



Vermont Residential Energy Codes Background for H.181

Richard Faesy & Zack Tyler

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Overview

- Context
- Act 47 Building Energy Code Study Committee
- Act 151 Building Energy Codes Working Group
- U.S. Department of Energy Vermont Energy Codes Administration Grant
- H.181 Questions & Answers
- Questions & Discussion

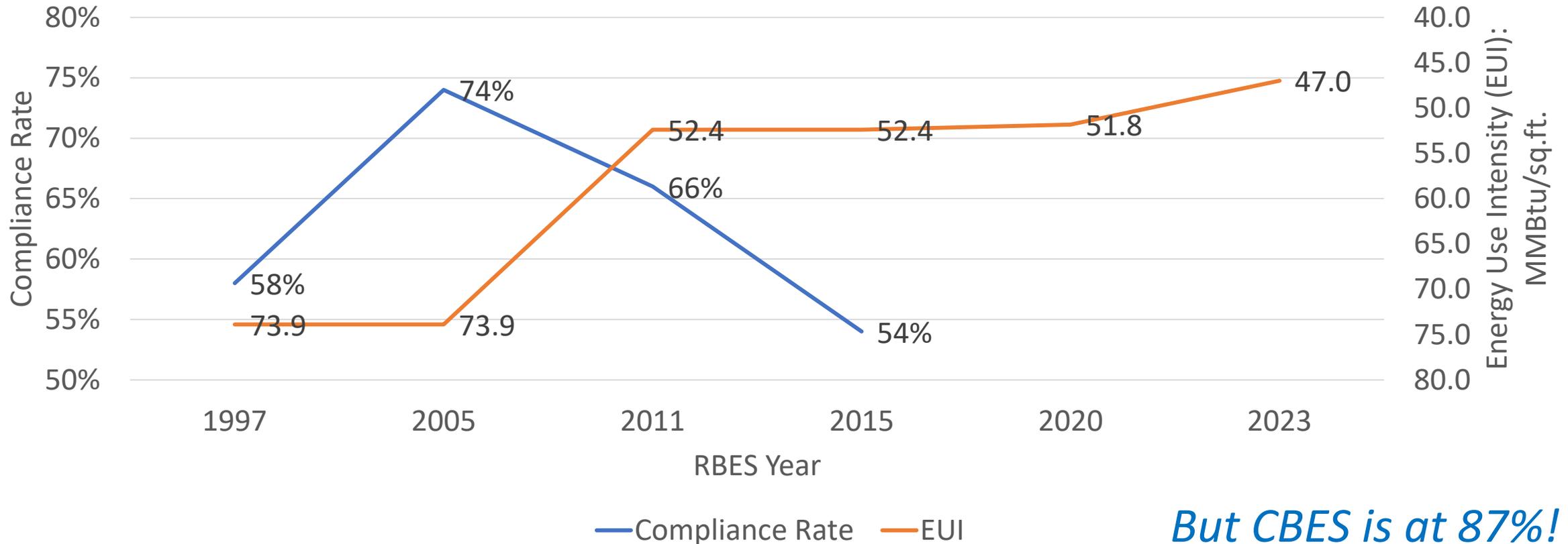


Context



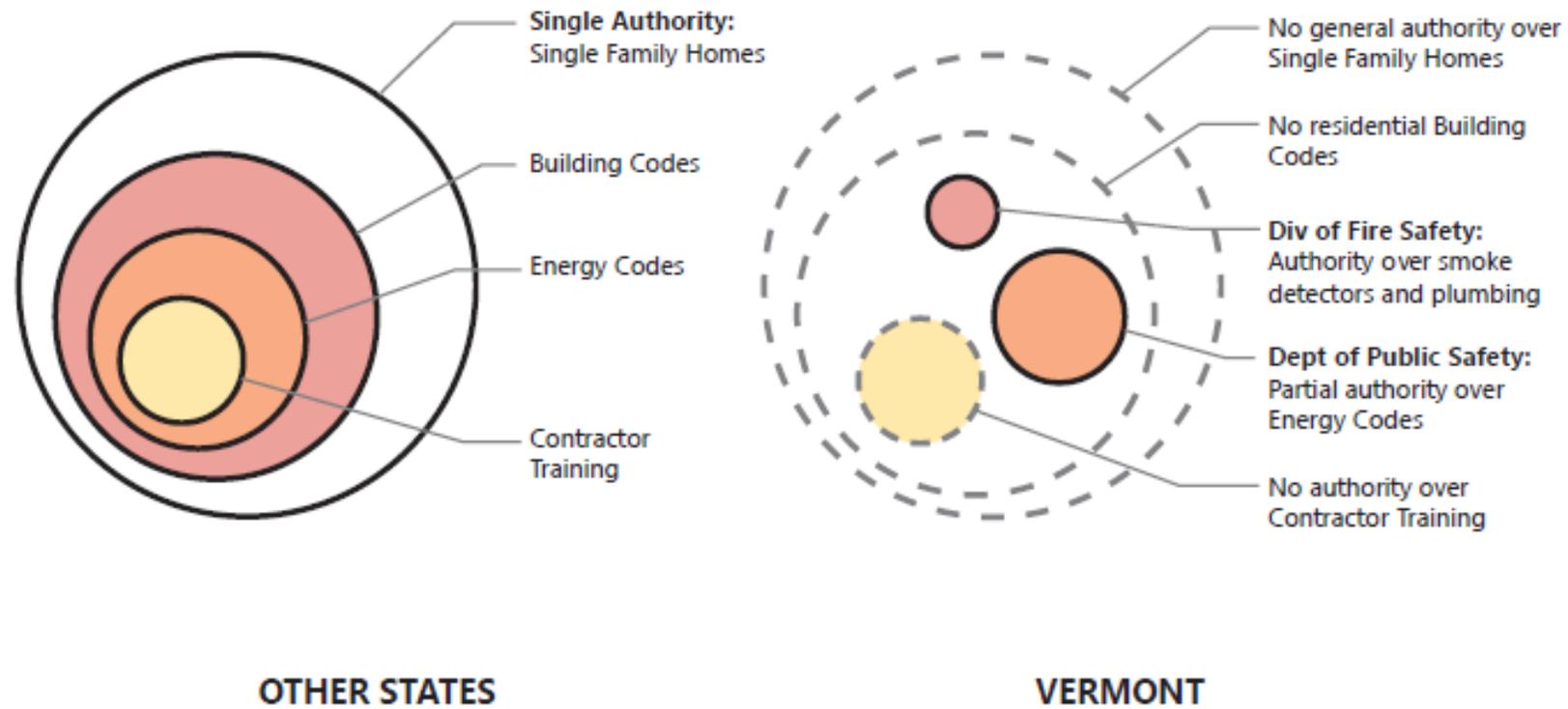
Energy Code Compliance History

Vermont RBES Energy Use Intensity (EUI) vs. Compliance Rate



Compliance based on NMR Market Assessment Studies conducted in 2002, 2011, 2016 and 2020 EUIs based on 15% reduction from DOE Normalized Energy Use

Building & Energy Code Structures in Other States & in Vermont



Current Scope of Vermont Building & Energy Codes



Energy Code	CBES	CBES	RBES	RBES	RBES	RBES
DFS Requirement ¹	Filing and Posting Certificate before Occupancy					None
Municipal Requirement ¹	Filing and Posting Certificate before Occupancy					
On-site Verification	Verification of Energy Code Compliance: None					Verification of EEU program compliance: EEU's - for some projects
Building Code	NFPA + IBC	NFPA + IBC	NFPA + IBC	NFPA	NFPA	Plumbing Only ²
Enforcement Authority (DFS)	Yes					No
On-site Verification	DFS Inspections					None

1. While there are no inspections for compliance or penalties for violations, filing the RBES or CBES certificate by builder or energy specialist assuring compliance is required by statute.

2. A plumbing permit is required for homes using public water and/or public sewer. No plumbing permit is required for well or septic systems (besides a Vermont wastewater permit).



