Centralized Hosting Capacity Map FAQs

1. What is the primary purpose of each map?

Across the Joint Utilities of New York, these maps serve one function: early-stage screening. They provide a public, standardized view of where the distribution system appears more or less capable of accommodating (1) new distributed generation, (2) storage charging/discharging, or (3) new electrification load under defined modeling assumptions. They are not an interconnection approval and they do not replace utility engineering review.

PV Hosting Capacity (PV HC) Map

Primary purpose: Provide a location-specific estimate of how much additional PV generation (export) can be added before modeled distribution constraints are reached (e.g., voltage, thermal loading, flicker/regulator impacts). This helps solar developers and customers identify feeders/segments that appear more suitable for PV interconnection during initial site screening.

BESS Hosting Capacity (BESS HC) Map

Primary purpose: Provide location-specific estimates of how much battery storage can interconnect in each operating mode:

- Charging (as added load), and
- Discharging (as export/generation).

Because the grid limits that bind for charging vs. discharging are different, the BESS map is designed to support realistic early screening based on the battery's intended operation.

Electrification Map

Primary purpose: Provide a location-specific view of remaining thermal headroom for new electric load, shown for summer and winter peak conditions. This supports early planning for electrification-related load additions (e.g., EV charging and building electrification) and helps stakeholders anticipate where load growth may be more likely to require upgrades or managed solutions.

2. What is shown on each map?

Each map displays location-specific distribution system data relevant to the type of resource being evaluated. The maps are interactive and allow users to view color-coded capacity values and detailed attributes at the feeder or segment level.

PV Hosting Capacity (PV HC) Map

A. Sub-Feeder (3-Phase Segment) Hosting Capacity

- Color-coded lines representing available PV hosting capacity in megawatts (MW).
- The displayed color reflects the minimum constraint limit identified in the hosting capacity analysis for that segment.

B. Feeder and Substation Information - When a Segment is Clicked, the Pop-Up Typically Includes:

- Feeder name/ID
- Substation name
- Maximum and minimum hosting capacity values
- Constraint breakdown (thermal, voltage, regulator, flicker, etc.)

C. Connected Generation

- Existing DER already interconnected on the feeder.

D. Queued Generation

- Projects in the interconnection queue that have not yet been built.

E. Optional Map Layers Depending on the Utility:

- Substations
- Voltage level
- Network vs. non-network system view (where applicable)
- Sub-transmission lines (in some territories)

BESS Hosting Capacity (BESS HC) Map

The BESS Map contains two separate layers, each representing a different operating mode.

A. Charging Layer (Load Hosting Capacity) Shows:

- Maximum additional battery charging load (MW) that can be added before modeled violations occur.
- Color-coded by charging hosting capacity.
- Feeder/substation information in pop-ups.
- Minimum and maximum charging values by constraint.

- This layer reflects system ability to absorb additional load.

B. Discharging Layer (Generation Hosting Capacity) Shows:

- Maximum battery export (MW) that can be injected before modeled violations occur.
- Color-coded by discharging hosting capacity.
- Feeder/substation details.
- Minimum and maximum discharge values by constraint.
- This layer reflects system ability to accommodate additional export.

Additional Information on BESS Map - Both Layers Typically Include:

- Connected generation
- Queued generation
- Substation information
- Constraint-specific limits in pop-ups
- The user must toggle between charging and discharging views.

Electrification Map

The Electrification Map displays remaining thermal headroom for new load, not generation hosting capacity. It shows:

A. Remaining Load Capacity (MW)

- For each feeder and, in some territories, substation bank:
  - Summer headroom (Summer rating – Summer peak load)
  - Winter headroom (Winter rating – Winter peak load)
- The user selects which seasonal view to display.

B. Feeder and Substation Data - Pop-ups Typically Include:

- Feeder ID
- Transformer/substation bank ID
- Seasonal ratings
- Seasonal peak load

- Remaining capacity (MW)

C. Optional Overlays Depending on the Utility:

- Disadvantaged Community (DAC) overlays
- EV target zones
- Network vs. non-network areas
- These overlays are informational and not part of the headroom calculation.

