

Unlocking the Value of an Energy Efficient Home

A Blueprint to Make Energy Efficiency Improvements Visible in the Real Estate Market

August 2013

CNT Energy
National Home Performance Council



National Home
Performance Council

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About CNT Energy

CNT Energy (www.cntenergy.org) combines rigorous research with effective solutions to help consumers and communities control energy costs and become more energy efficient. CNT Energy designs and implements programs and conducts research in the areas of dynamic electricity pricing, building energy efficiency, and regional energy planning to achieve significant savings and job creation. CNT Energy is an affiliate of the Center for Neighborhood Technology.

About Value for High Performance Homes Campaign

As a provider of regional energy efficiency programs, CNT Energy understands that future success is dependent upon energy efficiency becoming transparent in the real estate transaction. The Value for High Performance Homes Campaign is designed to advance how energy efficiency is reflected by the market in the sales transaction. For more information, please visit the Value for High Performance Homes Campaign at www.cntenergy.org/innovation/valuehph/ to find news on the energy efficient real estate transaction as well as relevant tools. The Green MLS Implementation Guide introduced in this paper was developed as part of the Value for High Performance Homes Campaign.

About National Home Performance Council

The National Home Performance Council (NHPC) is a national nonprofit organization created to support whole-home energy efficiency programs through research and stakeholder engagement. NHPC's board of directors includes a wide range of energy efficiency stakeholders including: state energy offices, non-profit organizations, contractors, program implementers, real estate representatives, utilities, and manufacturers. NHPC's mission is to address challenges that prevent the growth and expansion of the whole-home energy efficiency sector and communicate these solutions. The Building Performance Institute, Inc. (BPI) standards discussed in this paper were developed by a BPI working group chaired by NHPC and CNT Energy.

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Updated November, 2013. Since publication, we have reordered the steps in the Blueprint. This new order reflects the logical progression of steps that energy efficiency programs can take to help accurately reflect the value of efficiency in the real estate market.

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1. Executive Summary

Consumer demand for energy efficient homes that feature lower energy costs, greater comfort, and other benefits, has been growing steadily during the past decade. The success of energy efficiency programs in markets across the country has contributed to a growing inventory of improved existing homes. Yet, a disconnect currently exists between the energy efficiency program implementers, the real estate community, and the homebuyer and seller. Energy efficiency programs have not found ways to transmit consistent, standardized data about energy efficiency features in existing homes to the real estate industry so that these features can be taken into account by buyers, appraisers, lenders, and others during the home sales transaction.

This white paper was developed by CNT Energy and the National Home Performance Council to provide energy efficiency program sponsors and other stakeholders in the home performance industry with methods to document efficiency improvements and incorporate them into the real estate value chain. Making information about energy efficiency improvements visible to home buyers and others involved in a home sale transaction will play a crucial role in ensuring that improvements are fairly valued at the time an existing home is sold. The core of the paper consists of a blueprint that program sponsors and other energy efficiency organizations can use today to integrate information about improved existing homes into the real estate transaction process. The intended outcome of this blueprint is that energy efficient features that are often invisible to the naked eye become visible and can be accurately valued.

The goal for both the energy efficiency and real estate industries is a standardized approach to sharing the data that energy efficiency programs collect on successfully implemented energy efficiency improvements. With a standardized approach, the parties involved in real estate transactions can use this data when energy efficient existing homes are bought and sold. Standardizing the data incorporated into the transaction process also helps establish what premium (if any) markets place on energy efficient existing homes. Knowledge of such a premium, backed by research, would help set in motion a virtuous cycle in which homeowners become more likely to invest in energy efficiency improvements

because there is a clearer indication as to how much of the investment might be recaptured at the time of sale. Growing inventories of existing energy efficient homes create an opportunity for the energy efficiency and real estate industries to collaborate and help homebuyers and sellers understand the fair value of these improvements.

The blueprint that energy efficiency programs can implement right now includes the following steps:

Step 1

Document energy efficiency features and improvements using consistent, standardized methods. Energy efficiency improvements are already being documented by efficiency programs as part of programmatic work. Upon completion of improvements to an existing home, program implementers should provide homeowners with documentation consistent with a Building Performance Institute certificate of completion standard that lists the improvements made to the home.

Step 2

Disclose inventories of energy efficient homes to track supply. Efficiency programs have a key role to play in making sure the local real estate market understands how the inventory of existing energy efficient homes is growing, via consistent tracking of data and dissemination of efficiency trends in the local housing inventory.

Step 3

Capitalize on existing high-quality continuing education and designation training offered by local REALTOR® associations and other real estate industry chapters to educate all professionals involved in the sale of an energy efficient home about energy efficiency certifications and features.

Step 4

Work with the MLS community to ensure that data about home energy efficiency improvements are incorporated into for-sale listings. This requires energy efficiency programs to identify local multiple listing service (MLS) providers and their vendors. The energy efficiency industry should understand the data fields associated with energy efficiency, or “green fields,” already available in the MLS and introduce new fields as appropriate, drawing on data elements incorporated into the required MLS industry data standard.

Step 5

Ensure that the data about home energy efficiency improvements are incorporated into the appraisal process. As standard practice, energy efficiency program sponsors should provide homeowners with a report of program data in a format that can be readily passed along to an appraiser during home purchase or refinance. This paper outlines how this might work using an Appraisal Institute addendum, which programs are authorized to complete on behalf of the homeowner and provide as a record of their work.

Step 6

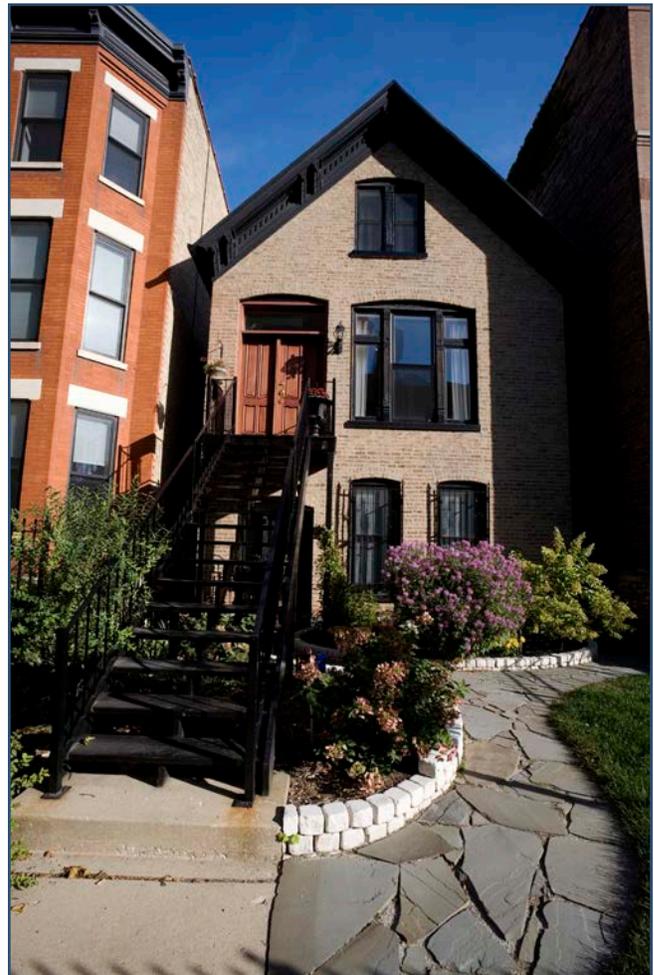
Develop standards and IT solutions that allow quicker and more automated transfer of data. The blueprint outlined in this paper is based on the transfer of data about energy efficiency upgrades from programs to the professionals involved in the real estate sales process. A number of currently available tools and approaches, including data standards, methods for auto-populating forms and databases, and transferring program data to multiple parties, could greatly facilitate the data transfer process necessary for energy efficiency improvements to be properly valued.

Step 7

Work with partner financial institutions to ensure selection of qualified appraisers. Sharing documentation about energy efficiency improvements in a standard way creates opportunities for financial partners to streamline some key processes. This may include opportunities to better match qualified appraisers to efficient home assignments, or to help underwriters work more effectively by generating a limited, consistent, and familiar set of supporting documents to be included in loan files.

The key audience to implement this blueprint consists of energy efficiency programs sponsored by utilities, non-governmental agencies, state energy offices and others, and the organizations that implement these programs. This blueprint may also be of interest to energy advocates, high-performance building contractors, energy efficiency program sponsors and administrators, utilities, architects and designers, verifiers and raters, building scientists, state energy offices, non-governmental agencies, and others.

The focus of this paper is the existing housing stock. To date, there has been no consistent method for documenting improvements in a way that can be reflected in the existing home sale transaction. While this paper does highlight emerging trends for improving the sales transaction for newly-built “green” or energy efficient homes, the recommendations in this paper focus on existing homes with energy efficient characteristics.



2. The Need: Demand for Energy Efficient Homes

In the spring of 2013, media reports from the Washington Post¹ and the National Association of REALTORS®² (NAR) described growing demand for newly constructed homes with energy efficient features. Studies in California³ and North Carolina⁴ show that newly built energy efficient homes trend toward shorter sale times and/or higher prices than comparable code-built homes. A study by the National Association of Home Builders⁵ found that ENERGY STAR® appliances and the ENERGY STAR® for New Homes label were ranked “very important” by 94 percent and 91 percent of new home buyers respectively, putting them both in the top five “must haves” among 120 features.

The demand for energy efficient characteristics in existing homes is growing as well. The NAR annual Home Buyer/Seller Profile⁶ found that 87 percent surveyed said a home’s heating and cooling costs were “important” or “very important” regardless of the age of the home. This number has been consistent since it was first surveyed in 2008. Costs for appliances and lighting have also ranked strongly, at about 70 percent.

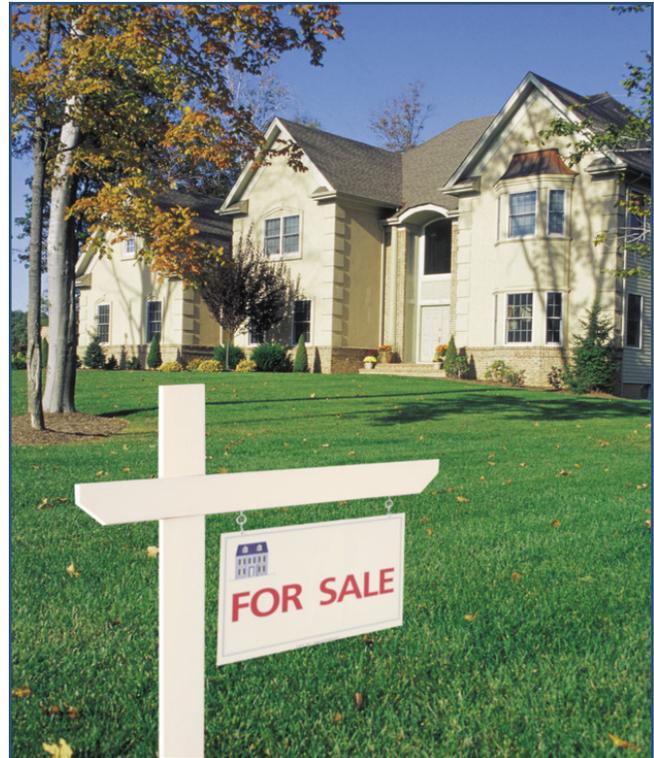
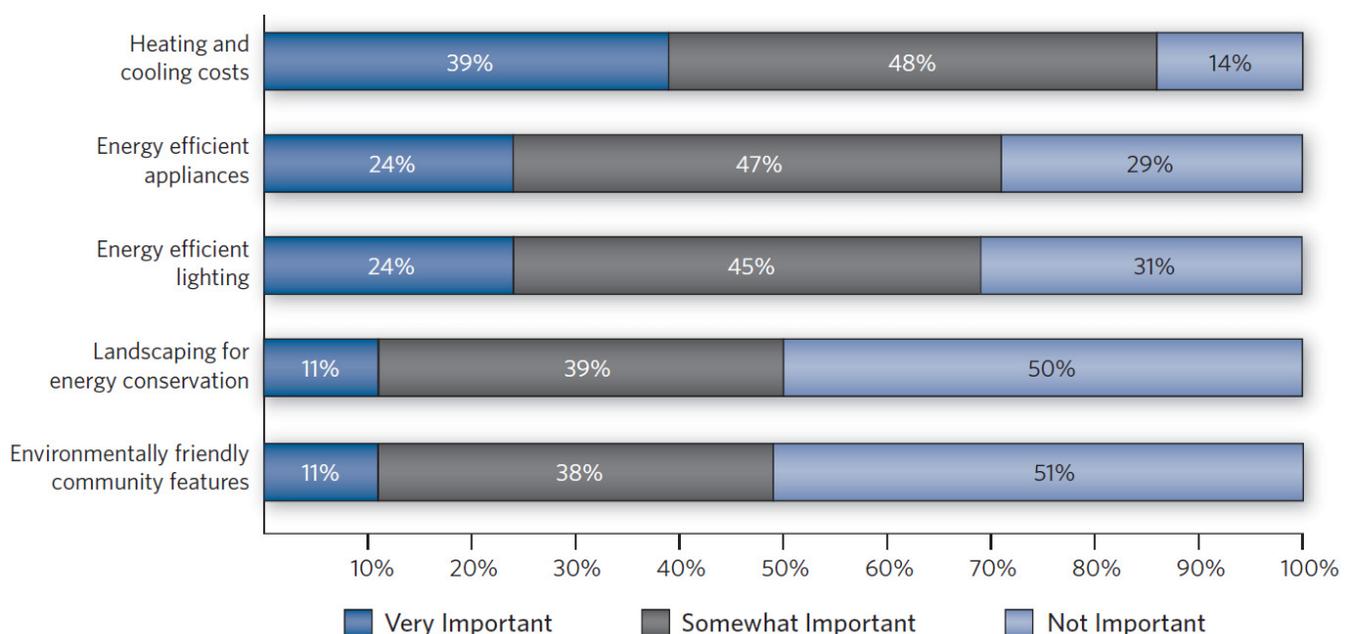