Act 47 Building Energy Code Study Committee



Committee Members

1. Christopher Bray - VT Senate, BECSC Committee Chair
2. Bob Duncan - American Institute of Architects Vermont
3. Chris Burns - Burlington Electric Department
4. Chris Company - Regional Planning Commission
5. Craig Peltier - Vermont Housing and Conservation Board
6. Jason Webster - Vermont Builders and Remodelers Association
7. Jim Bradley - Hayward Design Build
8. Kelly Launder - Department of Public Service – Division of Efficiency and Energy Resources
9. Matt Musgrave - Association of General Contractors of Vermont
10. Matt Sharpe - Efficiency Vermont
11. Michael Desrochers - Department of Public Safety - Division of Fire Safety
12. Sandra Vitzthum - Sandra Vitzthum Architect LLC
13. Scott Campbell - Vermont House of Representatives
14. Ted Brady - Vermont League of Cities and Towns
15. Timothy Perrin - Vermont Gas Systems
16. Richard Faesy and Liz Bourguet - Energy Futures Group (Staff to the Committee)

Act 47 Charges

- 1) Assess how the building energy codes interact with the fire and building safety codes.
- 2) Consider and recommend strategies to increase awareness of and compliance with the RBES and CBES, including the potential designation of the Division of Fire Safety (DFS) in the Department of Public Safety as the statewide authority having jurisdiction (AHJ) for administration, interpretation, and enforcement, in conjunction with DFS' existing jurisdiction, over building codes.
- 3) Evaluate current cost-effectiveness analyses for the RBES and the CBES, whether they include or should include nonenergy benefits such as public health benefits and the cost of carbon, and how that impacts the affordability of housing projects and provide recommendations.

Charge 1: Interaction of Building and Energy Codes

“The Committee identified two overriding issues impeding progress and compliance with the energy codes: (1) no state agency has comprehensive administrative authority over the RBES and CBES and (2) in the absence of a residential building code, there is no regulatory infrastructure on which to base energy code administration.”

Dissenting Comments: *The DFS , Department of Public Service (PSD), and Association of General Contractors (AGC) do not support the recommendation to designate DFS as the AHJ as this cannot be implemented on the strength of existing resources and therefore will require a tremendous amount of new costly resources that will increase the cost of housing, delay permitting, and unnecessarily expand DFS authority to single family residential housing and create additional layers of regulatory oversight.*



Act 47 Recommendations



Charge 2: Increase Awareness and Compliance

A. Make structural, statutory, policy, and programmatic changes to Vermont's energy code environment.

A.1. Designate the DFS as the statewide “authority having jurisdiction” (AHJ) over all building construction – public, private, commercial, residential.

- A.1.a. Clarify the chain of authority from the General Assembly, through DFS, to municipalities.
- A.1.b. Establish an advisory committee to advise on the overall transition to a new AHJ, help with future code revisions and examine building failure cases to improve building science and future codes.
- A.1.c. PSD continue in role administering the energy codes in support of the AHJ
- A.1.d. Develop a certification designation for contractors trained on the energy codes and include the certification on the OPR Contractor Registry and DFS website

A.2. Amend the energy code update cycle by changing “shall” in the energy code enabling statute to “may”.

A.3. Establish a study committee on adopting a statewide residential building code (e.g., IRC)

A.4. Require OPR to update contractor registry (A) so contractors explicitly acknowledge RBES/CBES legal requirements, and (B) to alert consumers to RBES/CBES and provide filtering functionality, e.g., by specialties, location, and certifications.

A.5. Authorize OPR to update their contract requirements and template for contractor-owner agreements to include a clause acknowledging that energy codes are mandatory.

A.6. Develop a certification designation for contractors trained on the energy codes and include the certification on the OPR Contractor Registry and DFS website.

B. Improve the process for filing and tracking energy code certificates.

B.1. Expand DFS's current database redesign to incorporate a statewide, central, publicly accessible repository for all Vermont buildings (including all residential) that includes energy code data.

