

Final Proposed Filing - Coversheet

Instructions:

In accordance with Title 3 Chapter 25 of the Vermont Statutes Annotated and the “Rule on Rulemaking” adopted by the Office of the Secretary of State, this filing will be considered complete upon filing and acceptance of these forms with the Office of the Secretary of State, and the Legislative Committee on Administrative Rules.

All forms shall be submitted at the Office of the Secretary of State, no later than 3:30 pm on the last scheduled day of the work week.

The data provided in text areas of these forms will be used to generate a notice of rulemaking in the portal of “Proposed Rule Postings” online, and the newspapers of record if the rule is marked for publication. Publication of notices will be charged back to the promulgating agency.

PLEASE REMOVE ANY COVERSHEET OR FORM NOT REQUIRED WITH THE CURRENT FILING BEFORE DELIVERY!

Certification Statement: As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I approve the contents of this filing entitled:

Vermont Residential Building Energy Standards (RBES) Amendments

_____/s/ June E. Tierney_____, on 4/25/23
(signature) (date)

Printed Name and Title:

June E. Tierney, Commissioner, Vermont Department of Public Service

RECEIVED BY: _____

- Coversheet
- Adopting Page
- Economic Impact Analysis
- Environmental Impact Analysis
- Strategy for Maximizing Public Input
- Scientific Information Statement (if applicable)
- Incorporated by Reference Statement (if applicable)
- Clean text of the rule (Amended text without annotation)
- Annotated text (Clearly marking changes from previous rule)
- ICAR Minutes
- Copy of Comments
- Responsiveness Summary

1. TITLE OF RULE FILING:

Vermont Residential Building Energy Standards (RBES) Amendments

2. PROPOSED NUMBER ASSIGNED BY THE SECRETARY OF STATE

22P028

3. ADOPTING AGENCY:

Department of Public Service

4. PRIMARY CONTACT PERSON:

(A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE).

Name: Kelly Launder

Agency: Department of Public Service

Mailing Address: 112 State Street, Montpelier, VT 05620

Telephone: 802-828-4039 Fax:

E-Mail: kelly.laundry@vermont.gov

Web URL *(WHERE THE RULE WILL BE POSTED):*

<http://publicservice.vermont.gov/content/building-energy-standards-update>

5. SECONDARY CONTACT PERSON:

(A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON).

Name: Ben Civiletti

Agency: Department of Public Service

Mailing Address: 112 State Street, Montpelier, VT 05620

Telephone: 802-622-4388 Fax:

E-Mail: benjamin.civiletti@vermont.gov

6. RECORDS EXEMPTION INCLUDED WITHIN RULE:

(DOES THE RULE CONTAIN ANY PROVISION DESIGNATING INFORMATION AS CONFIDENTIAL; LIMITING ITS PUBLIC RELEASE; OR OTHERWISE, EXEMPTING IT FROM INSPECTION AND COPYING?) No

IF YES, CITE THE STATUTORY AUTHORITY FOR THE EXEMPTION:

PLEASE SUMMARIZE THE REASON FOR THE EXEMPTION:

7. LEGAL AUTHORITY / ENABLING LEGISLATION:

(THE SPECIFIC STATUTORY OR LEGAL CITATION FROM SESSION LAW INDICATING WHO THE ADOPTING ENTITY IS AND THUS WHO THE SIGNATORY SHOULD BE. THIS SHOULD BE A SPECIFIC CITATION NOT A CHAPTER CITATION).

30 V.S.A. § 51 RESIDENTIAL BUILDING ENERGY STANDARDS

8. EXPLANATION OF HOW THE RULE IS WITHIN THE AUTHORITY OF THE AGENCY:

In accordance with 30 V.S.A. § 51(c), the Commissioner of the Department of Public Service is required to amend and update the residential building energy standards (RBES) through administrative rules.

