STATE OF VERMONT

PUBLIC SERVICE BOARD

EEU-2016-03

2016-2017 Demand Resources Plan Proceeding

2018-2020 BUDGET RECCOMENDATION FOR THE ENERGY EFFICIENCY UTILITY OPERATED BY VERMONT GAS SYSTEMS BY THE DEPARTMENT OF PUBLIC SERVICE

In its March 24, 2017 Order the Public Service Board ("Board") established today as the deadline for stakeholders in EEU 2016-03, the Demand Resource Plan ("DRP") proceeding, to file EEU final resource-acquisition scenario model recommendations, including resource-acquisition budget proposals, modeling assumptions, and quantifiable performance indicator ("QPI") and minimum performance requirement ("MPR") weighting. The Public Service Department ("Department" or "DPS") hereby presents its analysis and budget recommendations for Vermont Gas Systems ("VGS") energy efficiency programs.

The Department's recommendation includes the following elements:

1. Three and twenty-year resource acquisition budget forecasts for the VGS EEU efficiency programs;
2. Characterization of the final model and modeling assumptions;
3. Quantifiable performance indicators ("QPIs") with weighting;
4. Minimum performance requirements ("MPRs"); and
5. Statutory justification, relevant considerations. including impact on customers' rates and bills.

1. Natural Gas Energy Efficiency Resource Acquisition Budgets

The Department recommends budgets for the VGS EEU in the 2018 through 2020 DRP period that are consistent with the goal of reducing the EEC rate for all customers – a goal that VGS supports. Significantly, the Department's recommended budget can achieve this goal while also modestly increasing the total overall VGS efficiency budget because of the projected increase in VGS customer accounts and total load from the Addison County natural gas expansion project. The Department therefore recommends an increase over the current year budget by 6.2% in the first year of the DRP period (2018) followed by an increase of 4.3% in the second and 0.5% in the third year.

Table C-1
DPS 2018-2020 Proposed EEC Funded Budget for VGS

VGS EEC Funded Budget	2018	2019	2020	3 Yr. Total
Resource Acquisition	$2,889,201	$3,014,426	$3,030,476	$8,934,103
Devo. & Support Svcs.	$259,757	$267,135	$269,536	$796,428
TEPF Clearing House	$14,880	$14,880	$14,880	$44,640
VGS Total	**$3,163,838**	**$3,296,441**	**$3,314,892**	**$9,775,171**

2. Characterization of the Final Model and Modeling Assumptions

The next phase of the DRP proceeding requires VGS to model expected stretch savings goals for the resource acquisition portfolio. The Department proposes that the VGS final model be a budget constrained portfolio similar to Scenario 1 from the first-round scenario modeling but using the budgets recommended above. The Department further recommends that the final model be constrained by a prescribed, not-to-exceed, overall acquisition cost (expressed in RA$/Mcf) that has some continuity with historic performance. The model should also reflect an appropriate escalation to account for the increasing cost of savings expected for a mature market, as well as the results of the Potential Study and first round modeling, which showed an acquisition cost substantially greater than VGS' historic performance. The recommended acquisition cost for the total portfolio for the DRP period is listed in Exhibit A-2, below. Although setting both the budget and acquisition cost will pre-determine the portfolio-level savings goal, it is expected that the final scenario model will inform program design by disaggregating this overall acquisition cost into residential and non-residential sector values and possibly by end use.

Table C-2
PSD 2018-2037 Proposed Acquisition Costs for the Final Scenario Model

Program Year	RA Budget	Acquisition Cost ($/Mcf)
2016*	$2,513,464	$36.43
2017*	$2,720,276	$35.15
2018	$2,889,201	$36.49
2019	$3,014,426	$36.80
2020	$3,030,476	$36.94
2021-2037	$3,030,476	$36.89

*Transition Period Budgets and Savings goals

3. Quantifiable Performance Indicators and Minimum Performance Requirements

Pursuant to the Process and Administration Document which governs EEU operations,[1] VGS is required to have Quantifiable Performance Indicators ("QPIs"). The Department of Public Service and VGS jointly propose five performance metrics with QPIs and eight minimum performance requirements ("MPRs") related to the provision of natural gas efficiency services for implementation during the 2018 – 2020 performance period. These performance metrics were developed jointly with VGS and are consistent with Board Orders intended to ensure VGS customers receive the maximum value possible from rate-payer funded efficiency programs.[2] The QPIs and MPRs consist of the following:

The jointly proposed Quantifiable Performance Indicators (QPIs) for VGS, summarized in Table C-3, below, consist of four Performance Indicators (PIs):

1. Annual Incremental Natural Gas (Mcf) Savings
2. Lifetime Natural Gas Savings
3. Peak Day Natural Gas Savings
4. Residential Single Family Comprehensiveness
   a. Percent of home energy audits converted to a measure installation
   b. Percent of cost effective measures recommended by the audit and installed by the customer within 12 months.

