

Appendix M
Residential New Construction Baseline

Appendix M-1: Staff Testimony

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**By Laura Martel
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Introduction

1. What is the purpose of this testimony?

This testimony describes the Efficiency Maine Trust's (the Trust's or EMT's) interpretation of the Maine New Construction Baseline Assessment (attached hereto as Appendix M-2) for Triennial Plan V.

2. Who is introducing this testimony?

The testimony is provided by Laura Martel, Research and Evaluation Manager at the Trust.

3. Ms. Martel, please state your name, title, and business addresses.

My name is Laura Martel, and I am employed by EMT as the Research and Evaluation Manager. My business address is 168 Capitol Street, Suite 1, Augusta, ME 04330.

4. Please summarize your educational and professional experience.

I have a Bachelor of Science degree in Ocean Engineering from Florida Atlantic University and a Master of Engineering degree in Acoustics from Pennsylvania State University. I have over 21 years of technical leadership, project management, and research and evaluation experience. I was hired by EMT in 2014 to design and implement impact and process evaluations for energy efficiency programs. Prior to joining EMT, I was with Lockheed Martin in Manassas, Virginia, where I served in various engineering, management, and technical leadership roles of increasing responsibility.

Background

5. Why did the Trust commission the New Construction Baseline Assessment as part of the research for Triennial Plan V?

An earlier baseline study of residential new construction in Maine was conducted in 2008 by the Vermont Energy Investment Corp (VEIC).¹ That study found that many homes in Maine were not being built to code and had significant opportunities for improvements that would achieve energy savings. In the intervening 12 years, Maine has implemented updated energy codes. The Trust sought to understand the level of code compliance and savings opportunity in recently constructed homes. The Trust commissioned Ridgeline Energy Analytics to complete this study for that purpose.

6. How was the research conducted?

This study examined 127 homes across Maine, 29 of which were manufactured (mobile) homes. Home raters visited each home and recorded a detailed assessment of all home components that contribute to the energy use of the home, including the thermal envelope, heating equipment, lighting, and

¹ Vermont Energy Investment Corp., [*Maine Residential New Construction Technical Baseline Study*](#), May 15, 2008.

appliances. The on-site assessments were performed using Home Energy Rating System inspections developed by the Residential Energy Services Network (RESNET, Inc.). The study team modeled as-built energy use and potential energy savings through increased compliance with codes using REM/Rate and Ekotrope Rater software.²

7. What were the key findings of the study?

The study team found that homes built between 2017 and 2020 are more energy efficient than the homes assessed for the 2008 VEIC study, showing improvement in code compliance and construction techniques. Many of the new homes had one or more components that did not meet code. Though full code compliance for all components would reduce energy use, Ridgeline determined that the incremental savings would be minor for 25% of single and multifamily homes (less than 1 MMBtu/year) and moderate for the next 50% of single and multifamily homes (between 1 and 8 MMBtu/year/home). While 35% of all homes could achieve savings above 10 MMBtu/year/home, nearly all are manufactured homes that are not subject to local building codes. On the other hand, the potential energy and greenhouse gas emissions savings from electrification of space heating are significant (average savings of 23 MMBtu/year/home across all homes). This upgrade is applicable to 63% of homes not already heated with heat pumps and a portion of the 18% of homes that have fossil fuel-fired heating equipment in addition to heat pumps. Excluding homes already exclusively heated with heat pumps or heat pumps with small supplemental electric resistance (19%), the average savings per home achievable by electrification of space heating increases to 28 MMBtu/year/home, which is equivalent to almost half of the average per home energy use as-built. The study is included as [Appendix M-2](#).

8. Given the findings of the study, will the Trust offer energy efficiency measures related to code compliance during Triennial Plan V?

No. Code compliance is legally required for new homes built in every municipality in Maine, and the savings potential from improving code compliance (i.e., improving building practices to bring previously non-compliant practices up to code) is moderate. Moreover, most components in most newly constructed homes are code compliant. The Trust finds that there is not a cost-effective opportunity for it to offer thermal envelope measures to target new construction that would otherwise fail to comply with code.

9. What other opportunities will the Trust pursue related to new construction during Triennial Plan V given the findings of the study?

The findings of the study indicate that code compliance improves over time as builders become more familiar with the requirements and techniques required to meet them. The Trust sees an opportunity to accelerate that process, with the recent adoption of the 2015 International Energy Conservation Code (IECC) statewide, by offering training to builders and code enforcement officers.

² More information on these software packages is available at <http://www.remrate.com> and <https://www.ekotrope.com/ekotrope-rater>, respectively.

The Trust will continue to offer incentives for the most efficient heating equipment for which new homes are eligible. The Trust will focus on whole home space-heating solutions for new construction and continue to offer incentives on the most efficient domestic water-heating solutions.