

Accounting for Sustainable Features in Housing Appraisal: The Green MLS Toolkit

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Problem Statement

- homes are responsible for 21.53% of total energy consumption
- Sustainably designed homes are still considered to be costly
- Some of the sustainable design features such-as north-south orientation are low cost

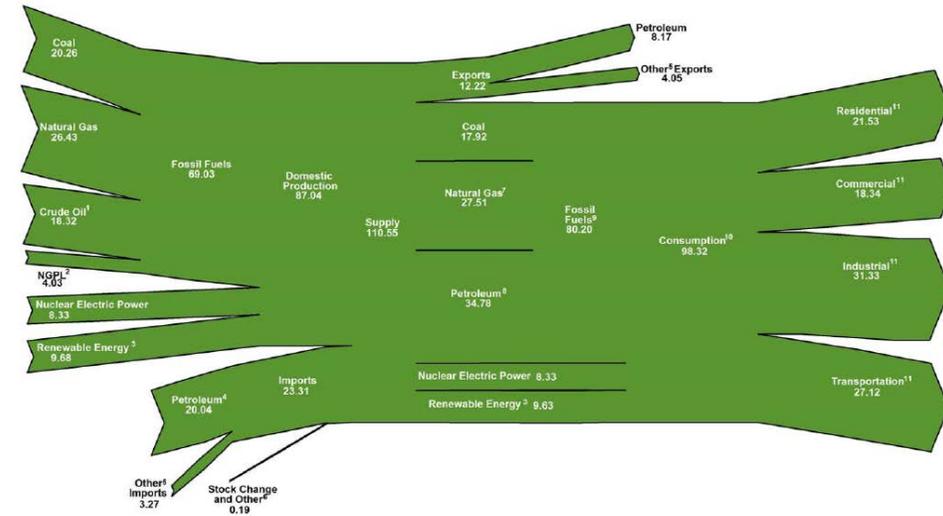


Figure 1. U.S. Energy Flow, 2014 Image
Source: www.EIA.gov.

The Case of Central Pennsylvania

- A recent study by the authors, “The Effect of Orientation and Elongation on the Price of the Homes in Central Pennsylvania” showed that Home-buyers are not necessarily aware of opportunities such as proper orientation and elongation that are cost-free choices in the design and can be highly effective in saving energy and promoting the quality of interior spaces.
- necessity of educating homebuyers and marketing agent

| | Log price difference | Std. Err. | T | P>t |
|-------------------------------|----------------------|-----------|------|------|
| Small elongation group | | | | |
| Orientation (0.25-0.50) | 0.0396 | 0.0187 | 2.12 | 0.03 |
| Orientation (0.50-0.75) | 0.0193 | 0.0174 | 1.11 | 0.27 |
| Orientation (0.75-1.00) | 0.0362 | 0.0169 | 2.15 | 0.03 |
| Large elongation group | | | | |
| Orientation (0.25-0.50) | 0.0118 | 0.0156 | 0.76 | 0.45 |
| Orientation (0.50-0.75) | 0.0037 | 0.0134 | 0.27 | 0.79 |
| Orientation (0.75-1.00) | 0.0010 | 0.0131 | 0.07 | 0.94 |

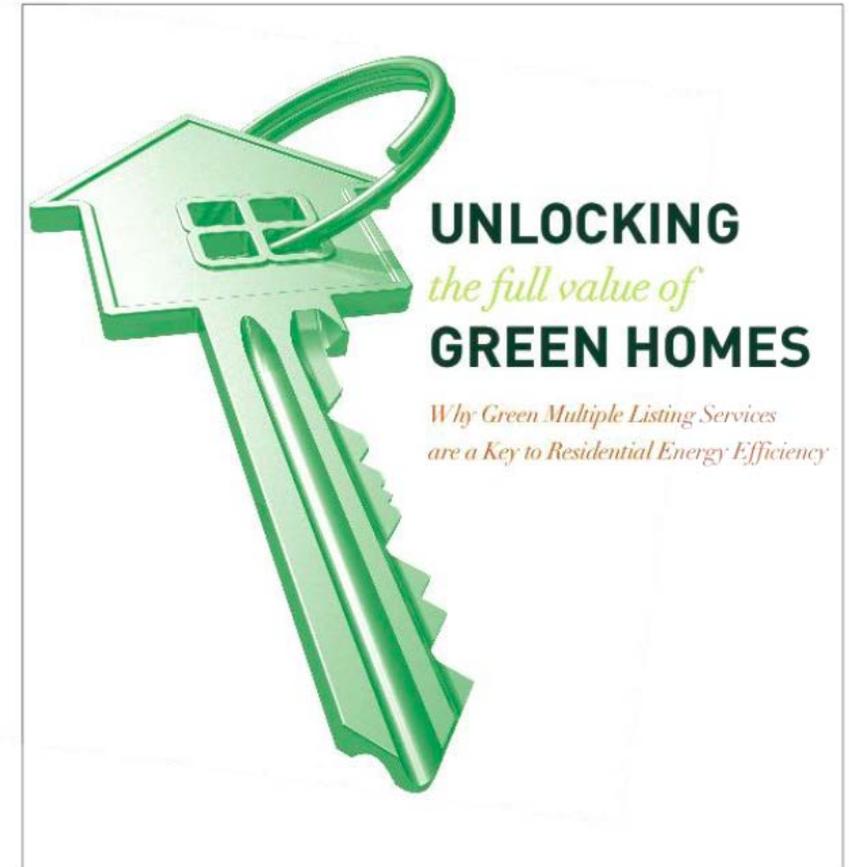
Table 1. log price difference between groups of large orientation values and the group of the smallest orientation value in single family homes of Centre County.

