

# Development and Use of Building Energy Disclosure Tools: Report to Vermont General Assembly

December 15, 2016

## Background

Act 89, passed in 2013, required the Public Service Department (PSD) to convene two Working Groups, one focused on residential single-family buildings and one focused on commercial and multifamily buildings. The Working Groups were charged with developing “a consistent format and presentation for an energy rating that an owner of a building may use to disclose the energy performance of the building or a unit within the building to another person, including a potential purchaser or occupant, or that a prospective purchaser or occupant of a building or unit within a building may use to compare the energy performance of multiple buildings or units.” The Working Groups were also asked to “develop or select one or more tools that can be used to generate the energy rating.”<sup>1</sup> The Working Groups developed recommendations and submitted reports to the General Assembly in 2013 and 2014. These reports are available at: [http://publicservice.vermont.gov/energy\\_efficiency/buildingenergy\\_labeling](http://publicservice.vermont.gov/energy_efficiency/buildingenergy_labeling).

Act 89 also required the PSD to further report to the General Assembly on the development and use of disclosure tools by December 15, 2016. This report fulfills this obligation. The following items were outlined in Act 89 to be addressed in this report:

1. Identify the tools selected or adopted by the Working Group under this subsection;
2. Describe the efforts made to disseminate the tools for public use;
3. Describe, to the extent feasible, the frequency of the tools’ use, including their relative use by sector, such as residential or commercial, and the contexts in which the tools were used, such as property sale or lease;
4. Analyze and recommend whether building energy disclosure requirements should be made mandatory for one or more sectors and whether any such requirement should be met by all subject properties by a date certain or whether it should be triggered by an event such as time of sale or lease; and
5. Include the Department’s proposed legislation to implement its recommendation under subdivision (4) of this subsection.<sup>2</sup>

This report uses the term “labeling” to mean the provision of a label that can be used to disclose the energy performance of a building. The label may include a “score” or “rating,” which is a single metric designed to convey the building’s energy performance on a scale such as 1-10, 0-

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<sup>1</sup> Vermont Act 89. An act relating to reducing energy costs and greenhouse gas emissions.

[http://publicservice.vermont.gov/sites/dps/files/documents/Energy\\_Efficiency/June%202013%20ACT089.pdf](http://publicservice.vermont.gov/sites/dps/files/documents/Energy_Efficiency/June%202013%20ACT089.pdf).

<sup>2</sup> Ibid.

100, or A-F. A disclosure “tool” is the energy modeling software used to generate a score or rating. A building energy label may also include supplemental information in addition to the score or rating, such as information on energy costs or building features, such as conditioned area, insulation levels and heating system efficiency.

In Vermont, as well as nationally, labeling activities for residential single-family buildings and multifamily, commercial, and mixed use buildings have proceeded on separate paths with different tools and approaches. Therefore, this report will address residential single-family building energy labeling and then multifamily/commercial/mixed-use building energy labeling.

Across all sectors, labeling and disclosure activities in Vermont are still in relatively early stages. Therefore, this report focuses on the state’s labeling and disclosure progress to date, rather than providing a formal evaluation of market impacts and trends.

### **Progress on Residential Single-Family Building Labeling**

This section reviews the status and progress to date on residential single-family building energy labeling since the Working Group recommendations were submitted in December 2013.<sup>3</sup>

#### **Tool Selection and Data Presentation**

The residential Working Group recommended a standard home energy label for statewide use in Vermont that should include four primary pieces of information:

1. An asset<sup>4</sup> and site energy-based<sup>5</sup> MMBtu/year total projected energy consumption score;
2. Projected annual energy costs and by fuel type;
3. The U.S. Department of Energy (DOE) Home Energy Score; and
4. A general description of the home.

Appendix A shows the latest version of Vermont’s home energy label, known as the Vermont Home Energy Profile.

