Appraising Energy Efficient Dwellings

By: Larry Disney, KREAB Executive Director

Energy Efficiency

Borrower

Lender

Builder

Appraiser

HERS Rater

What is an appraisal?

APPRAISAL: (noun) the act or process of developing an opinion of value; ***an opinion of value***.

(adjective) of or pertaining to appraising and related functions such as appraisal practice or appraisal services.

Comment: An appraisal must be numerically expressed as a ***specific amount***, as a range of numbers, or as a relationship (e.g., not more than, not less than) to a previous value opinion or numerical benchmark (e.g., assessed value, collateral value).

The appraiser is an analyst.

<u>SR 1-1(a)</u> In developing a real property appraisal, an appraiser must:

(a) be aware of, understand, and correctly employ those recognized methods and techniques that are necessary to produce a credible appraisal;

<u>SR 1-4</u> In developing a real property appraisal, an appraiser must collect, verify, and analyze all information necessary for credible assignment results.

The appraiser is an analyst.

- Anticipation – PW of Future net benefits

Question – What items contribute value?

Opinion is based on analysis of the market and market trends.

What type of value is appraised?

MARKET VALUE: a type of value, stated as an opinion, that presumes the **transfer of a property (i.e., a right of ownership or a bundle of such rights**), as of a certain date, under specific conditions set forth in the definition of the term identified by the appraiser as applicable in an appraisal.

Market Value

Comment: Forming an opinion of market value is the purpose of many real property appraisal assignments, particularly when the client's intended use includes more than one intended user, i.e. ***lender***.

What creates value.

- **Supply** – Created by two primary forces.
  - Utility
  - Scarcity

- **Demand** – Created by two primary forces.
  - Desire
  - Purchasing Power

Steps in Development of HBU

- Criteria for testing Highest and Best Use:
  - Legally permissible
  - Physically possible
  - Economically feasible
  - Maximally productive

Concern is Maximum Productivity.

- Contribution

Will the cost contribute a benefit or result in a loss?

Energy Efficient Items

- Energy Checklist
  - Insulation
    - Attic/roof
    - Ceiling
    - Exterior walls
    - Floors
    - Slab/perimeter
    - Foundation walls
    - Insulated water heater; insulation wrap
    - Insulated heat/cooling ducts or pipes

Estimated monthly savings $_____

Energy Efficient Items

- Windows and doors
  - Double (storm)/triple glazed windows
  - Storm doors: on # of doors
  - Insulated doors
  - Weatherstripping
  - Caulking
  - Other:

Estimated monthly savings $_____

Energy Efficient Items

- Heating and Cooling
  - Conventional Equipment
    - Automatic setback thermostat
    - Automatic flue damper
    - Entergy-efficient furnace
    - Energy-efficient air conditioner
    - Energy-efficient heat pump
    - Energy-efficient hot water heater
    - Special fireplace devices/features
    - Wood burning stove
    - Outside combustion air for fireplace or woodstove