9. THE FILING HAS CHANGED SINCE THE FILING OF THE PROPOSED RULE.
10. THE AGENCY HAS INCLUDED WITH THIS FILING A LETTER EXPLAINING IN DETAIL WHAT CHANGES WERE MADE, CITING CHAPTER AND SECTION WHERE APPLICABLE.
11. SUBSTANTIAL ARGUMENTS AND CONSIDERATIONS WERE RAISED FOR OR AGAINST THE ORIGINAL PROPOSAL.
12. THE AGENCY HAS NOT INCLUDED COPIES OF ALL WRITTEN SUBMISSIONS AND SYNOPSES OF ORAL COMMENTS RECEIVED.
13. THE AGENCY HAS INCLUDED A LETTER EXPLAINING IN DETAIL THE REASONS FOR THE AGENCY'S DECISION TO REJECT OR ADOPT THEM.
14. CONCISE SUMMARY (150 WORDS OR LESS):

These standards regulate the design and construction of residential buildings to require adequate thermal insulation, low air leakage, effective and efficient mechanical, ventilation, electrical, service water-heating and illumination systems and equipment to enable effective use of energy in residential buildings. This is an update of the 2020 Vermont Residential Building Energy Standards (RBES). Among the more significant changes from 2020 RBES are: Increased insulation R- values for basements; tighter air sealing requirements; efficient balanced whole-house ventilation system with heat recovery requirement; and EV Capable requirements.

15. EXPLANATION OF WHY THE RULE IS NECESSARY:

The rule is necessary to achieve the effective utilization of energy in residential buildings. Per 30

V.S.A. § 51(c), since 1997 the Commissioner of the Department of Public Service is required to amend the RBES after the issuance of updated standards for residential construction under the International Energy Conservation Code (IECC).

16. EXPLANATION OF HOW THE RULE IS NOT ARBITRARY:

The RBES are based on the 2015, 2018, and 2021 International Energy Conservation Code (IECC) and are reviewed and commented on by an Advisory Committee made up of Vermont builders, architects, Energy Efficiency Utilities, multi-family housing developers, and low-income housing advocates.

17. LIST OF PEOPLE, ENTERPRISES AND GOVERNMENT ENTITIES AFFECTED BY THIS RULE:

The Dept. of Public Safety, State Historic Preservation Office (SHPO)/Agency of Commerce and Community Development (ACCD), Office of Economic Opportunity (OEO), Act 250 Commissions, new home owners/buyers, existing home owners, builders, building designers, home energy raters and municipalities.

18. BRIEF SUMMARY OF ECONOMIC IMPACT (150 WORDS OR LESS):

This rule is an update of an adopted residential building energy standard that has been in effect for all residential building construction since 1998. Adoption of the rule will result in an incremental cost increase for the parties involved in new home construction, purchase, and ownership, and existing home renovation compared to the 2020 RBES, currently in effect. On the other hand, adoption of the rule will provide economic benefits of reduced energy costs, reduced environmental impacts, and improved indoor air quality for the lifetime of the home/building. Assuming a 30-year 6% APR mortgage including the additional cost of construction under the proposed rule, the increase in annual mortgage payments is more than offset by the annual energy savings, resulting in a positive cash flow and a return on investment (ROI) of 8% to 27% (35% including the social cost of carbon) compared to the same home built to the current standard (see Economic Impact Analysis section for details).

19. A HEARING WAS HELD.

20. HEARING INFORMATION

(THE FIRST HEARING SHALL BE NO SOONER THAN 30 DAYS FOLLOWING THE POSTING OF NOTICES ONLINE).

IF THIS FORM IS INSUFFICIENT TO LIST THE INFORMATION FOR EACH HEARING, PLEASE ATTACH A SEPARATE SHEET TO COMPLETE THE HEARING INFORMATION.

Date: 12/2/2022

Time: 02:00 PM

Street Address: VIRTUAL HEARING, MICROSOFT TEAMS

Zip Code:

URL for Virtual: https://teams.microsoft.com/l/meetup-join/19%3ameeting_NWMxYjYzOTktNGU4YS00NjEyLTNmZmMtYjU5ZmUxYTVlOWFi%40thread.v2/0?context=%7b%22Tid%22%3a%22f824a265-cbc1-4afc-acc-7191c2525f6d%22%2c%22Oid%22%3a%22d26bc85b-e562-4bc5-81ea-2a3b3911df03%22%7d.