Key Distinction Across the Maps

- PV HC Map: Shows export (generation) hosting capacity.
- BESS HC Map: Shows both export hosting capacity (discharging) and load hosting capacity (charging).
- Electrification Map: Shows remaining thermal headroom for new load, based on seasonal peak conditions.

All three maps display modeled or calculated values at the feeder or segment level and provide pop-up detail for transparency. None of the maps represent a final interconnection determination.

3. How should the capacity values displayed on each map be interpreted?

The MW values shown on each map represent modeled or calculated thresholds under defined system conditions. They indicate when a specific technical limit would be reached, not a guarantee of interconnection approval. The meaning of the value differs by map type.

PV Hosting Capacity Map

The displayed value represents:

The maximum additional PV generation (in MW) that could be added at that location before a modeled distribution constraint is violated.

That value is the minimum MW at which any one of the following constraints is reached:

- Thermal loading of lines or transformers
- Primary over-voltage
- Voltage deviation
- Regulator deviation
- Flicker

- Anti-islanding or backfeed protection screens

In other words, the number reflects the most restrictive constraint under daytime minimum load conditions.

It is not:

- A guaranteed interconnection limit
- A study result
- A forecasted future value

It is a modeled screening threshold under current system configuration.

BESS Hosting Capacity Map

Because storage operates in two modes, the interpretation differs by layer.

Charging Layer (Load Hosting Capacity):

- The value represents:
    - The maximum additional load (MW) that could be added at that location during charging before violating modeled load-related constraints.
    - Constraints evaluated typically include:
    - Thermal overload
        - Under-voltage
        - Voltage deviation
        - Regulator impacts
    - This value reflects system loading conditions during peak demand.

Discharging Layer (Generation Hosting Capacity):

- The value represents:
    - The maximum additional export (MW) that could be injected during discharge before violating modeled generation-related constraints.
    - Constraints evaluated typically include:
        - Over-voltage
        - Thermal overload
        - Flicker
        - Regulator deviation
        - Protection/backfeed limits
    - This value reflects minimum load conditions when export impacts are most severe.

Electrification Map

- The displayed value represents:
    - Remaining thermal load headroom (MW) under seasonal peak conditions
        - It is calculated as:
            - Summer Headroom = Summer Equipment Rating – Summer Peak Load
            - Winter Headroom = Winter Equipment Rating – Winter Peak Load
    - This is strictly a thermal capacity margin, not a voltage or protection analysis.
    - It does not:
        - Model dynamic power flow
        - Assess voltage performance
        - Account for queued projects
        - Incorporate forecasted load growth
    - It shows how much additional load could be added before the feeder or transformer reaches its seasonal rating under historical peak conditions.

4. How is hosting capacity calculated on each map?

The methodology differs by map type. The PV and BESS maps rely on distribution power flow simulations under defined load cases. The Electrification Map is a headroom calculation based on historical peak loading and equipment ratings.

PV Hosting Capacity Map

The PV HC Map is calculated using a distribution power flow model (e.g., DRIVE) under daytime minimum load conditions, which represent the time when voltage rise impacts from solar export are most likely.

Step 1: Base Case Setup

- The feeder is modeled under minimum daytime load.
- Existing interconnected DER are included.
- Queued (not yet built) DER are typically excluded.
- Current system configuration is assumed (no future upgrades).

Step 2: Incremental PV Injection

- PV generation is incrementally added at each node/segment.
- The model increases export in steps.

Step 3: Constraint Evaluation. At each increment, the model checks whether any constraint is violated, including:

- Thermal loading (lines, transformers, banks)
- Primary over-voltage (typically ≥ 1.05 per unit)
- Voltage deviation (e.g., ≥ 3%)
- Regulator deviation (tap movement thresholds)
- Flicker (per IEEE standards)
- Protection/backfeed limits (e.g., anti-islanding screens at feeder head)

Step 4: Determine Hosting Capacity

- The hosting capacity at that location equals: The smallest PV export level (MW) at which any single constraint is violated.
- The displayed value is therefore the most limiting constraint under minimum load conditions.