- B.1.a. Eliminate filing certificates in town records and the notarization requirement.
- B.1.b. Establish a certificate application tool for both CBES and RBES that generates an energy code “permit” before construction and a final certificate upon completion that is part of the DFS database.

Charge 2: Increase Awareness and Compliance cont.

C. Improve workforce training and support.

C.1. Coordinate and support energy code trainings and certifications.

- C.1.a. Develop training materials
- C.1.b. Conduct regular trainings

C.2. Develop “circuit rider” on-site energy code services statewide.

C.3. Increase training and support for Energy Consultants.

C.4. Increase and coordinate building science and energy code trainings including weatherization.

C.5. Coordinate the Energy Code Support Center (call center) with other code support efforts.

D. Increase awareness of building energy codes and requirements.

D.1. Develop and mail out bill stuffers reminding about energy codes

D.2. Work with lenders and attorneys to include energy information on loan closing checklists

D.3. Use state, regional, and municipal websites to reinforce energy code requirements.

D.4. Create a radio show on building science and energy codes to educate the public

E. Establish a plan for funding for base-code and above-base code compliance.

E.1. Develop a funding plan to pay for start-up and on-going costs to support the AHJ and energy code administration.

E.2. Establish a role for EEU's to play in supporting energy codes compliance and incentives.

F. Coordinate code compliance grant efforts in Vermont.

F.1. Coordinate with the U.S. Department of Energy's (DOE) grant to Energy Futures Group for the “Vermont Energy Code Administration Project” to support these strategies.

F.2. Continue the role of the Act 47 Building Energy Code Study Committee as the “Phase 2” Advisory Committee to EFG's DOE grant.

Charge 3: Evaluation of cost-effectiveness analysis

1. Continue calculating energy code "cost effectiveness" as has been done historically.
2. Establish a new committee of energy, economic, and housing experts to research and address whether and how to best include the cost of carbon and non-energy benefits in building energy codes for new and existing buildings.



Act 151 Building Energy Codes Working Group



Committee Members

1. Christopher Bray - Vermont Senate, BECWG Co-Chair
2. Scott Campbell - Vermont House of Representatives, BECWG Co-Chair
3. Kelly Launder - Department of Public Service
4. Michael Desrochers - Department of Public Safety - Division of Fire Safety
5. Peter Tucker - Vermont Association of Realtors
6. Craig Peltier - Vermont Housing and Conservation Board
7. Matt Bushey - American Institute of Architects Vermont
8. Matt Sharpe - Efficiency Vermont
9. Richard Wobby - Association of General Contractors of Vermont
10. Jim Bradley - Vermont Builders and Remodelers Association
11. Chris Burns - Burlington Electric Department
12. Timothy Perrin - Vermont Gas Systems
13. Ted Brady - Vermont League of Cities and Towns
14. Jennifer Colin - Office of Professional Regulation
15. Chris Company - Regional Planning Commission - Windham Regional Commission
16. Richard Faesy and Zack Tyler - Energy Futures Group (Staff to the Department of Public Service)

Act 151 Charges

1. Recommend strategies and programs to **increase awareness of and compliance** with the RBES and CBES, including the use of appropriate certifications for contractors trained on the energy codes;
2. Develop plans and recommendations for a potential **transition** to a comprehensive program for the RBES and CBES at the **Divisions of Fire Safety**, including potential funding sources; and
3. Consider whether or not the State should adopt a **statewide building code**.



Act 151 Recommendations



Charge 1: Increase Awareness and Compliance

1.1 Establish a role for EEU's to play in supporting energy codes compliance. **

1.2 Support OPR with the rulemaking process to establish voluntary specialty certifications for residential contractors that are registered in the OPR contractor registry.

