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ISO New England Perspective on Portable Solar

Presentation to the Vermont House Committee on Energy & Digital Infrastructure

Sarah Adams

SENIOR STATE POLICY ADVISOR, EXTERNAL AFFAIRS

Daniel Schwarting

SENIOR MANAGER, TRANSMISSION PLANNING

ISO-NE PUBLIC

Overview of Presentation

ISO New England Perspective on Portable Solar Devices

Distributed Energy Resources and the New England Electric Grid

IEEE 1547

UL 1741

Key Takeaways

Questions

ISO NEW ENGLAND PERSPECTIVE ON PORTABLE SOLAR DEVICES

Portable Solar Devices

ISO New England Perspective

- S.202 would allow portable solar devices that function as “load reducers,” masking actual demand on the electric grid without consistent grid-performance requirements
  - If portable solar devices disconnect unexpectedly – especially during grid disturbances – demand served by the transmission system can spike suddenly
  - Uncoordinated loss of behind-the-meter solar is a known reliability risk and can worsen system events
- ISO-NE encourages lawmakers to consider requiring portable solar devices meet established grid standards (UL 1741 and the latest IEEE 1547), consistent with rooftop and larger solar systems
  - Applying these standards enables innovation while protecting grid stability and avoiding unintended reliability impacts

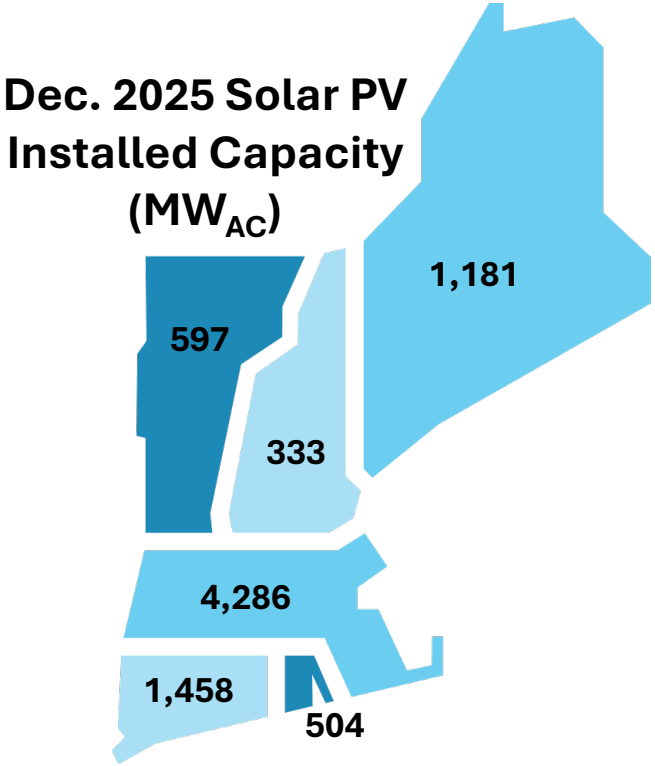
DISTRIBUTED ENERGY RESOURCES AND THE NEW ENGLAND ELECTRIC GRID

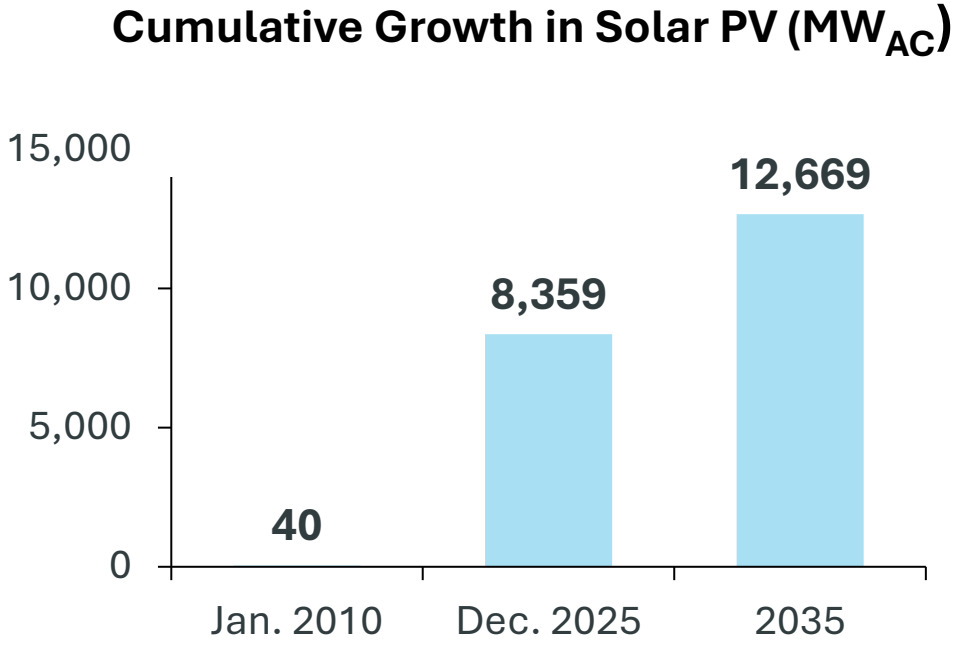
ISO New England Has Nearly Three Decades of Experience Overseeing the Region's Restructured Electric Power System

