

2018 Vermont Long-Range Transmission Plan  
Efficiency Vermont Comments on VSPC draft &  
VELCO responses

Page 2        Is it accurate to say "declining loads" here? Is it not more accurate to say flat loads? May not be a big deal, but it seems to portray a different reality.  
Could say lower loads

Page 5        It seems like EE should be in this list as a form of load management.  
Load management includes EE, demand response, price responsive demand. No need to call out EE.

Page 6  
The Efficiency Vermont budget is flat compared to the previous performance period (which is when the prior study would have been completed.)  
Will remove the word "greater"

these trends should be called out here by name; not immediately obvious.  
We are referring to EV and heat pumps specifically, but also other technologies that we either do not yet know or cannot forecast at this time

Page 7        Is there a definitional difference between "non-transmission alternatives" and "non-wires solutions"? It appears to be used interchangeably.  
They mean the same thing, but non-wires is a way to encompass all voltage levels, not just transmission voltages.

Page 10       Efficiency Vermont supports this, but we're unaware of any efforts to "advocate regionally" for parity. Who would actually be doing the advocating?  
VELCO and the Department have advocated for parity over the past few years anytime an occasion presents itself.

Page 11  
a reference to where that distinction/criterion originates ... could clarify why we care about the differences between "reliability" and "reliability resulting from load growth"  
It is not that we care about one form of criteria versus another. In this paragraph, we are referring to reliability issues not related to load, such as asset condition issues (degraded poles, transformers, etc) that cannot be resolved by non-transmission options.

EVT invested a lot into the St. Albans region to defer investment in the region. Is it possible to say something about the value of deferring investments, even if it means having to replace old equip.?

Not in this context. There is another location in the report where this comment comes up again. We will work with GMP to see how we can address this. The geo targeting effort was meant to address a

distribution level concern on the GMP system. The scale of those load reductions was too small to affect transmission.

Page 12 If I remember correctly, this was one of the favored projects of SHEI engineering study. Does that have any relevance here?

Only tangentially. We are going to address the K42 asset condition concerns whether the SHEI issue is resolved or not, whether by an upgrade or load management. However, we are saying that depending on the challenges related to construction outages, we may need to rebuild the line on the other side of the right of way and reconnect it with minimal outages. There may be a SHEI benefit, but this is not the primary objective.

Page 14 This is a very interesting factoid. I wonder if this is worth unpacking a little bit. It might also be relevant to explain how daytime peak has been reduced through local resources.

We will provide additional information.

Page 15

Is it possible to be more specific with this?

We do not think we can do that.

I think this is supposed to be a fairly innocuous sentence, but it might agitate renewable suppliers. The truth is, that the whole energy system relies on favorable policies, grants, tax incentives, etc. To single out DG for this treatment might be seen as unfair. I suggest you just recognize that the price of renewables has been going down.

We saw this as a positive statement. In other regions, renewable energy has stagnated. In VT, which has the lowest load in New England, renewable energy has taken off in a big way.

Page 16

Would it be worth noting why the VT peak is so much different from the ISO-NE peak? Could that be a discussion point for how we have "decoupled" from the ISO-NE peak, and reduced our peak demand as a result?

This is a direct effect of solar PV.

What's the reason for picking 7 when we have heard that the VT peak was much later in the day?

The timing of the peak in the ITRON forecast varies between 6PM and 7PM, but recent peaks have actually occurred after sundown. We thought that we were being reasonably optimistic by using ITRON's timing instead of 8PM, where the contribution of incremental solar PV would be 0%.

I am told these funds are no longer supporting solar; only advanced wood heating and wood powered evaporators.

OK. Will correct.

suggest that this part of the sentence be struck. Tier 3 is legislated to encourage energy transformation to reduce fossil fuel. these measures are not exhaustive. We will modify this bullet.

Page 18

Is solar staying flat because no matter how much is added, it's not doing much after dark? What about storage? That will probably grow during this time period and shift solar's effect after dark

The installed solar PV is not flat, but its effect is small and relatively constant in the forecast because of the timing of the peak load varies between 6PM and 7PM from year to year and the contribution of the solar PV also varies at those peaks. We could plot 2.5% of the installed solar PV capacity, which will be a straight line, but we will not be able to subtract it directly from the base load forecast because the timing of the base load peak is not 7PM every year. As currently plotted, all the curves can be added together to yield the net forecast. We will see how we can address this flat but somewhat wavy curve.

