

STATE OF VERMONT  
PUBLIC SERVICE COMMISSION

Case No. 19-0397-PET

Investigation to update screening values for use )  
by the Energy Efficiency Utilities when they )  
perform cost-effectiveness screening of energy )  
efficiency measures )

**PREFILED TESTIMONY OF  
ERIK BROWN  
ON BEHALF OF EFFICIENCY VERMONT**

May 23, 2019

In this testimony Witness Brown describes the role screening plays in the development and delivery of efficiency measures and programs. In addition, Witness Brown explains how Efficiency Vermont's proposals are closely aligned with the results of the 2018 AESC study, why Efficiency Vermont believes that winter capacity values would help to improve screening, why the risk adjuster relied upon by the Commission should not be altered, and the role that line losses play in screening.

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EFFICIENCY VERMONT**

**INTRODUCTION**

1 **Q. Please state your name, business address and occupation.**

2 **A.** My name is Erik Brown. I am employed as a Senior Technical Energy Analyst by  
3 Vermont Energy Investment Corporation (“VEIC”) for Efficiency Vermont, Vermont’s  
4 statewide energy efficiency utility (“EEU”). My business address is 128 Lakeside  
5 Avenue, Suite 401, Burlington, Vermont, 05401.

6 **Q. Please describe your background and experience.**

7 **A.** My background is in the analysis and design of utility-sponsored energy efficiency  
8 programs. I have a Master of Science in Natural Resources Planning from the University  
9 of Vermont and a Bachelor of Arts degree in Mathematics and Psychology from Syracuse  
10 University. I have been working in the energy efficiency field for over 22 years since I  
11 have been employed by VEIC, and have been in my current position for 10 years. During  
12 my time at VEIC I have performed a variety of functions, including serving as lead  
13 analyst for energy performance contracts, managing multifamily efficiency projects,  
14 managing Efficiency Vermont’s technical analysis and verification activities, and

1 developing analysis methodologies, tools, and policies.

2 **Q. What are your responsibilities at Efficiency Vermont?**

3 **A.** In my capacity as Senior Technical Energy Analyst my responsibilities at Efficiency  
4 Vermont include maintaining the Vermont State Screening Tool; working with regulators  
5 and evaluators in the Technical Advisory Group on savings methodologies, evaluation,  
6 and verification activities; developing and reviewing energy efficiency savings analyses,  
7 algorithms, methodologies, policies, and analysis tools; assisting with development of  
8 data tracking and analysis systems; and providing mentoring, guidance, and training on  
9 cost-effectiveness screening and energy efficiency analysis.

10 **Q. Have you previously testified before the Vermont Public Utility Commission (the**  
11 **“Commission” or “PUC”)?**

12 **A.** No, I have not.

13 **Q. What is the purpose of your testimony?**

14 **A.** The purpose of my testimony is to:

- 15 a. describe how the Vermont State Screening Tool works and is used in the  
16 development and delivery of efficiency measures and programs;
- 17 b. explain how Efficiency Vermont’s proposals are closely aligned with the  
18 results of the 2018 Avoided Energy Supply Component/Cost (“AESCC”) study;  
19 and
- 20 c. explain Efficiency Vermont’s proposals with regard to winter capacity  
21 avoided costs, Risk Adjustment, Wholesale Risk Premium, demand reduction  
22 induced price effect (“DRIPE”) and Line Losses.