Date:

Time: AM

Street Address:

Zip Code:

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Street Address:

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Date:

Time: AM

Street Address:

Zip Code:

URL for Virtual:

21. DEADLINE FOR COMMENT (NO EARLIER THAN 7 DAYS FOLLOWING LAST HEARING):

12/9/2022

KEYWORDS (PLEASE PROVIDE AT LEAST 3 KEYWORDS OR PHRASES TO AID IN THE SEARCHABILITY OF THE RULE NOTICE ONLINE).

residential building energy standards

residential energy code

RBES

Adopting Page

Instructions:

This form must accompany each filing made during the rulemaking process:

Note: To satisfy the requirement for an annotated text, an agency must submit the entire rule in annotated form with proposed and final proposed filings. Filing an annotated paragraph or page of a larger rule is not sufficient. Annotation must clearly show the changes to the rule.

When possible, the agency shall file the annotated text, using the appropriate page or pages from the Code of Vermont Rules as a basis for the annotated version. New rules need not be accompanied by an annotated text.

1. TITLE OF RULE FILING:

**Vermont Residential Building Energy Standards (RBES)
Amendments**

2. ADOPTING AGENCY:

Department of Public Service

3. TYPE OF FILING (*PLEASE CHOOSE THE TYPE OF FILING FROM THE DROPDOWN MENU BASED ON THE DEFINITIONS PROVIDED BELOW*):

- **AMENDMENT** - Any change to an already existing rule, even if it is a complete rewrite of the rule, it is considered an amendment if the rule is replaced with other text.
- **NEW RULE** - A rule that did not previously exist even under a different name.
- **REPEAL** - The removal of a rule in its entirety, without replacing it with other text.

This filing is **AN AMENDMENT OF AN EXISTING RULE** .

4. LAST ADOPTED (*PLEASE PROVIDE THE SOS LOG#, TITLE AND EFFECTIVE DATE OF THE LAST ADOPTION FOR THE EXISTING RULE*):

SOS LOG #:19-072

Title: Residential Building Energy Standards (RBES)

Effective Date: 09/01/2020



INTERAGENCY COMMITTEE ON ADMINISTRATIVE RULES (ICAR) MINUTES

Meeting Date/Location: October 10, 2022, virtually via Microsoft Teams

Members Present: Chair Douglas Farnham, Brendan Atwood, Diane Bothfeld, Jared Adler, Jennifer Mojo, John Kessler, Diane Sherman, Michael Obuchowski and Donna Russo-Savage

Minutes By: Melissa Mazza-Paquette

- 2:01 p.m. meeting called to order, welcome and introductions.
- Review and approval of minutes from the September 12, 2022 meeting.
- No additions/deletions to agenda. Agenda approved as drafted.
- No public comments made.
- The following emergency rules were supported by ICAR Chair Farnham (*note the summaries may be found on the agenda*):
 - Transitional Housing Program Emergency Rules, Agency of Human Services, Department for Children and Families, on 09/22/22
 - The Board of Medical Practice Emergency Rule, Agency of Human Services, Department of Health, on 09/30/22
 - PUC Emergency Rule 2.500 COVID-19 Emergency Procedures, Public Utility Commission, on 09/30/22
- Presentation of Proposed Rules on pages 3-9 to follow.
 1. Licensing Regulations for Foster Homes in Vermont, Agency of Human Services, Department for Children and Family Services, page 3
 2. Telehealth, Agency of Human Services, page 4
 3. Prosthetic and Orthotic Devices, Agency of Human Services, page 5
 4. Podiatry Services, Agency of Human Services, page 6
 5. Transplantation Services, Agency of Human Services, page 7
 6. Vermont Commercial Building Energy Standards, Department of Public Service, page 8
 7. Vermont Residential Building Energy Standards Amendments, Department of Public Service, page 9
- No other business.
- Next scheduled meeting is November 14, 2022 at 2:00 p.m.
- 3:47 p.m. meeting adjourned.

Presented By: Ben Civiletti, Barry Murphy and Kelly Launder

Motion made to accept the rule by Diane Bothfeld, seconded by Mike Obuchowski, and passed unanimously with the following recommendations:

1. Incorporate relevant feedback from the Vermont Commercial Building Energy Standards – stated below for reference:
 - a. Provide the year when referring to the ICC standards.
 - b. Proposed Filing Coversheet, #8: Include the date when the update occurred, what was updated, what is being done beyond the ICC, and explain the importance. Clearly identify that this is the Commercial rule – as it’s written now, it’s the same as the Residential rule.
 - c. Proposed Filing Coversheet, #12: Provide an overview of the cost and benefit. Define ‘modest’.
 - d. Economic Impact Analysis, #3: Clarify units and title in the chart, and include references and footnotes.
 - e. Define acronyms early and often.
 - f. Economic Impact Analysis: Include parallel data to ICC.
 - g. Economic Impact Analysis: Clearly identify who benefits from the economic impacts. Perhaps include a narrative separating the affecting parties.
 - h. Environmental Impact Analysis, #9: Identify the sources of information used and the analysis done.
 - i. Public Input Maximization Plan, #4: Remove duplicates.