In order to ensure that energy performance is being consistently and accurately estimated, the Working Group recommended the use of a single energy modeling tool to generate the information included in the Vermont home energy label. For residential buildings, the Working Group recommended that the DOE Home Energy Scoring Tool be the tool used for labeling and disclosure of residential single-family buildings in Vermont. Key reasons the DOE tool was selected include:

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<sup>3</sup> [http://publicservice.vermont.gov/sites/dps/files/documents/Energy\\_Efficiency/BEDWG/Vermont\\_Energy\\_Label\\_Report\\_to\\_Legislature\\_12-13-13\\_FINAL.pdf](http://publicservice.vermont.gov/sites/dps/files/documents/Energy_Efficiency/BEDWG/Vermont_Energy_Label_Report_to_Legislature_12-13-13_FINAL.pdf).

<sup>4</sup> “Asset-based” means that energy consumption is modeled based on the energy features found in the home under average occupancy and weather conditions, rather than on the actual electricity and fuel consumption.

<sup>5</sup> “Site energy” means that the energy consumption only factors in the electricity and fuel used on-site, and does not include the energy required to produce, transport and deliver those fuels.

- Analysis found the DOE tool to be reasonably accurate for Vermont housing stock.
- The DOE tool is free to use and supported by DOE and the Pacific Northwest National Laboratory.
- The DOE tool has APIs<sup>6</sup> that can enable it to be integrated with energy audit tools that are already in use in Vermont, such as the CakeSystems software used by Neighborworks of Western Vermont.
- DOE has established standards for training and quality assurance for energy auditors, contractors, and others to become certified as Qualified Assessors.<sup>7</sup>
- Alignment with the DOE Home Energy Score as a nationally standard approach could create opportunities for Vermont homeowners to benefit from national tax credits and loan products.

### **Efforts Made to Disseminate Tools for Public Use**

The Working Group recommended beginning with a voluntary approach to home energy labeling, to test how energy labeling and better energy information can add value for homeowners, buyers, sellers and renters.

The Working Group also recommended that Efficiency Vermont serve as coordinator of Vermont's home energy labeling efforts, with guidance and oversight from an Advisory Board that includes the PSD, utilities, WAPs, and real estate industry representatives. As coordinator, Efficiency Vermont was charged with the following functions:

- Procuring, configuring, maintaining, and updating the scoring tool software;
- Serving as a repository for energy scores and associated data;
- Hosting a website where customers can learn about the energy label
- Serving as a resource to answer Vermonters' questions about the energy label;
- Training and supporting Assessors;
- Performing quality assurance (QA) on a percentage of the energy scores produced; and
- Reporting aggregate results.

Since 2013, Efficiency Vermont has been working with the Advisory Board to implement the Working Group's recommendations for voluntary home energy labeling. One initial challenge was the lack of dedicated funding for labeling. In 2014, on behalf of Efficiency Vermont, Vermont Energy Investment Corporation (VEIC) secured a \$380,000 grant from DOE that provided funding to advance home energy labeling in both Vermont and New Hampshire. In combination with matching funds from Efficiency Vermont and the PSD, this grant has covered the majority of costs for the state's residential labeling activities to date. The grant became active in July 2015 and extends through December 2017.

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<sup>6</sup> An application programming interface (API) is a protocol intended to be used as an interface by software components to communicate with each other.

<sup>7</sup> Qualified Assessors are qualified to use the DOE Home Energy Score tool.

With funding from this DOE grant, Efficiency Vermont and the Advisory Board have completed the following activities as of December 2016:

- Trained two Efficiency Vermont staff as quality assurance (QA) providers for the DOE tool;
- Completed a mini-pilot in 2015 to test the recommended implementation approach;
- Offered trainings in spring 2016 on the DOE Home Energy Scoring Tool, with 23 individuals successfully completing the training to become DOE Qualified Assessors. In addition to those trained by Efficiency Vermont, five Assessors completed the training independently, bringing the total to 28 Qualified Assessors, including:
  - 15 Home Performance with ENERGY STAR (HPwES) contractors
  - 1 home inspector
  - 4 unaffiliated home assessors
  - 6 WAP energy auditors
  - 2 Efficiency Vermont QA providers
- Initiated a larger pilot program in June 2016 making the VT Home Energy Profile available to Vermont homeowners, home buyers, and home sellers via the above Assessors. The pilot was market-based, and Assessors were able to set their own pricing for the Profile and determine how best to fit it into their business model.
- Developed marketing materials and an outreach campaign to promote the Profile through community groups and real estate agents.
- Partnered with Vermont Realtors and the Vermont Green Homes Alliance on numerous educational programs for real estate agents, appraisers, and lenders. These include a successful Green Real Estate Symposium in October 2015 that attracted more than 200 real estate industry stakeholders for continuing education courses related to green building topics.

