Home Energy Labeling:

A Guide for State and Local Governments

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Introduction

This guide provides background information and actionable guidance for jurisdictions thinking about enacting a home energy labeling policy or program on either a voluntary or mandatory basis. The recommendations presented here were developed by a project team representing a group of state energy offices led by Rhode Island, with support from Arkansas, Massachusetts, Missouri, and Oregon, with funding from the U.S. Department of Energy (DOE) State Energy Program. The information in this guide has been informed by interviews with state and local government officials, energy efficiency organizations, and electric utilities that have implemented labeling policies or programs. We hope the guide will provide you with the information needed to implement a successful home energy labeling program in your jurisdiction, as well as an understanding of how residents will benefit.

This guide focuses on labels for single-family residential homes that communicate the overall estimated efficiency of a home's energy assets, such as its heating, ventilation, and air conditioning (HVAC) systems and insulation levels. Think of the yellow EnergyGuide labels that provide the estimated energy consumption and costs for appliances. Similar to an appliance label, or a vehicle's miles-per-gallon rating, a home energy label provides an estimate based on assumed user (occupant) behaviors, in addition to assuming typical weather patterns for the area in which the home is located. In general, residential home energy labeling refers to programs or policies that provide standardized home energy information, typically to the real estate market. By providing consistent and comparable information about how homes use energy, consumers can make more informed decisions when purchasing or renting a home.

When describing home energy labeling programs, whether voluntary or mandatory, this guide generally references two nationally recognized approaches to home energy scoring:

- The United States Department of Energy's (U.S. DOE's) Home Energy Score
- The Residential Energy Services Network's (RESNET's) Home Energy Rating System (HERS)

HERS Ratings have historically been utilized and promoted for new homes. The Home Energy Score was developed more recently in response to a need for a more accessible means of scoring existing homes. A home energy labeling program may rely on one or both of these national programs. For more information on these scoring systems, click here for information on HERS and here for information Home Energy Score.

The Value Proposition
Why should state and local governments make home energy labels a priority?

If your jurisdiction has goals to help residents save energy and reduce their energy bills, to fight climate change, to create a more resilient energy system, to protect consumers, or to develop the local economy, then home energy labeling can help you reach those goals. By facilitating a residential real estate market that appropriately values energy efficiency, home energy labeling has the potential to stimulate significant reductions in the energy consumption of existing buildings, which comprises 40% of

the total energy used in the United States[1]. Residential buildings consume about 20% of U.S. total energy use and have been found to disproportionately impact electricity grid peak demand, even up to 50% of electricity use on peak demand days[2]. Knowing the status of your jurisdiction's housing stock can help you best target upgrades and incentives while also building a market for energy efficient housing, which helps reduce energy demand and associated costs. In addition, home energy labeling can support local jobs and overall economic growth.

Home energy labeling programs and policies help people get the information they need to make smart home investment decisions. In new construction, energy efficiency levels are largely addressed by building code

> **What is Home Energy Labeling, and Why is it Beneficial?**
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> Increased uptake of home energy labeling in a jurisdiction can support energy, environmental, health, and economic goals, including less obvious objectives such as consumer protection, improved local air quality, as well as enhanced local economic development through the creation and support of home energy retrofits. Learn more about how home energy labeling helps achieve these goals by clicking here.

adoption, code compliance enhancement initiatives, and above-code programs. That said, new homes eventually become existing homes so it is important that they are labeled as they are constructed. The vast majority of U.S. homes, on the other hand, were built to an older, or to no, energy code which makes these homes a logical target for improving energy efficiency. Residential energy labeling helps consumers get the information needed to begin addressing this problem.

Home energy labels bring market forces to bear by making the efficiency level of a home visible to homebuyers and by allowing them to compare energy efficiency potential across homes. Once residential energy efficiency becomes visible in the market, efficient homes are more likely to attain a higher market value. In turn, homeowners will be more apt to invest in energy efficiency projects that will then translate into a higher price for their homes when put up for sale. With labels available, buyers looking at less efficient homes will be made aware of what energy upgrades are needed and can roll the cost of the upgrades into their mortgage or keep the upgrades in mind for future home improvements. Regardless of how they choose to respond to the label, buyers will be able to make more informed choices and be more prepared to handle high utility costs once they move in. A deeper dive into the benefits of home energy labeling can be found here.

Organization of this Guide
The audience for this guide is likely to have a wide variety of experiences and differing levels of understanding regarding home energy labeling. To provide information that is easy to navigate, with details needed by some, but not others, the guide is divided into four primary parts. Part 1 outlines the first steps that should be taken to begin a home energy labeling effort. Part 2 points out specific issues or actions that jurisdictions need to undertake depending on whether they elect to pursue mandatory or voluntary labeling. Part 3 outlines six critical elements for developing and implementing home labeling programs and policies. Additional web links provide specialized guidance on supporting topics, give case examples of labeling policies and programs, and point out additional resources. By including more

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[1] U.S. Energy Information Administration. Frequently Asked Questions: How much energy is consumed in U.S. residential and commercial buildings? https://www.eia.gov/tools/faqs/faq.php?id=86&t=1. Accessed October 30, 2017.
[2] Electricity Reliability Council of Texas (ERCOT). 2013. A Strategic View of the Future. http://www.ercot.com/content/news/presentations/2013/GCPA%20-%2002%20Oct%202013%20FINAL.pdf

detailed information on website links, our hope is that each reader will find it easy to pick and choose the sections they need to effectively provide home energy labels in their jurisdiction.

Part 1

Steps to Establishing a Labeling Program/Policy

Jurisdictions should follow these key steps to develop a successful labeling policy or program. This section outlines four steps:

> Step 1: Assess Your Market and Set Goals
>
> Step 2: Define the Policy or Program Parameters
>
> Step 3: Identify a Program Coordinator and Funding Source
>
> Step 4: Connect the Dots Between Labels and Market Transformation

Home Energy Labeling Policy: The creation of a legal framework such as an ordinance, statute or regulation that in some way dictates the use, creation, and/or deployment of home energy labels.

Home Energy Labeling Program: A coordinated effort by one or more entities to increase the use, creation, and/or deployment of home energy labels within a jurisdiction.

Step 1. Assess Your Market & Set Goals

By completing Step 1, your jurisdiction will have:

- *Established clear objectives for implementing a home energy labeling program or policy*
- *Researched existing programs or policies in the area*
- *Engaged relevant stakeholders in the discussion.*

All jurisdictions should start by defining your jurisdiction's policy objectives for home energy labeling. These might include any one or combination of the following:

- Provide a means to value energy efficiency and renewable energy home features in the real estate market
- Encourage home energy upgrades
- Increase energy efficiency of both new and existing homes
- Increase the number of installed renewable energy systems
- Increase market demand for zero energy homes
- Decrease consumer energy bills/improve affordability of housing
- Decrease greenhouse gas emissions
- Increase participation in energy efficiency programs
- Boost local workforce development efforts

After defining your objectives, you should review current policies as well as market conditions, including relevant energy efficiency and rating programs in the area. For example, consider the following questions:

- What building energy codes does your jurisdiction currently require if any?
  - For new homes?
  - For renovations to existing homes?
- How does your jurisdiction enforce such codes?
- Is there any pending legislation that covers energy efficiency in homes, labeling, or other related topics?
- Are there any current real estate practices that can be leveraged to support building energy labeling?
- Does any entity in your jurisdiction offer lending/financing mechanisms to encourage construction of energy efficient homes or retrofits of existing homes? (e.g., banks, state/local funds, utilities, non-profits)
- Does your jurisdiction have programs or policies related to specific housing types (e.g., low income, mobile homes, manufactured or modular housing)? If yes, what are they?
- Do any entities in your jurisdiction implement energy efficiency programs (e.g., utility, non-profit, government entity)?
- What data are available to help you inform your jurisdiction's home energy labeling strategy? Are data available to help you estimate current average home energy usage, cost, and/or number of labeled homes? Is there information available to help you target specific market segments? (It may be helpful to ask what kind of data your local utilities, energy efficiency programs, and/or MLSs have, and if are they willing to share it)

Once your jurisdiction is clear about its goals and how home energy labeling can help achieve them, it's important to articulate these priorities to stakeholders and more formally engage them in the process. Dialogue and engagement early in the process are necessary to gain a better understanding of key stakeholders' interests and to assist you in refining your program or policy design. Stakeholder engagement is critical to helping your jurisdiction --

- Get input, feedback and buy-in regarding its goals;
- Make sure relevant organizations and interest groups all mutually understand terms, key issues, etc.;
- Address objections or concerns early on; and
- Garner support for the home energy labeling effort.

There are many stakeholders in home energy labeling that should be included at the table. Below is a list to get you started, but it is not exhaustive. Think about who in your area will be impacted by the policy or program and how they can help inform the design process:
- Real estate stakeholders
- Banks and lenders
- Low-income programs and residents

- Housing associations
- Energy programs & energy contractor businesses
- Environmental groups
- Home builders

Develop and publish a stakeholder engagement plan so that your efforts are transparent, inclusive of key interest groups, and clearly articulated. Be sure to also identify "champions" among your key stakeholders to help spur action. For resources on state and regional policies, as well as best practice guidance on creating a stakeholder group, please click here to view Home Energy Labeling Case Studies and here to view other relevant resources.