1.3 Support OPR for website improvements

1.4 Work with lenders, attorneys, real estate professionals, and home inspectors to include acknowledgement of RBES in the residential real estate transaction process. **

1.5 Include municipal floodplain administrators in RBES and CBES education and outreach efforts.

** Updated recommendations from Act 47.

Charge 2: Develop Plans for a Transition to DFS

2.1 A) Designate the DFS as the statewide “authority having jurisdiction” over all building construction – public, private, commercial, residential with an appropriation to cover necessary resources. *

B) Establish a process to transition away from municipal staff filing RBES and CBES certificates in town records and towards a process where certificates are filed directly with the state. **

2.2 Incorporate RBES and CBES certificates, for buildings currently under DFS jurisdiction, into the DFS permit database expansion. **

2.3 Ensure that the detailed inputs from RBES and CBES certificates are logged as unique data points in the database to ensure the data are accessible for future analyses.

2.4 Create a comprehensive document detailing the costs and benefits associated with RBES and CBES energy code administration at DFS and calculate the incremental permit fees that would be required to support ongoing energy code administration.

*Repeat recommendations from Act 47.

** Updated recommendations from Act 47.

Red Shading = Recommendations for legislative action.

Dissenting Comments

- Dissenters included the Division of Fire Safety, the Department of Public Service, and the Associated General Contractors of Vermont
 - DFS rationale
 - Lack of capacity to extend current authority
 - DFS mission is to protect from human life from fire and other health and safety issues
 - Focus should be on training and education, not regulation
 - PSD rationale
 - Concurs with DFS
 - Impact of statewide building code are not yet known, wait for cost/benefit analysis on that
 - AGC/VT rationale
 - Concerned about costs associated with RBES enforcement

Charge 3: Consider Adoption of a Building Code.

3.1 Provide the necessary resources to ensure the DFS and the IRC Working Group can answer key questions about the costs, benefits, and impacts (including life safety impacts) associated with adopting the IRC, starting with buildings currently under DFS jurisdiction.



U.S. Department of Energy Vermont Building Energy Codes Administration Project



Vermont Building Energy Code Administration Project

“Develop an energy code administration plan for Vermont, including a proposed funding mechanism, that will lay the groundwork for future implementation of a code compliance mechanism, ultimately resulting in significant and sustained reductions in energy use.”

Team Members	Role
Energy Futures Group	Project Lead and Management
Vermont Secretary of State	State Sponsor, Office of Professional Regulation (OPR) Contractor Certification(s)
International Code Council	Contractor Certification(s) Support
Burlington Electric Department	Advisor, Energy Code Implementation Support
Efficiency Vermont	Advisor, Energy Code Implementation Support, Training, Circuit Rider
Vermont Gas Systems	Advisor, Energy Code Implementation Support
Vermont Association of Planning and Development Agencies (VAPDA)	Education, Community Outreach and Support

Project Summary

- Training and support of builders, designers, trade associations, and other stakeholders
- Establishment of circuit riders to ensure widespread information sharing and technical support
- Municipality outreach training, resources, and support
- Recruitment, training, and support of an Energy Professionals workforce to assist energy code administration
- Establishment and coordination with project advisory committee
- Develop an energy code administration plan





H.181 Questions & Answers



Why continue the Act 151 Working Group?

- Need to continue to navigate a pathway forward to energy code administration until an Authority Having Jurisdiction (AHJ) is named
 - Have been trying with Act 47 and Act 151 without resolution
- Why is an AHJ important?
 - No one is in charge of energy code compliance, administration, and enforcement
 - Avoid any confusion about energy code interpretation and technical answers
 - Establish a compliance mechanism for RBES
- Continue to explore lowest-cost, market-based solutions
 - Energy Professionals
 - Coordination with Energy Efficiency Utilities and stakeholders

Why does Vermont need a building code for all homes?

- Set a standard of practice for designers and builders to reference
 - How high should railings be?
 - What framing lumber should be used for a given roof span?
 - How do we ensure buildings are safe and durable?
- All “public buildings” are covered by DFS but not “single family owner occupied” (SFOO)
- Coordinate and address conflicts and questions between energy and building codes

Why do Energy & Building Codes make sense?

- Build in energy efficiency from the start
 - It costs much less to build it right from the start than to weatherize later
- Consider “building science”
 - Avoid moisture issues and building failures
 - Protect occupant health and safety
- Least-cost option
 - Small incremental cost is offset by energy savings from year 1



Single Family Home, Essex VT Built: approx. 2002
Estimated cost to repair: \$50,000 - \$75,000.