Figure 1: Importance of a Home’s Environmentally Friendly Features

(percentage distribution)



Source: National Association of REALTORS®, Profile of Home Buyers and Sellers 2012. Chicago, IL: National Association of REALTORS®.

The energy efficiency industry has been working to supply this rapidly growing demand. Between 2009 and 2012, more than 1.25 million existing homes were upgraded to improve their energy efficiency through programs working in partnership with the U.S. Department of Energy (DOE).⁷ The Home Performance with ENERGY STAR® program, administered nationally by the DOE in conjunction with the U.S. Environmental Protection Agency (EPA), is now available in 35 states.⁸ The goal of the program is to help homeowners improve the efficiency and comfort of their homes using whole-home energy upgrades, while helping to protect the environment. Other existing home programs sponsor stand-alone energy efficiency measures that improve a particular feature of the home, such as insulation or heating system upgrades. (See definitions in Figure 2.)

Historically, the real estate community has focused on client effective demand – their needs as well as their ability to pay for them – and has been wary of selling features that clients do not explicitly ask for or want. The energy efficiency industry’s efforts to encourage labeling and regulations, accordingly, have been opposed by the real estate community, because these approaches put homes that are not energy efficient at a disadvantage.

While opposed to mandating labels and regulation, NAR⁹ and the energy efficiency industry have long agreed that voluntary programs and incentives benefit consumers. The fact that consumers are showing increasing interest in energy efficiency features – also indicating that these features are growing in demand – should further help to allay the real estate community’s concerns. As the real estate market rebounds and the volume of home sale transactions increases, a new opportunity is emerging for these industries to collaborate by enabling buyers and sellers of these homes to understand the fair value of efficiency investments. (See Figure 3.)

Figure 2: Definitions of Energy Efficiency Measure and Whole-Home Energy Upgrade

Important Definitions

Note: The term “energy efficiency improvement” or “energy efficiency upgrade” is used throughout this paper to refer to the terms below.

Energy Efficiency Measure (also known as a single measure): A single change or improvement to a home that increases the home’s energy performance by decreasing its energy consumption. Insulating an attic or replacing an old, inefficient furnace with a new, high-efficiency model are examples of energy efficiency measures.

Whole-Home Energy Upgrade (also known as a Home Energy Upgrade, or HEU): A comprehensive initiative designed to improve a home’s energy efficiency through the implementation of multiple energy efficiency measures that take into account the fact that a home is a complex, dynamic system. If a whole-home energy upgrade includes insulation and air sealing of the walls and attic, and replacement of an old air conditioning system with a new, higher-efficiency system, for example, the contractor doing the work would take into account the fact that the building would be less leaky (as a result of the insulation and air sealing) when selecting the capacity of the new air conditioning equipment.

Figure 3: Historical Trend in Transaction Volume



Source: NAR Research. Historical trend in transaction volume.

However, as a result of two significant limitations, home improvements made through energy efficiency programs are not often recognized – or are not valued even if they are recognized – in the real estate transaction when these homes are later bought and sold. First, lack of standard methods for documenting energy efficiency upgrades means there is no easy way for buyers to find homes that often include relatively invisible features such as:

- ENERGY STAR® appliances
- Heat pumps
- High efficiency HVAC systems
- High quality insulation and air sealing
- Integrated, systematic whole-home energy improvements such as offered through a program like Home Performance with ENERGY STAR®

Second, even if prospective buyers can find efficient homes, the market frequently fails to accurately value more efficient homes or energy efficient features, not because they have no intrinsic value, but because this value is difficult to quantify.

Energy efficiency programs that focus on home energy improvements need to address these two limitations to achieve successful integration with the real estate market. A standardized documentation methodology is an important priority for energy efficiency programs because, as described below, a certificate process could address the vicious cycle some homeowners currently experience where improvements are either ignored or invisible during a home sale. Instead, programs can lay the groundwork for a virtuous circle in which homeowners are eager to pay for energy efficiency improvements because they know that they can recover some or all of the value of their investment at the time of home sale.



3. Success Measure: Contributory Value

Data is the key to addressing the transactional barriers that make it difficult for the market to identify and properly value energy efficient homes. Energy efficiency programs need to develop ways to transfer information about energy efficient features of existing homes to people and institutions involved in real estate transactions, including prospective buyers, real estate agents, appraisers, home inspectors, and others. Energy efficiency programs need to keep several key concepts in mind when collecting and disseminating this information:

- Ensure that this information is intelligible to professionals who are not experts in building science.
- Confirm that this data is standardized within markets, and beyond them, to the greatest extent possible.
- Implement strategies that will allow this data to be used to determine the value of energy efficient features.

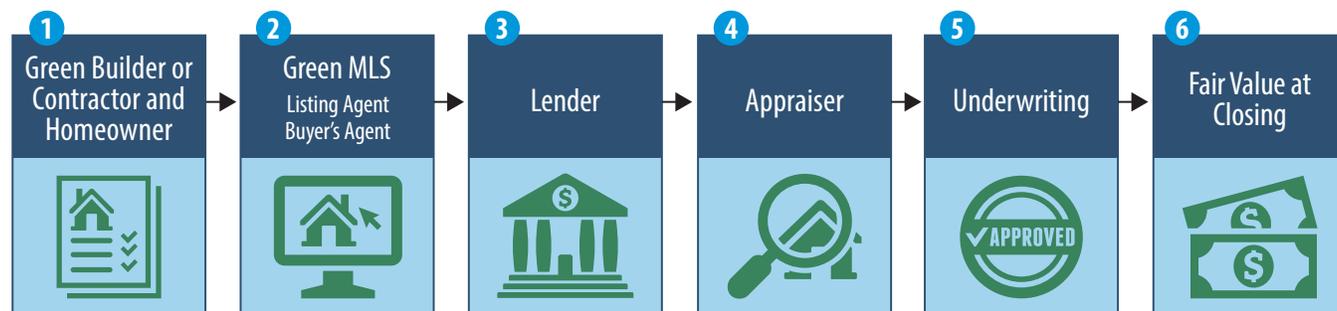
The key points at which the information needs to enter the real estate transaction are depicted in Figure 4.

The most immediate role of this data is to make invisible home energy efficiency features visible at the time of the real estate transaction. Because the most important energy efficiency improvements are often sealed into the attic and behind walls, or programmed into appliances, lighting, or other systems, buyers find it hard to inspect these improvements directly, or recognize them when they see them. Real estate agents may not be familiar with or notice these features or may not know how to verify them. The most important aspects of home performance – including safety, comfort, energy efficiency, durability, and environmental impact – are literally invisible during key steps of any home sale or refinance transaction.



Figure 4: The High Performance Home Value Chain

Value for Green Homes



Documentation is key:
 ✓ Green building certificate
 ✓ Performance test results
 ✓ Local green disclosure form
 ✓ 12 month utility usage

Source: Green MLS Toolkit: National Association of REALTORS®

Documentation is the best tool to make invisible energy efficiency features visible to homeowners. In the new home sector, builders can arrange to have the homes that they build certified to indicate that they meet highly regarded standards, such as those established by the U.S. Green Building Council's (USGBC) LEED program, or the EPA's ENERGY STAR® program. These certifications communicate clear, consistent, and trustworthy information – for example, that the home has received a LEED Silver or a specific RESNET Home Energy Rating (HERS) system rating – and their representations can be inspected by home buyers and real estate agents.

Energy efficiency programs that support improvements in existing homes could benefit from adopting a similar approach. The Home Performance with ENERGY STAR® program, which provides support to homeowners who want to improve their home's energy efficiency through a comprehensive, whole-home upgrade, is exploring one approach to documentation for existing homes. Home Performance with ENERGY STAR® is implemented by local or state-level sponsors who agree to follow national guidelines issued by the DOE and EPA; some of these sponsors issue certificates to homeowners who have upgraded their homes, and DOE provides guidance for a certificate template. The Building Performance Institute (BPI) is developing a standard that builds off these efforts by providing a standardized set of data fields that can be reported in a certificate format.

The primary benefit of using such a standard for energy efficiency programs is that it makes information easy to transfer to other parties in the real estate transaction process, as detailed later in this paper. A certificate standard can be used to communicate information about single energy efficiency measures such as heat pumps, duct sealing, or high-performing insulation, as well as whole-home energy upgrades.

The immediate benefit of documentation for the real estate transaction is that it allows buyers to make informed choices. As discussed above, many buyers have a strong interest in purchasing an energy efficient home. Documentation such as a standard-compliant certificate or information about single-measure improvements would enable buyers to locate homes that are efficient or have specific energy efficient features.

Information that is useful to buyers also benefits other professionals involved in the transaction, including underwriters and real estate agents.

A second benefit of documentation is that it makes the appraisal process easier. Appraisers cannot consider attributing value to energy efficiency unless they have information about energy efficient features. Documentation provides an important method for getting information to appraisers so that they can take into account the contributions that energy efficiency improvements – from air sealing and attic insulation to heat pumps or high-efficiency boilers – may make to a home's overall value.

Over the longer term, data is crucial because it allows energy efficiency improvements to be valued. In theory, the evidence that buyers want energy efficient homes suggests that they are willing to pay a premium for these features. The technical term for this premium is “contributory value.” Contributory value is defined by the Dictionary of Real Estate Appraisal as the change in the value of a property as a whole, whether positive or negative, resulting from the addition or deletion of a property component.¹⁰

Sandra Adomatis, SRA and LEED GA, a leading appraiser of energy efficient homes, describes contributory value as: *[T]he amount the market is willing to pay for a given feature. It is not always equal to cost and is often defined as the cost less all forms of depreciation.*

An example of contributory value

A swimming pool costs \$35,000, but after one year the house sells for only \$10,000 more than a similar house without a pool. Therefore, the contributory value of the pool is \$35,000 minus \$25,000 in loss from all forms (physical depreciation and functional obsolescence) for a contributory value of \$10,000 based on market support or paired sales.

Clear identification of the positive contributory value of energy efficient features, or energy efficiency premium, is crucial because it has the potential to drive a tremendous increase in residential energy efficiency by demonstrating to the buyer and other participants in the real estate transaction that improvements can “pay for themselves,” in part or in whole, through an incremental increase in the home’s resale value. Once research consistently demonstrates the contributory value of energy efficiency characteristics, and a critical mass of homeowners have confidence that energy efficiency improvements add value, a virtuous cycle is set in motion in which homeowners upgrade the energy efficiency of their existing home because they believe that they can recapture the value of their improvements at time of sale.