Step 2: Define the Policy or Program Parameters
By completing Step 2, your jurisdiction will have:

- *Determined the scope of housing types to be labeled*
- *Identified the timing and "trigger points" for when homes will get labeled*
- *Considered whether a voluntary program or mandated policy/program is the best fit*

After completing Step 1, a jurisdiction must determine the specifics of the policy or program, including scope, roles/responsibilities, timing, etc. Although you may encounter additional issues that must be addressed, the following discussion summarizes the major considerations that need to be resolved when designing such a policy or program.

Scope: Types of Housing
Labeling can be applied to all single-family, residential homes or a portion of homes. Your jurisdiction must decide whether to include various subsets of homes, including:
- Existing single-family homes
- New construction
- Multi-family homes/apartments, condos
- Owner occupied versus rented homes
- Mobile homes/manufactured homes

Depending on your market, builder competition may drive labeling of homes that are built beyond energy code; however, standard new homes will likely remain unlabeled without a requirement.

> Defining the Mandate in Berkeley, California
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> Berkeley's Building Energy Saving Ordinance (BESO, 2015) requires homeowners and owners of buildings of up to 25,000 square feet to complete comprehensive energy assessments at time of sale. BESO also requires that commercial and multifamily buildings get an energy assessment once every 5 or 10 years, depending on building size. Buildings less than 600 square feet and individually owned units within a larger building are exempted. Single-family homes (1-4 units) are subject to BESO at time of sale.
>
> To learn more about the ordinance, read Case Study: Berkeley, California.

Policies or programs for both new and existing homes should incorporate elements into the label that are equally applicable to both new and existing homes. This could be estimated annual energy use (measured in millions of British Thermal Units (MBtu) or kWh-equivalents per year), and information on energy costs and fuel usage (click here to see the EMPRESS Labeling Component Matrix and accompanying narrative, for more information). You can think of these commonalities as the base

information – the common denominator that will allow comparisons across all homes. Additional information beyond this common denominator (e.g., how a home is built relative to code) may be added where relevant either on a standard label or on supplementary reports.

Timing & Targeted Use Cases
Energy labels can be useful in different ways to a range of users, including home buyers, sellers, owners, lenders, home inspectors, real estate agents, appraisers, building code officials and energy or housing programs. Because of this, jurisdictions should determine which labeling "use cases" are most aligned with their priorities. Further, policies and programs should be designed to ensure that the information contained in the label is available to the target users at the right time.

> Providing Labels Through Utility Programs in New Jersey
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> New Jersey Natural Gas reaches homeowners through their SAVEGREEN Project, which provides a free Home Energy Score when homeowners install qualifying new equipment. The goal of the assessment is to encourage follow-on participation in the Home Performance with ENERGY STAR program and ultimately installation of other energy improvements. As of 2018, the program has provided more than 18,000 scores. Read more in Case Study: New Jersey Natural Gas.

This guide defines two primary strategies for home energy labeling: voluntary and mandatory. These are defined below.

Voluntary: Voluntary programs can offer labels at any time for voluntary use in the real estate market, but your jurisdiction may want to encourage programs that target specific times in a home's ownership cycle and focus on specific use cases.

Mandatory: Most mandatory labeling policies or programs are designed to require that information be provided to inform home purchases and support valuation of home energy features in the real estate market. Mandatory policies should include a "trigger" for the labeling requirement, such as time of listing, time of sale, time of rental, or "when obtaining a Certificate of Occupancy".

Table 1 depicts the common use cases or "trigger" points, along with corresponding policy goals and primary stakeholder(s) engaged in getting the label.

Table 1: Key timing and triggers to consider when designing labeling policies & programs

TYPES OF HOME ENERGY LABELING POLICIES				
Opportunity	**Moment/ Trigger**	**Goal**	**Participating Entity**	**U.S. Policy or Program Examples**
Home Selling	Time of Listing	Incorporate energy information in home appraisal, lending, and purchasing process.	Seller	**Mandatory:** Portland, OR **Voluntary:** Colorado, Vermont
Home Buying	Time of Sale	Inform home buyers to energy features and needs for potential upgrades.	Seller or Buyer	**Mandatory:** Berkeley, CA; Austin, TX; Montgomery County, MD **Voluntary:** Colorado, Vermont, Oregon
Home Rental	Time of Rental Listing	Inform renters of energy features and estimated energy bills.	Owner/Landlord	**Mandatory:** N/A **Voluntary:** N/A
Home Energy Benchmarking	Getting an Energy Assessment	Document building energy use / features to encourage homeowners to take next steps.	Energy Audit Program & Participant	**Mandatory:** N/A* **Voluntary:** New Jersey Natural Gas, Oregon
Participating in Home Energy Upgrade or Financing Program	Getting an Energy Upgrade	Document results of home energy upgrades to show programmatic impacts.	Energy Upgrade Program & Participant	**Mandatory:** N/A **Voluntary:** Connecticut; Missouri; Austin, TX; Oregon

| Documenting Energy Code Compliance | Completing Building a Home | Demonstrate code compliance in new home (HERS program). | Home Builders or New Home Owners | Mandatory: N/A Voluntary: Vermont, Oregon |

* Requiring the periodic disclosure of energy performance is common for commercial benchmarking ordinances (e.g., every 1 year, 5 years, etc.), but no such policies currently exist for single-family homes.

Step 3: Identify a Program Coordinator and Funding Source

Jurisdictions designing a labeling policy or program should designate an entity responsible for coordinating labeling activities and determine how implementation costs will be covered. This is summarized below depending on if the jurisdiction has chosen a mandatory or voluntary strategy.

Mandatory: Under most policies focused on mandatory labeling, at the time of listing or sale, the local government is responsible for coordinating implementation. For a statewide policy, the state energy office would likely be the responsible entity. (See Part 3: Element 1: Create a Start-Up and Implementation Plan for more information.)

Under most mandatory labeling policies, home sellers subject to the requirement pay to obtain energy labels at market prices. Some jurisdictions, such as the City of Berkeley, also require home sellers[3] to pay a filing fee when they submit their home energy label information to the city to document compliance with the ordinance. Such filing fees may be used to help cover the costs of administering the labeling program. Jurisdictions that choose to not require processing or filing fees may need to identify other funding sources to support program administration. Start-up funds are usually a necessity no matter the long-term funding structure.

> **Coordinating Programs through Oregon's Department of Energy**
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> Oregon has a voluntary home energy performance scoring administrative rule drafted and maintained by the Oregon Department of Energy. If energy performance scores are issued in Oregon they must follow these rules. Oregon Administrative Rules specify what is required for residential and commercial energy performance scores, and include training requirements for licensed home energy assessors, and requirements for score systems. Learn more in Case Study: Oregon.

Voluntary: Most voluntary programs, such as those offered in Connecticut, Missouri, New Jersey, and Oregon, piggyback on energy efficiency programs and focus on delivering labels to program participants. For these programs, the utility or efficiency program administrator typically leads program implementation. (See Part 3: Element 1: Create a Start-Up and Implementation Plan for more information.)

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[3] The City of Berkeley allows the seller to defer responsibility of obtaining the Score/label to the buyer, up to 12 months after home purchase.

A few voluntary programs, notably Colorado, New Hampshire, and Vermont, have attempted to develop market-based labeling programs that also aim to engage home buyers and sellers at time of sale (click here to see more detailed Home Energy Labeling Case Studies). Jurisdictions focused on time of sale are often coordinated by state energy offices or another statewide or regional designee. For example, in Vermont, the statewide energy efficiency utility, Efficiency Vermont, was designated as the lead program implementer. The program is overseen by the Vermont Public Service Department and a stakeholder advisory board. Oregon's Energy Performance Scoring (EPS) program implemented by Energy Trust of Oregon provides scores that compare the performance of newly built homes to those built to code. The benefits and drawbacks of these different program coordinators for voluntary programs are summarized in Table 2: Benefits and drawbacks of different program coordinators for voluntary labeling programs.

Although the long-term goal of some voluntary programs is to create a sustainable private market for home energy labels, the start-up phase often requires funding. More information on funding options for voluntary programs can be found in Part 2: Voluntary Approach: Special Considerations.

There are two major choices regarding who can implement a home energy labeling strategy. As described above, a government agency or designee may be the best fit for a policy, while an efficiency program administrator may be the best fit for a program. The benefits and drawbacks for each of these options are summarized below:

Table 2: Benefits and drawbacks of different program coordinators for voluntary labeling programs

COORDINATOR	BENEFITS	DRAWBACKS
Efficiency Program Administrator	✓ Can piggyback on existing efficiency program processes and software, which may reduce cost and complexity ✓ Good alignment with desire to promote energy upgrades	• Less focused on time of sale use case and connections to real estate industry • May be concerned about negative customer experience with low scores • May not want to fund efforts that don't result in measurable energy savings • May only cover part of the desired service territory, leading to inconsistent customer experience
Government Agency or Designee	✓ Can provide central oversight and coordination across multiple entities for the entire region	• Possibly no built-in source of funding • May require additional development or planning for software and training needs • May be out of sync with efficiency programs operating in the region

Step 4: Connect the Dots Between Labels and Market Transformation

One of the principle reasons that jurisdictions pursue home energy labeling is that this approach shows promise in terms of leading to meaningful market transformation of housing stock. Jurisdictions should consider ways to bridge labeling efforts with policies, programs, or entities that can help homeowners or buyers move forward with energy upgrades and/or advanced building practices.

