VERMONT

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August 15, 2013

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

Re: EEU- 2013-01 Demand Resource Plan Proceeding

Dear Mrs. Hudson:

As part of the Public Service Board ("Board") EEU-2013-01 Demand Resources Plan ("DRP") proceeding to devise a set of long-term assumptions pursuant to which each of the current Energy Efficiency Utilities (EEUs) shall operate, the Department of Public Service ("Department, PSD or DPS") provides information and recommendations on: 1) Electric Model Scenarios; 2) Model Input Assumptions and; 3) Quantifiable Performance Indicator (QPI) Frameworks. This information is provided as requested in the Board Order in this matter entered on 8/1/2013 entitled: *Schedule and Request for Proposed Electric Budget and Savings Scenarios*. The Department's filing includes:

1. Department proposed electric three- and twenty- year scenario modeling recommendations including value-weighted descriptions of the scenarios
2. Department, VEIC and BED proposed numerical values for available modeling input assumptions and
3. Department, VEIC and BED proposed recommendations on the framework for electric and Thermal Energy and Process Fuel (TEPF) Quantifiable Performance Indicators (QPIs).

Item 1: The electric three- and twenty- year scenario modeling recommendations, is presented on behalf of only the Department. The Department understands that Vermont Energy Investment Corporation ("VEIC") and City of Burlington Electric Department ("BED") may file electric scenario modeling recommendations separately or file subsequent comments. Items 2 and 3: The recommendations for available modeling assumption and QPI frameworks, have been co-developed, and herein are filed jointly, by the Department, VEIC and BED.

Scenario Modeling Recommendations

The Department recommends the following EEU territory specific electric three- and twenty- year scenario modeling recommendations for VEIC and BED. It should be noted that these scenarios apply only to modeling electric resource acquisition budgets and savings. In addition, it is assumed that no geographically targeted energy efficiency efforts are included in the scenarios. Finally, the basis for scenarios one and two below are the resource acquisition budgets identified in Attachment A of the Board's Order dated 8/1/2011 in EEU-2010-06 entitled *Energy Efficiency Utility Electric Budgets for Demand Resources Plan*.

1. Level Budget with Inflation
    a. This scenario inputs updated modeling assumptions to estimate savings based on the Board approved framework of the inaugural DRP. Year 2015 resource acquisition budgets for VEIC and BED are extended through 2034, plus inflation, to model achievable savings.

2. Sustained Growth – Inaugural DRP Extended
    a. This scenario uses updated modeling assumptions to estimate savings based on the Board approved framework of the inaugural DRP. This scenario uses the projected annual resource acquisition allocations from the inaugural DRP to model the achievable savings for VEIC and BED. Years 2032, 2033, and 2034 are added to complete the twenty-year time horizon with no change to the ramp rate for achieving savings. Year 2032, 2033, and 2034 resource acquisition budgets are estimated based on prior year's average annual increase over time.

3. Aggressive Growth – 3.5% Savings
    a. This scenario uses updated modeling assumptions to estimate resource acquisition budgets required to ramp up to and maintain 3.5% savings relative to annual electric energy usage for VEIC and BED by year 2020.

Note: In addition to the scenarios above the Department is updating the potential study used in the inaugural DRP. The updated potential study will reflect "maximum achievable potential" (sometimes also referred to as maximum achievable cost-effective potential) results for VEIC and BED territories. The Department expects this information will be available for consideration within the DRP proceeding prior to the end of 2013. While not contemplated in the DRP Timeline ordered on 8/01/2013, the Department expects this information will provide a valuable reference point for the Department, Board and interested stakeholders and may also serve as a resource for development of electric efficiency budget recommendations in Phase 3 of the DRP proceeding. Further, the Department anticipates applying the same modeling assumptions recommended within this document.

DRP 2015-2035 Modeling Input Assumption Recommendations

The Department, VEIC and BED recommend the Board consider the following available

scenario modeling input assumptions. Modeling assumptions are presented in two primary categories: 1) Policy Assumptions and; 2) Model Input Assumptions. Note that the basis for Low-income spending and Residential and Commercial sector equity splits have been filed with this memo and more detail regarding these assumptions is included in Attachments A and B of the excel spreadsheet titled "20130814 Recommended VEIC_BED Modeling Assumptions and QPI Frameworks.xlsx".