The energy efficiency industry can look to the green residential building sector for signs of this virtuous cycle. The transaction process for sales of new green homes is beginning to follow the process outlined in Figure 4. This graphic captures the emerging process the green home construction industry has established for documenting home improvements in order to make them visible to the various professionals involved in the sales transaction. The certified high-performance upgrades of the property that affect value are starting to be passed along the chain from builder, to listing agent, to buyer’s agent, to lender and underwriter, to appraiser. Established documentation processes such as the USGBC’s LEED for Homes program and the HERS index score can now be made visible in the real estate transaction through established fields in many MLS databases and on standard appraiser worksheets.

The data that has been collected through this process provides early evidence of the contributory value that accrues to homes built to specific energy efficient standards. For example, a 2012 UCLA study *The Value of Green Labels in the California Housing Market*¹¹ finds a nine percent contributory value for green-labeled homes. The North Carolina Energy Efficiency Alliance’s ENERGY STAR Market Impact Study finds that ENERGY STAR® new homes sold for a \$5,500 premium, 90 days sooner than other homes.¹² NAR’s Green REsource Council provides a sample of trend reports using MLS data in a few markets that also may show a premium sales price or shorter marketing period.¹³

For documentation to meet any of the uses described above, it must be accurate. As consumers have become more interested in energy efficiency over the past decade, incidents involving false claims about a home’s energy efficient features have become increasingly common. Such representations – that a home is characterized by energy efficient features, such as a high-efficiency furnace or highly rated insulation, which it does not actually have, for example – are sometimes referred to as “greenwashing.” Such misinformation poses a serious danger to the energy efficiency industry because it has the potential to make homebuyers skeptical about energy efficiency and less willing to consider the real benefits of energy efficient features. Accordingly, it is important for the energy efficiency and real estate industries to ensure that documentation incorporated into the real estate transaction is accurate and reliable.

In short, to ensure that buyers can find energy efficient homes, and to ensure that these homes are properly valued, energy efficiency programs need to incorporate reliable data into the real estate transaction. A blueprint describing how to do this is the subject of the next three sections.



4. The Blueprint: Tools

The blueprint recommended in this paper is based upon three transaction tools:

- Real Estate Transaction Standard and Green MLS Implementation Guide
- Appraisal Institute Residential Green and Energy Efficiency Addendum
- Building or Home Improvement Verification

Implementation of these tools together for both new and existing homes, in a consistent fashion in markets around the country, would result in more accurate valuation of energy efficient homes and home characteristics.

The Real Estate Transaction Standard and Green MLS Implementation Guide

In any given market, the multiple listing service, or MLS, allows real estate agents to add or search available homes for sale. The majority of homes sold are via an MLS, according to the National Association of REALTORS® 2012 Home Buyers and Sellers Profile.¹⁴ Only nine percent of homes sold in 2012 were sold directly by the owner, and were therefore not listed on an MLS. Thus, it is critical for the energy efficiency industry to understand how homes are listed in the MLS, as these systems constitute the primary marketplace where homes that have completed improvements through energy efficiency programs will be listed for sale.

The MLS industry is large, decentralized, and complex. Over 850 MLSs operate in different markets around the country. Each has different governance models and field offerings. More than ten major MLS system vendors provide database, programming, and hosting services to this industry. Hundreds more provide niche services.

The core of any MLS service offering is to make high-quality data on homes for sale available so real estate brokers can work together to match homebuyers and sellers. Given the complexity of the industry and the core mission of high-quality data, the industry has collaborated on data standards to facilitate the transfer of data between MLS, system vendors, data aggregators, and others vital players.



The Real Estate Standards Organization (RESO) is the entity that manages and maintains the industry's technology standard. RESO is responsible for both the data transfer standard, known as the Real Estate Transaction Standard or RETS, and the data collection standard, known as the RETS Data Dictionary. RESO and its standards allow for consistent and accurate information across the industry.

Energy efficiency programs have an interest in consistent and accurate data about energy efficiency improvements, and much like the MLS industry, programs have a similar interest in seeing that this information is reflected consistently and accurately during a real estate transaction. Therefore, knowledge of the RETS data transfer standard and the RETS Data Dictionary can help energy efficiency programs advance the goal of making energy efficiency improvements visible during a real estate transaction.

The RETS data transfer standard facilitates communication of high-quality data across the real estate industry. RETS allows different parties with different technology systems to transfer data sets consistently. NAR has required that MLSs migrate to RETS-compliant fields beginning in 2009.¹⁵ RESO is considering a compliance program so that MLSs and software vendors can confirm and promote their compliance to RETS data transfer standard as tested by a third party.

The RETS Data Dictionary provides a set of national standard terms for use in MLS databases. The Data Dictionary definitions and guidelines for data fields serve as a “common ground” for systems that comply with RETS, and as a point of reference for those that do not.

Consistency of data fields and data transfer creates many opportunities for partners to work together to improve the industry. For example, many MLSs use RETS to make their listings available on websites like Realtor.com. Or, some vendors that aggregate county tax assessor records use RETS-compliant MLS fields to allow for auto-population of fields such as tax rates or square footage.

One important characteristic of the RETS data transfer standard and the RETS Data Dictionary is that they define a universe of data elements, but leave the choice of which data elements to use to individual MLSs.

A second important characteristic of these standards is that they are updated periodically through a collective process involving input from multiple stakeholders, resulting in different versions of the standard. The Data Dictionary and each version of RETS data transfer standard are slightly different, as a result of additions, subtractions, and changes to data elements that reflect larger market changes. As a result, the capacity of a given MLS to store information about energy efficiency in its database and to display it in listings can vary considerably.

Three factors determine an MLS’s ability to capture and communicate energy efficiency-related data:

1. Whether or not the MLS is RETS-compliant
2. Which version of RETS¹⁶ the MLS uses
3. Which of the available energy efficient fields the MLS chooses to implement

Regardless of version implemented, following the RETS data transfer and Data Dictionary standards creates a universal language all energy efficiency programs and real estate professionals can understand and use to communicate effectively.

The first RESO Data Dictionary was released in 2012 and included four fields dedicated to green or efficiency program documentation.¹⁷ (See Figure 5.)

Figure 5: RETS Green MLS Fields

RETS Green MLS Fields: Verifications

Green Verification Body

Example: Home Innovation Research Labs

Green Verification Program

Example: ICC-700 NGBS

Green Verification Rating (if applicable)

Example: Gold

Green Verification Version

Example: 2012

In fall 2013, a resource with an additional level of detail about these four fields as well as over 40 additional efficiency-related fields will be published by NAR’s Green REsource Council.¹⁸ The Green MLS Implementation Guide is a first-of-its-kind resource for MLS and vendor technology staff responsible for implementing fields and related drop-down values or “enumerations.” The guide will take the Data Dictionary down to an additional level of detail, further defining Green MLS fields as well as relevant enumerations.

The implementation guide will be a resource for efficiency programs as well. The guide will help programs understand these fields in the RETS Data Dictionary so they can report energy efficient characteristics in a manner consistent with a typical MLS listing. In other words, the RETS-defined efficiency-related fields offer a way to bring consistency to communications between everyone involved in the energy efficient home transaction. As shown in Figure 4, these fields facilitate communication about energy efficiency between contractors and homeowners, listing agents, buyer’s agents, lenders, appraisers, and underwriters.

The Appraisal Institute Residential Green and Energy Efficiency Addendum

Much as RETS provides an access point for efficiency programs to the home sale transaction, the Appraisal Institute Residential Green and Energy Efficiency Addendum (G&EEA) creates an important opportunity for the same programs to inform the appraisal process. The addendum is an optional form appraisers can use as a worksheet to identify energy efficiency improvements, renewables, and other “green” characteristics, and to help make an accurate assessment of the value of energy efficient and green homes.

This addendum is meant to accompany the Uniform Residential Appraisal Report (Form 1004), which does not have sufficient space to capture details about energy efficient homes. With the version 2.0 release of the addendum in spring 2013, the Appraisal Institute confirmed that the G&EEA Addendum can be completed by contractors or program implementers; that is, whoever has primary information on energy efficiency improvements and features.¹⁹

The addendum captures details about high performance property details in a thorough and consistent way, allowing a clean transfer of data from energy efficiency programs to appraisers. Appraisers can use this data to inform their “opinion of value” for the property. In the case of existing homes that have received energy efficiency upgrades, there may be a significant lag time between the completion of the upgrade and the time that the home is appraised, whether for a mortgage refinancing or a home sale process.

Therefore, efficiency programs have a key role to play not just in reporting work complete in an appraiser-friendly format, but also in emphasizing to homeowners just how vital it is to save this report and ensure it is included with other key mortgage paperwork, such as tax records. Crucially, programs also need to ensure that the data that flows to the addendum is accurate and can be relied upon by the appraiser.

Figure 6: Appraisal Institute Residential Green and Energy Efficiency Addendum (page 1 of 5)

		Client File #:	Appraisal File #:
Residential Green and Energy Efficient Addendum			
Form 820.04*		Client:	
		Subject Property:	
		City:	State: Zip:
Additional resources to aid in the valuation of green properties and the completion of this form can be found at http://www.appraisalinstitute.org/education/green_energy_addendum.aspx			
<p>The appraiser hereby certifies that the information provided within this addendum:</p> <ul style="list-style-type: none"> has been considered in the appraiser's development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report. is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report. is the result of the appraiser's routine inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumption: Data provided herein is assumed to be accurate and if found to be in error could alter the appraiser's opinions or conclusions. is not made as a representation or as a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments. <p>Green Building: The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classic building design concerns of economy, utility, durability, and comfort.¹ High Performance building and green building are often used interchangeably.</p> <p>Six Elements of Green Building: A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor air quality, and (6) maintenance and operation. A Green Building will be energy efficient but an energy efficient building is not synonymous with Green Building.</p>			
Green Features			
The following items are considered within the appraised value of the subject property:			
Certification	Year Certified:	Certifying Organization: <input type="checkbox"/> Home Innovation Research Labs (ICC-700) <input type="checkbox"/> USGBC (LEED) <input type="checkbox"/> Other:	<input type="checkbox"/> Verification Reviewed on site <input type="checkbox"/> Certification attached to this report
Rating	Score:	<input type="checkbox"/> LEED Certified: <input type="checkbox"/> LEED Silver <input type="checkbox"/> LEED Gold <input type="checkbox"/> LEED Platinum <input type="checkbox"/> ICC-700 National Green Building Standard Certified: <input type="checkbox"/> Bronze <input type="checkbox"/> Silver <input type="checkbox"/> Gold <input type="checkbox"/> Emerald Green Certifying Organization URL (website)	
Additions	Explain any additions or changes made to the structure since it was certified:		
	Do changes require recertification to verify rating is still applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Comments	<p>If a property is built green but not formally certified, it still deserves proper description and analysis to value the features. The market analysis is of the structure's physical, economic, and locational attributes and not an analysis of its label alone.</p> <p>Attach the rating worksheet that provides the ratings for each element to provide a better understanding of the features. The worksheet will assist in comparing the subject to sales rated by different organizations.</p>		
The objective of this Addendum is to standardize the communication of the high performing features of residential properties. Identifying the features not found on the 1004 form provides a basis for comparable selection and analysis of the features. Builders, contractors, homeowners, and third party verifiers are encouraged to complete this Addendum and present to appraisers, agents, lenders, and homeowners.			

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Building or Home Improvement Verification

With new homes, the green building industry has provided leadership around building verification by encouraging use and public understanding of programs including the HERS Index, ENERGY STAR®, and LEED and National Green Building Standard certifications. This helps make the energy efficient and other “green” features of these homes transparent during a new home sale. As a result, it is becoming possible to measure a contributory value for these features.

Compare this to the existing housing stock. Until very recently, no consistent way to record home energy improvements completed in an existing home has been developed. The result is that MLS administrators are wary about deploying fields related to energy efficiency in MLS systems. Real estate agents are wary of including these upgrades in listings due to potential liability risks and the fear of greenwashing.

The Building Performance Institute (BPI) is leading the way to make home energy efficiency more MLS- and appraiser-friendly and reduce greenwashing through the creation of a new national standard. *BPI-2101-S-2013 Standard Requirements for a Certificate of Completion for Whole-House Energy Efficiency Upgrades* defines a standard way to describe energy efficiency improvements in an existing home.²⁰

BPI-2101 defines a voluntary certificate that includes a label or indication of energy consumption, such as a HERS index score, Home Energy Score, or a prediction of post-upgrade energy savings, as a “Certificate of Performance.” A voluntary certificate that describes energy improvements made in a home, but does not include quantitative information about energy consumption, is defined in the standard as a “Certificate of Energy Efficiency Improvements.”