Additionally, the Department is recommending the following seven Minimum Performance Requirements (MPRs):

5. Equity for all Natural Gas Ratepayers
6. Equity for Residential Ratepayers
7. Equity for Low-Income Customers
8. Equity for Small Business Customers
9. Long-term Market Transformation
10. Business Comprehensiveness of Savings
11. Administrative Efficiency
12. Total Resource Benefits

These QPIs are, for the most part, similar to the QPIs currently in place under the Transition Period Plan implemented by the Board in EEU 2015-02, Order of December 24, 2015. The Department notes that most of the proposed performance indicator categories have been used in some form in the past by both BED and EVT. These quantifiable performance metrics provide a measurement framework that can appropriately balance priorities within the natural gas energy efficiency delivery portion of EEU services.

[1] Process and Administration of an Order of Appointment approved by the Board on February 12, 2016 in EEU 2015-02.
[2] Docket 7676 Final Order of April 17, 2015 and EEU 2015-02 Order of April 17, 2015

Natural Gas Performance Indicators

The following sections provide brief descriptions of the proposed performance indicators, the assigned weights, overall policy goal advanced as well as how the metrics will be calculated during the 2018 – 2020 performance period.

Table C-3
PSD Proposed VGS EEU QPIs for the 2018-2020 Performance Period

QPI#	Title	Performance Indicator	Policy Goal Advanced	Weight
1	Annual Incremental :Natural Gas Savings	Annual incremental net Mcf expected savings	Annual incremental Mcf savings indicator intended to encourage EEUs to design and implement efficiency initiatives that will maximize energy savings	30%
2	Lifetime Natural Gas Savings	a. Present worth of lifetime natural gas avoided costs	Encourage EEUs to design and implement efficiency initiatives that will maximize lifetime natural gas benefits	30%
		b. Lifetime Mcf savings		
3	Peak Day Natural Gas Savings	Peak day incremental expected savings	Cumulative peak day savings indicator intended to encourage EEUs to design and implement efficiency initiatives that will maximize the capacity reduction coincident with peak day demand	20%
4	Residential Single Family Comprehensiveness	a. Percent of home energy audits converted to a measure installation within 12 months	Residential comprehensiveness indicator intended to encourage EEUs to maximize the conversion rate for home energy audits.	10%
		b. Average percentage of auditor-recommended cost-effective measures that are installed by the customer within 12 months	Residential comprehensiveness indicator intended to encourage EEUs to maximize the number of recommended measures that are installed per home.	10%

The above four metrics are specific to resource acquisition savings goals.

These four performance metrics all correlate with one another although they are weighted separately. While peak day is critical to Vermont Gas, it has been weighted slightly lower given that no peak-day savings accrue to interruptible participants and it is difficult to predict from year-to-year the split between firm and interruptible participation.

The targets for each metric will be established in the next phase of the proceeding using the results of the final scenario model described in Section 2, “Characterization of the Final Model and Modeling Assumptions.”

Each of the first three metrics will be verified annually by the Department of Public Service with performance assessed at the end of the three-year performance period. The metrics will be based on measures installed during the calendar year. VGS will make an annual savings claim to the Department. The Department will evaluate and verify the claim. A realization rate will be applied to the claim to reflect the DPS verified savings. Progress towards QPI 1, 2 and 3 will be measured against the DPS verified savings at the end of the three-year performance period.

The purpose of QPI #4: Residential Single Family Comprehensiveness, is to ensure that energy efficiency initiatives are designed and implemented to acquire comprehensive savings. It has been broken into two components as follows:

a) Percent of home energy audits converted to measure installation within one calendar year.

b) Percent of cost effective measures as well as those recommended by the audit and installed by the customer within 12 months.