Category: Policy Assumptions

Low-income – sector equity requirements

Recommended low-income sector equity requirements assumed for scenario modeling are different for VEIC and BED[1]. The low-income modeling assumptions for VEIC and BED are based on primary and secondary research cited and documented in the attached excel spreadsheet on the tab titled "Low Income % Spending".

- BED - It is assumed that 12% of BED's residential customers are low-income. The recommended level of low-income spending to assume for BED scenario modeling is 2.6% of the Resource Acquisition (RA) budget for each scenario. The percentage is based on the assumed Energy Efficiency Charge (EEC) contribution from low-income customers in BED territory for years 2015-2017 ($200,000) as a percent of RA spending in 2015-2017 ($7.5M). The assumption is that no equity constraint is applied to the low-income spending in the model. This includes both single family and multifamily low-income program spending.
    - $200,000/ $7.5M =2.6%

- VEIC – It is assumed that 31% of statewide (non-BED) residential customers are low income. The recommended level of low-income spending to assume for VEIC scenario modeling is 8.9% of the Resource Acquisition (RA) budget for each scenario. The percentage is based on the assumed EEC contribution from statewide (non-BED) low-income customers for years 2015-2017 ($15M) as a percent of RA spending in 2015-2017 ($130M). In addition, it is assumed that an equity constraint of 70% is applied to determine a minimum spending requirement. Also, an adder is applied (0.8%) so not to model savings at a bare minimum spending requirement.[2] This includes both single family and multifamily low income program spending.
    - ($15M/$130M)*0.7= 8.1%
    - 8.1%+0.8%= 8.9%

Small Business – sector equity requirements

The current 2012-2014 performance period "equity for small business" metric is measured by the minimum number of participating non-residential customers with less than 40,000kWH annual consumption. The target in the current 2012-2014 performance

[1] The Department notes the disparity between these figures and does not suggest that they are definitive percentages. Sources for the data for this metric varied widely. While we used the best data available to arrive at these numbers, it came from different sources for VEIC and BED, which in turn required us to use different calculation methodologies, resulting in calculations that are not comparable.

[2] The .8% figure is the mid-point between a hypothetical minimum spending requirement and the assumed full contribution amount, and should in theory produce a yield rate for Low Income spending that is in the middle of the appropriate range.

period for small business participation is 1,950 customers for VEIC and 158 customers for BED. While this actual target may vary slightly in the future, no significant conceptual changes to this minimum performance requirement are anticipated for the next performance period. In addition, this assumption is expected to have minimal impact on the model. For these reasons it is recommended the basis for this assumption be the current "equity for small business" minimum performance requirements as reflected in the EEUs QPIs; specifically a minimum of 1,950 customers for VEIC and 158 customers for BED.

Residential – sector equity requirement

Residential sector equity requirements assumed for scenario modeling are different for VEIC and BED. For both VEIC and BED it is recommended that the level of residential spending be based on the percentage of resource acquisition (RA) spending used in the inaugural DRP. As a basis for scenario modeling the residential/ commercial splits used in the inaugural DRP for BED and VEIC are presented in Attachment A in the excel spreadsheet, tab titled "EEC Res_Com Split". VEIC and BED proposed residential spending as a percent of RA for 2015-2017 are also presented below.

- VEIC - The level of residential spending in the model is recommended to assume 34% of the VEIC RA budget for 2015, 36% for 2016, and 37% of the RA budgets in 2017. Multifamily program spending is included as residential sector spending. Currently, the residential sector contributes about 48% of the total Energy Efficiency Charge (EEC) in VEIC territory. For modeling it is recommended that the percent spending in the residential sector steadily increase over time until it is assumed there is little available potential remaining. This residential sector percentage of EEC collections spending in VEIC territory is presented as a "ramp rate over time" in Attachment A of the excel spreadsheet, tab titled "EEC Res Com Split" of the attached excel spreadsheet.