**SUMMARY**

1 **Q. Please summarize your testimony.**

2 **A.** My testimony describes Efficiency’s Vermont’s recommendations concerning aspects of  
3 the avoided costs and methodologies to be approved in this investigation. My testimony  
4 supports the following findings:

- 5 1. Efficiency Vermont employs the Commission’s adopted screening  
6 values and methodologies in the development and delivery of  
7 efficiency measures and programs.
- 8 2. Efficiency Vermont’s proposal to update the avoided costs is closely  
9 aligned with the results of the AESC study and accepted Vermont  
10 screening precedent.
- 11 3. EEU screening could be improved if the Commission adopts winter  
12 capacity values allowing for a better assessment of the impacts of  
13 proposed measures and programs on the winter peak.
- 14 4. A 10% risk discount should continue to be applied to the costs of  
15 demand-side resources for electricity, natural gas, and unregulated  
16 fuels in program and measure screening.
- 17 5. The Wholesale Risk Premium is different from the risk discount, and  
18 the Commission should adopt the Vermont Department of Public  
19 Service’s (the “Department”) proposal to include it in addition to the  
20 traditional risk discount.
- 21 5. Vermont-specific line loss factors should continue to be used to adjust  
22 electric avoided costs.
- 23 6. The Rest-of-Pool DRIPE values found in the AESC report should be  
24 employed in societal cost-effectiveness screening. These values  
25 reflect both energy and capacity, and are reduced by 47% to account  
26 for the portion that may be considered transfer payments.
- 27 7. The pooled transmission value found in the AESC report should be  
28 applied to summer kW reductions

1 **Q. Does your testimony include any Exhibits? If yes, can you briefly describe them?**

2 **A.** Yes. Exhibit EVT-EB-1 is an Excel file titled “VEIC Proposed Avoided Costs” that  
3 contains the proposed values discussed in my testimony and in that of witness Westman.  
4 It includes one sheet “Proposal Tables” with several tables summarizing VEIC’s  
5 proposals alongside a comparison with current values, 2018 AESC default values, and the  
6 values proposed by the Department. It also includes sheets with the full proposed  
7 avoided cost values (by year where appropriate) for each category, along with the source  
8 tables from the AESC Study.

## **DISCUSSION**

### **1. THE ROLE OF SCREENING IN THE DEVELOPMENT AND DELIVERY OF EFFICIENCY MEASURES AND PROGRAMS.**

9 **Q. What is the Vermont State Screening Tool?**

10 **A.** The Vermont State Screening Tool is an Excel-based analysis tool that incorporates the  
11 avoided costs and other screening assumptions as adopted by the Vermont Public Utility  
12 Commission. It is maintained by Efficiency Vermont on behalf of the state. Efficiency  
13 Vermont also maintains a web application version of the screening tool, using the same  
14 assumptions and formulas. The web application is rigorously tested to ensure that its  
15 results are the same as those of the Excel-based tool. The two screening tools (referred to  
16 hereafter jointly as “the screening tool”) are used to perform societal cost-effectiveness  
17 screening of energy efficiency measures, projects, and programs in both its energy

1 efficiency charge (“EEC”)-funded electric efficiency programs and its Thermal  
2 Efficiency and Process Fuels (“TEPF”) programs. A new version of the screening tool is  
3 created for each program year, incorporating any changes to the avoided costs and other  
4 assumptions that have been adopted by the Commission.

5 **Q. Please describe the role that screening plays in the development and delivery of EEU**  
6 **efficiency measures and programs.**

7 **A.** As witness Eaton describes in her testimony, Efficiency Vermont performs societal cost-  
8 effectiveness screening at the measure, project, and portfolio level. The results of cost-  
9 effectiveness screening for potential prescriptive measures are used to help determine  
10 whether to support them through Efficiency Vermont’s prescriptive programs. Screening  
11 is also used in custom projects to help determine which measures to recommend and  
12 support, and to ensure that the project as a whole is societally cost-effective. Individual  
13 measures that do not screen may sometimes be supported if they are part of a package  
14 from which it would not make sense to remove them, as long as the entire package is  
15 cost-effective. For example, efficient lighting may be installed in spaces with low  
16 operating hours for consistency with other lighting being installed; while it may not be  
17 cost-effective on its own, it makes sense in the context of the project.

