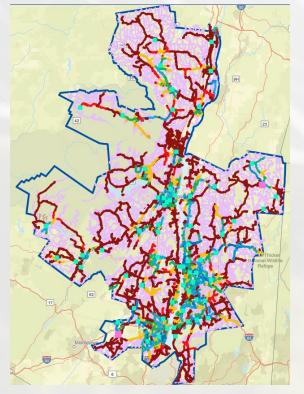
## Central Hudson – Hosting Capacity Maps

**Triana Cano, Assistant Engineer** 

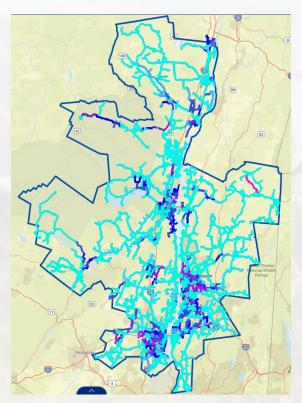
**Central Hudson – Distribution Planning & Interconnections** 



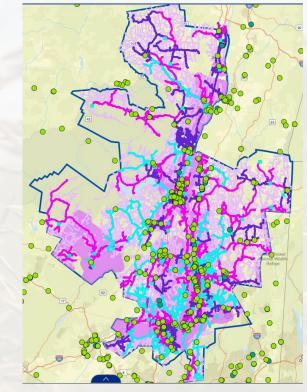
### Hosting Capacity Maps



Solar PV



**Energy Storage** 



Electrification

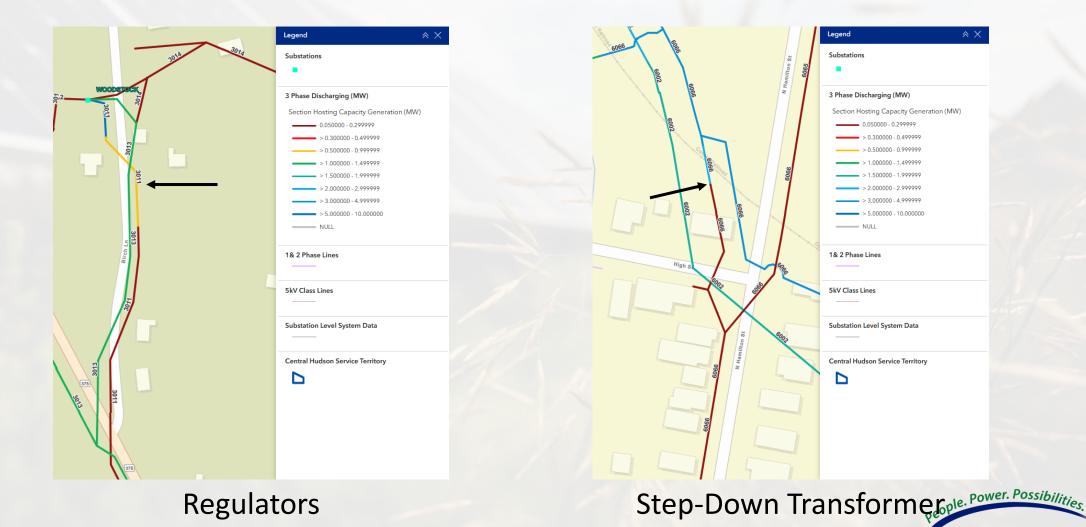


### Impacts on Hosting Capacity

- Circuit Loading
  - More load on a circuit helps hosting capacity for PV and ESS discharging but hurts ESS charging
- Existing DG
  - More DG on a circuit will hurt hosting capacity, less DG will help
- Distribution Equipment
  - Depending on the equipment, the devices can help or hurt hosting capacity
  - Hosting capacity takes into account regulation equipment for excessive operation
- Conductors
  - A conductor of a larger size will help hosting capacity, but smaller sizes will hurt it due to the conductor's rating causing thermal concerns



#### Effects of Distribution Equipment



Central Hudson

A FORTIS COMPANY

#### Solar PV Map Tab

Legend $pprox  imes$	
Substations	Î
· · · · · · · · · · · · · · · · · · ·	
Substations with CIP Project	
3 Phase OH (MW)	
Section Hosting Capacity (MW)	
> 5 - 1,000	
> 3.00 - 4.99	
> 2.00 - 2.99	
> 1.49 - 1.99	
> 1.00 - 1.49	
> 0.50 - 0.99	
> 0.30 - 0.49	
> 0.01 - 0.29	
0.0 - 0.0	
NULL	
3 Phase UG (MW)	
Section Hosting Capacity (MW)	
>5-1,000	
> 3.00 - 4.99	· .
> 2.00 - 2.99	/
> 1.50 - 1.99	
> 1.00 - 1.49	
> 0.30 - 0.49	/
0.0 - 0.0	
NULL	

