

STATE OF VERMONT
PUBLIC SERVICE BOARD

EEU-2016-03

2016-2017 Demand Resources Plan Proceeding)

Order entered: 10/27/2016

**ORDER DETERMINING RESOURCE ACQUISITION SCENARIOS TO BE ANALYZED, MODELING
INPUTS, TEPF REVENUE FORECAST, AND QUANTITATIVE PERFORMANCE INDICATOR
FRAMEWORK**

I. INTRODUCTION

On June 17, 2016, the Vermont Public Service Board (“Board”) initiated this Demand Resources Plan (“DRP”) proceeding to devise a set of long-term assumptions pursuant to which Vermont’s energy efficiency utilities (“EEUs”) shall operate. This workshop process will lead to, among other items, a Board decision regarding statewide short- and long-term electric, natural gas, and thermal energy and process fuel (“TEPF”) budgets and goals. To facilitate this decision, workshop participants have proposed to analyze certain savings “scenarios.” In this Order, we determine which scenarios should be analyzed, consider the Department’s TEPF revenue forecast, and adopt assumptions that should be incorporated into the modeling of these scenarios. In addition, we determine the broad framework that workshop participants should use in subsequent phases of this proceeding to develop proposed electric, natural gas, and TEPF quantifiable performance indicators (“QPIs”) and minimum performance requirements (“MPRs”).

II. PROCEDURAL HISTORY

On June 7, 2016, the Vermont Department of Public Service (“Department”) filed a request with the Board to commence this DRP proceeding to develop budgets and goals for the upcoming 2018-2020 performance period. All the EEU¹ joined in this request.

On June 17, 2016, the Board issued an Order opening this proceeding and scheduling a workshop.

On June 24, 2016, the Department, in coordination with the EEU^s, submitted a proposed schedule for this proceeding and agenda for the workshop.

On June 30, 2016, the Board conducted a workshop at which the schedule and proposed changes to the DRP process were discussed.

On July 11, 2016, the Department and EEU^s jointly submitted a revised scheduling proposal for this proceeding.

On August 5, 2016, the Board issued an Order that established a schedule for this proceeding (“Scheduling Order”), including deadlines for the submission of modeling proposals, QPI and MPR frameworks, estimated rate and bill impacts, a TEPF forecast proposal, and comments on the proposals.

On September 16, 2016:

(a) The Department filed (i) proposed resource-acquisition modeling proposals, including modeling assumptions, QPI and MPR frameworks, and estimated rate and bill impacts; and (ii) a TEPF forecast proposal, reflective of Forward Capacity Market (“FCM”) and Regional Greenhouse Gas Initiative (“RGGI”) revenue projections. In its filing, the Department indicated that it expected each EEU to file its own resource-acquisition modeling proposal, which would include, as appropriate, proposed optimization targets;

(b) Vermont Energy Investment Corporation (“VEIC”) submitted a proposal for resource acquisition modeling of its activity as Efficiency Vermont;

1. The City of Burlington Electric Department, Vermont Energy Investment Corporation, and Vermont Gas Systems, Inc., have each been appointed by the Board to serve as an EEU.

(c) The City of Burlington Electric Department (“BED”) submitted a proposal for modeling the potential effects of various scenarios on BED’s investments in future demand resources;

(d) Vermont Gas Systems, Inc. (“VGS”) submitted a proposal for resource-acquisition modeling of its EEU activities; and

(e) Conservation Law Foundation (“CLF”) submitted comments regarding resource-acquisition modeling in which CLF recommended that the modeling include a clear evaluation of greenhouse gas (“GHG”) emission impacts.

On September 22, 2016, Board staff convened a workshop to discuss: (a) proposed resource-acquisition modeling proposals, including modeling assumptions, QPI and MPR frameworks, optimization targets, and estimated rate and bill impacts; and (b) the Department’s TEPF forecast proposal.

On October 3, 2016, VEIC, VGS, CLF, and the Department each submitted further comments, and the Vermont Public Interest Research Group (“VPIRG”), Vermont Natural Resources Council (“VNRC”), and Vermont Conservation Voters (“VCV”) jointly filed a letter supporting the comments and recommendations of CLF.

On October 6, 2016, the Department filed a reply to CLF’s comments related to evaluating GHG emission impacts.

III. BACKGROUND

The Board is authorized pursuant to 30 V.S.A. § 209(d)(2)(A) to appoint one or more EEUs to undertake demand-side efficiency resource-acquisition initiatives in place of utility-specific programs developed pursuant to 30 V.S.A. § 218c. The Board has issued Orders of Appointment to VEIC,² BED,³ and VGS⁴ to serve as EEUs. Under their respective Orders of Appointment, the EEUs are each required to design and implement demand-side services and initiatives to comprehensively address cost-effective opportunities associated, in the case of

2. Order of Appointment, dated February 12, 2016 (issued in Docket 8455).

3. Order of Appointment, dated April 19, 2011 (issued in Docket 7466).

4. Order of Appointment, dated April 17, 2015 (issued in Docket 7676).

VEIC and BED, with electric and TEPF efficiency, and, in the case of VGS, with natural gas energy efficiency.

Pursuant to 30 V.S.A. § 209(d)(3), the Board is required to establish budgets for the EEUs to obtain all reasonably available, cost-effective electric and natural gas energy efficiency savings, and in so doing must balance the various factors enumerated in Sections 209(d)(3) and (f). The Board conducts a DRP proceeding every three years to address budgets, savings goals, and QPIs and MPRs for the next three-year performance period. The purpose of the current proceeding is to determine such values for VEIC, BED, and VGS during the 2018-2020 performance period.

