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January 31, 2014

Ms. Susan Hudson, Clerk
Vermont Public Service Board
112 State Street
Montpelier, VT 05620-2701

Re: **EEU 2013-01** VEIC Additional Information Regarding Electric Resource Acquisition Scenario Modeling Results

Dear Ms. Hudson:

On January 16, 2014 Vermont Public Service Board ("Board") held a Workshop regarding Electric Resource Acquisition Scenario Modeling Results for the Demand Resources Plan ("DRP") Proceeding. In follow up to this workshop, the Department of Public Service ("Department"), Vermont Energy Investment Corporation ("VEIC"), and the City of Burlington Electric Department ("BED") filed a joint request to adjust the schedule in this proceeding as well as establish a comment period to allow participants to file comments regarding the workshop.

On January 29, 2014, the Board issued an order adjusting the schedule and adding a comment period for participants to file additional information regarding electric resource acquisition scenario modeling results. VEIC presents the following responses to questions posed at the workshop to supplement its presentation of the three Demand Resource Plan scenarios originally presented in VEIC's December 6, 2013 filing.

1. Behavior Based Thermal Savings

During the workshop, Mr. Hopkins inquired about the calculation basis of the cost-effectiveness of the behavior measures incorporated in VEIC's three scenario models, specifically asking whether thermal savings were included.[1] Mr. Wickenden responded that the model addressed electric benefits

[1] Transcript, Workshop on Electric Scenario Modeling Results, January 16, 2014, Vermont Public Service Board: 70, lines 5-11.

only. That statement was partially accurate. Residential behavior savings **do** include estimates of annual thermal savings. The Commercial and Industrial components do not.

In VEIC's December 6 filing of its Analysis of Three Electric Energy Efficiency Scenarios for the 2015 – 2034 Demand Resources Plan, VEIC addressed Residential behavior-based savings, stating, "These measures are expected to realize 1.5% savings for non-thermal electric load, plus 1% thermal savings, modeled as becoming increasingly electric through likely expanding sales of heat pumps."[2] The annual savings estimates are illustrated in **Figure 1**. The savings assumptions remain constant for all three scenarios.

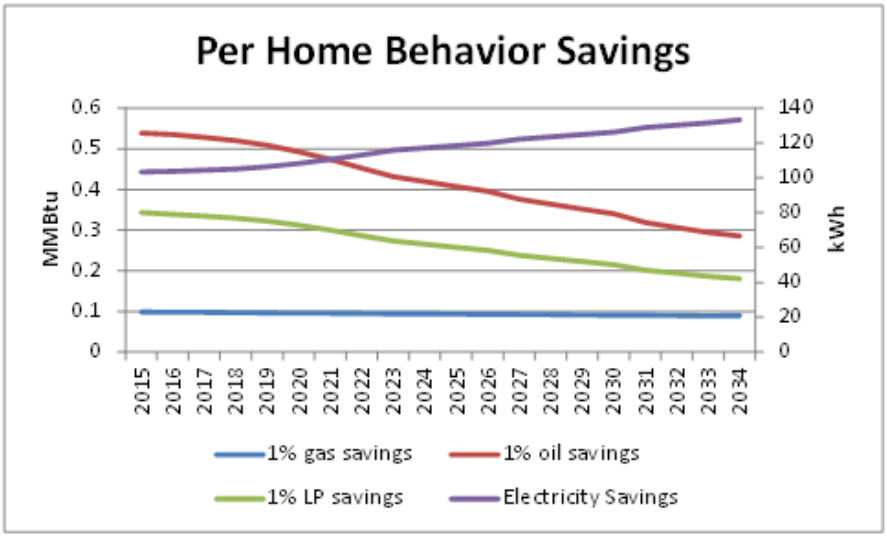

Figure 1 Expected electricity and thermal savings from behavior across the forecast period.

VEIC's estimates of thermal savings are based upon its review of program results from ten independent evaluations of five Home Energy Report programs. A summary of those results are presented in **Attachment A** of this filing. Because of the wealth of research supporting thermal savings in natural gas utility programs, VEIC decided to recognize conservative estimates of unregulated fuel thermal efficiency in the filed scenarios.

VEIC's recognition and evaluation of the thermal savings potential in these scenarios does not alter VEIC's position that it is not intending to claim thermal savings in its annual savings claims without

[2] Analysis of Three Electric Energy Efficiency Scenarios for the 2015 – 2034 Demand Resources Plan EEU-2013-01. Filed with the Public Service Board December 6, 2013 by Vermont Energy Investment Corporation page 12.

further investigation in the Technical Advisory Group of reliable and accurate behavior based unregulated fuel thermal efficiency savings quantification protocols.

At the request of the Department, VEIC also performed additional cost-effectiveness sensitivity analyses of the projected residential behavior-based program, using only the benefits provided by reductions in electric load. As illustrated in Table 1, that analysis showed the program was cost effective when cost-per-participant was as high as 140% of those estimated in our scenarios. The program was modeled at a cost of $11.50 per home and screens up to a cost of just over $16.00 per home.

