



Labels, Certifications, and Scores, Oh My! Following the Road to Green Real Estate

Wednesday

3:45 pm

Panelists

- Deborah Philbrick, Elevate Energy
- Jeremy Crawford, RESO
- Sandy Adomatis, Appraisal Institute
- Madeline Salzman, DOE

Deborah Philbrick

Elevate Energy

With a Little Help from our Friends: The Power of Partnership

Deborah Philbrick

Better Buildings Summit
May 2017



Our Mission

We promote smarter energy use for all.



We give people the resources they need to make informed energy choices.



We design and implement efficiency programs that lower costs, and protect the environment.



We ensure the benefits of energy efficiency reach those who need them most.



Real Estate Industry Keeps us Grounded

This is us...



ComEd
An Exelon Company

Issued 2/11/16 Account # 000000000

SERVICE FROM 1/11/16 THROUGH 2/11/16 (31 DAYS)
Residential - Single

Customer Name
Service Address
City, ST, ZIP
000.000.0000

Total Amount Due by 3/4/16 \$69.42
Thank you for your payments totaling \$77.44.

TOTAL USAGE (kWh)
2015 2016

AVERAGE DAILY USE (monthly usage/days in period)

Current Month	15.8 kWh	↑ 24% from last year	25° avg. temp
Last Month	17.1 kWh	36° avg. temp	
Last Year	12.7 kWh	25° avg. temp	

⚡ Ten 100W light bulbs for 1 hour = 1 kWh

CURRENT CHARGES SUMMARY
See reverse side for details

SUPPLY	\$31.98
DELIVERY	\$30.96
TAXES & FEES	\$6.48
Current Charges	\$69.42

ComEd provides your energy.
ComEd.com
1.800.334.7661

ComEd delivers electricity to your home.
ComEd.com
1.800.334.7661

For Electric Supply Choices visit pluginillinois.org

Return only this portion with your check made payable to ComEd. Please write your account number on your check.

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0100001 00 IV 0.000 6577 -C65-B3-P00000-11 4 6 BSA C

CUSTOMER NAME
123456789

Pay your bill online, by phone or by mail.
See reverse side for more info
Account # 0000000000

Total Amount Due by 3/4/16 \$69.42
Payment Amount:

00000000000000000000694260640069424

This is everyone else...



Home Energy Information Accelerator (HEIA)

A collaborative effort among national organizations, federal agencies, and regional, state, and local leaders in real estate and energy efficiency.

Partners are working to *expand the availability and use of* reliable home energy information at relevant points in residential real estate transactions.





HEIA Collaborations

Local Pilot Sites

California

Colorado

Illinois

Northeast

Oregon

National Partners



Benefits of Partnerships

- Forced to distill your asks and messaging
- Your assumptions are challenged
- An added checks and balance on the quality of data
- Expanded coalition of invested stakeholders



Partnerships in Play



Home Energy Information Guide

Taking Verified Data Through The MLS To The Consumer



Created in Partnership with the
U.S. Department of Energy's
Home Energy Information Accelerator
by
Council of Multiple Listing Services
and
National Association of REALTORS®
Real Estate Standards Organization



Engaging Your Local Real Estate Power Players

- Who is your Multiple Listing Service?
 - Do they have green fields? RESO 1.5?
- Contact your local REALTOR® association
 - NAR's Green Designation
- Find your champions
 - REALTOR S®
 - Appraisers



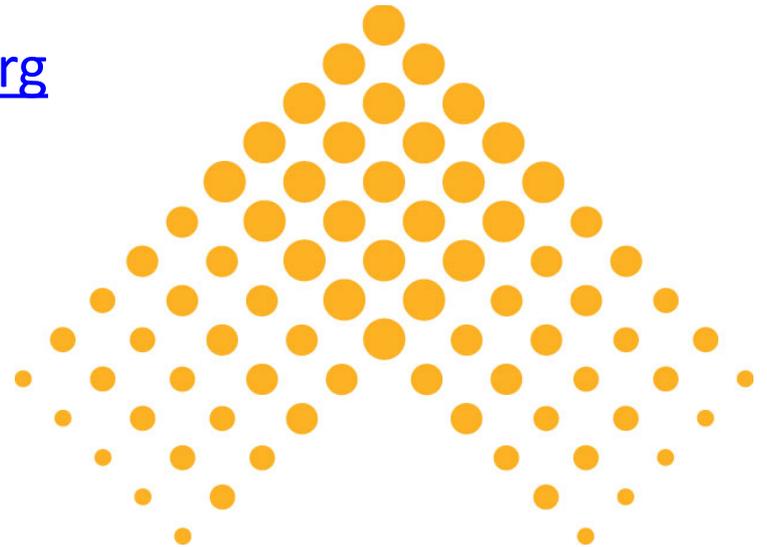
Questions? -- Stay in Touch

Deborah Philbrick

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@elevate_energy



Facebook/elevateenergy



LinkedIn



Jeremy Crawford

RESO



Real Estate Green Field Standardization Efforts
& RESO's Data Dictionary
May 17, 2017



Jeremy Crawford
Chief Executive Officer
Real Estate Standards Organization

Standards are the Key Ingredient of Business Success

- In the U.S. alone there are more than 100,000 standards at work
- The U.S. Department of Commerce estimates standards impact over 80% of global commodity trade
- Standards helped prevent over 40,000 home fires, 1,400 injuries and 350 deaths annually via standardization of Arc Fault Circuit Interrupters
- Standards allow you to offer sought-after products and services, increasing innovation, competitiveness, data availability and quality while reducing costs and duplicate efforts

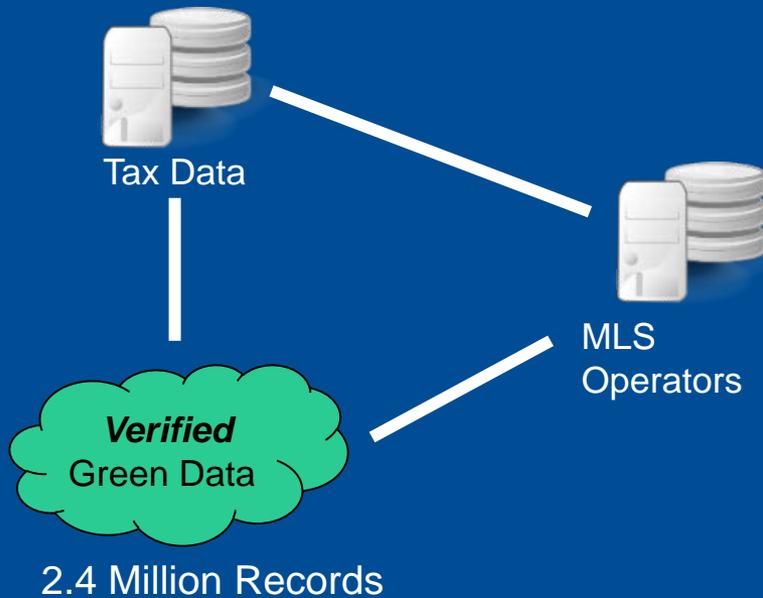


Who, Why RESO?

