



Vermont System Planning Committee

Update on Distributed Generation Forecast

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Who is ISO New England, and What is Our Role?

- ISO New England was created to oversee the region's restructured electric power system
 - Private, not-for-profit corporation
 - Regulated by the Federal Energy Regulatory Commission (FERC)
- ISO-NE is the Regional Transmission Organization
 - Independent of companies doing business in the market
 - No financial interest in companies participating in the market
- Major Responsibilities
 - Reliable operation of the electric grid
 - Administer wholesale electricity markets
 - Plan for future system needs



ISO New England's Responsibilities

Operating the Regional Power System

- Balance electricity supply and demand every minute of the day by centrally dispatching the generation and flow of electricity across the region's transmission lines.

Administering Wholesale Electricity Markets

- Develop and administer the region's marketplace through which wholesale electricity is bought and sold.

Regional Power System Planning

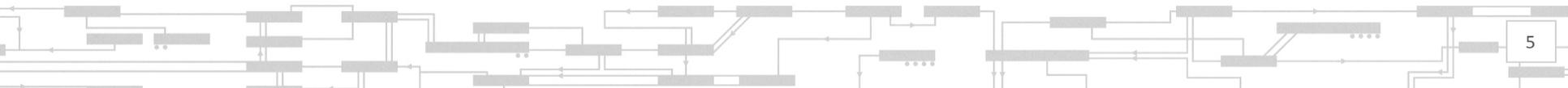
- Ensure the development of a reliable and efficient power system to meet current and future electricity needs.

Overview

- Existing and new ISO planning processes address two types of non-transmission alternatives (NTA)
 - Energy efficiency (EE)
 - Distributed generation (DG)
- The ISO developed a forecast for future EE, and incorporates this into planning decisions for the grid
 - The third EE forecast process currently underway
 - See www.iso-ne.com/eefwg
- The ISO recently launched a stakeholder process that will develop a long-term DG forecast
 - Primary focus on solar photovoltaic (PV) resources

Definition of Distributed Generation

- For purposes of the DGFWG, distributed generation resources are defined as those that are typically 5 MW or less in nameplate capacity and are interconnected to the distribution system (typically 69 kV or below) according to state-jurisdictional interconnection standards. These may include both those installations that are located behind a customer load (i.e., “behind-the-meter”) and those that are interconnected directly to the distribution system without a customer load being present. Note that this definition of DG is more expansive than that in the ISO’s Tariff. The Tariff definition is focused only on resources participating in the markets as Demand Resources, and the work of the DGFWG will focus on DG both in and outside of the markets. (http://www.iso-ne.com/regulatory/tariff/sect_1/sect_i.pdf).



Background

- Going back to 2002, the ISO has periodically provided region with detailed information on DG
 - Focus of ISO's annual Regional System Plan public meeting
- The ISO already accounts for many existing DG resources in long-term planning in a number of ways
- Approximately 2,000 MW of DG, mostly PV, are anticipated in the region by the end of 2021
- The ISO engaged stakeholders to learn more about the operational, planning, and market implications of high penetrations of DG
 - ISO created Distributed Generation Forecast Working Group

Background – ISO's Current Practice

- Existing and future DG with obligations in the Forward Capacity Market (FCM) contribute to meeting New England's Installed Capacity Requirement (ICR)
- Existing non-FCM DG that is registered in the Wholesale Energy Market are counted as generating load assets
- Load reductions from the remainder of existing DG are embedded in the historic loads used to develop ISO's 10-year load forecast used in the ICR calculation on the load side
 - The ISO does not have data about this type of DG

Distributed Generation Forecast Working Group

- First meeting was September 30, 2013
- Discussion topics included
 - Reports from New England states in response to data request provided by the ISO
 - ISO-led discussion of:
 - Forecast complexities
 - Integration challenges

Distributed Generation Forecast Working Group

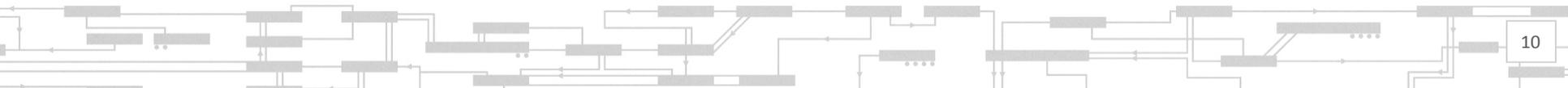
State DG Presentations

- Reports from New England states in response to data request provided by the ISO
- States described DG programs
 - Examples included: RPS Solar Carve-Out or other RPS class targeting DG, a DG feed-in-tariff, other long-term contracts, etc.
 - Nameplate capacity: existing and anticipated
 - Indications of any geo-targeting
 - Eligibility of out-of-state resources
 - Projected timing of the incremental capacity growth
 - Future of existing or new DG programs
- Materials available at: http://www.iso-ne.com/committees/comm_wkgrps/othr/distributed_generation_frcst/2013mtrls/index.html

Distributed Generation Forecast Working Group

Forecasting DG Is Complex

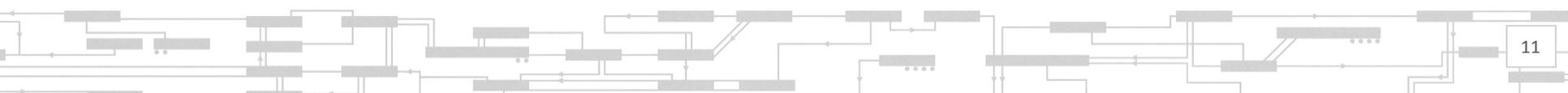
- No methodology currently exists for forecasting DG
- Need to avoid double-counting of DG resources
- Policy
 - State DG programs are diverse and not easily aggregated
- Uncertainties of market dynamics and technological developments may impact DG development
 - Future electricity costs?
 - Future technology costs?
- Technical
 - Interconnection and distribution system issues



Distributed Generation Forecast Working Group

Integration Challenges

- Currently, no real-time telemetry and dispatch
 - PV may eventually impact reserve/regulation operational requirements
 - ISO will need real-time data to support a solar forecast to enable the efficient commitment and dispatch of resources
- Growing penetrations of DG could impact grid reliability
 - Efforts are needed to harmonize state-jurisdictional interconnection standards with FERC-jurisdictional standards and other relevant Northeast Power Coordinating Council and North American Electric Reliability Corporation standards



Other ISO Efforts to Address Challenges of DG

- The ISO is participating in a National Renewable Energy Laboratory (NREL) study to examine possible operational and reliability concerns associated with large amounts of DG
 - A primary study goal is the determination of the stability impacts of these resources on the transmission system resulting from state-jurisdictional interconnection standards modeled after IEEE 1547
- The ISO is participating on the Technical Review Committee for NREL's Eastern Renewable Generation Integration Study (ERGIS)
 - See http://www.nrel.gov/electricity/transmission/eastern_renewable.html
 - ERGIS is the follow-up study to the Eastern Wind Integration and Transmission Study (EWITS), completed in 2010
- The ISO is working with collaborative team led by IBM on a DOE-funded project to improve the state of the science of solar forecasting
 - “Sunshot” team includes Green Mountain Power

Next Steps

- Next DGFWG meeting will be held at ISO on November 22, 2013
 - A review of state interconnection standards
 - State regulators and/or distribution utilities are asked to share details on interconnection standards and distribution queues
 - ISO will circulate a survey to guide the types of information requested
 - Other issues
- 3rd meeting will be scheduled for mid-January
- A future discussion topic will include DG economics

Questions