2024 (2023) RBES Standard Code

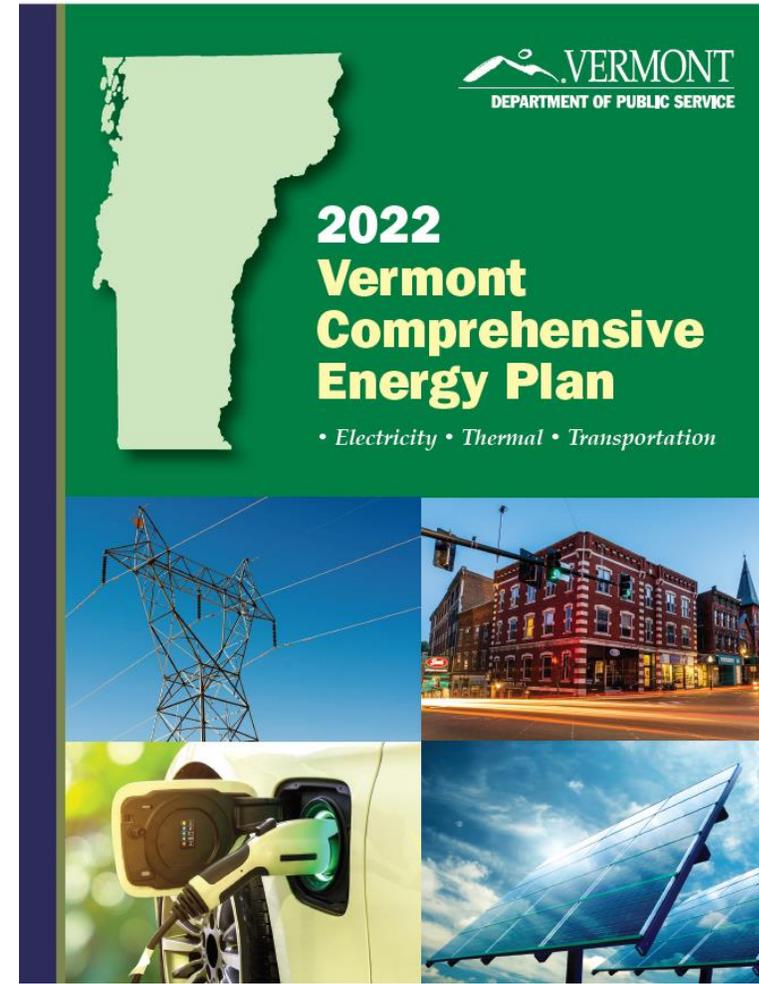
2024 RBES	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback	ROI	Cash Flow
Standard Low Cost	\$83	\$1,018	12.2	8%	\$9
Standard All Electric	\$785	\$2,951	3.8	27%	\$570
Standard Blended (Fossil & Electric)	\$216	\$1,385	6.4	16%	\$116

2024 (2023) RBES Stretch Code

2023 RBES	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback	ROI	Cash Flow
Stretch Low Cost	\$158	\$1,718	10.9	9%	\$33
Stretch All Electric	\$908	\$4,551	5.0	20%	\$577
Stretch Blended (Fossil and Electric)	\$301	\$2,256	7.5	13%	\$137

Why is attributing savings to code compliance important?

- Vermont Comprehensive Energy Plan target “to achieve net-zero ready construction for all newly constructed buildings by 2030 through building energy standards”
 - We’ll never achieve this without full EEU support
- If EEUs are allowed to claim savings from code support activities, they will be incentivized to support energy code compliance
 - Energy Professionals
 - Builder Training
 - Technical Assistance





Questions & Discussion





Zack Tyler

Managing Consultant

ztyler@energyfuturesgroup.com

(802) 305-0355

energyfuturesgroup.com

Richard Faesy

Principal

rfaesy@energyfuturesgroup.com

(802) 355-9153

energyfuturesgroup.com