18 Efficiency Vermont also uses societal cost-effectiveness screening in the  
19 development of its Demand Resources Plan (“DRP”) to ensure that the portfolio of  
20 measures and programs as a whole is cost-effective. Finally, Efficiency Vermont uses the  
21 results of cost-effectiveness screening to calculate Total Resource Benefits (“TRB”) (the

1 sum of the present value of electric, fuel, and water lifetime impacts) and to determine  
2 compliance with the Minimum Performance Requirement for its electric programs  
3 requiring that total electric benefits divided by total costs exceed a ratio of 1.2.

4 **Q. How does the Screening Tool work?**

5 **A.** The screening tool includes inputs for electric, fuel, and water savings, as well as costs  
6 and operation and maintenance cost impacts. The screening tool calculates the present  
7 values of the impacts on electric energy and coincident peak demand, fuel use, water use,  
8 and operation and maintenance costs, based on the avoided costs and other assumptions  
9 built into the screening tool. A measure or group of measures is found to be societally  
10 cost-effective if the present value of benefits over the life of the measure(s) is greater  
11 than the present value of costs (as adjusted by the Risk Discount).

**2. EFFICIENCY VERMONT’S PROPOSAL IS CLOSELY ALIGNED  
WITH THE RESULTS OF THE AESC STUDY.**

12 **Q. Please describe the role of the AESC Study in the development of assumptions and**  
13 **methods employed in the screening process.**

14 **A.** The assumptions built into the screening tool are provided to Efficiency Vermont by the  
15 Commission. These assumptions have historically been adopted with minor  
16 modifications from the conclusions described in the most recent AESC Study. The  
17 values proposed by Efficiency Vermont in Exhibit EVT-EB-1 for adoption are also based  
18 on the 2018 AESC Study.

**3. THE COMMISSION SHOULD ADOPT WINTER CAPACITY  
VALUES TO IMPROVE THE EFFICACY OF EEU SCREENING.**

1 **Q. Should the Commission adopt Winter capacity value as a part of the avoided costs**  
2 **developed in this investigation?**

3 **A.** Yes, I believe that it should. Efficiency Vermont bids its winter coincident peak kW  
4 savings into the Forward Capacity Market (“FCM”), demonstrating that it has value. The  
5 FCM revenue received by Vermont relies on both the summer and winter coincident peak  
6 reduction attributable to Efficiency Vermont’s program activities. In addition,  
7 Efficiency Vermont has a Performance Indicator for Winter Peak Demand Savings,  
8 further indicating that it has value to the state.

9 **Q. What are the expected benefits of adopting Winter capacity values for use in EEU**  
10 **screening?**

11 **A.** Having a value for Winter capacity allows cost-effectiveness screening to better account  
12 for all the benefits of an energy efficiency measure. Further, if a measure increases  
13 electric use through a fuel-switch program currently allowed under TEPF programs,  
14 having this value will be important to ensure that the added load does not significantly  
15 increase winter peak loads. Recognizing that increased peak load has a cost, providing an  
16 incentive to ensure that the peak load efficiency is maximized helps to provide for the  
17 delivery of least-cost energy services.

18 **Q. What is the basis of the Capacity value included in the AESC report?**

19 **A.** The projections of avoided capacity costs included in the AESC report are largely based

1 on expected Forward Capacity Auction (“FCA”) prices. These prices are stated in \$/kW-  
2 month, and are multiplied by 12 to determine the \$/kW-year values in the avoided cost  
3 tables.

4 **Q. How are the Capacity values used in the screening tool?**

5 **A.** The \$/kW-year values for capacity have been used in the screening tool to represent the  
6 avoided cost for summer kW reductions. This therefore does not recognize the  
7 contribution of winter kW reductions to realizing those payments.