- RESO Is an independent Non-Profit membership based organization
- RESO facilitates over 650 member-organizations and 1000s of individual subject matter experts contributing real estate data standards that MLSs are required to implement
- RESO's membership community includes brokerages, associations, MLSs, technology companies and green organizations contributing to the creation and evolution of industry wide data standards ensuring all stakeholders are involved
- RESO Standards are Free & Open Source to Everyone
- RESO provides certification services to ensure the correct adoption of standards
- RESO is an active member of the Department of Energy Home Information Accelerator Program & Green Button Alliance
- RESO is actively involved with N.A.R.'s Home Sustainability Program, Orange Button Alliance, BEDES, BPI, HPXML and HELIX



Green Multiple Listing Service Initiative Connecting Energy Data to Property Listings



Brokerages



Aggregators



The RESO Data Dictionary

- RESO Data Dictionary Servers as a “Rosetta Stone” for defining real estate fields
- RESO Data Dictionary globalizes most common fields with standard names, data types and definitions
- Fostering Technology Innovation, the RESO Data Dictionary Benefits Everyone
- RESO DD Wiki: [Http://ddwiki.reso.org](http://ddwiki.reso.org)



Home Energy Fields & Data Dictionary Field Levels

- MLS Home Energy field adoption paves the way for MLS Data Integration between Listings and Energy Data
- RESO Data Dictionary provides data mapping between MLSs and the Building Energy Data Exchange Specification
- Silver level designated fields include standardization of Green Fields
- MLSs must adopt Green Field Standards by January 1st, 2018 (N.A.R. MLS Policy 7.90 - adopting RESO Standards)
- Over 350 MLSs have already certified Silver or higher representing 900,000+ Real Estate Brokers and Agents!



Home Energy Field & Lookup Values Examples

∨ Performance Group

∨ **GreenMarketing Group**

- GreenEnergyEfficient Field
- GreenEnergyGeneration Field
- GreenIndoorAirQuality Field
- GreenLocation Field
- GreenSustainability Field
- GreenWaterConservation Field
- WalkScore Field

∨ Performance Group

> **GreenMarketing Group**

∨ GreenVerification Group

- GreenBuildingVerificationType Field
- GreenVerification[Type]Body Field
- GreenVerification[Type]Metric Field
- GreenVerification[Type]Rating Field
- GreenVerification[Type]Source Field
- GreenVerification[Type]Status Field
- GreenVerification[Type]URL Field
- GreenVerification[Type]Version Field
- GreenVerification[Type]Year Field

∨ G - Lookup Fields

- > GreenBuildingVerificationType Lookups
- > GreenEnergyEfficient Lookups
- ∨ GreenEnergyGeneration Lookups
 - **Solar**
 - Wind
- > GreenIndoorAirQuality Lookups
- > GreenSustainability Lookups
- > GreenVerificationSource Lookups
- > GreenWaterConservation Lookups



GreenBuildingVerificationType Field

Created by RESO DD Workgroup on Jun 13, 2016

Field Name (Standard Name)²: GreenBuildingVerificationType

i Definition (May contain rules that must be observed)

The name of the verification or certification awarded to a new or pre-existing residential or commercial structure. For example: LEED, Energy Star, ICC-700. In cases where more than one certification have been awarded, leverage multiple iterations of the green verification fields via the repeating element method.

Group²: [Property Resource](#), [Structure Group](#), [Performance Group](#), [GreenVerification Group](#)

Lookup Status²: Open with Enumerations

Simple Data Type²: String List, Multi

Lookup²: [GreenBuildingVerificationType Lookups](#)

Suggested Maximum Length²: 1024

Sug. Max Precision²:

Synonym(s)²: GreenBuildingCertification, GreenBuildingVerification, GreenBuildingRating

Repeating Element²: Yes

Field (Element) Status²: Active

Property Types²: [RESI](#), [RLSE](#), [RINC](#), [MOBI](#), [FARM](#), [COMS](#), [COML](#)

BEDES²:

Payloads²: IDX

Certification Level²: Silver

Status Change Date²: Jun 21 2016

RecordID²: 100334

Revised Date²: Oct 18 2015

Lookup Values²

Added in Version²:

> [Click here to expand...](#)



Zero Energy Ready Home

Created by RESO DD Workgroup on Jun 13, 2016

Lookup Value²: Zero Energy Ready Home

From Lookup Field²: [GreenBuildingVerificationType Lookups](#)

i Definition (May contain conditions that must apply)

DOE Zero Energy Ready Home is a set of optional construction practices and technologies (above minimum code and ENERGY STAR Certified Home requirements) that builders can follow to ensure high-performance homes so energy efficient all or most annual energy consumption can be offset with renewable energy. Guidelines are outlined in the "DOE Zero Energy Ready Home National Program Requirements."

Synonym(s)²:

BEDES²: Assessment Program = "ENERGY STAR Certified Homes"

References²: [RESI](#), [RLSE](#), [RINC](#), [MOBI](#), [FARM](#), [COMS](#), [COML](#)

Lookup Status²: Active

Lookup Field ID²: 347000

LookupID²: 347012

Lookup Status Change Date²: Jun 21 2016

Revised Date²: Sep 17 2015

Added in Version²: 1.5.0



- Real Estate Professions: Include home energy information with the listing, ensure local MLSs adopt fields to hold information based upon already existing RESO Standards, encourage MLSs to work towards data auto-population
- Energy Entities: Work proactively with brokers, agents and local AORs/MLSs to enable feeding home energy information directly into the listing detail that is expose to millions of brokers, agents and consumers worldwide
- Everyone: Review the RESO Data Dictionary regarding home energy information. Provide RESO and its members feedback on what is missing, what needs expansion, what needs corrections to ensure the efficient and accurate flow of information into MLSs and out to brokers, agents and consumers in the real estate transaction process

Sandy Adomatis

Appraisal Institute



Appraisal Institute®

Professionals Providing Real Estate Solutions

KNOWLEDGE. | EXPERIENCE. | INTEGRITY.