Economic Impact Analysis

Instructions:

In completing the economic impact analysis, an agency analyzes and evaluates the anticipated costs and benefits to be expected from adoption of the rule; estimates the costs and benefits for each category of people enterprises and government entities affected by the rule; compares alternatives to adopting the rule; and explains their analysis concluding that rulemaking is the most appropriate method of achieving the regulatory purpose. If no impacts are anticipated, please specify “No impact anticipated” in the field.

Rules affecting or regulating schools or school districts must include cost implications to local school districts and taxpayers in the impact statement, a clear statement of associated costs, and consideration of alternatives to the rule to reduce or ameliorate costs to local school districts while still achieving the objectives of the rule (see 3 V.S.A. § 832b for details).

Rules affecting small businesses (excluding impacts incidental to the purchase and payment of goods and services by the State or an agency thereof), must include ways that a business can reduce the cost or burden of compliance or an explanation of why the agency determines that such evaluation isn't appropriate, and an evaluation of creative, innovative or flexible methods of compliance that would not significantly impair the effectiveness of the rule or increase the risk to the health, safety, or welfare of the public or those affected by the rule.

1. TITLE OF RULE FILING:

**Vermont Residential Building Energy Standards (RBES)
Amendments**

2. ADOPTING AGENCY:

Department of Public Service

3. CATEGORY OF AFFECTED PARTIES:

LIST CATEGORIES OF PEOPLE, ENTERPRISES, AND GOVERNMENTAL ENTITIES POTENTIALLY AFFECTED BY THE ADOPTION OF THIS RULE AND THE ESTIMATED COSTS AND BENEFITS ANTICIPATED:

This rule will primarily affect new home builders, developers, and buyers. For the home buyer or home owner, this rule will result in a positive cash flow and an 8% to 27% (35% including the social cost of carbon) return on investment (ROI) for a typical new home compared to the same home built to the 2020 RBES,

currently in effect. Modifications to the proposed 2023 RBES since the proposed filing with the Secretary of State on 10/27/2022 were necessary to ensure a cost-effective set of improvements compared to RBES 2020. These changes were necessary after the 2020 code reference home used in the model for comparison to the proposed 2023 code was changed to better reflect a 2020 RBES-compliant home, and cost estimates were updated based on feedback from stakeholders. Specifically, the baseline reference home used in the proposed filing was the 2020 RBES Package 1 only, without the added components that provide the required points for 2020 RBES compliance. Using this improved 2020 RBES reference home in the cost effectiveness model results in a more efficient baseline, which in turn means less energy savings when a 2023 RBES-compliant home is compared to this more efficient baseline. Additionally, new cost estimates were received for the proposed wall insulation measure, which made both the measure and the RBES package of recommendations as a whole not cost-effective. Accordingly, the Department found it necessary to make changes to certain components of the proposed 2023 RBES to arrive at a cost-effective package of improvements. These changes were: 1) window U-factor requirements (changing from 0.27 back to the former 2020 RBES value of 0.30); 2) wall U-factor requirements (changing from the proposed 0.033 back to 2020 RBES value of 0.044); and 3) requiring "solar ready" for Stretch Code only and not for the base code. These changes resulted in a reduction of the total incremental package costs from \$12,081 (for the standard low cost package) to \$1,018 (for standard low cost package) as compared to RBES 2020 (See Attachment A, Tables 1 and 2).

The Department took a conservative approach for the analysis by not including any projected increase in fossil fuel heating prices or consideration of available incentives from Efficiency Vermont, federal tax credits, or impending rebates from the Inflation Reduction Act.