- BED – The level of residential spending in the model is recommended to assume 25% of the BED RA budget for 2015, 25% for 2016, and 25% of the RA budgets in 2017. Multifamily program spending is included as residential sector spending. Currently, the residential sector contributes about 25% of the total EEC in BED territory.

Commercial & Industrial – sector equity requirement

The level of commercial and industrial spending in the VEIC and BED models should reflect the inverse of the residential percentages provided above. This sets the level of spending for commercial and industrial combined program spending.

- VEIC - The level of commercial and industrial spending is recommended to assume 66% of RA budgets for 2015, 64% of RA budgets for 2016, and 63% of RA budgets for 2017.

- BED – The level of commercial and industrial spending is recommended to assume 75% of the RA budget for 2015, 75% for 2016, and 75% of the RA budgets in 2017.

Category: Modeling Inputs

Impacts of changes in Codes and Standards on reduced efficiency potential

The following commercial and residential energy codes and standards assumptions apply equally to VEIC and BED. The impact of energy codes and standards updates reduces the amount of available electric energy savings potential as indicated below.

Commercial Energy Code

Current commercial energy code is *2011 Vermont Commercial Building Energy Standards* (CBES), effective January 2012, based on the equivalent model codes: 2009 International Energy Conservation Code (IECC) and ASHRAE 90.1-2007. This code is expected to remain effective through December 2014.

- Next code revision expected to be effective on 1/1/15 based on the equivalent model codes: 2012 IECC and ASHRAE 90.1-2010. An estimated savings impact of 14% compared the current 2011 Vermont CBES is recommended.

- Future code revision expected to effective on 1/1/18 based on the equivalent model codes: 2015 IECC, ASHRAE 90.1-2013 (now in development). The estimated savings impact is still in development but for modeling purposes is recommended at the expected value which is about 5% compared to 2012 IECC and ASHRAE 90.1-2010.

Residential Energy Code

Current residential energy code is *2011 Vermont Residential Building Energy Standard* (RBES), effective October 2011 and is based on the equivalent model code: 2009 IECC. This is expected to remain in effect through December 2014.

- Next residential code revision is expected to be effective on 1/1/15 based on 2012 IECC. Since the current version of RBES is already more efficient than 2009 IECC, the estimated and recommended savings is expected to be 10% as compared to 15% expected of a full increase in efficiency between 2009 to 2012 IECC.

- Future residential code revision expected to be effective on 1/1/18 based on 2015 IECC. Although still in development the estimated and recommended savings impact is expected to be 5% compared to 2012 IECC

Stretch Codes

As part of the next code update process, both residential and commercial "stretch codes" will be developed to set a higher efficiency requirement for projects that fall under Act 250, criteria 9F. The standards on which these stretch codes will be based have not yet been determined but discussions and suggestions often reference the next

higher tier of the model code. If the stretch codes are approved following this assumption, this would require buildings that fall under ACT 250 to meet 2015 IECC and ASHRAE 90.1-2013 beginning on 1/1/2015.

Avoided Costs

For both VEIC and BED the assumption for avoided costs should use the current *Avoided Energy Supply Costs in New England* report and most recent Board Order regarding avoided costs (*Cost-Effectiveness Screeening of Heating and Process-Fuel Efficiency Measures and Modifications to State Cost-Effectiveness Screening Tool. Order Dated: 2/7/2012*). However, if, as anticipated, updated avoided cost figures become available, they should be used instead.

Self-Managed Energy Efficiency Program (SMEEP) and Customer Credit Program (CCP) participant load

As it relates only to VEIC it is recommended the scenario model should assume that IBM and OMYA will continue to operate in the SMEEP and CCP respectively. In addition, for modeling it is recommended that no new SMEEP and Customer Credit Program participants enter the programs. The load for these customers will be addressed and documented appropriately in the VELCO/Itron forecast prior to modeling the scenarios.