U.S. Department of Energy Better Buildings Summit

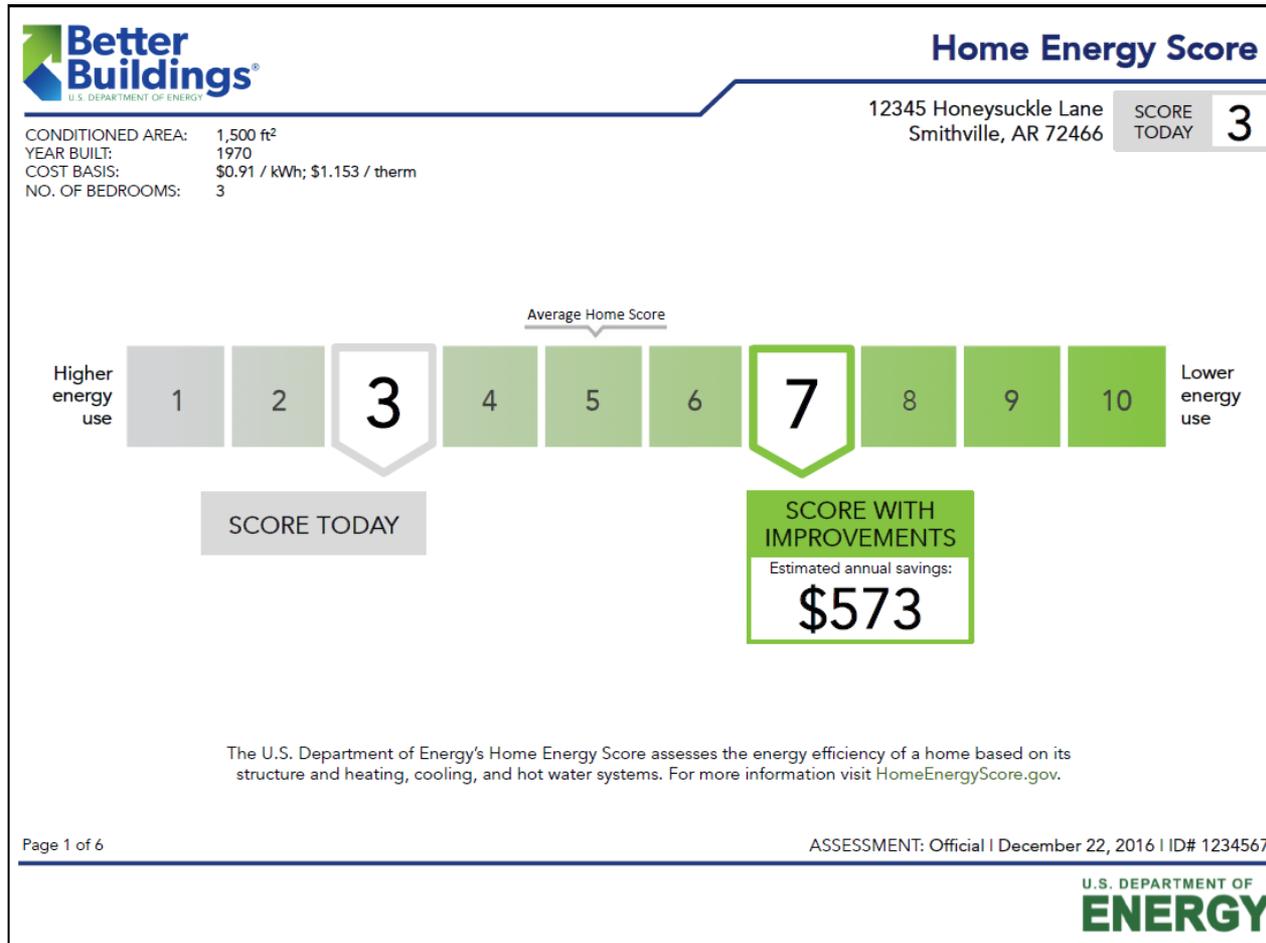
Sandra K. Adomatis, SRA, LEED GA

May 17, 2017

What Will be Discussed?

- Home Energy Score and the appraisal process
- Recognition of the Home Energy Score
- Appraisal Institute resources on appraised value and energy efficiency

The Score and the Appraisal Process



Opt-Out Language Example

Capturing the Sun:

*A Roadmap for Navigating Data-Access Challenges
and Auto-Populating Solar Home Sales Listings*

