

REPORT TO THE VERMONT STATE LEGISLATURE

Act 62 – Final Report on All-Fuels Energy Efficiency

**Submitted by the Vermont Public Utility Commission to the
Senate Committee on Natural Resources and Energy and the
House Committee on Energy and Technology**

January 15, 2021

ACT 62 – FINAL REPORT TABLE OF CONTENTS

Executive Summary	1
I. Introduction and Statutory Basis	6
II. Funding.....	7
A. Transportation.....	10
B. Weatherization and Thermal Efficiency	12
1. Thermal Efficiency Benefit Charge	13
2. Gradually Increase the Fuel Tax	15
3. Weatherization Is Good for the Economy	18
4. Protecting Vulnerable LIHEAP Participants from Increased Costs	19
5. Prioritize Measures for Low- and Moderate-Income Vermonters.....	20
6. Act Quickly and Responsibly	21
III. Creation of an All-fuels Efficiency Program.....	22
A. Appropriate Entities for Service Delivery	22
B. Comments from Stakeholders on an All-Fuels Efficiency Program.....	25
IV. Conclusion.....	27
Appendix A – Other Considerations	A-1
Appendix B -- Enacting Language	B-1
Appendix C -- Summary of Several Previous Reports Addressing Policy Options	C-1
Appendix D -- History of Commission Case No. 19-2956-INV	D-1
Appendix E -- Participants in Commission Case No. 19-2956-INV (<i>listed alphabetically</i>) ..	E-1

Executive Summary

Vermont has a reputation for leadership, innovation, and excellence in our energy programs. For several decades, our electric, natural gas, and energy efficiency utilities and other energy service providers have helped Vermont make important progress in lowering the carbon content of our energy supply and decreasing our energy use. We have the people, the know-how, the infrastructure, and the coordination in place to help Vermont take the next step along its climate journey to reduce greenhouse gas emissions from the transportation and heating sectors.

That is the good news, and that is why the Commission's answer to the first question in this report is "no" — we do not need to create an "all-fuels" energy efficiency program. Vermont already has the organizational structures, regulatory oversight, and experience to implement the programs we need. These systems and programs have made important progress. However, that progress falls woefully short in the unregulated-fuels sector, and it is vital to step up the pace.

The inconvenient truth is that we need more funding. The basic policy question—how to fund energy efficiency¹ and fuel switching² in the world of unregulated-fuels³—has been studied for many years. A long list of studies—going back over a decade—from a variety of stakeholders all recommend that the Legislature establish a stable and sizable stream of funding for thermal and transportation efficiency and fuel switching.⁴ At current funding levels, Vermont will fail to achieve its ambitious goals to reduce energy usage and greenhouse gas emissions.

The other good news is that public investments in programs that reduce Vermonters' energy use and greenhouse gas emissions will leverage private sources of capital and will produce economic and public health benefits for the State and its residents. Economic impact modeling indicates that continuing to fund the State's core weatherization efforts will be a timely investment in Vermont that will yield long-term economic gains for the State. Such investment will increase personal income by \$27-\$39 million per year, increase gross state product by \$20-\$21 million per year, and employ

¹ Energy efficiency means using less energy to perform the same task—such as heating a house.

² Fuel switching means substituting one fuel for another to perform the same task. Ideally, the act of fuel switching will result in less overall energy use and less overall greenhouse gas emissions.

³ "Unregulated fuels" means fuels used by thermal-energy and process-fuel customers other than electricity and natural gas delivered by a regulated utility. 30 V.S.A. § 209(e)(3)(F). These fuels are unregulated by the Commission but are regulated otherwise.

⁴ A brief review of these studies may be found in Appendix C.

hundreds of Vermonters. More public funding will produce even greater public benefits and will contribute to Vermont's attainment of its energy and climate goals.

In Act 62 of 2019, lawmakers asked the Commission to consider a number of ways to help Vermont achieve these goals. Following 18 months of investigation, we conclude that the single most important step for Vermont lawmakers to take is to establish stable, sizable, long-term funding for decarbonizing the heating and transportation sectors. This funding is the linchpin to achieving Vermont's goals. Experience to date demonstrates that dedicating only a modest amount of funding toward these goals results in only modest gains. Thus, we are failing to achieve what we have set out to do. Minor gains may be achieved by increasing organizational efficiencies, coordination, or public-private partnerships, but these alone will fall far short. The focus must be on securing additional funding.

This report, like the Preliminary Report filed last year,⁵ has been significantly informed by the important contributions of many Vermont stakeholders participating in our investigation. Additionally, we have relied on much prior research and reporting by Vermont entities and those in other jurisdictions.⁶ The Commission appreciates the active participation and thoughtful contributions to our efforts by the many stakeholders listed in Appendix E.

More Funding Is Needed

Vermont is falling far short of its climate goals in the heating and transportation sectors,⁷ which represent the vast majority of our greenhouse gas emissions and the greatest cost burden for Vermont households.⁸ Without a stable, sizable stream of public funding in those two sectors, Vermont will not meet its carbon-reduction commitments. Furthermore, weatherization of buildings, fuel switching in heating, and decarbonization of the transportation sector offer opportunities for improved health, environmental quality, economic development, and savings for individual Vermonters.

⁵ The Preliminary Report was issued on January 15, 2020, and is an essential component of this Final Report in fulfillment of the requirements of Act 62. The full Preliminary Report is available at https://legislature.vermont.gov/assets/Legislative-Reports/Act-62_PreliminaryReport-1.15.20.pdf.

⁶ A partial list of resources reviewed by Commission staff is included in Appendix D.

⁷ Vermont is on a path to achieving its climate goals for the electric sector as a result of Vermont's successful energy efficiency programs and the Renewable Energy Standard. These important programs for the electric sector are paid for by electricity customers. The heating and transportation sectors do not have a similar source of funding, and thus those sectors are far behind in their climate goals.

⁸ See Preliminary Report at 2, 14, 16.

Funding for these sectors should come from charges on *unregulated* fossil-fuel sources—fuel oil, propane, kerosene, and other dyed diesel fuel—rather than charges on electricity. Vermont should strive to keep electricity affordable because it is a relatively low-emission energy source. Applying the energy efficiency charge on customers’ electric bills to fund thermal efficiency measures or the switch away from unregulated fuels would send the wrong price signal and drive customers away from electricity as a clean alternative to fossil fuels. Vermont should continue its long tradition of minimizing cross-subsidies across fuel types. In order to align the costs to the benefits and to provide an appropriate price signal to the market, funding should come from sources tied to the relevant fuels. Gradually implementing and increasing charges on unregulated fossil fuels, rather than electricity, will make those fossil fuels slightly more expensive and send the right price signal to customers to use those fuels more efficiently or move away from them entirely.

An All-Fuels Efficiency Entity Is Not Needed

Vermont already has a robust and vibrant ecosystem of program administrators and market actors who are working in a coordinated way and are ready to take advantage of new funding streams,⁹ as long as the funding is phased in and predictable to allow for sustained growth of the workforce and supply chains. Creating a new all-fuels efficiency entity to manage all programs is unnecessary and may actually hinder innovation or stifle the marketplace. The current ecosystem allows for a multitude of approaches that play to different strengths and meet Vermonters where they are.

Principles and Recommendations

Based on the robust stakeholder process over 18 months, the Commission developed principles and recommendations to guide lawmakers’ considerations.

Principles

1. Funding should come from unregulated fossil-fuel sources consistent with Vermont’s energy and environmental policies. Keep electricity affordable because it is a low-carbon, mostly renewable fuel.
2. Focus on low- and moderate-income Vermonters.

⁹ A detailed description of Vermont’s current suite of energy-related programs can be found in the Preliminary Report, pages 20-36.

Recommendations

1. Achieve financial benefits for Vermont from the regional Transportation Climate Initiative.
2. Collect a Thermal Efficiency Benefit Charge on the sale of fuel oil, propane, and kerosene.
3. Gradually increase the fuel tax to benefit more low-income Vermonters.¹⁰
4. Support the existing resilient ecosystem of program administrators and market actors. An all-fuels efficiency entity or new program is not necessary.

¹⁰ Vermont's fuel tax is a "tax on the retail sale of heating oil, propane, kerosene, and other dyed diesel fuel delivered in Vermont." 33 V.S.A. § 2503. It is set by statute at a rate of 2 cents per gallon and funds exclusively the Home Weatherization Assistance Fund, for the low-income Weatherization Assistance Program. Dyed diesel fuel is not a heating fuel and is commonly used for farming equipment, construction equipment, and other off-road uses, and may be used for on-road purposes by government entities.

Current and Proposed Funding

To understand our funding recommendations, it will help the reader of this report to begin with a basic understanding of the current myriad funding streams and the programs they support.

Current sources of revenue

Source	Application	Revenue collection mechanism
Fuel Tax	Low-income Weatherization Assistance Program	Existing fuel tax on heating oil, propane, kerosene, and dyed diesel
Gross Receipts Tax	Low-income Weatherization Assistance Program	Existing gross receipts tax on sale of electricity, natural gas, and coal
ISO-NE - Forward Capacity Market	Weatherization, thermal efficiency, and heating-fuel switching for all income levels	Revenues from bidding electric efficiency resources in Forward Capacity Market
Regional Greenhouse Gas Initiative (RGGI)	Weatherization, thermal efficiency, and heating-fuel switching for all income levels	RGGI auction proceeds
Electric utilities RES Tier III	Greenhouse gas reductions	Electric rates
Electric Energy Efficiency Charge	Electric efficiency for all income levels and businesses	Electric energy efficiency charge
Natural Gas Energy Efficiency Charge	Weatherization, thermal efficiency, and heating-fuel switching for all income levels	Natural Gas energy efficiency charge
LIHEAP	Low-income fuel assistance	Federal and State appropriations

Proposed new sources of revenue *(Note: All current revenue sources listed in the chart above would be maintained for existing thermal efficiency programs.)*

Source	Application	Revenue collection mechanism
Fuel Tax (raised amount)	Low-income Weatherization Assistance Program	Fuel tax on heating oil, propane, kerosene, and dyed diesel
Thermal Efficiency Benefit Charge (TEBC)	Weatherization, thermal efficiency, and heating-fuel switching for all income levels	New efficiency charge on fuel oil, propane, and kerosene
Transportation Climate Initiative (TCI)	Transportation decarbonization	TCI auction proceeds

I. Introduction and Statutory Basis

On July 1, 2019, Section 2 of Act 62 (H.63) of the 2019-2020 Vermont legislative session took effect. In Act 62, lawmakers recognized that the State is failing to achieve its legislated environmental goals and that a multi-pronged approach is necessary to address Vermont's greenhouse gas reduction and weatherization goals. Section 2 of Act 62 directs the Commission to report on the following: consideration of an all-fuels energy efficiency program, the expansion of the services that efficiency utilities may provide, and related issues — including funding for those programs.¹¹

In response, on July 11, 2019, the Commission initiated an investigation to explore the issues identified by Section 2, as well as other related topics that arose during the investigation.¹²

On January 15, 2020, the Commission submitted its preliminary report to lawmakers. The preliminary report concluded that if Vermont is to make meaningful progress towards its energy and greenhouse gas emissions reduction goals and commitments, funding is the most pressing issue and the State will need to identify appropriate, stable, and robust funding and program options outside the traditionally regulated sectors of electricity and natural gas. Dedicating funds toward these ends is an investment in Vermont that will leverage private capital, produce local jobs, boost the Vermont economy, and enhance the health and affordability of the State.

The most pressing issue is to identify appropriate, stable, and robust funding outside the traditionally regulated sectors.

This final report is organized in four sections.

- Section I provides this introduction.
- Section II picks up where the Preliminary Report left off — on the topic of funding. We recommend three complementary funding mechanisms for lawmakers to consider:
 - Institute a Thermal Efficiency Benefit Charge,
 - Increase the amount of the fuel tax but not the gross receipts tax, and
 - Access the benefits provided by the regional Transportation Climate Initiative.

¹¹ The full text of Section 2 of Act 62 is attached to this report as Appendix B.

¹² Case No. 19-2956-INV. All documents issued by the Commission and filed by the various participants can be accessed via ePUC, the Commission's online filing and case-management system.

- Section III provides our analysis and recommendations with respect to the creation of an all-fuels efficiency program.
- Section IV provides some concluding thoughts.

II. Funding

In Act 62, lawmakers directed the Commission to “consider and recommend how best to provide consistent, adequate, and equitable funding for efficiency, conservation, and related programs and services,” including “how to use existing or new funding sources to provide sufficient funds to implement and support the Commission’s recommendations.”

In the January 2020 Preliminary Report, the Commission recommended that lawmakers “identify appropriate, stable, and robust funding and program options for the transportation and heating sectors — the two sectors that consume the most energy and emit the most greenhouse gases — to complement Vermont’s existing, successful programs. New funding options should be sustainable, sufficient to meet Vermont’s goals yet affordable to Vermonters, equitable, administratively efficient, and transparent, and should send price signals that support Vermont’s policy goals.”¹³ Our recommendations in the Preliminary Report, and those made here, are based on and consistent with a substantial body of work that has been conducted in Vermont and other jurisdictions for more than a decade on the topic of unregulated-fuels efficiency.¹⁴ The Commission recommends two core principles that should inform lawmakers’ consideration of new funding.

Principle 1

New funding should come from unregulated fossil fuel sources. Keep electricity an affordable, renewable fuel.

First, beyond what is currently authorized by statute, Vermont electric and natural gas customers should not subsidize new or expanded programs aimed at reducing the consumption of unregulated fuels and the resulting carbon emissions. Vermont should keep electricity affordable because it is a clean fuel for customers to adopt as they turn away from more polluting fuels for transportation and heating.

Participants in this proceeding were nearly unanimous in their position opposing the redirection of electric and natural gas ratepayer funds to other purposes, such as

¹³ Preliminary Report at 2.