The word, "additions" is surprising. Why do some say that and not others? Sounds almost like annual/cumulative impact. Also, shouldn't the additional efficiency be part of these component forecasts?

Removal of the word "additions" helps

Page 19

An important distinction! Isn't this also true for why batteries weren't added to the high solar forecast?

Yes, and it would be a total guess as to the amount and location of storage or load management. From a modeling perspective, it does not matter to the power flow program what we call these resources.

They are either negative load or positive generation.

Was there a reason for not including penetration/impact for heat pump water heaters?

Probably was a question raised at the forecasting committee, but I forgot.

We don't remember this being discussed during the forecast effort by the VSPC forecast subcommittee.

Perhaps this is something we need to address as part of the next forecast if sufficient data is provided by the VT experts.

Page 20

"carbon-based heating"? is that a thing? we're assuming electric heat is non-carbon based? seems a strange way to describe it this way.

We think the point is that we did not increase the electrical load assuming that Vermonters would use electrical heat during the very cold days that would coincide with the winter peak. Perhaps we were too optimistic here, and this could be discussed further in the next load forecast.

this conclusion is not what I get from the graph above - from the graph, it looks like the only technology really impacting a "significant increase in summer peak loads after 10 years" is EVs - heat pumps only add about 10-12 MW.

Agreed. Will remove "significant"

Do the heat pump and EV growth mentioned earlier fully reconcile this trend with the growing peak forecast? Or is it possible, the forecast doesn't capture this trend?

We think this statement is consistent with the forecast, where the peaks remain constant for the first ten years of the forecast.

Page 21

Could it not be argued that the growth of solar has offset a growth in electric load during the peak cooling periods? Framed another way, this could be used to say that policies for DG and efficiency are having their intended effect.

Yes, but incremental solar PV will not reduce the peak. Solar PV has moved the summer peak timing much faster than we thought. Less than 300 MW of solar PV was able to move the timing of the peak to later in the evening.

Why not zero if the peak is occurring past sunset?

We used 2.5% to be consistent with the load forecast. We recognize this is somewhat optimistic, but this is something we can live with.

Page 22 This sentence is slightly vague, and therefore unclear. We disagree that current measures that are installed are less effective. As the VT peak changes, the efficiency measures installed are as effective as ever; it speaks the need to add different measures to affect the new peak. I think that is the sentiment trying to get across, but it's not reading that way.

We think we are saying the same thing. Current measures "may become" ineffective if we do not modify the types of measures to better match the timing of the later peak hours.

Page 23

It might be helpful to have some examples here.

OK.

As discussed at the VSPC, this is not necessarily likely as those circuits and neighbors may have reached their limit and the Plan should provide the results of the other

scenarios VELCO considered, PV distributed according to MW and MWh demand. It is possible this will help inform the net metering proceedings and could result in new adders and subtractors based on location on the grid.

We will try to provide these results without making the report any more technical than it is. In our efforts to write a report for everyone to understand, we do not include all of the details.

total building energy consumption? Or electric consumption? They seem most likely to go where propane and oil are most

The state level heat pump forecast is based on the state's heating needs. That state heat pump forecast is allocated to the zones based on the relative electric energy consumption of the zones.

Page 24 It would be worth combining the High Load and High Solar forecast into a 3rd scenario in order to see if and how the two scenarios "cancel out" the negative impact on the system. This is also closer to how they would actually be deployed to meet the CEP. Not treated in isolation by together.

We think combining these two scenarios will not provide additional information. The high solar PV scenario tests the system under low load/high generation conditions that would occur at 1PM on a spring day, while the high load scenario tests the system under high load/low generation conditions that would occur in the evening on a summer peak day. Combining the two scenarios means modeling high solar PV at 7 or 8PM on a summer day. While solar PV is close to its installed capacity in the middle of the day in April, it is negligible on a summer night.

Page 26

should this simply say "daytime net loads in April"? "lowest" seems out of place.

The graph is actually showing days where the day time load has been the lowest.

maybe it should be said that it was assumed the solar load could not be curtailed with today's availability. but in the future, such DG power generation could also be curtailed through direct control.

Agreed, but we want to test whether the system can accommodate all renewable generation without curtailments.

Page 28 why none for morrisville?

This is based on the data we had at the time. Since then, Morrisville has provided more current data, and we will make corrections.

