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Request IR-01:

"Water savings values were adjusted by using Halifax Water and Wastewater rates..." (p. 8)

a) It appears that any measure with water savings is wildly cost-effective without any NEBs. If the inclusion of water savings would change any of E1's program proposals, please explain how those proposals would change.

b) Does E1 expect that the water prices for smaller Nova Scotia water utilities would be higher than those of Halifax Water?

c) Does E1 expect that the water costs per m^3 for Nova Scotia customers without municipal water would be higher than those of Halifax Water?

d) Has E1 considered whether the avoided cost of water consumption for Halifax Water would be higher or lower than the Halifax Water rates? If so, please describe that consideration and provide any workproducts.

Response IR-01:

a) EfficiencyOne included water savings in the 2016-2018 DSM Resource Plan's cost-effectiveness testing analyses. It is expected that VEIC's refinement of these values would not result in changes to any program proposals.

b) The per-cubic-meter charge for water varies across smaller Nova Scotia water utilities with some having higher rates, and some have lower rates.

c) Additional research would be required to establish marginal water costs for customers without access to municipal water.

d) The water rates used by VEIC in their work included volumetric charges only. EfficiencyOne has no knowledge of Halifax Water's avoided costs.

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Request IR-02:

Regarding the inclusion of residential Property Value as an NEB (Application, p. 9).

a) Please provide any evidence available to VEIC or E1 that the Massachusetts program administrators have included an increase in residential Property Value as an NEB in screening measures or programs for the 2019 program year.

b) If a participant in the Massachusetts survey believed that the reduction in the energy bills for the property would increase the property value, would that amount to double-counting the avoided energy cost?

i) Please provide any information available to VEIC or E1 regarding the relationship between the Massachusetts residential energy charges and the Massachusetts avoided energy costs. (E.g, are the residential energy charges close to the avoided energy costs, much higher than avoided costs, or much lower than avoided costs?)

ii) Please explain anything that the Massachusetts surveys did to eliminate this double-counting.

iii) If the measure reduces the participant's bill by $200/year and reduces NS Power's costs by $100/year, and the participant sells the property after five years for $1,000 more than the unimproved home, how would E1 compute the TRC benefit to NS Power and its customers over 20 years.

c) If a participant in the Massachusetts survey believed that the improved thermal comfort, reduced maintenance and increased equipment durability resulting from adding a wood boiler would increase the property value, would that amount to double-counting the other NEBs?

i) If not, please explain why the participants would not have included the annual value of comfort, maintenance and durability after the sale of the property in their estimates of property value.

ii) Please explain anything that the Massachusetts surveys did to eliminate this potential double-counting.

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d) Please identify any measures that fail the TRC without this NEB, but would pass the TRC with this NEB.

i) If there are no such measures, please explain why it is important to include this NEB.

Response IR-02:

The following response has been provided by Vermont Energy Investment Corporation (VEIC).

a) Please refer to EfficiencyOne's IR Response to Multeese IR-16.

b) Please refer to EfficiencyOne's IR Response to Multeese IR-16.

c) Please refer to EfficiencyOne's IR Response to Multeese IR-16.

d) Please refer to EfficiencyOne's IR Response to Multeese IR-16.

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Request IR-03:

Regarding the statement that "the NEB category that included property value increases…also includ[ed] the perceived value of ease of sale from the participant's perspective" (Attachment 1, p. 25)

a) Please clarify whether this statement also applies to the Increased Rent Revenue NEB.

b) Please provide any information on the share of the participant-reported property value increases that actually reflected the value of increased ease of sale.

   i) If the statement also applies to the Increased Rent Revenue NEB, please provide the same information for responses to that question.

c) Please explain whether the value of "ease of sale" is distinct from "property value increases." Specifically, if a participant thought that the reduced energy bills and increased amenities would increase the value of the property, wouldn't the participant expect that either the property would sell faster at the pre-measure price or could be sold for a higher price if the owner asked for a higher price?

   i) If the statement also applies to the Increased Rent Revenue NEB, please provide the same information for responses to that question.

Response IR-03:

a) Please refer to EfficiencyOne's IR response to Multeese IR-16.

b) Please refer to EfficiencyOne's IR response to Multeese IR-16.

c) Please refer to EfficiencyOne's IR response to Multeese IR-16.

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Request IR-04:

Regarding the statement that "The original Massachusetts studies included what amounts to an error check within the survey methodology – after declaring perceived NEBs by category, participants are then asked to provide their estimation of total impacts across all categories. This total value used to pro-rate the values in each category." (Attachment 1, p. 25)

a) Please explain whether the check was based on the annual benefits, the one-time benefits, or separately for both.

b) Please provide the Massachusetts survey instrument, or the portion with this "error check."

c) If a participant believed that the increase of comfort for the measure would be worth $100 annually, and that the increased comfort would increase the resale value of the house by $500, what should the participant have reported on the survey?

d) If the participant enjoys the increased comfort for $100/year for five years, then sells the house for $500 more than it would have attracted without the efficiency measure, and the new owner pays $500 more than it would have otherwise and enjoys $100/year in increased comfort for fifteen years, what is the total benefit to NS Power and its customers over the twenty-year life of the measure?