¹⁴ Appendix C to this report provides our summary of several previous reports addressing policy options for addressing unregulated-fuels efficiency.

funding unregulated-fuels efficiency, conservation, and related programs and services. We concur and explained our reasoning in the Preliminary Report.¹⁵

Electric and natural gas ratepayers already pay an energy efficiency charge on their electricity and natural gas consumption and pay a gross receipts tax to support Vermont's low-income Weatherization Assistance Program.¹⁶ In addition, electric ratepayers are responsible for funding Vermont's multiple renewable electricity programs, such as net-metering, standard-offer, and the Renewable Energy Standard. Together, these programs represent a meaningful portion of a customer's electricity costs. By contrast, fuel oil, propane, and kerosene customers pay a fuel tax of only 2 cents per gallon — less than 1% of the current price of a gallon of residential heating fuel — to support the Weatherization Assistance Program. This adds about \$15 per year to the average family's fuel expenses.

Second, any new sources of funding to support Vermont's clean energy programs should be sensitive to the needs of low- and moderate-income Vermonters. Due to their financial circumstances, lower-income customers tend to have the highest energy burdens (energy costs as a percentage of income), are most likely to experience the negative health effects of poorly weatherized homes, and are the least able to afford investments in efficient and renewable energy projects. Therefore, new funding strategies should be affordable for all Vermont customers, should not jeopardize current energy programs such as the Weatherization Assistance Program, and should be prioritized to benefit low- and moderate-income customers.¹⁷

Principle 2

Focus on low- and moderate-income Vermonters.

New sources of funding will be required to achieve Vermont's building energy and greenhouse gas emission reduction goals. The primary reason Vermont is falling short of its goals is that there is simply not enough public funding to reduce the use of

¹⁵ Preliminary Report at 52-54.

¹⁶ Section 2503 of Title 33 imposes a 0.75% gross receipts tax on the retail sale of natural gas and coal and a 0.5% gross receipts tax on the retail sale of electricity. Electricity, natural gas, and coal are not subject to the fuel tax.

¹⁷ Moderate-income customers are those with a total household income that falls between 80% and 120% of area median income. According to Efficiency Vermont, as of July 2019 approximately 60% of Vermont families fall into the moderate-income range.

unregulated fossil fuels for space heating and transportation.¹⁸ The policy question of how to fund unregulated-fuels efficiency and fuel switching in Vermont and other jurisdictions has been studied for many years. A long list of studies—going back over a decade—from a variety of stakeholders all recommend that the Legislature establish a stable and sizable stream of funding for thermal and transportation efficiency.¹⁹ This funding would be used to implement programs that help Vermonters use energy more efficiently and switch to clean energy alternatives. Accordingly, the Commission urges lawmakers to identify and authorize new stable sources of funding for unregulated-fuels efficiency and fuel-switching programs consistent with and adequate to achieve Vermont’s ambitious energy and environmental goals. Even with private investment, innovative financing tools, energy education, and public awareness campaigns, millions of dollars in public investment are needed annually to set Vermont on a path to achieve its goals and commitments.

Consonant with the principles identified above, we offer three specific and complementary funding recommendations for lawmakers to consider. Timely consideration of these recommendations is key, because current sources of funding are insufficient now and are expected to diminish over time.

Current sources of funding are insufficient to meet VT’s greenhouse gas emissions reduction goals.

These recommendations are made in the context of the ongoing COVID-19 pandemic and its attendant economic recession, which has negatively affected the financial well-being of many Vermonters. We encourage lawmakers to balance these difficult economic circumstances with the equally pressing need to act promptly to fund currently underfunded efficiency programs for unregulated fuels in the thermal and transportation sectors. Underinvestment results in lost opportunities for substantial economic and environmental benefits. One way to achieve this balance is to phase in funding sources over time.

In summary, it remains important to focus on low- and moderate-income weatherization, thermal efficiency, and fuel-switching programs and to continue working toward decarbonization in all sectors. As the Climate Council engages in

¹⁸ Other, less salient causes of Vermont’s failure to reach goals are discussed at length in the Preliminary Report.

¹⁹ For a summary of this past research, see Appendix D.

longer-term deliberations, the Legislature can take effective action in the near-term to provide more funding for these programs.²⁰

The Commission joins the chorus of voices seeking climate action. Based on the substantial work by those who have come before us and our consideration of participants' comments in this proceeding, we make three recommendations for how to adequately fund programs to achieve greenhouse gas reduction goals in the thermal and transportation sectors.

- **Recommendation 1: Work toward achieving financial benefits for Vermont from the regional Transportation Climate Initiative to decarbonize the transportation sector.**
- **Recommendation 2: Collect a Thermal Efficiency Benefit Charge on the sale of fuel oil, propane, and kerosene.**
- **Recommendation 3: Increase the fuel tax to benefit more low-income Vermonters.**

A. Transportation

As the largest contributor to greenhouse gas emissions in the state, transportation-sector emissions must be addressed to achieve Vermont's goals. Currently, there is no dedicated funding stream with a properly aligned price signal for this essential transportation efficiency work. The Commission recommends that Vermont work toward achieving the benefits for Vermont from the Transportation Climate Initiative (TCI) Memorandum of Understanding, a regional cap-and-

Recommendation 1

Achieve financial benefits for Vermont from the Transportation Climate Initiative.

²⁰ Lawmakers have already passed two pieces of legislation aimed at decarbonizing the Vermont economy: Act 151 and the Global Warming Solutions Act. In addition, we are aware that several working groups are developing alternative, potentially complementary proposals that would address greenhouse gas emissions in the heating sector. For example, there is currently a working group exploring the creation of a Clean Heat Standard to reduce carbon emissions in the heating-fuels sector. This effort may yield a promising policy option, but it still may be several years before programs are up and running. For example, discussions and program design for the Renewable Energy Standard for electric utilities began in 2011, the Legislature enacted it in 2015, and the requirement took effect in 2017, with some smaller utilities only beginning programs in 2019. These programs take years to develop and implement. By contrast, there are existing programs that can quickly make use of revenues from a new Thermal Efficiency Benefit Charge. An eventual Clean Heat Standard and the solutions we propose here are not mutually exclusive.

invest program under discussion by Northeastern, Mid-Atlantic, and Southeastern states. This program would be modeled on the very successful Regional Greenhouse Gas Initiative, which has greatly benefited Vermonters by directing cap-and-invest auction revenues into thermal efficiency programs. Initial estimates of potential revenue for Vermont from the TCI range from \$20-\$40 million annually.²¹ One of the main benefits of the TCI is that price impacts from the purchase of allowances will be the same across states.

On December 21, 2020, a final Memorandum of Understanding was released, with Massachusetts, Rhode Island, Connecticut, and the District of Columbia announced as the first jurisdictions to participate. Eight other jurisdictions, including Vermont, have signaled that they will continue to develop the TCI program while also pursuing state-specific initiatives. The TCI program may be implemented as early as 2022.

The revenue from the TCI could be used to invest equitably in low-carbon and more resilient transportation infrastructure. Subject to legislative appropriations, Vermont's TCI proceeds could be invested in public transportation, active transportation (such as bicycle, pedestrian), electric vehicles and charging infrastructure, renewable fuels, smart growth, and mitigation programs for rural and low-income populations.²²

Modeling has shown that the TCI may add to the cost of gasoline and on-road diesel that Vermonters pay at the pump. However, this may be inevitable whether or not Vermont participates in the TCI because fuel prices could increase regionally as other, larger states like Massachusetts participate in TCI.²³ Thus, Vermont should participate in the TCI program so as not to miss out on the net TCI revenues while potentially paying more for gas. Additionally, a 5- to 20-cent-per-gallon increase in the price of fuel at the pump is within the range of fluctuations in gas prices that consumers are used to.²⁴

The Commission supports solutions like the TCI that will raise funds from the sale of polluting fuels, such as gasoline and diesel. A core requirement that will sustain decarbonization of the economy is affordable electricity. If taxes, fees, or other charges are added to electric rates to raise funds for decarbonization, electricity will become more expensive. Higher electric rates make switching to electricity for transportation or

²¹ Case No. 19-2956-INV, tr. of 10/25/19 at 23 (Dutcher).

²² Case No. 19-2956-INV, Presentation by Dan Dutcher, Vermont Agency of Transportation, 10/25/19.

²³ 19-2956-INV, tr. of 10/25/19 at 18 (Dutcher).

²⁴ 19-2956-INV, tr. of 10/25/19 at 22-23 (Dutcher).

heat less attractive for customers.²⁵ Therefore, the Commission does not support raising additional funds for transportation programs from electric ratepayers. Electric ratepayers already support two sources of funding for transportation: Tier III of the Renewable Energy Standard and Act 151.²⁶

As stated in the Preliminary Report and elsewhere in this report, the Commission supports using the electric efficiency charge revenue generated from electric vehicle charging to decarbonize the transportation sector. As evidenced by the Commission's approval of special electric-vehicle-charging rates through utility tariffs, the Commission also supports utility rate design that recognizes the value that electric vehicles can bring to the grid and offers reduced rates to electric vehicle drivers for the electricity needed to charge their cars.

Vermont General Fund or transportation fund incentives for electric vehicle purchases will also remain important. The Commission recommends that the Legislature continue to fund up-front incentives for vehicle purchases through the General Fund or transportation fund, as it currently does. For example, in Act 154 (the "Big Bill" for FY21), lawmakers appropriated \$1 million from the transportation fund for the New Plug-in Electric Vehicle Incentive Program established in Act 59 of 2019.²⁷ Because up-front incentives are key to moving the market and overcoming one of the primary barriers to electric vehicle adoption (the initial purchase price),²⁸ this program should continue and should be funded through the General Fund unless and until funding from the fossil-fuel sector (likely through the TCI) is secured.

B. Weatherization and Thermal Efficiency

To achieve long-term market transformation for weatherization, Efficiency Vermont and the Department of Public Service agree that new strategies are needed to increase participation and to scale up services.²⁹ Ideally, strategies to spark large-scale market

²⁵ The Commission's Supplemental Electric Vehicle Report to the Vermont State Legislature, submitted pursuant to Section 35 of Act 59 of the 2019-2020 Vermont Legislative Session, 12/13/19 at 5.

²⁶ Act 151 authorized Energy Efficiency Utilities to use up to \$2 million from the Energy Efficiency Charge (a charge on customer electric bills) for new initiatives that may include transportation electrification. The Commission supports the current sunset of Act 151 after three years.

²⁷ Act 154, Section B.1100.1(a)(2)(C).

²⁸ See Promoting the Ownership and Use of Electric Vehicles in the State of Vermont, A Report to the Vermont State Legislature, Vermont Public Utility Commission, June 27, 2019.

²⁹ Efficiency Vermont Reply Comments, Case No. 19-2956-INV, September 4, 2020, at 2; Reply Comments of the Department of Public Service, Case No. 19-2956-INV, September 4, 2020, at 1. With increased

demand for weatherization services should include less reliance on ratepayer or taxpayer monies and instead promote initiatives that rely on private investment such as “Energy Savings Guarantees” or “Pay-As-You-Save” models, enhanced rate design, and pricing in the value of environmental and health benefits. However, reducing customers’ up-front costs through incentives will remain a prominent part of weatherization services.³⁰ Efficiency Vermont’s research indicates that Vermont homeowners identify up-front project cost as the primary barrier to energy-saving projects, and that many Vermonters are reluctant to take on new debt or leverage too much personal capital for energy-related projects.³¹ Therefore, more funding is required to reach the State’s weatherization goals.

More funding will deliver results. With additional funding, Efficiency Vermont was able to quadruple the number of projects it completed by reducing up-front project costs. In August and September, 2020, increased funding allowed Efficiency Vermont to complete four to five times the number of projects historically completed in those months through a combination of its Home Performance with Energy Star program and its Home Energy Loan finance offering.³²

1. Thermal Efficiency Benefit Charge

As authorized by Vermont law, current funding to support unregulated-fuels thermal efficiency and weatherization programs implemented by Efficiency Vermont and the City of Burlington Electric Department comes from revenues from bidding the savings of electric energy efficiency programs into the ISO New England Forward Capacity Market and from the sale of CO₂ allowances under the Regional Greenhouse Gas Initiative.³³ These revenues have been productively used over the last decade, but they are insufficient to achieve Vermont’s building efficiency and greenhouse gas emissions reduction goals. From 2018 to 2020,

Recommendation 2

Collect a Thermal Efficiency Benefit Charge on the sale of fuel oil, propane, and kerosene.

funding, both Home Performance with Energy Star and Home Energy Loan finance offerings saw increased participation.

³⁰ Efficiency Vermont Reply Comments, Case No. 19-2956-INV, September 4, 2020, at 2-3.

³¹ This finding is consistent with the Clean Energy Industry Finance reports produced for the Department of Public Service, as well as the Commission’s findings with respect to electric vehicle adoption described in its report “Promoting the Ownership and Use of Electric Vehicles in the State of Vermont,” 6/27/19.

³² Efficiency Vermont Reply Comments at 3.

³³ 30 V.S.A. § 209(e).

Efficiency Vermont was expected to receive average annual revenues from these sources of about \$10 million. Going forward, these funds are forecasted to decrease due to anticipated declines in revenues from the Forward Capacity Market (i.e., capacity prices are forecasted to decline over the next several years).

To supplement these existing revenue sources, the Commission recommends that a “Thermal Efficiency Benefit Charge” be assessed on fuel oil, kerosene, and propane. Much like the statutorily authorized efficiency charge on electricity and natural gas, the Thermal Efficiency Benefit Charge would draw revenues from these end-use fuels and provide funds for thermal efficiency programs that benefit the users of those fuels. Basing the charge on just fossil fuels would mean that renewable heating fuels such as biomass (wood and wood pellets) and biofuels (biodiesel) would be exempt.³⁴ As discussed above, electricity and natural gas are already assessed a “systems benefit charge” (the energy efficiency charge authorized by 30 V.S.A. §209(d)(3)). Therefore, the Thermal Efficiency Benefit Charge should not apply to those fuels so that electricity can remain an affordable, renewable fuel option for Vermonters.