Technical Sustainability and Market

- There is a more clear relationship between technical sustainability and price/ more research is done in this area
- Bloom, Nobe and Nobe (2011) studied a sample of 300 homes in Fort Collins, Colorado consisting of 150 ENERGY STAR qualified homes and compared them to 150 non-ENERGY STAR qualified homes concluded that ENERGY STAR homes originally sell for approximately \$8.66 per square foot more than conventional ones
- Yoshida and Sugiura (2013) used transaction prices of 1,452 green projects and 10,481 non-green ones in Tokyo. They report that the initial transaction premium of green buildings might be negative due to higher expected maintenance costs of these buildings. However, the premium becomes positive after two years due to slower depreciation of green buildings.

But What Is a Better Solution?

- The green premium relates to specific energy efficient characteristics and other environmentally-sensitive features.
- *“The Green Premium exists when homes with environmentally-sustainable features sell for more, or sell more quickly, relative to otherwise identical homes lacking these feature.”*
- The green premium can be a strong motivators for homebuilders and home-buyers to incorporate sustainable features in the homes.



MLS and Green MLS

- **The MLS** is the primary source of information about properties and neighborhoods for real estate agents, appraisers, and ultimately for consumers.
- A "green" Multiple Listing Service (MLS) system offers data entry fields to identify green features and certifications. This helps agents search for sustainable homes and properties, and allows builders and sellers to market their green endeavors.
- Benefits of Green MLS:
 - Home-buyers can quickly find green homes
 - Makes it easy to fully promote the special features of a green home, or a brown home with green retrofits
 - Supports apples-to-apples comparison when it is time to appraise a green home

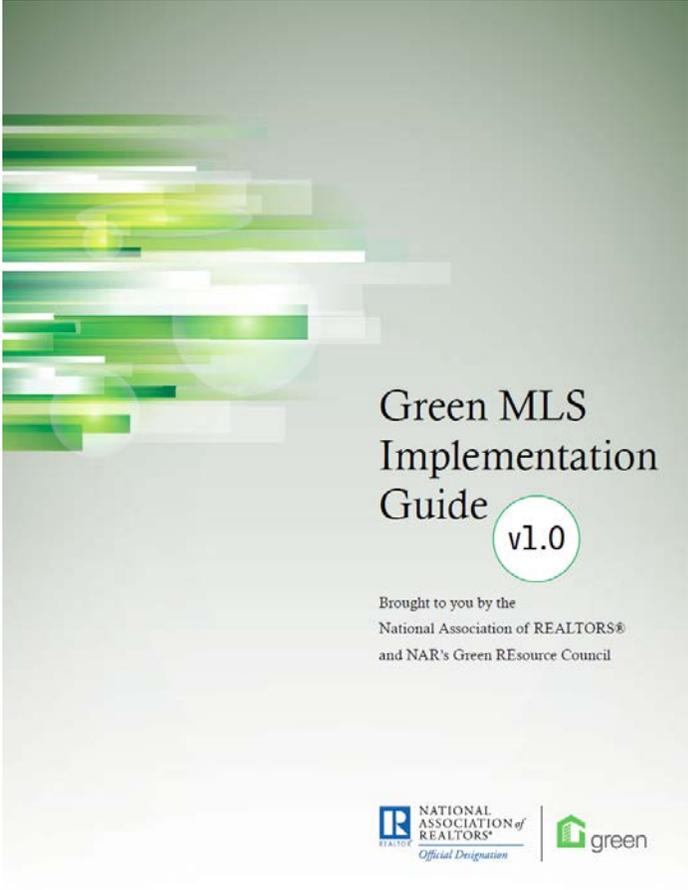


Categories and Fields

There are 3 types of fields of entry in the Green MLS Toolkit:

1. 3rd party verified fields (certifications and labels)
 - Green Building Verification
 - Green Verification Body
 - Green Year Verified
 - Green Verification Metric
2. Green search/marketing fields
 - Green Energy Efficiency
 - Green Energy Generation
 - Green Sustainability
 - Green Water Conservation
 - Green Indoor Air Quality
 - Green Location
3. Specific/technical fields
 - Property Fields
 - Structure Fields

How to implement the Green MLS toolkit?