Scenario modeling is part of the process of developing a DRP to assist in identifying and realizing reasonably available, cost-effective energy efficiency savings consistent with applicable law. As part of the DRP proceeding process, the Department is required to propose EEU-specific electric and natural gas resource-acquisition scenarios to be modeled for three- and twenty-year periods.⁵ An EEU and other interested parties may also propose electric and gas resource-acquisition scenarios to be modeled. Scenarios may be either budget- or savings-based.

After the Board has determined the applicable modeling scenarios, the EEUs are required, as applicable, to present demand-side resource-acquisition budgets and savings based on Board-ordered scenarios for three- and twenty-year periods, as well as a set of year-by-year resource-acquisition budgets and modeled TEPF savings, by calendar year for three- and ten-year periods.⁶ The Department and other stakeholders may also present modeled budgets and savings.

The EEUs and the Department are required to take all reasonable steps to collaborate in the development of model assumptions, and such modeling is intended to be an iterative process.⁷ Model assumptions are filed with the Board, and the process provides for making model assumption values available to interested stakeholders.

The DRP proceeding also includes the development of QPIs by which the performance of an EEU can be measured over specified time periods. The purpose of the QPIs and any

5. Process and Administration of an Energy Efficiency Order of Appointment as of April 17, 2016 (“P&A Document”) at 9 (Section II.1.D.).

6. P&A Document at 9 (Section II.1.E.).

7. P&A Document at 9 (Section II.1.D.(a)).

associated performance award is to establish a reasonably balanced system of risks and rewards that encourages an EEU to operate as efficiently as possible using sound management practices while achieving the objectives set forth in 30 V.S.A. § 209(d) through (g) and maximizing the benefits to Vermont's ratepayers.

IV. ELECTRIC AND NATURAL GAS RESOURCE ACQUISITION SCENARIOS,

MODEL OUTPUTS, AND TEPF FORECAST

Section 209(d)(3)(B) of Title 30 requires that the budget for electric and natural gas efficiency acquisition be “adjusted as necessary in order to realize all reasonably available cost-effective energy efficiency savings.” Sections 209(d)(3)(B) and (f) also include various factors that the Board must balance when setting the budget for electric and natural gas efficiency acquisition.

To assist us with this determination, the Department will complete a potential study that will show the technical, economic, maximum achievable, and program achievable electric and natural gas energy efficiency potential in Vermont. Potential studies are intended to identify, among other items, the available cost-effective electric efficiency savings. In addition, as noted in the Scheduling Order in this proceeding, the EEU's, and possibly other workshop participants, will analyze the scenarios identified in today's Order. The analysis of these scenarios will provide us with useful information regarding the various factors the statute requires us to consider when establishing electric and natural gas efficiency budgets.

The Scheduling Order set forth a September 16, 2016, deadline for workshop participants to file proposed electric and natural gas scenarios. BED, VEIC, and VGS each proposed scenarios to be modeled for their service territories. CLF recommended an additional scenario to be modeled based on greenhouse gas savings. We discuss each of the proposed scenarios below.

A. BED Scenarios

BED proposed five distinct electric efficiency scenarios to model in its service territory: (1) Base Case; (2) Maximize Annual MWh Savings; (3) Maximize Lifetime MWh Savings; (4)

Maximize Annual Summer and Winter kW Savings; and (5) Maximize Lifetime Summer and Winter kW Savings.

Base Case

BED describes the Base Case scenario as a continuation of the previously approved long-term electric resource-acquisition budget, altered for inflation. In order to model its ability to cost-effectively acquire energy and capacity savings with the assumed budgets, BED will apply a set of parameters — including evaluations, potential studies, integrated resource plans, rate and bill impacts, and changes in baseline efficiencies, among others — to its analyses of existing programs. BED states that the results of this scenario will serve as the “control group” or baseline to which the other scenarios will be compared.

BED notes that the electric resource-acquisition budget approved in the last DRP was based, in part, on a 2013 statewide potential study that apportioned the statewide potential for energy efficiency to BED’s service territory. BED contends that its service territory contains unique market characteristics, and that the 2013 statewide potential study may not have reflected these dynamics. Accordingly, BED believes that the Base Case scenario should fully account for any unique market dynamics before the other scenarios are analyzed.

Maximize Annual MWh Savings

In this scenario BED proposes to apply 20% of the previously approved long-term electric resource-acquisition budget to efficiency programs and measures designed to obtain as much annual MWh savings as possible. BED states that the intent of this scenario is to prioritize first-year savings over cumulative savings and other performance metrics. BED expects this scenario to result in investments being directed toward efficiency measures and programs that have shorter lives and that may be less expensive relative to other types of programs and measures.

Maximize Lifetime MWh Savings

In this scenario BED proposes to apply up to 40% of the previously approved long-term electric resource-acquisition budget to resources that have longer measure lives in order to

maximize lifetime MWh savings. BED contends that focusing efficiency efforts on programs and measures that produce large amounts of cumulative savings is a priority. BED recommends this scenario, in part, based on its overarching goal of helping the City of Burlington transition to a net-zero energy community. BED states that accomplishing this transition will require investments in measures like HVAC equipment that last a long time and accumulate large savings over time. BED maintains that promoting long-lived measures over others has historically been “a great investment of ratepayer dollars.”