The BPI standard does not dictate the appearance of the certificate, which can be designed to meet the requirements and tastes of the local market. The standard is currently scheduled to be approved by BPI in the late summer or early fall of 2013.

BPI-2101 was designed partly to standardize the flow of information into real estate transactions by providing a common vocabulary that would allow the many energy efficiency programs across the U.S. to describe energy efficiency improvements in the same way. Use of a national standard will support comparability and enable research on the benefits of residential energy upgrades.

Figure 7: Data Alignment from Home Performance to MLS and Appraisal



Verified data about energy efficiency improvements also creates better opportunities for working with the real estate industry, and especially with MLSs that have a core operating mission of providing the highest-quality data about homes for sale. Standardized, verified data reduces MLS and real estate concerns about greenwashing and liability for information provided to a buyer as the source of the information (in this case, an efficiency program) can be quickly identified.

The real potential for BPI-2101 to promote more accurate valuation of energy efficiency, however, is the way it has been designed to facilitate the transfer of data from contractors and programs to real estate agents, appraisers, and MLS systems, thereby making the invisible visible. The data elements in BPI-2101 are drawn from another BPI standard (BPI-2200) that serves as a data dictionary for the energy efficiency industry. A companion BPI standard (BPI-2100, or HPXML) produces information in a way that allows the data to be transferred among a wide range of parties.



The data elements in BPI-2101 are also aligned with the data in elements in the RETS Data Dictionary and the Appraisal Institute addendum (see Figure 7). As a result, it is relatively simple to translate the information describing a home energy efficiency upgrade contained in a BPI-2101-compliant certificate to an MLS system that collects data about energy efficient features or to a PDF or database that contains the fields from the addendum. In practical terms, this means that energy efficiency programs could set up systems that would automatically feed nationally standardized data on home energy upgrades to databases and systems that can be accessed by real estate agents and appraisers.

Taken alone, each of the three tools described above makes residential energy efficiency improvements more transparent to the real estate market. Together, these tools provide even greater impact. At the national level, these tools have been aligned in their design and create the quality and trust needed to enable a better transaction process for existing energy efficient homes.

5. The Blueprint: Immediate Steps for Energy Efficiency Program Administrators

CNT Energy and the National Home Performance Council have carefully mapped out the tools and processes energy efficiency programs must implement and coordinate to ensure that improvements made on existing homes are transparent during the sales transaction.

Step 1

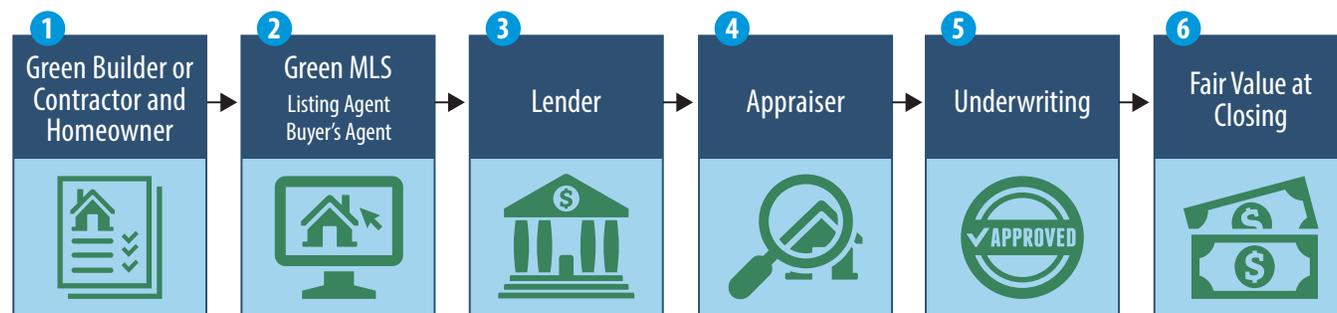
Document energy efficiency features and improvements using consistent, standardized methods.

Energy efficiency program administrators should collect data regarding energy efficiency improvements in homes that can be reported to the homeowner through a BPI-2101-compliant certificate (either a Certificate of Efficiency Improvements or a Certificate of Home Performance). Administrators also should ensure that the program’s quality assurance process is sufficient to protect the integrity of the information being verified, limit programs’ exposure from unnecessary liability, and reduce greenwashing.



Figure 8: The High Performance Home Value Chain (Figure 4, repeated)

Value for Green Homes



- Documentation is key:
- ✓ Green building certificate
 - ✓ Performance test results
 - ✓ Local green disclosure form
 - ✓ 12 month utility usage

Step 2

Disclose inventories of energy efficient homes to track supply.

Efficiency programs have a key role to play in making sure the local real estate market understands the growth of the existing energy efficient home inventory. MLSs need a solid business case before implementing and releasing fields. Understanding how many homes will utilize a given field is key. If usage will be low, an MLS is less likely to implement fields. Niche fields do not get implemented.

Energy efficiency programs should look for opportunities to advance high-quality, impartial research studies that may help identify the local contributory value for energy efficiency improvements. Appraisers seek studies based on comparable home sales because they provide more credible results for use in the valuation process. Such market studies done with the involvement of real estate appraisers, appraisal chapters, or REALTOR® associations using MLS data are useful for this purpose. Local colleges and universities may be a good partner to facilitate market studies that can be most widely utilized for local valuations.

Statistical methods can sometimes be applied to calculate adjustments to comparable sales if the results reflect the thought processes and conclusion of market participants to serve as a useful, persuasive valuation tool. This implies the statistical methods would be a secondary method and not the primary method for extracting adjustments.

Appraisers do not seek pricing models studies (hedonic). Pricing model studies use a large datasets and identify how different environmental attributes affect pricing. While many energy efficiency programs favor pricing model research, these general studies are typically less credible when it comes to identifying local contributory value, and thus not useful for appraisers or for advancing the fair valuation of the energy efficient home

Figure 9: Conforming and Non-Conforming Properties

The extent to which energy efficient features in for-sale homes are recognized and valued will be influenced by whether these homes are conforming or non-conforming properties. Conforming properties share the same characteristics as the general market. For example, the homes in a certain subdivision feature four bedrooms and two baths. The market tends to reward conforming properties with shorter market time and strong sales prices. On the other hand, non-conforming properties tend to be outside the typical inventory, such as a four bedroom and one bath home in the neighborhood above. The market tends to penalize non-conforming homes.

Currently, energy efficiency is evolving and considered a novel advancement in the housing inventory. Some of these homes may receive a premium at resale or refinancing, if they are carefully documented. But if supply of these homes continues to grow and starts to represent 20 and ideally 50 percent or more of the market, energy efficient home sales will be easily compared with other recent sales and a premium (if any) will become much more visible in the market. As the inventory tips over 50 percent of the market, the homes without efficiency improvements will sell for less because they are considered non-conforming compared to the overall inventory of homes. Both appraisers and real estate agents need data to confirm the inventory of energy efficient homes in the local market and how these general benchmarks apply.



Step 3

Capitalize on existing high-quality continuing education and designation training.

Inclusion of information about energy efficiency into an MLS database is a necessary but not sufficient condition for valuing energy efficient homes. The information is useless unless it is understood and properly used. As shown in Figure 8, many professionals are involved in the sale of an energy efficient home, from the contractor and program implementer to the real estate agent, lender, underwriter, and appraiser. Ideally, each of these parties should understand and be able to explain the energy efficient features and characteristics included in an MLS listing.

Education for real estate agents and appraisers, two critical parties in an efficient home real estate transaction, is complex in that it is often a combination of continuing education required for state licensing as well as voluntary professional development. Energy efficiency programs benefit by understanding education requirements in their state as well as trends for voluntary development. This foundation can help programs assess training assets and needs when working to advance efficiency education in their market.

States license real estate agents and appraisers. For the most part, continuing education for these professionals is not simply for professional development but clearly regulated and required to maintain licensure. It is important to know who licenses real estate agents and appraisers in a given state, and what the renewal requirements are. Some states relicense professionals on a rolling basis according to individual licensing renewal anniversaries, while others renew all the licensed professionals in a category (i.e., all appraisers, all real estate agents, all real estate brokers) together every two to three years. Courses, schools, and instructors often are subject to licensing as well. Many schools specializing in licensing education offer electives on energy efficiency. Programs interested in encouraging education on energy efficiency should understand renewal cycles, the quality of efficiency-related continuing education already approved by the state, and licensing requirements to provide continuing education if education gaps exist.

Professionals may also seek voluntary coursework for professional development. Several organizations offer rigorous designations which typically require several days of coursework and a final test. Designees are usually recognized in a nationally published database. The National Association of REALTORS®,²⁴ other real estate certification organizations such as EcoBroker International,²⁵ and the Appraisal Institute²⁶ currently provide high-quality designation training which may additionally qualify as continuing education credit. Local REALTOR associations and Appraisal Institute chapters may seek local partners to defray that costs of designation training and seek support from the energy efficiency industry to market the trainings, provide physical education space, or assist with tuition grants so more professionals can attend. Such partnerships create opportunities for energy efficiency programs to support accessible, high-quality training in the local market.

Once programs understand the licensing requirements or trends that drive the pursuit of voluntary education, it is possible to work with real estate educators in a given area to deliver appropriate and effective training. Topics might range from building trends and building science to proper use of Green MLS fields.



Step 4

Work with the MLS community to ensure that data about home energy efficiency improvements are incorporated into for-sale listings.

Energy efficiency programs should work with the local real estate community to determine the most effective way to incorporate data about energy efficiency characteristics into MLS listings. The first step may involve identifying the vendor that provides the software system used by the local MLS. (See list of major MLS vendors in Figure 11.) Several successive versions of RETS have been developed, and not all MLS and their vendors use the most current version, so it is important for a program to know which software system vendor serves an MLS. The current version of RETS used by an MLS determines which energy efficiency-related fields may be available or implemented. Another step is to understand the MLS's established update cycles for minor changes and major upgrades, which may include migration to the latest version of RETS, including any selected energy efficiency fields.

Both to encourage consistency and to reduce design efforts, programs can use the RETS Data Dictionary as a starting point when advocating for energy efficiency-related fields. Programs can use the Green MLS Implementation Guide described in Section 4 to work with local MLS committees and staff to verify the appropriate drop-down values for available fields and to work within existing MLS timeframes to introduce new fields and drop-down values as appropriate. An MLS's leadership committee, technical staff, or a RETS manager, if one is assigned, are key contacts, as well as real estate agents with specialized green training such as NAR Green²² or EcoBroker.²³

Step 5

Ensure that the data about home energy efficiency improvements are incorporated into the appraisal process.

The data elements listed in BPI-2101 for standard Certificate of Efficiency Improvements or Certificate of Home Performance has been designed to capture the same set of fields as the Appraisal Institute addendum. The addendum clearly specifies that efficiency programs can be cited as the source for completing this addendum.²¹ (See Figure 10.) As a standard practice, energy efficiency programs can complete the addendum on behalf of the homeowner and provide it as a record of their project in the addendum format. The addendum can be provided to homeowners to be passed along to their lender at the time of refinancing or reselling the home.

NHPC and several energy efficiency programs are currently exploring how the HPXML data transfer standard might be used to automatically report program data into the addendum format.

The presence of this addendum may actually change the qualification requirements of the appraiser assigned to do the valuation, as described in Step 7.

Figure 10: Authority for Programs to Issue Appraisal Institute Green and Energy Efficiency Addendum

“The objective of this Addendum is to standardize the communication of the high performing features of residential properties. Identifying the features not found on the 1004 form provides a basis for comparable selection and analysis of the features. **Builders, contractors, homeowners, and third party verifiers are encouraged to complete this Addendum and present to appraisers,** agents, lenders, and homeowners.” *(Emphasis added)*

Source: Appraisal Institute Residential Green and Energy Efficient Addendum

Step 6

Develop standards and IT solutions that allow quicker and more automated transfer of data.

The blueprint outlined in this paper is based on the transfer of data about energy efficiency upgrades from programs to entities and professionals involved in the real estate sales process. Although each program could develop its own strategy for communicating data to the local MLS and appraisers, the process of incorporating energy efficiency data into real estate transactions will take years or decades to implement if the industry relies on one-off strategies.