Table 1. Estimates of cost-effectiveness of behavior measures under different installed cost values

Measure Name	Analysis Period	Installed Cost	kWh (annual)	TRB	PV of Measure Benefits	PV of Measure Costs	**Benefit-Cost Ratio**	**PV of Net Benefits**
Behavior Measure	**1**	**$11.50**	**103**	$7.36	$13.56	$9.52	1.42	$4.04
Behavior Measure	**1**	**$12.00**	**103**	$7.36	$13.56	$9.93	1.37	$3.62
Behavior Measure	**1**	**$12.50**	**103**	$7.36	$13.56	$10.34	1.31	$3.21
Behavior Measure	**1**	**$13.00**	**103**	$7.36	$13.56	$10.76	1.26	$2.80
Behavior Measure	**1**	**$13.50**	**103**	$7.36	$13.56	$11.17	1.21	$2.38
Behavior Measure	**1**	**$14.00**	**103**	$7.36	$13.56	$11.59	1.17	$1.97
Behavior Measure	**1**	**$14.50**	**103**	$7.36	$13.56	$12.00	1.13	$1.56
Behavior Measure	**1**	**$15.00**	**103**	$7.36	$13.56	$12.41	1.09	$1.14
Behavior Measure	**1**	**$15.50**	**103**	$7.36	$13.56	$12.83	1.06	$0.73
Behavior Measure	**1**	**$16.00**	**103**	$7.36	$13.56	$13.24	1.02	$0.31
Behavior Measure	**1**	**$16.50**	**103**	$7.36	$13.56	$13.65	0.99	($0.10)
Behavior Measure	**1**	**$17.00**	**103**	$7.36	$13.56	$14.07	0.96	($0.51)

2. Distribution Communication Concerning Behavior Initiatives

At the Workshop, Mr. Poor asked about the extent of the engagement of VEIC with the distribution utilities in exploring behavior-based initiatives.[3] In his response, Mr. Wickenden noted that all utilities had been invited to vendor presentations in response to VEIC's Request for Proposal – Efficiency Vermont Energy Efficiency Data Platform and Residential Customer Behavioral Savings Pilot. Subsequent to the vendor demonstrations, VEIC has kept gas and electric utilities informed of progress toward planning and implementation of the Opower data

[3] Transcript, Workshop on Electric Scenario Modeling Results, January 16, 2014, Vermont Public Service Board: 77, lines 1-12

project. VEIC also invited Opower to deliver a presentation on their privacy and security practices, and all the utilities offering Advanced Metering Infrastructure (AMI) attended. Prior to issuing the RFP, VEIC provided a roadmap to the Department and the utilities in its white paper, *Efficiency Vermont Smart Grid Proposal: Recommendations for Developing Consumer-facing Services to Ratepayers* (2012). **Attachment B** lists many of those communications and meetings, beginning in September 2012. In addition, future meetings with VEIC and the AMI distribution utilities have been scheduled, and will address protocols for AMI data transfer.

3. Design and Distribution Schedule of Home Energy Reports

Chairman Volz raised questions concerning the appearance and frequency of the Home Energy Report (HER).[4] Although the Efficiency Vermont Home Energy Report design has not been finalized, **Attachment C** shows a Home Energy Report sample from another jurisdiction, offering the same kinds of features that the Efficiency Vermont HER will contain.

Opower has evaluated the effects on participants' energy savings rates in the context of the frequency of HERs. Its analysis shows that the company can vary the frequency of the reports without adverse effects on participant's savings rates. VEIC's 2014 contract with Opower calls for a schedule of report delivery over the course of one year, as shown in Table 2. The first HER mailing will include an insert welcoming the participant.

Table 2. Schedule of HERs in Year 1 of participation by Efficiency Vermont customers

	SERVICE	TRACK	PROGRAM YEAR 1[1]
	**Home Energy Reports (PRINT/PAPER)**	High Use Designated Customers	Up to 25,000 Designated Customers Up to 7 reports per customer
		Above average use Designated Customers	Up to 25,000 Designated Customers Up to 5 reports per customer
		Average use Designated Customers	Up to 50,000 Designated Customers Up to 3 reports per customer
	**Home Energy Reports (EMAIL)** [2]		Up to 100,000 Designated Customers Up to 12 reports per customer

[4] Transcript, Workshop on Electric Scenario Modeling Results, January 16, 2014, Vermont Public Service Board: 66, lines 5-7, 88, and lines 19-21.

The calculation of HER savings is unaffected by the frequency of HER communications. The savings calculations will occur each month and the costs and savings will be incorporated into Efficiency Vermont's regularly scheduled reports in the residential category, "Existing Homes".

4. Basis for Commercial and Industrial 8.8% Behavior Initiative Penetration Rate

Mr. Flagg raised a question concerning the basis for VEIC's 8.8 % estimate of the small and medium-sized Commercial peak program penetration, stated in the *Analysis of Three Energy Efficiency Scenarios* filing (page 18).[5] In making the 8.8% estimate, VEIC was unable to find 20-year estimates of Commercial and Industrial behavior-based initiative penetration rates. There were case studies of individual programs, but they were not estimates of potential for savings within a geographical sector such as a state or territory. In the absence of any documented studies, VEIC relied upon its professional judgment, and assumed the following:

- Approximately 42,000 small and medium sized commercial customers in Vermont
- Average annual electricity use approximately 40 MWh
- Adoption of behavior initiatives by Commercial and Industrial customers would be slow and gradual.

With these factors, VEIC assumed:

- A starting penetration rate of 0.25%, or about 100 customers the first year
- 0.45% annual penetration rate increase after the first year (an additional 190 customers per year)

That rate of increase over the remaining 19 years results in an approximate penetration rate of 8.8%, or about 3,700 customers.

VEIC appreciates the opportunity to provide this additional information regarding electric resource acquisition scenario modeling results to the Board and parties in this proceeding. Please feel free to contact me if you have any questions regarding this filing.

Sincerely yours,

Michael Wickenden
Director of Regulatory Affairs
cc: 2013-01 Service List (electronic service only)

[5] Transcript, Workshop on Electric Scenario Modeling Results, January 16, 2014, Vermont Public Service Board: 96, lines 3-12.