Maximize Annual Summer and Winter kW Savings

In this scenario BED proposes to apply between 20% and 40% of the previously approved long-term electric resource-acquisition budget to efficiency programs that would maximize annual peak demand savings. BED states that it is facing a capacity shortfall over the next several years and that capacity prices are expected to increase. BED is pursuing multiple strategies to address this challenge, including the development of active demand response programs and potentially implementing new rate designs that would allow for greater transparency of electric power costs. According to BED, these strategies alone may not be sufficient to close its capacity gap. Therefore, BED maintains that it will need to develop energy efficiency programs that concentrate their efforts and resources on peak demand reductions.

Maximize Lifetime Summer and Winter kW Savings

In this scenario BED proposes to apply between 20% and 40% of the previously approved long-term electric resource-acquisition budget to programs that will maximize lifetime peak demand reductions. BED states that this scenario is nearly identical to the previous scenario, but includes only durable measures with high expected persistence rates, whereas the previous scenario could include behavior-like initiatives.

Discussion

No participant opposed BED’s proposed five scenarios.

Pursuant to 30 V.S.A. § 209(d)(3)(B), the Board is required to establish budgets to obtain all reasonably available, cost-effective energy efficiency savings. Thus, when the Board ultimately establishes budgets at a later stage in this proceeding, it will need to make an assessment of the reasonably available cost-effective potential while also determining an appropriate balance of the objectives set forth in Section 209(d)(3)(B). We conclude that the five scenarios proposed by BED, in conjunction with the Department's potential study, will provide us with useful analysis that will inform our consideration of the enumerated statutory criteria. Therefore, we approve the five scenarios proposed by BED, and we direct BED to model them consistent with the modeling assumptions discussed in this Order.

B. VEIC Scenarios

VEIC proposes to use the electric resource-acquisition planning budgets for 2018-2034 established in the previous DRP, extend the budgets through 2037, and model several different scenarios in order to understand the opportunities for maximizing the shape and depth of an efficiency portfolio within the defined budget constraint. VEIC proposes four distinct electric scenarios to model for its service territory: (1) Base Case Scenario; (2) Maximize Annual MWh Savings; (3) Maximize Lifetime MWh Savings; and (4) Maximize Summer and Winter Peak kW Savings.

Base Case Scenario

In this scenario VEIC proposes to use the 2015-2017 performance period QPI and MPR structure to balance measures and programs for the 2018-37 planning period. VEIC proposes to adjust the QPI and MPR indicators based on the scale of the 2018-2020 electric resource-acquisition planning budget levels. VEIC characterizes this scenario as the "control" scenario against which all other scenario results will be compared.

Maximize Annual MWh Savings

In this scenario VEIC proposes to maximize annual MWh savings by applying 20% of the electric resource-acquisition budget to efficiency measures and programs with high first-year

MWh savings, and by prioritizing their deployment over measures of equivalent cost that would have achieved other metrics. VEIC states that this scenario prioritizes the deployment of efficiency measures that will have the greatest short-term impact on reducing energy consumption.

Maximize Lifetime MWh Savings

In this scenario VEIC proposes to maximize lifetime MWh savings by applying 20% of the electric resource-acquisition budget to efficiency measures and programs that will result in the greatest amount of electric savings over their lifetimes, and by prioritizing their deployment over measures of equivalent cost that are shorter-lived. VEIC anticipates that this scenario will have a direct and positive impact on the total resource benefits QPI and electric-sector GHG emission reductions, which both favor energy savings calculated by year-over-year lifetime savings.

Maximize Summer and Winter Peak kW Savings

In this scenario VEIC proposes to maximize annual returns from the FCM through electric efficiency measures by applying 20% of the electric resource-acquisition budget to efficiency measures and programs that will have the greatest impact on Vermont's winter and summer peak demand as determined by ISO New England. VEIC states that the first three years of the scenario would be modeled to fully meet Efficiency Vermont's FCM resource obligation, and the final years of the scenario would be modeled to identify maximum FCM resources. VEIC notes that while some measures will be most successful at reducing load during winter peak, and others during summer peak, FCM resources that receive the greatest remuneration are those that are available year-round and thus can contribute toward meeting both summer and winter peak demand. For energy efficiency, VEIC contends that this means that winter and summer peak kW reduction must be of the same value to guarantee the largest possible revenue stream from the FCM.

Discussion

No participant opposed VEIC's proposed four scenarios.

As we discussed above for BED, the Board is required to establish budgets to obtain all reasonably available, cost-effective energy efficiency savings. The budgets must strike an appropriate balance among the objectives of Section 209(d)(3)(B). We conclude that the four scenarios proposed by VEIC, in conjunction with the Department's potential study, will provide us with useful analysis that will inform our consideration of the enumerated statutory criteria. Therefore, we approve the four scenarios proposed by VEIC, and we direct VEIC to model them consistent with the modeling assumptions discussed in this Order.

C. VGS Scenarios

Because this is its first DRP, VGS proposes to focus on the development, modeling, and analysis of the available savings and related costs over a 20-year planning horizon. VGS proposes three resource-acquisition modeling scenarios: (1) Level Budget; (2) Sustained Savings; and (3) Ramp Up.

VGS states that its goal is to not only have cost-effective programs but to also focus on cost per Mcf saved (yield) while maintaining a balanced portfolio. VGS notes that a 2015 study of Vermont's natural gas efficiency potential indicated that the achievable savings potential averaged 0.9% of sales from 2015 to 2029. Based on this result and the maturity of its efficiency programs, VGS contends that its three proposals are appropriate and will provide meaningful scenario results.