National data transfer standards, such as BPI-2100 (HPXML), should be used whenever possible, both to reduce the costs of developing data transfer systems and to facilitate collection and aggregation of comparable data from multiple sources. Methods for auto-populating MLS databases and the Appraisal Institute addendum

should also be explored. APIs could be developed that would allow data to be transferred from programs to multiple sources such as MLS databases, real estate data repositories, and sites that allow automatic generation of the addendum.

At present, some energy efficiency programs may find the cost of developing systems to transfer data to MLS systems or the addendum to be prohibitively expensive. However, the standardization provided by BPI-2101 and BPI's related data standards significantly reduces the costs of data collection and transfer.

These systems would provide a more effective means of getting information into the marketplace than reliance on homeowners to remember and locate physical certificates. They also have the additional benefit of allowing energy efficiency data to be accessed at any time. Privacy concerns would clearly have to be addressed to allow this system to work, but given the amount and nature of real estate data already available, these concerns should not be impossible to address.

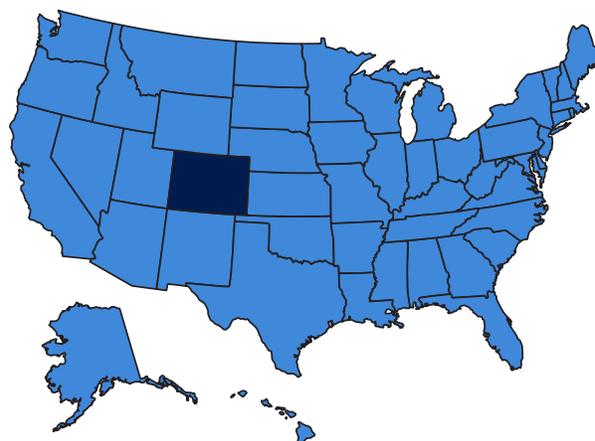
Statewide Example: Colorado Energy Office and Regional MLS Design

The Colorado Energy Office (CEO) pioneered the work of regional MLS design back in 2009. The effort has resulted in implementation of a common set of green fields in 16 MLSs across the state. (The effort predates current tools including high-performance fields in the RETS Data Dictionary, the Appraisal Institute addendum, and the BPI certificate of completion.) Because of the project's resulting scale and consistency, an investment was also possible in training on new fields for MLS users.

CEO has worked with key partners throughout the state including MLS and REALTOR® associations; Colorado Coalition of Appraisers (CCA) and the Colorado Chapter of the Appraisal Institute; the three largest home inspection organizations in the state; lenders, underwriters, and related professional organizations; builders; and the Colorado Chapter of USGBC.

See case study for more information: www.naseo.org/Data/Sites/1/documents/committees/buildings/calls/2013-06-13-colorado.pdf

The case study still serves as an example of the outstanding benefits of state- or region-wide cooperation on transaction design. The benefits for this scale of coordination are even greater today due to the comprehensive set of available tools described in Section 4 of this paper, which have already been designed to be compatible.



Step 7

Work with partner financial institutions to ensure selection of qualified appraisers.

This paper highlights dependencies and opportunities between energy efficiency programs and other professionals involved with a real estate transaction. This dependency is very clear when looking at opportunities with financial partners. The more streamlined and consistent documentation flows from energy efficiency programs, the more opportunities financial partners have to improve how they work.

One key example is the process by which qualified appraisers are assigned to efficient home valuations. Another addresses the process constraints which often limit the time and attention on efficient homes during the underwriting process and may result in a lower assessment of the value of improvements.

Consistent documentation can influence the process for assigning qualified appraisers to efficient home valuations. For example, if a BPI-2101 compliant certificate is available at scale in a given market, it might be used as a trigger to require specific qualifications of the appraiser assigned.

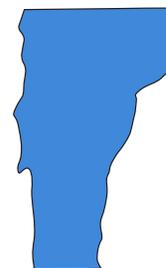
Likewise if the same documentation is available during the manual underwriting review process, underwriters would become accustomed to the information provided and the quality of the verification behind it. The step of reviewing a standard efficiency document might become part of the review checklist, thus increasing the chance that the appraiser's opinion of value related to energy efficiency improvements will be accepted.

See the supplemental section at the end of this paper for further details on the current situation and the constraints and opportunities for both appraiser assignment and manual underwriting review.



Navigating Appraiser Assignment: Vermont Green Homes Alliance

The Vermont Green Homes Alliance (VGHA) is a collaborative of state trade groups including builders, mortgage bankers, appraisers, Realtors, and MLSs. The alliance provides a leading example of how the appraiser assignment process can be recalibrated to better ensure a competency match. VGHA is working through the trade organizations to map out a process where a completed Green and Energy Efficiency Addendum will act as a trigger for assigning the right appraiser.



Regional Organization Example: Midwest Energy Efficiency Alliance and Certification in Illinois and Missouri

Working through one of the six Regional Energy Efficiency Organizations can help organize real estate data across multiple states. In 2012, the Midwest Energy Efficiency Alliance (MEEA) introduced a state-wide energy efficiency project record certification as part of the Illinois Home Performance with ENERGY STAR® Program (IHP). More than 800 homes have been awarded Illinois Home Performance certificates to date. Homes which have received an IHP certificate can be searched specifically via the Midwest Real Estate Data (MRED) green data fields. This MLS serves over 40,000 users in the Chicago metro region, and MRED adopted these green information fields in 2010.

Expanding its Illinois program, MEEA began to work with Missouri home performance stakeholders in 2013 to introduce a state-wide, Missouri Home Energy Certification program. The design is based on many of the same BPI-2101 and RETS-compliant fields adopted in Illinois. Instead of starting from scratch, MEEA facilitated the State of Missouri's process to design a certificate procedure that was suitable to fit within the existing MLS data standard. At the same time, the process incorporated the needs of Missouri's various energy efficiency stakeholders.



MEEA continues to assist real estate integration between these two states. Missouri has five key MLSs that share one vendor, with three other MLSs that share a separate vendor. At the same time, Illinois has six MLS's beyond the Chicago region that currently do not have a data field for Illinois Home Performance, but do share the same vendors as Missouri. Working with both states, MEEA continues to ensure energy efficiency programs collect standardized data that will be useful for the real estate industry regionally.

MEEA created a process that makes it possible to engage just two MLS software system vendors and encourages future progress while providing consumers in both states broad access to a robust certification process.



6. The Blueprint: Immediate Steps for State Energy Offices and Regional Energy Efficiency Organizations

This blueprint for the energy efficiency industry creates a straightforward path for important changes in the short-term to create a free market for energy efficient homes. Regional energy efficiency organizations and state energy offices have an opportunity to create even bigger change, in more places, and to make the process faster overall.

Regional energy efficiency organizations and state energy offices are in a unique position to coordinate both certificate programs and MLS design by working with MLSs that share the same system vendors across the region. (See previous case studies.) The Green MLS Implementation Guide was created with vendor MLS systems specifically in mind. While there are over 850 MLSs covering the country, less than ten of these software companies provide database, programming, and hosting services to this market.²⁷ Only a small number – around 10 percent – of MLSs develop their own software in-house. (See Figure 11.)

The process to date and the action steps above assume market-by-market progress in over 850 MLS areas. However, regional energy efficiency organizations or state energy offices can encourage a more coordinated path, as shown in Figure 12. Here is a suggested equation to get from one data standard to multiple MLSs.

- Use **one data standard** – RETS data transfer standard (which is compatible with the BPI data standards)
- Implement a minimum of **four documentation fields** for energy efficiency certificates in an MLS (see Figure 5):
 - Green Verification Body
 - Green Verification Program
 - Green Verification Rating (if applicable)
 - Green Verification Version
- Bring the **10 MLS system vendors** on board
- Disseminate to **850 MLSs**

This approach dramatically increases scale and significantly holds down costs and time to implement. By implementing fields already in the RETS Data Dictionary, individual design costs are reduced as well. This creates an opportunity for MLSs, energy efficiency

programs, and partners to shift budget where it is critically needed: toward communication and training for those involved in the transaction, rather than on software design and implementation.

Figure 11: Less Than 10 Software Companies Provide Services for MLSs

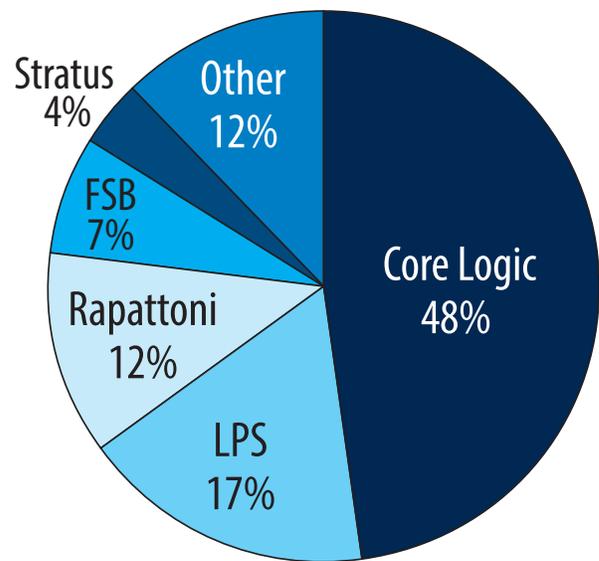
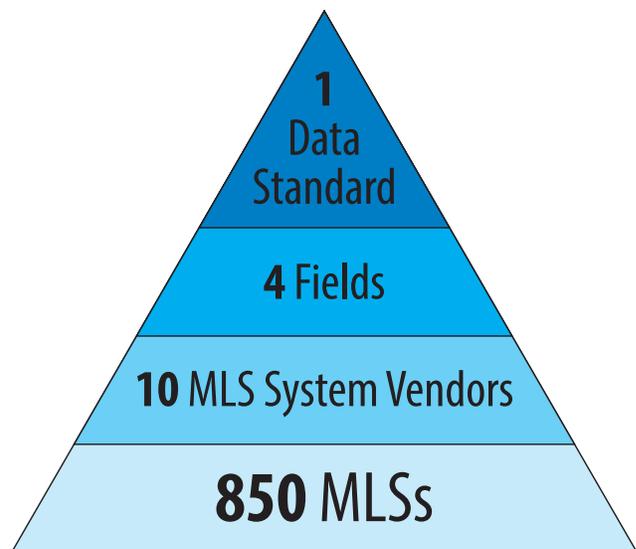


Figure 12: An Equation to Get from One Data Standard to 850 MLSs



7. Conclusion

Real progress is happening. This paper attempts to lay a foundation to promote the home energy upgrade process, implement standards in the MLS industry, and develop consistent methods for incorporating consideration of energy efficiency into the appraisal process. Now, the energy efficiency industry and the real estate community need to collaborate, both locally and at a national level. A focused effort by energy efficiency programs and coordination among regional energy efficiency organizations will accelerate the reality of an improved real estate transaction for existing energy efficient homes.

Speed is crucial. Energy efficiency programs have upgraded an unprecedented number of existing homes, fueled by the DOE's Better Buildings Neighborhood Program grants and other initiatives. Many leading real estate economists, including Goldman Sachs Group and Zillow,²⁸ predict that the housing market has hit bottom. The volume of transactions will grow as the market rebounds. The time is now for energy efficiency programs to collaborate with real estate partners to create an infrastructure that makes efficiency improvements to existing homes visible in the real estate transaction.

The role of the energy efficiency industry is to increase the number of existing energy efficient homes in the marketplace. However, energy efficient organizations and programs also need to develop strategies to communicate information about these homes to the marketplace, and to support training that will allow real estate professionals to understand and use this information during the sales process so that the value of the energy efficient home is no longer questioned or misunderstood.

The goal for both the energy efficiency and real estate industry is to develop methods that ensure that the upgraded features of new and existing energy efficient homes are fully visible during a real estate transaction. The responsibility for the first step lies with the energy efficiency industry, as most of the data required for a transparent transaction is already being captured by energy efficiency programs. Standardizing the information about efficiency improvements makes these upgrades visible and accessible during a real estate transaction.

This enables buyers and sellers to come together in an informed market and captures any contributory value for energy efficiency improvements. As a premium emerges, this will encourage homeowners to invest in these improvements because they understand the potential for capturing the value at the time of sale. Through collaboration, the energy efficiency industry and real estate community can ensure that energy efficiency investments are properly valued at the time of the transaction.

The blueprint presented in this paper outlines the first steps toward establishing a virtuous cycle of investment in energy efficiency that is valued in the real estate market. The energy efficiency industry needs to consistently document energy efficiency improvements, report on the growing inventories of energy efficient homes, capitalize on existing education and training opportunities, work with the real estate community to reflect these improvements in local for-sale listings, and encourage further advancement of data standards.