An addition made to the cost-effectiveness analysis from the previous filing with the Secretary of State is it considers three scenarios; a fossil fueled home, an all-electric home, and a blend of the two (the blending of the two is new). The all-electric home is significantly more cost effective than the fossil fuel home. The recently completed PSD market assessment study found 19% of new homes were electrically heated and 81% were heated with fossil fuels. So, when weighted at 19%/81%, the blended results (16% ROI) are between the fossil fuel home (8% ROI) and the all-electric home (27% ROI). We present the results of the cost effectiveness analysis in Attachment A, Tables 1 and 3, for each of the three scenarios. All the scenarios are cost-effective.

While developers or builders may initially be impacted by the added cost of more energy efficient buildings due to the more stringent Residential Building Energy Standards (RBES), ultimately it will be the homebuyer who ends up paying for the improved home and also reaping the savings and benefits of the more energy efficient home and lower operating costs. In addition, society benefits from a lower-polluting home through reduced impacts on the climate relative to standard construction.

Below is a summary of the 2023 RBES enhancements and substantive changes relative to the current 2020 RBES:

1. Multifamily Alignment

a. Aligned RBES and CBES standards for multifamily buildings as much as possible to provide consistency regardless of whether they fall under RBES or CBES.

2. Packages

a. Combined Base Code and Stretch Code into a single "Standard Package" for simplicity and flexibility with just a different level of points required for each.

b. Maintained a "Log Home Package"

3. Thermal Envelope Improvements

a. Increased insulation requirements for some surfaces

b. Tighter air leakage rates

4. Points

a. Adjusted the number of required points based on house size, while recognizing the inherent higher efficiency of multifamily buildings

b. Added additional options for points:

i. Demand Response (DR) enabled appliances

ii. Higher insulation levels

iii. More efficient mechanical ventilation systems

iv. Better windows

v. Solar ready zone (for base only, required for stretch)

c. Insulation Embodied Carbon

i. Developed new optional points for selecting low embodied carbon insulation materials

5. Mechanical Ventilation

a. Now requires an efficient balanced whole-house ventilation system with heat or energy recovery

6. Electrification

a. Electric Vehicles (EV)

i. Included "EV Capable" requirements to ensure that it will be easy to install EV Supply Equipment in the future

b. Electric Service Panel

i. Require an electric service panel capable of powering the whole home or apartment with all electric end-uses

7. Tiny Houses

a. Recognized and added standards for tiny houses

8. Definitions

a. Updated and added a number of definitions

9. New Specific Measures

a. 100% LED Lighting

- b. Air-sealed electrical boxes
 - c. All ducts must be placed inside the building thermal envelope
 - d. Exterior lighting controls
 - e. Electric meter for every unit (except affordable multifamily housing)
 - f. Efficient electrical transformers
10. Home Energy Rating System (HERS)
- a. Updated HERS Index scores for Base Code (60) and Stretch Code (59)
 - b. Recognize additional HERS rating software tools
11. Additions and Alterations
- a. Clarified that unaltered portions of buildings do not need to comply with RBES
12. Referenced Standards
- a. Updated referenced standards

In order to price out the incremental cost of these proposed code improvements, we worked with a modular home builder and an affordable housing developer and one of their contractors to estimate two typical 2023 RBES compliant building configurations for the Base Code and the same two building configurations for the Stretch Code. The Stretch Code is slightly more stringent than the Base Code and is the required standard for Act 250 projects.

All of these building configurations start from the same basic "package" of building insulation, windows and doors, air tightness and HVAC systems required to meet the 2020 RBES. There is then a long list of measures with associated "points" from which the builder or homeowner may choose. Depending on the house type (e.g., single family, multifamily, addition) and size, a certain number of points are required. Two different configurations based on the average Vermont new home size and fuel type were used as examples in this analysis.

The standard base code "low cost" configuration is comprised of the required basic home "package" plus those points that would achieve code compliance at the lowest cost. The measures selected in this example to achieve the required five points include tightening up the building's air leakage to 1 ACH50 and installing a more efficient heat recovery ventilation system. The second standard "all electric" home installed a cold climate air source heat pump and basic electric water heater instead of fossil fuel heating and hot water equipment. The total package costs, annual savings compared to the same home built to the 2020 RBES with the statewide mix of fuel types, simple payback, return on investment (ROI) and cash flow (assuming the incremental costs of building to the 2023 RBES are rolled into a 30-year 6% APR mortgage, and the annual mortgage payments are compared to the annual energy savings) are all presented in Attachment A, Table 1. With a simple payback shorter than the life of the measures, an ROI greater than 8%, and positive cash flow in all cases, we have determined that these example home configurations demonstrate that the 2023 RBES is cost effective.

