Scaling DER Interconnection:

Modernizing Engineering Assessments & Developer Decision-Making in CT & MA



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accenture EVERSOURCE

Today's Discussion: Three Key Themes



1. The Challenge: DER Growth is Changing Interconnection Engineering

How DER growth increases the complexity of interconnection engineering



2. The Response: Better Data, Transparency & Automation

How Eversource is improving developer transparency and scaling engineering screening



3. The Engineering: Ensuring Reliable Assessments

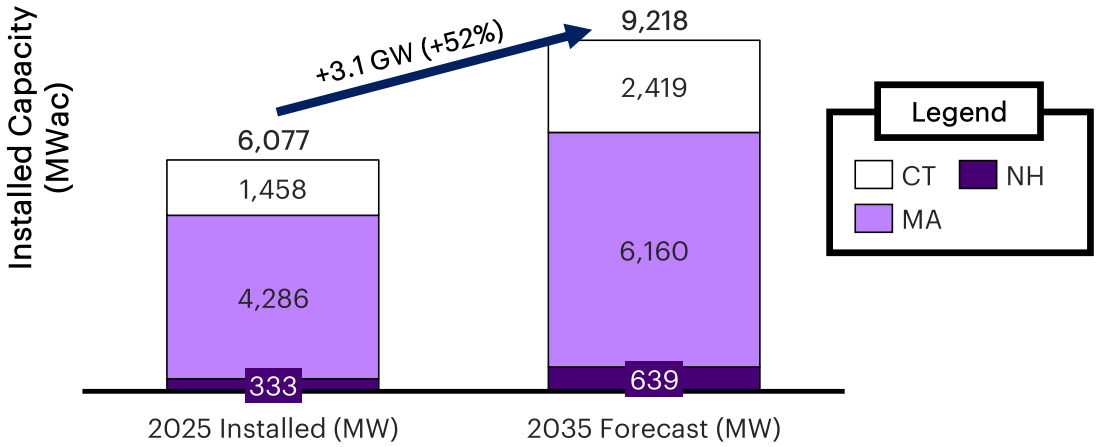
How hosting-capacity analysis, technical constraints, and grid data quality support reliable assessments

DER Growth is Reshaping Eversource's Service Territory

ISO New England forecasts sustained distributed solar growth across all three states through 2035.

Distributed PV Capacity: CT, MA & NH[1]

Nameplate Capacity, MW_{ac}



State	10-Year Forecasted Growth
CT	+66%
MA	+44%
NH	+92%
Combined	+52%

Statewide distributed PV capacity; includes service territories of other utilities.

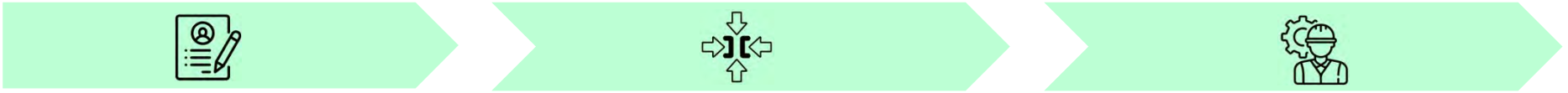
Key Takeaway: Distributed PV capacity across CT, MA, and NH is forecast to increase by 3.1 GW (+52%) between 2025 and 2035.

[1] ISO New England's 2026 DER Forecast

Why DER Planners Care

As DER penetration increases, utilities must evaluate more interconnection requests against increasingly localized distribution-system constraints.

Business Process Layer



More DER Applications

More Localized Distribution-System Constraints

More Complex Engineering Reviews at Scale

Digital Grid Capabilities

AMI + GIS + DER Application Data + Hosting-Capacity Models

Integrated Data & Analytical Foundations

Granular Grid Visibility

Identify available capacity and potential constraints at specific grid locations.

Data-Driven Engineering Reviews

Standardize screening and automate repeatable assessments under engineering supervision.

Key Takeaway: Integrated grid data and supervised automation can help utilities scale interconnection reviews while preserving engineering rigor.