Laura Stukel, Ben Hoen, Sandra Adomatis, Craig Foley, Laura Parsons

Lawrence Berkeley National Laboratory

LBNL-1006628

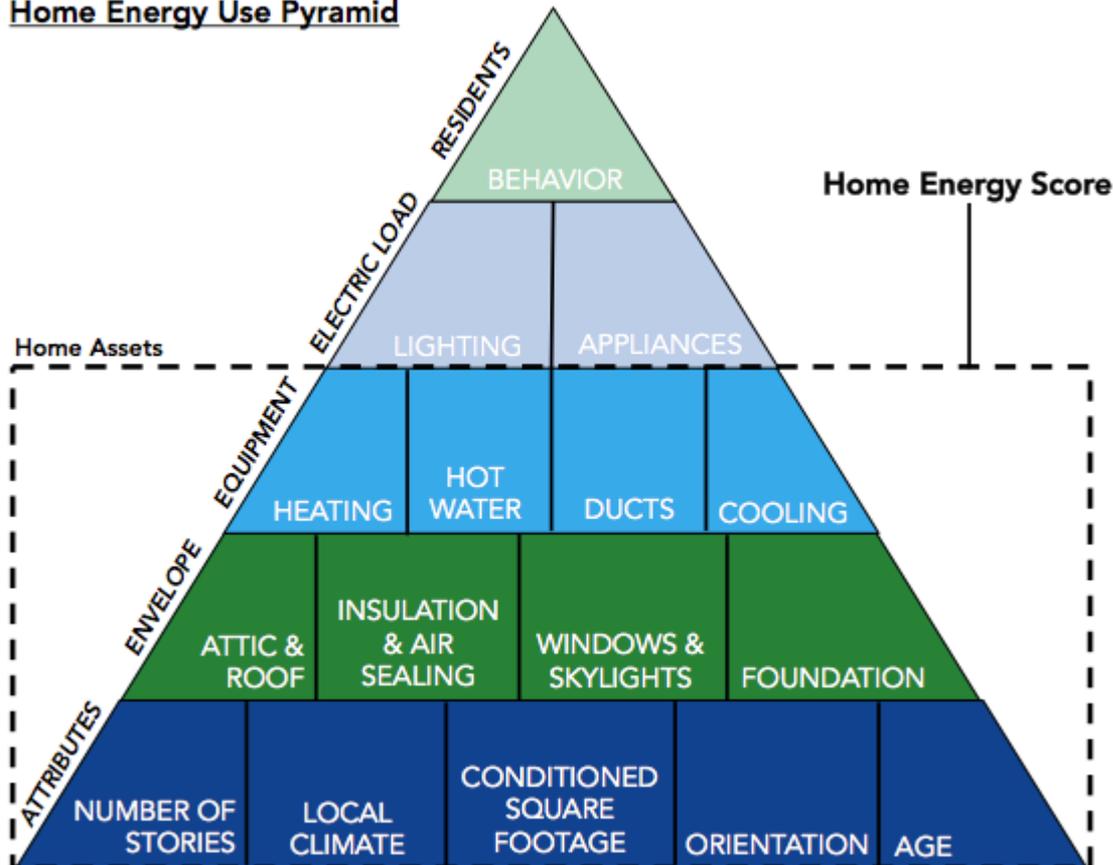


- Review the roadmap and be prepared to do your part in auto-populating the MLS
- It offers information on the Opt-Out already being used around the country

<https://emp.lbl.gov/sites/all/files/lbnl-1006628.pdf>

Home Energy Score Pyramid and the Valuation Process

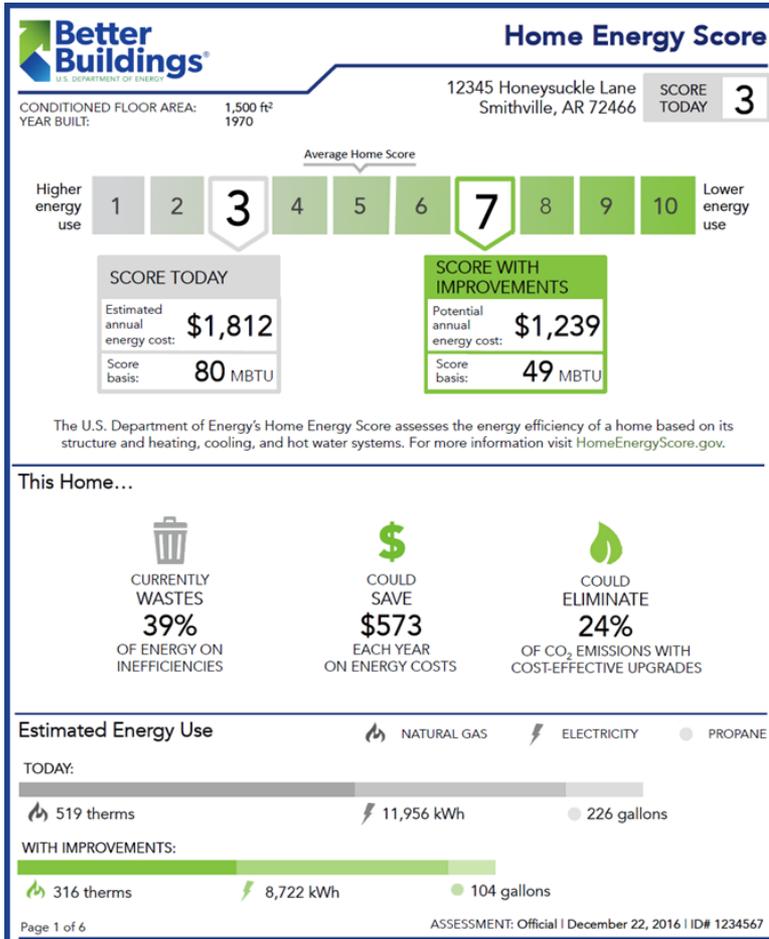
Home Energy Use Pyramid



- Home Energy Score based on home's assets
- Assets stay with house
- Most relevant at time of sale

Pyramid of Home Energy Use. Diagram shows the major components of a home that contribute to its annual energy use.

Score Page Appraisers Can Use



1. Energy costs today and with improvements
2. Breakdown of energy use by fuel type
3. Cost savings from improvements
4. Energy savings potential
5. **Cost of the improvements**

What Home Facts Reveal



Home Energy Score

12345 Honeysuckle Lane
Smithville, AR 72466

SCORE TODAY 3

Home Facts

The Home Energy Score's Home Facts includes details about the home's current structure, systems, and estimated energy use. For more information about how the score is calculated, visit our website at HomeEnergyScore.gov.

About This Home

ASSESSMENT	
Type	Official
Assessor ID	#1234567
Scoring tool version	v2016
Date	December 22, 2016

HOME CONSTRUCTION	
Year built	1970
Number of bedrooms	3
Stories above ground level	1
Interior floor-to-ceiling height	10
Conditioned floor area (ft ²)	1,500
Direction faced by front of house	North
Air sealed?	No
Air leakage rate	6,500 CFM50

Estimated Annual Energy Use

ENERGY BY TYPE	
Total (MBtus)	204
Score basis (MBtus)	141
Electricity (kWh)	11,956
Natural gas (therms)	519
Propane (gallons)	226

COST BASIS	
Electricity	\$0.091 / kWh
Natural gas	\$1.153 / therms
Propane	\$2.171 / gallon
Energy cost per square foot	\$1.45 / ft ²

DEFINITIONS & CONVERSIONS	
MBtu	Million British thermal units; generic energy unit
kWh	Kilowatt-hour; electricity unit
Therm	100,000 Btu; heat energy unit
Electricity conversion	1 MBtu = 293 kWh
Heat conversion	1 MBtu = 10 therms

Foundation

FOUNDATION / FLOOR 1	
Floor area (ft ²)	500
Foundation type	Slab-on-grade foundation
Foundation walls insulation	R-0

FOUNDATION / FLOOR 2	
Floor area (ft ²)	1,000
Foundation type	Unconditioned basement
Floor insulation above foundation	R-0
Foundation walls insulation	R-0

Walls

WALL CONSTRUCTION	TYPE / EXTERIOR FINISH	INSULATION VALUE
Front	Wood frame with Optimum Value Engineering (OVE) / Brick Veneer	R-19
Back	Wood frame / Wood, Asbestos, Fiber Cement, Shingle, or Masonite	R-0
Right	Concrete block or stone / Stucco	R-3
Left	Wood frame with rigid foam sheathing / aluminum siding	R-3

Windows & Skylights

WINDOW AREA	
Front (ft ²)	70
Back (ft ²)	90
Right (ft ²)	40
Left (ft ²)	30

WINDOW CONSTRUCTION	PANES	FRAME	GLAZING or U-VALUE & SHGC
Front	Single	Aluminum	Clear
Back	Double	Wood or Vinyl	Solar-controlled low-E
Right	Double	Aluminum w/ thermal break	Insulating low-E, argon gas fill
Left	Triple	Wood or vinyl	Insulating low-E, argon gas fill