We recommend that the new Thermal Efficiency Benefit Charge be modeled after and take advantage of the systems already in place for the collection of the existing fuel tax. For example, like the fuel tax, the Thermal Efficiency Benefit Charge would apply to the retail sale of heating oil, propane, and kerosene delivered in Vermont, would be “levied upon and collected monthly from the seller,” and would be administered by the Commissioner of Taxes.³⁵ Unlike the fuel tax, which is deposited in the Home Weatherization Assistance Fund intended for low-income Vermonters, the Thermal Efficiency Benefit Charge would be deposited elsewhere—for example, to support and grow the existing thermal-efficiency and process-fuels efficiency programs for all income levels, with priority for programs that benefit low- and moderate-income Vermonters.

The amount of the Thermal Efficiency Benefit Charge could be set in statute or, like the electric and natural gas energy efficiency charges, could be administratively set by a State agency based on a set of statutory goals and criteria. While we do not recommend

³⁴ With respect to biodiesel blended heating oil, we recommend that the charge be assessed only on the petroleum fuel portion. For instance, if a gallon of fuel oil is assessed a charge of \$0.098, a B-20 BioHeat Blend (20% biodiesel, 80% fuel oil) would be assessed a charge of \$0.0784 (\$0.098 X 80%).

³⁵ 33 V.S.A. § 2503

a specific value for the Thermal Efficiency Benefit Charge, we provide the following table of potential annual revenue for such a charge.³⁶

TEBC Level	Range of Potential Annual Revenue		
\$.02 per gallon	\$4,020,000	–	\$4,544,000
\$.04 per gallon	\$8,039,000	–	\$9,087,000
\$.06 per gallon	\$12,059,000	–	\$13,631,000
\$.08 per gallon	\$16,079,000	–	\$18,174,000

For a sense of scale, Efficiency Vermont estimated it would need an average of approximately \$18 million per year over 15 years for an aggressive weatherization campaign to help the State achieve its climate goals.³⁷ We recommend gradually increasing the Thermal Efficiency Benefit Charge over time to produce sufficient revenues to achieve Vermont’s policies.

2. Gradually Increase the Fuel Tax

The fuel tax on the retail sale of heating oil, propane, kerosene, and other dyed diesel fuel delivered in Vermont, along with the gross receipts tax on the retail sale of natural gas, coal, and electricity, raises funds to support the low-income Weatherization Assistance Program. These funds support enhanced weatherization assistance to eligible customers, with priority given to those customers or building units with the highest energy usage. In Fiscal Year 2019, the Weatherization Assistance Program weatherized 767 households at an average program investment per household of \$9,689. This activity is expected to save more than 190,000 gallons of fuel oil for these customers in the first year, and to prevent 1,886

Recommendation 3

Gradually increase the fuel tax to benefit more low-income Vermonters.

³⁶ These projections are approximate and intended to give only a general range of potential revenue. Revenue will vary from year to year based on weather and economic conditions. Data sources for underlying sales volumes: Vermont Department of Taxes, U.S. Energy Information Agency.

³⁷ Efficiency Vermont Comments, August 21, 2020 at 6-7.

tons of carbon dioxide from entering the atmosphere. Projected revenues for Fiscal Year 2020 were \$11,794,767.³⁸ Under current law, this tax will end after June 30, 2024.³⁹

The fuel tax is set in statute and has not been adjusted since 2016. In 2016, the fuel tax on heating oil, propane, kerosene, and other dyed diesel fuel, in place since 1990, was converted from a tax based on a fuel company's gross receipts (and thus volatile, changing with the price of delivered fuel) to a tax based on the volume of fuel sales.

The current fuel tax rate is 2 cents per gallon on the sale of fuel oil, kerosene, propane, and other dyed diesel fuel. In addition, a 0.75% gross receipts tax is applied to the retail sale of natural gas and coal, and a 0.5% gross receipts tax is applied to the retail sale of electricity. All these funds are directed at low-income customers, with most spent to support the low-income Weatherization Assistance Program Trust Fund. Some of these funds have also been allocated to LIHEAP.

The Commission recommends that lawmakers increase the fuel tax on the sale of fuel oil, kerosene, propane, and other dyed diesel fuel, from the current 2 cents per gallon to 4 cents per gallon, and in 2023, increase the fuel tax to 6 cents per gallon. We provide the following table of potential annual revenue for such an increase.⁴⁰

Fuel Tax Level		Range of Potential Annual Revenue	
\$.04 per gallon	\$8,936,000	–	\$10,043,000
\$.06 per gallon	\$13,404,000	–	\$15,064,000
\$.08 per gallon	\$17,872,000	–	\$20,085,000

After the 2023 increase, it would be appropriate to re-examine the fuel tax rate. Incremental revenues should be used solely by the Vermont Office of Economic Opportunity to fund the weatherization agencies for the purpose of low-income

³⁸ Performance Indicators for the Vermont Weatherization Assistance Program, Report to the Vermont Legislature submitted by Ken Schatz, Commissioner of Vermont Department for Children and Families, January 31, 2020.

³⁹ Section 2503(d) of Title 33 states: “No tax under this section shall be imposed for any month ending after June 30, 2024.” The Commission understands that the fuel tax has always had a sunset date, which has always been extended. Lawmakers may consider eliminating the statutory sunset date, or at least setting it further away to signal to market participants that this is a steady, predictable program.

⁴⁰ These projections are approximate and intended to give only a general range of potential revenue. Revenue will vary from year to year based on weather and economic conditions. Although we are not recommending an increase to 8 cents per gallon, we have included information here for reference. Data source for underlying sales volumes: Vermont Department of Taxes.

weatherization, thermal efficiency, and fuel switching to renewable fuels, with controls to prevent the redirection of funding to other purposes.

The Commission does not recommend increasing the gross receipts tax on natural gas and electricity. The low-income Weatherization Assistance Program relies on the revenues currently derived from these regulated fuels, so as a matter of public policy in support of this important program it is reasonable for natural gas and electricity to continue to be subject to this tax. However, increasing the gross receipts tax on electricity and natural gas would not send efficient price signals to electric and natural gas customers and would be counterproductive to Vermont's efforts to persuade more Vermonters to heat with renewable energy.

Any changes to the fuel tax on delivered fuels must be carefully considered so as not to jeopardize what is now a primary funding source to help low-income Vermonters weatherize their homes. For example, statutory mechanisms could be put in place that would prevent the reduction or redirection of fuel tax receipts to other public purposes.

The fuel tax collection mechanism has the benefit of being in place and successfully used for many years to fund the low-income Weatherization Trust Fund. Thus, the process of changing the fuel-tax rate would be incremental and easily understood and implementable. Low-income weatherization agencies have waiting lists of hundreds of Vermonters who are ready to participate in the Weatherization Assistance Program. We recommend that the Legislature take action to invest further in this weatherization effort. As discussed in the subsection that immediately follows, this investment will produce Vermont jobs, save Vermonters money, and lead to better public health outcomes.

3. Weatherization Is Good for the Economy

Several studies highlight the positive financial and economic effects on Vermonters when public funds are directed to thermal-fuels efficiency. This year, the Vermont Department of Public Service worked with the Vermont Agency of Commerce and Community Development (ACCD) to model the economic impact of weatherization. The economic impact modeling suggests that over the 2020-2030 period, sustained annual investments of \$18.8 million in low-income and market-rate weatherization programs would increase personal income in the state by \$27-\$39 million per year, would increase State gross domestic product by \$20-21 million per year, and would employ 390 to 440 people during those years.

Economic impact modeling suggests that sustained investments in weatherization programs would increase personal income and State gross domestic product, and would employ hundreds of people.

Weatherization programs have two direct impacts on the economy. First, investments cause an increase in economic activity in the construction sector. Second, investments result in a reduction in fuel consumption by building occupants, who spend their savings in other areas of the economy. These direct economic impacts also create indirect impacts on the economy. The Department of Public Service and ACCD modeling results clearly indicate that investments in weatherization have a positive economic impact.

Not included in the Department of Public Service and ACCD modeling are non-energy benefits, such as improved housing conditions that produce beneficial health results for occupants. We know that these beneficial health impacts are substantial. In 2018, the Vermont Department of Health reported on the economic benefits of low-income weatherization when viewed through a health lens. In addition to the energy savings, that report estimated substantial household-health and public-health economic benefits from reduced asthma, thermal stress, and fine particulate emissions. At an average weatherization cost of \$8,500 per unit, the Department of Health calculated a 10-year return on investment ratio of at least 2.9, with benefits exceeding costs by year four.⁴¹

With respect to impacts on individual Vermonters, data from Efficiency Vermont also demonstrate that cost-effective investments in weatherization are beneficial to

⁴¹ Weatherization + Health, Health and Climate Change Co-Benefits of Home Weatherization in Vermont, Vermont Department of Health, December 2018.

individual participants. In Efficiency Vermont's Home Performance with Energy Star program, the average project has a total cost of approximately \$8,000. Of that, approximately \$6,200 is paid by the customer, with the balance paid in incentives. Efficiency Vermont estimates that the average project will yield approximately 13 MMBtu in fuel savings and \$13,000 in customer savings. For those Vermonters who participate, the long-term savings clearly improve their financial well-being.

These findings are consistent with the conclusions reached in previous economic impact analyses. In 2011, the Department of Public Service reported that for every \$1 million of public funds spent on thermal efficiency programs, a net of 16 job-years was created through increased demand for efficiency retrofits (and the associated demand for labor). The Department also noted the indirect economic effects created by increased disposable income for program participants—largely spent within the Vermont economy. Overall, net-present-value benefits of \$1.6 million were put back into the State's economy over the lifetime of the thermal efficiency measures.⁴²

The Department of Public Service noted that this finding is consistent with the Regulatory Assistance Project's report "Affordable Heat: Whole-Building Efficiency Services for Vermont Families and Businesses," which found that the net present value of benefits for every public dollar of thermal efficiency investment brought back \$1.55.⁴³ The Department's 2013 Thermal Efficiency Task Force report noted that "the energy efficiency and renewable energy program recommendations presented in this report will yield significant economic benefits: over \$1.4 billion. The direct benefit-to-cost ratio from the recommended thermal energy programs (based on private and public costs) is 2.05 to 1, and \$6.18 in overall benefits is provided for every dollar in public investment."⁴⁴

4. Protecting Vulnerable LIHEAP Participants from Increased Costs

It is important to protect the most vulnerable Vermonters from paying more to heat their homes. Currently, the LIHEAP program provides heating-fuel bill assistance directly to enrolled Vermont households.⁴⁵ This assistance is a lump-sum payment to

⁴² 2011 Comprehensive Energy Plan, Volume 2, Page 160.

⁴³ 2011 Comprehensive Energy Plan, Volume 2, Page 160-161.

⁴⁴ Thermal Efficiency Task Force Report, January 2013, page 8.

⁴⁵ In FY19, Vermont's LIHEAP program served 28,912 households.

[https://liheappm.acf.hhs.gov/sites/default/files/private/congress/profiles/2019/FY 2019 VT Profile.pdf](https://liheappm.acf.hhs.gov/sites/default/files/private/congress/profiles/2019/FY%2019%20VT%20Profile.pdf)

offset a portion of the cost of heating-fuel. Federal LIHEAP guidelines allow states to provide those benefits to households whose income is between 110% and 150% of the Federal Poverty Guidelines, or up to 60% of the state's median income adjusted for family size, whichever is greater. Vermont has increased the eligibility ceiling to 185% of the Federal Poverty Guidelines.

LIHEAP is mostly funded through federal LIHEAP block grants, and partially through state-allocated funding to allow the higher eligibility ceiling.⁴⁶ Adding a Thermal Efficiency Benefit Charge and raising the fuel tax on oil, propane, kerosene, and other dyed diesel would increase a customer's heating-fuel bill. However, the total impact on a household's annual heating-fuel bill should not be overestimated. An extra few cents per gallon will be small when compared to typical factors that influence the portion of the annual heating-fuel bill covered by the LIHEAP benefit, such as enrollment levels, the availability of federal funding, and fluctuations in overall fuel cost. Furthermore, as more Vermonters participate in weatherization and thermal efficiency programs, their fuel usage will go down, as will their draw on the LIHEAP program.

To mitigate the potential for low-income Vermonters to end up paying more for their heating fuel, we recommend that lawmakers consider options to make low-income Vermonters whole. For example, a tax rebate could be issued to participants in the LIHEAP program in the amount of the increased fuel cost that a LIHEAP participant would experience as a result of adding a Thermal Efficiency Benefit Charge and raising the fuel tax.⁴⁷ Under this example, if the increased fuel tax and new Thermal Efficiency Benefit Charge together added \$30 to a Vermonter's annual fuel bill, LIHEAP participants would be sent a \$30 rebate. The rebate would avoid regressive impacts on low-income Vermonters.

5. Prioritize Measures for Low- and Moderate-Income Vermonters

The Commission strongly recommends that funds raised by the new Thermal Efficiency Benefit Charge prioritize weatherization, thermal efficiency, and fuel-switching programs for low- and moderate-income Vermonters. The most urgent need for relief, as well as the greatest opportunities for health and safety benefits, is for low- and moderate-income families. The Commission recommends that all new funding from

⁴⁶ Report of the Analysis of Administrative Costs Associated with Seasonal and Crisis Fuel and Weatherization Programs, prepared by the Vermont Joint Fiscal Office, 12/15/16, at 8-9.

⁴⁷ This rebate could be funded by a portion of the Thermal Efficiency Benefit Charge. Once funding from the Thermal Efficiency Benefit Charge is available, the tax rebate could be administered prospectively.

the increased fuel tax be directed to the low-income Weatherization Assistance Program, which can increase the size of grants made to the weatherization agencies.

In 2020, Efficiency Vermont demonstrated that even in a pandemic economy, there is very strong consumer demand for thermal efficiency and weatherization services. As funding ramps up over time and as the market evolves, other sectors and income brackets can be added to the portfolio of programs offered.