	< >		≣ 1 of							
	Local Hosting Capacity for PV									
	SS (Zoom to									
	3 Phase Overhead									
	Substation	EAST PARK								
	Feeder	6075								
	Section ID	c226293255_OH								
	Section Voltage (kVLL)	13.20								
	Section Hosting Capacity (MW)	3.20								
	Flicker (MW)	4.60								
	Primary Over-Voltage (MW)	6.00								
	Primary Voltage Deviation (MW)	6.00								
	Regulator Deviation (MW)	3.20								
	Thermal from Generation (MW)	6.00								
	Anti-Islanding (MW)	0.90								
	DG Connected (MW) (Circuit)	0.36								
	DG in Queue (MW) (Circuit)	0.01								
	NYISO Load Zone	G								
	HCA REFRESH DATE	9/30/2023								
	DG Connected/In Queue Refresh Date (Circuit)	2/13/2025								
	DG Installed Since Last HCA Refresh (MW) (Circuit)	0.06								
0.	Notes	None								

All fields are updated annually or semiannually with each hosting capacity analysis

#### Section Hosting Capacity is determined by

- Primary Over-Voltage
- Primary Voltage Deviation
- Regulator Deviation
- Thermal from Generation

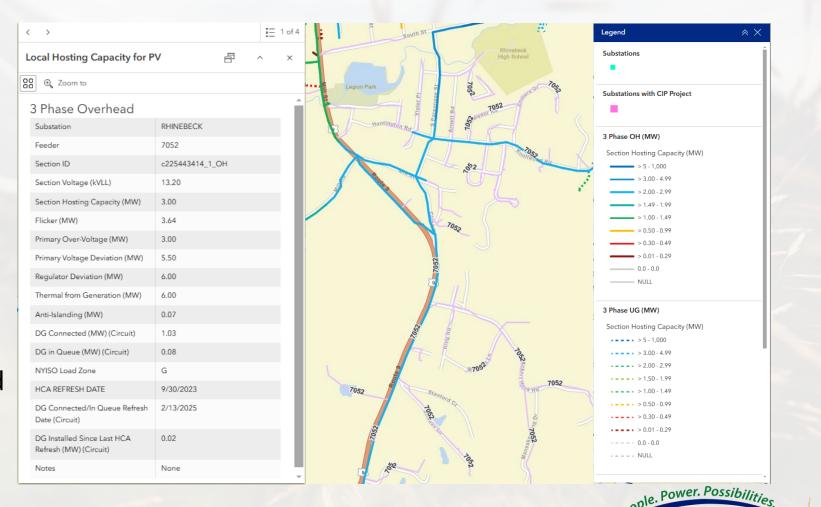
#### Updated monthly with queue data



### Ideal Feeder Option for Solar PV

- Gradual decrease in hosting capacity downstream of substation
- High hosting capacity at feeder
- High section hosting capacity

Attempting to interconnect a large DER system to a circuit similar to this would likely result in lower upgrade costs and would be less likely to be downsized



### Weak Feeder Option for Solar PV

- Drastic decrease in hosting capacity downstream of substation
- Low hosting capacity at feeder
- Low section hosting capacity

Attempting to interconnect a large DER system to a circuit similar to this would likely result in high upgrade costs and possible downsizing or a dedicated feeder

<	>		1	of 4	1	Pond			Legend
	ocal Hosting Capacity for P	v 昌 ^		×		A		Attlebury	Substations
8	B ⊕ Zoom to				Y	-M			Substations with CIP Project
	3 Phase Overhead			Î	-		1 Vite	Stiang	
	Substation	STANFORDVILLE					Provingen of		3 Phase OH (MW)
	Feeder	7072			1		4 (1)		Section Hosting Capacity (MW)
	Section ID	c225219384_OH			2			1 P Z	> 5 - 1,000
	Section Voltage (kVLL)	13.80					e <	$\lambda$	> 3.00 - 4.99
	Section Hosting Capacity (MW)	0.05					A V V		> 1.49 - 1.99
	Flicker (MW)	6.00							> 1.00 - 1.49
	Primary Over-Voltage (MW)	0.10							> 0.50 - 0.99
	Primary Voltage Deviation (MW)	6.00					Mcilture		> 0.01 - 0.29
	Regulator Deviation (MW)	0.05			Rd		Stanfordville	K I	0.0 - 0.0 NULL
	Thermal from Generation (MW)	2.10			X		1 ~~~		
	Anti-Islanding (MW)	0.00			$  \rangle$		$T \cap i$		3 Phase UG (MW)
	DG Connected (MW) (Circuit)	5.61					T I Kad	2	Section Hosting Capacity (MW)
	DG in Queue (MW) (Circuit)	5.04			1	X i			> 3.00 - 4.99
	NYISO Load Zone	G			man (	j-	Dangai		> 2.00 - 2.99
	HCA REFRESH DATE	9/30/2023				V C			> 1.00 - 1.49
	DG Connected/In Queue Refresh	2/13/2025				t re		-	> 0.50 - 0.99
	Date (Circuit)					Lund.		$\xi$ , $\chi$	> 0.30 - 0.49
	DG Installed Since Last HCA	-0.01				NI	1		0.0 - 0.0
	Refresh (MW) (Circuit)					A STA	NFORDWILLE VIEW		NULL
	Notes	None		Ţ		$\langle 0 \rangle \land$	- And	M	



