

Do Renters and Home Buyers Care About Efficiency?

Findings from Three Randomized Controlled Experiments

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ABSTRACT

Rental listing websites rarely include energy information about homes and apartments. Considering that 93% of homebuyers and 72% of renters use the internet to find their next homes, energy information on these websites could be a game changer. But would home seekers respond to efficiency information if it were included? How much would it change their behavior, if at all? And what type of label would be best?

We conducted three separate experiments to answer these questions. The experiments each involved creating mock real estate listing websites to evaluate how the presence of energy information (or lack thereof) impacted homebuyer and renter behavior. One experiment focused on homebuyers in the United States, one focused on homebuyers in Canada, and the most recent focused on renters in the United States.

In all three experiments, we used a large nationally representative sample of home buyers or renters and found statistically significant results. Energy information in listings led participants to choose more-efficient options over less-efficient options. Moreover, all three experiments demonstrated that context information in labels makes them more effective. Labels with rich context information that help consumers compare options, such as those that display energy information along a continuum of possible scores, worked best. Likewise, labeling programs without context information, such as those that label only the most-efficient homes, were less effective. We compare findings across all three experiments to better understand how energy information affects different demographics (e.g., renters, homebuyers, people with low income) and provide policy recommendations based on these findings.

Introduction

Real estate listing websites rarely provide energy performance information about homes and rentals on the market. However, consumer research has shown that homeowners and renters care about energy efficiency and want more-efficient homes. Nielsen's Demand Institute surveyed more than 10,000 US households about what they need and want in their housing and found the number one desire was for an energy-efficient home. While 71% of households reported thinking that energy efficiency is important, only 35% of households said they were satisfied with their current home's energy performance (Demand Institute 2013).

Local policymakers are in a unique position to require landlords and home sellers to provide this information to their housing market. Policies that require disclosure of energy use information at the time of listing are a key mechanism to close this information gap. Several leading cities have implemented such policies, including Portland, Oregon (for home sales), and Minneapolis, Minnesota (for home sales and rentals). However, these policies are still relatively new and therefore there is no robust analysis on the long-term effects of energy use disclosure on consumer choices yet.

We conducted three discrete choice experiments to evaluate the impact of energy information in rental listings on consumer behavior. The first study focused on home sales in the United States, the second on home sales in Canada, and the third on rental listings in the United States. Our research found that including energy efficiency labels in real estate listings did influence the behavior and decision making of prospective homebuyers and renters. Although the value of efficiency varied within and among experiments, the pattern of results was similar. We also identified the types of labels that had the greatest impact and found consistent results across all three experiments. Here, we summarize our findings and compare them across all three experiments to identify the similarities and differences between real estate sales and rental markets.

Experiment Designs

In all three experiments, we created discrete choice experiments that looked like home listing websites. We recruited a nationally representative group of participants for each experiment.¹ In each experiment, we asked participants to act as if they were looking for their next home. We analyzed real listing websites to design a realistic-looking mock listing website that included all of the most important, most common home attributes. Figures 1 and 2 below show the website design for our rental listing website (which was very similar to the design for the real estate listing website).

The figure consists of two side-by-side screenshots of a web application interface for RentDragon. The left screenshot shows a landing page with an aerial view of a neighborhood. The heading 'Where do you want to live?' is prominently displayed. Below it, there are two input fields: 'Place' with the placeholder text 'Choose your city and state' and 'Neighborhood' with the placeholder text 'Enter neighborhood or leave blank if unsure'. A red 'Next' button is located at the bottom right. The right screenshot shows a form for selecting property details. It includes a 'My expected rent' field with a dollar sign and 'per month' text, a 'Property Type' section with two options: 'Apartment' (with a photo of an apartment interior) and 'House' (with a photo of a house), and a 'Preferred number of Bedrooms' section with four buttons labeled '1', '2', '3', and '4'. A red 'Next' button is at the bottom right. Both screenshots have the RentDragon logo at the top center.

Figure 1. The image on the left shows the first page of the mock listing website. Participants entered their preferred location (city or state) and neighborhood (optional). They were then taken to the page shown in the image on the right, where they entered their preferred rent price, property type (apartment or house), and number of bedrooms (1-4).

¹ For the rental listing experiment, we recruited 2,455 participants that closely matched the demographics of renters in the United States. In the US real estate listing experiment, we recruited 1,538 participants that closely matched the demographics of US home buyers. In the Canadian real estate experiment, we recruited 1,574 participants that closely resembled the demographics of homebuyers in Canada.