    Estimated monthly savings $_____

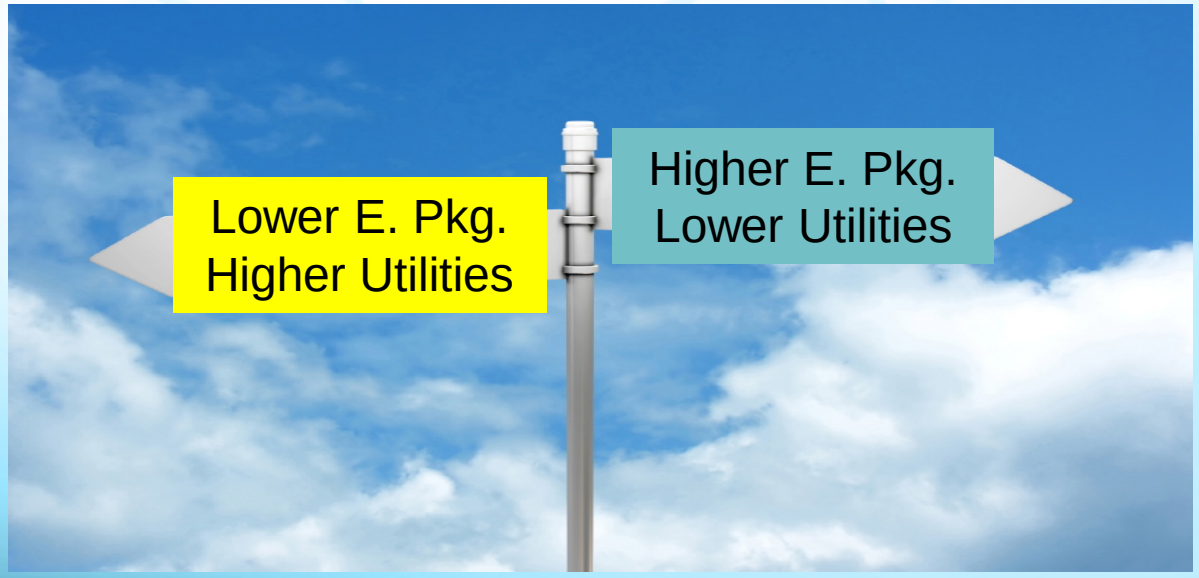
Energy Efficient Items

- Solar equipment or design
  - Passive solar design/landscaping – exterior
  - Passive solar design – interior
  - Solar space heating/cooling
  - Back-up heating/cooling system
  - Solar electric panels
  - Solar hot water heating
  - Earth-sheltered housing design

Estimated monthly savings $_____

Principle of Substitution (Economic Feasibility)

The principle of substitution states that a buyer will not pay more for a property than the cost of an ***equally desirable*** alternative property.



How Much does Energy Efficient Construction Cost?

Energy efficient construction cost vary depending on location, availability of material, skilled labor and professional raters

Of the two, which one offers the greatest return on investment?

Typical Code Built House 2012 HERS Index 100

3BR, 2 Bath, 1380 Gross Sq. Feet, Morehead, KY

Process
Foundation
Framing
Insulation
Air Sealing
Electrical
HVAC
Plumbing
Drywall
Interior Finish
(I.E: Paint, Cabinets, Floor Coverings)
Exterior Finish
(I.E.: Roofing, Siding, Conc. Etc.)
Misc.

Total Construction Cost $103,500.00

Energy Star V 3.0 Energy Star House Built in 2012 HERS Index 44

3BR, 2 Bath, 1380 Gross Sq. Feet, Morehead, KY

Process	**Additional Cost**
Foundation	$1,875.00
Framing	$495.00
Insulation	$2,170.00
Air Sealing	$651.00
Electrical	$0.00
HVAC	$1,870.00
Plumbing	$450.00
Drywall	$350.00
Interior Finish	$0.00
(I.E: Paint, Cabinets, Floor Coverings)	
Exterior Finish	0.00
(I.E.: Roofing, Siding, Conc. Etc.)	
Misc.	$0.00

Total Construction Cost

Additional Energy Star Cost $ 7,861.00

Total Cost $111,361.00

The itemized cost are associated with Frontier Housing, Inc, based on our labor and material rates. All rates for labor and material are at variance.

3 Possible approaches to developing an opinion of value.

- Cost
- Sales Comparison
- Income

Does the cost of an item equal the contributory value?

Cost to build or create

- Cost Approach – The estimate of cost to complete the subject dwelling by either reproduction or replacement.

  - Depreciation
  - Functional Obsolescence
  - External Obsolescence

Cost Approach to Value

OPINION OF SITE VALUE ..... $ 15,000

Cost of Dwelling 1,380 Sq. Ft. @ $ 55.26 ..... = $ 76.259

Cost of Garage 480 Sq. Ft. @ $13.00 ..... = $ 6,240

Energy Star Package..... = $ 7,861

Total Estimate of Cost-New..... = $105,360

Less Physical Functional External Depreciation = ... =$ 0 ???

Depreciated Cost of Improvements..... = $ 105,360

“As-is” Value of Site Improvements..... = $ 6,000

Indicated Value by Cost Approach..... = $ 111,360

Sales Comparison

- The most direct and reliable valuation approach for many appraisal situations, including 1-unit owner occupied residential properties.

- For greatest reliability there must be a sufficient number of recently closed sales of similar properties offering similar features and characteristics to use for comparison with a subject property.