BESS Hosting Capacity Map

Because batteries operate in two modes, hosting capacity is calculated separately for charging and discharging.

Charging Hosting Capacity (Load Mode)

- Charging is modeled under summer peak load conditions, when feeders are already heavily loaded.
    - Process:
        - Start with peak summer load.
        - Incrementally add charging load at each node.
        - Evaluate constraints at each increment.
    - Constraints include:
        - Thermal overload
        - Under-voltage (≤ 0.95 pu)
        - Voltage deviation
        - Regulator deviation
    - The charging hosting capacity equals: The smallest additional load (MW) that triggers a violation.

Discharging Hosting Capacity (Generation Mode)

- Discharging is modeled under minimum load conditions, similar to PV, because export impacts are greatest when system load is low.

- Process:
  - Start with minimum daytime load.
  - Incrementally add export at each node.
  - Evaluate generation-related constraints.
- Constraints include:
  - Over-voltage
  - Thermal overload
  - Flicker
  - Regulator deviation
  - Anti-islanding/protection limits
- The discharging hosting capacity equals: The smallest export level (MW) that triggers a violation.

Electrification Map

The Electrification Map does not use power flow simulation. It is calculated using a thermal headroom approach.

Step 1: Identify Seasonal Ratings

- Feeder rating (MVA or MW)
- Substation/transformer bank rating
- Ratings reflect normal continuous operating limits.

Step 2: Identify Historical Peak Load

- Summer peak load
- Winter peak load
- Typically based on most recent recorded seasonal peak.

Step 3: Calculate Remaining Headroom

For each season:

- Remaining Load Capacity (MW) = Equipment Rating – Seasonal Peak Load
- The map displays this remaining headroom.
- No incremental simulation is performed.

Key Distinction Across the Maps

- PV and BESS Maps: Use modeled incremental power flow analysis to determine when a constraint binds.

- Electrification Map: Uses arithmetic subtraction of peak load from equipment rating to show thermal margin.

5. What operational assumptions are made in each hosting capacity analysis?

Each map reflects defined system conditions at the time of modeling. The results depend directly on those assumptions.

PV Hosting Capacity (PV HC) Map

Operational assumptions reflect worst-case export conditions. Key assumptions include:

A. Minimum Daytime Load Condition
   - The feeder is modeled during low daytime load.
   - This represents the period when voltage rise from PV export is most severe.
   - Hosting capacity values reflect this "light load" condition — not average loading.

B. Current System Configuration
   - The feeder topology reflects its configuration at the time of modeling.
   - Normal switching state is assumed.
   - No temporary or contingency reconfiguration is modeled.
   - Planned future upgrades are generally not embedded.

C. Existing DER Included
   - Already interconnected DER are included.
   - Queued (not yet constructed) projects are typically excluded.
   - Results therefore reflect today's installed system, not future buildout.

D. Static Operating Assumptions
   - PV is modeled at full output.
   - No dynamic curtailment, advanced inverter controls, or managed export strategies are assumed beyond baseline model settings.
   - No operator intervention is assumed.

E. Normal Equipment Ratings
   - Thermal limits are based on normal continuous ratings.
   - Emergency or short-term overload ratings are not assumed.

BESS Hosting Capacity (BESS HC) Map

Because storage has two modes, assumptions differ for charging and discharging.

A. Charging (Load Mode)
   - Operational assumptions reflect peak load stress.
     - Modeled under summer peak conditions.
     - Assumes the feeder is already carrying its seasonal peak load.
     - Battery charging is modeled as full load addition.

        - No staggered or managed charging is assumed.
        - No operator intervention is assumed.
        - System reflects current configuration only.
        - Existing DER included; queued typically excluded.
        - Normal equipment ratings used.

B. Discharging (Generation Mode)
    - Operational assumptions reflect worst-case export conditions.
        - Modeled under minimum daytime load (similar to PV).
        - Battery discharge is modeled at full export.
        - No dispatch coordination or export limitation is assumed.
        - Protection screens are evaluated based on modeled conditions.
        - Existing DER included; queued typically excluded.
        - Current system topology assumed.
        - Normal equipment ratings used.

Electrification Map

The Electrification Map uses a different framework.