8 **Q. Does Efficiency Vermont have a recommendation as to the Winter capacity values  
9 that should be adopted by the Commission at this time?**

10 **A.** Yes, it does. Efficiency Vermont proposes that the capacity value from the AESC report  
11 be split to apply 2/3 (8 months’ worth) of the value to summer kW reductions, and 1/3 (4  
12 months’ worth) to winter kW reductions. This treatment more accurately reflects the  
13 relative contributions of the summer and winter kW reductions to the overall avoided  
14 capacity reductions.

**4. THE COMMISSION SHOULD CONTINUE ITS RELIANCE ON THE  
APPROVED RISK ADJUSTMENT, AS WELL AS INCLUDING THE  
WHOLESALE RISK PREMIUM.**

15 **Q. Please describe the role that the Commission’s Risk Adjustment plays in efficiency  
16 measure and program screening.**

17 **A.** As established in Vermont Public Service Board (the “Board”) Docket No. 5270 in 1990,  
18 a 10% Risk Discount is applied to the costs of demand-side resources, to account for “the  
19 substantial risk and flexibility advantages of demand-side resources.” *See* Docket No,

1 5270, Order of 4/16/90, Volume III-A-2 at 273. These advantages “include flexibility,  
2 short lead time, availability in small increments, and ability to grow with load.” *Id.* This  
3 adjustment was adopted to encourage the use of demand-side resources compared to  
4 supply-side resources as a way to reduce society’s long-term risks associated with supply  
5 side resources. The risk discount reduces the effective cost of energy efficiency  
6 resources for the purposes of societal cost-effectiveness screening.

7 **Q. What changes to the Risk Adjustment are proposed by the Department?**

8 **A.** The Department proposes that the Risk Adjustment be reduced from 10% to a 5%  
9 discount on the cost of demand-side electric resources, and that a 10% risk discount be  
10 maintained for natural gas and unregulated fuel types.

11 **Q. Does Efficiency Vermont support the changes to the Risk Adjustment proposed by**  
12 **the Department? If not, please explain.**

13 **A.** No it does not. Efficiency Vermont is unable to verify the Department’s analysis, and  
14 does not believe that its conclusions are strong enough to overturn nearly 30 years of  
15 precedent in energy efficiency cost-effectiveness screening. Efficiency Vermont also  
16 does not believe that there is sufficient evidence to suggest that the Risk Adjustment for  
17 electric demand-side resources should be different from that used for natural gas and  
18 unregulated fuel demand-side resources. Energy efficiency remains a very low risk  
19 method to acquire cost-effective energy resources. It is scalable, flexible, and can be  
20 tailored to customer needs. Efficiency resource acquisition can rely on passive measures  
21 or be delivered as a dynamic program designed to change customer behavior and

1 resultant loads. While the technologies used to generate electricity are changing, the  
2 factors that differentiate demand resources from supply have not materially changed  
3 since the time the Risk Adjustment was developed.

4 We further think that there are additional risks avoided by demand-side resources.  
5 These include but are not limited to interruption from large-scale weather events, terrorist  
6 attacks, and other catastrophic disruptions. It is unclear if the Commission took these  
7 risks into account when the Risk Adjustment was promulgated. However, these  
8 considerations support the conclusion that demand-side resources are a robust addition to  
9 the energy portfolio that helps to reduce risk. As when the Risk Adjustment was  
10 established, the approved screening tool is correct in applying a 10% discount for  
11 demand-side resources and the practice should be continued.

12 **Q. What actions does Efficiency Vermont recommend that the Commission take, if**  
13 **any, concerning the approved Risk Adjustment? Please explain.**

14 **A.** Efficiency Vermont recommends that the existing 10% risk discount be maintained for all  
15 demand-side resources, including electric, natural gas, and unregulated fuel efficiency  
16 resources.