6. Act Quickly and Responsibly

The Commission recommends that the additional funding from the new Thermal Efficiency Benefit Charge and the increased fuel tax be authorized and implemented this year, or as soon as possible after the economy recovers from the COVID-19 pandemic. The pandemic has caused hardship for many Vermonters with unemployment, hunger, and household financial pressures at historic highs. As discussed above, raising funds for weatherization, thermal efficiency, and fuel-switching programs prioritized for low- and moderate-income Vermonters will have an immediate, positive impact on the Vermont economy, household budgets, and health conditions in participating homes. The moderate increase in the fuel tax proposed here (from 2 to 4 cents) and the addition of the Thermal Efficiency Benefit Charge together would be less than typical seasonal and annual variations in the underlying price of fuel.

Low-income weatherization agencies and other service providers are poised to take advantage of incremental new funds; however, recruiting and training an adequate workforce will require a steady, slow ramp-up in funding. Overnight, temporary cash injections to the weatherization program do not allow adequate time to develop the necessary workforce, nor do they create a steady market that contractors can rely on when making business decisions—for example, to hire and train additional staff and invest in weatherization equipment. In a memorandum to the House Committee on Energy and Technology, the Vermont Department for Children and Families Office of Economic Opportunity recommended that any ramp-up in spending occur over three years and persist for at least five years.⁴⁸

To the extent that an immediate doubling of the fuel tax from 2 cents to 4 cents, as we recommend, could be anticipated to result in short-term excess revenues that the weatherization agencies could not immediately use, lawmakers could consider

⁴⁸ Memorandum to House Committee on Energy and Technology, from Sarah Phillips, Director, Department for Children and Families Office of Economic Opportunity, 2/26/19 at 2.

applying those initial revenues to fund prospective rebates for LIHEAP participants. This could provide the dual benefits of providing extra time for the weatherization agencies and subcontractors to hire and train staff and providing short-term financial relief to Vermonters. A collection mechanism exists, and government regulators and program administrators are poised and ready to implement this recommendation.

III. Creation of an All-fuels Efficiency Program

A. Appropriate Entities for Service Delivery

The robust and well-coordinated ecosystem of program administrators and market actors in Vermont is well situated to continue providing services to Vermonters. Adding an all-fuels efficiency entity, program, or redundant regulation would complicate the delivery of effective programs to reduce greenhouse gas pollution.

We recommend supporting the existing efficiency infrastructure. A robust and resilient ecosystem of market actors currently deliver a variety of services that help meet the greenhouse gas emission reduction goals articulated in statute. This ecosystem has developed over time to reach Vermonters through organizations they trust. There are strong relationships among these organizations so that efficiency programs are well coordinated.⁴⁹ Coordination is already happening among electric companies, efficiency utilities, car dealers, weatherization agencies, contractors, and retailers across the state. This is important for customers who are thinking about a specific product, service, or project that is important to them and seek out organizations that specialize in that particular product or service.

Recommendation

Support the existing ecosystem of service providers, rather than appoint a new all-fuels efficiency entity.

⁴⁹ As the Cost-Benefit Accounting section of Appendix A illustrates, the existing programs are also guided by cost-effectiveness accounting and least-cost integrated planning to ensure that the funds invested in Vermont's energy policy and programs remain tethered to the relevant statutory objectives and criteria.

For example, the electric utilities offer incentives for fuel switching through their Tier III programs. The efficiency utilities also offer incentives for fuel-switching measures. The electric utilities and efficiency utilities have regular meetings to coordinate programs and services. These regular meetings have expanded to provide coordination and information sharing across a wide range of programs and offerings, including flexible load

management, weatherization, and seamless customer service. When the incentives from an electric utility can be combined with incentives from Efficiency Vermont, customer service representatives in both companies are cross-trained to walk customers through the process. Whether customers feel more comfortable contacting Efficiency Vermont or their electric company, they will receive the total possible incentive amount.

The Department of Public Service has developed a statewide information clearinghouse for thermal-energy and process-fuels efficiency services. The website, Vermont Energy Saver, was created in response to legislation requiring the establishment of a clearinghouse “to enable effective access for customers . . . and effective coordination across programs.”⁵⁰ Through the website, Vermonters can learn ways to more efficiently heat and cool their homes and businesses, can review the many available programs, incentives, and financing options, and can navigate directly to the websites of program administrators and other energy information resources. The Vermont Energy Saver website provides objective, reliable information that can be updated regularly as programs and markets evolve.

Another example of excellent coordination occurs in the promotion of electric vehicles. Car dealers have strong existing relationships with local utilities and can apply utility

and State purchase incentives up-front, at the point of sale, to lower the purchase price of electric vehicles. These relationships have taken several years to develop. Now they are working well, and Vermonters are seeing the positive impact of the various electric vehicle incentives

Example of Coordination

Regular meetings between efficiency utilities and electric utilities to coordinate delivery of Tier III and efficiency incentives

Example of Coordination

Electric utilities coordinate with car dealerships to apply Tier III incentives up-front at the time of purchase.

⁵⁰ Public Act No. 89, § 2 (2013 Vt., Bien. Sess.). <https://energysaver.vermont.gov/>

working together, delivered at the most impactful point: the dealership.

Act 151 authorizes an efficiency utility, following Commission approval, to spend a portion of its electric resource acquisition budget on programs, measures, and services that reduce greenhouse gas emissions in the thermal energy or transportation sector. For example, one such program might allow an energy efficiency utility to use some electric energy efficiency charge funding to develop upstream education programs to train sales teams at dealerships about electric vehicles. The Commission supports this type of activity and recommends that it be funded not with electric revenue, but with revenue from the Transportation Climate Initiative or other sources of transportation money in the future.

Drive Electric Vermont is another example of a well-coordinated transportation electrification effort. It is a statewide public-private partnership of policy makers, industry leaders, and ordinary citizens focusing on electric vehicle education, charging infrastructure, electric vehicle incentive programs, and the coordination of stakeholders. Its partners include Vermont Energy Investment Corporation and a broad cross-section of State agencies, utilities, and non-profit advocacy groups.⁵¹

A review of some of the current network of efficiency providers demonstrates the effectiveness of specialized and targeted expertise across the broad landscape of programs and applications. Weatherization programs are best delivered by weatherization agencies and “efficiency excellence” network contractors, who have a unique awareness of both building science and social issues. Up-front incentives for electric vehicles are most effective when delivered at the point of sale by vehicle dealers. Electric and natural gas efficiency measures are being effectively delivered by the energy efficiency utilities. These diverse programs all require specialized knowledge and unique objectives and as such may not fit well under the umbrella of one all-fuels entity or program.

The robust ecosystem of program administrators and market actors in the efficiency, weatherization, and transportation spaces is necessary to the success of these programs. Creating an overarching entity to coordinate the delivery of these services is unnecessary and may even stifle the development of effective, innovative programs by creating additional, unnecessary layers of bureaucracy. Reorganizing or implementing a new efficiency program or regulation risks undoing years of work that have gone into developing tighter and more efficient coordination among the current actors and

⁵¹ See <https://www.driveelectricvt.com/about-us>.

marketplace participants.⁵² Each entity in this ecosystem has a unique role and its own market segment. Fully funding the range of services that Vermonters need is the most pressing concern.

Therefore, the Commission does not recommend the creation of a single all-fuels energy efficiency program or regulation. It recommends full, sustainable, and economically efficient funding for fuel switching, weatherization, and energy efficiency services to be administered under existing programs and regulations. However, if the Legislature chooses to create an all-fuels energy efficiency program, the Commission recommends that the program be administered under existing programs and regulations with appropriate public oversight by the Commission and the Department of Public Service to ensure that public utility programs continue to benefit public utility customers.

Example of Coordination

The Public Utility Commission and the Department of Public Service oversee the delivery of both efficiency and Tier III programs, ensuring a comprehensive view.

B. Comments from Stakeholders on an All-Fuels Efficiency Program

In response to the question of whether a single entity is necessary or appropriate to deliver or coordinate all-fuels efficiency services, most stakeholders opposed creating a single entity. They agreed that the diverse and robust ecosystem of providers is the reason that Vermont has had success in this area, and that funding is the primary barrier to scaling that success to meet our clean energy goals.

Many stakeholders urged that Vermont first determine how to secure additional funding before considering the contours or character of an all-fuels program.⁵³ With the exception of one group of commenters that filed joint comments,⁵⁴ the stakeholders

⁵² In Appendix A, we detail the programs and services that efficiency utilities may provide. This list illustrates that programs in their infancy two years ago, when Act 62 became law, have learned how to accommodate work that spans multiple state programs. The current participants' work in these areas, for example, risks being undone by efforts to conglomerate efficiency activities.

⁵³ The Building Performance Professionals Association also highlighted the importance of crafting innovative programs through the combined efforts of current market participants and a diverse set of funding mechanisms to facilitate the conversion of Vermont homes away from fossil fuels. Building Performance Professionals Association Phase II Reply Comments (9/11/20) at 2.

⁵⁴ In joint comments, CLF, VPIRG, and VNRC strongly supported creation of an all-fuels efficiency program and were the only participants that urged soliciting proposals from potential new market actors.

recommended maintaining the current division of energy efficiency program administration between the energy efficiency utilities and electric utilities, which are already working collaboratively to provide efficiency services, with additional efforts aimed at improving coordination in the division of labor.⁵⁵

The Department of Public Service recommended that if the Legislature were to move forward with a single all-fuels efficiency entity despite the contrary recommendation in this report, the “single actor” should be a State agency or quasi-governmental entity (a role currently filled by the Commission).⁵⁶ As a principle for the delivery of energy services, the Department further recommended: “Ensure efficient rules and regulations that facilitate efficient coordination across service providers including energy efficiency utilities (“EEUs”) and distribution utilities (“DUs”) while keeping a single entity as the decision-maker to direct the course of service activity and ensure maximum statewide impact.”⁵⁷ The existing regulatory oversight provided by the Commission and the Department of Public Service largely fulfills the role of “directing the course of service activity to ensure maximum statewide impact.”

Aside from the role that State agencies already play in this process, energy efficiency utilities and distribution utilities did not support the appointment of a dedicated all-fuels coordinator.⁵⁸ To the extent that further opportunities for decarbonization arise, the stakeholders advocated for more flexibility to provide additional services and innovative delivery options, not new actors.⁵⁹ If an overall theme emerged from the comments on the creation of an all-fuels program, it is that more funding is needed to achieve something beyond the status quo.

CLF Comments, dated at 3/20/20 at 1 (“There are numerous ways that this can be structured including creation of a new program, adding to existing programs, or authorizing new or existing utilities or other entities to achieve these savings.”).

⁵⁵ Vermont Gas Systems Comments (8/21/20) at 2.

⁵⁶ Department Comments (8/21/20) at 8.

⁵⁷ Case No. 19-2956-INV, Department Comments (11/15/19) at 1-2; Department of Public Service Reply Comments (9/4/20) at 2.

⁵⁸ BED Phase II Reply Comments (9/11/20) at 4 (urging narrow purpose for such coordinator); Vermont Gas Systems Comments (8/21/20) at 2; GMP Comments (12/2/19) at 1-2.

⁵⁹ *See, e.g.*, Efficiency Vermont Comments (8/21/20) at 21; VPSSA Comments (8/21/20) at 4-5. The issue of how to grant entities more flexibility can be addressed, and has started to be addressed, in Commission proceedings like review of the energy efficiency utilities Demand Resources Plans. *See, e.g.*, Efficiency Vermont Comments (8/21/20) at 21 (advancing proposals that have, in part, been addressed in Efficiency Vermont’s Demand Resources Plan).

IV. Conclusion

“Delaying necessary policy action to address the climate crisis risks significant economic damage to Vermont.” (Act No. 153 of 2020, the “Global Warming Solutions Act.”) We acknowledge the recent creation of the Vermont Climate Council, which will consider and analyze the same topics addressed in this report and will adopt a Vermont Climate Action Plan to reduce greenhouse gas emissions. That Plan will then be reflected in rules adopted and implemented by the Agency of Natural Resources on or before December 1, 2022. Funding recommendations for unregulated-fuels efficiency and fuel-switching programs will likely be an important part of that work. The Commission urges lawmakers to adopt the funding recommendations made in this report now, rather than wait for the activities called for in the Global Warming Solutions Act to bear fruit. Acting now will be one step to address the climate crisis and will be one step to mitigate the risk of significant economic damage to Vermont. Put simply, it will be expensive to remain inefficient.

Specifically, we recommend that lawmakers:

- Engage in ongoing consideration of the benefits of Vermont’s participation in the Transportation Climate Initiative and continued support for Vermont’s existing transportation efficiency and fuel-switching programs.
- Adopt and phase in a Thermal Efficiency Benefit Charge on heating oil, propane, and kerosene delivered in Vermont to support additional thermal efficiency, heating fuel switching, and weatherization programs, with priority given to programs serving low- and moderate-income Vermonters.
- Phase in an increase to the existing fuel tax on heating oil, propane, kerosene, and other dyed diesel fuel delivered in Vermont to support additional low-income weatherization.

These investments will result in economic and public health benefits to Vermont and will put the State on track to achieving its environmental and building energy goals.

Appendix A – Other Considerations

Act 62 also directs the Commission to consider the use of cost-benefit accounting, Thermal Renewable Energy Certificates, and a list of technologies, services, and strategies within the context of its overarching questions about an all-fuels efficiency program. We address these additional considerations here. Our recommendations in the Report focus on funding because that is the primary impediment to achieving the State’s energy and greenhouse gas emissions reduction goals. Funding must be the principal concern.

Cost-benefit Accounting

Section 2(a)(1)(C) of Act 62 directs the Commission to consider how to: (i) develop and utilize a full cost-benefit, full life-cycle accounting method for analyzing energy policy and programs; and (ii) employ metrics that assess positive and negative externalities including health impacts on individuals and the public.

