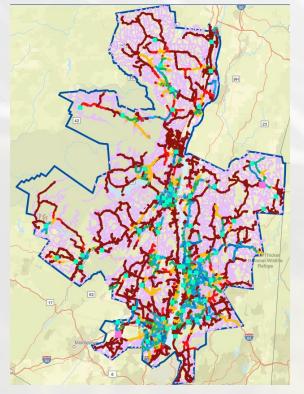
Central Hudson – Hosting Capacity Maps

Triana Cano, Assistant Engineer

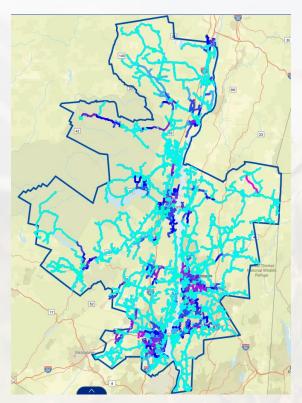
Central Hudson – Distribution Planning & Interconnections



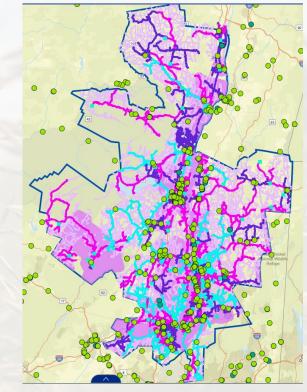
Hosting Capacity Maps



Solar PV



Energy Storage



Electrification

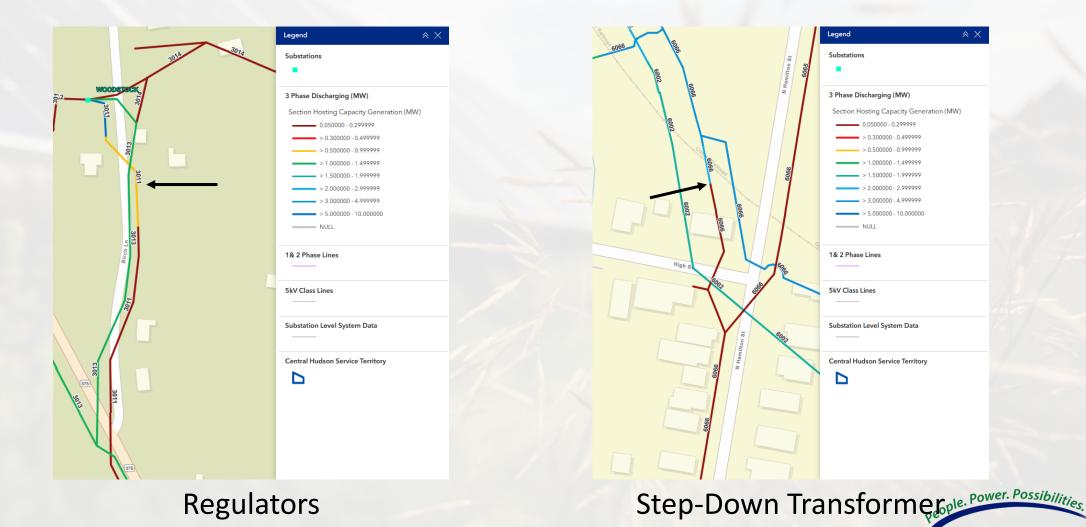


Impacts on Hosting Capacity

- 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

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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

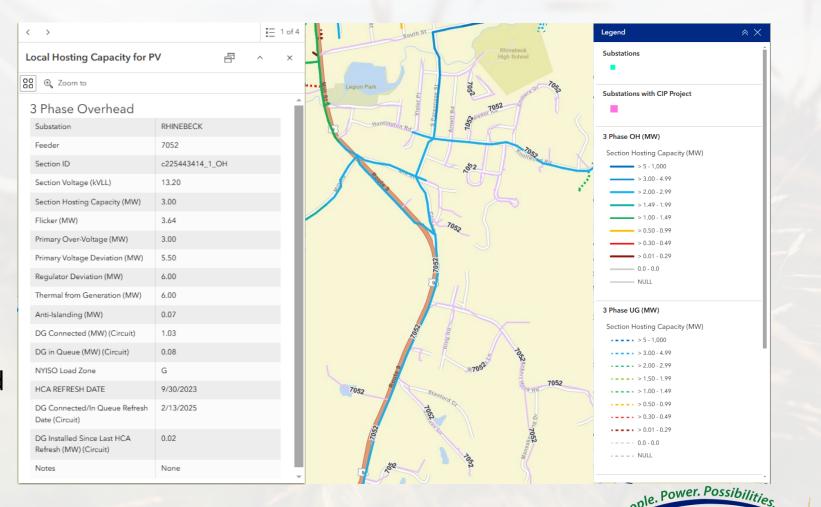
Updated monthly with queue data



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 <	λ	> 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.		ξ , χ	> 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	



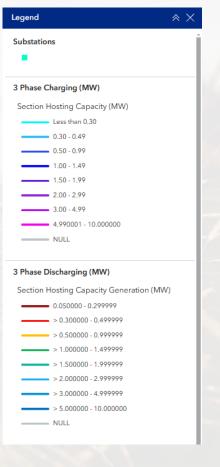
Energy Storage Map Tab

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										
Λ	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!