For example, you may be able to establish an automatic link between those who get a label and contractors or utilities who can perform upgrades. Retailers interested in selling home improvement materials or energy efficient appliances may also prove to be effective allies in getting consumers to move from a label to an actual installation.

Partnering with local lenders can lead to greater use of available financing to invest in building energy efficiency. Your jurisdiction should research federal, state, and local policies on attractive financing and other incentives for energy efficiency and/or renewable energy investments in homes, and provide this information to stakeholders (see Table 3: Nation-wide financing products related to energy efficiency and home energy labeling).

Table 3: Nation-wide financing products related to energy efficiency and home energy labeling

FINANCING PRODUCTS RELATED TO HOME ENERGY LABELS	
Entity	**Financing Product & Description**
Energy Efficient Homes Policy	
Federal Housing Administration (FHA)	Allows borrowers to qualify for up to a 2% stretch on their debt-to-income ratios for homes that score a 6 or higher on the Home Energy Score scale or that commit to making improvements that will get the home to a 6 or higher. The cost of improvements can be rolled into complementary products such as the Section 203(k) Rehabilitation Mortgage or Energy Efficient Mortgage.[4]
Energy Efficient Mortgages (EEMs)	
U.S. Department of Veterans Affairs (VA)	VA insured energy efficiency mortgages can be used for the purchase of existing homes or for refinancing loans. Depending on the documentation submitted, homeowners may borrow up to $6,000.[5]
FHA	FHA allows ≤100% of the cost of energy efficiency measures to be financed by the lender through an existing mortgage loan. Maximum amount of the energy efficiency portion of the loan is the lesser of 5% of the value of the property, 115% of the median area price of a single-family dwelling, or 150% of the Freddie Mac conforming loan limit.[6]
Fannie Mae's HomeStyle® Energy Mortgage Loan	
Fannie Mae	Homeowners with conventional mortgages issued by private lenders and sold to Fannie Mae can finance up to 15% of "as completed" home value for energy improvements with purchase or refinance. Requires a Home Energy Score or comparable report if financing improvements are worth ≥$3,500. There is a 2% stretch on debt-to-income ratios available for high scoring homes, and Fannie Mae provides a $500 incentive to lenders on each loan.[7]

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[4] Energy Efficient Mortgage Program. U.S. Department of Housing and Urban Development. https://www.hud.gov/program_offices/housing/sfh/eem/energy-r. Accessed May 11, 2018.
[5] Energy Efficient Mortgages. U.S. Department of Energy. https://energy.gov/savings/energy-efficient-mortgages. Accessed November 3, 2017.
[6] Energy Efficiency Mortgages. Database of State Incentives for Renewables and Efficiency. NC State University. June 24, 2015. http://programs.dsireusa.org/system/program/detail/742. Accessed November 3, 2017.
[7] Energy Efficient Mortgages. US DOE. https://energy.gov/savings/energy-efficient-mortgages. Accessed November 3, 2017.

It is important to note that many lending policies exist at the national level but are underused. Currently, energy efficient mortgage products are not well-understood by many banks and mortgage lenders, so jurisdictions seeking to promote labeling in conjunction with mortgage financing may need

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Transforming the Housing Market in Colorado

Colorado integrates the Home Energy Score into real estate transaction infrastructure by sharing information with home buyers, real estate agents, lenders, and appraisers to ensure that the energy features are appropriately valued. They also previously tied Home Energy Score to the Energy Saving Mortgage Incentive, offering $750 for every one-point improvement up to $3,000. To learn more about Colorado's market integration efforts, read Case Study: Colorado.

Transforming the Housing Market in Austin, Texas

Austin, Texas was an early adopter of an Energy Conservation Audit and Disclosure ordinance (ECAD, 2008) requiring ratings and disclosures. The seller must disclose the results of the audit to potential buyers and to any real estate agent acting on behalf of the seller. Noncompliance, a Class C misdemeanor, involves fines from $500 to $2,000. To learn more about market integration efforts in Austin, Texas, read Case Study: Austin, Texas.

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to invest heavily in outreach and training for lenders.

Part 1 Summary

By utilizing Part 1: Steps to Establishing a Labeling Program, your jurisdiction should feel prepared to take the first steps to establish a home energy labeling policy or program. Regardless of which strategy is chosen, you will need to bring together stakeholders to consider the goals, scope, and implementation strategy for home energy labeling. You will also need to consider the landscape of existing policies, programs, and lending products and how these should shape your strategy. Part 2 will dive deeper into the major considerations between mandatory and voluntary policies/programs for home energy labeling.

Part 2

Home Energy Labeling Strategies: Mandatory vs. Voluntary

This section will help you address the question of whether to pursue a mandatory or voluntary approach as your home energy labeling strategy. There are pros and cons to each approach, and this section details the particular considerations necessary for both approaches, with much depending upon the local stakeholder preferences and the political context.

The decision-making process includes an analysis of several factors. If considering a mandatory approach, a locality should determine who is likely to oppose mandatory labeling, and whether their opposition can

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A Deeper Dive: Trade Offs Between Mandatory and Voluntary Strategies

To get a deeper dive into various stakeholder perspectives on different home energy labeling strategies, click here to see tables comparing the significant differences between these programs & policies.

be softened by education or other means. The locality must also determine the level of political will in the legislature, city council, Mayor's Office, etc. to enact such a policy. Consider the attractiveness of establishing a voluntary program as an "ice breaker" that could evolve into a mandatory policy. Your jurisdiction's ultimate success in creating either a mandatory or voluntary strategy rests significantly on its ability to be strategic and sensitive to political and other interests.

Briefly, the pros and cons of each approach are as follows:

- **Mandatory programs** achieve much higher levels of real estate market penetration and may be less expensive to administer if customers pay the cost of obtaining the label. However, mandatory labeling policies can be difficult to enact due to a perception of slowing or interfering with the real estate transaction.

- **Voluntary programs** initially achieve lower levels of real estate market penetration but have the potential to reach high levels if substantially supported by utilities and/or significant marketing. They can be a good option for jurisdictions that can piggyback home energy labels onto utility energy efficiency programs. To date, voluntary programs have required significant incentives, subsidies, and marketing to drive demand.

As of the writing of this document, a few localities have enacted mandatory labeling ordinances (click here to view Case Studies of Mandatory Home Energy Labeling Programs and Polices). No jurisdiction has been fully successful at creating a functioning voluntary market dependent solely on consumer demand for labels. In a few jurisdictions, several pieces of the voluntary labeling puzzle have been put into place, such as developing a pool of trained assessors, and educating the real estate community, but the demand for labels among homeowners and buyers of existing homes remains weak. This may be due to a lack of consumer awareness of the labels and their benefits. Therefore, a primary goal for program implementers working to establish a voluntary labeling market for existing homes must be to spur demand through market forces.

Level of Market Traction

Mandatory labeling programs have the highest likelihood of driving the levels of market penetration required to transform the real estate market. Mandatory programs also offer the best chance for an affordable and sustainable funding model, since labels can be offered at market prices if they are required at time of listing or sale. However, mandatory approaches may encounter more opposition, so assess your political and market factors before determining the right path for your jurisdiction.

Programs focused on existing homes and integrated with utility program delivery have led to large numbers of labeled homes in states such as Connecticut. In contrast, experience to date has shown that voluntary labeling initiatives aimed at the time of sale are difficult to grow, despite efforts in states like Vermont which try to deeply engage the real estate industry through voluntary, education-based approaches.

For states and regions committed to a voluntary strategy that includes both upgrade programs and information at point of sale, the strategy that appears most likely to gain widespread traction across both use cases is for a state or local government to establish a standardized, in-home energy assessment that is:

- Provided at no cost through ongoing utility or state funding;
- Delivered through utility efficiency programs;
- Produced using energy audit software that is already in use or integrates with the already established energy scoring tool application programming interface (API);
- Standardized to produce a comparable report for customers that includes a "pre" score, as well as customized improvement recommendations tailored to the local housing stock and climate zone; and
- Accompanied by extensive real estate training and outreach so that scores are listed on multiple listing services (MLSs) and real estate professionals promote the label to home buyers and sellers.

See Table 4 for a summary of best practices aimed at growing the penetration and use of labels.

Table 4: Best practices for achieving high levels of market penetration with home energy labeling policies

ACHIEVING HIGH MARKET PENETRATION	
Use Case	**Best Practice**
Upgrade Existing Homes	✓ Incorporate fully into utility efficiency program, or at least coordinate with local utility. ✓ Full software integration. ✓ Free to customers or part of standard energy assessment practice and pricing.
Time of Sale	✓ Require label generation and disclosure through policy, or provide free to customers if program is voluntary. ✓ Connect real estate professionals and brokers to home inspectors, assessors, and/or others offering labels so real estate professionals can easily direct clients.

As described in Part 1, jurisdictions should begin with a few common steps regardless of whether they are interested in proceeding with a mandatory or voluntary home energy labeling approach. That said, it's important to note a couple of key differences. Stakeholder engagement and outreach may be more critical on the front end if your jurisdiction chooses the mandatory path, while continuous marketing and efforts to drive demand through a program's life are more critical to the success of a voluntary approach. The following section provides additional guidance depending on which path you choose.

Mandatory Approach: Special Considerations

Mandatory programs are based on a piece of legislation or ordinance which must be passed for the program to take effect. Once this occurs, promotion of the labeling program takes on a different shape and purpose. A mandatory program will exist as long as the legislation is in effect, and program implementers do not need to create a market in the same way that they would in the case of a voluntary program. After legislation is enacted, implementers are responsible for establishing the six critical elements of a working system as described later in this guide, and ensuring policy compliance. Although a mandatory approach may establish a long-term funding stream through fines or administrative fees, start-up funds are usually needed to get a program off the ground.