Vermont has a long history of implementing energy policy and programs guided by statutory objectives and criteria that place an emphasis on cost-effectiveness accounting and least-cost integrated planning.⁶⁰

For more than two decades, Vermont electric and thermal efficiency programs have successfully used cost-benefit, full life-cycle accounting. This accounting includes comprehensive performance goals and cost-benefit screening tools that are regularly updated and vetted through a stakeholder process. As discussed in further detail below, this approach is used by the Energy Efficiency Utility (“EEU”) programs and Renewable Energy Standard (“RES”) Tier III programs.

Under the EEU electric and thermal efficiency programs, every three years, the Commission establishes performance and savings goals based on “all reasonably available, cost-effective energy efficiency.”⁶¹ The performance goals include MWh savings, MMBtu savings, total resource benefits, and greenhouse gas reductions. The programs also include minimum performance requirements that help ensure appropriate stewardship of ratepayer funds and participation across customer sectors (including low-income customers) and geographic locations.

⁶⁰ See 30 V.S.A. §§ 202(a), 218c, and 209(d).

⁶¹ 30 V.S.A § 209(d)(3)(B).

To meet established EEU performance goals, energy-efficiency programs and measures are screened based on Vermont's societal cost-effectiveness test. This test compares the societal benefits and costs associated with an energy efficiency program or measure over its lifetime. If an energy efficiency investment's benefits are greater than its costs, it can be said to be "societally" cost-effective. The Department of Public Service has developed cost-effectiveness screening tools that employ the use of the societal cost test. The Commission requires EEUs to use this screening tool to determine that the programs and measures implemented are cost-effective.

Benefits under the societal cost test include resource impacts associated with the reduction in the use of electricity, fuel, and water. Benefits also include externalities such as non-energy benefits and the reduction of environmental externalities (e.g., the avoidance or minimization of air and water pollution and greenhouse gas emissions). The screening tools include a non-energy benefits adder (currently 15%) to account for non-quantified externalities such as comfort and health. The screening tools also include a low-income adder (currently 15%) to encourage participation by low-income customers and to account for indirect benefits such as improved quality of life.

The components used in the screening of efficiency programs are reviewed by the Commission every two years. The Commission conducts a review process with stakeholders to update the avoided costs, benefits, externality adjustments, and other components used in the cost-effectiveness screening tools. This process allows the consideration of new methodologies and improved accuracy in cost-benefit accounting. The process also allows the cost-benefit accounting to reflect any changes in goals and scope of efficiency programs. Updates can include consideration of accounting methods used by other jurisdictions. For example, the United States Environmental Protection Agency has released tools and methodologies to calculate regional estimates of the monetary health benefits per kWh for general and peak energy efficiency strategies.⁶² It may be appropriate for this EPA metric, or something similar, to be added as an externality component in Vermont's screening tools. Such a metric would more accurately account for health impacts than approximating health impacts as part of the non-energy benefit adder. The Commission plans to consider this during the current biennial review of the non-energy benefit adder.

The EEU program developed a Technical Reference Manual that serves as documentation for inputs to the cost-effectiveness screening tools. The manual

⁶² <https://www.epa.gov/statelocalenergy/estimating-health-benefits-kilowatt-hour-energy-efficiency-and-renewable-energy>

provides technical descriptions of all prescriptive and some custom energy-efficiency measures. Updated annually based on work by the Technical Advisory Group, the Technical Reference Manual is maintained by Efficiency Vermont. The Technical Advisory Group, which stewards the Technical Reference Manual, includes members of Efficiency Vermont, Vermont Gas, Burlington Electric Department, other electric distribution utilities, and the Department of Public Service. The Group reviews and approves the methodology and associated assumptions underlying measure-savings calculations included in the Technical Reference Manual.

Vermont Statute and Commission Rules require the cost-effectiveness screening of energy transformation projects implemented by the distribution utilities to meet their RES Tier III requirements.⁶³ When offering the same measures as EEU's, the distribution utilities assess the eligibility of an energy transformation project using the statewide cost-effectiveness screening tools and the Technical Reference Manual. For other projects, over the energy transformation project's life, the project is required to result in a net reduction in fossil fuel consumed and a reduction in the emission of greenhouse gases. An energy transformation project is required to meet the need for its goods or services at the lowest present-value life-cycle cost, including environmental and economic costs. This evaluation includes an analysis of alternatives that do not increase electric consumption.

Some of the cost-benefit accounting employed by the distribution utilities, under RES Tier III, can or are already being applied to the transportation sector (e.g., electric vehicle programs). In addition, there are several transportation-based tools for estimating the health benefits associated with strategies that affect physical activity, air quality, safety, and other transportation-related health impacts. For example, the Vermont Health Department has employed the use of the Integrated Transport and Health Impact Model, which estimates and monetizes health impacts associated with transportation system changes. The Health Department applied this tool to estimate that 2,000 early deaths could be prevented and \$1.1 billion saved in health care costs and lost productivity by 2050 if Vermont were able to meet the transportation energy goals identified in the Comprehensive Energy Plan.⁶⁴ These goals include doubling rates of walking, biking, and bus use by 2030, increasing carpooling, and electrifying 80% of passenger vehicles by 2050. This tool, or similar tools, in combination with

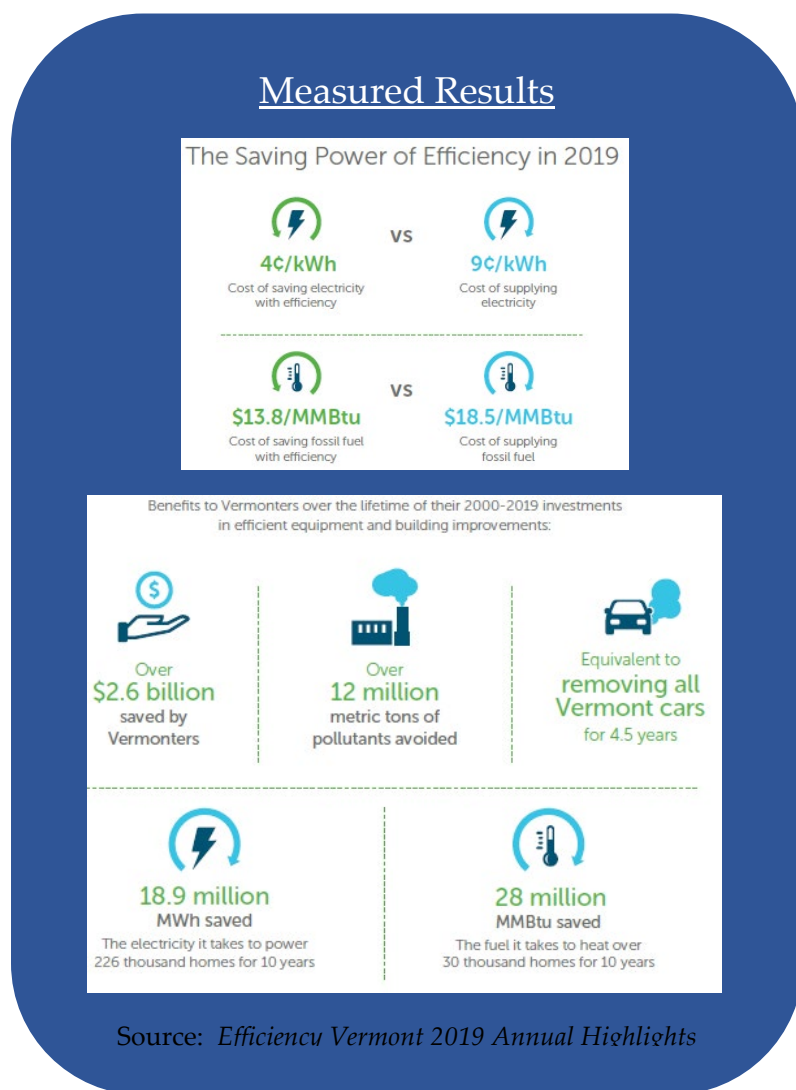
⁶³ See 30 V.S.A. §§ 8005(a)(3)(C) and 8005(a)(3)(F)(iii) and Commission Rule 4.410.

⁶⁴ <https://www.healthvermont.gov/environment/climate/take-action>

adaption of the societal cost-effectiveness test, could potentially be used to do a cost-benefit analysis of specific transportation strategies.

In sum, electric and thermal efficiency programs currently use a full cost-benefit, full-

life-cycle accounting method that employs metrics to assess positive and negative externalities, including health impacts on individuals and the public. Vermont has successfully used cost-benefit accounting for decades. Goals and screening values are updated on a regular basis through a robust stakeholder process. The accounting process includes comprehensive cost-benefit screening tools and Technical Advisory Group analysis to facilitate the most up-to-date accounting methods. This cost-benefit accounting produces programs with meaningful and measurable results. We recommend that these systems remain in place and serve as examples for any



new or expanded decarbonization programs.

Thermal Renewable Energy Certificates

Act 62 directs the Commission to consider whether Thermal Renewable Energy Certificates (“T-RECs”) can be used to value thermal load reduction investments, to create a revenue stream to support thermal load reduction work, and to evaluate the

role of such work within the overall suite of energy programs designed to reduce greenhouse gas emissions and generate savings for Vermonters.

A T-REC, like other renewable energy certificates, documents the legal ownership of attributes associated with thermal renewable energy. Typically, T-RECs are associated with a Thermal Renewable Energy Standard, which could be a thermal energy carve-out within a state's renewable energy standard. For example, in New Hampshire, T-RECs have supported local economies by generating funding streams for local renewable thermal projects, including advanced wood heating systems, solar water heaters, and geothermal heating systems.⁶⁵

Efficiency Vermont noted that a framework for implementing T-RECs in Vermont would be redundant to the existing Renewable Energy Standard — where many T-REC-eligible projects may already be used for compliance with Tier III—and also to Vermont's modern wood heat initiatives that today may be funded through Efficiency Vermont's TEPF budget. Further, if the point of regulation for T-RECs were to be put on Vermont's utilities, electric utility ratepayers would bear the costs, representing an economically inefficient policy that would discourage the use of Vermont's clean electricity.⁶⁶

Participants in the Commission's investigation did not support creating a regulatory structure or mechanism that would use T-RECs. Participants questioned the cost-effectiveness of devising, implementing, and administering a T-REC structure. As Burlington Electric Department noted, contractors seeking to monetize the value of their work installing heat pumps and other eligible Tier III programs can partner directly with Vermont's electric utilities and their customers to take advantage of incentives aimed at valuing the fossil-fuel and emissions reductions.⁶⁷

Because of Vermont's existing suite of programs aimed at reducing greenhouse gas emissions and increasing the savings to Vermonters, we do not perceive a need to adopt policies that would use T-RECs.

⁶⁵ Efficiency Vermont Comments, 8/21/20 at 12.

⁶⁶ Efficiency Vermont Comments, 8/21/20 at 13.

⁶⁷ Burlington Electric Department Comments, 3/20/20 at 13.

Expansion of Programs and Services That Efficiency Utilities May Provide

Act 62 requires that the Commission consider whether efficiency programs and services should include the following list of technologies, services, and strategies:

- (A) demand response;
- (B) flexible load management;
- (C) energy storage;
- (D) reduction of fossil fuel use through electrification and the use of renewable fuels and energy; and
- (E) building shell improvement and weatherization.

The Commission does not recommend any statutory changes that would codify the listed technologies as efficiency programs or services, whether provided by an efficiency utility, electric utility, or new entity.

Which entities should deploy new technologies?

Utilities, third-party energy companies, and customers are the appropriate entities to deploy and coordinate the integration of these new technologies with grid operation.

Demand response, flexible loads, energy storage, and beneficial electrification measures, such as electric vehicles, offer a wide range of potential values to the grid. We collectively refer to these resources as Distributed Energy Resources, or DERs.

Using two-way, automated communication, these technologies coordinate load with the needs of the grid. DER loads can be shifted away from costly peak energy and capacity times, reduce the need for costly grid infrastructure upgrades, provide back-up power, regulate electric frequency, and integrate renewable generation. When all these savings and values are added together, many DER resources are cost competitive today. Electric utilities are the gateways that can unlock the value of these resources and provide access to customers and third-party entities to develop DERs.

Electric utilities maintain system control rooms, predict load, monitor wholesale markets, and make power supply decisions. Electric utilities, not efficiency entities, have the fundamental tools and information needed to effectively coordinate and deploy demand response, flexible load management, energy storage, and beneficial electrification.

Third-party energy companies are likely to play a significant role in developing and deploying these technologies. As such, Vermont should foster an environment in which

these companies can gain fair and equal access to the value provided by flexible load management, demand response, and energy storage. The electric utilities could provide pathways for interoperability and integration of these new resources with the day-to-day operation of the grid.

Electric utilities may also play an important role in deploying these technologies themselves where markets are nascent or when their intervention is necessary to direct new loads away from costly peak times.

Many DERs are economically viable today when third-party energy companies and consumers can access the full range of value DERs offer to the grid. Those values, as noted above, include energy, capacity, and infrastructure savings; reliable back-up power; frequency regulation; and renewable energy integration. Traditional energy efficiency, weatherization, and electrification in heating and transportation typically require public funding to achieve scale, and are fundamentally different from DERs for that reason. With public funding come program design, administration, oversight, reporting, and evaluation. While the Commission, the Department of Public Service, and the utilities are closely tracking and monitoring the development and deployment of DERs, forcing those technologies into a semi-public entity would stifle development of promising new technologies and new players.

Vermont's regulatory environment should:

- ensure that there are clear, transparent, and equal pathways available to third-party energy companies and customers to offer valuable grid services consistent with the principles of least-cost planning;
- ensure that interconnection and operation of new technologies do not jeopardize the reliability of the grid;
- ensure that deployment of new technologies does not unnecessarily increase power-supply and distribution grid costs for customers.

How to provide access

New, innovative technologies can gain a foothold in the electric system through clear and technology-neutral pathways. A recent order by the Federal Energy Regulatory Commission (FERC) requires that regional grid operators provide meaningful pathways for the participation of DERs in wholesale markets.⁶⁸ States have a significant

⁶⁸ FERC Order 2222.

role to play in harmonizing the wholesale participation of DERs with local distribution-level concerns.