Measure Decay

Treatment of measure decay is reccomended to be the same for VEIC and BED. Measure decay is a factor that impacts the DRP load forcast. Assumptions about measure decay should be considered and applied to the DRP load forecast which is used to estimate savings in the DRP. The Vermont System Planning Committee (VSPC) is considering the issue of measure decay in the forecast and how this assumption should be reflected in the savings model. Note, a significant impact of measure decay in the model is reflected in compact flourescent lighting (CFL) becoming baseline in 2020 (based on the *Energy Independence and Security Act of 2007* (EISA)) and how this is handled in both the VELCO/Itron load forcast and the energy efficiency potential modeling is currently being considered by the VSPC. Measure decay in the forecast is not to be confused with the actual "measure life" assigned to each measure, which is discussed below.

Base Appliance and Equipment Energy Efficiency Levels, Free Rider and Spill Over Rates, and Measure Life

Base appliance and equipment effciency levels, free rider (FR) and spill over (SO) rates, and measure life are assigned at a detailed measure level in the models. These rates are based on either the values in theTechnical Reference Manaul (TRM) or specific measure characterizations where TRM values are not available. The EEUs and DPS are currently reviewing all the existing measures to determine if any anticipated changes to either base efficiency levels, FR and SO rates, and measure life for any particular measures would be significant enough to be identified specifically and adjusted for accordingly in the model. The measures are prioritized based on greatest savings impact (kWh, kW, TRB), quanity installed, risk to portfolio, and magnitude of change anticipated. A final list of

measures which are determined to significantly impact the modeling results will be available for inclusion in the models by October 1, 2013.

Behavioral Measures, Advanced Metering Infrastructure (AMI) Measures, and other New Measures

Behavioral measures, AMI-enabled Measures, and other "new" measures that are not currently part of the TRM and the EEU's savings portfolio. These measures are currently being identified, characterized, and prioritized by the EEUs and the DPS to be included in the model starting in year 2015. This list of assumed new measures will be finalized and available by October 1, 2013. Although currently in pilot form only, behavior and AMI-enabled measures, in particular, are both expected to be part of the modeled savings portfolio starting in year 2015. The EEUs and the PSD are in ongoing discussions related to acceptable savings methodologies, verification pratices, and treatment of "persistence" for behavior and AMI-enabled measures.

QPI Framework Recommendations

The Department, VEIC and BED recommend the Board adopt the following electric and TEPF quantifiable performance indicators (QPI)[3] consisting of Performance Indicators (PIs) and Minimum Performance Requirements (MPRs) for VEIC and BED.

Table 1: Electric Quantifiable Performance Indicators

Performance Indicators	Minimum Performance Indicators
Electricity Savings	Equity for All Electric Ratepayers
Total Resource Benefits	Equity for Residential Ratepayers
Summer Peak Demand Savings[4]	Equity for Low-income Customers
Winter Peak Demand Savings	Geographic Equity
Business Comprehensiveness	Equity for Small Business Customers
Market Transformation	Administrative Efficiency
	Service Quality
	Performance Period Bridge Spending (if ordered by the Board in EEU 2011-04)

Table 2: TEPF Quantifiable Performance Indicators

Performance Indicators	Minimum Performance Indicators
Thermal and Mechanical Energy Efficiency Savings	Equity for Residential Customers
Residential Single Family Comprehensiveness	Equity for Low-income Customers

The Department notes that all but one of the proposed performance indicator categories

[3] The Department intends these QPI recommendations to be subject to appropriate modification during this proceeding, if appropriate.

[4] See *Summer and Winter Peak Demand Savings* narrative below for a description of how the QPI framework recommendation treats Peak Savings from future geographic targeting of energy efficiency services.

have been used in some form in the past. The Winter Peak Demand Savings QPI was previously used, deleted and is now being reinstituted for the upcoming performance period, while the Bridge Funding QPI is being proposed for the first time and is explained in further detail in a separate narrative section. Some of these proposed categories may not apply equally to both VEIC and BED. For example, a geographic equity indicator in BED's territory is not necessary. The narrative descriptions below provide brief explanations of the policy objective behind each metric. In addition, the attached Excel spreadsheet titled *20130814 Recommended VEIC_BED Modeling Assumptions and QPI Frameworks.xlsx* details the specific electric and TEPF QPI recommendations for VEIC and BED.