As of February 2018, only a few cities in the U.S. have passed mandatory home energy labeling, most notably Portland, Oregon; Berkeley, California; and Austin, Texas. States including Massachusetts and Vermont have considered residential energy labeling and disclosure mandates, but to date, no state has passed legislation requiring home energy labeling. While home energy labeling is voluntary in the state of Oregon, it is required in the city of Portland. Both voluntary and mandatory scoring systems in Oregon follow the statewide law that requires home energy performance labels to have consistent information and to use a consistent modeling engine (the Home Energy Score tool) to generate the energy score. For other examples, jurisdictions should also look to Europe which has experience with mandatory labeling programs.

> **Example Legislation & Ordinances for Home Energy Labeling**
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> [Click here](#) to read example legislation and ordinance language modified from Berkeley, CA and Portland, OR, which require home energy labels in real estate market transactions. You will also find links to existing ordinances and legislation and as well as additional policy examples and analysis.

Engage Stakeholders and Address Concerns

Once the policy has been designed and a program coordinator identified, a jurisdiction should begin scoping out existing allies and potential detractors. Individual conversations about the pros and cons of mandatory home energy labeling policy options with a variety of stakeholders can help a state or municipality better understand the existing political context. Engaging all stakeholders, including those who may oppose such a policy, will help inform and shape the talking points and informational campaigns needed to garner support over the long-run.

Engage a coalition of supporters by identifying and cultivating key allies and constituencies, establishing a formal stakeholder group, and educating the public on the proposed legislation or ordinance. Ensure that letters of support are delivered and/or a contingent of supporters are present at relevant hearings or council meetings. In Oregon, initial guidance from a Governor's taskforce lead to a permanent Stakeholder Panel. The panel, along with stakeholder participation, are critical for ongoing, consistent, and meaningful engagement for a statewide scoring model.

It is also extremely valuable to include a cohort of "green real estate professionals" in your coalition. These green real estate agents can be valuable messengers in explaining the policies and informing other parts of the real estate industry. Other groups that have come out in support of home energy labeling include environmental groups and home performance contractors. Click here for an example of how Vermont engaged with local Realtors.

Successful adoption of a mandatory home energy labeling policy will likely require multiple years of informational campaigns and alliance-building.

Below is a table summarizing policy concerns from various stakeholder groups, along with potential solutions for addressing them.

Portland, Oregon's Efforts to Establishing a mandatory Home Energy Score policy:

Energy efficiency leaders in Portland, Oregon spent years building a coalition of stakeholders interested in passing an ordinance requiring home energy labels at time of listing.

Ensuring the coalition represented a wide array of stakeholders was key to gaining the interest of the Portland City Council. Active coalition partners included home performance contractors, real estate champions, and environmental groups. For more information about the coalition, it's work, and relevant resources, see Case Study: Portland, Oregon.

Table 5: Key stakeholders, common concerns about home energy labeling, and ways to address their needs

KEY STAKEHOLDER GROUPS & COMMON CONCERNS		
Group	**Policy Concerns**	**Potential Solutions**
Real Estate Professionals	Concerned that low scores will reduce home values.	• Show research that energy disclosure does not seem to hurt sales, just informs upgrades.
	Concerned about policies that increase burdens in home transaction processes.	• Trustworthy data through a standard program is much better for the real estate market than energy models available online. • Energy labeling can help sell more efficient homes at higher prices and more quickly
Utilities & Energy Efficiency Program Administrators	Concerned about the costs of implementing a labeling initiative without directly measurable energy savings.	• Show that a policy can help drive customers to utilize existing resources.
Low-Income Advocates	Concerned about policies that would require low-income homeowners to pay for assessments.	• Offer free labels for income-eligible homeowners. • Show that labels are useful for consumers to know the full cost of owning or renting a home.
Home Performance Contractors	Concerned about increasing hurdles and requirements without being able to recuperate costs.	• Show that low scores could drive homeowners to utilize services.

Voluntary Approach: Special Considerations

Jurisdictions seeking to establish a voluntary labeling program should realize that for the program to be sustainable, it must be market driven. In other words, the program must establish both supply and demand in a functioning market. For this reason, the project team recommends including your local economic development agency into early planning stages. There are strong ties between establishing a labeling program and economic development, which are described here.

Beyond the six critical elements common to any labeling program (described in detail in the following sections), a voluntary program must also develop a plan to promote labels to consumers and other stakeholders. In the long run, marketing to consumers will ideally be undertaken by market actors who are making a profit from generating labels, but initially, efforts will need to be supported and possibly subsidized by program implementers.

Although the goal of voluntary labeling programs is to become sustainable through market forces, funding is required during the startup phase. Program implementers should look for opportunities to leverage existing programs and infrastructure. Funding options for starting a voluntary program include

- Utility ratepayer funding: Utilities roll the cost of delivering home energy labels into efficiency programs, using funding from either utility rate base or system benefit charges. Examples: New Jersey Natural Gas, Columbia Water & Gas in Missouri, EPS implemented through Energy Trust of Oregon, and Energize Connecticut
- Government funds (local, state, and Federal): Agency uses local, state, or Federal funding to pay for home energy labeling efforts. Examples: Colorado (largely funded by DOE State Energy Program (SEP) formula grant), Vermont (largely funded by DOE SEP competitive grant).

Labeling programs that leverage existing service delivery infrastructure, such as residential retrofit programs that conduct in-home energy audits, usually have lower incremental costs than stand-alone programs. Program components requiring funding during the startup phase include:

- Training for program assessors,
- Financial incentives for scoring homes,
- Education programs for real estate professionals, appraisers and other stakeholders,
- Administrative costs.

Drive Demand for Labels

Driving market demand also better enables the valuation of home energy performance by home buyers and sellers. The easiest way to establish value for home energy features is for home appraisers to use home energy labels to develop comparable sales. Only significant market penetration will allow appraisers to access comparable homes with energy labels.

Key strategies to drive demand include:

- Offer incentives or subsidies
- Integrate label delivery into energy efficiency programs
- Promote financing options that use labels
- Conduct effective marketing and outreach
- Educate real estate professionals as to the value of marketing labels to their clients
- Provide assessors and other data providers with marketing tools

Offer incentives or subsidies, or tie to financing

When left to the private market, the cost for a customer to obtain an asset-based home energy label as a standalone product from an energy assessor can range from $100-400 for a DOE Home Energy Score and $400-1000 for a HERS rating. Market-based pricing is appealing because it means that programs must only pay for the costs of program coordination, not for the cost of delivering the label. However, if labels are priced too high, there may be little consumer demand under voluntary programs. Voluntary programs may choose to subsidize or incentivize labels to reduce or eliminate the cost to customers.

Program administrators may also want to subsidize workforce training to encourage home inspectors, energy auditors, and home performance contractors to become qualified to deliver home energy labels. In this case, program administrators should encourage label providers to market labels to potential customers. Partnering with local economic development agencies is one method to engage with label providers. They can provide marketing advice and tools, and may be able to subsidize the cost of engaging with label providers.

> **Vermont's Challenges with Consumer Demand:**
>
> With a purely voluntary approach, Vermont experienced low levels of demand for home energy labels when customers had to pay market prices.
>
> Vermont structured its limited-time incentive at $200 per label to the assessor and required that labels be offered for free to customers. The $200 amount was designed to fully cover the cost of delivering the label for an average home.
>
> Demand increased dramatically from approximately 2 labels per week to 11 per week during a limited time when Efficiency Vermont was able to make labels available for free to customers. For more information see Case Study: Vermont.

As described in Part 1, Step 4:Step 4: Connect the Dots Between Labels and Market Transformation, financing policies through FHA, Fannie Mae, and Freddie Mac recognize specific energy labeling systems. Therefore, jurisdictions may be able to drive demand for labels by promoting financing options and/or local lenders that offer loans with preferential terms for homes with good energy ratings. If promoted at time of list/sale or refinancing borrowers are more likely to demonstrate interest in getting a home energy label.

Integrate label delivery into existing programs

The cost of delivery can be reduced by bundling home energy labels with other in-home services offered by qualified assessors or contractors, such as home energy audits or upgrades. Because much of the label cost is associated with an assessor's travel to the home, the incremental cost of delivering a home energy label will be lower than if the label is offered during a stand-alone visit. Further, if the data collection and software used for home energy labeling is fully integrated with the software used for their standard energy audit, then there may be little or no incremental cost to deliver the home energy label. Note that depending on what software tool the program chooses (e.g., a free on-line user interface, a tool that's already linked to a label, or a new tool), there may be upfront costs associated with software integration. For more information on software integration see Part 3:

METRIC	HOME ENERGY SCORE	HERS INDEX

Home Energy Score	✓	✗
HERS Rating	✗	✓
Total Source Energy	✓	✗
Total Site Energy	✓	✓
Estimated Energy Costs	✓	✓
IECC Code Compliance	✗	✓
Estimated Carbon Equivalent Emissions	✓	✓
Energy per Square Foot	✓	✓
Energy Cost per Square Foot	✓	✓
Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.)	✓	✓
Estimated Electricity Production from On-Site Photovoltaics	✓	✓
Score / Rating with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Total Source Energy with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Total Site Energy with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Estimated Energy Costs with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Estimated Carbon Equivalent Emissions with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Energy per Square Foot with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.) with Recommended Improvements	✓	In Economic Cost Effectiveness Report

Element 3: Determining a Software & IT Path

.