There are several avenues that the electric utilities currently use to ensure that DERs have fair access and cause no harm to the grid and Vermont customers. For example, utilities can use innovative new tariffs that allow third-party participants, comprehensive resource planning, open requests for proposals, and thoughtful interconnection requirements to harness the full value of DERs.

New technologies are not desirable ends in themselves. They bring value when deployed to achieve meaningful goals—for example, carbon reduction, renewable integration, grid stability, and cost management. Programs should target the desired ends, not specific technologies.

Participants in this proceeding note that programs for demand response, flexible load management, energy storage, reduction in fossil-fuel use through electrification and building-shell improvements, and weatherization are currently in place and are working effectively. Participants suggest that the best strategy for achieving the State’s policy targets is to ramp up and further align the existing cooperative efforts by the energy efficiency utilities and distribution utilities. The Commission concurs with this assessment and notes that these efforts occur in context with the performance goals established in the energy efficiency utilities’ Demand Resources Plan proceedings and through the Commission’s review and approval of the electric utilities’ Integrated Resource Plans, innovative pilots, tariff filings, and the implementation of the Renewable Energy Standard Tier III annual plans. The Commission does not recommend additional statutory changes to further these efforts.

Below are descriptions and examples of how the listed technologies are being implemented in Vermont.

Successful programs

The energy sector is rapidly transforming with evolutions in generation, use, load-shifting, and demand response. For example, customers are increasingly pairing their solar generation facilities with storage to flatten loads. Appliances and two-way communication to utility operating rooms allow grid operators to dial demand up and down to match production. Electric vehicle charging and other beneficial electrification technologies can be dynamically controlled to avoid costly peak times or even provide electricity back to the grid. Providing these technologies ample space to evolve and participate in grid services will allow innovation to flourish.

As this energy transformation continues, it remains important to focus on the ends we are trying to achieve (e.g., carbon reduction, renewable integration, or cost-containment) rather than privilege one technology over the other.

Load control

Demand response and flexible load management are generally ways that utilities influence customer demand to coordinate it with grid concerns like the availability of renewable energy or regional peak times. The behavioral changes can be voluntary, established by contract, and incentivized with price signals from the utility. Many Vermont customers can take advantage of time-based rates, including time-of-use pricing, critical peak pricing, or variable peak pricing. Many can access direct load-control programs whereby a utility can cycle appliances or vehicles on and off during periods of demand in exchange for a financial incentive and lower electric bills.⁶⁹

Demand response and demand management can be further enabled by Advanced Metering Infrastructure (or smart meter) investments made by utilities. The utilities, their customers, or third parties can actively manage customer demand across residential, commercial, and industrial sectors by using Advanced Metering Infrastructure in conjunction with data analytics and other emerging control and communications platforms. Advanced Metering Infrastructure information allows for two-way communication between the customer and the utility.

Burlington Electric Department's (BED) packetized energy-management pilot program is an example of an active demand management and response strategy. BED's program controls water-heating devices to balance energy supply and demand in real time, while enabling BED to evaluate whether coordinating energy consumption of equipment in people's homes can better balance the supply and demand for electricity.

Washington Electric Cooperative's "Powershift" pilot, jointly implemented with Efficiency Vermont, aims to test the ability of cold-climate heat pumps and water heaters to shift load during peaks and other high-cost times, by using two different control platforms to aggregate and dispatch resources.

⁶⁹ U.S. Office of Electricity, "Demand Response," found at <https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid/demand-response>.

Likewise, Green Mountain Power (GMP) is piloting the use of DERs to control load and manage fluctuating demands in the commercial and industrial sector—for example, through thermal or ice storage or load shifting.

GMP aggregates DERs to reduce demand through pilots that are enabled by its multi-year rate plan, tariffs, RES Tier III programs, and other capital projects. As a management tool, GMP uses several cloud-based, shared-access control platforms to connect to these resources. The resources are then aggregated and dispatched to reduce system peaks.

Flexible Load Management

Flexible load management is a relatively nascent demand-management tool. The term has been adopted by Efficiency Vermont and GMP and is not used anywhere else in the United States.⁷⁰ Flexible load management uses a combination of data analytics, system communication platforms, and control measures to shift customer loads to times of the day when there is a lower cost for electricity. This shift is an active demand-management strategy, in contrast to the more passive demand-management strategies (e.g., time-based rates) that have been employed over the last two decades. Flexible load management can also be contrasted with traditional demand response in that it is now possible for bi-directional communication with commercially available devices such as water heaters and electric vehicle chargers.

Flexible load management is dependent on the Advanced Metering Infrastructure investments made by the distribution utilities. The use of Advanced Metering Infrastructure in conjunction with data analytics, control devices, and communication protocols allows utilities, customers, or third-party contractors to manage customer loads in residential, commercial, and industrial settings. Flexible load-control devices can actively manage load in response to price signals and peak loads, allowing the controlled devices to shift the impact on load to periods when demand is lower, or can be used to synchronize load with variable (or sometimes excessive) renewable energy production. At present, the overall potential of flexible load management is not well understood by the energy efficiency utilities or distribution utilities.

The use of flexible load management may become more important as Vermont advances towards its GHG-reduction goals, including more extensive end-use electrification and the integration of a higher level of renewable energy into Vermont's

⁷⁰ Revised Work Paper for Efficiency Vermont's Support of Flexible Load Management, Case No. 19-3272-PET, 5/13/2020 at 2.

electric supply. In conjunction with Efficiency Vermont, several utilities in Vermont—including GMP, BED, and Washington Electric Company—have implemented pilot programs to test the management of a range of customer devices to control heat pumps, water heaters, electric vehicle chargers, and battery storage systems. Behind-the-meter battery storage devices such as the Tesla Powerwall have also been dispatched when peak demand requires more power. The pilot programs have tested how the implementation of flexible load management devices might benefit ratepayers and the environment.

The 2021-2023 Demand Resources Plan proceeding authorized a flexible load management program for Efficiency Vermont with spending of \$1.15 million in year one and \$3.44 million over the 2021-2023 performance period. The flexible load management program will deliver load-management services to customers in conjunction with Vermont’s distribution utilities to support some combination of cost reduction, operational priorities, and grid efficiency.⁷¹ Efficiency Vermont will leverage its expertise in mid-stream and up-stream support services to deliver flexible load management capability, which is also important to the formulation of resource-supply strategies going forward. The pilot is expected to result in peak savings of 2,600 kW over the 2021-2023 performance period.⁷² Evaluating the post-installation impact of flexible load management measures on customer loads will be an important exercise to guide program evolution. A successful flexible load management program will need to be designed around a distribution utility’s plans to utilize the load flexibility enabled by Efficiency Vermont’s assistance.

Before extending the flexible load management program beyond that authorized in Efficiency Vermont’s Demand Resources Plan, the Department of Public Service and the Commission have both noted the importance of conducting a statewide potential study to understand the extent to which flexible load management might be beneficial across the spectrum of distribution utilities that might choose to use this tool.⁷³ The Commission recommends that adequate resources be available to the Department of Public Service to contract for such a study.

⁷¹ Case No. 19-3272-PET, *Order Approving Efficiency Vermont’s 2021-2023 Demand Resources Plan*, October 22, 2020 at 11.

⁷² *Id.* at 13.

⁷³ Case No. 19-3272-PET, *Order Approving Efficiency Vermont’s 2021-2023 Demand Resources Plan*, October 22, 2020 at 11.

Energy Storage

By shifting less expensive power to serve peak demand, energy storage may reduce electricity costs for all ratepayers; and by flattening the regional demand curve, it may also reduce or delay the need for electricity grid infrastructure investments.⁷⁴

Energy storage involves the management of energy so that it is discharged, either onto the grid or within the customer's end-use medium, at a different time than when that energy was originally absorbed from the grid. There are many ways to store energy (chemically, thermally, mechanically, kinetically, to name a few). Two common types of energy storage are:

- Thermal storage involving the storage of energy in its end-use state, such as heat produced by renewable energy that exceeds grid demand, storage of heat or cold for short-term use, or waste heat from industrial processes; and
- Electric energy that may be stored chemically in the form of electric batteries, such as lithium-ion batteries and vehicle-to-grid electric vehicle batteries.⁷⁵

When paired with the output from net-metered solar, the timed use of stored energy may be used to mitigate the disparity between peak production and peak demand. This is accomplished by absorbing low-cost or renewable power generated during off-peak times and discharging that power during peak demand hours.

Utility funding for energy storage initiatives may be embedded in utility rates and based on whether the service provides a net benefit to Vermont ratepayers as part of a utility's least-cost service. To date, some electric utilities have piloted battery storage projects to understand the potential benefits, costs, and risks of the technology.⁷⁶ Behind-the-meter energy storage, including batteries and thermal technologies, are becoming more available to customers.⁷⁷

Two tariffs filed by GMP—an Energy Storage System tariff (the “ESS Tariff”) and a Bring Your Own Device tariff (the “BYOD Tariff”)—were recently approved by the

⁷⁴ Comments of Clean Energy Group to the Vermont Public Utility Commission, September 16, 2019 at 1.

⁷⁵ Efficiency Vermont Comments in Advance of Second Workshop, October 18, 2019.

⁷⁶ See *Petition of Washington Electric Cooperative Inc.*, Case No. 20-3324-PET, 2020 Integrated Resource Plan at 47,85.

⁷⁷ See *Petition of Lyndonville Electric Light*, Case No. 20-3405-PET, 2019 Integrated Resource Plan at 3, 32; *Petition of Vermont Electric Cooperative*, Case No. 19-3402-PET, 2019 Integrated Resource Plan, Action Plan at 9.

Commission.⁷⁸ Small-scale battery storage in GMP's service territory can reduce peak power costs, better integrate renewable generation, and provide reliable power for homes in which batteries are deployed.

Under the ESS Tariff, customers can lease a battery storage system from GMP. Under the BYOD Tariff, customers receive an upfront incentive upon purchase and installation of a battery storage system through a separate, third-party energy services company in exchange for allowing GMP to access the customer-owned battery system during peak events. Implementation of the ESS and BYOD Tariffs will allow GMP to continue to deploy its own utility-owned batteries and grow the battery storage market while providing an alternative option for customers to work with third-party energy services companies to install customer-owned battery storage systems.

Efficiency Vermont has also used thermal storage to create efficiency savings. For example, the Brattleboro Retreat revitalized an ice storage system to align building and grid efficiency. In collaboration with Efficiency Vermont, Dynamic Organics, and Green Mountain Power, the Retreat cools its buildings on peak capacity days by pumping water through ice blocks that are frozen during times of the day when lower-cost energy is available. Through this collaboration, the Retreat was able to reduce campus demand by more than 115 kilowatts (kW) during peak capacity periods throughout the 2018 summer cooling season, resulting in an estimated annual savings of \$20,000.⁷⁹

Participants in this proceeding recognized that demand response, flexible load management, and energy storage are active demand-management strategies that may affect local and system-level reliability criteria and recommended that they be primarily planned and managed by the distribution utilities in coordination with the energy efficiency utilities. The Commission concurs with this assessment and acknowledges that the distribution utilities should retain primacy over those measures to ensure there are no local or system-level reliability impacts. Additionally, because several distribution utilities are already either considering or implementing energy storage as a component of their Tier III portfolios in coordination with the energy efficiency utilities,

⁷⁸ *Tariff filing of Green Mountain Power Corporation for approval of an Energy Storage System tariff effective on bills rendered on or after September 15, 2019, Case No. 19-3167-TF, and Tariff filing of Green Mountain Power Corporation for approval of a Bring Your Own Device tariff to be effective October 31, 2019, Case No 19-3537-TF, Order of 5/20/20.*

⁷⁹ Efficiency Vermont 2018-2020 Triennial Plan, at 4.

the Commission concludes that no statutory changes are needed to enable further participation by the energy efficiency utilities to promote these efforts.

Although we conclude here that no statutory changes are needed to enable further participation by the energy efficiency utilities, the Commission does support several statutory recommendations related to storage. Those recommendations were laid out in the Department of Public Service’s report “Act 31 Storage Regulation—Final Recommendations,” which was submitted to the Legislature on January 2, 2020, with accompanying proposed legislation.⁸⁰ Those recommendations are important for the Commission to regulate the safe and effective deployment of storage in Vermont. None suggests the involvement of any energy efficiency utility.

Beneficial Electrification and the Use of Renewable Fuels and Energy

More funding is needed to effectively implement beneficial electrification programs for transportation and heating. In the funding section of this report, the Commission recommends ongoing consideration of Vermont’s participation in the Transportation Climate Initiative and continued support for Vermont’s existing transportation efficiency and fuel-switching programs. The Commission also recommends that funds for fuel switching be raised through a Thermal Benefit Efficiency Charge on fossil heating fuels. Together these two funding streams could significantly advance State energy and environmental policy. We do not recommend expansion of efficiency utility programs to include programs for transportation and heating, especially if a new source of public funding is not authorized.⁸¹

Tier III of the Renewable Energy Standard is one avenue that currently promotes fuel switching. Most RES Tier III energy transformation requirements have been met with electrification measures.⁸² The electric utilities have offered upstream or direct

⁸⁰ Available at <https://publicservice.vermont.gov/content/2019-energy-storage-regulatory-recommendations-2017-energy-storage-study>

⁸¹ Act 151 authorizes an EEU, under certain conditions, to spend up to \$2 million of its resource-acquisition budget on programs, measures, and services that reduce greenhouse gas emissions in the thermal energy or transportation sectors. The Commission does not support a further extension of this program because it depends on electric ratepayer funds.