Response IR-04:

The following response has been provided by Vermont Energy Investment Corporation (VEIC).

a) According to Section 9.3 of Tetra Tech's 2011 study (please note that Massachusetts uses the term non-energy impacts or NEI): [1]

[1] NMR Group Inc./Tetra Tech 2011. Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-
Energy Impacts (NEI) Evaluation. Prepared for the Massachusetts Program Administrators http://www.rieermc.ri.gov/documents/evaluationstudies/2011/Tetra_Tech_and_NMR_2011_MA_Res_and_LI_NEI_Evaluation(76).pdf

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"After providing values for the individual NEIs, respondents were asked to assign an annual value to the total impact of all the NEIs together (except for any changes in property value). Each respondent's individual NEI values were scaled in proportion to the respondent's valuation of the total impact of all the NEIs in order to account for any overlap in NEIs or over-estimation of the individual NEIs. Potential overlap and overestimation can be conceptualized in two ways. First, when asking respondents to valuate non-market goods with multiple parts or components, the stated value of the whole is often less than the value of the sum of the parts. This is often referred to as 'part-whole bias' when the values of the individual parts are not adjusted for the value of the whole (Bateman et al., 1996; Brown and Duffield, 1995). Second, when valuating several related things, the stated value of the total is often less than that of the sum of the individual items, often referred to as an "embedding effect" (Baron and Greene, 1996; Brown et al, 1995). There could be any number of explanations for this, but in the case of NEIs it is likely that there is "overlap" among the various NEIs asked about, such that respondents do not conceptualize the individual NEIs as being completely distinct and thereforetheir values are not additive."

b) The error check approach is described in Section 9.3 of the 2011 Tetra Tech study. Please see Appendix A for a detailed discussion of the scaling of the NEB values and Appendix F to review the full text of the survey.

c) It depends on the measure. According to Section 9.3 of Tetra Tech's 2011 study:

"The individual NEI values were scaled in the following way: each NEI value was represented as a proportion of the sum of that respondent's individual NEI values. This proportion was then applied to the respondent's reported valuation of the total impact of all the NEIs, yielding the scaled value for each NEI. The scaling factor is specific to each respondent and varies widely throughout the sample. For example, if a respondent said their total NEI value was $300, while reporting their health NEI as $300 and their thermal comfort NEI as $100, the scaled NEI values for this respondent would be a health NEI of

$225 and a thermal comfort NEI of $75. The specific NEI values for this same respondent would be much different if the respondent reported their total NEI value to be $1000 or $100. In addition to scaling, respondent values were weighted according to their strata. For example, NLI respondents in the heating and cooling strata received a weight of 1.53 while NLI respondents in the shell plus heating and cooling strata received a weight of 0.10. Thus, the scaling and the weights affect the calculation of average values.

As an example, assume respondent A is from the heating and cooling strata and reports total NEIs as $300, health NEI as $300 and their thermal comfort NEI as $100, the scaled NEI values for this respondent would be a health NEI of $225 and a thermal comfort NEI of $75. Respondent B, from the shell plus heating and cooling strata, reports total NEIs as $650, health NEI as $500 and their thermal comfort NEI as $200, the scaled NEI values for this respondent would be a health NEI of $464 and a thermal comfort NEI of $186. Because the respondents are weighted differently, the weighted average value for health would equal $240 and the weighted average value for comfort would equal $82."

d) It depends on the measure. For example, assuming a measure lasting three years providing a benefit of $10 annually, realized at the end of the period and an interest rate of 5.4591%, the present value of benefits is:

[10/(1+0.054591)^1] + [10/(1+0.054591)^2] + [10/(1+0.054591)^3] = $27.00 (rounded)

To learn more about the treatment of property values, please refer to EfficiencyOne's response to Multeese IR-16.

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Request IR-05:

Regarding Attachment 4 - Appendix C:

a) Please explain the meaning of the $1.26 in cell Z3.

Response IR-05:

The following response has been provided by Vermont Energy Investment Corporation (VEIC).

a) $1.26 is the conversion rate used to translate USD$ to CAD$.

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Request IR-06:

Regarding the inclusion of Increased Rent Revenue as an NEB (Application, p. 9).

a) Please provide the studies that developed the values for increases in rent revenues.

b) Please explain how the analysis netted out the effect of reduced tenant electric bills on rent revenues.

c) Please provide any evidence available to VEIC or E1 that the Massachusetts program administrators have included an increase in rental revenue as an NEB in screening measures or programs for the 2019 program year.

Response IR-06:

a) Please refer to EfficiencyOne's response to Multeese IR-16.

b) Please refer to EfficiencyOne's response to Multeese IR-16.

c) Please refer to EfficiencyOne's response to Multeese IR-16.