It is important to consider the difference between using utility programs to deliver energy labels and using a separate, locally established rebate program focused on valuing efficiency in the real estate market. The utility will often use energy scores to communicate a complex topic to their customers with the hope that customers will follow through with energy efficiency retrofits. Utility involvement brings with it the potential to score many homes relatively inexpensively, but it can be unclear how these scores will be shared with the real estate market. Nonetheless, some of the homes scored through a utility program will enter the real estate market over time, and if those homes feature the energy label in the listing, then they will increase market awareness and demand. Note that the goals of the utility are

Connecticut/Utility Partnership: Leading the Way

The voluntary program with the highest market traction, Energize Connecticut, has fully integrated the delivery of Home Energy Scores into its flagship Home Energy Solutions energy assessment and upgrade service. Home Energy Solutions assessors use a mobile tool to collect the Home Energy Score data and produce the label at no extra cost to customers.

Connecticut generates approximately 12,000 scores per year using this integrated approach. For more information, see Case Study: Energize Connecticut.

likely different from those of the jurisdiction, and simply having many homes scored does not necessarily create a functioning market.

Another productive avenue for delivering home energy labels may be through home inspectors. Providing labels as an add-on to a home inspection has the potential to significantly reduce the cost to the consumer and to reach consumers during the home purchase process. According to the National Association of Realtors® [8], "Seventy-seven (77%) percent of all recent home buyers obtained a home inspection prior to the purchase of their homes". Generating low cost scores through home inspectors could be a valuable pathway to generating labels quickly, and has the potential to create a sustainable market.

Conduct effective marketing and outreach

Marketing channels include paid media (social media promoted posts, online ads, newspaper ads, etc.), owned media (newsletters, websites, blogs, utility bill inserts, and social media posts), and earned media (newspaper articles). Community-based marketing can also be helpful, such as partnering with local energy groups to conduct outreach or participating in community events.

Different customers require different outreach tactics:

- **Homeowners.** Outreach to homeowners interested in understanding more about how their home performs can often be coordinated with energy efficiency program messaging and marketing channels, such as utility newsletters and Facebook posts. Homeowners can also be reached through community events, home shows, and local energy groups.
- **Home sellers.** Programs interested in encouraging home sellers to obtain labels to document their home's superior energy features can target real estate professionals specializing in green homes. If data are available, programs may also be able to conduct direct outreach to past participants in energy upgrade programs.
- **Home buyers.** Programs can reach home buyers through first-time home buyer courses, as well as targeted ads on websites commonly used by home buyers, such as Zillow and Trulia.

> ### Testing & Refining Your Marketing Strategy
>
> Efficiency Vermont tested the effectiveness of a range of marketing tactics and messaging approaches and used a website landing page to track conversion rates. It found that a Facebook campaign and email newsletter promoting free energy labels were more cost-effective at driving interest than participating in time-consuming community events. Efficiency Vermont also tested different images to promote energy labels. One sponsored online advertisement showed a contractor working with homeowners and the other showed a snapshot of the label itself. The image with people proved twice as effective at driving clicks as the other image. (Efficiency Vermont, Vermont Home Energy Profile Pilot Final Evaluation, July 2017)

For market-based programs, assessors, home inspectors, and contractors are a key channel to promote labels. Programs can support assessors and contractors in marketing energy labels by offering funding for cooperative marketing and advertising, and by developing marketing materials and messages that assessors and contractors can use with prospective customers. For example, DOE has developed a

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[8] http://www.homeinspector.org/NAR-ASHI-2001-Home-Inspection-Study-Executive-Summary

standard PowerPoint presentation that home inspectors can use to engage real estate agents and real estate brokers and get them interested in the Home Energy Score. Programs can also help assessors highlight their third-party credential from RESNET or DOE as a market differentiator by providing them with marketing collateral such as lapel buttons and truck decals.

Real estate professionals can also be a good resource for marketing the program, and educational events geared towards training real estate professionals on green homes and home energy labels are an effective strategy (see Part 3: Element 5: Educating Real Estate Professionals and Appraisers for further information on real estate professional education). For example, DOE provides resources on the Home Energy Score website, which can help home inspectors, real estate agents, and energy contractors explain the benefits of home energy labeling to customers.

Part 2: Summary

By utilizing Part 2: Home Energy Labeling Strategies: Mandatory vs. Voluntary, your jurisdiction should be better prepared to choose between either a mandatory or voluntary approach to home energy labeling. By reading this section, you should have a better understanding of the benefits and drawbacks associated with each approach, and the types of investments required to undergo each successfully. Part 3 will outline the technical details and implementation considerations for all types of home energy labeling initiatives.

<div align="center">Part 3</div>

Six Critical Elements for Successful Home Energy Labeling

Once you have formulated a stakeholder group, your goals and objectives, and the type of program or policy you want to implement, the next step is to determine the technical and implementation details. We have identified six critical elements for success:

1. Create a Start-Up and Implementation Plan
2. Define Label Components
3. Determine a Software & IT Path
4. Train Professionals
5. Educate real estate professionals & Appraisers
6. Link Labels with Multiple Listing Services

Element 1: Create a Start-Up and Implementation Plan

First, the program coordinator should develop a comprehensive plan for activities needed during both the start-up phase and ongoing program implementation. The plan should cover the following topics and be updated to reflect decisions or changes as they are made during the design and implementation phases:

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Navigating Privacy Concerns & Legal Issues

When starting a new program, there are often concerns about whether the information contained on home energy labels are public or private information. To learn about the legal precedent on this issue and how other programs have addressed this issue, click here to read Privacy Concerns.

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Table 6: Key questions to address in a home energy labeling start-up and implementation plan.

START UP & IMPLEMENTATION PLANS	
Planning Category	**Key Questions to Address**

Program Management	• What are the roles and responsibilities for various stakeholder groups?
	    o State/local government
	    o Utilities
	    o Private Entities
	    o Non-Profits
	    o Others

Stakeholder Engagement	• How will you engage real estate professionals? • How should utilities participate? • Who will promote the label to customers? • Who are other key stakeholder groups?
Multi-Year Budget & Funding	• Where will funding for the program be derived in the short-term and long-term? • How many stakeholder educational events are needed? • Will you subsidize the cost of training for Assessors? • Will you provide rebates to consumers to incentivize labels? • How much will administration/overhead cost?

- What are other likely miscellaneous costs?

- Which tool(s) will be used to model the home's energy use and generate the label? (see Part 3:

Software Integration

METRIC	HOME ENERGY SCORE
Home Energy Score	✓
HERS Rating	✗
Total Source Energy	✓
Total Site Energy	✓
Estimated Energy Costs	✓
IECC Code Compliance	✗
Estimated Carbon Equivalent Emissions	✓
Energy per Square Foot	✓
Energy Cost per Square Foot	✓
Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.)	✓
Estimated Electricity Production from On-Site Photovoltaics	✓
Score / Rating with Recommended Improvements	✓
Total Source Energy with Recommended Improvements	✓
Total Site Energy with Recommended Improvements	✓
Estimated Energy Costs with Recommended Improvements	✓

	Estimated Carbon Equivalent Emissions with Recommended Improvements	✓	In Economic Effectiveness
	Energy per Square Foot with Recommended Improvements	✓	In Economic Effectiveness
	Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.) with Recommended Improvements	✓	In Economic Effectiveness

Element 3: Determining a Software & IT Path

-)
- How will Application Programing Interfaces (APIs) be used?
- Is software development required?
- Who will update and maintain the software/IT systems?

Label Format

- What metrics will the label feature? (see Part 3: Element 2: Defining Label Components

As you move forward in developing your energy labeling initiative, it's important to think through what types of information are most likely to be valuable to your stakeholders and will advance your goals. To answer those questions, you need to understand the

	different types of metrics and measurements that can be included on home energy labels, what they mean, and how they can be applied, among other details. A building energy labeling program can create a new, custom label unique to a jurisdiction, or can adopt usage of existing labels offered by national home energy labeling programs. Stakeholders should consider what information will be most valuable to homeowners and real estate professionals, and best reflect the program/policy goals. States that have designed a custom label found that designing a label that is agreed upon by all stakeholders can be a valuable, but challenging experience (see Label Examples). Starting in January 2017, DOE funded a two-year building labeling project called Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS) through DOE's State Energy Program (SEP). One of the key deliverables from this project was this guide. Recommendations from the EMPRESS team on how to best "harmonize" metrics and measurements on a home energy labels can be found here. At a minimum, the EMPRESS team, which includes energy office staff from Arkansas, Massachusetts, Missouri, Oregon, and Rhode Island along with other energy labeling experts, believes consistent label elements should be established to ensure comparability between labels, even if multiple implementers are able to deliver labels that display the information differently. •) • How should the label be designed?
Assessors (see Part 3: Element 4: Training Professionals)	• How will you recruit candidates to the program to become Assessors? • Will your jurisdiction impose requirements and/or credentials of Assessors beyond the minimum requirements of national programs (e.g., Home Energy Score, HERS)?
MLS Integration (click here to learn more about current efforts)	• How will the labels and their associated energy metrics be connected to MLS listings?

