

The VELCO logo is displayed in a bold, white, sans-serif font against a background of a scenic Vermont landscape with rolling hills and power lines.

VERMONT'S TRANSMISSION RELIABILITY RESOURCE

Vermont System Planning Committee Update & Scoping for the 2015 Vermont Long-Range Transmission Plan

8/14/2014

MOVING **POWER.** MOVING **FORWARD.**



Outline

- Study plan
 - VT planning process
 - Overview of 2015 study plan
- Criteria and assumptions
 - Comparison between 2015 and 2012
- Next steps
- Other VSPC activities

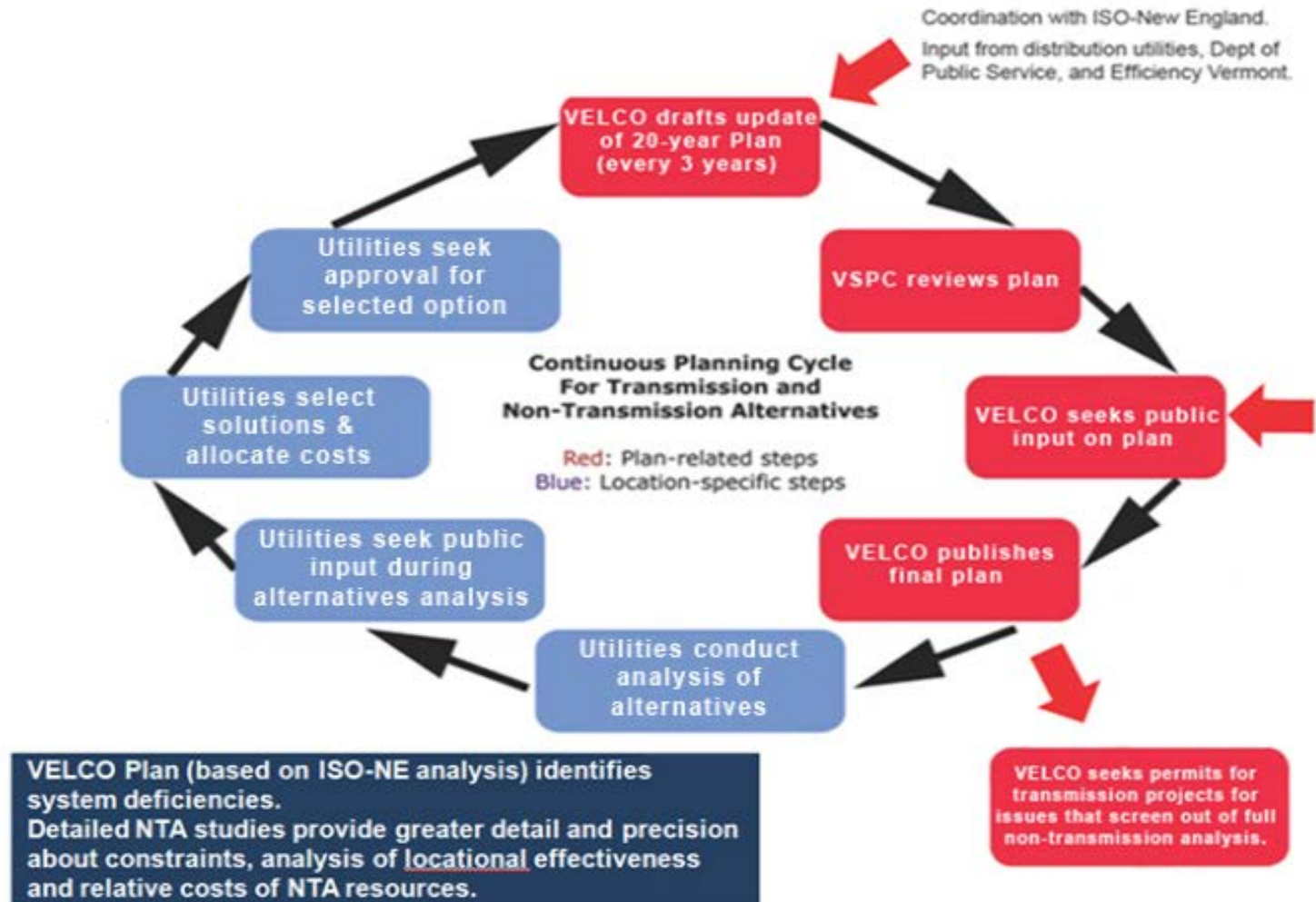
Vermont study history

- **Before 2005** (pre-Docket 7081)—VELCO performed long-range studies as needed prior to 7081 MOU
 - Northwest Reliability Project (NRP) originated from the 2001 long-range study, which used the Public Service Department load forecast
- **2005**—VT Legislature required VELCO to file a long-range plan looking out at least 10 years and to update every three years [Act 61 amendments to 30 V.S.A § 218c(d)]
- **2006**—VELCO published 10-year long-range plan using the PSD load forecast
- **2007**—VT Public Service Board approved Docket 7081 MOU, establishing a 20-year planning horizon
- **2009**—VELCO published the 20-year Vermont Long-Range Transmission Plan
 - VELCO prepared its own forecast with VSPC assistance

Vermont study history, continued

- **2011**—ISO-NE completed the 10-year VT/NH 2010 needs assessment
- **2012**—ISO-NE updated 10-year needs assessment
 - For the first time, ISO-NE studies incorporated future EE that had not yet cleared the Forward Capacity Market (FCM)
- **2012**—VELCO published 20-year long-range plan
- **2014**—ISO-NE currently updating the 10-year needs assessment
- **June 2014**—VELCO starting the 2015 long-range plan study process

High-level overview of Vermont planning process



Plan development timeline

Milestone		Timeframe
1	In conjunction with VSPC Forecasting Subcommittee, work with Eric Fox/Itron on forecast model for initial Vermont forecast, incorporating net metering, DG, etc.	1/30/14 - 4/30/14
2	Seek DU input on sub-transmission issues	3/1/14 - 6/30/14
3	Obtain input from VSPC Plan scope	7/1/14 - 7/31/14
4	ISO-NE 2023 VT/NH needs assessment and solutions report finalized	9/30/14
5	Complete initial VT load forecast	9/30/14
6	Prepare draft plan with ISO-NE coordination	9/30/14 - 12/31/2014
7	Conduct sub-transmission and years 11-20 analysis	8/1/14 - 10/1/14