17 **Q. What is the Wholesale Risk Premium?**

18 **A.** The Wholesale Risk Premium (“WRP”) as proposed in the AESC report is intended to  
19 reflect the difference between the retail price of electricity supply from a fixed-price  
20 contract over the sum of wholesale prices for energy, capacity, and other services. The  
21 AESC report states:

1 This premium over wholesale prices, or wholesale risk premium, is  
2 attributable to various costs that retail electricity suppliers incur in  
3 addition to the cost of acquiring wholesale energy, capacity, and ancillary  
4 service at wholesale market prices. These additional costs include costs  
5 incurred to mitigate cost risks associated with uncertainty in charges that  
6 will be borne by the supplier but whose unit prices cannot be definitely  
7 determined or hedged in advance. These cost risks include costs of hourly  
8 energy balancing, transitional capacity, ancillary services, and uplift.  
9

10 See Exhibit EVT-DCW-1, AESC Report, Appendix A, at 253.

11 **Q. Does the Wholesale Risk Premium account for the same risks as the Risk  
12 Adjustment?**

13 **A.** No, I believe that the risks accounted for in the WRP are different from the risks  
14 addressed by the Risk Adjustment. In past Commission findings, the WRP has been set  
15 to zero because it had been considered duplicative of the risk discount on costs. See, for  
16 example, Case No. EEU-2015-04, *Order approving updated avoided costs for use by the*  
17 *Energy Efficiency Utilities*, entered 12/20/2013, at 11. However, Efficiency Vermont  
18 does not agree that the WRP covers the same costs accounted for by the risk discount.  
19 The risk discount addresses system-wide risks associated with demand-side resources  
20 versus supply resources, whereas the WRP addresses short-term costs associated with the  
21 delivery of electric energy and the uncertainty of load forecasts. Reduction of load via  
22 energy efficiency directly reduces these costs.

23 **Q. Does Efficiency Vermont support the changes to the Wholesale Risk Premium  
24 proposed by the Department?**

25 **A.** Yes it does. Efficiency Vermont agrees with the Department that the WRP should be

1 included, but in addition to the Risk Adjustment. Efficiency Vermont further supports  
2 the Department’s proposal that a WRP value of 4% be applied in winter months and 0%  
3 in summer months.

**5. REST-OF-POOL DEMAND REDUCTION INDUCED PRICE  
EFFECT (“DRIPE”) SHOULD CONTINUE TO BE ACCOUNTED  
FOR IN SOCIETAL SCREENING.**

4 **Q. What is the demand reduction induced price effect?**

5 **A.** DRIPE refers to the reduction in energy and capacity prices resulting from a reduction in  
6 demand due to energy efficiency and demand response programs.

7 **Q. What is the Department’s proposal with regard to DRIPE?**

8 **A.** In their proposal, the Department asserts that all of DRIPE is a transfer payment, with  
9 benefits accruing to customers at the expense of resource providers. They therefore  
10 propose that DRIPE should not be included in the societal cost-effectiveness screening.

11 **Q. Do you agree with the Department’s proposal? Please explain.**

12 **A.** No, I do not. The Department does not offer any analysis beyond assertion to counter the  
13 previous findings of the Commission that only a portion of Rest-of-Pool DRIPE should  
14 be considered a transfer payment. *See* Case No. EEU-2013-07, *Order Re: Demand*  
15 *Reduction Induced Price Effect and Distribution Line Loss Values*, entered 10/24/2014, at  
16 5. Efficiency Vermont believes that a portion of DRIPE represents a real and substantive  
17 benefit to society and that the previous finding should stand.

18 **Q. What is Efficiency Vermont’s proposal with regard to DRIPE?**

19 **A.** Efficiency Vermont proposes including the Rest-of-Pool DRIPE values found in the

1 AESC report in societal cost-effectiveness screening, reduced by 47% to account for the  
2 portion that may be considered transfer payments. This includes both electric energy and  
3 capacity values. Efficiency Vermont further proposes that the capacity DRIPE value be  
4 split between winter and summer kW reductions using the same factors as proposed for  
5 avoided capacity costs, with 1/3 accruing to winter kW reductions and 2/3 accruing to  
6 summer kW reductions.