SKYLIGHTS ROOF / ATTIC 1	
Present?	Yes
Area (ft ²)	30
Type	Single Aluminum Tinted

Systems

HVAC SYSTEM 1	
Percent conditioned area served	33%
Heating type	Electric heat pump
Heating efficiency value	7.8 HSPF
Cooling type	Electric heat pump
Cooling efficiency value	12 SEER

DUCT SYSTEM 1	INSULATED?	SEALED?	PERCENT OF DUCTS IN THIS LOCATION
Unconditioned attic	Yes	No	100%

HVAC SYSTEM 2	
Percent conditioned area served	67%
Heating type	Central gas furnace
Heating installation year	2009
Cooling type	Central air conditioning
Cooling installation year	2009

DUCT SYSTEM 2	INSULATED?	SEALED?	PERCENT OF DUCTS IN THIS LOCATION
Unconditioned basement	No	No	50%
Unconditioned attic	No	No	25%
Conditioned space	No	No	25%

HOT WATER	
System type	LPG storage
Installation year	1997

Recommendations Page

Recommended Improvements

REPAIR NOW. These improvements will save you money, conserve energy, and improve your comfort.

- ▶ **Air Tightness:** Have a professional seal all the gaps and cracks that leak air to save **\$110** / year
- ▶ **Ducts 1:** Add insulation around ducts in unconditioned spaces to at least R-6 to save **\$43** / year
- ▶ **Attic 2:** Increase attic floor insulation to at least R-19 to save **\$57** / year
- ▶ **Ducts 2:** Add insulation around ducts in unconditioned spaces to at least R-6 to save **\$23** / year
- ▶ **Ducts 2:** Have a professional seal all the gaps and cracks that leak air to save **\$74** / year

REPLACE LATER. These improvements will help you save energy when it's time to replace or upgrade.

- ▶ **Windows:** Choose ones with an ENERGY STAR label to save **\$61** / year
- ▶ **Water Heater:** Choose an ENERGY STAR appliance to save **\$159** / year
- ▶ **Electric Heat Pump:** Choose an ENERGY STAR appliance to save **\$32** / year

Comments

Current local incentives may make this house a good candidate for a new water heater.

- Recommendations categorized as:
 - Repair now
 - Replace later
 - Deferred maintenance (mtce)

Recognition of Home Energy Score

- New financing products and policies recognizing Home Energy Score:
 - FHA Policy (FHA Mortgagee Letter)
 - Fannie Mae's HomeStyle® Energy Mortgage Loan
 - Freddie Mac recognizes Home Energy Score
 - Homeowner insurance companies PACE programs



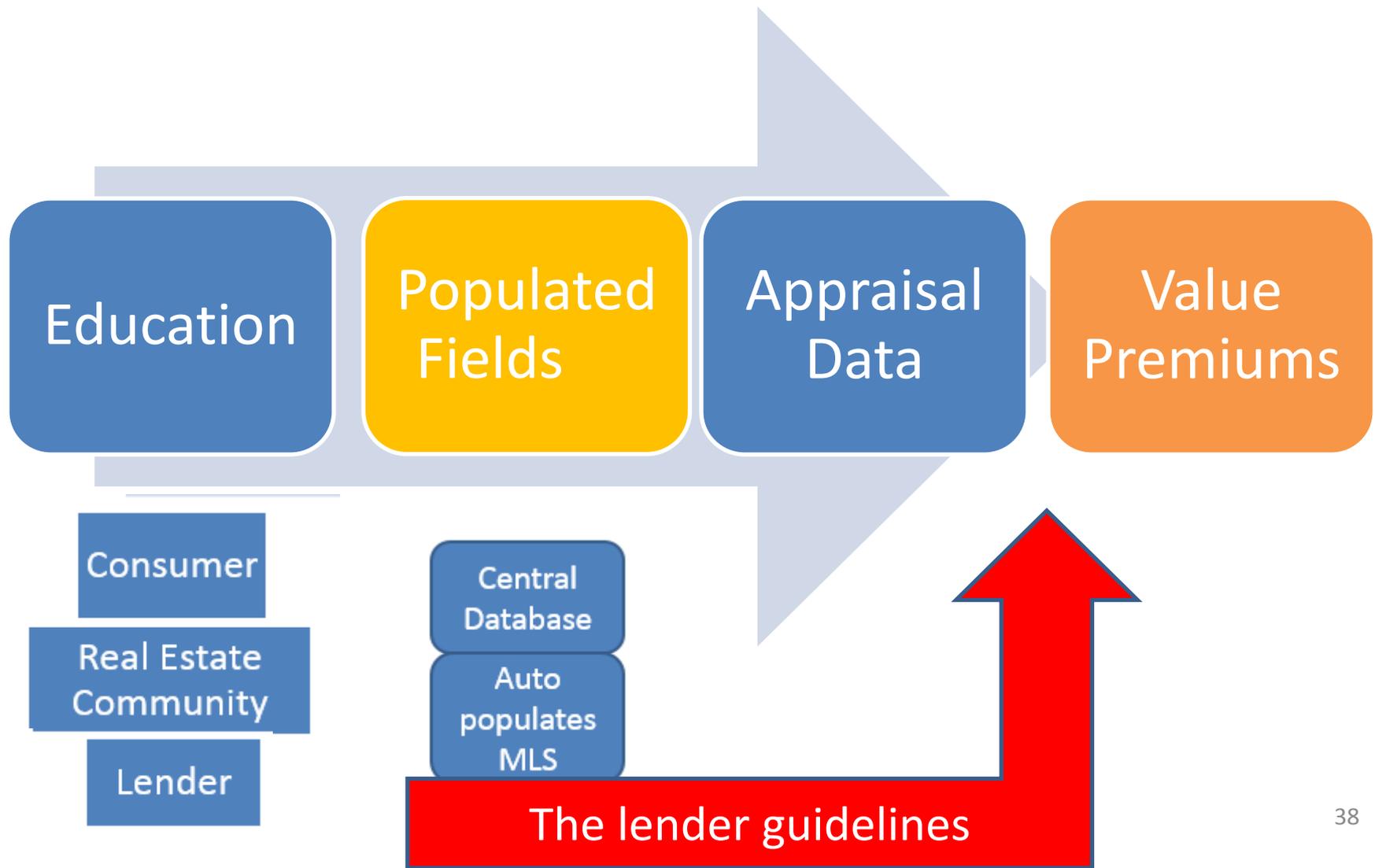
Appraisal Results Without Home Energy Score