Interconnection Review is Where Growth Becomes a Challenge

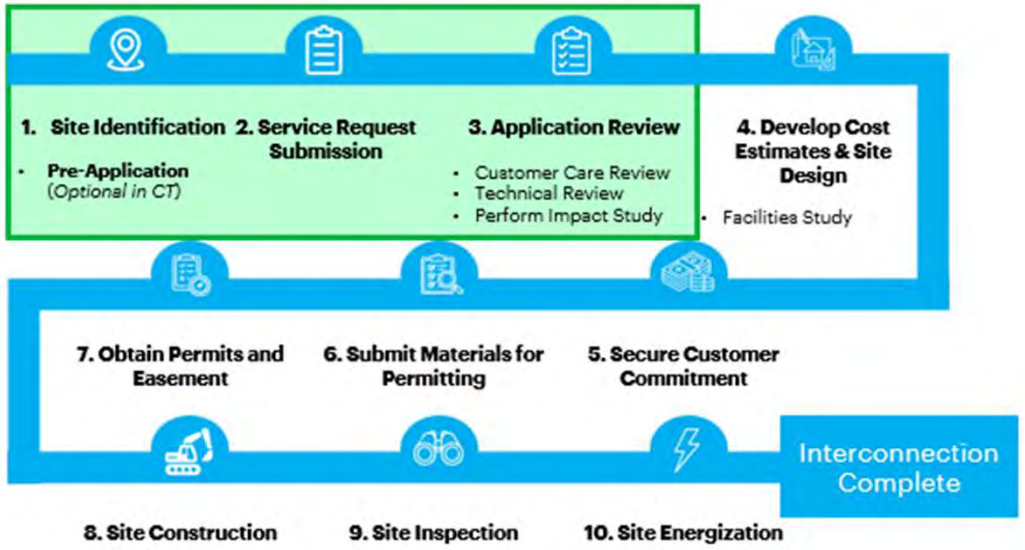
Utilities must accommodate growing DER application volumes while preserving engineering rigor

Developer-Side Challenge

- Where can I connect?
- How much capacity is available?
- How does capacity vary by time/season?
- What should I submit?

Project Automation Scope

Targeted Automation Opportunities



Engineering-Side Challenge

- Does the project exceed circuit hosting capacity?
- Does it exceed transformer rating?
- Is maximum export acceptable?
- Does it require additional engineering reviews?

Legend

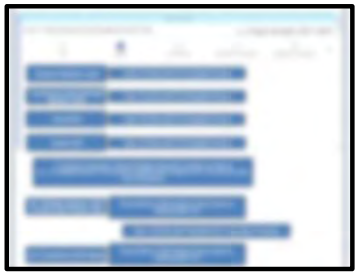
Impacted by Project Scope

Two Complementary Responses: Improve Developer Transparency & Scale Engineering Automation

Delivered Two Connected Capabilities

The solution improved both the developer experience and the engineering review process





	Enhancements for Developers	Supervised Engineering Automations
Interconnection Phase	(1) Site Identification & (2) Service Request Submission	(3) Application Review
Key Capabilities	• Parcel-based Hosting Capacity & Headroom Capacity Maps • Automated Summary Reports • Seasonal 24-hour Time Series Capacity Views	• Automated Point of Interconnection recommendation • Automated screening questions • PowerClerk integration • Reduced manual engineering steps

Key Design Principle: Deliver more information to developers and fewer manual steps for engineers

*Platform screenshots are included solely for illustrative and educational purposes. Identifying information has been obscured where appropriate. Their inclusion does not imply endorsement of any third-party technology provider by Eversource or Accenture.

Evolution of Eversource's DER Planning Journey

How DER Planning's Role at Eversource Has Evolved

Legacy: Before 2018

These preliminary questions had limited predictive value, leading to a heavy second round of reviews

#	Question
1	Is the Point of Common Coupling on a radial distribution system?
2	Is the aggregate generating facility capacity less than 15% of feeder/circuit annual peak load, and, if available, line segment?
3	Does the facility use a listed inverter (UL 1741-SB)?
4	Is the Facility power rating < 15 kW single phase of < 25 three-phase?
5	Is the Service Type Screen met?
6	Is the facility listed per IEEE 1547?
7	Is the Starting Voltage Drop Screen met?
8	Is the Fault Current Contribution Screen met?
9	Is the Service Configuration Screen met?
10	Is the Transient Stability Screen met?

