



Potential Strategies for Reducing Climate Impacts from Vermont's Buildings

Key Drivers for Building Policies

Presentation to the
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Vermont Climate Council

Christine Donovan and David Farnsworth

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Key Drivers - Introduction

- Vermont has 30+ years of experience beginning the transformation to an efficient, clean energy economy
- Many existing policies, programs, and initiatives should be continued and expanded
- Yet - it is clear Vermont will not achieve the emissions reduction targets set for 2025, 2030, and 2050 without aggressive new approaches as well
- The overall goal is to leverage public monies in ways that scale private investment and **transform energy and housing markets** to deliver cost-effective, efficient, carbon-free or low-carbon energy for buildings that is affordable and accessible to all



“Pathways” to meet GWSA Goals

Pathway / Method	2018	2025	2030	2050
Wx – Residential (units)	27,186	80,000	148,102	262,767
Heat Pumps – Heating & Cooling (units)	13,770	70,000	200,000	250,000
Heat Pumps – Water Heating (units)	9,510	50,000	200,000	200,000
Advanced Wood Heating (units)				
Commercial	0,231	1,586	3,205	6,441
Residential	20,490	30,000	50,000	60,000
Renewable Natural Gas (MMBTU)	2,650	1,417,038	2,839,221	11347873

Source: Energy Action Now, Emissions Reduction Pathways Model, April 2021



Policies Need Drivers – What “key drivers” are most needed to achieve the pathways?

Key Drivers	Why?
1. Enforced Building Energy Codes	To reduce GHG emissions from new buildings
2. Rental Property Efficiency Standards	To reduce GHG emissions from existing buildings
3. State/Regional Appliance Standards	To drive the market for better performing appliances
4. Weatherization at Scale	Current mandates are limiting, and resources are inadequate



What “key drivers” are most needed

Key Drivers	Why?
5. Clean Heat Standard	To drive the market towards the use of carbon-free or low-carbon fuels for space heating, cooling, and water heating
6. State Agency GHG Planning	To ensure that agency authorizations reflect GHG goals in their programming, investment, and analyses.
7. Workforce Development and Education	The achievement of fuel carbon-intensity and building efficiency goals will require educational support for all levels of Vermont’s workforce, including those whose jobs change
8. Tariffed On Bill Financing	Innovative financing is necessary to support Vermont’s clean energy transition



1a. Enforced Building Energy Performance Standards

Why?	<ul style="list-style-type: none">• To drive the market to reduce energy waste & GHG emissions in buildings• Ensure that professionals warrant commercial and residential building efficiency
What is it?	<ul style="list-style-type: none">• Regularly updated efficiency standards that buildings must meet• VT DPS currently reviews standards, and educates building professionals
Who is doing this already?	<ul style="list-style-type: none">• Today there is accountability in VT's commercial building sector due to licensure requirements for architects and builders• They certify that commercial buildings meet applicable standards



1b. Enforced Building Energy Performance Standards

What are keys to success?

- Require the same cert. for residential buildings
- Additionally, incorporate certification into property transfers
- Education and certification of building professionals: architects, engineers, contractors, and code enforcement officials
- Support code inspection and enforcement

What are the equity considerations?

More efficient buildings use less energy, reduce energy bills, and are more comfortable and healthier to live and work in



2a. Rental Property Efficiency Standard

Why?	Leasing agreements produce “split incentives” between owner and tenant, in which capital improvements that avoid GHG emissions and energy savings result in one party paying for improvements while the other party receives the benefits
What is it?	A policy for existing residential rental properties that requires property owners to meet a minimum efficiency standard before they can receive authorization to rent properties.
Who is doing this already?	<ul style="list-style-type: none">• Burlington, VT, Boulder, CO, Gainesville, FL.• Underway in Columbia, MO, Somerville, MA, and several MI cities.



2b. Rental Property Efficiency Standard

What are keys to success?	<ul style="list-style-type: none">• Financial support and training for landlords for a period of years• Landlord support provided in exchange for an agreement to not change rents for, e.g., 5 years.
What are the equity considerations?	<ul style="list-style-type: none">• Ensuring the improved efficiency of rental housing will benefit all occupants, especially energy burdened ones.



3a. Increased State Adoption of Appliance and Equipment Performance Standards

Why?	To drive the market to higher performing, more efficient appliances and equipment that can integrate in the power system
What is it?	Minimum <i>control-based</i> or <i>emissions-based</i> standards for appliances and equipment
Who is doing this already?	Federal and State governments adopt <i>efficiency</i> standards for products, ranging from lighting to refrigerators
What are keys to success?	<ul style="list-style-type: none">• States are not preempted by US DOE from adopting standards designed to enable the addressability and control of appliances for greater grid integration<ul style="list-style-type: none">• Same for appliance standards based on their emissions• Coordinating adoption with neighboring states can still drive appliance markets to scale



3b. Increased State Adoption of Appliance and Equipment Performance Standards

Equity considerations?