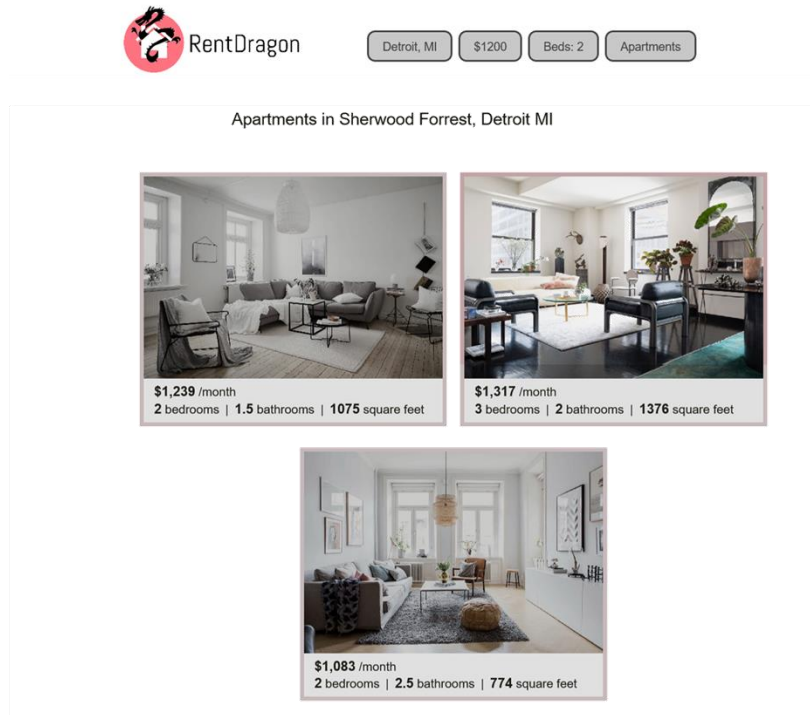


Figure 2. The screenshot above is the results page that participants saw after putting in the preferences in the first two pages in Figure 1. Each participant saw six sets of three choices, which varied based on their input preferences. Each set of choices showed the same images to ensure that pictures did not influence the participants’ decisions.

Although the home search results displayed for participants were made to look like those in real websites (as shown in Figure 2), they were actually carefully designed discrete choice experiment choice sets. Each set of three choices included several key attributes. In all experiments the listings included price (monthly rent or purchase price), number of bedrooms, number of bathrooms, square footage, a photo, and energy information. The real estate experiments also included number of days on the market. These attributes were selected after an extensive review of popular real estate and rental listings websites. We varied the level of each attribute in the choices and asked participants to make trade-offs to determine how much they valued each attribute with respect to the other attributes. For example, one choice may have had a high rent price and high energy efficiency rating, and another may have had a low rent price and moderate efficiency rating. By having participants choose between price and efficiency level, we could determine which they valued more. Table 1 below summarizes the attributes used in each study.

Table 1. Attributes in Each Study

	US Real Estate (2020)	Canadian Real Estate (2020)	US Rental (2022)
Attributes	• Listing price • Number of bedrooms • Number of bathrooms • Square footage • Photo	• Listing price • Number of bedrooms • Number of bathrooms • Square footage • Photo	• Listing price • Number of bedrooms • Number of bathrooms • Square footage • Photo

	US Real Estate (2020)	Canadian Real Estate (2020)	US Rental (2022)
	- Energy information - Days on market	- Energy information - Days on market	Energy information

We also tested several different ways of depicting energy efficiency via energy information labels in each experiment to see which were the most effective. Each participant was randomly assigned to one of several conditions, corresponding to a different labeling approach. Table 2 below summarizes the labels used in each experiment.