Metrics 4a and 4b will be reviewed annually by the Department of Public Service using data from the VGS tracking system. Performance will be assessed at the end of the three-year performance period. Metric 4a will be based on prior year's number of audits. For example, for 2016 results, the denominator will be single family audits completed in 2015 and the numerator will be the number of measures suggested in those audits that were completed within 365 days of the audit.

Metric 4b specifically addresses the goal of installing as much of the auditor recommended scope as possible in single family homes that proceed beyond the audit phase to the installation phase. This metric takes the number of auditor recommended measures[3] and reports the percentage of those measures that are installed within 12 months[4] of the recommendation.

Mechanism for Large Industrial Efficiency Projects

The Demand Side Management (DSM) history of VGS has been punctuated by a few, very large and inexpensive energy efficiency projects in the industrial sector that, in part, explain VGS's historical and superior low cost for energy saved. Anticipating such projects in the future, the Department and VGS jointly propose a mechanism to encourage VGS to pursue such projects while simultaneously encouraging the company to continue to work toward overall savings goals. The following mechanism is proposed to increase the goals set for QPI #1, #2 and #3 upon the completion of a large industrial project:

[3] At times a measure may not screen as cost effective but the auditor may still recommend the measure because it "just makes sense". The entire project must remain cost effective or the measure cannot be included.
[4] This QPI does not include single family residential buildings that qualify for low income measures or home performance through EVT. This measurement also pertains only to those that go on to completion. The measures that are cost effective or recommended is the denominator and those that complete is the numerator.

The proposed mechanism is triggered for large projects, defined as projects with claimed annual incremental savings above 6,000 Mcf. Once triggered, the annual incremental Mcf savings goal (QPI #1), Lifetime Mcf savings goal (QPI#2) and peak day Mcf savings goal (QPI #3, if applicable) for the three-year performance period will be increased by 75% of the claimed savings above 6,000 Mcf in each category 100% of the verified project savings in each of the three categories will be applied toward meeting the increased savings goals under QPI #1, #2 and #3 modified as described in paragraph 2, above.

4. Minimum Performance Requirements

The eight Minimum Performance Requirements (MPRs 5 through 12) for the 2018-2020 DRP performance period are summarized in Table C-4 below. Apart from MPR #12, these are all similar or identical to the MPRs for the Transition Period.

Table C-4
PSD Proposed VGS EEU MPRs for the 2018-2020 Performance Period

MPR #	Title	Performance Indicator	Policy Goal Advanced	Weight
5	Equity for all Natural Gas Ratepayers	Total natural gas energy efficiency benefits divided by total costs	Equity for all Vermont natural gas customers by assuring that the overall natural gas efficiency benefits are greater than the costs incurred to implement and evaluate the EEU	Minimum Requirement
6	Equity for Residential Ratepayers	A minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to residential customers	Equity for residential natural gas customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to residential customers	Minimum Requirement
7	Equity for Low-Income Customers	A minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to low-income customers	Equity for Vermont's low income natural gas customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to low-income customers	Minimum Requirement
8	Equity for Small Business Customers	Percent of commercial (non-residential) installed measures that are classified as Rate GI or G2 (use 600 Mcf/yr. or less)	Equity for small business customers by assuring that a minimum level of overall efficiency efforts, as reflected in the number of measures, will be dedicated to small business customers	Minimum Requirement
9	Long-term Market Transformation	Offer energy efficiency training for contractors.	Encourage EEU to design and implement efficiency initiatives that maximize market transformation	Minimum Requirement
10	Business Comprehensiveness of Savings	Diversity of measures implemented in commercial retrofit projects	Intended to ensure that energy efficiency initiatives are designed and implemented to acquire comprehensive savings	Minimum Requirement
11	Administrative Efficiency	Meet determined milestones on schedule, including: • Defining all Administrative costs and providing the costs for the 2015-2017 period. • By July 31, 2018, submit a proposal on how these costs will be tracked and reported, including a metric on the ratio of incentive costs to non-incentive costs and total administrative costs as a percent of total budget for the current performance period.	This indicator is intended to define and track administrative costs and ultimately require the program administrator to assess operations to ensure delivery of services in a cost effective manner that maximizes ratepayer value.	Minimum Requirement
12	Total Resource Benefits	In consultation with the Department, file a status update on the feasibility and cost/benefit analysis of tracking water and delivered fuel resource benefits	This indicator is intended to encourage the program administrator to design and implement efficiency initiatives that will maximize the lifetime natural gas, fossil fuel, and water benefits	Minimum Requirement

Equity for all Natural Gas Ratepayers

This metric is designed to assure equity for all Vermont natural gas customers as a group by assuring that the overall natural gas benefits are greater than the costs incurred to implement and evaluate the natural gas EEU and the natural gas EEC.