### **Frequency of Tools' Use**

As of December 2016, the labeling pilot had achieved the following metrics over five months of activity:

- 42 VT Home Energy Profiles generated.
- 18 Assessors remaining active offering the VT Home Energy Profile, including two Assessors providing Quality Assurance. Ten Assessors opted out or let their certification lapse for a variety of reasons.

The following are key lessons learned to date from the pilot:

- **Low demand from customers for voluntary labels.** With the exception of one Assessor who offered the Profile for free, most Assessors reported little or no customer demand for the Profile at market prices despite efforts to promote the Profile through real estate and community groups.

- **Variable pricing.** Assessors set their own prices during the 2016 pilot. The price that Assessors charged for the Profile ranged from free<sup>8</sup> to \$250. Pricing varied in part based on the complexity of the home and the driving distance.
- **Profiles used as customer engagement tool.** During the pilot, Profiles were most commonly delivered as a stand-alone offering to homeowners interested in learning more about their home's energy performance. It was less common for Profiles to be delivered in combination with another service, such as an energy audit or retrofit project.
- **Limited experience delivering the Profile at time of sale.** While many real estate agents were educated about the Profile, few seem to be actively promoting it to customers. With the departure of the lone home inspector from the program, it was challenging to actively target home buyers. In a few cases, sellers of efficient homes requested the Profile as a way to promote their home's performance to prospective buyers. Sellers faced some challenges leveraging the Profile in this way, however. Sometimes, the DOE scores for these homes were not always as high as hoped. Additionally, the New England Real Estate Network (NEREN) Multiple Listing Service (MLS) did not include a field for the DOE Home Energy Score or the VT Home Energy Profile MMBtu Energy Use metric until late in 2016.
- **Challenges integrating delivery of Profile with energy audit and retrofit programs.** The Working Group envisioned that energy audit and retrofit programs, such as the Vermont Gas Retrofit Program, Efficiency Vermont Home Performance with ENERGY STAR (HPwES) program, and Weatherization Assistance Program (WAP) would be the primary delivery channel for home energy labels in Vermont. In practice, integration with retrofit programs has proved difficult for several reasons. First, the Energy Efficiency Utilities (EEUs) and WAPs have not been able to integrate the DOE Home Energy Score API with their existing audit tools, so during the pilot Assessors needed to use at least two different tools to assess the home and generate the Profile. Second, it is resource-intensive to use the DOE tool, both because of the extensive training/testing procedure to become certified to use the tool and because of the added data collection and data entry time required. Third, the retrofit programs are concerned that incorporating the Profile could complicate customer messaging, particularly in cases where DOE score is not as good as hoped post-retrofit.

### **Planned Activities and Next Steps**

In order to allow for a more robust test of the VT Home Energy Profile, Efficiency Vermont and the Advisory Board plan to extend the pilot through June 2017. The 2017 pilot will incorporate a few key enhancements that should enable the Advisory Board to better assess the potential for voluntary home energy labeling in Vermont.

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<sup>8</sup> The most active Assessor delivered the Profiles for free as a way to test the approach and stimulate interest.

- **Subsidized delivery of the Profile.** It is clear that there is limited demand for the Profile at market prices. On a limited-time basis, Efficiency Vermont will subsidize the delivery of the Profile and associated in-home assessment so that it is free to customers.
- **Increased marketing and outreach.** Efficiency Vermont will increase marketing and outreach through a variety of channels, including additional promotion through community energy groups and real estate industry trainings and events.
- **More accurate energy modeling.** DOE plans to release an updated version of the Home Energy Scoring tool that will enable more accurate modeling of minisplit heat pumps and photovoltaic (PV) systems. This should enable the tool to be used with all Vermont single-family houses.
- **Ability to include DOE Home Energy Score and VT Home Energy Profile in the MLS.** Now that new fields are included in the NEREN MLS, Efficiency Vermont will work with the Vermont Green Homes Alliance and real estate stakeholders to provide training on the use of these new fields.