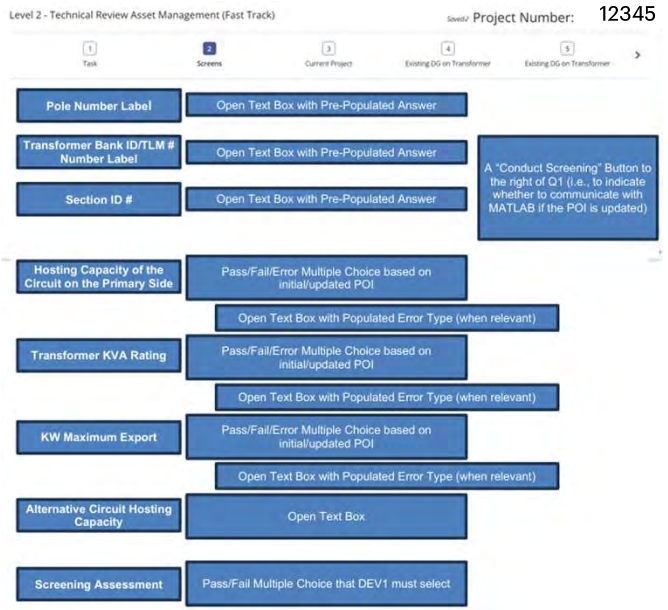
Pre-Project: 2018-2026

Utilized better data that relied on load-flow (worst-case scenario), skipping unnecessary steps

#	Question
1	Does the interconnection request exceed the hosting capacity of the circuit on the primary side?
2	Does the interconnection request exceed the Transformer KVA rating?
3	Does the interconnection request exceed the KW Maximum export?
4	[Optional] Does the interconnection request exceed the alternative circuit hosting capacity?

Post-Project: 2026 –

"Supervised Automation"



Hosting Capacity Calculation Methodology – Engineering Process

Hosting-capacity studies establish available grid capacity, providing an engineering foundation for screening individual DER interconnection requests.

01

Establish operating scenarios

Evaluate representative operating conditions, including minimum daytime load, maximum PV output, and relevant system configurations.

02

Simulate incremental DER

Incrementally increase DER injections at selected nodes and perform power flow simulations to evaluate system response

03

Evaluate Technical Constraints

Check voltage, equipment loading, reverse power flow, and power quality

04

Determine hosting capacity

Identify the maximum feasible DER injection, satisfying applicable operating constraints, including relevant contingency scenarios (i.e., N-1 limits)

Applying Hosting-Capacity Results to Interconnection Screening

Engineering Inputs

Hosting Capacity + Equipment Ratings

→

Supervised Engineering Screening

Evaluate DER Location, Size, & Export

→

Engineering Review & Disposition

Advance qualifying requests or flag exceptions for engineering review

Hosting Capacity Calculation Methodology – Technical Constraints

Maximize incremental DER capacity subject to network and operating constraints

Hosting Capacity

$$HC = \max_{\Delta P_{\mathrm{DER}} \geq 0} \Delta P_{\mathrm{DER}}$$

Subject to network power-flow equations and all applicable operating constraints.

Voltage

$$V_{\min} \leq |V_i| \leq V_{\max}$$

Thermal Loading

$$Whether\ Exceeding\ Cable\ Rating$$

Reverse Flow (At Substation Level)