Example of Implementation: Fayetteville, AR.

In 2013, Green MLS adopted by the Northwest Arkansas Board of Realtors (NABOR). They found out that changing the drop down menus in the software would require 4 hours of effort and only \$787.92.

LEVEL OF EFFORT

| Task | Hours |
|---------------------------------------|------------|
| Database Changes | 2.0 |
| Application Configuration and Testing | 1.0 |
| Project Planning/Management | 1.0 |
| Total Hours | 4.0 |

PRICING AND PAYMENT

This service shall constitute a Database Change and Consulting Services under the terms of the "Agreement". The cost for implementing these Database Change services is as follows:

| | |
|-------------------------|----------------------|
| Rate: | \$196.98/hour |
| Level of Effort: | 4.0 Hours |
| Total Price: | \$787.92 |

Example of Implementation: Fayetteville, AR.

The following information exists in regards to **Green Data Fields** in the **Northwest Arkansas Board of REALTORS® MLS**:

- 110 listings in the MLS that utilize Green Efficiency Ratings (HERS, LEED, etc.)
- 709 listings utilizing green efficient amenities (recycling curbside, LED lighting, etc.)
- 1 listing utilizing green efficient exterior values.
- 54 listings utilizing energy efficient heating values.
- 186 listings utilizing green efficient insulation values.
- 4 listings utilizing green efficient landscaping values.
- 14 listings utilizing green efficient lot description values.
- 4 listings utilizing green efficient roof values.
- 9 listings utilizing low flow faucets.
- 8 listings utilizing low flow showers.
- 11 listings utilizing low flow toilets.
- 133 listings utilizing energy efficient window values.

Multiple Listing Services that Have Implemented the Toolkit

- More than 125 multiple listing service including:
 - Tucson MLS Green Plans
 - Phoenix MLS Green Plans
 - Santa Barbara MLS Inputs
 - Lehigh Valley Residential Profile Sheet**
 - Memphis Green Features Checklist
 - Middle TN MLS Inputs
 - San Antonio MLS Inputs
 - Houston MLS Green Plans
 - Central Virginia Regional MLS Green Fields
- Local Customization Based on Climate and Business Practices
- Implementation is not hard!

Future Research Topics

- Frequency of using specific fields?

| Number | State | IEC Climate zone | Department of Energy Guide to Tucson MLS Green Plans | ENE RGY STAR (ES) Appli | ES label on the equipments | ES qualified windows, doors, CFLs, | ES qualified lighting, CFLs, | Programmable thermostat | Tankless water heater | Low flow showerhead | Dual flush toilet | Energy audit avail. | Green roof | Utility bills | Passive solar features | Solar water heater | off-grid | Solar photo voltaic (PV) system | Wind turbine | HERS rating | Builders Challenge qualified | Geothermal Heat Pump | ENERGY STAR qualified home | EarthCraft House | LEED® | NAHB National Green Building Progra | ANSI National Green Building Standar | Passive House Certification | Other green building program certification | Triple Windows | Green Materials | Atrium | | | |
|--------|-------|------------------|--|-------------------------|----------------------------|------------------------------------|------------------------------|-------------------------|-----------------------|---------------------|-------------------|---------------------|------------|---------------|------------------------|--------------------|----------|---------------------------------|--------------|-------------|------------------------------|----------------------|----------------------------|------------------|-------|-------------------------------------|--------------------------------------|-----------------------------|--|----------------|-----------------|--------|---|---|---|
| 0 | - | - | Department of Energy Guide to Tucson MLS Green Plans | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | | |
| 1 | AZ | 2 | Phoenix MLS Green Plans | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | | |
| 2 | AZ | 2 | Santa Barbara MLS Inputs | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | | |
| 3 | CA | 3 | SoCal MLS Inputs | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | |
| 4 | CA | 3 | Tuolumne County Green MLS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | |
| 5 | CA | 4 | MLSListings Green Fields | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | |
| 6 | CA | 2 | Pismo Coast MLS Green Data Fields | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| 7 | CA | 2 | Colorado Real Estate Network Residential Data | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 8 | CO | 6 | Chaffee County MLS Inputs Steamboat | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 9 | CO | 6 | Springs Energy Efficient Features | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 10 | CO | 7 & 8 | St. Augustine and St. Johns County MLS Coded | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 11 | FL | 2 | Des Moines Area MLS Energy-Elkhart County Residential Farm Data Form | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 12 | IA | 4 & 5 | Berkshire County MLS Energy | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 13 | IN | 4 & 5 | Traverse City MLS Statement | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 14 | MA | 4 & 5 | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 15 | MI | 6 | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |

- Outcomes of the Green MLS so far?

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