Additionally, in order to show the benefits of the climate impacts, Table 1 also shows the calculations when current societal cost of carbon for the saved energy are included. When considering the societal cost of carbon as a benefit, the savings and cost effectiveness metrics increase significantly.

The stretch code standards for the 2023 RBES require improved energy performance at a slightly higher cost. In addition to the measures listed above for the standard home, the "low cost" stretch home also included points for low-flow water fixtures and a demand response enabled thermostat. The stretch "all electric" home swapped out the standard electric water heater for a more efficient heat pump water heater. Similar to the results for the standard "low cost" and "all electric" homes, these homes upgraded to the stretch code are also all cost effective, as shown in

Attachment A, Table 3. Adding in the social cost of carbon makes the results look even better.

This analysis for both the Base Code and the Stretch Code demonstrates savings greater than costs and therefore the cost effectiveness of the 2023 RBES.

4. IMPACT ON SCHOOLS:

INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON PUBLIC EDUCATION, PUBLIC SCHOOLS, LOCAL SCHOOL DISTRICTS AND/OR TAXPAYERS CLEARLY STATING ANY ASSOCIATED COSTS:

No impact, as school buildings are not covered under RBES.

5. ALTERNATIVES: *CONSIDERATION OF ALTERNATIVES TO THE RULE TO REDUCE OR AMELIORATE COSTS TO LOCAL SCHOOL DISTRICTS WHILE STILL ACHIEVING THE OBJECTIVE OF THE RULE.*

N/A

6. IMPACT ON SMALL BUSINESSES:

INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON SMALL BUSINESSES (EXCLUDING IMPACTS INCIDENTAL TO THE PURCHASE AND PAYMENT OF GOODS AND SERVICES BY THE STATE OR AN AGENCY THEREOF):

No impact, as businesses are not covered under RBES.

7. SMALL BUSINESS COMPLIANCE: *EXPLAIN WAYS A BUSINESS CAN REDUCE THE COST/BURDEN OF COMPLIANCE OR AN EXPLANATION OF WHY THE AGENCY DETERMINES THAT SUCH EVALUATION ISN'T APPROPRIATE.*

N/A

8. COMPARISON:

COMPARE THE IMPACT OF THE RULE WITH THE ECONOMIC IMPACT OF OTHER ALTERNATIVES TO THE RULE, INCLUDING NO RULE ON THE SUBJECT OR A RULE HAVING SEPARATE REQUIREMENTS FOR SMALL BUSINESS:

An alternative to this rule would be to adopt the 2021 IECC code as is. The up-front cost of this alternative would likely be less than the proposed rule as the efficiency measures are less stringent, although the energy savings would also be lower, resulting in a higher cost to the homeowner in the long run through added energy costs. Adopting no rule would mean significant lost opportunities with each home built if those additional savings weren't captured through an

improved energy code. Adopting no rule would also run afoul of the statutory requirement under 30 V.S.A. Section 51 that the Department "Commissioner shall ensure that appropriate revisions are made promptly after the issuance of updated standards for residential construction under the IECC."

9. SUFFICIENCY: DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.

The cost - benefit analysis underlying this economic impact statement was prepared by the Department's contractor and has been extensively reviewed by stakeholders and experts including home builders, architects, developers, and affordable housing advocates. Feedback from these stakeholders and experts was incorporated into the estimates presented here. External sources of information: For development of fuel costs: the Energy Information Administration (EIA). For information about electric rates: Green Mountain Power. For costs of natural gas: Vermont Gas Systems. For fuel incidence weighting: NMR VT Market Assessment Study. For costs of new measures in 2023 RBES: Internet searches, Huntington Homes analysis, and Evernorth review. For cost of carbon calculation: the Energy Information Administration (EIA). For information about carbon intensity of fuels and social cost of carbon in Vermont in 2023: Vermont Agency of Natural Resources.