By implementing this blueprint in markets across the country, energy efficiency programs will move together down a standard path where the contributory value of energy efficiency improvements is visible, triggering a virtuous cycle that will increase the number of existing energy efficient homes across the U.S.



Appendix A: Using the Blueprint and Transaction Tools to Navigate Lasting Change – Appraiser Assignment and Underwriting Guidelines

This supplemental section is included to provide context on larger issues that impact the sales transaction of the existing energy efficient home. It also speaks to beneficial changes that can be expected as a result of implementing the transaction tools outlined in this paper.

While the three integrated tools (Real Estate Transaction Standard/Green MLS Implementation Guide, Appraisal

Institute Residential Green and Energy Efficiency Addendum, and BPI- 2101 - Standard Requirements for a Certificate of Completion for Whole-House Energy Efficiency Upgrades) create immediate improvements, they also offer a pathway to advancement by addressing complex and root-cause problems. If used extensively, the addendum may specifically influence how appraisers are assigned to “energy efficient” jobs, as well as underwriting guidelines for energy efficient homes.

Figure 13: Important Definitions and Acronyms

Important Definitions and Acronyms

Appraisal Management Company (AMC)* – AMC’s have contracts with companies (such as lenders) that require appraisal services; AMCs act as agents to hire the appraiser and provide other valuation services

Credible Appraisal* – A credible appraisal is one that is worthy of belief; A credible appraisal provides support, by relevant evidence and logic, for the opinion of value

Government Sponsored Entity (GSE) – Financial entities like Fannie Mae and Freddie Mac that securitize mortgages and issue mortgage-backed securities

Federal Housing Finance Agency (FHFA) – Agency created in 2008 and responsible for overseeing vital components of the secondary mortgage markets, including Fannie Mae, Freddie Mac, and the Federal Home Loan Banks

Home Valuation Code of Conduct (HVCC) – Legislation effective in 2009 which introduced greater independence in the appraisal process

Lender – The client and initiator of an appraisal when it is required for residential financing

Licensed and Certified Appraisers* – Appraisers are licensed and certified by the state appraiser regulatory agencies, after meeting minimum education, experience and examination requirements ... established by ... the Appraisal Foundation

Underwriter – Term used (sometimes interchangeably) to describe the process of determining the risk in issuing financing for a specific borrower under set conditions. The term can refer to an individual employed by a lender to assess risk. It can also refer to a lender that is initiating a mortgage. Finally, it may refer to GSEs and the secondary mortgage market that issue their own underwriting guidelines that mortgage originators may choose to follow.

Uniform Standards of Professional Appraisal Practice (USPAP)* – Minimum performance standards for appraisal practice in the United States, as authorized by Congress and published by The Appraisal Foundation

**Definition provided by Appraisal Foundation’s “A Guide to Understanding a Residential Appraisal” (www.realtor.org/appraisal/a-guide-to-understanding-a-residential-appraisal)*

Additional background from Appraisal Institute’s “Understanding the Appraisal” (www.appraisalinstitute.org/myappraisalinstitute/resources/understand_appraisal_1109.pdf)

How appraisers are assigned to energy efficient jobs

One major policy response following the housing crash of 2007 was the implementation of the Federal Home Valuation Code of Conduct (HVCC) in 2009. Fannie Mae and Freddie Mac implemented the HVCC and as part of their seller/servicer guidelines to firmly establish appraisal independence requirements for loan sellers to the secondary market. The HVCC strictly prohibited mortgage brokers, loan officers, and real estate agents – who have a vested interest in the transaction – from ordering appraisals to avoid coercion of appraisers.

In 2010, the Dodd–Frank Wall Street Reform and Consumer Protection Act further clarified HVCC and emphasized the importance of appraisal independence. The improvements in appraisal independence have brought some unintended consequences. Where before, most residential appraisals were ordered by mortgage brokers, following the implementation of the Act, loan sellers have elected to order a sizable percentage of residential appraisal assignments through appraisal management companies, or AMCs. AMCs are third party brokers of appraisals. These firms offer appraisal order and review functions. A common complaint of residential real estate appraisers is that many AMCs focus on criteria such as lowest cost or quickest turnaround time of the appraisal over such factors as the complexity of the assignment or the qualifications of the appraiser. Such procurement models would deemphasize the extra diligence required to thoroughly analyze most energy efficient properties.

These regulations have particularly harmful yet unintended consequences for energy efficient homes. In introducing a clearinghouse for appraisers, AMCs have created a market that values pricing rather than the quality of the appraisal. In practice, the lowest fee and quickest turnaround becomes the most important factor in matching appraisers to assignments. Moreover, state-based licensing has fragmented the field, resulting in 50 approaches to how AMCs are monitored. Just as energy efficient home practices were gaining strength, appraisers stopped being rewarded for these niche competencies and the mechanism to match appraisers qualified to evaluate energy efficient homes was eliminated.

However, the Uniform Standards of Professional Appraisal Practice (USPAP) sets the minimum standards for appraisers and defines competency requirements in order to complete appraisal assignments. USPAP sets a standard that appraisers must be competent for the assignments they accept. If an appraiser is offered an assignment for which he or she does not already have competence, USPAP defines the process to obtain needed competency prior to completion of an appraisal and requires that it be stated in the report. This has not been changed following either HVCC or the Dodd–Frank act. As this paper was going to print the Appraisal Foundation, which is authorized by Congress to maintain USPAP, released a draft for further clarification of appraiser background and competency required to complete a high-performance home appraisal. The first draft of *Valuation of Green Buildings: Background and Core Competency* was released in July, 2013.

Government Sponsored Enterprises (GSEs) including Fannie Mae²⁹ and Freddie Mac, and all secondary mortgage market lenders under FHFA, have a higher standard than USPAP and require that an appraiser have competency prior to accepting the assignment. These standards make originating lenders responsible for hiring competent appraisers.³⁰ Even if a lender uses an AMC to order appraisals, the lender is still responsible for hiring competent appraisers. Unfortunately, this requirement currently does not seem to be upheld due to a lack of oversight.

Figure 14: USPAP Ethics, Competency, and Scope of Work Rules

Ethics Rule

An appraiser must promote and preserve the public trust inherent in appraisal practice by observing the highest standards of professional ethics.

Competency Rule

An appraiser must: (1) be competent to perform the assignment; (2) acquire the necessary competency to perform the assignment; or (3) decline or withdraw from the assignment.

Scope of Work Rule

An appraiser must properly identify the problem to be solved in order to determine the appropriate scope of work. The appraiser must be prepared to demonstrate that the scope of work is sufficient to produce credible assignment results.

It is important for anyone working with energy efficient homes to understand the push and pull for this segment when it comes to assigning appraisers to jobs. The huge asset of mandated competency competes with a current emphasis on using AMCs to assign appraisers to jobs amid a focus on low cost and quickest turnaround over competency.

The bright light in a poorly designed market is the Residential Green and Energy Efficiency Addendum. Widespread use of the addendum at the conclusion of every project will change how appraisers are assigned to energy efficient home jobs. Currently, the first signal that an unqualified appraiser has been assigned to a job is when the submitted appraisal report is reviewed. Only after all the work has been filed does the consumer notice that similar energy efficient homes were not used, or notable features were ignored, or both. At that point the consumer's typical recourse is to accept the sub-par results or pay out-of-pocket for a new appraisal.

The biggest opportunity will come as builders, contractors, and real estate agents learn that inclusion of the addendum when loan or refinancing paperwork is initiated can act as a trigger to assign an appraiser with significant competency for energy efficient homes. As such, the addendum should align with the sales contract or appraisal order that is submitted to a lender. (See Figure 15.)

How energy efficiency programs can use the blueprint to create lasting change

Efficiency programs can facilitate wider recognition of the Green and Energy Efficiency Addendum as a valuation tool by beginning to report program data in the addendum format. Efficiency programs or contractors must aggressively communicate the importance of the addendum report when reselling the home or refinancing in the future.

Efficiency programs must work with members to incorporate the prefilled Green and Energy Efficiency Addendum with every sales contract. Efficiency programs or contractors must aggressively communicate the importance of the prefilled addendum when refinancing or reselling the home in the future.

Figure 15: New Home Contract Language to Navigate Appraiser Assignment

For new energy efficient homes, an appraisal is usually imminent – typically to finalize construction financing on custom homes or as part of builder-to-homeowner transfer of spec homes.

Builders can clear hurdles for the transaction by specifying appraiser requirements in the sales contract. For example:

“This Home is being built to nationally recognized standards above prevailing code with unique features, materials and high-efficient equipment. The Lender shall choose an Appraiser educated and knowledgeable in valuating this type of specialized Home, preferably an appraiser who holds a professional appraisal designation that requires advanced education on such issues as the valuation of sustainable buildings. The appraiser shall provide verification of this advanced education from a qualified educational provider to be permitted to conduct the appraisal for this project.”

Sample builder contractor language provided by National Association of Home Builders.



Underwriting Guidelines for Energy Efficient Homes

Another role where the Green and Energy Efficiency Addendum may influence the course of the energy efficient home transaction is with underwriting. While the addendum is not currently a mandated form, its prevalent use could influence future requirements.

Stories emerging from the field paint a picture where underwriters are tightly time-constrained and may spend ten minutes or less reviewing each file associated with a home for sale and financing. The underwriter role involves identifying collateral risk for the lender. Anything that falls outside the reviewer's checklist receives a rigorous review and can be removed from the paperwork if it is not easily understood and strongly justified. While major financing entities like Fannie, Freddie, FHA, and VA guidelines allow for energy efficient adjustments if the market data supports the value, it appears in practice today that underwriters do not acknowledge this. The added value of these improvements are often removed and ignored.

When prefilled copies of the addendum are offered at scale, the forms would become more familiar to underwriters and the associated files would have a better chance of being accepted with their documented valuations on a case-by-case basis.

Another benefit of widespread use of the addendum is that ongoing feedback of its increased role and frequency of use will help make the case to FHFA and others that updated guidelines are needed.



Appendix B: Sample Appraisal Institute Residential Green and Energy Efficiency Addendum

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See the following five pages for the sample copy or download the complete addendum at the Appraisal Institute website at www.appraisalinstitute.org/education/downloads/ai-residential-green-energy-effecient-addendum.pdf.

		Client File #:	Appraisal File #:
Residential Green and Energy Efficient Addendum		Client File #:	Appraisal File #:
Form R204-04		Client File #:	Appraisal File #:
Additional notes to be included in the appraisal report and the completion of this form are to be used as follows:			
<p>The appraiser hereby certifies that the information provided within this addendum:</p> <ul style="list-style-type: none"> has been considered in the appraisal development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report. is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report. is the result of the appraiser's active inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumptions: Data provided herein is assumed to be accurate and if found to be in error could affect the appraiser's opinion or conclusions. is not made as a representation or a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items of the subject property in general, and this addendum should not be relied upon for such assessments. <p>Green Building: The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. High Performance building and green building are often interchangeable.</p> <p>Key Elements of Green Building: A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor air quality, and (6) maintenance and operation. A Green Building will be energy efficient but an energy efficient building is not synonymous with Green Building.</p>			
Green Features:			
The following items are considered within the appraised value of the subject property:			
Certification:	Year Certified:	Identifying Organization:	<input type="checkbox"/> Home Innovation Research Labs (ICC-700) <input type="checkbox"/> USGBC (LEED) <input type="checkbox"/> Other:
Rating:	Score:	<input type="checkbox"/> Verification Reviewed <input type="checkbox"/> Verification Attached to this report	<input type="checkbox"/> LEED Silver <input type="checkbox"/> LEED Gold <input type="checkbox"/> LEED Platinum <input type="checkbox"/> ICC-700 National Green Building Standard/Certified <input type="checkbox"/> Bronze <input type="checkbox"/> Silver <input type="checkbox"/> Gold <input type="checkbox"/> Emerald Green Certified Organization (URL, website)
Address:	Explain any additions or changes made to the structure since it was certified:		
Comments:	Do changes require recertification to verify rating is still applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:	If a property is built green but not formally certified, it is advisable to perform inspection and analysis to value the features. The market analysis of the structure's physical, economic, and locational attributes are not an analysis of its label alone.		