Page 29 this seems like a significant finding, and yet incongruous to what we know of the SHEI region. Technically, the load curtailment in those regions also stems from a reliability concern. Recognizing the difference between generation and transmission assets, how can this seeming contradiction be reconciled?

When we talk about system reliability, we are referring to the system's ability to serve load. Concerns associated with generation in excess of system capacity are economic in nature, not reliability concerns, because generation is controllable and responds to market prices. Essentially, generation is non-firm, while load requires firm service. If a specific generator requests firm service, the transmission system

will be designed to provide that service, but it is virtually impossible to guarantee that a generator can run unencumbered under all system conditions.

Page 31

I believe these results come from the assumption that solar grows in proportion to where it has manifested today. that might not be the case. Effective pricing signals for solar might actually have the opposite effect - of homogenizing the distribution of solar, which could reduce these effects below.

We will try to address this issue to the extent we can. We do not have any data on distribution limitations. A solar PV distribution based on substation peak demand comes close to what would be considered a homogeneous distribution, but this was found to be equally problematic because a large amount of solar PV is modeled in areas that lack available space for solar PV installation.

while understanding that the long range plan is meant to demonstrate the n-1 or n-2 contingencies, wouldn't it be helpful to see this scenario during the other times of the year - how systemic is the problem identified, or is this really just a 1-day-in-April

It is not just 1 day of the year. We are showing the worst case. The system concerns will be less severe during higher load levels, but they will not disappear. Exposure to reliability concerns can be illustrated to some extent with additional analysis that involves testing several system conditions varying load and generation.

Page 32

It would seem that all three of these could be turned off and so could be modeled with that as an option. I don't want a reader to finish and think about "all the transmission upgrades necessary for solar". They would be better informed if they compared those upgrades to renegotiating the converter operation, and siting solar differently, in addition to the storage option mentioned below.

Agreed, but the Highgate contract is for 25 years, and we do not see why HQ would accept a contract change that reduces its sales. We do get the point that some of the system concerns can be eliminated if we curtail generation

This whole section is good. But I thought at the VSPC it sounded like some numbers were available for the other scenarios. Results would be great. If not, directional indications would be good

We will see how we can do this without too much detail

Page 37 "from time to time" - is that accurate? My sense, based on all the SHEI discussions is that it's frequent - seems like the language is too weak here Will remove "from time to time", but curtailments do not occur all the time

Page 38 Does the sort order mean something?

The order allows us to reference the system concerns by number. Looking at the table, it appears that the concerns were listed in geographical order from north to south, and in terms of voltage level from transmission lines to substations to subtransmission lines.

Page 40 If these locations are entirely dependant on the assumed location of new solar, it may not be useful to get too specific. If there are dozens of others that also could have this issue with different PV distribution, maybe the names aren't meaningful. Agreed. This table is kind of an example of where storage could be installed and their relative size.

Page 41

this is an interesting assumption regarding "solutions" at subtransmission level. In this case, would batteries be a "non-wires" solution? Would it be a "non-transmission alternative"?

We can call batteries non-wires solutions

Are these today's costs, or do they consider any change in pricing or time value of money for installation by 2025?

Yes, we did not try to estimate the cost decline and then bring the cost back to present day

Page 45

We noticed that the NTA's are limited to batteries, but many of the DUs have said that strategic efficient electrification and residential storage could play a role. That should be worth a discussion in this plan, somewhere.

Perhaps. The difficulty is to predict how much load will be added and where it will be located. Beyond that, we would need to know how much of that load will continue to be in place at the peak load hour. This is another good topic for the forecast committee.

Page 49

strange that I don't recall hearing much about this...

Most if not all of these line items have been noted in prior plans. The DUs have either dismissed them as non-issues or are still evaluating them.

I always feel a sensitivity to comments about St. Albans screening out of an NTA analysis ... it screened out this time - but only because it had screened in and was geo-targeted for 7 years previously, which set the stage for the latest evaluation. How can VELCO better represent prior investments and prior deferrals in these reports?

We will work with GMP on this one.

Page 51 seems like we should use the term "energy efficiency" not "energy conservation" here.

This definition may have been copied from somewhere. We will check.

Page 55 seems like if they include GMP in the acronym list, they should also include all the utilities ... I see VEC, but I don't see WEC nor VPPSA. We think it is because GMP and VEC are specifically noted in the plan. We will verify.