Sales Comparison Approach to Value

Characteristics	Subject	Sale 1	$ Adjust.	Sale 2	$ Adjust
Sale Price	$111,500	$103,500	+$7,000	$111,361	0
Style	Ranch	Ranch	0	Ranch	0
Age	New	New	0	New	0
Rooms / BRs	6 / 3	6 / 3	0	6 / 3	0
Baths	2.0	2.0	0	2.0	0
Sq. Footage	1,380	1,380	0	1,380	0
Garage	2-CG Att.	2-CG Att.	0	2-CG Att.	0
Energy Star	Energy Star	Code Built	0	Energy Star	0
Functional Loss		None	0	None	0
Adj. Sale Price			$110,500		$111,361

Income Approach

- Only applicable when active rental market exists and when buyers consider the income from the property as a reason to purchase.
- Used to capitalize and discount income flows.
- This approach can often be a good indicator of value, when considering income or components of income, i.e. rents, savings required for replacement.

Income Approach to Value

Characteristics	Rental 1	$ Adjust.	Rental 2	$ Adjust.	Rental 3	$ Adjust.
Sale Price	$105,000		$98,000		$110,000	
Rent	$800		$750		$850	
GMRM	131.25		130.66		129.41	
Style	Ranch		Ranch		Ranch	
Rooms	6 3		6 3		6 3	
Baths	2.0		2.0		2.0	
Sq. Footage	1,350		1,380		1,375	
Garage	2.0 Att.		2.0 Att.		2.0 Att.	
Age	1 Year		5 Years	+$50	1 Year	
Const. Quality	Code	$50	Code	+$50	E. Star	
Adj. Rent		$850		$850		$850

Value by Income Approach $850 Rent x 130 GMRM = $110,500

Reconciliation

Cost Approach	$111,360
Sales Comparison Approach	$111,000
Income Approach	$110,500

Weighted

Cost	$111,360 x 2 =	$222,720
Sales Comp.	$111,000 x 3 =	$333,000
Income	$110,500 x 1 =	$110,500
Total		$666,220 / 6 = $111,000 (R)

Supporting Income Methodology

Present worth of the estimated savings in utility costs.

- Capitalizing savings at an interest rate that is not less than the current interest rate for the mortgage for a period not to exceed the

This is one alternative method that can be used to support the adjustment.

Using the HERS Report.

- Borrowers should obtain an energy report prepared by a Home Energy Rating Systems (HERS) energy rater. The energy report must:
  - identify the recommended energy improvements and expected costs of the completed improvements,
  - specify the monthly energy savings to the borrower, and
  - Verify that the recommended energy improvements are cost-effective.

Questions that should be addressed.

- Will the cost of the energy report be paid by the borrower?
- If so, can the cost be financed as part of the mortgage in the total cost of the energy improvements?

Questions that should be addressed.

- How will a copy of the energy report be delivered to the appraiser?
- Verify if the builder and/or the lender will have direct communication access with the appraiser?

Questions that should be addressed.

- Energy Rating
  - Has an energy rating been performed on the subject property?

- Energy efficiency appears:
  - High
  - Adequate
  - Low

Example – How one can use the "HERS" Report in developing an opinion of Market Value.

Report Instructions - The appraiser ***must***

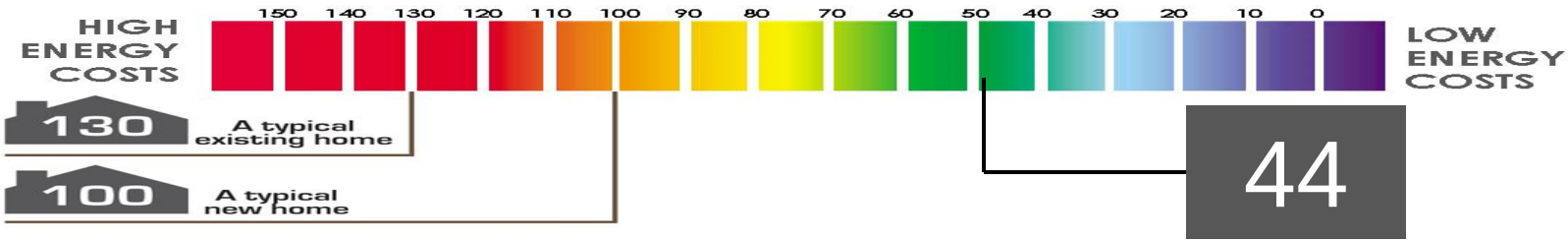
1. Review both the estimate of energy efficiency improvement costs; ***and***