Features	Subject	MLS Sale 1	MLS Sale 2	MLS Sale 3
Sale Date	Today	04/XX	02/XX	03/XX
Living Area	1,114	1,250	900	980
Room Count	5/2/1	5/2/1.5	5/2/1	5/2/1
Basement	Full	Full	Full	Full
Energy Eff.	Average	Average	Average	Average
Sale Price	\$145,000	\$135,000	\$115,000	\$120,000
Days on Mkt	32	40	55	75

Appraisal Use of Home Energy Score

Features	Subject	MLS Sale 1	MLS Sale 2	MLS Sale 3
Sale Date	Today	06/XX	03/XX	05/XX
Living Area	1,114	1,350	1,000	1,100
Room Count	5/2/1	5/2/1.5	5/2/1	5/2/1
Basement	Full	Full	Full	Full
Energy Eff.	Retrofit	Retrofit	Retrofit	Retrofit
Sale Price	\$145,000	\$155,000	\$139,000	\$142,000
Days on Market	32	30	29	20

Home Energy Score Offers Big Data



Appraised Value and Energy Efficiency: Getting it Right

While location, design and price are a home buyer's main considerations, surveys show that buyers rank energy saving features and equipment (e.g., air and duct sealing, insulation, and high-efficiency heating, ventilation, and air conditioning equipment) as desirable features for which buyers are willing to pay more. The home may also have an addition built to the 2012 or 2015 International Energy Conservation Code (2012 IECC or 2015 IECC), which would make the addition between 15 and 16 percent more efficient than if built to previous codes.

However, energy efficiency may be overlooked in the appraisal process for a variety of reasons, including a lack of access to quality data, underwriting impediments, and appraiser qualifications. **Many appraisers may not be aware of the unique features of an energy efficient home.**

To ensure that a home's green and/or energy efficient features and equipment are taken into account during an appraisal, it is important to document the home's energy efficiency features in a standard format. This documentation may be completed as part of an energy upgrade through a program such as the

Department of Energy's Home Performance with ENERGY STAR® program or as part of the generation of a recognized energy performance score, such as a Home Energy Score ("HEScore"), a Home Energy Rating System ("HERS") index, or other metric. It is also important for homeowners to choose an appraiser that is qualified to value the green and/or energy efficiency features of a high performing, energy efficient home in the local real estate market.



https://www.appraisalinstitute.org/assets/1/29/AI-BCAP_Flyer.pdf

A Ready-Made Solution Exists

Fannie Mae, Freddie Mac and Federal Housing Administration require appraisers to consider the energy efficient features of the home. There are many specially-trained appraisers who are qualified to assess the value of these features that are often hidden behind the drywall.

What Can Contractors Do?

Contractors can help clients ensure that a qualified appraiser is selected by doing the following things:

1. Complete and provide homeowners with the *Residential Green and Energy Efficient Addendum*, available at <http://www.appraisalinstitute.org/assets/1/7/Interactive820.04-ResidentialGreenandEnergyEfficientAddendum.pdf>.
2. Provide homeowners with a copy of a completed third-party-certified inventory of home's energy efficiency features in a standard format, such as a certificate that conforms to the *Building Performance Institute's 2101-S-2013 Standard Requirements for a Certificate of Completion for Residential Energy Efficiency Upgrades*, available at <http://www.hpxmlonline.com/wp-content/uploads/2017/02/BPI-2101-S-2013-Standard-Requirements-for-a-Certificate-of-Completion-for-Residential-Energy-Upgrades-2013-09-03.pdf>, and/or a copy of a completed report with a HERS rating, HEScore, or other recognized energy performance score (if available).
3. Prepare the homeowner to notify the lender that they require an appraiser that is qualified to value energy efficient, high performing homes. Add your logo, the property address, and contact information to the letter for



Appraisal Institute Resources

For Lenders

Dear Lender,

The home located at: _____
is a special property type. It has green and/or energy efficient, high-performing features that may include:

- Existing home that has received an energy upgrade through a program such as the Department of Energy's Home Performance with ENERGY STAR® program
- Existing home with green, energy efficient or other high-performing features such as high-efficiency HVAC equipment, high-quality insulation, air or duct sealing, and similar features
- An addition built to the 2012 or 2015 International Energy Conservation Code (2012 IECC or 2015 IECC)

Description of energy efficient and/or green features:

A completed copy of the *Residential Green and Energy Efficient Addendum*, and the energy report (if available, or two years of utility bills) should be included with the appraisal engagement letter. Fannie Mae, Freddie Mac and Federal Housing Administration require lenders to choose appraisers properly qualified to value the green and/or energy efficiency features of a high performing, energy efficient home in the local real estate market.

You can access a list of appraisers who may have those qualifications at the *Valuation of Sustainable Buildings Professional Development Program Registry*, available at: http://www.myappraisalinstitute.org/findappraiser/green_sustainability_residential.aspx.

These specially-trained appraisers have completed 28 hours of education and passed three exams. If the appraisers on your panel are not on this list, they can complete 14 education hours online to get started at: http://www.myappraisalinstitute.org/education/course_descrb/Default.aspx?prgm_nbr=826&key_type=CO.

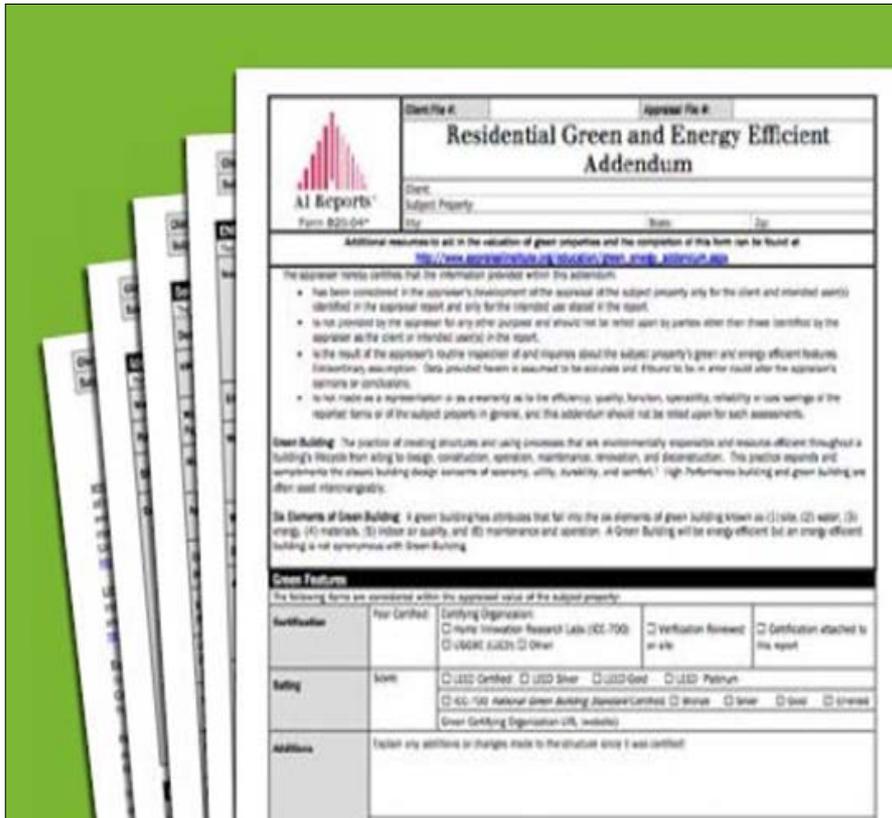
Appraisers on this list are not required to be Appraisal Institute members but must take the required courses and pass the exams to be listed.