A. Historical Peak Loading
    - Seasonal peak load (summer and winter) is based on historical data.
    - It is not a forecast and does not reflect projected growth.

B. Static System Configuration
    - Reflects equipment ratings and configuration at time of analysis.
    - Planned upgrades are generally not embedded unless already in service.

C. Thermal-Only Perspective
    - Assumes thermal ratings define the binding limit.
    - Does not model voltage performance.
    - Does not evaluate protection or power quality criteria.

D. No Managed Load Assumption
    - Assumes full coincidence with seasonal peak.
    - Does not assume demand response, managed charging, or load shaping.

E. Normal Equipment Ratings
    - Uses normal continuous equipment ratings.
    - No emergency margin assumed.

Summary of Assumption Differences

Map	Load Case Assumed	DER Treatment	Control Assumptions	Constraint Type
PV HC	Minimum daytime load	Existing included; queued excluded	No curtailment assumed	Voltage, thermal, flicker
BESS Charging	Summer peak load	Existing included; queued excluded	No managed charging	Thermal, under-voltage
BESS Discharging	Minimum load	Existing included; queued excluded	No export limitation	Voltage, thermal, flicker
Electrification	Seasonal historical peak	N/A	No load management assumed	Thermal only

6. What is "queued" and "connected" generation?

On the Joint Utilities' maps, these terms distinguish between DER that is already operating on the system and DER that has applied to interconnect but is not yet in service.

A. Connected generation is DER capacity that has:
   - Completed the interconnection process
   - Been constructed
   - Been energized and is currently operating
   - This capacity is part of the system's existing conditions.

B. Queued generation is DER capacity associated with projects that:
   - Have submitted an interconnection application
   - Are progressing through the study process
   - Have not yet been constructed or energized
   - Queued projects may ultimately interconnect, change size, or withdraw.

C. How this appears on the maps
   - PV Hosting Capacity Map: Typically displays both connected and queued generation to provide context about existing and pending export on the feeder.

- BESS Hosting Capacity Map: Also generally displays connected and queued generation, particularly relevant for export-capable storage projects.
- Electrification Map: Does not typically display queued or connected generation in the same manner. The Electrification Map focuses on remaining thermal load headroom and is not centered on DER export impacts.

7. What if the map shows no hosting capacity at my location?

A value of zero (or very low capacity) does not mean a project cannot proceed. It indicates that, under the map's modeled conditions, at least one constraint is already binding at that location. The implications differ by map type.

PV Hosting Capacity Map

- If the PV map shows zero (or near zero) MW:
  - One or more modeled constraints (e.g., over-voltage, thermal loading, regulator limits, flicker, protection screens) are already at or near their threshold under minimum load conditions.
  - Additional export at that location would likely trigger a violation under the screening model.
- This suggests:
  - The proposed project may require system upgrades,
  - A smaller system size may be more feasible, or
  - An alternate feeder may present lower interconnection risk.
- A formal interconnection study is required to determine actual feasibility and upgrade scope.

BESS Hosting Capacity Map

- If charging capacity is zero:
  - The feeder is near its modeled peak loading limits.
  - Additional load during peak conditions would exceed thermal or under-voltage thresholds.
  - This suggests:
    - Peak-period charging may require upgrades or managed charging strategies.
- If discharging capacity is zero:
  - Export-related constraints (e.g., voltage rise, thermal loading, flicker, protection limits) are binding under minimum load conditions
  - This suggests:

        - Export capability may be limited without upgrades, curtailment, or operational controls.
- In both cases, zero capacity reflects screening results only, not a final interconnection determination.

Electrification Map

- If the Electrification Map shows no remaining headroom:
    - The feeder or substation is at or near its seasonal thermal rating under historical peak conditions.
    - Additional coincident load would exceed normal equipment ratings.
- This suggests:
    - Infrastructure upgrades,
    - Load management strategies, or
    - Phased development
- Because the Electrification Map reflects thermal headroom only, a detailed engineering review is necessary to determine actual impacts.

