Memorandum

To: Kerrick Johnson

cc: Paul Renaud

From: Hantz Présumé

Date: 2/5/2014

Re: **Energy Efficiency's Role in Transmission Deferrals**

Energy efficiency was a major factor in reducing Vermont's forecasted peak load. In 2012, an update to the 2010 VT/NH Needs Assessment, an analysis undertaken by ISO-NE that seeks to assess the performance of the transmission system under future peak load growth over the next decade, reduced Vermont's projected ten-year net peak load from 1166 MW to 947 MW, or 219MW, from the previously projected net peak load. Seventy-six percent of this 219 MW reduction was due to future projections of energy efficiency savings. For purposes of this analysis, energy efficiency comprises both bids that have cleared the ISO-NE forward capacity market and those that have not yet cleared the market. Below is a comparison of the load projection components modeled in the 2010 study and the 2012 study:

Forecast year	Gross load	DR from FCM	EE from FCM	EE beyond FCM	Net load
2020	1255	23	66	0	1166
2022	1230	51	124	108	947

By way of context, in 2012 ISO-NE reduced its gross load forecast by 25 MW due to a projected slower economic recovery, although part of this reduction can also be attributed to net metering and distributed generation, whose growth has accelerated starting in 2011. Essentially, the growth of these two new resources was embedded in the gross load trend, and they have not been explicitly represented in prior load forecasts. ISO-NE produced this month an interim, discrete, net metering and distributed generation forecast calculation. A net metering and distributed generation forecast will be incorporated in future studies.

At the end of 2011, the ISO-NE ten-year study recommended the following upgrades:

Location	Proposed T&D solution	Estimate
Northwest Vermont	Rebuild several 115 kV lines from West Rutland to Tafts Corner	$221M
Central Vermont	Install a second 345 kV line between West Rutland and Coolidge	$157M
Connecticut River	Install a second 115 kV line between Coolidge and Ascutney and rebuild the line section from Ascutney to Ascutney tap	$105M
Southeast Vermont	Upgrade Vermont portion of the Vernon to Northfield 381 line	$6M
Northern Vermont	Install two 12.5 MVAr capacitor banks at Jay Install a special protection system at Sand Bar	$4.4M $3.8M

ISO-NE updated the load forecast for the entire region during the first quarter of 2012. This update reflected, for the first time, consideration of future energy efficiency that has not yet cleared the forward capacity market. The net load for year 2020 was projected to be reduced to 1020 MW, and this significant reduction was achieved mostly (72%) by projected energy efficiency. The ISO-NE follow-up study recommended the addition of capacitor banks at the Bennington substation at an estimated cost of $1.4M, but it also recommended the postponement of several previously proposed upgrades as follows:

Location	Deferred T&D solution	Estimate
Northwest Vermont	Rebuild several 115 kV lines from West Rutland to Tafts Corner	$221M
Connecticut River	Rebuild the line section from Ascutney to Ascutney tap	$13M
Northern Vermont	Install two 12.5 MVAr capacitor banks at Jay	$4.4M

During the summer of 2013, ISO-NE presented preliminary results of the 2012 study update, which utilized the latest load forecast showing a net load of 947 MW. As a result of the further-reduced projected load, ISO-NE recommended the postponement of these additional previously proposed upgrades:

Location	Deferred T&D solution	Estimate
Central Vermont	Install a second 345 kV line between West Rutland and Coolidge	$157M
Northern Vermont	Install a special protection system at Sand Bar	$3.8M

Clearly, future energy efficiency represents the overwhelming majority, on the order of 70%+/-, of the load reductions that have resulted in the postponement of several upgrades proposed in the 2010 study. The forecasted load has also been reduced, however, as a result of the slow economy, additional demand response, and the effects of net metering and distributed generation embedded in the load trend.