In the second half of 2017, the Residential Building Energy Labeling Advisory Board will evaluate the results of the home energy labeling pilot and recommend next steps. The Advisory Board will assess whether the voluntary labeling approach originally recommended by the Residential Working Group is viable in the Vermont market, and what incentives or supports are needed to promote market adoption. It will also discuss how to coordinate and fund Vermont's labeling activities on an ongoing basis after 2017, when DOE funding is no longer available.

### **Progress on Commercial, Multifamily, and Mixed Use Building Labeling**

A Working Group focused on commercial, multifamily and mixed-use buildings was formed from interested and representative stakeholders in 2014 and met regularly throughout the year. The Commercial/Multifamily/Mixed-Use Building Energy Labeling Working Group presented its report<sup>9</sup> to the General Assembly in December 2014. This section summarizes the findings and recommendations from that report, following the questions presented in Act 89.

#### **Tool Selection and Data Presentation**

The Working Group reviewed the available tools and options for labeling commercial, multifamily, and mixed use buildings, as well as labeling individual units within buildings. The Working Group reached agreement that the best approach for conveying energy information would be to recommend benchmarking<sup>10</sup> buildings based on actual operational site-based energy consumption data. The Working Group recommended using the benchmarking tool that is used predominantly throughout the country, the U.S. Environmental Protection Agency's (EPA)

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<sup>9</sup> [http://publicservice.vermont.gov/sites/dps/files/documents/Energy\\_Efficiency/BEDWG/Comm-MF%20Bldg%20Energy%20Labeling%20Report%20to%20Legislature%2012-15-14%20final.pdf](http://publicservice.vermont.gov/sites/dps/files/documents/Energy_Efficiency/BEDWG/Comm-MF%20Bldg%20Energy%20Labeling%20Report%20to%20Legislature%2012-15-14%20final.pdf)

<sup>10</sup> Benchmarking: The process of tracking a building's energy (and water) usage, using a standard metric to evaluate its relative efficiency over time as well as to compare the building's efficiency to its peers locally and nationwide.

ENERGY STAR Portfolio Manager (ESPM). The Working Group also recommended presenting information in terms of an Energy Use Intensity (EUI) measured in kBtu/square foot/year as the primary metric for commercial, multifamily, and mixed-use buildings. The EUI is relatively easy to derive but requires obtaining information on all energy used in a building in the past year, as well as the building size. The Working Group recommended using the ESPM “Statement of Energy Performance Report” as the interim label to report the EUI and supporting building information to prospective buyers and tenants, but did not reach consensus on where and how the label and energy information would be posted or disclosed.

### **Efforts Made to Disseminate Tools for Public Use**

The Commercial/Multifamily/Mixed Use Building Energy Labeling Working Group recommended a phased approach for implementation, starting with buildings that use only regulated fuels (electricity and/or natural gas) with a single whole-building utility account owner before embarking on buildings with multiple utility account holders and buildings that use delivered fuels. The challenge with these later building types is the complexity and challenge of obtaining fuel bill releases from all renters within these commercial buildings in order to accurately calculate the EUI.

The Working Group found that other jurisdictions have put in place provisions to allow for the aggregation of tenant utility data and release to the building owner in order to facilitate benchmarking. Beginning in 2015, the Working Group participated in a Building Energy Labeling proceeding conducted by the Vermont Public Service Board (PSB), which held two workshops to discuss benchmarking and data aggregation and storage issues. In the end, the PSB inferred that it did not have the statutory authority to order the data aggregation and release obligations that are a necessary condition precedent to establishing a building energy labeling program. Therefore, we also seek a legislative declaration that building energy labeling and benchmarking is a “valid public purpose” as that term is defined by the Board in their Order of June 23, 2000 in Docket 6379 and that the PSB should be authorized to implement mechanisms that will require utilities to aggregate and release anonymized data for that purpose.