The objective of this Addendum is to determine the contribution of the high performing features of residential properties. Identifying the features based on the ICC-700 form provides a basis for comparative analysis and present to appraisers, lenders, contractors, homeowners, and third party entities an assessment to compare the structure and present to appraisers, lenders, and contractors.

U.S. Environmental Protection Agency at www.epa.gov/greenbuilding/

Client File #:		Appraisal File #:	
Subject Property:		Appraisal File #:	
ENERGY EFFICIENT ITEMS			
The following items are considered within the appraised value of the subject property:			
Insulation:	<input type="checkbox"/> Fiberglass Blown-In <input type="checkbox"/> Foam Insulation <input type="checkbox"/> Cellular <input type="checkbox"/> Fiberglass Batt Insulation <input type="checkbox"/> Other (Specify):	<input type="checkbox"/> Radiant <input type="checkbox"/> Chasing <input type="checkbox"/> Floor <input type="checkbox"/> Other:	<input type="checkbox"/> Basement Insulation (Describe): <input type="checkbox"/> HERS Insulation Installed Rating: 1 2 3 4 5 (See Glossary)
Envelope:	Envelope Tightness: <input type="checkbox"/> Envelope Tightness based on Blower Door Test	<input type="checkbox"/> CMU <input type="checkbox"/> CMU65 <input type="checkbox"/> CMU60 <input type="checkbox"/> ADO60 <input type="checkbox"/> ADO60	<input type="checkbox"/> Other (Specify):
Water Efficiency:	<input type="checkbox"/> Recycled Water System (Specify): <input type="checkbox"/> Drain - Size: Gallons <input type="checkbox"/> Location of drain:	<input type="checkbox"/> Water Meter: <input type="checkbox"/> Dishwasher <input type="checkbox"/> Refrigerator <input type="checkbox"/> Other:	<input type="checkbox"/> Water Meter: <input type="checkbox"/> Dishwasher <input type="checkbox"/> Refrigerator <input type="checkbox"/> Other:
Windows:	<input type="checkbox"/> ENERGY STAR <input type="checkbox"/> Low E <input type="checkbox"/> High Impact <input type="checkbox"/> Storm <input type="checkbox"/> Double Pane <input type="checkbox"/> Triple Pane <input type="checkbox"/> Tinted <input type="checkbox"/> Solar Shades	<input type="checkbox"/> Storm <input type="checkbox"/> Double Pane <input type="checkbox"/> Triple Pane <input type="checkbox"/> Tinted <input type="checkbox"/> Solar Shades	<input type="checkbox"/> Storm <input type="checkbox"/> Double Pane <input type="checkbox"/> Triple Pane <input type="checkbox"/> Tinted <input type="checkbox"/> Solar Shades
Day Lighting:	<input type="checkbox"/> Skylights <input type="checkbox"/> Solar Tubes <input type="checkbox"/> Other (Specify):	<input type="checkbox"/> Skylights <input type="checkbox"/> Solar Tubes <input type="checkbox"/> Other (Specify):	<input type="checkbox"/> Skylights <input type="checkbox"/> Solar Tubes <input type="checkbox"/> Other (Specify):
Appliances:	<input type="checkbox"/> ENERGY STAR Appliances: <input type="checkbox"/> Dishwasher <input type="checkbox"/> Refrigerator <input type="checkbox"/> Other:	<input type="checkbox"/> Water Heater: <input type="checkbox"/> Heat Pump <input type="checkbox"/> Tankless <input type="checkbox"/> Size: Gal.	<input type="checkbox"/> Appliance Energy Source: <input type="checkbox"/> Natural Gas <input type="checkbox"/> Other (Specify):
HVAC (Describe in Comments Area):	<input type="checkbox"/> High Efficiency HVAC (Specify Rating: <input type="checkbox"/> COP <input type="checkbox"/> Annual Fuel Utilization Efficiency:	<input type="checkbox"/> Heat Pump Efficiency Rating: <input type="checkbox"/> COP <input type="checkbox"/> SEER <input type="checkbox"/> EER	<input type="checkbox"/> Thermostat/Controls: <input type="checkbox"/> Radiant Heat <input type="checkbox"/> Geothermal
Energy Rating:	<input type="checkbox"/> ENERGY STAR Home - Venues: <input type="checkbox"/> Other (Describe):	<input type="checkbox"/> Home Energy Score (HES) (Score range 1-10):	<input type="checkbox"/> Certification Attached
Indoor Air Quality:	<input type="checkbox"/> Indoor Air Purification System:	<input type="checkbox"/> Energy Recovery Ventilator (ERV) or Whole Building Ventilator (WBV):	<input type="checkbox"/> Radon Test Post Control
HERS Information:	<input type="checkbox"/> HERS Rating:	<input type="checkbox"/> Monthly Energy Savings on Rating 1-5:	<input type="checkbox"/> Data Source:
Utility Costs:	<input type="checkbox"/> Average Annual Utility Cost: \$ per month based on:	<input type="checkbox"/> per month based on:	<input type="checkbox"/> If Occupants:
Energy Audit:	<input type="checkbox"/> Infrared Photograph Attached:	<input type="checkbox"/> Has an energy audit/audit been performed on the subject property? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
Comments:	(Provide details for information provided in this section) Attach documents or reference them in your report. The energy element is the most measurable element of green or high performance building.		

NOTE: The Appraiser certifies that the form is to be used to appraise the reported items of the form operations. Depending on the engagement, the appraiser may need to provide additional data, analysis and work product to be used for this form. The Appraiser hereby agrees to be complying the form and assumes any responsibility for the data, analysis and work product provided by the intended appraiser.

AI Report # R204-04 Residential Green and Energy Efficient Addendum © Appraisal Institute 2013. All Rights Reserved January 2013

Client File #:		Appraisal File #:	
Subject Property:		Appraisal File #:	
Solar Panels			
The following items are considered within the appraised value of the subject property:			
Description:	Array #1:	<input type="checkbox"/> Fixed <input type="checkbox"/> Tilted <input type="checkbox"/> Other:	<input type="checkbox"/> Array #2: <input type="checkbox"/> Fixed <input type="checkbox"/> Tilted <input type="checkbox"/> Other:
Warranty on Panels:	<input type="checkbox"/> Manufacturer of Panels:	<input type="checkbox"/> Storage Tank Size:	<input type="checkbox"/> Galons:
Age of Panels:	<input type="checkbox"/> Collector Type:	<input type="checkbox"/> Flat-Plate Collector <input type="checkbox"/> Heat Pipe Collector <input type="checkbox"/> Evacuated Tube Solar	<input type="checkbox"/> Heat Pipe Collector <input type="checkbox"/> Heat Pipe Collector <input type="checkbox"/> Evacuated Tube Solar
Energy Production kWh per Array:	<input type="checkbox"/> Back-Up System:	<input type="checkbox"/> Commercial Water He <input type="checkbox"/> Tankless On Demand <input type="checkbox"/> Tankless Heat Pump	<input type="checkbox"/> Commercial Water He <input type="checkbox"/> Tankless On Demand <input type="checkbox"/> Tankless Heat Pump
Location (City, County, etc.):	<input type="checkbox"/> Age of System:	<input type="checkbox"/> Age of System:	<input type="checkbox"/> Age of System:
Warranty Terms:	<input type="checkbox"/> Manufacturer:	<input type="checkbox"/> Solar Energy Factor (SEF) (Rating range 1 to 11 - Higher number is more efficient)	<input type="checkbox"/> Manufacturer:
Name of Utility Company:	<input type="checkbox"/> Name of Utility Company:	<input type="checkbox"/> Name of Utility Company:	<input type="checkbox"/> Name of Utility Company:
Comments:	(Provide details of information and define other renewable energy sources, such as wind, hydroponic, biomass power, etc.)		

NOTE: The Appraiser certifies that the form is to be used to appraise the reported items of the form operations. Depending on the engagement, the appraiser may need to provide additional data, analysis and work product to be used for this form. The Appraiser hereby agrees to be complying the form and assumes any responsibility for the data, analysis and work product provided by the intended appraiser.

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Client File #:		Appraisal File #:	
Subject Property:		Appraisal File #:	
Walk Score			
The following items are considered within the appraised value of the subject property:			
Walk Score:	Score:	<input type="checkbox"/> Walk Score:	<input type="checkbox"/> Walk Score:
Public Transportation:	<input type="checkbox"/> Bus - Distance: Blocks <input type="checkbox"/> Bus - Distance: Blocks <input type="checkbox"/> Subway - Distance: Blocks	<input type="checkbox"/> Bus - Distance: Blocks <input type="checkbox"/> Bus - Distance: Blocks <input type="checkbox"/> Subway - Distance: Blocks	<input type="checkbox"/> Bus - Distance: Blocks <input type="checkbox"/> Bus - Distance: Blocks <input type="checkbox"/> Subway - Distance: Blocks
Site:	<input type="checkbox"/> Orientation - North/South <input type="checkbox"/> East/West <input type="checkbox"/> West/East <input type="checkbox"/> North/South	<input type="checkbox"/> Orientation - North/South <input type="checkbox"/> East/West <input type="checkbox"/> West/East <input type="checkbox"/> North/South	<input type="checkbox"/> Orientation - North/South <input type="checkbox"/> East/West <input type="checkbox"/> West/East <input type="checkbox"/> North/South
Comments:	(Provide details for information provided in this section)		
Incentives - Amount of Incentive and Terms:	(Provide details for information provided in this section)		
Federal:	<input type="checkbox"/> Federal:		
State:	<input type="checkbox"/> State:		
Local:	<input type="checkbox"/> Local:		
Source:	<input type="checkbox"/> Source:		
Comments:	(Provide details for information provided in this section)		

Client File #:		Appraisal File #:	
Subject Property:		Appraisal File #:	
Residential Green and Energy Efficient Addendum			
Green and Energy Efficient Addendum			
The following items are considered within the appraised value of the subject property:			
ICC-700 National Green Building Standard (NGBS):	An ANSI-approved residential green building standard developed by the National Association of Home Builders (NAHB) and the International Code Council (ICC). It is applicable to single and multifamily projects, renovations and additions and residential development. A certified building must incorporate sustainable for development techniques and address energy, water & material resource efficiency and indoor environmental quality. Also, all owners must be educated about building operation and maintenance. Certification to the NGBS is provided by the Home Performance Center (HPC) . http://www.nahb.com/icc700/		
LEED:	Leadership in Energy and Environmental Design is redefining the way we think about the places where we live, work and learn. As an internationally recognized leader of sustainable, LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. http://www.usgbc.org/leed/		
ENERGY STAR:	ENERGY STAR certified new homes must meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency. These homes are independently verified to be at least 15% more energy efficient than homes built to the 2009 International Energy Conservation Code (IECC) and feature additional measures that deliver a total energy efficiency improvement of up to 30 percent compared to typical new homes and even more compared to most resale homes. http://www.epa.gov/energy/star/icc700-new-homes.asp		
Home Energy Score (HES):	The Home Energy Score (HES) is similar to a vehicle's miles per gallon rating. The Home Energy Score allows homeowners to measure the energy performance of their homes to other homes in the area. It also provides homeowners with suggestions for improving their home's efficiency.		
HERS Index:	The national state with a home energy auditor collecting energy information during a field home walk-through. The assistant that scores the home on a scale of 1 to 10, with a score of 10 indicating that the home has excellent energy performance. A score of 1 indicates that the home needs additional energy improvements. In addition to providing the score, the Home Energy Addendum provides the homeowner with a list of recommended energy improvements and the associated cost savings estimates. http://www.energystar.gov/building/index.cfm?i=1012		
Building Envelope:	The building envelope is everything that separates the building's interior from the exterior. This includes the foundation, exterior walls, roof, doors and windows.		
Geothermal:	A geothermal heat pump uses the constant below ground temperature of soil or water to heat and cool your home.		
Low-E:	Low-emittance (low-e) is a coating applied to the glass surface. The coating allows visible light to pass through the glass while stopping the infrared heat energy from the sun and heat sources in the building from passing through the glass. Approximately 60% of the sun's harmful ultraviolet rays are blocked and insulation enhanced.		
Whole Building Ventilation System:	A whole building ventilation system assists in a controlled movement of air in tight envelope construction and may include an air-to-air exchanger. These building ventilation equipment is often a part of the forced air heating and cooling systems.		
Energy Recovery Ventilation System:	Often called Heat Recovery Ventilators (HRV). These systems replace the indoor air without wasting all the energy already used to heat the indoor air. In some climates, these systems are also used to handle water vapor in the incoming air.		
Passive Solar:	Passive solar technology is a technology for using sunlight to light and heat buildings with a collecting field of energy conversion systems.		
Water Sense:	EPA released its First Step 1 WaterSense New Home Specification. This specification will be effective January 1, 2013 and establishes the criteria for new homes labeled under the WaterSense program and is applicable to newly constructed single-family and multi-family homes. http://www.epa.gov/watersense/		
Water Heaters:	Color, Heat Pump, Tankless On Demand or Tankless Coil water heaters are described at the following locations: http://www.epa.gov/watersense/		
Green Certified Organizations:	A partial list of organizations can be found at: http://www.usgbc.org/leed/icc700-new-homes.asp		
HERS Information:	HERS Rating is the best with 3 the lowest rating. http://www.energystar.gov/building/index.cfm?i=1012		
SAVE Act:	The SAVE Act is proposed legislation to improve the accuracy of mortgage underwriting used by federal mortgage agencies by ensuring that energy costs are included in the underwriting process. http://www.fdic.gov/financeandbanking/act/		

NOTE: The Appraiser certifies that the form is to be used to appraise the reported items of the form operations. Depending on the engagement, the appraiser may need to provide additional data, analysis and work product to be used for this form. The Appraiser hereby agrees to be complying the form and assumes any responsibility for the data, analysis and work product provided by the intended appraiser.