- Controllable appliances can be operated at lower cost than non-controlled alternatives
- Lower emitting appliances reduce indoor air emissions and improve public health
- Careful attention should be paid to appliance and equipment prices
- Program incentives for controllable/low-emissions appliances should be designed especially for consumers with high energy burdens



4a. Weatherization at Scale

Why?	Because new construction accounts for only 1% of buildings in Vermont and much of our building stock is old and inefficient
What is it?	A scaling up of weatherization and energy efficiency services statewide
Who is doing this already?	Of the 262,761 buildings in Vermont as of 2018, 27,186 have been weatherized (or just over 10%) through the Weatherization Assistance Program, Efficiency Vermont, Burlington Electric Department, and Vermont Gas.



4b. Weatherization at Scale

What are keys to success?	<ul style="list-style-type: none">• Funding to meet the scale required by GWSA emissions reduction goals• Improved program design: “one-stop shopping” providing a single point of contact for consumers
What are the equity considerations?	<ul style="list-style-type: none">• Positive - Lower energy bills; increased comfort, health, and safety• Negative - The high upfront cost makes it critical to provide funding and non-debt alternatives (e.g., <i>tariffed on bill financing</i>) to those with high energy burdens



5. Clean Heat Standard

Why?	To drive the market towards the use of carbon-free or low-carbon fuels (including solar) for space heating, water heating, and transportation
What is it?	A performance standard, applied to the providers of fossil heating fuels to Vermont, requiring them to deliver a gradually increasing percentage of low-emission heating services to Vermont customers.
What are keys to success?	<ul style="list-style-type: none">• Cost control• Focus on delivering and accounting for benefits
What are the equity considerations?	<ul style="list-style-type: none">• Lower emissions from home heating fuels;• Reduced up-front costs for heating/cooling appliances



6. State Agency GHG Planning

Why?	Because state government has purchasing power and resources that can help drive markets
What is it?	An effort to ensure that all state agencies reflect GWSA, GHG goals in their analyses, programming, and expenditures.
Who is doing this already?	Various states including California, New York, and Massachusetts
What are keys to success?	Identification and review of incremental agency actions that can avoid GHG emissions reductions
What are the equity considerations?	Broad benefits from government reductions of GHG emissions



7a. Workforce Development & Education

Why?	<ul style="list-style-type: none">• This energy transition calls for a substantial ramp-up in the trained workforce• Especially in this early transition, program design and installation must succeed; mistakes will mean money lost, unhappy consumers, and an unnecessary backlash
What is it?	Recognition for the need to coordinate statewide, workforce development and training, and the willingness to pay for it
Who is doing this already?	New York State; 37 cities – Boston, Providence, Worcester, Baltimore, etc.
What are keys to success?	Involving <ul style="list-style-type: none">• Community Action Agencies administering the Weatherization Assistance Program as well as the contractors doing the work



7b. Workforce Development (con't)

Keys to Success	<ul style="list-style-type: none">• The Efficiency Vermont Efficiency Excellence (Contractor's) Network• Vermont State Colleges – Leadership and Professors• Vermont Technical High Schools – Leadership and Teachers• Department of Employment and Training• Department of Education
Equity Considerations	<ul style="list-style-type: none">• Workforce training should take into special consideration local, underserved and overburdened communities• Promoting new career paths will enable recruitment for more lucrative, clean energy work



8a. Tariffed On-Bill Financing

Why?	To provide a new funding source for clean energy projects that does not require public subsidy or personal debt
What is it?	<ul style="list-style-type: none">• A mechanism to pay for clean energy upgrades in a building and to recover the costs through a tariff on the customer's monthly utility bill.• The tariff is set at a level to ensure the increase in monthly costs is less than the estimated savings resulting from the energy improvements.
Who is doing this already?	Arkansas, North Carolina, New Hampshire (for certain utility customers), and Burlington Electric Department (through a recent offering)



8b. Tariffed On-Bill Financing

What are keys to success?	<ul style="list-style-type: none">• Estimating savings and financing levels are very important• Adopting best practices, including consumer protections
What are the equity considerations?	<ul style="list-style-type: none">• Positive – This provides a new mechanism (and potentially, lower cost capital) for customers to benefit from energy efficiency and clean energy upgrades without paying for the upfront cost and without using conventional debt financing• Negative – Increases utility and its customer transactions