If you have questions, please contact:

NAME: _____
PHONE: _____
EMAIL ADDRESS: _____

- This sample letter is a communication tool for the lender and appraisal management company

New Residential Green and Energy Efficient Addendum



The New and
Improved
AI Residential Green
and Energy Efficient
Addendum
820.05

<http://www.appraisal.org/education/education-resources/green-building-resources/more-green-resources/>

AI Residential Green and Energy Efficient Addendum

THIRD-PARTY VERIFICATIONS (See types defined in glossary).

The following verified items are considered within the appraisal analysis of the subject property:

Green Certification Certifications attest that the home meets certain <u>minimum</u> thresholds.	Environmental Protection Agency (EPA):	<input type="checkbox"/> Indoor airPLUS	<input type="checkbox"/> WaterSense	<input type="checkbox"/> ENERGY STAR
	Energy Department (DOE):	<input type="checkbox"/> Zero Energy Ready Home (ZERH)		
	Home Innovation Research Labs NGBS Home Remodel:			
	Home Innovation Research Labs NGBS New Home:	<input type="checkbox"/> Bronze	<input type="checkbox"/> Silver	<input type="checkbox"/> Gold <input type="checkbox"/> Emerald
	Living Building Challenge (LBC):	<input type="checkbox"/> Living Building Certified	<input type="checkbox"/> Petal Certification	
	Passivhaus Standard:	<input type="checkbox"/> PHI Low Energy	<input type="checkbox"/> EnerPhit	<input type="checkbox"/> Passive House
	Passive House Institute US:	<input type="checkbox"/> PHIUS+ 2015		
	USGBC LEED:	<input type="checkbox"/> Certified	<input type="checkbox"/> Silver	<input type="checkbox"/> Gold <input type="checkbox"/> Platinum
Other:				
Date Verified: _/_/___	Green Certification Version: ___ Organization URL: _____	ABOVE VALID ONLY IF CHECKED: <input type="checkbox"/> Verification reviewed on site <input type="checkbox"/> Verification attached to this report		

<http://www.appraisalinstitute.org/education/education-resources/green-building-resources/more-green-resources/>

AI Residential Green and Energy Efficient Addendum

Energy Label Labels <u>disclose</u> the state the home's energy assets.	RESNET's HERS Rating (0 to 150): ____ <input type="checkbox"/> Sampling Rating <input type="checkbox"/> Projected Rating <input type="checkbox"/> Confirmed Rating	Estimated energy savings for this home: \$ __/year __ ¢kWh rate dated __/__/__ <i>Energy Savings includes electricity, heating & Cooling.</i> <i>Score below 100 <u>indicates</u> energy costs are expected to be lower than average local code home per square foot. HERS Index Report estimates energy cost based on number of bedrooms plus one. Only a "confirmed rating" is a diagnostic test.</i>
	DOE's Home Energy Score Score (1 to 10): ____ <input type="checkbox"/> Official Score <input type="checkbox"/> Unofficial Score	Estimated energy savings for this home: \$ __/year __ ¢kWh rate dated __/__/__ <i>Energy Savings includes electricity, heating & Cooling.</i> <i>Score above five <u>indicates</u> energy costs are expected to be lower than average local home. Home Energy Score estimates energy cost based on state average energy rates and the home's energy features.</i>
	Other Energy Score: Range (__ to __): ____	Estimated energy savings: \$ __/year __ ¢ kWh rate dated __/__/__ Describe energy label system:
	Date Verified: __/__/__	Score or Rating Version: ____ Organization URL: <input type="checkbox"/> www.resnet.us/ <input type="checkbox"/> www.homeenergyscore.gov <input type="checkbox"/> Other: _____

<http://www.appraisalinstitute.org/education/education-resources/green-building-resources/more-green-resources/>

AI Residential Green and Energy Efficient Addendum

Verified Energy Improvements Only include improvements with verified documentation.	Explain energy-related improvements: Cost of improvements: \$ _____		
	Date Verified: ____/____/____	Certificate of Efficiency Improvements Version: ____ Organization URL: <input type="checkbox"/> Other: _____ <input type="checkbox"/> energystar.gov/homeperformance	ABOVE VALID ONLY IF CHECKED: <input type="checkbox"/> Verification reviewed on site <input type="checkbox"/> Verification attached to this report
Completed by: _____ Title: _____ Date: _____			
EFFICIENCY FEATURES (Water, Energy, and Environmental. See types defined in glossary).			

<http://www.appraisalinstitute.org/education/education-resources/green-building-resources/more-green-resources/>