AI Report # R204-04 Residential Green and Energy Efficient Addendum © Appraisal Institute 2013. All Rights Reserved January 2013

 <p>AI Reports® Form 820.04*</p>	Client File #:	Appraisal File #:	
	<h2 style="margin: 0;">Residential Green and Energy Efficient Addendum</h2>		
Client:			
Subject Property:			
City:		State:	Zip:
Additional resources to aid in the valuation of green properties and the completion of this form can be found at http://www.appraisalinstitute.org/education/green_energy_addendum.aspx			
<p>The appraiser hereby certifies that the information provided within this addendum:</p> <ul style="list-style-type: none"> has been considered in the appraiser's development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report. is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report. is the result of the appraiser's routine inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumption: Data provided herein is assumed to be accurate and if found to be in error could alter the appraiser's opinions or conclusions. is not made as a representation or as a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments. <p>Green Building: The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classic building design concerns of economy, utility, durability, and comfort.¹ High Performance building and green building are often used interchangeably.</p> <p>Six Elements of Green Building: A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor air quality, and (6) maintenance and operation. A Green Building will be energy efficient but an energy efficient building is not synonymous with Green Building.</p>			
Green Features			
The following items are considered within the appraised value of the subject property:			
Certification	Year Certified:	Certifying Organization: <input type="checkbox"/> Home Innovation Research Labs (ICC-700) <input type="checkbox"/> Verification Reviewed on site <input type="checkbox"/> USGBC (LEED) <input type="checkbox"/> Other:	<input type="checkbox"/> Certification attached to this report
Rating	Score:	<input type="checkbox"/> LEED Certified: <input type="checkbox"/> LEED Silver <input type="checkbox"/> LEED Gold <input type="checkbox"/> LEED Platinum <input type="checkbox"/> ICC-700 <i>National Green Building Standard</i> Certified: <input type="checkbox"/> Bronze <input type="checkbox"/> Silver <input type="checkbox"/> Gold <input type="checkbox"/> Emerald Green Certifying Organization URL (website)	
Additions	Explain any additions or changes made to the structure since it was certified: Do changes require recertification to verify rating is still applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Comments	Attach the rating worksheet that provides the ratings for each element to provide a better understanding of the features. The worksheet will assist in comparing the subject to sales rated by different organizations. If a property is built green but not formally certified, it still deserves proper description and analysis to value the features. The market analysis is of the structure's physical, economic, and locational attributes and not an analysis of its label alone.		

The objective of this Addendum is to standardize the communication of the high performing features of residential properties. Identifying the features not found on the 1004 form provides a basis for comparable selection and analysis of the features. Builders, contractors, homeowners, and third party verifiers are encouraged to complete this Addendum and present to appraisers, agents, lenders, and homeowners.

¹ U.S. Environmental Protection Agency at www.epa.gov/greenbuildings/pubs/about.htm.

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute plays no role in completing the form and disclaims any responsibility for the data, analysis or any other work product provided by the individual appraiser(s).

Client:		Client File #:	
Subject Property:		Appraisal File #:	

Solar Panels				
The following items are considered within the appraised value of the subject property:				
Description	Array #1 <input type="checkbox"/> Leased <input type="checkbox"/> Owned	Array #2 <input type="checkbox"/> Leased <input type="checkbox"/> Owned	Description	Solar Thermal Water Heating System
kW (size)			If Active System - type	<input type="checkbox"/> Direct <input type="checkbox"/> Indirect
Manufacturer of Panels			If Passive System - type	<input type="checkbox"/> Integral collector <input type="checkbox"/> Thermosyphon
Warranty on Panels			Storage Tank Size	# Gallons:
Age of Panels			Collector Type	<input type="checkbox"/> Flat-Plat Collector <input type="checkbox"/> Integral Collector <input type="checkbox"/> Evacuated-Tube Solar
Energy Production kWh per Array				
Source for Energy Production Estimate			Back-Up System	<input type="checkbox"/> Conventional Water Htr <input type="checkbox"/> Tankless On Demand <input type="checkbox"/> Tankless Heat Pump
Location (Roof, Ground, Etc.)			Age of System	
Tilt/Slope for Array			Warranty Term	
Azimuth per Array			Manufacturer	
Age of Inverter(s)			Solar Energy Factor (SEF) (Rating range 1 to 11 - higher number is more efficient)	
Manufacturer				
Warranty Term				
Name of Utility Company:		Cost per kWh charged by Company: \$ /kWh		
Comments (Discuss incentives available for new panels, condition of current panels, and any maintenance issues. If leased, provide the lease terms.) A free online tool and manual for valuing the energy production of the Solar PV System is available at www.pvvalue.com Download the PV Value™ Manual for explanation of the solar terms on this form and inputs used in the PV Value Tool.	Discuss source of information and define other renewable energy sources, such as wind, hydropower, biomass power, etc.			

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute plays no role in completing the form and disclaims any responsibility for the data, analysis or any other work product provided by the individual appraiser(s).
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Client:		Client File #:	
Subject Property:		Appraisal File #:	

Location - Site			
The following items are considered within the appraised value of the subject property:			
Walk Score	Score:	Source: (Example: http://www.walkscore.com)	
Public Transportation	<input type="checkbox"/> Bus - Distance: Blocks	<input type="checkbox"/> Train - Distance: Blocks	<input type="checkbox"/> Subway - Distance: Blocks
Site	Orientation - front faces: <input type="checkbox"/> East/West <input type="checkbox"/> North/South	Landscaping: <input type="checkbox"/> Water Efficient <input type="checkbox"/> Natural	
Comments			

Incentives - Amount of Incentive and Terms	
The following items are considered within the appraised value of the subject property:	
Federal	
State	
Local	
Source (For example www.dsireusa.org)	
Comments Incentives offset cost and should be reported in the cost approach section of the report. Incentives are typically not a sales comparison approach concession since they do not transfer with the property.	

Completed by: _____ Title: _____ Date: _____

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute plays no role in completing the form and disclaims any responsibility for the data, analysis or any other work product provided by the individual appraiser(s).
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Client:		Client File #:	
Subject Property:		Appraisal File #:	

Residential Green and Energy Efficient Addendum Glossary and Resources

ICC-700 National Green Building Standard (NGBS): An ANSI-approved residential green building standard developed by the National Association of Home Builders (NAHB) and the International Code Council (ICC). It is applicable to single and multifamily projects, renovations and additions and residential land development. To comply, all buildings must incorporate sustainable lot development techniques and address energy, water & material resource efficiency and indoor environmental quality. Also, all owners must be educated about building operation and maintenance. Certification to the NGBS is provided by the **Home Innovation Research Labs**. <http://www.nahb.org/page.aspx/generic/sectionID=2510> or <http://www.homeinnovation.com/>

LEED: Leadership in Energy and Environmental Design is redefining the way we think about the places where we live, work and learn. As an internationally recognized mark of excellence, LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>

Energy Star®: ENERGY STAR certified new homes must meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency. These homes are independently verified to be at least 15% more energy efficient than homes built to the 2009 International Energy Conservation Code (IECC), and feature additional measures that deliver a total energy efficiency improvement of up to 30 percent compared to typical new homes and even more compared to most resale homes. http://www.energystar.gov/index.cfm?c=new_homes.hm_index

Home Energy Score (HES): The Home Energy Score is similar to a vehicle's mile-per-gallon rating. The Home Energy Score allows homeowners to compare the energy performance of their homes to other homes in the area. It also provides homeowners with suggestions for improving their homes' efficiency.

The process starts with a home energy assessor collecting energy information during a brief home walk-through. The assessor then scores the home on a scale of 1 to 10, with a score of 10 indicating that the home has excellent energy performance. A score of 1 indicates that the home needs extensive energy improvements. In addition to providing the score, the home energy assessor provides the homeowner with a list of recommended energy improvements and the associated cost savings estimates. http://www1.eere.energy.gov/buildings/residential/hes_index.html

HERS Index: The Home Energy Rating System (HERS) Index is the Industry Standard by which a home's energy efficiency is measured. It's also the nationally recognized system for inspecting and calculating a home's energy performance. <http://www.resnet.us/hers-index> This Index is assessed by a qualified third party certifier based on the physical characteristics of the house. The energy estimates from this assessment may vary depending on the lifestyle of the occupants, increasing utility expenses, and changes in the maintenance or characteristics of the energy features.

Building Envelope: The building envelope is everything that separates the building's interior from the exterior. This includes the foundation, exterior walls, roof, doors and windows.

Geothermal: A geothermal heat pump uses the constant below ground temperature of soil or water to heat and cool your home. <http://energy.gov/energysaver/articles/geothermal-heat-pumps>

Low-E: Low emittance indicates a coating is added to the glass surface. The coating allows visible light to pass through the glass while stopping the radiant heat energy from the sun and heat sources in the building from passing through the glass. Approximately 40% of the sun's harmful ultra violet rays are blocked and insulation enhanced.

Whole Building Ventilation System: A whole building ventilation system assists in a controlled movement of air in tight envelope construction and may include air-purifying systems. Whole building ventilation equipment is often a part of the forced air heating or cooling systems.

Energy Recovery Ventilation System: Often called Heat Recovery Ventilators (HRV). These systems replenish the indoor air without wasting all the energy already used to heat the indoor air. In some climates, these systems are also used to handle water vapor in the incoming air.

Passive Solar: Passive solar is technology for using sunlight to light and heat buildings with no circulating fluid or energy conversion system. <http://redc.nrel.gov/solar/glossary> A complete passive solar building design has the following five elements: (1) aperture (collector) (2) absorber (3) thermal mass (4) distribution (5) control. <http://www.nrel.gov/docs/fy01osti/27954.pdf>

SEER: Seasonal energy efficiency ratio - The higher the SEER rating, the more energy efficient the equipment is. A higher SEER can result in lower energy costs. http://www.energystar.gov/index.cfm?c=tax_credits.tx_definitions&dts=ssps,mcs,seer.eer

Water Sense: EPA released its Final Version 1.1 WaterSense New Home Specification. This specification will be effective January 1, 2013 and establishes the criteria for new homes labeled under the WaterSense program and is applicable to newly constructed single-family and multi-family homes. http://www.epa.gov/watersense/new_homes/homes_final.html

Water Heaters: Solar, Heat Pump, Tankless On Demand or Tankless Coil water heaters are described at the following location: <http://energy.gov/energysaver/articles/solar-water-heaters>.

Green Certifying Organizations: A partial list of organizations can be found at: <http://www.usgbc.org/ShowFile.aspx?DocumentID=2001>

HERS Insulation Installed Rating: Rating 1 is the best with 3 the lowest rating. http://www.resnet.us/standards/Enhancements_to_National_Rating_Standards.pdf

SAVE Act: The SAVE Act is proposed legislation to improve the accuracy of mortgage underwriting used by federal mortgage agencies by ensuring that energy costs are included in the underwriting process. <http://www.imt.org/finance-and-leasing/save-act>

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute plays no role in completing the form and disclaims any responsibility for the data, analysis or any other work product provided by the individual appraiser(s).
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