JOINT UTILITIES
OF NEW YORK

Hosting Capacity Maps

Use Case Guidance

How to use the maps (and how to not to use these maps)

✅ Appropriate uses (screening & early-stage planning)

- **Early-stage siting & screening:** Identify areas that are likely **more/less constrained** for PV, storage, and new load.
- **Site comparison:** Narrow a long list of candidate sites to a short list of higher-likelihood options.
- **Program targeting & planning:** Inform where incentives, outreach, and phased deployment may be most effective.
- **Upgrade prioritization (high-level):** Flag feeders/banks that appear constrained to inform longer-term modernization conversations.
- **Better interconnection conversations:** Prepare more informed questions and pre-application discussions (e.g., "what's driving the constraint here?").

❌ What these maps are NOT intended to replace

- **Interconnection process and studies:** They do not provide approval or guarantee timelines/costs.
- **Technology-specific engineering design:** They do not substitute for detailed design review (equipment configuration, controls, protection settings).
- **Protection/fault studies & power quality studies:** Especially important for non-inverter resources and atypical operating modes.
- **Permitting or construction-ready feasibility:** A "good" map result is not a permitability determination.

Use-Case Overview

Understanding and using the Joint Utilities' Hosting Capacity and Electrification Maps enables smarter, faster, and more strategic decisions across New York's clean energy transition.

Use Case 1: Siting Solar Projects

- Identify feeders or segments with available hosting capacity for PV.
- Avoid costly delays or upgrades by targeting grid-ready locations.
- Accelerate interconnection with data-informed proposals.

Use Case 2: Siting Energy Storage

- Assess where the grid can support battery systems for charging *and* discharging.
- Support reliability, time-shifting, and clean energy goals with minimal grid impact.
- Compare sites to find optimal value and feasibility.

Use Case 3: Electrification Planning

- Pinpoint areas with available capacity for new load, such as:
  - Electric vehicle charging hubs
  - Building electrification (heat pumps, electric stoves, etc.)
- Compare summer vs. winter capacity to align with seasonal needs.
- Inform municipal planning, program targeting, and equitable infrastructure expansion.

More PV HC Map Use-Cases

- Shows where solar PV can interconnect without exceeding voltage, flicker, or thermal limits.
- Highlights feeders nearing capacity to inform upgrades or voltage improvements.
- Supports developer screening for feasible interconnection sites.
- Provides planners insight into DER hosting trends and policy design.
- Helps prioritize feeder modernization and hosting capacity enhancements.
- Serves as a baseline for tracking CLCPA and DER integration progress.

Proxy Technologies – PV HC Maps

Can Be Used as Proxy For… (When)	Why It Can Serve as a Proxy (Shared Constraints/Behavior)	Limitations / Risks of Using as Proxy
Other DER that export to the grid – e.g. small wind, hydro, or CHP generation (especially inverter-based systems).	**Shows export-constrained capacity:** PV maps are calculated by evaluating voltage rise, thermal loading, and other limits from injecting power. These are the same fundamental constraints any generator would face. In effect, the PV hosting map reveals the feeder's maximum generation export that can be added without upgrades. A high PV HC value (green) indicates a robust grid segment with headroom – likely able to accommodate various DER exports – while a near-zero PV HC (red) flags a constraint that would impede any additional generation on that circuit.	**Profiles may differ:** PV hosting assumes full solar output at midday during light load conditions; a generator with output at night or continuous output could hit limits not shown by the PV map's daytime snapshot. **Inverter vs. synchronous:** PV maps assume inverter-based DER. Synchronous generators of similar size can contribute high fault currents and other dynamic effects not captured by the PV map – so a feeder that looks "open" for PV might still require upgrades for a synchronous machine (always check fault current limits separately). **Export-only:** The PV map says nothing about capacity for new load or charging (import). Using it to site **new loads** (like EV chargers) is inappropriate – generation constraints occur at different times than peak-load constraints, so a feeder open for PV might already be near its limit at peak demand. **Not a guarantee:** All hosting maps are planning indicators, not guarantees. PV hosting capacity is an estimate under certain conditions; any project must still undergo utility review/study to confirm it won't cause issues.

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More BESS HC Map Use–Cases

Charging

- Shows where batteries may be able to safely draw energy without exceeding thermal or voltage limits.
- Highlights feeders that may have available load margin for charging.
- Supports peak-demand planning and identifies circuits that may need upgrades.
- Reveals opportunities for off-peak load growth (e.g., EV hubs, renewables).
- Aids analysis of transformer and feeder loading.