Consistent with the DRP timeline ordered by the Board, the Department recommends that the weighting and scaling of performance, as well as the performance award amounts for specific indicators be proposed later in Phase 4 of the DRP proceeding. In addition, we recommend that the methods for calculating some metrics be proposed later in phase 4 of the DRP[5]. Each proposed category for electric and TEPF QPIs is described in more detail below.

Electric Efficiency

Electricity Savings - Annual Incremental MWh Savings
This performance indicator is intended to encourage EEUs to design and implement efficiency initiatives that will maximize electrical energy savings. EEUs should be measured upon the cumulative three year total of the incremental MWh savings achieved in a performance period.

Total Resource Benefits
This performance indicator is intended to encourage EEUs to design and implement efficiency initiatives that will maximize the lifetime electric, fossil, and water benefits. EEUs should be measured upon cumulative three year Total Resource Benefits achieved in a performance period.

Cumulative Summer Peak Demand Savings
Cumulative Winter Peak Demand Savings
These performance indicators are intended to encourage EEUs to design and implement efficiency initiatives that will maximize the capacity reduction coincident with peak demand. Currently, peak demand is measured relative to the Independent System Operator-New England identified peak. This assumption should be revisited by parties in the development of the actual target. EEUs should be measured upon cumulative three-year coincident peak savings in a performance period.

It is recommended that if the Board approves specific energy efficiency geographic targeting (GT) initiatives for EEU implementation in the 2015-2017 performance period

[5] Detailed methods for calculating metrics for the following PIs and MPRs are not currently determined 1) Electric Comprehensiveness 2) Market Transformation 3) Administrative Efficiency and 4) TEPF Residential Single Family Comprehensiveness.

that the relevant number of GT area specific capacity reduction QPI goals be added to the EEUs QPI framework.

It is recommended that Cumulative Winter Peak Demand Savings be added because ISO-NE levies a regional networks service ("RNS") charge on all utilities based on their peak loads each month. This RNS charge is the primary means by which utilities pay for transmission projects within the region, and it has been growing rapidly. Focusing EEUs' efforts on the winter as well as summer peaks will better align the EEUs' goals and efforts to reduce these costs. In addition, on winter-peaking circuits (and for winter-peaking utilities) explicitly addressing winter peak will increase the leverage that efficiency has to reduce distribution costs.

Business Comprehensiveness of Savings
This performance indicator is intended to ensure that energy efficiency initiatives are designed and implemented to acquire comprehensive savings.

Long-Term Market Transformation
The Order of Appointment structure affords EEUs the opportunity to undertake long term planning for efficiency initiatives and implementation. This performance indicator is intended to encourage EEUs to design and implement efficiency initiatives that maximize market transformation (MT). Consistent with the 2012-2014 QPIs, the Department recommends that the VEIC QPI framework have one residential and one commercial MT performance indicator. As BED operates in a smaller footprint, we recommend that its QPI framework have one MT performance indicator.

Equity for All Electric Ratepayers
This minimum performance requirement is intended to ensure equity for all Vermont electric ratepayers by assuring that the overall electric benefits are greater than the costs incurred to implement and evaluate the EEUs. The EEUs should be measured upon total verified electric benefits divided by total costs.

Equity for Residential Ratepayers
This minimum performance requirement is intended to ensure equity for residential customers by assuring that a minimum level of overall efficiency effort, as reflected by spending, will be dedicated to residential customers. The EEUs should be measured by a minimum total spending dollar amount in the residential sector.

Equity for Low-income Customers
This minimum performance requirement is intended to ensure equity for low-income customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to low-income households. EEUs should be measured by a minimum total spending dollar amount on low-income services.

Equity for Small Business Customers This minimum performance requirement is intended to ensure equity for smaller non-residential customers by assuring that a minimum level of overall efficiency effort will be dedicated to small commercial accounts. EEUs should

be measured by the total number of participating non-residential accounts with an annual electric use below an agreed upon amount.

