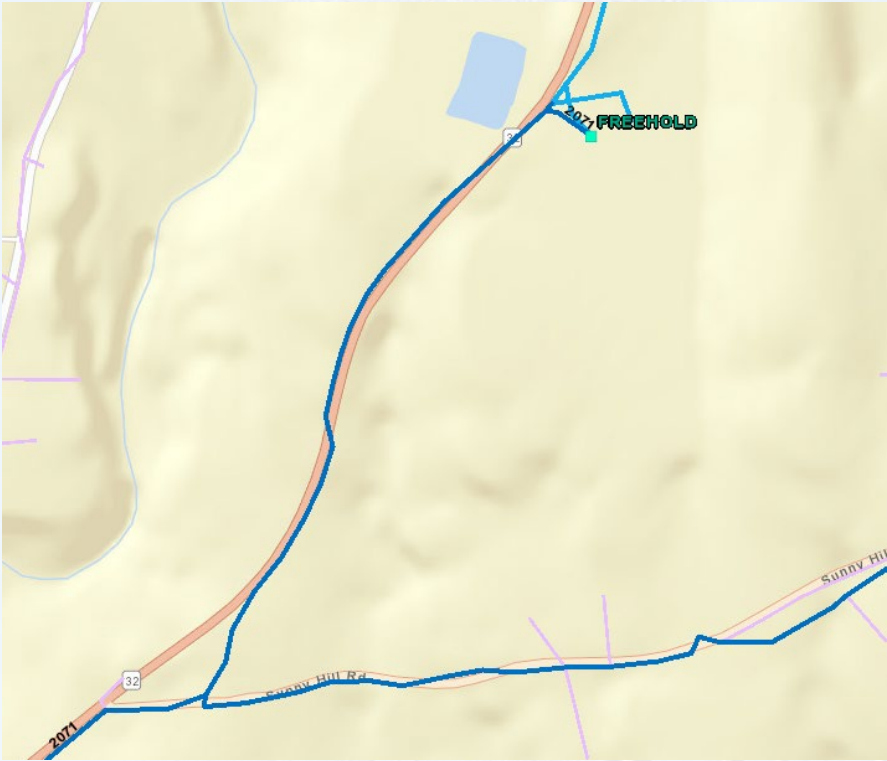
1. Slow drop-off of hosting capacity on mainline
2. High feeder head hosting capacity
3. Minimum hosting capacity > 0.5 MW



Example of a Strong ESS Feeder



Charging Layer



Discharging Layer

Layer List

- Substations
- Energy Storage Hosting Capacity
 - 3 Phase Charging (MW)
 - 3 Phase Discharging (MW)

3 Phase Charging (MW)	3 Phase Discharging (MW)
Less Than 0.30	Less Than 0.30
0.30 - 0.49	0.30 - 0.49
0.50 - 0.99	0.50 - 0.99
1.00 - 1.49	1.00 - 1.49
1.50 - 1.99	1.50 - 1.99
2.00 - 2.99	2.00 - 2.99
3.00 - 4.99	3.00 - 4.99
Greater than 5.00	Greater than 5.00
NULL	NULL

When looking for a “strong” feeder look for less loaded feeders

Example of a Weak PV Feeder

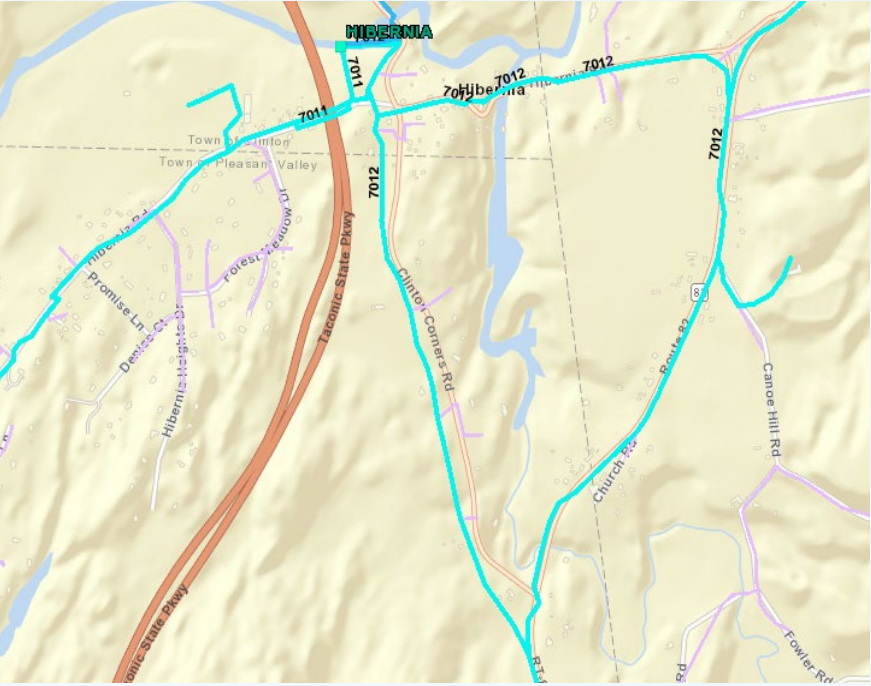
A weak feeder will have the following:

- 1. Quick drop-off of hosting capacity on mainline
- 2. Low feeder head hosting capacity