Discharging

- Shows where batteries may be able to export power without over-voltage or flicker.
- Highlights feeders with limited backfeed capability for voltage control planning.
- Reveals potential available export headroom for interconnection and policy planning.
- Flags circuits at risk of reverse-flow instability, guiding upgrade priorities.
- Informs hosting capacity and grid modernization strategies.

Charging behaves like load; discharging behaves like generation. Hosting capacity values are screening-level and must be confirmed through interconnection

Proxy Technologies – BESS HC Maps, Charging

Can Be Used as Proxy For... (When)	Why It Can Serve as a Proxy (Shared Constraints/Behavior)	Limitations / Risks of Using as Proxy
Large new industrial/commercial loads (e.g. a data center expansion coincident with peak hours)	▪ Storage HC charging analysis uses the peak-load scenario, same as a large facility drawing power during the highest demand period. ▪ Both stress the grid similarly: heavy peak-time consumption hits the same thermal and voltage constraints (line capacity limits, low-voltage risks) as a battery charging at peak.	▪ Assumes the new load would add to the existing peak – if the facility shifts usage off-peak, actual capacity could be higher (the map is a worst-case snapshot). ▪ Does not account for unique load nuances (e.g. motor start surges, harmonics) or future load growth – it's an initial screen, not a substitute for a full interconnection study.
Flexible deferrable loads (e.g. water pumping or thermal storage scheduled off-peak)	▪ Both involve drawing discretionary energy from the grid; they face the same limits (conductor capacity, voltage drop) whenever they operate. ▪ The charging HC map sets a safe baseline – any load kept under that peak-time limit will be within grid capabilities (with even more headroom at true off-peak times when the grid is lightly loaded).	▪ If operated strictly in off-peak or high-generation periods, this proxy is conservative – the feeder could likely handle more than the map's peak-based value in those hours. ▪ However, if the load unintentionally overlaps with peak demand, it could trigger constraints. Active coordination is required, since the map doesn't reflect control strategies to avoid peak times.
Site-specific high-power EV charging hubs (fleet depots, highway DC fast-charger sites)	▪ High-capacity chargers draw large bursts of load, much like a BESS charging, causing comparable stresses (voltage sag, thermal loading) on local circuits. ▪ Unlike the feeder-wide EV capacity map, the BESS charging layer shows location-specific limits (per line section) – highlighting if a particular site (e.g. end of a long feeder) would hit local constraints for a big charging load.	▪ The map assumes a worst-case: all chargers pulling at peak times. In reality, EV charging may be staggered or off-peak, so actual feasible load could be higher (i.e. the proxy is on the safe/conservative side for managed charging). ▪ Does not capture EV-specific issues like diverse charging profiles or power-quality impacts (e.g. flicker from fast charger turn-on). It's a planning-level approximation – d

Proxy Technologies – BESS HC Maps, Discharging

Can Be Used as Proxy For... (When)	Why It Can Serve as a Proxy (Shared Constraints/Behavior)	Limitations / Risks of Using as Proxy
Continuous or dispatchable DG (e.g. CHP or fuel cell running during low-demand hours)	▪ The discharging layer simulates exporting during minimum-load conditions – exactly when a constantly-run generator would most likely cause backfeed or over-voltage issues on the feeder. ▪ Both a battery exporting and a CHP/fuel cell online overnight face similar constraints: risk of voltage rise on lightly loaded lines and potential reverse power flow limits at substation or regulators.	▪ The map assumes worst-case low demand – if the generator can modulate or isn't at full output in those hours, the actual hosting capacity may be higher than shown. ▪ Focuses on steady-state limits (voltage, thermal); other factors (e.g. protection upgrades for anti-islanding, fault current, etc.) aren't fully captured. Using this proxy highlights capacity issues but doesn't replace a detailed interconnection assessment.
Off-peak renewable generation (e.g. wind farm or hydro output peaking at night)	▪ These resources often generate most when loads are low (late-night or seasonal off-peak). That mirrors the battery discharging scenario – both will hit the same limitations when injecting into a lightly loaded grid (feeder over-voltage, line/regulator capacity exceeded, etc.). ▪ The storage HC map's min-load case highlights areas prone to voltage rise or thermal overload from any injection during light demand, which is directly applicable to night-peaking renewables.	▪ The map's snapshot is conservative – actual wind/hydro output fluctuates and may not always coincide with the absolute minimum load period, so the grid might accommodate a bit more generation at times than the static hosting limit suggests. ▪ Does not reflect dynamic variability (rapid output swings). For instance, sudden wind gusts might cause flicker beyond steady-state limits (though the map's voltage deviation criteria partially address this risk). Developers may need additional analysis for control or curtailment strategies.
Peak-time injections (V2G or battery peak-shaving during high demand)	▪ Even when exporting at peak demand (when overall voltage support is better), total injection is still constrained by physical circuit capacity (conductor thermal limits, transformer loading, etc.). The discharging map highlights those hard limits on export power for any scenario. ▪ Both involve pushing power onto the grid (like a generator); while peak-hour injections avoid worst-case voltage rise, they still rely on available headroom in infrastructure – similar constraints to those identified by the map's hosting values (just with more inherent margin at peak).	▪ Because the map assumes minimum load, it underestimates capacity for strictly peak-hour exporters – the feeder can likely accept more output at peak than the map's value. This proxy is very conservative for resources guaranteed to only discharge during high load times. ▪ However, it assumes perfect timing control. If these resources ever inject at unintended low-load periods, they may quickly encounter the constraints shown on the map. Operational safeguards (e.g. controls or contractual limits to prevent off-peak export) are needed, since the map doesn't account for scheduling-based mitigation.