As you develop your start-up and implementation plan, keep in mind lessons learned from other states and local governments (click here to view case studies). Table 7 summarizes some important program considerations and approaches that can save resources and help make your effort successful.

Table 7: Best practices for program design and implementation

PROGRAM DESIGN & IMPLEMENTATION	
Consideration	**Best Practice**
Program Management	✓ Define one entity as the lead implementer to manage the work cohesively.
Label Format	✓ Use default label design; customize label only if target population has very different needs and funds permit.
Software Integration	✓ Use one energy model or calculator that can be accessed via an API by multiple software tools to generate a standard label.
Assessors	✓ Prioritize training Assessors who are computer-literate and trained in conducting basic energy assessments. ✓ Focus on Assessors who work directly for or are subcontractors to an efficiency program.
Funding	✓ If possible, secure funding for program development and the first year of implementation.

Examples of program management and coordination approaches for home energy labeling programs can be found here.

Ongoing Implementation Activities

Ongoing implementation activities include:

- Partner and stakeholder coordination (see **Error! Reference source not found.**)
- Maintaining and updating software (see

METRIC	HOME EN
Home Energy Score	
HERS Rating	
Total Source Energy	
Total Site Energy	
Estimated Energy Costs	
IECC Code Compliance	
Estimated Carbon Equivalent Emissions	
Energy per Square Foot	
Energy Cost per Square Foot	
Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.)	
Estimated Electricity Production from On-Site Photovoltaics	
Score / Rating with Recommended Improvements	
Total Source Energy with Recommended Improvements	
Total Site Energy with Recommended Improvements	
Estimated Energy Costs with Recommended Improvements	
Estimated Carbon Equivalent Emissions with Recommended Improvements	

Element 2: Defining Label Components

As you move forward in developing your energy labeling initiative, it's important to think through what types of information are most likely to be valuable to your stakeholders and will advance your goals. To answer those questions, you need to understand the different types of metrics and measurements that can be included on home energy labels, what they mean, and how they can be applied, among other details.

A building energy labeling program can create a new, custom label unique to a jurisdiction, or can adopt usage of existing labels offered by national home energy labeling programs. Stakeholders should consider what information will be most valuable to homeowners and real estate professionals, and best reflect the program/policy goals. States that have designed a custom label found that designing a label that is agreed upon by all stakeholders can be a valuable, but challenging experience (see Label Examples).

Definitions
Measure: single unit with single point in time, unit-specific, usually a quantifiable attribute. For example, annual gallons of oil used.
Metric: a derivative of one or more measurements, provides broader context by abstracting measurements to be more understandable. For example, a Home Energy Score or a HERS index rating.

Custom vs. Standard Label

At some point in this process, likely sooner rather than later, your jurisdiction will need to decide whether to design a new, custom label or simply adopt or modify a standard label offered by one of the national home energy labeling programs. Keep in mind there are pros and cons to either approach.

Custom labels can help highlight the jurisdiction's goals by focusing attention on local energy use, emissions reduced, jobs created, or dollars saved. In addition to creating a local market-facing product, a custom label can engender a feeling of ownership amongst stakeholders, from the label designers to the end use consumer. The design process offers an opportunity to engage important actors and create a buzz of anticipation and excitement. And once launched, the label may reflect a certain amount of consensus that can bring it an air of legitimacy.

On the other hand, the process of creating the label and deciding which metrics to include can take significant time and pull resources away from other pressing needs like training, stakeholder engagement, and market development and integration. For this reason, creating a timeline for figuring out your path forward is essential, whether that means a step by step plan for designing a new label or a more modest set of tasks to tailor a national label to meet your needs. A decision must be made early on whether the final product needs to be a consensus decision or can be decided by a majority vote. Stakeholders must commit to the timeline and process up front. The timeline should include firm dates for choosing which metrics to include, and for subsequent drafts.

Keep in mind that a number of national, state, and local entities have grappled with many technical issues related to labels; so, make sure to reach out to experienced colleagues in the field to help you quickly ascend a steep learning curve.

Starting in January 2017, DOE funded a two-year building labeling project called Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS) through DOE's State Energy Program (SEP). One of the key deliverables from this project was this guide. Recommendations from the EMPRESS team on how to best "harmonize" metrics and measurements on a home energy labels can be found here. At a minimum, the EMPRESS team, which includes energy office staff from Arkansas, Massachusetts, Missouri, Oregon, and Rhode Island along with other energy labeling experts, believes consistent label elements should be established to ensure comparability between labels, even if multiple implementers are able to deliver labels that display the information differently.

Specifically, the EMPRESS team created a matrix and accompanying narrative that describes the effectiveness of currently available metrics and measurements from Home Energy Score and HERS in supporting common building-related energy policy objectives. The matrix also describes metric and measurement characteristics that should be considered when creating a labeling program or policy. States and local governments can use the matrix to help them select those metrics and measurements to be displayed on building energy labels in their jurisdictions. To view the Labeling Component Matrix and its narrative, please click here. The table below summarizes the metrics that are currently generated by Home Energy Score and HERS software programs.

Table 8: Metrics generated by Home Energy Score and HERS software programs

METRIC	HOME ENERGY SCORE	HERS INDEX
Home Energy Score	✓	✗
HERS Rating	✗	✓
Total Source Energy	✓	✗
Total Site Energy	✓	✓
Estimated Energy Costs	✓	✓
IECC Code Compliance	✗	✓
Estimated Carbon Equivalent Emissions	✓	✓
Energy per Square Foot	✓	✓
Energy Cost per Square Foot	✓	✓

Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.)	✓	✓
Estimated Electricity Production from On-Site Photovoltaics	✓	✓
Score / Rating with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Total Source Energy with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Total Site Energy with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Estimated Energy Costs with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Estimated Carbon Equivalent Emissions with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Energy per Square Foot with Recommended Improvements	✓	In Economic Cost Effectiveness Report
Estimated Energy Use by Fuel Type (Electricity, Fuel Oil, Natural Gas, LPG, etc.) with Recommended Improvements	✓	In Economic Cost Effectiveness Report

Element 3: Determining a Software & IT Path

Software plays a key role in labeling. Software is used to:

- Model the home's energy use
- Calculates energy metrics
- Determine the home's score/rating
- Produce the label

There are many asset-based software options available, and certain software tools may be popular in your market. Research the numerous available options to ensure you pick the right tool for your jurisdiction. Selecting the wrong software tool can pose significant cost impacts, waste assessors' time in training, and potentially set back a labeling initiative for years from the backlash. Take advantage of lessons-learned by talking to jurisdictions that have already experimented with options and fully research the options available before fully investing in a tool.

> Currently Available Home Energy Labeling Tools
>
> There are generally three approaches to generating a score or rating that would populate a home energy label: asset-based, operational, or automated. These three types of scores vary greatly. While all approaches to scoring share the goal of summarizing home energy performance into a single metric, or score, they are typically utilized for different purposes.
>
> These three approaches to score homes are discussed briefly under "Home Energy Labeling Tools".

The label components may drive the software choice. Figure out which metrics you want to present on your label, then find the asset-based software that can produce them. Many tools can be modified to meet any specific needs or requirements if they don't already include the desired options. However, expect any customization to come with a price tag and take months or years (in some cases) to be modified. Therefore, it is best to find a software tool that meets all the local requirements without needing further customization. The ideal software for your program will:

- Produce desired metrics;
- Be accurate in predicting energy use and cost based on the home's local climate and fuel mix;
- Provide consistency in generating energy use and cost predictions with other software tools already in place in the local jurisdiction (see below for more discussion);
- Be easy to use, both for the user and for the administrator;
- Provide simple and understandable reports for customers;
- Update to new versions easily via internet-based and centrally managed systems;
- Be able to run locally if internet/cellular connection is an issue in your jurisdiction;
- Be supported sufficiently by the developer;
- Come with robust manual and support materials to provide both user and administrative guidance;
- Be compatible with other software data systems already locally in place (by the administrator, local utilities, weatherization agencies and other partners);

- Use HPXML[9] data transfer language to ensure data compatibility between tools and databases;
- Comply with Real Estate Standards Organization (RESO) Data Dictionary[10] to ensure that data can be used in local Multiple Listing Service (MLS) systems; and
- Have robust administrative management capabilities for reporting, tracking and project management.

Energy use and cost inconsistencies with different energy modeling software has become an issue[11], especially in locations where the most predominant rating systems are in place: HERS and Home Energy Score. Since HERS and Home Energy Score use different underlying energy modeling engines to predict energy use and cost, they generate different results for the same house. To resolve this issue so that regardless of which rating system or tool is used the same energy use and costs metrics are produced, there are efforts underway to adopt a single energy modeling engine for all the major modeling software tools. The U.S. DOE supports moving to Energy Plus as the single hourly-based simulation tool for all energy modeling software. As of January 2018, efforts are underway to coordinate and align software tools used for generating HERS ratings, Home Energy Scores, low-income Weatherization Assistance Programs, and others by promoting linkages to EnergyPlus. Moving in this direction would go a long way toward energy use and cost consistency, thereby reducing customer confusion and increasing confidence in these systems by program administrators.

Element 4: Training Professionals

During the start-up phase, labeling programs must focus on establishing a base of professionals who are qualified to generate and deliver home energy labels. This section offers tips on identifying professionals who can provide the label, conducting training and testing, as well as related needs such as mentoring and quality assurance.

