ATTACHMENT B NVDA Wind Study Committee: Propositions on Transmission

1. A majority of Vermont's electric transmission system is operated by the Vermont Electric Power Company (VELCO). VELCO is responsible for bulk transmission lines with a voltage rating of 115kV and above. The Northeast Kingdom serves as an important gateway for electricity coming from both Canada and New Hampshire.[i]

   1.1 Within the *2012 VELCO Long Range Transmission Plan*, most of the NEK region is identified as a constrained zone due to transmission grid congestion. Constrained states have a limited transmission network and transport electricity over long distances, creating congestion on the lines and restricting the ability to receive additional electricity from outside the state during increasing demand.

1.2 The increasing demand has congested the Northeast Kingdom's transmission network – limiting the capacity to receive additional electricity from out of state when needed. Constraint issues usually result in increased electricity costs.

2. VT Electric Cooperative has recommended a moratorium on implementing renewable mandates until the problems in the existing transmission system have been figured out. Grid integration issues exist. [ii]

   2.1 The Grid was designed for "spinning generation". Most generation technologies provide "ride-through" (akin to inertia), but solar and wind provide no ride-through. In our section of the Grid, we're at about 20% renewables and we're experiencing problems. There is a growing realization that we don't know everything we need to know about grid-integration of renewables.

3. VELCO is statewide transmission-only company. Owned by distribution utilities, VELCO connects smaller systems and brings power to VT. [iii]

   3.1 Energy Switching is occurring with movement toward renewable generation resources.
   3.2 Forecasted load growth for VT of <1% going forward and trend is decreasing.
   3.3 Costs to connect to grid are increasing, while costs to exit grid are decreasing.
   3.4 Transmission costs are increasing. VELCO is taking projects off the table as they assess whether they really need to build all that they wanted to build.
   3.5 Transmission and generation are being used for economic development. This differs from reliability projects.

4. Utilities pay for reliability projects. Developers would pay transmission costs for non-reliability projects. [iv]

   4.1 No reliability projects are proposed for NEK region of VT.
   4.2 VELCO Long-range Transmission Plan map indicates where new generation should be sited. Adding new generation strains transmission in some areas, including most of the NEK region. Adding/upgrading transmission adds to project costs.
   4.3 *Interconnecting Wind Generation in Northern Vermont* document provided by K. Johnson (p.5): Northern VT system still reliable, but with 140+ MW of new generation in last five years, power is now exported to other parts of VT and New England. To preserve reliability, generators in VT have been curtailed.

4.4 *Interconnecting Wind Generation in Northern Vermont* document regarding Potential Impact of Additional Generation in Northern Vermont (p.6): If export capacity does not increase and more generation is added, additional curtailment of all generation in northern VT is likely. Potential exists for significant adverse financial impact for existing and new generators in northern VT. Recommended that long term solution is to site generation in more advantageous locations in VT.

5. A *System Reliability: Renewable Generation as a Non-Transmission Solution* document provided to the committee by K. Johnson, VELCO indicates that VELCO has a responsibility to provide early information to allow sufficient time to plan and implement more cost-effective, non-transmission alternatives to meet reliability needs wherever feasible.

   5.1 *2012 VELCO Long Range Transmission Plan* map indicates that generation in the northern VT region has reached transmission capacity as of 2012.

6. The "New England Wind Integration Study", published in December 2010, analyzed wind penetrations at 2.5%, 9%, 14%, 20% and 24**%.** The study found that New England's regional electric generation system, which is dominated by natural gas-fired generators, is very flexible and compatible with wind generation.[v]

   6.1 The New England Wind Integration Study looked at New England as a large region and this study does not account for local or sub-regional transmission issues or constraints.[vi]

7. Costs of solar and ridgeline wind are now roughly in the same ballpark, assuming transmission costs for wind are minimal. If transmission costs for a large build-out of wind are included, it is difficult to see how wind could be competitive with solar. [vii]

8. The NVDA Wind Study Committee takes the following positions:

   8.1 We acknowledge that VELCO, through its long-range plan and presentation, has identified most of the NEK region as a constrained zone due to transmission grid congestion. This limits the system's ability to accept additional generation resources.
   8.2 We acknowledge the VT Electric Cooperative's recommendation for a moratorium on implementing renewable mandates because of transmission constraints and grid integration issues associated with renewable generation resources.
   8.3 Accepting VELCO's assertions that new generation added over the last five years now makes our region an exporter of power to other regions of VT and New England; our regional constraint issues; and, that the forecasted annual load growth for VT is less than 1% (and decreasing) going forward, there seems to be little need for new large-scale generation facilities in the NEK region.
   8.4 Improving transmission reliability within the existing system is preferable to adding new generation and transmission facilities that may exacerbate curtailment issues or destabilize the existing transmission grid.

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[i] NVDA Regional Plan adopted March 28, 2013.
[ii] David Hallquist, VEC, April 3, 2013 presentation to Committee.
[iii] Kerrick Johnson, VELCO, August 14, 2013 presentation to Committee.
[iv] K. Johnson, VELCO, August 14, 2013.
[v] John Soininen, Eolian, May 29, 2013 presentation to Committee.
[vi] D. Snedeker, NVDA.
[vii] Dr. Ben Luce, LSC, January 29, 2014.