More Electrification Map Use-Cases

- **Pre-screen siting for large new loads:** DCFC hubs & depots, fleets, campuses, multifamily electrification, heat-pump conversions.
- **Targeting & phasing:** steer incentives and outreach toward feeders with headroom; defer or phase projects where headroom is tight.
- **Upgrade planning:** flag feeders/banks likely to need reconductoring, transformer upsizing, or sectionalizing as electrification grows.
- **Seasonal risk view:** quickly see winter- vs summer-constrained areas to plan heat-pump adoption and managed charging.
- **Community & resilience:** site resilience hubs and public charging where capacity exists, align with equity overlays.
- **Permitting/interconnection prep:** help large customers get realistic timelines and avoid applications on clearly constrained feeders.

Proxy Technologies – Electrification Maps

Can Be Used as Proxy For... (When)	Why It Can Serve as a Proxy (Shared Constraints/Behavior)	Limitations / Risks of Using as Proxy
Any new large load or demand increase – e.g. siting EV charging hubs (public fast chargers, bus/truck depot chargers), planning building electrification (electric heat, industrial electrification in neighborhoods), or other significant load additions. These maps guide where the grid has room for additional demand without immediate upgrades. (Some utilities label this as an "EV Hosting" or load capacity map – it's for importing power.)	**Shows spare capacity at peak:** An electrification hosting map focuses on the peak-load constraints of the grid. It identifies how much extra demand can be added to a feeder or transformer before hitting thermal limits or voltage drop issues at peak times. In other words, it's the mirror image of a PV map: instead of how much generation you can add at light load, it tells you how much load you can add at heavy load. For example, a feeder might have ~1 MW of headroom before the hottest summer afternoon or coldest winter evening peak is at capacity. These maps provide seasonal capacity values (e.g. separate summer vs. winter limits) to reflect different peak conditions – summer ratings are used to gauge EV charging and A/C load, while winter ratings show capacity for electric heating loads. This alignment with real peak conditions lets planners and developers target sites that can absorb new demand (charging, electrification) with minimal grid impact.	**Generation not addressed:** A load-focused map does not evaluate voltage rise or backfeed – it should not be used to infer PV or generator hosting capacity. A feeder might show plenty of load capacity but still have no room for backfeeding (or vice versa); the maps for generation and load are not interchangeable without analysis. Always use the proper map for the type of DER (generation vs. load) to avoid misinterpretation. **Timing and coincidence matter:** The electrification map assumes new loads will contribute during the feeder's peak period (worst case). If your load will mostly occur off-peak, the feeder might handle more than the map's stated limit. Conversely, if multiple "extra" loads all occur together, the combined impact could exceed what each alone suggests. For instance, a feeder could show zero PV capacity (midday generation causes backfeed) but still have room at night for EV charging if nighttime load isn't maxed out – or it might show some PV capacity yet actually be near its thermal limit on hot afternoons, leaving little room for more air conditioning or EV load. Thus, when using a load HC map, consider how the new demand aligns with existing load patterns. Managed charging or load shifting can sometimes increase usable capacity, but that coordination isn't reflected in the static map values. **Check seasonal and local limits:** Pay attention to whether the summer or winter capacity is the limiting factor for your project's load profile. (For example, a feeder might accommodate more EV charging in summer but be constrained on a cold winter peak if a lot of electric heat is added.) Additionally, these maps are typically at the feeder/substation level – they might not show local bottlenecks on secondary or service lines. A neighborhood transformer or voltage regulator could limit a specific site even if the feeder overall has capacity. **Not a substitute for planning/studies:** The electrification map is a screening tool to indicate "good candidate" areas. Any large load addition (e.g. a new fast-charger station or cluster of heat-pump installations) should still be reviewed with the utility. The map's values are estimates; final connection may require infrastructure upgrades or operational solutions if real-world conditions differ.