7 Based on the methodology used previously for natural gas DRIPE, only gas supply  
8 DRIPE was included and gas cross DRIPE was not included; since the AESC report  
9 shows a zero value for gas supply DRIPE in Vermont, Efficiency Vermont does not  
10 propose any value for natural gas DRIPE.

**6. LINE LOSSES SHOULD CONTINUE TO BE ACCOUNTED FOR IN  
THE EEU SCREENING TOOL.**

11 **Q. How are distribution line loss values used in the EEU Screening Tool?**

12 **A.** Distribution line loss factors are used in the screening tool to adjust the avoided costs  
13 from the values provided in the AESC study to apply to savings at the customer meter.  
14 The avoided costs provided in the AESC study assume an average 8% line loss in all  
15 periods. Previous studies of average line losses in Vermont have found higher values,  
16 differing by period. In the screening tool, the base avoided costs from the AESC are  
17 multiplied by a line loss factor that represents the differential between the 8% value  
18 already included in the avoided costs and the period-specific line loss values. In  
19 accordance with guidance provided by the Department, the line loss values excluding

1 PTF losses are applied to energy and capacity avoided costs, while line loss values  
2 including PTF losses are applied to avoided environmental costs (non-embedded costs).

3 **Q. What distribution line loss values does Efficiency Vermont recommend be adopted**  
4 **for use in EEU screening?**

5 **A.** Efficiency Vermont recommends that the line loss values most recently adopted by the  
6 Commission in Case No. EEU 2015-04, *Order Re: EEU Avoided Costs. Externality*  
7 *Adjustments, and other Screening Components for 2017-2018 Time Period*, dated  
8 November 20, 2017, be adopted again for use in EEU screening.

9 **Q. Why does Efficiency Vermont recommend continued reliance on the approved line**  
10 **loss values?**

11 **A.** Efficiency Vermont believes that the approved line loss values more accurately reflect the  
12 actual average distribution line losses in Vermont than the 8% default value included in  
13 the AESC report. Efficiency Vermont is not aware of a more recent analysis of line  
14 losses on which to base updated Vermont-specific values.

**7. AVOIDABLE POOLED TRANSMISSION SHOULD BE APPLIED TO**  
**SUMMER kW REDUCTIONS IN THE EEU SCREENING TOOL.**

15 **Q. Why does Efficiency Vermont recommend inclusion of the AESC values for pooled**  
16 **transmission costs in place of the existing values of avoided transmission and**  
17 **distribution (“T&D”) costs?**

18 **A.** As witness Westman explains in his testimony, the AESC report includes a new value for  
19 pooled transmission costs that can be avoided through energy efficiency. Original

1 estimates of avoided T&D values were based on locally-identifiable projects that were  
2 being deferred through efficiency, and whose costs would have been pooled among all  
3 ISO-NE customers. The AESC value appears to be a more recent, or updated value to the  
4 original value used by Vermont, and would be more appropriate to use than the original  
5 Vermont estimate.

6 **Q. How are T&D costs currently applied in the screening tool?**

7 **A.** The existing values for avoided T&D costs are currently applied to 40% of the winter  
8 coincident peak kW reduction and 60% of the summer coincident peak kW reduction.  
9 This split was established in 2007, prior to adoption of the current T&D values in 2012.

10 **Q. How does Efficiency Vermont recommend that the pooled transmission costs be  
11 applied in the screening tool?**

12 **A.** The AESC Study states that the “value should be applied to the reduction in summer peak  
13 load, which appears to dominate ISO New England’s transmission planning.” Efficiency  
14 Vermont therefore recommends that the pooled transmission costs identified in the AESC  
15 Study be applied to 100% of the summer coincident peak kW reduction, with none  
16 applied to the winter kW reduction.

17 **Q. Does this conclude your testimony?**

18 **A.** Yes, it does.