MPR 5 will be reviewed annually by the Department of Public Service using data from the VGS tracking system. Performance will be assessed at the end of the three-year performance period. This metric will be calculated based on lifetime avoided natural gas costs calculated in the board-approved screening tool in effect at year end (excluding externalities and non-energy benefits) for the same measures installed in QPI 1. The costs will reflect only EEU costs (including RA, DSS, fiscal agent and evaluation costs) and will exclude participant costs.

Equity for Residential Rate Payers

The performance metric to address residential customer equity requires a minimum level of resource acquisition spending to be dedicated to the residential sector. A residential spending minimum ensures that a guaranteed level of residential spending occurs. The Department proposes that the minimum performance requirement for residential customer equity should be that 70 percent of the 2018-2020 residential resource acquisition budget. This minimum requirement is set in accordance with the residential/commercial sector shares established as modeling assumptions in the Board's October 27, 2016 Order in this proceeding which were based on a joint DPS and EEU recommendation filed on September 16, 2016.

Metric 6 will be reviewed annually by the Department of Public Service using data from the VGS tracking system. Performance will be assessed at the end of the three-year performance period. The metric will be measured as total RA costs dedicated to residential customers as a percent of total RA budget.

Equity for Low Income Customers

The performance metric to address low-income customer equity requires a minimum level of spending on low-income services. The Department proposes that the minimum performance requirement for low-income sector customer equity should be that 70 percent of the 2018-2020 low-income resource acquisition budget. This minimum requirement is set in accordance with the estimated low-income sector share established as modeling assumptions in the Board's October 27, 2016 Order in this proceeding which were based on a joint DPS and EEU recommendation filed on September 16, 2016.

The calculation of Metric 7 will be reviewed annually by the Department of Public Service using data from the VGS tracking system and will be based on the EEC contributions from Low Income customers. Performance will be assessed at the end of the three-year performance period. The metric will be measured as total RA costs dedicated to low income customers as a percent of total RA budget.

Equity for Small Business Customers

This metric is designed to assure that a minimum level of overall efficiency efforts, as reflected in participation, will be dedicated to small business customers. Currently small business customers are classified as Rate G1 or G2 and use less than 6,000 Mcf per year.

Metric 8 will be reviewed annually by the Department of Public Service using data from the VGS tracking system. Performance will be assessed at the end of the three-year performance period. The metric will tally the total measures installed at premises served under Rates G1 and G2 as compared to total measures installed for customers served under all non-residential rates.

Long-term Market Transformation

This metric is intended to encourage VGS to design and implement efficiency initiatives that maximize market transformation. VGS has already successfully been a part of this process which has transformed the baselines in both the commercial and residential new construction programs. Vermont Gas and the Department jointly propose a metric for this MPR of holding energy efficiency training workshops to ensure contractors are installing energy efficient measures for natural gas and delivered fuels, thus assisting in transforming the market.

Business Comprehensiveness of Savings

This metric is intended to ensure that energy efficiency initiatives are designed and implemented to acquire comprehensive savings. In doing so, the metric will balance measure installations with customer-specific economic and operational considerations. Vermont Gas has proposed the diversity of measures implemented in commercial retrofit projects as a metric for this MPR.

Administrative Efficiency

This metric is intended to encourage VGS to continually assess its operations to continue to deliver services that maximize ratepayer value. The MPR requires Vermont Gas to develop and meet a milestone schedule for proposing a QPI, along with a method for measurement, in time for the next performance period.

The Department has concluded that it is necessary to develop specific tailored metrics to appropriately define and measure administrative efficiency. This conclusion is based on: (1) the Department's experience in establishing a QPI for administrative efficiency for the electric EEUs, along with (2) certain key findings and recommendations related to measuring administrative efficiency from the last Benchmarking Study conducted by the Department's consultant, Navigant. The key findings from the Benchmarking Study include:

- Defining administrative costs to clearly differentiate them from incentive costs, program delivery costs and Evaluation, Measurement and Verification (EM&V) costs in a manner that is aligned to EEU delivery models.
- Tracking the costs associated with each significant driver (e.g. administrative costs, incentive costs, program delivery costs, etc.) to facilitate future benchmarking, identifying performance improvement or trends, and ensuring administrative cost effectiveness.
- Adopting an overall results-oriented metric to measure administrative efficiency that is aligned with the Department's goal of achieving energy efficiency savings at minimal administrative costs.