Across all three maps:

- A zero value reflects modeled or calculated limits under defined assumptions.
- It signals higher likelihood of system constraints.
- It does not represent a final engineering decision.
- The interconnection process remains the formal mechanism for determining feasibility and required upgrades.

8. If the map shows plenty of capacity, can I assume my project will be served without upgrades?

No. The Hosting Capacity and Electrification maps are screening tools. A high capacity value indicates that no modeled constraint is binding under the defined assumptions. It does not guarantee that upgrades will not be required.

The maps:

- Do not replace the interconnection study process
- Do not capture all protection, relay, or secondary network considerations
- Do not model site-specific design details
- Do not reflect real-time system conditions
- May not incorporate all queued project impacts

A formal interconnection application and engineering review are required to determine whether upgrades are needed and to define final project limits.

9. Why might actual interconnection results differ from map values?

Because the maps are screening tools based on standardized modeling assumptions, while interconnection studies evaluate the specific project under detailed engineering review.

Differences may arise due to:

- Site-specific conditions (exact point of interconnection, secondary network impacts, conductor configuration, transformer loading).
- Protection and relay coordination requirements not fully represented in the screening model.
- Fault current limitations or other short-circuit considerations.
- Updated system topology or switching conditions not reflected in the latest map snapshot.
- Queued project progression that changes feeder conditions after the modeling date.
- Detailed voltage regulator behavior under the specific project's characteristics.
- Operational constraints identified during study (e.g., contingency scenarios).

The maps represent modeled conditions at a defined point in time.
The interconnection study reflects the actual system configuration and the specific project's electrical characteristics.

10. Do the maps account for planned system upgrades?

In general, no. All three maps reflect the system as configured at the time the analysis was performed.

PV Hosting Capacity Map

Hosting capacity values are based on the feeder's configuration, equipment ratings, and connected DER at the time of modeling. Planned upgrades are not typically embedded unless they were already placed in service or formally incorporated into the model.

BESS Hosting Capacity Map

Charging and discharging capacity values are similarly based on current feeder topology and ratings. Future reconductoring, regulator replacements, or substation upgrades are not assumed unless already implemented in the system model.

Electrification Map

Headroom values are calculated using existing seasonal equipment ratings and historical peak loads. Planned upgrades that would increase feeder or transformer ratings are generally not reflected unless already in service.

11. How often are the maps updated?

Hosting capacity values (PV and BESS) are refreshed on a scheduled modeling cycle, including an April refresh, with additional mid-cycle updates for circuits experiencing significant DER activity. Connected and queued DER fields are updated more frequently, often monthly. Electrification map values are refreshed when seasonal peak load data and equipment ratings are updated. Users should refer to the "last updated" date displayed on each map for the applicable utility.

12. Does high hosting capacity mean low interconnection cost?

No. A high hosting capacity or headroom value indicates that no modeled constraint is binding under the map's screening assumptions. It does not determine interconnection cost or eliminate the need for upgrades. Project-specific costs may still arise due to protection requirements, transformer loading, secondary network impacts, construction complexity, or other detailed engineering considerations. A formal interconnection study determines actual upgrade scope and cost.

13. How should developers use the maps?

The maps are intended for early-stage screening and planning. They help identify areas that may present lower interconnection risk before submitting an application. They do not replace the interconnection process. Developers should use the maps to compare locations, understand system conditions, and inform preliminary sizing decisions.

Developers can use the PV map to:

- Screen potential sites across multiple feeders.
- Identify locations with higher modeled export headroom.
- Avoid clearly constrained segments during early siting.
- Inform preliminary system sizing before application.
- The map helps reduce avoidable applications on feeders where export-related constraints are already binding.

Developers can use the BESS map to:

- Evaluate charging and discharging capacity separately.

- Align project design with the feeder's limiting condition.
- Assess whether export, charging load, or both may be constrained.
- Inform sizing and operational strategy discussions early.
- Because charging and discharging constraints differ, both layers should be reviewed.

Developers and large load customers should use the Electrification Map to:

- Screen locations for new coincident load (e.g., EV hubs, building electrification).
- Compare summer and winter headroom.
- Identify feeders nearing thermal limits.
- Inform phasing or load management strategy discussions.