Level Budget

In this scenario VGS proposes to adjust the Board-approved 2017 resource-acquisition budget for inflation annually over the 20-year forecast period. VGS states that this scenario will likely result in declining savings due to program maturity and adjustments for commercial programs that have not previously been subject to formal evaluation.

Sustained Savings

In this scenario VGS proposes to model efficiency savings of 1% of forecasted sales by 2023, and to maintain this level of annual savings for the remainder of the planning period. VGS states that its 2016 and 2017 savings targets represent approximately 0.85% of annual sales. Further, VGS states that between 2005 and 2015, its efficiency savings were about 1% of sales, yet notes that these savings rates were not subject to formal evaluation. Thus, the realization rates for the period may have been lower than reported.

Ramp Up

In this scenario VGS proposes to model efficiency savings of 1.5% of forecasted sales by 2028, and to maintain this level of annual savings for the remainder of the planning period.

Discussion

No participant opposed VGS's proposed scenarios.

This is the first DRP proceeding in which VGS will participate as an EEU. As such, the Board has not previously reviewed or approved long-term resource-acquisition planning budgets for the natural gas EEU. For this first-round scenario modeling exercise, we conclude that, when combined with the Department's potential study, the VGS proposed scenarios are likely to produce meaningful information for the Board to consider in light of the mandates and objectives of Section 209(d)(3)(B). Therefore, we approve the three scenarios proposed by VGS, and we direct VGS to model them consistent with the modeling assumptions discussed in this Order.

D. CLF Scenario

CLF states that while it generally supports the scenarios proposed by the Department and VEIC, CLF believes that the scenarios will not be sufficient to identify the investments in energy efficiency that will have the greatest impact in reducing GHG emissions. Accordingly, CLF recommends that one of the scenarios specifically model GHG emission impacts. Rather than simply track GHG emissions reductions as an output of scenario modeling, CLF contends that GHG emissions should be a driver of efficiency investments. In support of its recommendation,

CLF states that reducing the generation of GHG is one of the objectives in Section 209(d)(3)(B) to which the Board must grant particular emphasis. CLF maintains that GHG emissions are affected by the source of the electricity and the electricity's end use. CLF states that these will vary, and will not be fully captured by only modeling peak, annual MWh, and lifetime MWh savings. As an example, CLF states that the GHG emissions would be different if electricity is used for an increased share of transportation or thermal uses compared to simply analyzing peak, annual, or lifetime electricity savings. In addition, CLF notes that Vermont has specific statutory goals to reduce GHG emissions,⁸ and that Vermont's investments in energy efficiency have resulted in consistent reductions in GHG emissions, and maintains that a key focus of Vermont's energy efficiency programs should be the reduction of GHG emissions.

Discussion

VPIRG, VNRC, and VCV all support CLF's recommendations.

The Department supports evaluating GHG emission reductions as a scenario modeling output, and notes that it is planning for its potential study to assess GHG emission reductions. However, the Department argues that CLF's recommendation is not fully defined and does not provide enough detail to be an actionable scenario to model. As an example, the Department states that the CLF recommendation does not propose any modeling assumptions associated with increased electrification and that it is unclear what type of transportation measures should be modeled. Further, the Department maintains that transportation measures that constitute "fuel switching" from gas or diesel to electric would not be allowed using EEC or TEPF funding. Similarly, because CLF did not specify the thermal measures to be modeled, the Department contends that it is difficult to ascertain whether the measures would be allowed with either EEC or TEPF funding. The Department states that CLF's proposal does not meet the criteria of the Process and Administration of an Energy Efficiency Utility Order of Appointment Document, which according to the Department requires scenarios to be either budget- or savings-based. Finally, the Department notes that the scenarios that have already been proposed, as well as the potential study, will report GHG emission reductions, and may serve as the functional equivalent

8. 10 V.S.A. § 578.

of CLF's proposed GHG scenario. Therefore, the Department does not recommend that a separate scenario focused solely on GHG impacts is necessary in order to understand the impacts of this factor in setting the budgets and savings goals of Vermont's EEU's.

We recognize that energy efficiency investments constitute a meaningful and cost-effective way for Vermont to address GHG emissions and to make progress toward Vermont's statutory GHG emission reductions goals. As CLF points out, reducing the generation of greenhouse gases is one of the statutory objectives to which the Board must accord particular emphasis when establishing electric and natural gas efficiency budgets. With this in mind, we are directing the EEU's to report GHG emissions reductions as an output of each of their scenarios. In addition, we note that the Department's potential study will provide information on GHG emissions for each of the scenarios that will be presented in the study.

Based on the foregoing, we do not believe that expenditure of ratepayer resources on modeling CLF's proposed scenario is justified. As for CLF's example regarding the potential increased electrification of transportation and thermal loads, we note that the use of EEC funds for investments in such energy end-uses is subject to statutory restrictions, and further that the magnitude of TEPF budgets is not subject to Board discretion under Section 209(d)(3)(B). Therefore, we do not direct any EEU to model CLF's proposed scenario. However, should CLF choose to model this scenario, CLF may submit its modeling results by the deadline established for the EEU's to file their first round of modeling results, and the results would be discussed at the workshop on first-round scenario modeling.