Identifying individuals to train

Determine if the following types of professionals will be appropriate to provide home energy labels for your jurisdiction:

- Home performance contractors and insulation/HVAC installers
- Energy auditors and independent energy consultants
- HERS raters
- Home inspectors

The table below outlines onboarding considerations for each of these groups.

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[9] https://www.energystar.gov/campaign/improvements/professionals/resources_library/hpxml_guide

[10] https://www.reso.org/data-dictionary/

[11] Oregon requires a single modeling engine, DOE's Home Energy Score, to provide consistent modeling results

Table 9: Who should provide home energy labels?

WHO SHOULD PROVIDE HOME ENERGY LABELS?	
Assessor Type	**Onboarding Considerations**
Home Performance Contractors & Insulation / HVAC Installers	• There is a wide range of knowledge about building science, energy modeling, and software tools among home performance contractors. • Knowledge gaps in building science and/or software tools may present a barrier to becoming qualified to offer home energy labels. • Contractors and/or installers may be biased in their data entry if they are also selling products and services. Some homeowners may perceive a conflict of interest and prefer a label delivered by a third-party. • Contractors may be able to offset the cost of delivering an energy label if they are hired to perform upgrades generated by the label modeling software. This can help reduce costs and streamline the transaction for homeowners.
Energy Auditors, Independent Energy Consultants	• Energy auditors and energy consultants are likely familiar with energy modeling software and have deep knowledge of building science. • May be perceived as the least biased delivery of information to homeowners, as they are not selling a product aside from the label.
HERS Raters	• HERS raters are qualified to deliver one type of energy label, a HERS rating. • HERS raters have deep knowledge of building science and energy modeling, so are strong candidates to deliver other types of home energy labels as well. • Becoming a DOE Home Energy Score Assessor may be a good business opportunity for existing HERS raters. Until there is market demand for home energy labels, the business opportunity may rely on incentives or other subsidies.
Home Inspectors	• In theory, home inspectors would seem to be good candidates to deliver home energy labels in conjunction with home inspections. In practice, labeling programs have found it difficult to recruit participation from home inspectors. • Home inspectors may need more support completing the training and offering marketing materials on home energy labels. • Home inspectors may need more training and support in the areas of building science and energy. • The International Association of Certified Home Inspectors (InterNACHI), American Society of Home Inspectors (ASHI), and Inspection Depot are all Home Energy Score Partners. Programs can target inspectors with any of these groups in their region to better integrate Home Energy Score with the local home inspection community.

Training best practices

Training efforts depend on the type of software your jurisdiction decides to use to generate labels (e.g. HERS, Home Energy Score, other). While training to become a Certified HERS Rater or a DOE Home Energy Score Assessor do share some attributes, the differences are worth noting when considering best

practice approaches to training. HERS Rater candidates are required to attend classroom trainings conducted by an accredited Energy Rater Training organization. Some training organizations may offer a portion of the training online, but the primary approach is classroom training. By contrast, DOE Assessor candidates can complete their training and testing independently, via a web-based training and testing process.

Both HERS Rater and DOE Assessor candidates must conduct their first home assessment(s) under the supervision of a qualified trainer. DOE allows this initial mentored site-visit to happen one-on-one, as a group session, or remotely. RESNET requires two training ratings, one of which must be conducted on-site with the trainee, followed by three probationary ratings. With these differences in mind, below are a list of best practices to consider when training candidates for home energy labeling.

> The Value of Qualified Energy Professionals
>
> According to feedback gathered by Efficiency Vermont, Vermont's energy efficiency program administrator, customers highly valued the opportunity to receive recommendations and advice from the qualified professional who delivered their home energy label. This is the case for both new construction (where homeowners typically receive a certificate based on a HERS rating) and existing homes (where homeowners typically receive a label based on the DOE Home Energy Score.)
>
> For more information on training requirements and best practices see **Error! Reference source not found.** and **Error! Reference source not found.**.

- Whether approaching training in a classroom setting or independently, candidates should prepare for the training and testing by reviewing all materials provided to them.
- When independent training and testing is allowed, offering on-site classroom training is highly encouraged.
- Whenever possible, provide computers for trainees. If this is not possible, ensure candidates have a computer that meets all requirements and specifications prior to beginning the training.
- Ensure access to high-speed internet.
- Be attentive to the student to trainer ratio. For example, DOE Assessor trainers have found that a 5:1 student to trainer ratio is ideal. HERS Providers have been delivering training for a much longer period of time and may have higher student to trainer ratios.
- Trainers should be deeply familiar with the training material and any quirks or bugs associated with training software to preempt issues during training sessions.
- Trainers should plan to debrief following classroom and field training sessions to understand what worked and what didn't to improve future trainings.
- If possible, have another person (non-trainer) available for logistical support.
- If possible, provide a group mentoring, probationary assessment session, or in-field training, to allow candidates to learn from each other. This approach can be particularly useful when initially implementing a labeling program to ensure labels are delivered in a uniform manner
- Don't forget the perks! Consider providing meals, snacks, coffee etc. during classroom trainings. Consider having special 'treats' upon successful completion of testing requirements and keep it fun.

Mentoring and Quality Assurance (QA)

If a home energy labeling program is based on DOE's Home Energy Score, RESNET's HERS Rating, or a combination of the two, an initial mentoring period and ongoing quality assurance (QA) are required. These requirements foster accuracy and consistency of data collection and uniform energy modeling, as well as uniform delivery of results. Mentoring and QA are provided by individuals who hold additional credentials qualifying them to provide these services.

Mentorship and QA has historically been conducted onsite. As of 2017, remote mentoring and Desktop QA (DTQA) was provisionally approved by the U.S. DOE[12] for the Home Energy Score program. DTQA has been successfully implemented by Home Energy Score Partners as well as third-party Remote Service Providers. This approach can be extremely valuable in cases where high volumes of Home Energy Scores are being generated, or in cases where geography is a limiting factor. This approach also offers a business opportunity for Remote Service Providers to support the Home Energy Score when Partners are unable to provide these services directly. RESNET has also recently announced a Virtual QA Draft Protocol.[13] RESNET Virtual QA is included in the Standard Amendment currently out for public comment.[14]

Technical assistance for customers is also important. For example, Efficiency Vermont trained its customer service call center staff to field inquiries about home energy labels. The program developed an internal Frequently Asked Questions (FAQ) document[15] to support call center staff in responding to basic questions. The FAQ document was largely developed from DOE's Home Energy Score FAQs[16], with added Efficiency Vermont program-specific content. Efficiency Vermont also established a process to elevate more complicated or technical inquiries to a trained technical staff member. When implementing a home energy labeling program, consider how to provide this type of technical assistance for homeowners.

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[12] For more information about Remote Mentoring and Desktop Quality Assurance visit: https://betterbuildingssolutioncenter.energy.gov/home-energy-score/provide-quality-assurance, RESNET draft virtual QA protocol: http://conference2017.resnet.us/data/energymeetings/presentations/RESNET-2017-Virtual-QA-Timely-Feedback-in-a-Long-Distance-Partnership.pdf

[13] http://conference2017.resnet.us/data/energymeetings/presentations/RESNET-2017-Virtual-QA-Timely-Feedback-in-a-Long-Distance-Partnership.pdf

[14] http://www.resnet.us/professional/standards/RESNET_QA_Standard

[15] VERMONT HOME ENERGY PROFILE PILOT FAQS, 6/8/16

[16] https://betterbuildingssolutioncenter.energy.gov/home-energy-score/home-energy-score-faqs

<u>Proving the Value Proposition to Assessors</u>

The key to growing the market of qualified energy professionals capable of delivering home energy labels is proving the value proposition.

Providing labels based on national programs, like HERS and Home Energy Score, requires individuals to become qualified to use the required software. It is no small effort to become a certified HERS rater or a DOE qualified Home Energy Score Assessor, or both. To warrant the time investment, it must be worth it. Requirements for both certified RESNET HERS Raters and DOE Assessors are extensive. Training involves establishing a base level of building science knowledge, understanding the software, and learning about the umbrella program. Both involve training, self-study, examinations and scoring or rating of a home with oversight by a designated qualified individual. Specific details about qualification and training requirements may be found on the RESNET[1] and DOE[2] websites.

In the case of new construction, home energy labels or certificates are commonly part of existing utility incentive programs. Additionally, the rating or score delivered on the label is often an integral part of the program. Therefore, HERS raters are incentivized to work within new construction utility programs. A small subset of HERS raters work outside of utility programs and are paid directly by a homeowner desiring a home energy rating, but the majority operate in conjunction with a utility program structure[3].

In the case of existing homes, the primary mechanism to provide a home energy label is through DOE's Home Energy Score program. Helping new Assessors with marketing is also critical to building consumer demand and making the proposition worth the Assessors' time. See Part 2: Voluntary Program Considerations for an overview of resources available and guidance on implementing a voluntary Home Energy Score program.

[1] Certified HERS Rater requirements: http://www.resnet.us/professional/rater/hers-certification-requirements
[2] DOE Home Energy Score Assessor requirements: https://betterbuildingssolutioncenter.energy.gov/home-energy-score/become-assessor
[3] Performance Systems Development, presentation at 2017 RESNET Conference:
https://www.nehers.org/Data/Sites/1/media/training/webinars/presentations/resnet-2017-rater-survey-short-_3117.pdf

Element 5: Educating Real Estate Professionals and Appraisers

Real estate professionals are a direct link to home buyers and home sellers, two key market actors who can act upon the information contained in a home energy label. Moreover, access to verified, independent home energy information enables real estate professionals to:

- Better market their properties
- Empower buyers to make better informed investments
- Promote wiser use of energy in homes

- Be able to identify which home features and building attributes provide greater energy, water, and resource efficiency
- Create a healthier living environment for their clients

These benefits are contingent upon real estate professionals receiving comprehensive and targeted training for how to understand and use information from home energy labels. For real estate professionals to adequately explain home energy labels to their clients, they must have some training in the specifics of the home energy labeling program and general home energy efficiency.