AI Residential Green and Energy Efficient Addendum

The following items are considered within the appraisal analysis of the subject property:						
Insulation	<input type="checkbox"/> Fiberglass Blown-In <input type="checkbox"/> Foam Insulation <input type="checkbox"/> Cellulose <input type="checkbox"/> Fiberglass Batt Insulation <input type="checkbox"/> R-Value _____ Wall _____ Ceiling <input type="checkbox"/> Other (Describe): _____					
Building Envelope	Envelope Tightness: _____ Unit: <input type="checkbox"/> __ CFM25 <input type="checkbox"/> __ CFM50 <input type="checkbox"/> __ ACH50 <input type="checkbox"/> __ ACH natural Instructions: Insert the rating as a number that could be 0.5 to 7ACH50 or higher. The lower the number, the more air tight the envelope. Building Codes for area show <u>maximum</u> Envelope Tightness allowed based on the climate zone. Not all areas have adopted a building code. http://bcap-energy.org/					
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
Day Lighting	<input type="checkbox"/> # Of Skylights: _____	<input type="checkbox"/> # Of Solar Tubes: _____	<input type="checkbox"/> Other (Describe): _____ (% Of lighting LEDs): _____			
ENERGY STAR® Appliances	ENERGY STAR®: <input type="checkbox"/> Dishwasher <input type="checkbox"/> Refrigerator <input type="checkbox"/> Washer/Dryer <input type="checkbox"/> Other: _____ Energy Source: <input type="checkbox"/> Propane <input type="checkbox"/> Electric <input type="checkbox"/> Natural Gas <input type="checkbox"/> Other: _____ Note: ENERGY STAR® appliances do not result in an ENERGY STAR® Home.					
Water Heater	<input type="checkbox"/> ENERGY STAR®	Size: _____ gallons <input type="checkbox"/> Tankless	<input type="checkbox"/> Solar (next page) <input type="checkbox"/> Heat Pump <input type="checkbox"/> Coil			
HVAC & Related Equipment Describe in comments area.	<input type="checkbox"/> High Efficiency HVAC SEER: _____ Efficiency Rating: _____% AFUE* _____% *Annual Fuel-Utilization Efficiency	<input type="checkbox"/> Heat Pump Efficiency Rating: _____ COP: _____ HSPF: _____ SEER: _____ EER: _____	Thermostat/Controllers? <input type="checkbox"/> Yes <input type="checkbox"/> No Programmable Thermostat? <input type="checkbox"/> Yes <input type="checkbox"/> No Auxiliary heat source? <input type="checkbox"/> Yes <input type="checkbox"/> No Radiant Floor Heat? <input type="checkbox"/> Yes <input type="checkbox"/> No Geothermal? <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Vehicle Ready? (car charger) 84 <input type="checkbox"/> Yes <input type="checkbox"/> No			

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AI Residential Green and Energy Efficient Addendum

Indoor Environmental Quality	<input type="checkbox"/> Energy (ERV) or Heat Recovery Ventilator (HRV) <input type="checkbox"/> Other Measured Whole-House Ventilation Device (See glossary) <input type="checkbox"/> Humidity Monitoring Device installed	<input type="checkbox"/> <u>Non Toxic</u> Pest Control <input type="checkbox"/> Radon System: <input type="checkbox"/> Active <input type="checkbox"/> Passive
Water Efficiency	<input type="checkbox"/> Reclaimed Water System (Describe): _____ <input type="checkbox"/> Greywater reuse system <input type="checkbox"/> Water Saving Fixtures	<input type="checkbox"/> Rain Barrels Used in Irrigation Cistern size: _____ gallons Location of cistern: _____
Utility Costs	Annual Utility Cost: \$ ___/year, based on: ___/___/___ to ___/___/___ (full year). Includes (check all that apply): <input type="checkbox"/> Electric <input type="checkbox"/> Heating <input type="checkbox"/> Water <input type="checkbox"/> Other: _____	
Comments Include source for information provided in this section.	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. <u>Provide</u> additional information that illustrates how this property exceeds local building code. This document is intended for new construction or existing homes that have been retrofit to include higher energy or green features.	

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AI Residential Green and Energy Efficient Addendum

Solar Panels		
The following items are considered within the appraised value of the subject property:		
Solar Photovoltaic (Electric) System		
Type of Ownership	Array #1	Array #2 (if applicable)
	<input type="checkbox"/> Leased <input type="checkbox"/> Owned <input type="checkbox"/> Solar Loan <input type="checkbox"/> UCC Filing <input type="checkbox"/> Power Purchase Agreement (PPA)	<input type="checkbox"/> Leased <input type="checkbox"/> Owned <input type="checkbox"/> Solar Loan <input type="checkbox"/> UCC Filing <input type="checkbox"/> Power Purchase Agreement (PPA)
Panel Specifications	System Size: _____ kW (1kW = 1000 Watts) Age of Panels: _____ years Energy Production: _____ kWh Source of Energy Production Estimate: _____ Manufacturer: _____ Warranty on Panels: _____ years	System Size: _____ kW (1kW = 1000 Watts) Age of Panels: _____ years Energy Production: _____ kWh Source of Energy Production Estimate: _____ Manufacturer: _____ Warranty on Panels: _____ years
Array Placement <i>Affects energy production.</i>	Location (roof, ground, etc.): _____ Tilt / Slope: _____ Azimuth: _____ Orientation (direction panels face): _____	Location (roof, ground, etc.): _____ Tilt / Slope: _____ Azimuth: _____ Orientation (direction panels face): _____
Inverter Specifications	Number of Inverters per Array: _____ Age: _____ years Wattage: _____ watts Manufacturer: _____ Warranty Term: _____ years	Number of Inverters per Array: _____ Age: _____ years Wattage: _____ watts Manufacturer: _____ Warranty Term: _____ years

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AI Residential Green and Energy Efficient Addendum

Solar Thermal Water Heating System			
Type of System	Active: <input type="checkbox"/> Direct <input type="checkbox"/> Indirect Passive: <input type="checkbox"/> Integral collector <input type="checkbox"/> Thermo-syphon	Storage Tank Size	Gallons: _____
Collector Type	<input type="checkbox"/> Flat-Plat <input type="checkbox"/> Integral <input type="checkbox"/> Evacuated-Tube Solar	System Age	Years: _____
Back-Up System	<input type="checkbox"/> Conventional Water Heater <input type="checkbox"/> Tankless On Demand <input type="checkbox"/> Tankless Heat Pump	Warranty Term	
Solar Energy Factor (SEF)	*Rating ranges 1 to 11. Higher number is more efficient.		Manufacturer
Comments Discuss incentives available for new panels, condition of current panels, and any maintenance issues. If leased, provide the lease terms.	<p>Discuss source of information and define other renewable energy sources, such as wind, hydropower, biomass power, etc.</p> <p>Note: Leased solar PV systems and Power Purchase Agreements should not be considered in market value appraised values. These systems are personal property and usually taxed as personal property. If a system is lease or a PPA the terms must be provided to the appraiser for analysis. Appraisers must analyze the effect if any the terms of the lease or PPA have on the price buyers are willing to pay for the property.</p> <p>A free online tool and manual for valuing the energy production of the Solar PV System is available at www.pvvalue.com. PV Value® is a discounted cash flow (Income Capitalization Approach) to valuing energy produced. The solar PV system inputs on this form are necessary to use this program. Attending the "Residential and Commercial Valuation of Solar" course provided by the Appraisal Institute will provide a hands-on classroom experience in using this software. http://www.myappraisalinstitute.org/education/course_descrb/Default.aspx?prgrm_nbr=844&key_type=C</p>		

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