ATTACHMENT A

Table 1: Revised Costs and Benefits Anticipated for 2023 RBES Standard Base Code

	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback	ROI	Cash Flow
Standard Low Cost 2023	\$83	\$1,018	12.2	8%	\$9
Standard Low Cost 2023 (with Social Cost of Carbon)	\$127	\$1,018	8.0	12%	N/A
Standard All Electric 2023	\$785	\$2,951	3.8	27%	\$570
Standard All Electric 2023 (with Social Cost of Carbon)	\$1,042	\$2,951	2.8	35%	N/A
Standard Blended (81% Fossil & 19% Electric)	\$216	\$1,385	6.4	16%	\$116
Standard Blended (81% Fossil & 19% Electric) (with Social Cost of Carbon)	\$301	\$1,385	4.6	22%	N/A

Table 2: Previously Filed Costs and Benefits Anticipated for 2023 RBES Standard Base Code

	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback (Years)	ROI	Cash Flow
Standard Low Cost 2023	\$917	\$12,081	13.2	8%	\$39
Standard Low Cost 2023 (with Social Cost of Carbon)	\$1,227	\$12,081	9.8	10%	N/A
Standard All Electric 2023	\$1,469	\$12,481	8.5	12%	\$562
Standard All Electric 2023 (with Social Cost of Carbon)	\$1,967	\$12,481	6.3	16%	N/A

Table 3: Revised Costs and Benefits Anticipated for 2023 RBES Stretch Code

	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback (years)	ROI	Cash Flow
Stretch Low Cost 2023	\$158	\$1,718	10.9	9%	\$33
Stretch Low Cost 2023 (with Social Cost of Carbon)	\$227	\$1,718	7.6	13%	N/A
Stretch All Electric 2023	\$908	\$4,551	5.0	20%	\$577
Stretch All Electric 2023 (with Social Cost of Carbon)	\$1,203	\$4,551	3.8	26%	N/A
Stretch Blended (81% Fossil & 19% Electric)	\$301	\$2,256	7.5	13%	\$137
Stretch Blended (81% Fossil & 19% Electric) (with Social Cost of Carbon)	\$412	\$2,256	5.5	18%	N/A

Table 4: Previously Filed Costs and Benefits Anticipated for 2023 RBES Stretch Code

	Average Annual Weighted Savings	Package Costs (over 2020 RBES)	Simple Payback (Years)	ROI	Cash Flow
Stretch Low Cost 2023	\$930	\$12,281	13.2	8%	\$38
Stretch Low Cost 2023 (with Social Cost of Carbon)	\$1,244	\$12,281	9.9	10%	N/A
Stretch All Electric 2023	\$1,592	\$13,481	8.5	12%	\$613
Stretch All Electric 2023 (with Social Cost of Carbon)	\$2,127	\$13,481	6.3	16%	N/A

Environmental Impact Analysis

Instructions:

In completing the environmental impact analysis, an agency analyzes and evaluates the anticipated environmental impacts (positive or negative) to be expected from adoption of the rule; compares alternatives to adopting the rule; explains the sufficiency of the environmental impact analysis. If no impacts are anticipated, please specify “No impact anticipated” in the field.

Examples of Environmental Impacts include but are not limited to:

- Impacts on the emission of greenhouse gases
- Impacts on the discharge of pollutants to water
- Impacts on the arability of land
- Impacts on the climate
- Impacts on the flow of water
- Impacts on recreation
- Or other environmental impacts

1. TITLE OF RULE FILING:

**Vermont Residential Building Energy Standards (RBES)
Amendments**

2. ADOPTING AGENCY:

Department of Public Service

3. GREENHOUSE GAS: *EXPLAIN HOW THE RULE IMPACTS THE EMISSION OF GREENHOUSE GASES (E.G. TRANSPORTATION OF PEOPLE OR GOODS; BUILDING INFRASTRUCTURE; LAND USE AND DEVELOPMENT, WASTE GENERATION, ETC.):*

The energy savings from homes built to the updated RBES will result in direct reductions in greenhouse gas emissions through reduced on-site fuel consumption and indirect greenhouse gas reductions through reduced electricity demand for the lifetime of the home. This rule also allows for the consideration of embodied carbon emissions from insulation materials used in the construction process (points may be earned for calculating estimated embodied carbon emissions from

insulation materials and for demonstrating lower insulation Global Warming Potential (GWP)).