8	Update load forecast with VSPC, DPS, EVT	11/30/14
9	Issue VSPC draft	1/2/15
10	VSPC input period	1/2/15 - 3/30/15
11	Incorporate VSPC input	3/30/15 - 4/20/15
12	Issue public draft	4/20/15
13	Public input period (including public hearings)	4/20/15 - 6/1/15
14	Incorporate public input	6/1/15 - 6/30/15
15	Submit final plan to PSB and DPS	7/1/15

Docket 7081 MOU steps for VSPC input

- VELCO consults with DUs, PSD and ISO-NE during plan development
- VELCO provides draft to VSPC
 - Minimum 60-day review period
 - Input on content
 - Specific review of system level determinations and NTA screenings
 - Formal memo of response to VELCO
- VELCO incorporates VSPC input or provides rationale why not

Overview of public outreach plan

- Identify targeted stakeholders
- Develop plan for public meetings
- Secure media coverage
- Develop website
- Conduct public meetings
 - At least two geographically diverse “open houses”
 - Public hearing in Montpelier
 - Presentation at meetings of groups as invited
- Compile public input
 - Statute requires transcript of public comments
- Incorporating Public Participation Subcommittee recommendations:
 - Considering use of additional social media as an input tool, such as Google Hangout
 - More robust online tools using the new VSPC website
 - Continuing outreach to Regional Planning Commissions
 - Using the outreach list developed by the Smart Grid Communications Group to target additional interested groups (selectively)
 - Leverage VT Energy & Climate Change Action Network for outreach
 - Inviting public officials, such as legislators and agency personnel, particularly to Montpelier hearing

Steps in developing 2015 long-range plan update

- ISO-NE's VT/NH needs and solutions assessments will be used as bulk system analysis for years 1-10
- VELCO will analyze sub-transmission system for years 1-10
- VELCO proposes not to perform load flow analyses for years 11-20 due to long-range forecast uncertainties and projections of flat or declining load
 - Plan address years 11-20 by examining significant risks and trends, and identifying areas where distributed resources and energy efficiency may help defer long-term, load-driven upgrades
- VELCO has requested DU input on subsystem analyses
- Plan will be non-CEII public document based on underlying technical analysis, as in 2009 and 2012
- VELCO will update the load forecast by November 2014 as needed