⁸² Tier III of the Renewable Energy Standard requires utilities to procure additional distributed renewable generation eligible for Tier II or to achieve fossil-fuel reductions from energy transformation projects equal to 2% of an electric utility’s retail sales in 2017, increasing by an additional two-thirds of a percent each year thereafter, eventually reaching 12% in 2032. See 30 V.S.A. § 8004 and Rule 4.400, Renewable Energy Standard Rule, effective April 1, 2020. Pursuant to 30 V.S.A. § 8005(a)(3)(B) and adopted in Commission Rule 4.401(b)(3), municipal electric utilities serving not more than 6,000 customers are

incentives as well as technical assistance to promote cold-climate heat pumps, electric vehicles, electric buses, electric vehicle charging stations, battery storage, new electric line extensions to diesel-generator-powered maple syrup producers and lumber mills, and other custom projects that reduce fossil-fuel use. The cost of the Tier III programs is embedded in electric rates that everyone pays.⁸³ Expanding Tier III goals would lead to higher electric rates, which will ultimately hinder Vermont's climate goals. The Commission does not recommend the expansion of Tier III goals.

Most RES Tier III energy transformation requirements have been met with electrification measures. However, it is important to note that weatherization measures are explicitly identified as eligible measures, and some utilities offer incentives for weatherization or electrification occurring in a home that has met certain building criteria.

The following examples are illustrative of the activity in the beneficial electrification of Vermont's transportation sector. Volkswagen's settlement agreement provided Vermont with \$2.84 million in funding to expand its network of electric vehicle charging stations.⁸⁴ A State grant program was established and is administered by the Vermont Department of Housing and Community Development in coordination with the Vermont Department of Environmental Conservation, the Vermont Agency of Transportation, the Department of Public Service, and the Department of Health. The latest round of grant funding focuses on locating a network of fast charging stations in priority locations on highway corridors.⁸⁵

The Agency of Transportation recently released a second round of State incentives totaling \$950,000 for the purchase and lease of electric vehicles. These funds were appropriated by Act 154.⁸⁶ Separate from the new electric vehicle purchase incentives, the State is also supporting a high-efficiency used-vehicle incentive program for lower-income households. These incentives are available through the MileageSmart program administered by Capstone Community Action. The program is available to income-

required to achieve 2% of the annual retail sales as of 2019, increasing by an additional two-thirds of a percent each year until reaching 10 and two-thirds percent in 2032.

⁸³ Department of Public Service Third Set of Comments, Case No. 19-2956-INV, November 15, 2019 at 5.

⁸⁴ See a description of funding and all programs from the Volkswagen settlement at <https://dec.vermont.gov/air-quality/vw>.

⁸⁵ See <https://accd.vermont.gov/community-development/funding-incentives/electric-vehicle-supply-equipment-evse-grant-program>

⁸⁶ See <https://www.driveelectricvt.com/why-go-electric/purchase-incentives>

eligible Vermonters and offers incentives worth 25% of the purchase price, up to \$5,000, on several electric vehicle models.⁸⁷

In addition to the State's rebate programs, many electric utilities currently offer customers incentives for reducing fossil fuel use to help meet the utilities' Tier III obligations. A list of these incentives, including rebates for the purchase or lease of electric vehicles, is available on the Drive Electric Vermont web site.

Furthering the support of transportation electrification efforts, Act 151 authorizes an energy efficiency utility, under certain conditions, to spend up to \$2 million of its resource-acquisition budget on programs, measures, and services that reduce greenhouse gas emissions in the thermal energy or transportation sector. This expenditure is complementary to the electric utilities' Tier III energy transformation projects for the 2021-2023 period.

Although many barriers and actions have been identified with respect to the transformation from internal-combustion vehicles to electric vehicles,⁸⁸ the Commission's Preliminary Report in this proceeding noted that there is a gap in the marketplace for upstream programs that support transportation electrification, including sales training and technical support to make electric vehicles more readily available and accessible in Vermont.⁸⁹ The Preliminary Report also recommended allowing an expansion of the use of electric efficiency charge funds raised from electric vehicle charging equipment to support upstream programs that are complementary to Tier III energy transformation projects. To effectuate this recommendation, the Commission offered language amending 30 V.S.A. § 209(d)(2)(A).⁹⁰ While the activities allowed by Act 151 may have delayed the urgency of this amendment, the Commission continues to support this change. We note that if other large-scale transportation programs or funding opportunities arise, such as the TCI, it may become unnecessary to use electric efficiency charge funds for this purpose.

⁸⁷ *Id.*

⁸⁸ See Promoting the Ownership and Use of Electric Vehicles in the State of Vermont, A Report to the Vermont State Legislature, Vermont Public Utility Commission, June 27, 2019.

⁸⁹ Report to the Vermont State Legislature, Act 62-Preliminary Report on All-Fuels Efficiency ("Preliminary Report"), January 15, 2020 at 50-51.

⁹⁰ *Id.* at 51-52. The proposed language states, "Programs approved by the Commission may support transportation electrification upstream programs that are complementary to distribution utility energy transformation projects under Section 8005 of this title. Funding for upstream transportation electrification programs that is collected via Section 209(d)(3) of this title shall be limited to the actual or estimated electric efficiency charge revenues collected from electric vehicle charging."

In the transportation sector, collaboration between entities is a necessary component of achieving a smooth transition to a decarbonized system. The State and electric utilities have successfully implemented numerous grant and incentive programs for transportation electrification, and it is essential that planning and coordination continue among the various entities involved in these efforts to allow for collaborative strategies and shared objectives.⁹¹ The coordination of transportation electrification efforts will become increasingly important, especially if Vermont eventually participates in the TCI or other substantial funding becomes available.

Turning to beneficial electrification efforts that are not transportation-related (as described in the Preliminary Report), strategies include the replacement of fossil-fuel-based energy uses with technologies such as cold-climate heat pumps and heat-pump water heaters. The energy efficiency utilities and electric utilities continue to promote beneficial electrification technologies through their programs and the use of incentives to promote weatherization efforts, thus attaining State goals while avoiding cross-subsidization between fuels. As suggested in the Preliminary Report, greenhouse gas emission reduction targets have been added to the performance metrics in the energy efficiency utilities' Demand Resources Plans.⁹² The Commission believes that the programs and budgets approved in those Demand Resources Plans—in concert with the distribution utilities' Integrated Resource Plans, tariffs, and Tier III programs reviewed by the Commission—will provide a strong record of success in this area. Accordingly, the Commission concludes that no statutory changes are necessary to encourage this work. Additional funding is necessary for fuel switching, and that funding should come from fossil sources, not electric ratepayers. Programs funded through fossil sources can be effectively administered by existing programs and regulatory regimes.

Building shell improvements and weatherization

In recognizing the increased potential for the equitable scaling of its delivered services, Efficiency Vermont has made commitments in its Demand Resources Plan to coordinate its work with electric utilities and municipalities in delivering weatherization and Tier III projects. Additionally, Efficiency Vermont has adopted a Memorandum of

⁹¹ For example, the energy efficiency utilities, distribution utilities, the Vermont Agency of Transportation, the Vermont Agency of Commerce and Community Development, the Vermont Agency of Natural Resources, the Department of Public Service, the Vermont Public Power Supply Authority, Drive Electric Vermont, and the regional planning commissions.

⁹² Preliminary Report at 55.

Understanding with the Vermont Public Power Supply Authority (VPPSA) to ensure that Efficiency Vermont will provide programs tailored to the member municipal utilities and that its efficiency programs will return a minimum of 47% of the total electric efficiency charge funds raised within those territories each year in the form of combined incentives for electric and thermal programs. Efficiency Vermont and VPPSA also agreed to collaborate on the development of a joint implementation plan for the delivery of programs and services to VPPSA customers.

Vermont Gas's recently approved Demand Resources Plan also reflects its intention to increase the number of homes weatherized and more rapidly reduce its customers' greenhouse gas emissions. Vermont Gas will increase spending on cost-effective efficiency measures without a significant overall energy efficiency charge increase. Vermont Gas's increased investments in energy efficiency and weatherization will be amortized over 15 years to allow the cost-recovery period to match the useful life of the efficiency measures.⁹³ The additional funding will support Vermont Gas's plan to increase its energy efficiency savings and weatherize additional homes to achieve a 30 percent reduction in greenhouse gas emissions by 2030 and to have zero greenhouse gas emissions by 2050.⁹⁴

As this report illustrates, the principal constraint in building-shell improvements and weatherization work is not additional statutory authority granted to the efficiency utilities or other market actors, but rather the lack of sufficient funding for the existing, well-coordinated efforts.

In sum, other than the recommendation related to the support of upstream electric vehicle programs, the Commission does not believe it is necessary for the energy efficiency utilities to incorporate additional technologies and services in order for the State to achieve its greenhouse gas goals. Instead, the Commission supports the continued strategic cooperation between and among the energy efficiency utilities, distribution utilities, weatherization agencies, and other market actors to align their existing programs most effectively and to apply additional legislatively appropriated resources towards energy efficiency and the reduction of greenhouse gas emissions.

⁹³ *Order Approving 2021-2023 Demand Resources Plan for Vermont Gas Systems, Inc.*, Case No. 19-3272-PET, October 22, 2020 at 23-24.

⁹⁴ *Id.* at 28.

Appendix B -- Enacting Language

Section 2 of Act 62 states:

(a) The Public Utility Commission shall open a proceeding, or continue an existing proceeding, to consider the following:

(1) Creation of an all-fuels energy efficiency program. The Commission shall consider whether to recommend that one or more entities should be appointed to provide for the coordinated development, implementation, and monitoring of efficiency, conservation, and related programs and services as to all regulated fuels, unregulated fuels, and fossil fuels as defined in 30 V.S.A. § 209(e)(3). The Commission shall consider all information it deems appropriate and make recommendations as to:

(A) whether the appointment of an all-fuels efficiency entity or entities to deliver the comprehensive and integrated programs and services necessary to establish an all-fuels energy efficiency and conservation program would, while continuing to further the objectives set forth in 30 V.S.A. § 209(d)(3)(B):

(i) accelerate progress toward the State goals set forth in 10 V.S.A. §§ 578, 580, and 581;

(ii) accelerate progress toward the recommendations contained in the State Comprehensive Energy Plan; and

(iii) further the objectives set forth in 30 V.S.A. § 8005(a)(3).

(B) the best model to create an all-fuels energy efficiency program including whether to recommend:

(i) the appointment of one or more new entities; or

(ii) the appointment of one or more entities that are currently providing efficiency and conservation programs pursuant to 30 V.S.A. § 209(d)(2) and distribution utilities that are currently providing programs and services pursuant to 30 V.S.A. § 8005(a)(3).

(C) how to:

(i) develop and utilize a full cost-benefit, full life cycle accounting method for analyzing energy policy and programs; and

(ii) employ metrics that assess positive and negative externalities, including health impacts on individuals and the public.

(2) Expansion of the programs and services that efficiency utilities may provide. The Commission shall consider whether to recommend that efficiency programs and services, whether provided by entities currently providing efficiency and conservation programs pursuant to 30 V.S.A. § 209(d)(2), distribution utilities currently providing programs and services pursuant to 30 V.S.A. § 8005(a)(3), or a new entity or entities recommended pursuant to subdivision (1) of this subsection (a), should incorporate additional technologies, services, and strategies, including:

(A) demand response;

(B) flexible load management;

(C) energy storage;

(D) reduction of fossil fuel use through electrification and the use of renewable fuels and energy; and

(E) building shell improvement and weatherization.

(3) Funding.

(A) The Commission shall consider and recommend how best to provide consistent, adequate, and equitable funding for efficiency, conservation, and related programs and services, including:

(i) how to use existing or new funding sources to better support existing efficiency and conservation programs and services, including those described in Sec. 1 of this act, during the period the Commission is conducting the proceeding pursuant to this subsection;

(ii) how to use existing or new funding sources to provide sufficient funds to implement and support the Commission's recommendations made pursuant to subdivisions (1) and (2) of this subsection (a); and

(iii) whether Thermal Renewable Energy Certificates (T-RECs) can be used to provide for the proper valuation of thermal load reduction investments, to create a revenue stream to support thermal load reduction work, and to evaluate the role of such work within the overall suite of energy programs designed to reduce greenhouse gas (GHG) emissions and generate savings for Vermonters.

(B) In reaching its recommendations pursuant to subdivision (A) of this subdivision (3), the Commission shall consider how any recommendation may affect the financial and economic well-being of Vermonters.

(b) The existing Energy Efficiency Utility Orders of Appointment issued by the Public Utility Commission shall not be altered or revoked in the proceeding pursuant to subsection (a) of this section.

(c) Process. The Commission shall schedule workshops and seek written filings from all interested stakeholders and ensure that all stakeholders have an opportunity to provide input. The Commission may use contested case procedures if it deems appropriate.

(d) Reports. On or before:

(1) January 15, 2020, the Commission shall submit a preliminary report to the House Committee on Energy and Technology and the Senate Committee on Natural Resources and Energy concerning its progress and any preliminary findings and recommendations as to subsection (a) of this section, including recommendations as to subdivision (a)(3)(A) of this section, and any findings and recommendations that may influence the scope and focus of Efficiency Vermont's 2021-23 Demand Resources Plan Proceeding; and

(2) January 15, 2021, the Commission shall submit a final written report to the House Committee on Energy and Technology and the Senate Committee on Natural Resources and Energy with its findings and detailed recommendations as to subsection (a) of this section, including recommendations for legislative action.

Appendix C -- Summary of Several Previous Reports Addressing Policy Options

Vermont lawmakers are aware of the imperative to act with respect to energy usage and its impact on the environment. They said it best in the Energy Efficiency and Affordability Act of 2007 (Act 92):

- (1) Global climate change, which is threatening our environment and perhaps ultimately our existence, has been caused in part by an energy policy that is largely dependent on the burning of fossil fuels.
- (2) In order to reduce greenhouse gas emissions and environmental degradation, it is essential that we reduce or eliminate our dependency on fossil fuels by significantly improving energy efficiency and shifting to nonpolluting benign forms of energy such as wind, sun, and water power.
- (3) In order for Vermont to meet the greenhouse gas reduction goals set by the conference of the New England governors and Eastern Canadian premiers' climate change action plan, Vermont needs to provide effective weatherization services, new funding strategies, green building practices, and installation of renewable energy systems.
- (4) The "Vermont energy efficiency potential study for non-regulated fuels" recently completed by the department of public service indicates that Vermont has cost-effective potential energy savings of \$486 million over the next ten years with 63 percent of those savings from building shell improvements.
- (5) Although workforce development in the field of green building, renewable energy, and energy efficiency is an essential component of the battle to combat global climate change, there are few trained applicants to fill the new well-paying jobs being created in this field.