4. **WATER:** *EXPLAIN HOW THE RULE IMPACTS WATER (E.G. DISCHARGE / ELIMINATION OF POLLUTION INTO VERMONT WATERS, THE FLOW OF WATER IN THE STATE, WATER QUALITY ETC.):*

No impact.

5. **LAND:** *EXPLAIN HOW THE RULE IMPACTS LAND (E.G. IMPACTS ON FORESTRY, AGRICULTURE ETC.):*

No impact.

6. **RECREATION:** *EXPLAIN HOW THE RULE IMPACTS RECREATION IN THE STATE:*

No impact.

7. **CLIMATE:** *EXPLAIN HOW THE RULE IMPACTS THE CLIMATE IN THE STATE:*

The energy savings from homes built to the updated RBES will result in direct and indirect reductions in greenhouse gas emissions and minimize the other negative environmental impacts of energy use.

8. **OTHER:** *EXPLAIN HOW THE RULE IMPACT OTHER ASPECTS OF VERMONT'S ENVIRONMENT:*

This rule promotes improved insulation and air sealing in new residential construction and renovations to reduce building heating and cooling demands. This rule also promotes the use of efficient appliances and mechanical systems, which will further reduce electricity and fuel consumption. Additionally, the rule will improve building durability, resident comfort and indoor air quality in new homes.

9. **SUFFICIENCY:** *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*

This environmental impact analysis covers the full range of environmental and climate impacts of the RBES updates.

Public Input Maximization Plan

Instructions:

Agencies are encouraged to hold hearings as part of their strategy to maximize the involvement of the public in the development of rules. Please complete the form below by describing the agency's strategy for maximizing public input (what it did do, or will do to maximize the involvement of the public).

This form must accompany each filing made during the rulemaking process:

1. TITLE OF RULE FILING:

**Vermont Residential Building Energy Standards (RBES)
Amendments**

2. ADOPTING AGENCY:

Department of Public Service

3. PLEASE DESCRIBE THE AGENCY'S STRATEGY TO MAXIMIZE PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF THE PROPOSED RULE, LISTING THE STEPS THAT HAVE BEEN OR WILL BE TAKEN TO COMPLY WITH THAT STRATEGY:

The Department of Public Service undertook a broad-based consensus building process to develop this rule. Between April and May 2022, the Department held two online public meetings to present the proposed code language and gather input from the public for modifying the draft 2023 RBES, which included builders, architects, multi-family housing developers, low-income housing advocates, electric and gas utilities, energy efficiency utilities, state agency staff (SHPO, Dept. of Fire Safety), modular home manufacturers, and log home industry representatives.

The Department also convened an RBES Advisory Committee as required by statute to delve deeper into the technical aspects of the code. The full Advisory Committee met in March and June of 2022 and a multifamily subcommittee met in late May. The Department modified the proposed RBES to incorporate

Public Input

changes recommended by the stakeholders and the Advisory Committee.

Public meeting participants, Advisory Committee members and other stakeholders were also encouraged to comment on the proposed RBES language posted on the PSD website. The PSD accepted comments for over a month (the comment period was extended per stakeholder request).

PSD developed the proposed rule based on these meetings, public comments and other feedback.

Information is available on the Department of Public Service website at:

<https://publicservice.vermont.gov/content/building-energy-standards-update>

After the proposed rule filing with the Secretary of State, we held a virtual public hearing and accepted comments for the duration of the public comment period.

4. BEYOND GENERAL ADVERTISEMENTS, PLEASE LIST THE PEOPLE AND ORGANIZATIONS THAT HAVE BEEN OR WILL BE INVOLVED IN THE DEVELOPMENT OF THE PROPOSED RULE:

The people and organizations below include Department staff and our contractors as well as those who participated in the Advisory Committee meetings, additional people (not listed below) also participated in the public stakeholder meetings and submitted comments.

Alex Weinhagen - Vermont Planners Association

Alison Stone - Vermont Natural Resources Board

Alyshia Jones - Snyder Homes

Anna Brannon - Guidehouse

Barry Murphy - VT Department of Public Service

Bob Duncan - Duncan Wisniewski Architecture

Brian Reilly - Burlington Electric Department

Charles Carpenter - Efficiency Vermont

Charlie Willner - EverNorth

Chris Burns - Burlington Electric Department