$$P_{\mathrm{rev}} \leq P_{\mathrm{rev,max}}$$

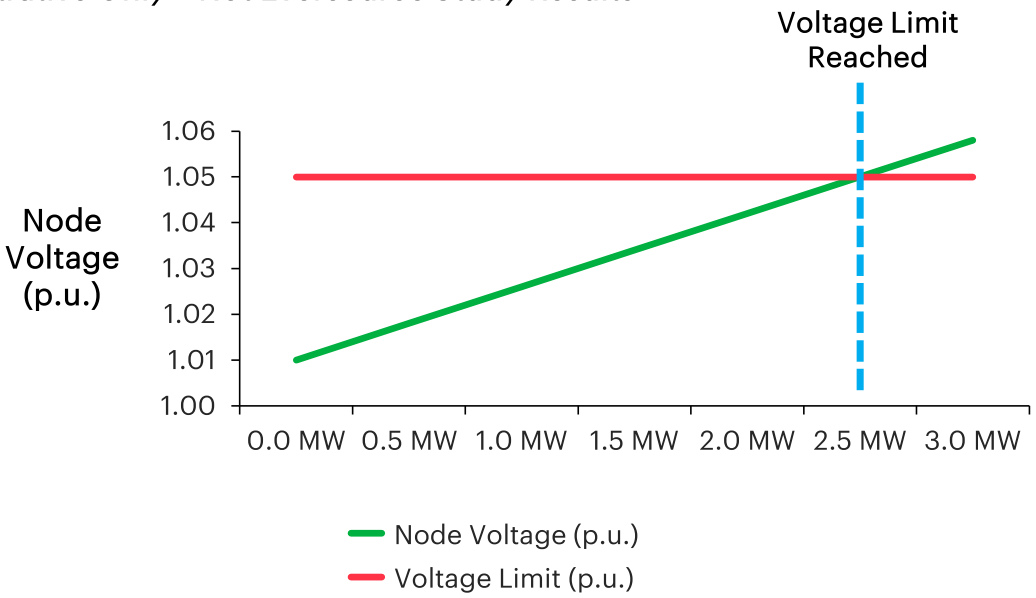
Power Quality (including Flicker)

$$F \leq F_{\max}$$

Hosting Capacity Calculation Methodology – Illustrative Calculation

One Constraint becomes binding before the others

Illustrative Only – Not Eversource Study Results



Illustrative Example

Assuming a Simplified Voltage Response:

$$V(P_{\mathrm{DER}}) = 1.010 + 0.016P_{\mathrm{DER}}$$

$$P_{DER} = \frac{1.050 - 1.010}{0.016}$$

$$P_{DER} = 2.5\ MW$$

Voltage in p.u.; DER injection in MW; assumed voltage sensitivity = 0.016 p.u./MW.

Key Takeaway: Voltage becomes the binding constraint at 2.5 MW of incremental DER injection, assuming all other technical criteria remain satisfied.

$$HC_{feeder} \approx 2.5\ MW$$

Accurate Hosting Capacity Assessments Depend on High-Quality Grid Data

Reliable engineering results require accurate network models, current operating conditions, and validated DER information

01

Network Model Accuracy

Feeder topology, conductor impedance, transformer ratings, and switching configurations.

02

Operating Conditions

Historical load and DER generation profiles, minimum daytime load, voltage-regulator settings, and seasonal variations.

03

Existing DER Information

Accurate DER locations, nameplate and export capacities, inverter settings, and interconnection status.

04

Data Validation & Maintenance

Periodically reconcile GIS, planning, operational, and interconnection records as grid conditions change

Impact of Initial Voltage Assumption

Scenario	V_0	HC
Baseline	1.010 p.u.	2.50 MW
Revised	1.020 p.u.	1.88 MW

25% reduction in estimated hosting capacity

Voltage in p.u.; DER injection in MW; assumed voltage sensitivity = 0.016 p.u./MW.

Illustrative sensitivity analysis; not representative of measured Eversource model inaccuracies or actual hosting-capacity changes.

Key Takeaway: Automated hosting-capacity assessments are only as reliable as the underlying network models, operating assumptions, and DER data.