- **Regulated** by the Federal Energy Regulatory Commission
- **Reliability Coordinator** for New England under the North American Electric Reliability Corporation
- **Independent** of companies in the marketplace and **neutral** on technology

ISO New England Keeps Power Flowing Across the Region Every Minute of Every Day

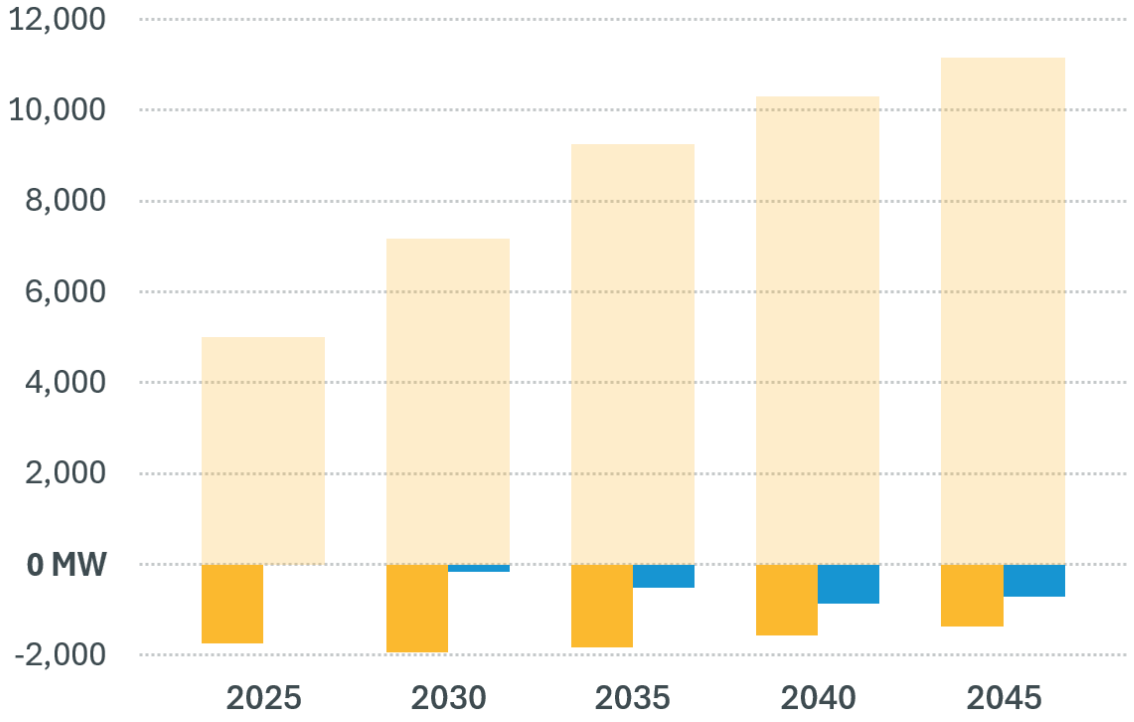
Strong Growth in Solar Resources Forecasted