Table 2. Labels Tested in Each Experiment

Label (condition)	US and Canadian Real Estate	US Rental
Energy Bills	Annual energy cost: \$X,XXX	Monthly Energy Bills: \$XX
Energy Bills on Continuum	N/A	
Energy Rating	Home Energy Score: X/10	Home Energy Score: X/10 Building Energy Score: X/10
Energy Rating on Continuum	 Efficient	 
Energy Rating on Continuum and Energy Bill Costs	Annual energy cost: \$X,XXX  Efficient	N/A
Voluntary (shown only for most-efficient homes)	Home Energy Score: X/10	Home Energy Score: X/10  Energy Star Home Building Energy Score: X/10  Energy Star Building
Energy Cost Included in Rent	N/A	\$X,XXX / month (including energy costs)
Control	Energy cost hidden	Energy cost hidden

For the energy rating conditions, we used the Department of Energy's Home Energy Score (HES) and Building Asset Score (BAS). We used the HES in all three experiments and the BAS in the rental listing experiment for apartment listings. Using these labels had several advantages for our experiment design. First, DOE had developed an intuitive label rating system (rating out of 10) and continuous label design. Having an easily understood, intuitive label was important because participants could understand the label even if they did not know the rating system. Second, we could use data from DOE to calculate the corresponding energy use for buildings at each score, ensuring the relative efficiency and costs were comparable and

consistent across conditions. This gave us more confidence in our analysis when comparing participant behavior across conditions.

Findings

Renters and Buyers Respond to Labels Similarly

In all three experiments, renters and buyers responded similarly to energy labels and the way the information was displayed. Participants who saw energy labels of any kind clicked on the most-efficient homes in each choice set more frequently than participants who saw the same homes with energy information hidden (control condition). Participants who saw energy labels of any kind clicked on the least-efficient homes in each choice set less frequently than participants who saw the same homes with energy information hidden. Table 3 below summarizes these findings across all three experiments.

Table 3. Impact of Energy Labels on Click Rates

	Clicked on efficient homes	Clicked on inefficient homes
US Real Estate (2020)	14% more often	23% less often
Canadian Real Estate (2020)	20% more often	27% less often
US Rental (2022)	21% more often	21% less often

We also found similarities in the most- and least-effective labels across all three experiments. Labels that provided the most context (best at facilitating comparison to other homes) were most effective. For example, labels that showed where homes ranked relative to the best possible homes had the greatest impact. In all three experiments, labels that showed the energy score out of 10 or along a continuum of possible scores were best at shifting selections toward more-efficient homes. Similarly, in all three experiments, energy costs on their own were not particularly persuasive, but when they were put along a continuum in the rental listings experiment, they were just as persuasive as other labels. Further, we saw the importance of context when labels reduced the ability to compare to other homes. In all three experiments, labeling only the most-efficient homes (the “voluntary label” condition) was not significantly better at shifting decisions than presenting no efficiency information (the control condition). Notably, although not effective in the current studies, the Energy Star® label can sway behavior for other purchases. Figure 3 below show the result from the US and Canadian real estate

experiment and Figure 4 shows the results for the US Rental Listing experiment.