E. Scenario Modeling Outputs

Electric Outputs

For electric resource-acquisition modeling, the Department recommends the following minimum modeling metrics that are intended to generate outputs that will enable comparisons between scenarios:

- (1) Annual MWh;
- (2) Lifetime MWh;
- (3) First-year summer peak kW reduction (ISO New England peak);

(4) Lifetime summer peak kW reduction (ISO New England peak), defined as first-year summer peak times the measure life;

(5) First-year winter peak kW reduction (ISO New England peak);

(6) Lifetime winter peak kW reduction (ISO New England peak), defined as first-year winter peak times the measure life;

(7) Total resource benefits;

(8) Cost effectiveness (program benefits divided by program costs);

(9) Net societal benefits; and

(10) GHG emission reductions.

Rather than include lifetime summer and winter peak kW reductions as a modeling output, VEIC proposes a metric that it terms “Forward Capacity Market resource,” defined as an annual metric measured in MW, based on the summer and winter peak resources as an effective year-round resource to the FCM. VEIC states that this metric incorporates the longevity of the resource from the prior year’s approved resources, and can be used to calculate FCM revenue from estimated market clearing prices.

Natural Gas Outputs

For natural gas resource-acquisition scenario modeling, the Department recommends the following minimum modeling metrics that are intended to generate model outputs that will enable comparisons between scenarios:

(1) Annual Mcf;

(2) Lifetime Mcf;

(3) Peak day savings;

(4) Lifetime peak day Mcf savings, defined as first-year peak day Mcf reductions times the measure life;

(5) Total resource benefits;

(6) Cost effectiveness (program benefits divided by program costs);

(7) net societal benefits; and

(8) GHG emission reductions.

For both electric and natural gas scenario modeling, the Department recommends that an additional model output be rate and bill impacts, which it will produce.

TEPF Outputs

For TEPF modeling, the Department recommends the following minimum modeling metrics:

- (1) Annual MMBTU;
- (2) lifetime MMBTU;
- (3) fossil fuel MMBTU;
- (4) number of building shells improved;⁹
- (5) total resource benefits;
- (6) cost effectiveness (program benefits divided by program costs);
- (7) net societal benefits; and
- (8) GHG emission reductions.

With respect to fossil fuel savings, the Department and VEIC maintain that the current methodology for accruing TEPF savings accounts only for MMBTUs saved as a result of a project, which they argue “penalizes” switching from fossil fuels to full or partial renewable energy (e.g., solar hot water, wood pellets, geothermal, and air-source heat pumps). The Department maintains that Section 209(g)(1) directs that TEPF programs be intended to “reduce greenhouse gas emissions from thermal and process fuel use in Vermont.” Therefore, the Department recommends that one objective of TEPF modeling be a re-orientation of the principal TEPF metric from MMBTU to fossil fuel MMBTU. However, the Department maintains that any such re-orientation of the TEPF energy-savings metric toward fossil fuel savings should be weighed against “comprehensive” treatment of buildings in order to ensure that VEIC and BED continue to work with Vermonters on weatherizing homes and businesses and not simply fuel switching.

9. In its October 3 comments, VEIC clarified that for Efficiency Vermont, this metric would be the number of residential homes with building shell improvements.

Under this scenario, VEIC maintains that customers should weatherize their homes to reduce their thermal energy burden, and that fuel switching to renewable resources would be treated as complementary to weatherization, and not as a replacement for or alternative to weatherization.

Discussion

No participant opposed the proposed scenario model output metrics.

We understand that there is a substantive disagreement between the Department and VEIC as to the best output metric to measure and compare peak demand savings among the various scenarios. Whereas the Department proposes output metrics termed “Lifetime summer peak kW reduction” and “Lifetime winter peak kW reduction,” VEIC proposes an output metric termed “Forward Capacity Market resource.” More than just a nominal difference, we understand that these proposals represent materially different output values and calculations. This disagreement was not addressed in depth in their written filings, nor was it addressed at length at the September 22 workshop. Therefore, we do not adopt an output metric to measure and compare peak demand savings. Instead, we encourage the Department, VEIC, and other workshop participants to engage in further discussions of this issue, and to propose within 30 days of the date of this Order either a resolution of this issue or substantive written filings addressing the merits of these, or potentially substitute, model output metrics.

With the exception of the metric discussed in the preceding paragraph, we find that the proposed model output metrics will facilitate both a comparison across scenarios and information relative to the statutory criteria. Therefore, we approve the proposed electric, natural gas, and TEPF scenario model output metrics, and we direct the EEU's to report them in their first-round modeling results.

With respect to the recommendation to incorporate a fossil fuel MMBTU metric, we agree that modeling this metric would provide a new and unique perspective on how TEPF programs may be oriented in the future. Therefore, VEIC and BED should include this metric as an output of first-round TEPF modeling. However, we caution that this determination is limited to first round modeling. Any decision to re-orient the TEPF savings QPI will come after further

exploration of this topic, and will be informed, at a minimum, by the first-round modeling results.

F. TEPF Forecast

Pursuant to 30 V.S.A. §§ 209(e)(1) and 255(d), net proceeds from the ISO New England FCM and RGGI auctions are to be used to provide TEPF service to unregulated fuels customers. FCM and RGGI auction proceeds can vary significantly from auction to auction; thus, any TEPF budget will necessarily involve significant uncertainty. In addition, both the FCM and RGGI are administered by regional groups, meaning that policy changes at the regional level, over which Vermont has limited control, can affect Vermont’s proceeds from these two sources. The Department provided a TEPF revenue forecast based on VEIC’s and BED’s estimated net FCM and net RGGI proceeds, which is replicated in the following table.