Geographic Equity
This minimum performance requirement is intended to ensure geographic equity for all Vermont electric customers by assuring that for the appropriate portion of efficiency efforts (non-geographically targeted), energy efficiency benefits are distributed on a geographically-equitable basis. VEIC should be measured by a minimum level of the Total Resource Benefits achieved for specific geographic areas of the state. Note, that a higher TRB may be reported in areas where energy efficiency programs are geographically targeted. This metric does not apply to BED.

Administrative Efficiency
This minimum performance requirement is designed to measure the administrative efficiency of energy efficiency delivery including but not limited to the efficiency of an EEU's key business processes.

Service Quality
This minimum performance requirement is designed to measure service quality as specified in Board approved Service Quality and Reliability Plans (SQRP) for EEUs that are not distribution utilities (as is the case for VEIC). An EEU that is also a DU may be subject to performance requirements in a Board approved SQRP, however, these requirements are not recommended as part of the QPI framework because the mechanism for tracking performance takes place outside the QPI framework (as is the case for BED).

Performance Period Bridge Spending
For VEIC only, the Department proposes a QPI to promote adherence, while providing appropriate flexibility, to Board established performance period budgets and goals. The Board is addressing this matter in EEU 2011-04. In a settlement filed in that proceeding, VEIC and the Department established and instituted the following QPI[6] for the 2012-2014 performance period:

> Efficiency Vermont expenditures above a Board established spending threshold of a total three year performance period budget (not including the maximum performance award) will result in a financial penalty. The ultimate financial penalty will depend upon the size of the variance. That is, a minimum penalty would be established and the penalty would increase based upon increasing variances.
> All spending above an approved budget and any associated energy savings and other quantifiable performance indicator benefits would be recorded and reported in the preceding year. This would result in a reduction in the proceeding performance period budget in that proceeding year to maintain the integrity of the Board's performance period budgets and the associated performance goals.

Depending on the outcome of EEU 2011-04, VEIC and the Department will propose that a QPI similar to the one outlined above, be included for 2015-2017 performance period.

[6] The full QPI, with specific budget detail, was contained in a settlement stipulation filed with the Public Service Board in EEU 2011-04 on April 20, 2012.

Thermal Energy and Process Fuels

Thermal & Mechanical Energy Efficiency Savings

This performance indicator is intended to encourage the design and implementation of efficiency initiatives that will maximize unregulated thermal energy savings. The metric should measure the cumulative total over the EEUs three year performance period.

Residential Single Family Comprehensiveness

This performance indicator is intended to ensure that energy efficiency initiatives are designed and implemented to acquire comprehensive savings. In the 2012-2014 period the metric accounted for; 1) average air leakage reduction per project; 2) percent of projects with square feet of insulation added as a percentage of the homes finished square feet of floor area; and 3) percent of projects with both shell and heating system measures installed. The Department, VEIC and BED recommend that the three individual methods for measuring this QPI be revisited for the 2015-2017 performance period. Therefore, the methods for measuring this QPI have been removed from the attached TEPF QPI framework tables for VEIC and BED. Individual methods will be developed and recommended later in the DRP to reflect an appropriate set of goals for this QPI.

Equity for Residential Customers

This minimum performance requirement is intended to ensure equity for residential customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to residential customers. The EEUs should be measured by a minimum percent of total TEPF spending in the residential sector.

Equity for Low-income Customers

This minimum performance requirement is intended to ensure equity for low-income customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to low-income customers. The EEUs should be measured by a minimum percent of total TEPF spending in the residential sector.

The Department believes that the above quantifiable performance indicator framework provides a structure that can appropriately balance priorities within the electric and TEPF energy efficiency delivery portion of VEIC and BED services. We look forward to discussing recommended electric scenarios, assumptions for scenario modeling and the QPI framework at the upcoming workshop.

Thank you for your consideration,

Brian Cotterill
Energy Programs Specialist

/s/
Jeanne Elias
Special Counsel