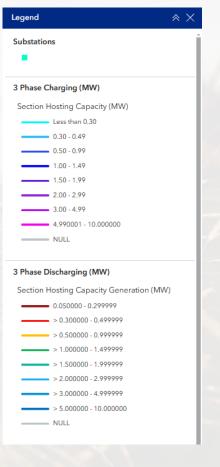
#### Energy Storage Map Tab

A	< >	i≣ 1 of 3										
79	3 Phase Charging (MW)	× ^ 톱										
Crosmour Dr	Co Q Zoom to											
ur Dr	Substation	RHINEBECK										
K	Feeder	7052										
N	Base Voltage (kVLL)	13.20										
EW	Section Hosting Capacity (MW)	2.00										
2	Primary Under Voltage (MW)	2.90										
$A \rightarrow$	Primary Voltage Deviation (MW)	6.00										
	Regulator Deviation (MW)	6.00										
612 6	Thermal from Load (MW)	2.00										
A A	DG Connected (MW)	1.03										
$\mathbf{k}$	DG in-Queue (MW)	0.08										
$\Lambda$	NYISO Load Zone	G										
	Hosting Capacity Refresh Date	9/30/2023										
3	DG Connected / In-Queue Refresh Date	2/13/2025										
	DG Installed Since Last HCA Refresh (MW)	0.02										
	Section ID	c225411292_OH										

Charging

i 2 of 3 < > 3 Phase Discharging (MW) P ~ X 88 @ Zoom to RHINEBECK Substation Feeder 7052 c225411292\_OH Section ID Base Voltage (kVLL) 13.20 Section Hosting Capacity 6.00 Generation (MW) Flicker (MW) 5.31 Primary Over-Voltage (MW) 6.00 6.00 Primary Voltage Deviation (MW) Primary Regulator Deviation 6.00 (MW) Thermal from Discharging 6.00 Anti-Islanding Limit Generation 0.07 (MW) DG Connected (MW) 1.03 DG In-Queue (MW) 0.08 NYISO Load Zone G Hosting Capacity Refresh Date 9/30/2023 DG Connected/In Queue Refresh 2/13/2025 Date DG Installed Since Last HCA 0.02 Refresh (MW)

#### Discharging





#### Substation Data Tab

<	>		≣ 3 of 3
S	ubstation Level System Data		^ ×
00	g 🕘 Zoom to		
	c225411292_OH		
	Substation	RHINEBECK	
	Substation/Bank Installed DG (MW)	5.00	
	Transmission Node PTID	355582.000000	
	Substation/Bank Queued DG (MW)	1.20	
	Substation/Bank Total DG (MW)	6.20	
	2022 Substation/Bank Peak (MW)	18.36	
	Substation/Bank Thermal Capacity (MVA)	46.21	
	Estimated 3VO Protection Threshold (MVA)	N/A	
	Substation Backfeed Protection	Yes	
	DG Connected/In Queue Refresh Date	2/13/2025	
	DG Installed Since Last HCA Refresh (MW)	0.02	
	HCA Refresh Date	9/30/2023	



### Summarized Hosting Capacity Maps Tips

- Locations closer to a substation will result in higher hosting capacity and likely fewer upgrades
- Check the DG interconnected and in queue on the feeder to get an idea of how much hosting capacity may be left
- Avoid circuits with drastic drops in hosting capacity, they may have a strict limiting factor
- Location will determine POI, circuit, and substation



### Hosting Capacity Map Status Updates

- Implemented a new load flow software
- New ESRI GIS map
- Anticipate map update in April that may differ slightly from the current version



#### **Relevant Sources**

Central Hudson - Solar Energy & Distributed Generation Homepage

Central Hudson - Hosting Capacity Maps

Central Hudson - Solar PV Hosting Capacity Map

Central Hudson - Energy Storage Hosting Capacity Map

Joint Utilities - Hosting Capacity



# Thank you!