### **Frequency of Tools’ Use**

Despite the lack of consensus on how best to implement benchmarking and labeling for commercial, multifamily, and mixed use buildings, and the current impediments to aggregation and release of anonymized data, notable progress has been made since 2014 on benchmarking Vermont buildings. Efficiency Vermont supports building owners and managers who are interested in benchmarking as tool to better manage their energy usage.<sup>11</sup> Efficiency Vermont has also enabled automatic transfer of utility data to ESPM, so that customers can automatically upload their electricity usage data without needing to enter the data manually. Efficiency

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<sup>11</sup> Efficiency Vermont, <https://www.encyvermont.com/services/energy-assessments/business-energy-assessments>.

Vermont has facilitated benchmarking for several targeted sectors, including commercial real estate, state and Federal buildings, hospitals, schools, and grocery stores. Efficiency Vermont has also incorporated benchmarking using ESPM in its Deep Retrofit Program, in which commercial customers commit to reduce their total energy use (combined fuel/electric) by half. Burlington Electric Department (BED) has also benchmarked its public schools along with several municipal, affordable housing, and privately owned buildings. In addition, some affordable housing agencies are benchmarking multifamily buildings when they already have access to all of the energy usage data.

Less progress has been made on labeling and disclosure of benchmarked buildings. The focus so far has been on using benchmarking as a tool to encourage owners and managers of lagging buildings to improve their energy performance and to recognize owners and managers of leading buildings with ENERGY STAR certification. Schools, hospitals, and the commercial real estate sector in particular have been interested in pursuing ENERGY STAR certification. At present, there is no requirement in Vermont to publicly disclose the EUI results for buildings that have been benchmarked, and important questions remain about how to protect customer confidentiality if benchmarking data were disclosed.

### **Planned Activities and Next Steps**

In order to facilitate building energy labeling and benchmarking across all types of commercial, multifamily, and mixed use buildings, the Commercial/Multifamily/Mixed Use Building Energy Labeling Working Group seeks a legislative declaration that building energy labeling and benchmarking is a “valid public purpose” as that term is defined by the Board in their Order of June 23, 2000 in Docket 6379 and that the PSB should be authorized to implement mechanisms that will require utilities to aggregate and release anonymized data for that purpose. Without direct legislative authorization it is possible that the current statutory language could be narrowly interpreted to prevent the aggregation and release of such data, which would prevent the wide-scale implementation of a building energy labeling program.

As of the writing of its report in December 2014, the Working Group had not reached consensus on many issues related to implementing commercial/multifamily/mixed use building benchmarking and labeling in Vermont. The following issues remain unresolved:

- Budgets for supporting these recommendations
- Schedule that addresses development, field testing and reporting back to the General Assembly
- Label design
- Benchmarking and labeling service statewide management, providers and process
- Technical resource call center
- QA provider
- Data storage
- Public disclosure of labeled building results



- Tenant lease language
- Evaluation

While there are no current plans to reconvene, the Working Group is open to continuing to meet to make progress on these unresolved issues.

### **Consideration of Mandatory Building Energy Disclosure**

For the residential sector, the Advisory Board believes that it is premature to consider whether building energy disclosure should be made mandatory at time of sale, given that a home energy labeling pilot is currently underway and a complete evaluation of results is not yet available. Given that key questions remain unresolved, Vermont Realtors and other real estate industry representatives do not at this stage support mandatory disclosure of energy performance at time of sale.

In the meantime, real estate stakeholders are meaningfully engaged in the current voluntary labeling pilot and related activities. A real estate representative serves on the Residential Energy Labeling Advisory Board, and Vermont Realtors supports continuing the home energy labeling pilot. Further, the Residential Energy Labeling Advisory Board has been working productively with Vermont Realtors, the Vermont Green Homes Alliance, and other real estate industry stakeholders on continuing education for REALTORS<sup>®</sup>, appraisers, and lenders on green building topics. Vermont Realtors also plans to offer a second Green Real Estate Symposium in fall 2017.