Therefore, the Department recommends an Administrative Efficiency Minimum Performance Requirement be imposed for the next Performance Period on all EEUs to generate the data needed to develop and define the specific metrics for evaluation. The milestones for this MPR (for each EEU) should include:

- In consultation with the Department, an EEU should identify and define all Administrative costs, and provide what the costs were for the period of 2015-2017.
- By July 31, 2018, in consultation with the Department, an EEU should submit a recommendation to the Public Service Board identifying and defining Administrative Costs, along with a proposal on how these costs would be tracked and reported for the 2018-2020 performance period.
- The proposal should include a metric which shows the ratio of incentive costs (potentially including Technical Assistance) to non-incentive costs.
- The proposal should include a metric which shows the total administrative costs as a percent of total budget for the performance period.

The Department proposes that this Administrative MPR replace the current Transition Period MPR for Program Implementation Efficiency. The ultimate goal, over the course of the 2018-2020 performance period, is to develop a set of Administrative Efficiency metrics to be applied during the 2021-2023 performance period that would enable program administrators and regulators to continually assess EEU operations and ensure that they are operating as efficiently as possible. This MPR will establish a baseline in order to track and assess administrative efficiency and aid in the development of a metric to maximize administrative efficiency in a manner that is aligned with the statutory goal of obtaining all reasonably available cost effective energy efficiency for all Vermonters.

Total Resource Benefits

This metric is intended to encourage VGS to design and implement efficiency initiatives that will maximize the customer benefits through lifetime natural gas, fossil fuel, and water benefits. Currently only lifetime natural gas savings is tracked in QPI#2, which was formerly entitled "Total Resource Benefits". This MPR is designed to encourage VGS to calculate and track the other components of TRB, including water savings and delivered fuel savings associated with energy efficiency measures. The MPR requires Vermont Gas, in consultation with the Department, to file a status update on the feasibility and cost/benefit analysis of tracking water and delivered fuel resource benefits by July 31, 2018.

5. Statutory Criteria, Including Impact on Customers' Rates and Bills

Section 209(d)(3)(B) establishes the specific criteria the Board must consider in setting the energy efficiency charge ("EEC"):

> *As circumstances and programs evolve, the amount of the charge shall be reviewed for unrealized energy efficiency potential and shall be adjusted as necessary in order to realize all reasonably available, cost-effective energy*

efficiency savings. In setting the amount of the charge and its allocation, the Board shall determine an appropriate balance among the following objectives; provided, however, that particular emphasis shall be accorded to the first four of these objectives:

- *reducing the size of future power purchases;*
- *reducing the generation of greenhouse gases;*
- *limiting the need to upgrade the State's transmission and distribution infrastructure;*
- *minimizing the costs of electricity;*
- *reducing Vermont's total energy demand, consumption and expenditures;*
- *providing efficiency and conservation as a part of a comprehensive resource supply strategy;*
- *providing the opportunity for all Vermonters to participate in efficiency and conservation programs; and*
- *targeting efficiency and conservation efforts to locations, markets, or customers where they may provide the greatest value.*

In addition, Section 209(f)(14) requires the Board to "*Consider the impact on retail electric rates and bills of programs delivered under subsection (d) of this section and the impact on fuel prices and bills."*

The Department recommends that the overall Vermont Gas Systems energy efficiency utility budgets over the coming three-year DRP period total $9.775 million. This figure represents an increase in the budget for the energy efficiency utility of 5.14% to $3.387 million in 2018 and 4.15% to $3.53 million for 2019, and 0.21% to $3.54 million 2020. The recommendation is based on an analysis of current conditions in relation to the statutory criteria set forth in Section 209 listed above.

Among the significant factors contributing to the Department's recommendation is that Vermont Gas Systems has only been a designated Energy Efficiency Utility for two years and the study for Natural Gas Energy Efficiency potential conducted by third party consultants indicates substantial additional savings could be acquired absent budget limitations. In addition, the VGS recent expansion into Addison Country presents new and unique potential. In making these recommendations, the Department is mindful that the magnitude of the energy efficiency charges on VGS customer bills should be tempered by competitive considerations that are not applicable in the electric utility context due to the presence of competition between natural gas and oil and propane providers. Together with electricity, delivered fuels represent competitive alternatives to natural gas.