CEII stands for Critical Energy Infrastructure Information

Assumptions—comparison with 2012 analysis

2012 Analysis	2015 Analysis
<p>Regional input: ISO-NE performs 10-yr study with VELCO and other TOs</p>	<p>Regional input: ISO-NE performs 10-yr study with VELCO and other TOs</p>
<p>Transfer assumptions: NY-NE flow: +/-1200 MW East-West flow: -1000 & 3500 MW</p>	<p>Transfer assumptions: NY-NE flow: +/-1200 MW East-West flow: -2200 & 3500 MW</p>
<p>Load assumptions: 2022 forecast: 1134 MW 2032 forecast: 1245 MW (estimated based on 2030 forecast of 1221 MW) Adjusted for DSM forecast</p>	<p>Load assumptions: 2025 forecast: ? MW 2035 forecast: ? MW Adjusted for DSM forecast</p>
<p>Demand Resource assumptions: ISO-NE 10-yr study: does not include future EE that has not cleared the market VELCO timing includes all VEIC EEF</p>	<p>Demand Resource assumptions: ISO-NE 10-yr study: includes future EE that has not cleared the market VELCO timing to include all VEIC EEF</p>

ISO-NE = Independent System Operator in New England
TO = Transmission Owner

NY-NE = New York to New England power transfer interface
East-West = East to West power transfer interface

Assumptions—comparison with 2012 analysis, continued

2012 Analysis	2015 Analysis
<p>Generation assumptions: All-lines-in: 55 MW With one facility out: 150 MW</p>	<p>Generation assumptions: All-lines-in or with one facility out: 200 MW (note 1)</p>
<p>PV20 flow assumptions: 0 MW</p>	<p>PV20 flow assumptions: 0 MW and 100 MW (Note 2)</p>
<p>Generation outages: VY retired or in service Two resources out in VT, NH and MA: AES Granite Ridge and Merrimack 2 AES Granite Ridge and McNeil AES Granite Ridge and Northfield 1&2</p>	<p>Generation outages: VY retired Two resources out in VT, NH and MA: AES Granite Ridge and Merrimack 2 AES Granite Ridge and McNeil McNeil and Berlin GT</p>

Note 1 = Amount of generation in limiting cases. McNeil is out of service in some cases that are not limiting.

Modeling assumptions: 10% hydro, 5% wind, solar and other small DG embedded in load, 80% combustion turbine, 100% other thermal units (methane, biomass)

Note 2 = PV20 flow is modeled at 0 MW in most cases.

Load assumptions

- Forecast is currently being reviewed with the VSPC Load Forecast Subcommittee seeking input and concurrence
- Will model 90/10 loads in all cases tested
- Newport block load supplied from Vermont
- Load power factor constant at 0.97 in all cases
 - Assumes ongoing power factor correction on the distribution and sub-transmission systems
- NY load will remain constant in all cases
- New England forecast will not extend beyond 10 years

Power factor = Measure of real power in relation to reactive power, which are perpendicular to each other.

Real power = Part of the electrical power that does the work, i.e. heat, lighting

Reactive power = Part of the electrical power needed for the system to function properly. By-product of alternating current.

Risks of the 7081 methodology

- 7081 MOU envisions a linear process
 - Reliability concern → NTA screening → full NTA or T&D upgrade
 - If conditions do not warrant a T&D upgrade, an NTA is not pursued
- Characteristics of our time
 - Utilities do not proceed with load growth related T&D upgrades unless concerns are within 10 years and projected to remain
 - Environment of emerging and disruptive technologies, as well as policies, e.g. EE, DG, EV, Governors' Initiative, significantly affecting load and resources
 - Rapid change and resulting uncertainty of forecasts beyond 10 years
- For system issues that “screen out” but are on the margin, changes in a few assumptions could result in criteria violations
- Issues that screen out in the short term may need attention and long-term development of EE and DG to mitigate risk
- How we may be able to mitigate the risk
 - Examine multiple scenarios in long-range plan
 - Continue to use geographical targeting subcommittee to identify areas where DG and EE can help mitigate

Next steps

- Scope reviewed with VSPC in July
 - Currently accepting comments
 - Seeking clarity from PSD on proposed approach to years 11-20
- Perform analysis and consult DUs on results
- Present draft report at January meeting

Other key VSPC activities & challenges

- Recommendations on geographic targeting of energy efficiency and standard offer now assigned to VSPC by PSB
 - Process improvement in 2013 better coordinated deadlines
 - Distribution constraints now included per Docket 7874 PSB order
 - GMP has presented all constraints for information purposes; not only those with NTA potential
 - Full participation remains a challenge
- Providing regular updates on regional developments to increase stakeholder awareness
- Renewed emphasis on Public Participation Subcommittee through new leadership, new membership and participation in website redesign