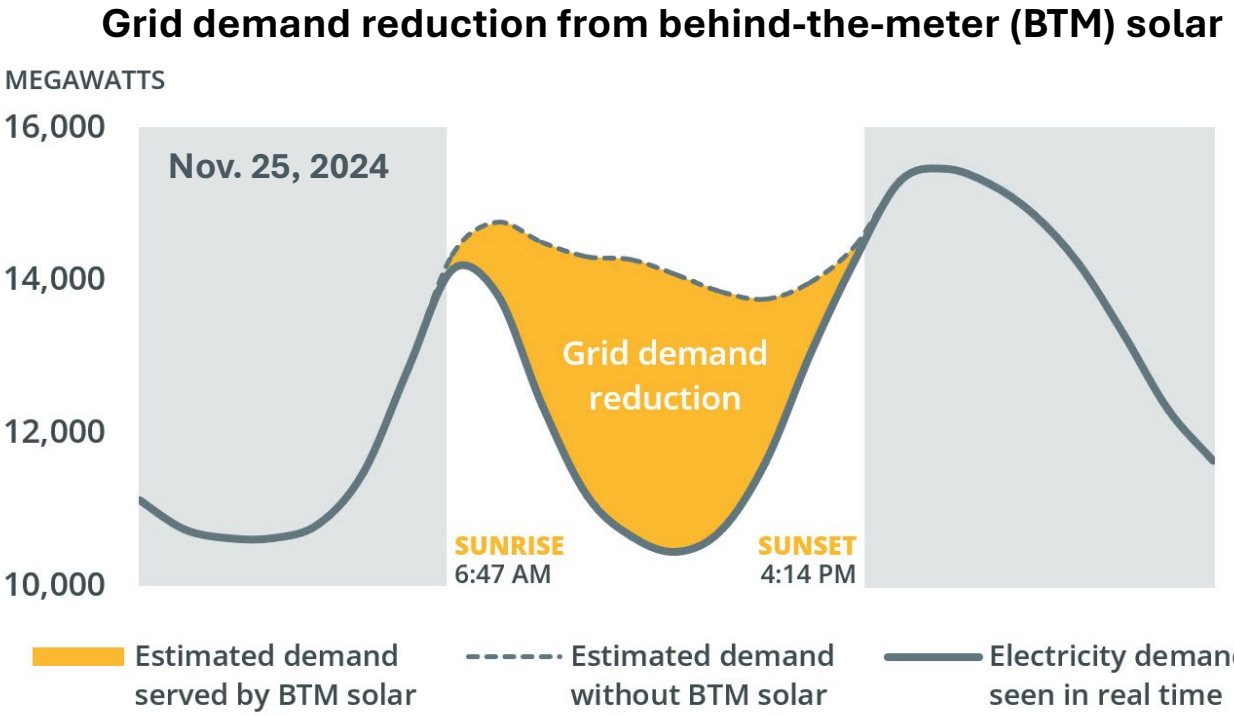
Note: Chart reflects projections for nameplate capacity from solar PV resources in the wholesale electricity markets, as well as those connected "behind the meter." Forecast does not include PV projects > 5 MW in nameplate capacity. Source: 2026 Photovoltaic (PV) Forecast; MW values are AC nameplate.

Strong Solar Forecast: Capacity Gains, Peak Reductions



Behind-the-meter solar is expected to reduce summer peaks by about **7% for the next 10 years**, declining to about **4% after 20 years**

Continued Development of Solar Drives Down Afternoon Load, Especially in Spring When Demand is Lower



Source: ISO Newswire Article from November 26, 2024, 100th 'duck curve' day marks New England solar power milestone - ISO Newswire

IEEE 1547

What Is IEEE 1547?

- **The Institute of Electrical and Electronics Engineers (IEEE) 1547** is the national standard governing how distributed energy resources (DERs) connect to the electric grid
- It establishes requirements for:
  - **Interconnection & interoperability** with utility systems
  - **Performance and operation** under normal and abnormal conditions
  - **Ride-through, power quality, and anti-islanding**
  - **Testing, safety, and maintenance**
  - **Cybersecure communications** between DERs and utilities

IEEE 1547 is Essential for the Reliable Integration of DERs

- As the distribution system has **evolved**, so has the transmission system
- Standards set by the North American Electric Reliability Corporation (NERC) and the Northeast Power Coordinating Council (NPCC) **require** the ISO to plan for **the contingency loss of resources**

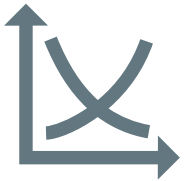
NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION
NPCC, Inc.

- Historically, the concern has been large generators being disconnected or going unstable and tripping
  - However, this has changed with the proliferation of solar PV and other inverter-based/power electronics-based resources

Illustrative Example: Why IEEE 1547 Matters

Grid Disturbance
(e.g., generator or transmission loss)

DERs Trip Offline



Sudden Demand Spike

IEEE 1547 Prevents Cascades

Ride-through keeps DERs online

Proper inverter settings can prevent cascading impacts and mitigate the need for transmission upgrades

UL 1741

What Is UL 1741

- UL 1741 is the primary equipment safety and performance certification standard for DERs connecting to the electric grid
- UL 1741 ensures that DER equipment:
  - **Safely interconnects** with distribution systems without creating hazards
  - **Implements IEEE 1547 requirements** through standardized testing
  - **Properly performs grid-support functions**, including voltage and frequency ride-through and response
  - **Prevents unintentional islanding**, protecting utility workers and the public
  - Is **interoperable** & **cybersecurity-ready** for communications with utility systems

*IEEE 1547 defines **what** DERs must do; UL 1741 verifies **how** inverters and DER equipment safely and reliably do it before they are allowed to connect to the grid*

KEY TAKEAWAYS

Key Takeaways

- ISO-NE applauds Vermont's continued leadership in energy innovation and policy, but urges safeguards to protect electric grid reliability
  - Portable solar devices can mask true electricity use; if they unexpectedly shut off, demand can spike suddenly
  - Uncoordinated loss of behind-the-meter solar during grid events can worsen outages or system instability
- We encourage Lawmakers to consider requiring that portable solar devices comply with established grid standards (UL 1741 and IEEE 1547), already used for rooftop and larger solar systems
  - Consistent technical standards allow innovation without unintended grid impacts and align portable solar with existing clean-energy safeguards

Questions