Reducing the size of future power purchases
Relative to electricity, the fuel procurements of VGS are relatively short term in character. The increases or decreases in the costs to VGS of natural gas flow through to customers through the Alternative Regulation Plan approved by the Public Service Board pursuant to 30 V.S.A § 218d.

As of April 2017, Vermont Gas Systems had extended service into Addison County along a new 41-mile pipeline and is serving Middlebury, Vermont. Consistent with Board requirements as a condition for certification, VGS is pursuing aggressive energy efficiency programs in the areas served by the Addison Natural Gas Pipeline expansion.[5]

The realistically achievable potential (RAP) from the Natural Gas Energy Efficiency Potential Study provides a reference point that the Department relies on in providing its budget recommendations. Over time, the RAP typically declines as the available efficiency resource diminishes, a reflection of the fact that the model does not assume new technologies become available. In the case of VGS, the RAP reflects an increasing trend as a result of adding customers in a new market, which underscores the potential for greater energy efficiency.

Reducing greenhouse gas emissions

Natural gas, comprised mostly of methane gas, is a significant source of greenhouse gas emissions. When utilized to deliver thermal and process energy through combustion, it produces CO2, which has been identified as the primary gas contributing to greenhouse emissions,[6] but CO2 is a much less potent form of GHG contribution than methane. (Methane contributions are relevant from the perspective of extraction and transfer of natural gas to the end users.)

Used efficiently in the production of thermal and process energy services, natural gas can serve as an important fuel for reducing greenhouse gases, especially in relation to the fossil fuel alternatives. The Department of Energy indicates that the CO2 contribution for energy services fueled from natural gas are about 72% of fuel oil and 84% of propane.[7] Improving the energy efficient end use of natural gas only improves its comparative advantage in this regard.

The Department's recommended budget reduce the usage of natural gas usage by roughly 243,000 Mcf over the 3-year performance period (or 0.84% of projected sales). This reduces greenhouse gas emissions by 1.7 million tons compared to business as usual without energy efficiency programs.

Limiting the need to upgrade transmission and distribution

The pipeline that delivers natural gas to VGS customers is designed to serve its firm customers on the coldest day of the year, which Vermont Gas defines as an 86 heating degree day. The VGS system capacity has increased over time to accommodate both new service area expansions and new loads within the existing footprint. Vermont Gas Systems could employ a variety of alternatives for increasing the capacity of its system including the installation of liquified natural

[5] Docket 7970- Final Order of 12/23/13
[6] EIA reports that CO2 accounts for 76% of GHG https://www.eia.gov/energyexplained/index.cfm?page=environment_where_ghg_come_from .
[7] https://www.eia.gov/tools/faqs/faq.php?id=73&t=11. The comparative advantage of natural gas, however, does not extend to electricity, even when fired, in part, by less efficient natural gas generation, as electricity in all the electric utility service areas served by Vermont Gas, as a relatively cleaner mix.

gas facilities (LNG); the installation of new compressed natural gas facilities (CNG), obtaining higher pressure from its pipeline sources, and looping the transmission system. Some form of upgrade to the capacity of the system will likely be needed within the next decade to accommodate growth, including the increase anticipated from the recent expansion into Addison County. Energy efficiency can help to improve the performance of the system and defer the need for further expansion of the system through one or more of the alternatives. Further, efficiency gains will improve the affordability of energy services, especially participating customers.

Minimizing costs of energy

By historical standards, natural gas prices and oil prices are at comparatively low levels. Nevertheless, natural gas services continue to compete favorably on price relative to fuel oil. The most recent reports available from the Vermont Public Service Department place natural gas prices about 14% below the price of oil service comparing each on a delivered service basis and comparable efficiency levels.[8] Efficient delivery of energy service from natural gas can improve the cost/performance advantage to roughly 35%.[9] The Department is including in its recommendations a proposal for increasing the program budgets of Vermont Gas Systems consistent with its statutory obligations. The Department's recommendations, however, are tempered by competitive considerations.