The policy question of how to fund unregulated-fuels efficiency and fuel switching in Vermont, and other jurisdictions, has been studied for many years. A long list of studies—going back over a decade—from a variety of stakeholders all recommend that the Legislature establish a stable and sizable stream of funding for thermal and transportation efficiency. In 2008 and 2011, the Regulatory Assistance Project issued "Affordable Heat: Whole-Building Efficiency Services for Vermont Families and Businesses."⁹⁵ Those reports identified a set of policies and services that could build on

⁹⁵ Affordable Heat: Whole-Building Efficiency Services for Vermont Families and Businesses, Regulatory Assistance Project, 2008 and 2011. (The 2011 report is an update of the 2008 report.)

existing efforts to lower heating costs by investing in Vermont’s building infrastructure. Among the funding options identified, in combination with private capital harnessed through loans and out-of-pocket expenditures by customers, the authors recommended a phased increase in the Fuel Gross Receipts Tax as the most logical source of revenue for an enhanced weatherization program serving low-income households.⁹⁶ The authors noted that potential “savings” from not investing in low-cost energy efficiency are illusory because those savings will be paid for multiple times over by additional fuel and human costs of higher bills and affordability challenges that result from inefficient buildings.⁹⁷

In the 2011 Comprehensive Energy Plan, the Department of Public Service noted that “no comprehensive funding source exists that is large enough to facilitate meeting the [S]tate’s goals for building thermal efficiency.”⁹⁸ Further, the Department concluded that “an additional source of stable public funding is necessary to facilitate private investment” if Vermont is to progress on its thermal efficiency goals.⁹⁹ The Department recommended that Vermont should not trade electric efficiency dollars collected from ratepayers for all-fuels efficiency because those electric dollars bring tangible and important benefits to the State tied to reductions in electric load. Instead, the Department noted the need to identify a secure, sustainable source of funding tied to the fuels that the efficiency measures are addressing.¹⁰⁰

In January 2013, the Vermont Department of Public Service issued the Thermal Efficiency Task Force Report, a report to the General Assembly on meeting the thermal efficiency goals for Vermont buildings.¹⁰¹ That report recognized the limited and constrained funding sources for Vermont’s existing thermal efficiency programs and advocated for actions and policies—including public funding options—to meet Vermont’s building goals. The report recommended a package of multiple funding options, with the highest-preference tier of new funding options including a “Thermal Systems Benefit Charge.”¹⁰² Under this recommendation, all fossil fuels would be subject to the same charge, using the same basis—either BTU content or CO₂ carbon

⁹⁶ Affordable Heat 2011 at 107.

⁹⁷ Affordable Heat 2011 at 106.

⁹⁸ 2011 CEP, Volume II at 163.

⁹⁹ 2011 CEP, Volume II at 165.

¹⁰⁰ 2011 CEP, Volume I at 5.

¹⁰¹ Thermal Efficiency Task Force Report, January 2013.

¹⁰² TETF Report at 100.

content. This Task Force recommendation rose to the top tier because of its alignment with key principles, including being equitable and transparent.

Later that year, in Act 89, Vermont lawmakers recognized that “substantial public investment would be necessary to meet the State’s statutory goals for improving the energy fitness of its homes and buildings.”¹⁰³ In response to the Act’s directive, the Commission (the Public Service Board at the time) issued its Report on the Efficient Use of Unregulated Fuels.¹⁰⁴ In that report, the Commission noted the positions of many participants who supported a “systems benefit charge” or “energy efficiency charge” on unregulated fossil fuels—a position matching the recommendation of the Thermal Efficiency Task Force. For example, in its comments for that report, the Vermont Energy Investment Corporation supported the collection of a volumetric charge on unregulated fuels (with biomass and biofuels exempt) to maximize the alignment of the costs to the benefits of unregulated-fuels efficiency, and to address the market inefficiency of fossil-fuel pricing not reflecting the total cost to society, stating that a rational policy “would fund efficiency services through charges imposed on the sale of the fuel that they are targeted to reduce. This would also provide an appropriate price signal to the market.”¹⁰⁵

Also in 2013, the Regulatory Assistance Project prepared “Policy Options for Achieving Vermont’s Renewable Energy and Carbon Targets for the Vermont Department of Public Service as part of the Department’s Total Energy Study.”¹⁰⁶ With respect to funding, the Policy Options report identified several important principles:

- It is important to ensure a clear, secure, long-term source of funding that continues uninterrupted.
- It is important to ensure that those who pay for a program receive as many of the benefits of that program as is possible.
- Care must be given to vulnerable segments of the population who may not be able to participate in programs without some form of subsidization from the larger populace.¹⁰⁷

¹⁰³ Public Act No. 89, § 1 (2013 Vt., Bien. Sess.).

¹⁰⁴ Efficient Use of Unregulated Fuels, Report on the (Sec. 29 of Act 89 of 2013), December 17, 2013.

¹⁰⁵ Letter from Michael Wickenden, VEIC Director of Regulatory Affairs, to Susan M. Hudson, Clerk of the Public Service Board, dated September 25, 2013, at 7.

¹⁰⁶ Policy Options for Achieving Vermont’s Renewable Energy and Carbon Targets, prepared by the Regulatory Assistance Project for the Vermont Department of Public Service. June 2013.

¹⁰⁷ Policy Options at 86.

One example identified in the Policy Options report was a public benefits charge, which is a mandatory charge imposed by the government and is collected from energy users for a purpose that benefits the public.

In the 2016 Comprehensive Energy Plan, the Department of Public Service again noted the “lack of consistent public or private funding at the quantities required to meet the statutory goals” as one of Vermont’s primary challenges to achieving building energy goals.¹⁰⁸ Moving forward, the Department of Public Service recommended fully funding existing thermal efficiency programs, particularly those serving low-income populations.¹⁰⁹ One of the Department of Public Service’s Comprehensive Energy Plan recommendations with respect to funding for whole-building efficiency was to consider “funding programs from sources tied to the impacted fuels.”¹¹⁰

¹⁰⁸ 2016 Comprehensive Energy Plan at 8.

¹⁰⁹ 2016 CEP at 9.

¹¹⁰ 2016 CEP at 107.

Appendix D -- History of Commission Case No. 19-2956-INV

The Commission initiated Case Number 19-2956-INV on July 11, 2019, in response to Section 2 of Act 62 (H.63) of the 2019-2020 Vermont legislative session.¹¹¹ A preliminary report was filed with the Vermont Legislature on January 15, 2020.¹¹² In light of the COVID pandemic, the second phase of the Commission's investigation consisted of a series of written requests with respect to process and additional information requests, each addressing one or more specific topic areas. One online workshop was also conducted.

Written comments were solicited as follows:

Date	Topics Addressed
February 21, 2020	Information and scheduling recommendations
April 24, 2020	Order seeking procedural recommendations
July 6, 2020	Information Request: (1) Efficiency Vermont's impact analysis of incremental weatherization and thermal services that could be provided with different revenue streams; (2) funding levels, cost-effectiveness, and cost-of-carbon reduction measures, strategies, or policies; (3) reports, updates, or current modeling that looks at the economic impacts of funding all-fuels efficiency; (4) cost per ton of carbon dioxide avoided through Vermont utilities' Tier 3 programs; (4) how should all-fuels efficiency measures or programs be prioritized; (5) recommended proposals for new funding sources for all-fuels efficiency; (6) recommended statutory changes regarding the creation of an all-fuels efficiency program; (7) comments on Efficiency Vermont's straw proposal and whether this proposal can serve as a model for other EEUs; (8) whether an all-fuels efficiency program should have a dedicated coordinator
August 5, 2020	Information Request: (1) comments on the American Council for an Energy-Efficiency Economy report titled "Braiding Energy and Health Funding for In-Home Programs: Federal Funding Opportunities"

¹¹¹ The procedural history of the first six months of the investigation are included as an appendix to the Preliminary Report.

¹¹² A technical correction to the report was issued on March 30, 2020.

An online workshop was conducted as follows:

Date	Topics Addressed
November 13, 2020	Results of modeling by Vermont Department of Public Service and the Agency of Commerce and Community Development with respect to the economic impact of thermal efficiency spending

The workshop presentation of modeling results included discussions addressing specific issues. Materials were often filed with the Commission in advance of the workshops to allow the Commission and participants to develop questions in advance of a workshop.

Commission staff also engaged in a significant amount of self-directed research during this investigation. As part of its research, Commission staff reviewed the following sources,¹¹³ among others:

Vermont Clean Energy Finance Report #3 Focus on: High Impact, “Ready-to-Implement” Financing Opportunities During COVID-19. Prepared for the Vermont Clean Energy Development Fund at the Department of Public Service. Energy Futures Group, September 30, 2020

2020 Vermont Clean Energy Industry Report. Prepared for the Vermont Clean Energy Development Fund and Vermont Department of Public Service. BW Research Partnership, May 2020

Performance Indicators for the Vermont Weatherization Assistance Program. Vermont Agency of Human Services Department for Children and Families, January 31, 2020

2019 ANNUAL PROGRESS REPORT for VERMONT. Energy Action Network, March 2020

Vehicle Feebate and Vehicle Incentive Programs Funding Report. Vermont Agency of Transportation Policy, Planning, and Intermodal Development Division. Report to the Legislature Pursuant to Act 57 of 2019 Section 46, October 2019

¹¹³ Listed by publication date, beginning with the most recent.

Quantifying the Impact of SNAP Benefits on the U.S. Economy and Jobs.

Patrick Canning and Rosanna Mentzer Morrison, Economic Research Service of the United States Department of Agriculture, July 18, 2019

Promoting the Ownership and Use of Electric Vehicles in the State of Vermont, A Report to the Vermont State Legislature. Vermont Public Utility Commission, June 27, 2019

Decarbonising heat in buildings – a comparison of policies in Germany and New England. Dr. Jan Rosenow and David Farnsworth, Regulatory Assistance Project, May 2019

Economic Benefits and Energy Savings through Low-Cost Carbon Management. Richard Cowart, David Farnsworth, and Frederick Weston, Regulatory Assistance Project, February 2019

2019 Annual Energy Report. Vermont Department of Public Service, January 15, 2019

Weatherization + Health, Health and Climate Change Co-Benefits of Home Weatherization in Vermont. Vermont Department of Health, December 2018

Report to the Governor. Vermont Climate Action Commission, July 31, 2018

Renewable Thermal in State Renewable Portfolio Standards. Samantha Donalds, Clean Energy States Alliance, Revised, July 2018

Vermont Clean Energy Finance Report. Prepared for the Vermont Clean Energy Development Fund at the Department of Public Service. Energy Futures Group, June 12, 2018

2016 Comprehensive Energy Plan. Vermont Department of Public Service.

Report of the Analysis of Administrative Costs Associated with Seasonal and Crisis Fuel and Weatherization Programs. Joint Fiscal Office, December 15, 2016

Total Energy Study: Final Report on a Total Energy Approach to Meeting the State's Greenhouse Gas and Renewable Energy Goals. Vermont Department of Public Service, December 8, 2014

Report to the House and Senate Committees on Natural Resources and Energy, the House Committee on Commerce and Economic Development, and the Senate

Committee on Finance on the Efficient Use of Unregulated Fuels. Prepared by the Public Service Board Pursuant to Section 29 of Act 89, December 15, 2013

Policy Options for Achieving Vermont's Renewable Energy and Carbon Targets. Prepared by the Regulatory Assistance Project for the Vermont Department of Public Service, June 2013

Meeting the Thermal Efficiency Goals for Vermont Buildings. Report to the Vermont General Assembly by the Thermal Efficiency Task Force, January 2013

Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes, Research Report Task XXII of the International Energy Agency Demand Side Management Programme, prepared by the Regulatory Assistance Project, June 2012

2011 Comprehensive Energy Plan, Volume 1 – Vermont's Energy Future. Vermont Department of Public Service, December 2011

2011 Comprehensive Energy Plan, Volume 2 – Facts, Analysis, and Recommendations. Vermont Department of Public Service, December 2011.

2011 Comprehensive Energy Plan, Appendices. Vermont Department of Public Service, December 2011

Affordable Heat: Whole-Building Efficiency Services for Vermont Families and Businesses. Ajith Rao and Riley Allen, Regulatory Assistance Project, June 2011

Funding for Energy Efficiency Programs for Unregulated Fuels. U.S. Department of Energy Technical Assistance Program, April 2011

Report on Petroleum Products Markets in the Northeast, Prepared for the Attorneys General of Maine, Massachusetts, New Hampshire, New York, and Vermont. Prepared by ERS Group, September 2007

Appendix E -- Participants in Commission Case No. 19-2956-INV (listed alphabetically)

Building Performance Professionals Association of Vermont
Capstone
City of Burlington Electric Department
Clean Energy Group
Conservation Law Foundation
Efficiency Vermont
Energy Futures Group, Inc.
Green Mountain Power Corporation
Green Mountain Transit
Michael Wickenden
New Leaf Design, LLC
Renewable Energy Vermont
Recurve
RSG, Inc.
Senator Christopher Bray
Shoreham Planning Commission
Sunrun Inc.
Utility Services, Inc.
Vermont Agency of Agriculture, Food, and Markets
Vermont Agency of Human Services, Office of Economic Opportunity
Vermont Agency of Natural Resources
Vermont Agency of Transportation
Vermont Department of Health
Vermont Department of Public Service
Vermont Electric Cooperative, Inc.
Vermont Electric Power Company, Inc.
Vermont Fuel Dealers Association
Vermont Gas Systems, Inc.
Vermont Public Power Supply Authority
Vermont Vehicle and Automotive Distributors Association