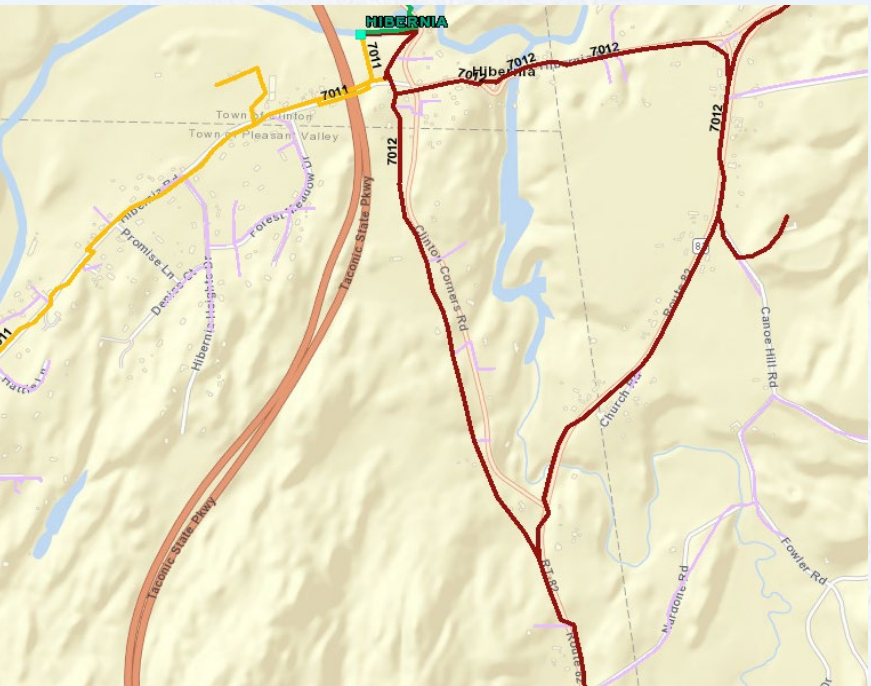
Attempting to interconnect a large DER system to a circuit such as this one will likely occur in high upgrade costs and possibly some downsizing



Example of a Weak ESS Feeder



Charging Layer



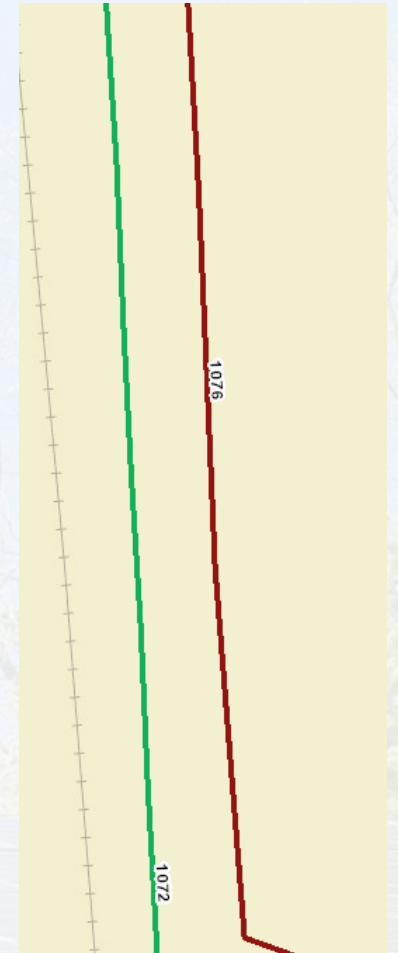
Discharging Layer

3 Phase Charging (MW)		3 Phase Discharging (MW)	
Cyan	Less Than 0.30	Dark Red	Less Than 0.30
Light Blue	0.30 - 0.49	Red	0.30 - 0.49
Blue	0.50 - 0.99	Yellow	0.50 - 0.99
Dark Blue	1.00 - 1.49	Green	1.00 - 1.49
Purple	1.50 - 1.99	Light Green	1.50 - 1.99
Dark Purple	2.00 - 2.99	Light Blue	2.00 - 2.99
Magenta	3.00 - 4.99	Blue	3.00 - 4.99
Grey	Greater than 5.00	Dark Blue	Greater than 5.00
Grey	NULL	Grey	NULL

This circuit is long and heavily loaded, which is non-ideal for ESS

Final Tips - Navigating the Hosting Capacity Map

1. Always be attentive on the queued-ahead DER and DER interconnected since the most recent refresh
2. For all circuits, especially weaker ones, the further you are from the substation the higher risk there is for expensive upgrade costs
3. Any significant and immediate drop in hosting may identify the location of a stepdown transformer. You can check local voltage within the pop-up boxes to confirm.
4. If the location of a proposed system is off of a double circuit, you can use the hosting capacity map to see which circuit will give you the best chance of avoiding high upgrade costs.



The Future of our Hosting Capacity Maps

1. Granular Project and Location Information
 - Better for information comparison and more direct for project details
2. More Granular Hosting Capacity Metrics
 - Primary Hosting Capacity would be the lowest value of the following criteria
 - Shows that Thermal from Generation is the limiting factor for this specific segment

Primary Level Data 3 Phase Energy Storage Discharge

Primary ID	39468075
Feeder	36_11_22358
Base Voltage (kV)	13.20
Primary Hosting Capacity (MW)	2.70
Primary Over-Voltage (MW)	3.30
Primary Voltage Deviation (MW)	5.40
Primary Regulator Deviation (MW)	10.00
Thermal from Generation (MW)	2.70
Anti-Islanding (MW)	10.00
Feeder Rating (MW)	8.25
Substation/Bank Rating (MVA)	38.00

Links

[Central Hudson Links](#)

[PV Methodology & Usage](#)

[ESS Methodology & Usage](#)

[Distributed Generation Website](#)

[Hosting Capacity Maps](#)

[Joint Utilities of NY Links](#)

[Joint Utilities Hosting Capacity](#)

[Joint Utilities Stakeholder Session 5-18-2022](#)

[Joint Utilities Stakeholder Session 11-2-2022](#)

Thank You

Support: DG@cenhud.com