Reducing Vermont's total energy demand, consumption, and expenditures

Natural gas resources have traditionally enjoyed a competitive price and expenditure advantage over traditional alternatives (largely propane and fuel oil). Appropriately structured, reasonably aggressive programs can serve to both increase the affordability of and reduce expenditures on energy. The programs that have been developed by Vermont Gas appear to the Department to be appropriately focused on lower cost segments of the residential and commercial users (largely higher volume users). With the expansion of services into Addison County, we recommend that the budgets be increased, but in measured steps, especially focusing on segments within the areas of expansion to avoid lost-opportunities. Emphasis of programs should ideally be focused on firm loads associated with end use categories that contribute to the peak day demands in the winter, especially through efficient heating options.

Providing efficiency as part of a comprehensive strategy

Vermont Gas Systems offers a natural gas commodity service. In recent years, its delivery strategy has been toward system expansion and increasingly toward cost-containment. Energy efficiency services offer a welcome complement to the delivery of natural gas service, both in helping to lower costs and in keeping down the costs of transmission capacity. Efficiency services should ideally place greater emphasis on areas of service expansion to minimize the risk of lost opportunities.

Enabling widespread participation

[8] http://publicservice.vermont.gov/sites/dps/files/documents/Pubs_Plans_Reports/Fuel_Price_Report/2016/November%202016%20Fuel%20Price%20Report.pdf

[9] Alternatively, the inherent advantage of natural gas, may be largely eroded by efficient consumption of fuel oil.

The delivery of energy efficiency services by VGS extends to all classes of customers, but the commercial programs currently focus on larger customers which present high value energy efficiency potential and the residential retrofit program focuses primarily on customers with higher energy density. VGS programs also target lower income households, and while this segment represents a relatively high cost focus, it is vitally important to ensure that the reach of VGS efficiency programs is widespread and appropriately addresses the need of the most vulnerable customers in its service territory.

Targeted programs
As indicated above, VGS is targeting geographic regions where it is expanding. The end use categories should be targeted on larger non-interruptible customers with demands that coincide with the peak day. Large customers should be targeted to capture the greatest opportunities at the earliest point in time, and to do so cost-effectively. Low-income customers should be targeted to help address the needs of the vulnerable and to ensure affordability.

Impact on natural gas rates and bills
The Department believes that the impacts of the proposed VGS EEU budget on rates are reasonable, and with growth in sales, the impact of the rising budgets for the energy efficiency programs of VGS should result in a decline in the energy efficiency charge[10].

The Department's rate and bill analysis calculates the impact of rate-payer funded energy efficiency on retail rates by estimating: 1) the changes in distribution utility revenue requirements associated with each of the following components of the cost of service: natural gas supply (energy, infrastructure and capacity costs), and local distribution capital expenditures; and 2) the pressures caused by decreases in the volume of sales of natural gas (Mcf) over which the distribution utility collects its revenue requirement.

The installation of efficiency measures avoids a significant amount of variable wholesale energy supply costs and, though more difficult to quantify, also yields cost savings in various categories of fixed infrastructure costs. These cost savings cause downward pressure on rates. However, upward pressure ultimately prevails due to the need to recover those fixed costs, which cannot be avoided by investment in efficiency, over a lesser volume of unit sales.

It is important to view this dynamic in the context of significant customer bill savings. In our analysis bill impacts are calculated by taking the percentage delta between what each customer class' will owe to the utility in two different scenarios: 1) a baseline scenario where no new rate-payer energy efficiency investments are made, and 2) a policy scenario where ratepayer funding of energy efficiency continues into the future. In general, over the long term, our findings are that existing residential and business customers are financially better off consuming less energy at a higher unit price than consuming more energy at a lower unit price.

[10] An abnormally warm winter could cause an increase in the subsequent year's EEC as prior year under-collections are recovered.

That said, there is an inevitable, incremental cost shift between customers associated with ratepayer-funded efficiency programs. Customers who do not, or cannot, take advantage of the program incentives, will be left paying a higher share of the utility's revenue requirement (due to the upward pressure on rates caused by reduced unit sales). Thus, to avoid ever increasing utility bills for non-participants, it is important to ensure both a manageable pace of efficiency investment and to encourage widespread program participation by all socio-economic demographics. The Department has concluded that the recommended budget for VGS is amenable to these goals and, if managed appropriately, will result in widespread customer benefits without imposing an inordinate cost shift between customers. Exhibit A4 below summarizes the Department's estimates of the rate and bill impacts associated with our recommended VGS budgets.