When implementing a home energy labeling program, it's important to include opt-in/out language that enables third-party access to the home energy labels. This provides standing for the real estate community to access and share the home energy information. Real estate professionals can ultimately serve as the bridge between their clients and the energy information that they want to access. However, real estate professionals need support from the home energy labeling program to fully understand this opportunity.

By working with local or national training providers, home energy labeling programs can provide real estate professionals with the knowledge and skills to communicate with clients about the value and benefits of energy efficiency. To attract real estate professionals beyond the "early adopters," trainings should provide state-approved Continuing Education Units (CEUs) for real estate professionals. DOE's Energy Efficiency for Real Estate Professionals presentation has been approved for CEUs in a few states and is available free online. DOE also created a Home Energy Score insert for the National Association of Realtors' (NAR's) Green Designation Training, which Green Designation trainers can use to provide specific information on Home Energy Score as part of regular programming. Trainings should provide an overview of home energy labeling programs and offer participants a hands-on exploration of high performance building techniques and products through home site visits.

Successful real estate engagement programs in Oregon and Vermont have demonstrated that identifying local real estate champions and forming partnerships with real estate associations are critical to garnering interest in trainings. One-touch training programs can be supplemented with ongoing training opportunities covering a diverse set of home energy issues. Real estate professionals often benefit from ongoing engagement so they can gather the latest market insights.

Real estate professionals can access trainings in diverse ways. Consider coordinating trainings that include webinars, videos, site-visits, in-classroom, and on-demand on-line. These trainings should also be of different lengths – from intensive three-day courses that can result in achieving a professional designation to 5-minute videos on a pertinent topic. Local and national real estate training providers can often customize

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Engaging with Real Estate in Vermont

Building on the relationships and trust developed between the energy efficiency and real estate industries' collaborations on education and training on energy topics, Vermont Realtors®, the trade association representing Realtors® in Vermont, proposed to voluntarily provide their buyer and seller clients with a two-page informational pamphlet on home energy use. In addition, Vermont Realtors® updated the Sellers Property Information Request (SPIR) to provide better information about the energy features of a home to prospective buyers.

For more information on efforts to engage real estate in Vermont, read Case Study: Vermont.

curriculums to support the specific home energy labeling programs and provide connections to on-line real estate training platforms.

While buyers need access to energy efficiency information that is credible and easy to understand, sellers need tools that help to accurately capture the value of investments already made to improve a home's energy performance. Appraisers play this important, although longer-term, role in supporting a home energy labeling program and increasing the effectiveness of the label in the local market. Appraisers are the critical link between labels and documenting the value of energy efficient features in a home. When appraisers understand a home's energy information, they can calculate the relative additional value of those features.

Appraisers can see benefits from access to home energy labels in their market. They can differentiate themselves in the marketplace by learning how to use home energy labels in the appraisal process. Labels also help them minimize the risk of inaccurate appraisals that do not correctly value home energy upgrades. Appraiser training surrounding labels is necessary to shift the real estate market toward valuing energy efficiency. As more home energy labels are created, appraisers will have access to improved data regarding how the local market responds to labels and whether the market values more energy efficient homes. The Appraisal Institute's residential green and energy efficiency addendum allows appraisers to capture elements of a green building, including the energy label and/or green certification.

Appraisers, like all real estate professionals, require specific training to be qualified to successfully and accurately appraise the energy features in a home. The Appraisal Institute maintains a registry of those appraisers qualified to value energy-efficient high-performance homes. An overview of the appraisal process and energy efficiency, as well as links to appraiser educational requirements and the registry of qualified appraisers are provided in the document, Appraised Value and Energy Efficiency: Getting it Right[17].

Element 6: Linking Labels and Scores with Multiple Listing Services

A 2013 study by the National Association of Home Builders (NAHB) found that "nine out of ten buyers would rather purchase a home with energy-efficient features and permanently lower utility bills than one without those features that costs 2 percent to 3 percent less."[18]

A primary barrier to widespread access to energy information for homes in the market is that there are few systems in place to transmit this data to the real estate listings that real estate professionals and buyers use to compare homes. To successfully auto-populate energy efficiency data into Multiple Listing Services (MLSs), there are privacy and technical issues that must be addressed. The privacy issues can be addressed through releases or program design. This is

Ongoing Efforts for Linking to the MLS

There are many ongoing efforts to connect home energy labeling information to MLSs around the country. For more information on these efforts, read Connecting with Multiple Listing Services: Current Efforts.

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[17] https://www.appraisalinstitute.org/assets/1/29/AI-BCAP_Flyer.pdf
[18] http://energyefficientcodes.com/wp-content/uploads/2013/09/Slide-1-2013-Mar-Building-Online-NAHB-Study-Reveals-What-Home-Buyers-Really-Want.pdf

discussed in detail on the EMPRESS webpage on privacy concerns. The technical issues that concern the creation of this type of database system are:

- The ability to efficiently import data generated from a variety of program types
- The capacity to store the data in a secure and durable form
- The methods to make the data available in the formats that the real estate market expects and can utilize.

In 2015, U.S. DOE initiated the Home Energy Information Accelerator to help interested organizations work towards making this home energy data available in local real estate markets. These efforts, and others, have led to several solutions intended to either serve a single market or scale across states and/or municipalities. In the Northeast region, Northeast Energy Efficiency Partnerships (NEEP) has developed the Home Energy Labeling Information eXchange (HELIX) through a multi-state effort. In the Northwest region, Earth Advantage has developed the Green Building Registry, which is used to auto-populate data for the Portland Home Energy Score program. The Colorado Energy Office developed its own database for aggregating data. The North Carolina Building Performance Association has plans to deploy a system and Build It Green has solicited proposals for a system in California. In coordination with the Accelerator, the Council of MLSs released the Home Energy Information Guide, which details the process for MLSs and real estate agents seeking to use home energy information. More detail on HELIX and the Green Building Registry can be found here.

Whether your jurisdiction builds its own database or uses one of the available systems, there will be challenges for integrating with local listing services. There are over 800 local Multiple Listing Services in the country, plus other national services like realtor.com, Zillow, Trulia, and Redfin. Although the Real Estate Standards Organization has created a data dictionary and certifies MLS compliance with that dictionary, there are still differences in how green data fields are applied at the local level. All auto-population efforts require partnering with the local MLS(s)to ensure the data is properly represented in listings. Before assembling its database, Colorado first completed an effort to standardize green fields across most of the MLS systems in the state. This is an excellent idea for a statewide effort.

It is becoming more common for MLSs to include "green attributes" in listings, and in some cases real estate agents use data generated by existing ordinances to populate the green fields in the MLS. For example, the Energy Conservation Audit and Disclosure ordinance in Austin, Texas allows home assessment data to populate the "green fields" of the MLS.[19] This webpage describes how some fields in the MLS can now be auto-populated once the data are collected by home energy raters and other verifiable data sources. Auto-population of home energy information can ensure greater accuracy and give real estate agents and their customers greater confidence in the information.

List of Web Links throughout this Guide

1. What Is Home Energy Labeling & Why Is It Beneficial: http://empress.naseo.org/energy-labeling
2. Mandatory vs. Voluntary Labeling Programs: Trading Off Benefits & Challenges: http://empress.naseo.org/mandatory-vs-voluntary-approaches
3. Home Energy Labeling Case Studies: http://empress.naseo.org/casestudies
   a. Voluntary Home Energy Labeling Programs & Policies
   b. Mandatory Home Energy Labeling Programs & Policies

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[19] Energy Audits-Benefits Await. Austin Board of Realtors. November 20, 2015. http://www.abor.com/blog-energyaudits/. Accessed October 31, 2017.

4. Example Legislation and Ordinances: http://empress.naseo.org/sample-legislation
    a. Sample Legislation, Derived from Oregon Voluntary Labeling Law
    b. Sample Ordinance Language, Derived from Portland, Oregon, Residential Energy Performance Rating Ordinance
5. Currently Available Home Energy Labeling Tools: http://empress.naseo.org/home-energy-labeling-tools
6. Privacy Concerns: http://empress.naseo.org/resources/privacy
7. Label Examples: http://empress.naseo.org/sample-labels
8. DOE's Home Energy Score Program: http://empress.naseo.org/resources/home-energy-score
    a. Home Energy Score Label Design
    b. Home Energy Score Energy Modeling Software and Score Generation
    c. Suitability of Local Housing Stock and Market for DOE's Home Energy Score
    d. Considerations for Updating Home Energy Scores after Home Energy Retrofits
    e. Training Assessors
9. Home Energy Rating System (HERS): http://empress.naseo.org/home-energy-rating-system
    a. HERS Background
    b. RESNET
    c. The HERS Index
    d. HERS Software
    e. HERS Rating Label Designs
    f. The Market for HERS Ratings
    g. Training HERS Raters
10. Connecting with Multiple Listing Services: Current Efforts: http://empress.naseo.org/resources/mls
11. Other Resources: http://empress.naseo.org/resources/other