2. Calculate the present worth of the energy efficient improvements as provided by the Certified HERS Energy Rater.

The HERS Rating…

HERS Rating - Is a comparative analysis of how energy efficient your home is as compared to other similar homes

Source: (www.resnet.us)



3BR, 2 Bath, 1380 Square Feet

This home is **56%** more energy efficient than a typical new home

&

86% more energy efficient than a typical existing home.

ENERGY STAR PARTNER

Assumptions necessary for PW calculation.

- The Monthly Energy Savings Value of ***$104*** was reported in the **HERS Report.**
- The installed cost of the energy efficient items was reported to be $7,861
- The mortgage interest rate was assumed to be 4.77%.
- The estimated home ownership was based on 7-years.

Depreciated Cost & PW New Dwelling

- Example – (Savings capitalized)
  - Installed cost less depreciation **$7,861**
  - Holding period 7 Years
  - Expected monthly savings $104 per month
  - Expected annual savings $1,248 per year
  - Present value factor 5.8349*
  - $1,248 x 5.8349 = $7,282 or **$7,000 (R)**

  - (*Annual compound interest @ 4.77% for 7-years)

The above is recommended ***only*** in absence of comparable closed sales data.

Information developed by the appraiser using HERS Report.

The estimate of energy efficiency value increment, based on the lesser of the referenced improvement cost or present worth, is concluded to be ***$7,000*** which represents an added value contribution to the market value opinion set forth in the appraisal report.

Developing an adjustment.

- The best method of support is via direct comparison.
- Price without energy efficient items $103,500
- Price with energy efficient items $111,500

Typically sales data does not exist to use in deriving this specific adjustment; therefore, the alternative method can be used.

Purchasing Power of EE dwelling.

Dwelling Market Value	**$103,500**	**$111,500**
Buyers monthly income	**$ 3,000**	**$ 3,000**
Buyers qualified monthly loan payment based on debt-to-income ratio	**$750**	**$750**
Maximum mortgage @ 95% of appraised value	**$98,325**	**$105.925**

Added borrowing power for EE items		$7,600

Supporting the opinion.

	Standard Dwelling	EE Dwelling
Property Price	$103,500	$111,500
Loan Amount (95%)	$ 98,325	$105,925
Monthly Payment	$513.10	$553.83
Energy bills	$179	$75
Cost of home ownership	$1,281	$1,177
Monthly Energy Savings	N/A	$104

Ownership of the energy efficient dwelling will contribute $104 per month savings. Therefore, $104 x 12 = $1,248 per year x 5.8349 (4.77% for 7 Years) = $7,281.95 = $7,000 savings.

Example Cost Effective Expenditure

In this example the borrower could request that the lender include a $7,000 energy upgrade package in the purchase of a new 1-unit residential dwelling. Doing so will increase the loan from $98,325 to $105,925.

- The loan payments will increase $40.73 per month for the upgrade package, but the property owner will realize $104 per month energy savings. (Net to the owner is $63.27 per month or $759.24 year.)
- Assuming a 7 year owner holding period and a 4.77% rate, the added present value provides a savings to home owner of $4,430.10

Benefit transfers with the property.

Positive Ownership Advantages

- Energy efficiency remains with the property and is not a personal item that can be removed.
- Property owner pays less monthly utilities and maintains more revenue, thus recognized savings.
- The environment benefits from added energy efficiency.
- There is no downside or negative with energy efficiency! Thus, PW of Future Benefits = Value

Expectations of the appraiser

- Select the appraiser based on knowledge, competency and experience.
- Appraising EE Residential properties is a specialty.
- Educate the lender in appraisal requirements.
- Make sure the lender and the appraiser are aware of all energy items that have been installed in the dwelling, the total cost, and the date installed.

Q&A

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