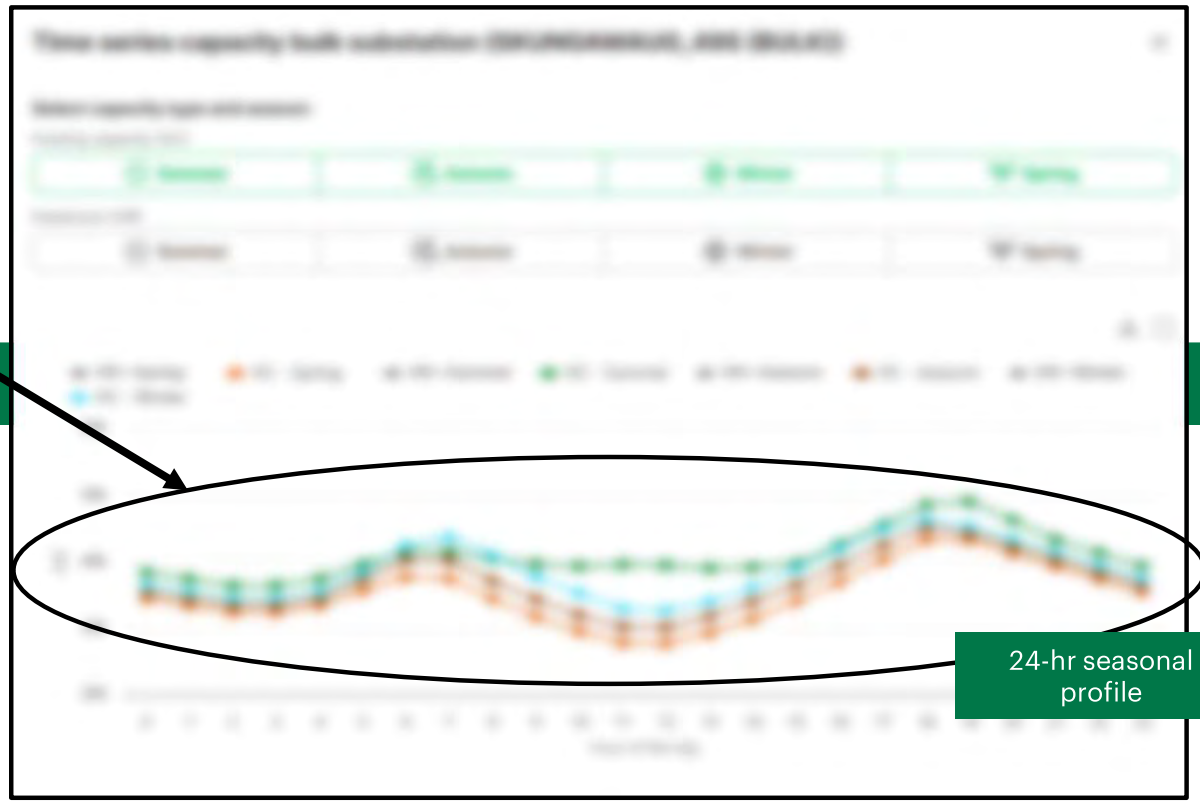
Project Spotlight: Seasonal Capacity Visualization

Giving developers visibility into how capacity changes throughout the day and across seasons

Project Deployment

Before

- Single hosting capacity value
- Limited planning insight
- Additional engineering engagement required



After

- 24-hour seasonal profile
- Hosting Capacity + Headroom views
- Better site selection decisions before applications submission

Key Improvement: Developers can now evaluate capacity by season and hour before submitting applications

Modernizing DER Interconnection: Outcomes & Lessons Learned

Eversource's experience highlights how engineering rigor, reliable grid data, and targeted automation can support DER growth at scale.

Capabilities Delivered

Developer Transparency

Public-facing hosting-capacity and headroom maps, seasonal capacity views, and pre-application reporting.

Engineering Review Automation

Automated screening activities and more consistent, repeatable engineering assessments.

Four Lessons for Utilities Scaling DER Interconnection

01

Start with Engineering Requirements

Translate screening criteria and operating constraints into clear, testable business and system requirements.

02

Build on Trusted Grid Data

Validate network models, operating assumptions, and existing DER records before scaling automated assessments.

03

Keep Engineers in the Loop

Automate repeatable screening activities while preserving engineering judgment for complex or exceptional cases.

04

Design for Operational Adoption

Engage engineering, IT, and business teams throughout design, testing, deployment, and ongoing support.

Key Takeaway: Scalable DER interconnection depends on trusted grid data, consistent engineering practices, and targeted automation that supports both utilities and developers.