	Efficiency Vermont Total Net TEPF Funds	BED Total Net TEPF Funds
2018	\$11,677,095	\$113,655
2019	\$13,085,078	\$115,928
2020	\$9,917,592	\$118,247
2021	\$8,119,049	\$120,612
2022	\$8,472,011	\$123,024
2023	\$8,669,920	\$125,484
2024	\$8,710,048	\$127,994
2025	\$9,300,171	\$130,554
2026	\$9,502,477	\$133,165
2027	\$9,777,457	\$135,828

No participant filed comments indicating that the Department’s estimates of net proceeds from FCM and RGGI auctions are unreasonable. Therefore, we direct VEIC and BED to use these budget estimates for the purposes of first round modeling.

VI. MODELING INPUT ASSUMPTIONS

The Department, BED, VEIC, and VGS collaborated to develop the following policy and model input assumptions.

A. Policy Assumptions

(1) Low-income Sector Equity Requirements

The Department, BED, VEIC, and VGS recommend that low-income sector equity requirements for scenario modeling be different for each EEU. For BED, they recommend that the level of low-income spending should be set at 2.0% of the resource-acquisition budget for each scenario. This value was based on the assumption that 12% of BED's residential customers are low-income, and further based on the assumed EEC contribution level of these customers (\$246,700) for the 2018-2020 period relative to an assumed \$8.6 million resource-acquisition budget. For Efficiency Vermont, they recommend that the level of low-income spending be set at a level of 8.2% of the resource-acquisition budget for each scenario. This value was based on an assumed EEC contribution level from statewide (non-BED) low-income customers (\$17.4 million) for the 2018-2020 period relative to an assumed \$149 million resource-acquisition budget. The 8.2% value further assumes an equity constraint of 70% to determine a minimum spending requirement, and includes a 0.8% adder which was applied to avoid modeling savings at a bare minimum savings requirement. For VGS, they recommend that the level of low-income spending should be set at a level of 1.9% of the resource-acquisition budget for each scenario. This value was based on the assumed EEC contribution from VGS low-income customers in 2017 (\$77,500) at a percent of resource-acquisition budgets for 2017 (\$2.8 million). The 1.9% value further assumes an equity constraint of 70% to determine a minimum spending requirement.

(2) Small Business Sector Equity Requirements

The current performance period (2015-2017) includes a QPI metric focused on small business equity. This metric is measured by a minimum number of non-residential customers with less than 40,000 kWh annual consumption. For the 2015-2017 performance period this

represents 2,000 Efficiency Vermont customers and 225 BED customers. In the VGS 2016-2017 Transition Period Plan, the small business equity metric is measured by the minimum number of participating non-residential customers with less than 600 Mcf annual consumption, which applies to two out of the four VGS commercial rate classes (G1 and G2). For the 2016-2017 Transition Period, the target is for a minimum of 30% of VGS's installed commercial measures to be in the G1 and G2 rate classes. The Department, BED, VEIC, and VGS recommend that these numbers be used as the basis for this assumption in scenario modeling.

(3) Residential Sector Equity Requirements

The Department, BED, VEIC, and VGS recommend that the level of residential spending be based on a percentage of the resource-acquisition budgets. For BED, they recommend that scenario models assume a level of residential spending equal to no less than 25% of resource-acquisition budgets for the forecast period based on the residential sector's contribution to the total EEC (25%). If the Department's potential study shows that the potential for cost-effective investments in the residential market over the forecast period declines and becomes a limitation for scenario modeling, it is proposed that BED reduce the 25% residential equity constraint by no more than 10% annually. For Efficiency Vermont, they recommend that the level of residential spending in scenario modeling be assumed to be no less than 40% of the resource-acquisition budget for 2018 through 2022, 43% for 2023 through 2027, 46% for 2028 through 2032, and 48% thereafter, based on the residential sector's contribution to the total EEC (48%). For VGS, they recommend that the level of residential spending in scenario modeling be assumed to be no less than 55% of the resource-acquisition budget for the forecast period, based on the residential sector's contribution to the total EEC (55%).

(4) Commercial and Industrial Sector Equity Requirement

The Department, BED, VEIC, and VGS recommend that the level of commercial and industrial spending in the scenario models be assumed to be the inverse of the residential percentages, described above.

B. Modeling Inputs

The Department and EEUs made recommendations for EEC modeling input assumptions in the following five categories: (1) Impacts of Changes in Codes and Standards; (2) Avoided Costs; (3) Self-Managed Energy Efficiency Program (“SMEEP”) and Customer Credit Program (“CCP”) participant load; (4) Measure Decay; and (5) Base Appliance and Equipment Energy Efficiency Levels, Free Rider and Spill Over Rates, and Measure Life. In addition, the Department and EEUs made recommendations for TEPF modeling input assumptions. We discuss each of the proposed modeling input assumptions below.

(1) Impacts of Changes in Codes and Standards

The Department, BED, VEIC, and VGS note that assumptions for commercial and residential energy codes and standards apply equally to the EEUs, and that updates of energy codes and standards reduce the amount of available energy efficiency savings potential. It is assumed that increasingly stringent codes and standards will be adopted over the 20-year planning horizon. For modeling purposes, the Department and EEUs expect reduced cost-effectiveness in the new construction programs to be significant enough to warrant discussions about potential changes to the methodology for energy savings claims and potential measurement metrics. The Department and EEUs expect to have these discussions early in the next performance period. The current commercial (*2015 Vermont Commercial Building Energy Standards*) and residential (*2015 Vermont Residential Building Energy Standard*) energy codes are expected to remain in effect through February 2018. Given the recent advances in codes, the Department and EEUs expect that commercial codes could increase in efficiency by approximately 10%, and residential codes could increase in efficiency by approximately 5-7%. In addition, the Department and the EEUs state that residential and commercial “stretch codes” were developed to set a higher efficiency requirement for projects that fall under Act 250, criterion 9F. The Department and EEUs recommend that savings claims for residential Act 250 projects assume savings above the stretch code, and that savings claims for commercial projects assume savings from base code.