As explained in Section 1, the Department estimates that our budget recommendation for VGS will result in a 0.5% year over year decrease in the Energy Efficiency Charge in 2018, and a further year over year decreases of 0.3% in 2019 and 2020. Thereafter the Department's recommendation holds the VGS budget flat for the duration of the projection period (2021 through 2037). However, as depicted below in Exhibit A4, a flat VGS budget will still naturally result in upward long-term rate pressures, all else constant. This underscores that it is the indirect effects of investing in energy efficiency—namely the decline in the volume of unit sales over which the cost of service must be distributed—not the direct ratepayer costs of funding EEU programs that are the main drivers of upward rate impacts. If investment in energy efficiency were to cease today, future growth in customer loads would be higher and upward pressure on retail rates would diminish over time. The less obvious truth of this counterfactual scenario is that, over the long term, customers would end up paying higher bills if investment in energy efficiency were discontinued. Energy efficiency investments reduce the overall cost-of-service (that is to say: the collective ratepayer bill) by avoiding both short-term energy and operating costs, along with the need to commit fresh capital to serve otherwise growing loads. These capital investments ultimately are depreciated and recovered as increases to customer bills over time.

It is important to emphasize that the metrics in Table C-5 represent the impacts of continuing to fund energy efficiency on an ongoing basis. Investments in energy efficiency yield cost-savings that recur for several years after the original expense is incurred. These recurring cost-savings are purposefully not fully captured in Table C-5.[11]

[11] For example, by the last year of the 20-year projection period (2037), customer loads in VGS service territories are projected to be approximately 1,500 BBtu lower than baseline because of the EEU investments made up to that point. If all efficiency efforts ceased in 2037, a gradually declining portion of these energy savings would recur in later years as the efficiency measures installed before 2037 gradually approach the end of their useful lives. The recurring cost savings associated with these measures are not accounted for in our analysis however, because our methodology is intended to take stock of the impacts of different scales of ongoing investment activity.
.

Table C-5
Rate and Bill Impacts 20-Year Average Percentage Change:
PSD Recommendation Scenario Compared to "No New EE" baseline scenario

Impacts of DPS Recommended Long-Term Budget Path for years 2018-2037		
All Customers	Rates	Bills
VGS	+4.8%	-0.8%
Residential	Rates	Bills
VGS	+6.7%	-0.5%
Business	Rates	Bills
VGS	+3.4%	-1.1%

Notes to Exhibit A4: These impacts assume that a certain amount of future capital expenditures on fixed infrastructure and distribution costs are avoided by efficiency investments. If it is instead assumed that such costs are strictly unavoidable, the magnitude of the rate and bill impacts would be close to 2 percentage points greater than shown above (though directionally, no different).

The Department's VGS budget recommendation results in an upward rate impact of nearly 5% on average over the 20-year projection period and a decrease in bills of nearly 1% on average over the 20-year projection period.[12] These results assume that VGS achieves similar, though slightly higher yields as they have historically.

VGS specific EEC rate impacts are a subset of the overall 20-year rate and bill impacts discussed above. Exhibit A5 below summarizes the VGS budget in a manner which differs from that indicated in Exhibit A1 above in that all the other costs required to calculate the EEC are included. The inclusion of all component costs is necessary to calculate the estimated VGS EEC (These costs include previous under collections and VGS's share of other cost categories). The Department used the same methodology employed for calculating EEC rates to estimate the average EEC rate per ccf as it related to its budget recommendation as well as the percent change from the previous year.

[12] In other words, the average of the differences between retail rates in each year of the "No New EE" baseline scenario and our recommended budget scenario for all 20 years in the projection period is around 5 percent. The average of the differences between a representative customer bill in each year of the two scenarios is around 1 per cent.

\Table C-6
EVT 2018-2020 EEC Budget and EEC Rate Impact

VGS Budget & Rate Impact	**2017**	**2018**	**2019**	**2020**
VGS Budget*	$3,221,755	$3,387,432	$3,528,171	$3,535,423
Budget % Change from Previous Year	-	5.14%	4.15%	0.21%
Estimated Average EEC Rates ($/ccf)	$0.03800	$0.0378	$0.0377	$0.0376
EEC % change from previous year		-0.53%	-0.26%	-0.27%

*Includes collections for previous years under collections, DSS, DPS EM&V and Fiscal Agent costs

In summary, the Department of Public Service recommends the budgets and goals as set forth herein and looks forward to discussing these recommendations at the Workshop in EEU 2016-03 scheduled for May 16, 2017.