For the commercial/multifamily/mixed use sector, the Working Group did not reach consensus on whether and how to publicly disclose energy data for benchmarked buildings. Therefore, the Working Group is not prepared to offer a recommendation at this time on whether building energy disclosure should be made mandatory.

### **Next Steps and Future Legislation**

The PSD will continue to work with the Residential Building Energy Labeling Advisory Board and the Commercial/Multifamily/Mixed Use Working Group and report back to the General Assembly by December 15, 2018 with a further update on Vermont's voluntary labeling activities. That report may revisit the question of mandatory disclosure and recommend legislation as needed.

The Residential Building Energy Labeling Working Group does not recommend legislation at this time.

The Commercial/Multifamily/Mixed Use Building Energy Labeling Working Group seeks a legislative declaration that building energy labeling and benchmarking is a “valid public purpose” as that term is defined by the Board in their Order of June 23, 2000 in Docket 6379 and that the Board should be authorized to implement mechanisms that will require utilities to aggregate and release anonymized data for that purpose. The Working Group, with the exception of one member,<sup>12</sup> recommends including the following language in legislation:

### **1. Energy Usage Data Release and Aggregation**

- a. All Vermont Distribution Utilities, including Energy Efficiency Utilities shall, upon a request of the owner or designated agent of a multifamily, multi-tenant commercial or mixed-use building, aggregate and release customer monthly energy usage data in their possession for the purpose of benchmarking and labeling energy use in buildings.
  - i. Before a Vermont Distribution Utility or Energy Efficiency Utility is obligated to fulfill a request for energy usage data for a multi-tenant commercial building, a building owner or designated agent must provide documentation that all building tenants have been notified at least 14 days prior to the request that their energy usage data is being requested and that the tenants have been provided an opportunity to 'opt out' of energy use aggregation. The building owner or designated agent must also provide a list of any tenants that have opted out.
    1. Vermont DUs and EEUs shall not aggregate or release energy usage data of any customers who have opted out as represented by the documentation provided by the building owner or agent.
- b. Vermont Distribution Utilities and Energy Efficiency Utilities, upon request from a building owner or designated agent of a multifamily, multi-tenant commercial or mixed-use building, shall provide, in an aggregated format, within a reasonable time, the energy usage data for the building, provided there are at least four tenants in the building.
- c. Before a Vermont Distribution Utility or Energy Efficiency Utility is obligated to fulfill a request for energy usage data for a multi-tenant commercial building with less than four tenants, a building owner or agent must provide an energy usage data release authorization from each tenant.
- d. Tenants may authorize release of their energy usage data through any of the following means:
  - i. Wet signature;
  - ii. Electronic authorization; or

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<sup>12</sup> While BED is generally supportive of benchmarking as a means to help customers better understand their energy usage, its current customer privacy policy prohibits the release of customer usage data to third parties without the customer’s consent. However, if the PSB were to order the EEUs to include benchmarking as a core EEU service and remove barriers that have the effect of impeding benchmarking, BED would take all appropriate steps to revise its current policy.

- iii. Tenant lease (with a clause stating that tenant agrees to authorize release of monthly energy usage data to the building owner).
  - e. A Distribution Utility may refer energy usage data requests to an Energy Efficiency Utility, unless the energy usage data is to be used for the Distribution Utility's own benchmarking program.
- 2. Maintenance and Publication of Energy Use Data:
  - a. Vermont EEUs and DUs who aggregate energy usage data shall maintain the aggregated energy data collected as part of this data aggregation process for at least five years.
  - b. Vermont EEUs and DUs who implement benchmarking or labeling services shall maintain the energy usage data and building information used in generating the building energy benchmarking and labeling for a minimum of 5 years. This data and information should include at minimum the required fields for ENERGY STAR Portfolio Manager (e.g., energy usage data, the building address, number of tenants/apartments if applicable, building type and size), as well as the software output metric Energy Use Intensity (EUI).