(2) Avoided Costs

The Department and EEUs recommend that modeling assumptions for avoided costs should be based on the most recent Board-approved Avoided Energy Supply Costs (“AESC”) in New England (2015 Report) and the most recent Board Order regarding avoided costs.¹⁰ They note that an update to the 2015 AESC report is expected to be available in December 2016.

(3) SMEEP and CCP Participant Load

The Department and EEUs recommend that scenario modeling should assume continued participation by large industrial customers in the SMEEP and CCP programs. The loads for participating customers will be addressed in the VELCO electric load forecast and VGS’s natural gas forecast so that scenario outputs related to savings as a percent of sales exclude the impact of these two programs. It is recommended that for modeling purposes no new SMEEP or CCP participants are assumed to enter the programs during the forecast period.

(4) Measure Decay

The Department and EEUs recommend that assumptions about measure decay be transparent in the electric and natural gas load forecasts. The treatment of measure decay in load forecasts is important for interpreting savings-based scenarios that target achieving a certain incremental savings as a percent of sales over time.

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

The Department and EEUs note that base appliance and equipment efficiency levels, free rider and spill-over rates, and measure life are all assigned at a detailed measure level in scenario models and are based on either the values in the Technical Reference Manual (“TRM”) or specific measure characterizations where TRM values are not available.

10. *Updated avoided costs for use by the Energy Efficiency Utilities, EEU-2015-04, Order of 12/22/15.*

(6) TEPF Modeling Assumptions

The Department and EEU's recommend that for VEIC, the TEPF resource-acquisition budget sector-split ratio be based upon the approximate ratio of consumed unregulated fuels by residential and commercial/industrial sectors in Vermont (75% residential and 25% commercial/industrial), consistent with the assumption approved in the last DRP. For BED, the Department and EEU's recommend that 95% of the TEPF resource-acquisition budget be assigned to residential, and 5% to commercial/industrial, based on BED's customer base and consistent with the assumption approved in the last DRP.

For low-income sector equity, the Department and EEU's recommend that TEPF modeling for VEIC assume low-income spending to be 21% of the resource-acquisition budget. Consistent with the last DRP, the Department and EEU's recommend that no minimum low-income spending or modeling be required for BED due to the small size of the low-income TEPF market in BED's service territory.

The Department and EEU's recommend that TEPF modeling include assumptions for the requirement to offer measures addressing high-efficiency biomass heating systems pursuant to 30 V.S.A. § 209(e)(1)(A).

The Department and EEU's recommend that TEPF modeling assume balanced fossil fuel MMBTU reductions with comprehensive treatment (e.g. weatherization plus a heating system) and stand-alone building shell improvements by maintaining the number of building shell improvements going forward relative to past performance. The Department believes that this could be achieved by dedicating some or all of the growing TEPF budgets to focus on fossil fuel MMBTU projects.

C. Discussion

No comments on the joint policy and modeling input assumptions have been received. We find the scenario policy and input modeling assumptions to be reasonable, and they are hereby approved.

VII. QPI FRAMEWORK

Participants' Recommendations

The Department, BED, VEIC, and VGS recommend, consistent with past practice, that the EEUs be measured on three types of performance indicators during the 2018-2020 performance period:

- Energy-related QPIs based on metrics that are scenario model outputs or easily calculated from the model outputs. For example, energy-related QPIs could include electric and thermal annual savings, electric and thermal peak demand reductions, and total resource benefits;
- Non-energy QPIs, which during past performance periods have included business comprehensiveness and market transformation targets; and
- Minimum performance requirements, which during past performance periods have included achievement of ratepayer equity, sector equity, low-income sector equity, and small business customer equity. (The proposed scenario modeling assumptions include minimum requirements for low-income equity, sector equity, and small business equity.)

The Department notes that the QPI framework recommendation represents a more general approach than the framework approved in the previous DRP proceeding. The Department contends that this less-prescriptive approach to establishing QPI frameworks provides flexibility and enables the Department to make informed recommendations on the specific QPIs and minimum performance targets after the first round of scenario modeling.

The Department further recommends that the specific number of QPIs and minimum performance requirements not be determined at this time, and that the Board should not place a cap on the number of QPIs and minimum performance requirements. VEIC and VGS support the Department's recommendation, but raise concerns about increases to the current number of QPIs and minimum performance requirements. VEIC contends that there may be a threshold beyond which the number of performance indicators becomes detrimental to EEU program performance. VGS maintains that an increase in the number of QPIs could put an additional burden on EEU managing and tracking.

Discussion

We accept the participants' QPI framework recommendation that the EEUs be measured on three types of performance indicators during the 2018-2020 performance period: (1) energy-related QPIs; (2) non-energy related QPIs; and (3) minimum performance requirements. The recommended QPI framework provides flexibility in the first round of scenario modeling and should result in more informed recommendations on the specific QPIs and minimum performance targets that will be filed in the later stages of this proceeding. We accept the participants' recommendation to not place a cap on the number of QPIs and minimum performance requirements in advance of the first round of scenario modeling. Before making specific QPI recommendations, we encourage participants to consider whether there may be a threshold beyond which the number of performance indicators becomes detrimental to EEU program performance.

VIII. CONCLUSION

In this Order, we determine that VEIC and BED should perform modeling based on their proposals, including a Base Case scenario intended to reflect a continuation of current program offerings adjusted to reflect the previously approved planning budgets, as well as several scenarios intended to maximize various individual performance metrics, including first-year energy savings, lifetime energy savings, and peak demand savings. In addition, we determine that VEIC and BED should use the Department's TEPF budget forecast to model potential TEPF savings. For VGS, we determine that it should model its proposal, which includes analyzing three increasingly aggressive savings-based scenarios.

In addition, we approve the scenario policy and modeling input assumptions jointly proposed by the Department and the EEUs.

We approve the model output metrics proposed by the Department, with the exception of the proposed metric to measure and compare peak demand savings among the scenarios. The Department, VEIC, and other participants are encouraged to revisit this issue, and within 30 days of this Order present either a resolution of this issue or substantive written filings addressing the merits of these, or potentially substitute, model output metrics.

We also determine that the EEU's should be measured on three types of performance indicators during the 2018-2020 performance period: (1) energy-related QPIs; (2) non-energy related QPIs; and (3) minimum performance requirements.

IX. ORDER

IT IS HEREBY ORDERED, ADJUDGED, AND DECREED by the Public Service Board of the State of Vermont that:

1. For this first round of modeling, VEIC shall analyze the following electric resource acquisition scenarios:

- Base Case;
- Maximize annual MWh savings;
- Maximize lifetime MWh savings; and
- Maximize Summer and Winter Peak kW.

BED shall analyze the following electric resource acquisition scenarios:

- Base Case;
- Maximize annual MWh savings;
- Maximize lifetime MWh savings;
- Maximize Summer and Winter Peak kW; and
- Maximize lifetime Summer and Winter Peak kW.

VGS shall analyze the following natural gas resource acquisition scenarios:

- 2017 resource-acquisition budget adjusted for inflation;
- achieve energy efficiency savings of 1% of forecasted sales by 2023; and
- achieve energy efficiency savings of 1.5% of forecasted sales by 2028.


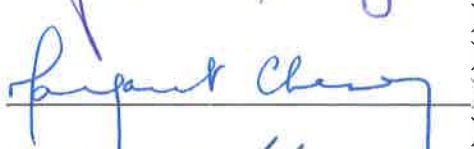

2. If Conservation Law Foundation or any other entity elects to model additional scenarios, it shall file its modeling results on or before the February 10, 2017, deadline previously established for filing modeling results. If such modeling results are filed, they shall be discussed at the workshop to be held in February 2017.

3. All scenario modeling results shall report at a minimum the fuel-type specific model output metrics discussed in this Order. The Department, VEIC, and other participants are

encouraged to revisit the appropriate peak demand savings model output metric, and within 30 days of this Order present either a resolution of this issue or substantive written filings addressing the merits of these, or potentially substitute, model output metrics.

4. The jointly proposed scenario policy and modeling input assumptions are approved.
5. The Department's TEPF revenue forecast shall be used for first-round TEPF modeling.
6. The EEU's shall be measured on three types of performance indicators during the 2018-2020 performance period: (1) energy-related QPIs; (2) non-energy related QPIs; and (3) minimum performance requirements.

Dated at Montpelier, Vermont, this 27th day of October, 2016.


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PUBLIC SERVICE
BOARD
OF VERMONT

OFFICE OF THE CLERK

FILED: October 27, 2016

ATTEST: Judith C. Whitney
Clerk of the Board

NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: psb.clerk@vermont.gov)

Whitney, Judith

From: PSB - Clerk
Sent: Thursday, October 27, 2016 8:24 AM
To: 'Bang-Jensen, Lars'; 'Buckley, Brian'; 'Burns, Christopher'; 'Cotterill, Brian'; 'Curtis, Neil E.'; 'Driscoll, William'; 'Elias, Jeanne'; 'Enterline, Shawn'; 'Frankel, Deena'; 'Galvin, Toben'; 'Gray, Brian'; 'Hakstian, Carole'; 'Hammer, Lauren'; 'Hilbert, Mick'; 'Hopkins, Asa'; 'Horne, Karen'; 'Knauer, Tom'; 'Krolewski, Mary Jo'; 'Lauder, Kelly'; 'Levenson, Keith'; 'Levine, Sandra E., Esq.'; 'Lyle, Thomas'; 'Massie, James'; 'McHugh, Andrea'; 'Murphy, Barry'; 'Necrason, Adam'; 'PSB Clerk'; 'Simollardes, Eileen'; 'Stephensen, Robert'; 'Stevens, Melissa'; 'Walker, Matther J'; 'Walsh, Ben'; 'Westman, David'; 'Wickenden, Michael'; 'Wolfe, Sarah'
Subject: EEU-2016-03 (2016-2017 Demand Resources Plan Proceeding)
Attachments: EEU-2016-03 Order re ScenariosandQPIFramework.pdf

Dear Participants: Enclosed is an Order being issued today by the Public Service Board regarding the above-referenced subject matter.

Thank you.

Sincerely,

Judith C. Whitney
Clerk of the Board
Vermont Public Service Board
112 State Street
Montpelier, VT 05620-2701
802-828-2358
psb.clerk@vermont.gov

Copies of Order Given to:
✓ EEU Team (8)
✓ DPS
✓ WEB
10/27/2016
DMW