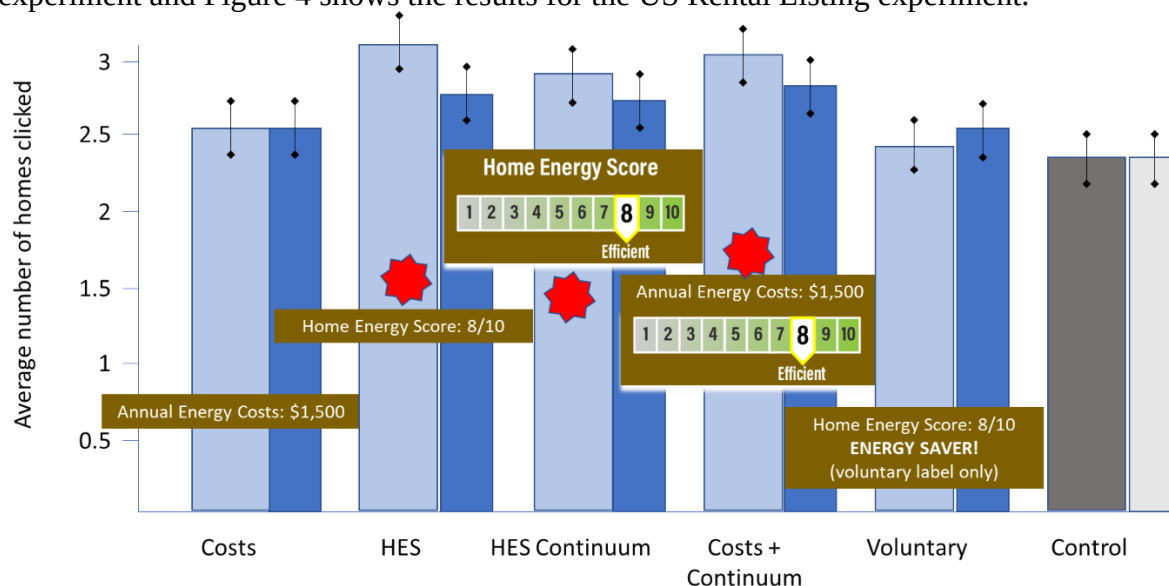


Figure 3. Impact of various label types on click rates for the most-efficient homes in the US and Canadian real estate listing experiment. The light blue bars on the left are results from the Canadian study and dark blue bars on the right are the results from the US study. Red stars indicate conditions that are significantly different than the control condition. The y-axis shows the average number of clicks on efficient homes out of a maximum of six (the total number of choice sets decisions participants were asked to make). The whisker bars show the standard error for each result.

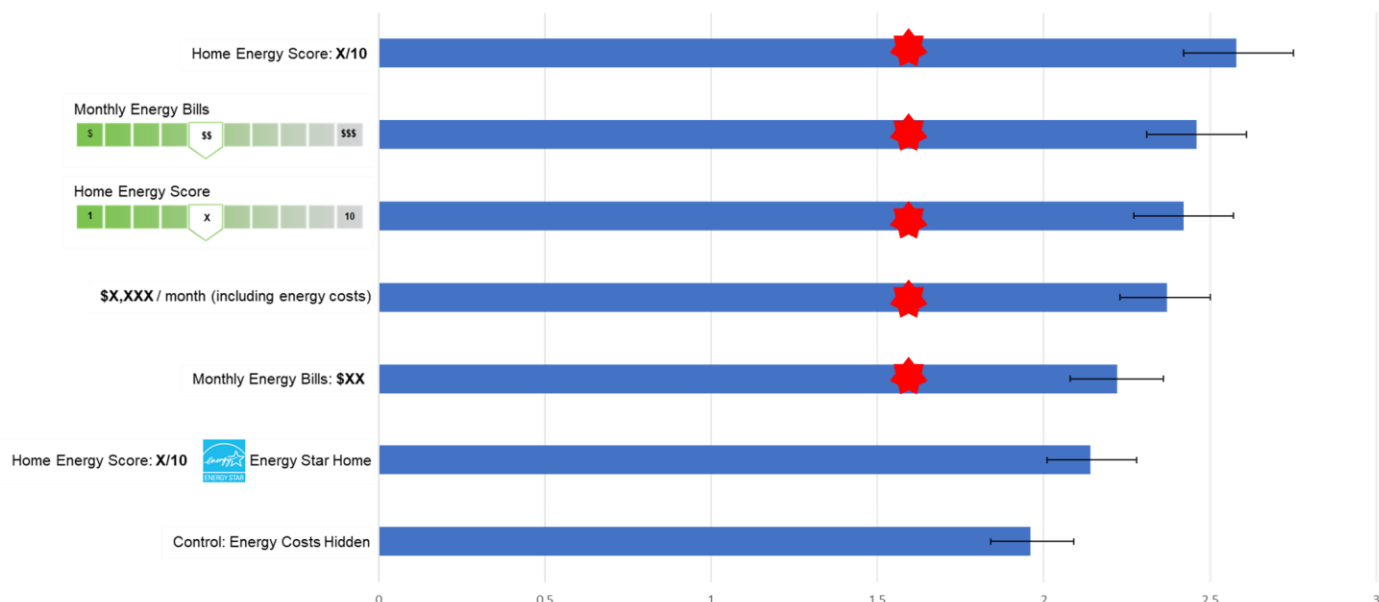


Figure 4. Impact of various label types on click rates for the most-efficient homes in the US rental listing experiment. The x-axis shows the average number of clicks on efficient homes out of a maximum of six (the total number of choice sets decisions participants were asked to make). The whisker bars show the standard error for each result and red stars indicate conditions that are significantly different from the control.

Buyers Are Willing to Pay More for Increased Energy Efficiency

Homebuyers in the United States were willing to increase their purchase price by 5–11% for a one-point increase in HES, and Canadian homebuyers were willing to increase their purchase price by 2–5% for a one-point HES increase (depending on the type of label used). In the rental listing study, renters were willing to increase their monthly rent price by 1.4–2.3% for a one-point increase in energy score using nearly identical labels (but displaying monthly rental price instead of purchase price).

Policy Recommendations

Our experiments showed that homebuyers and renters factor energy use information into their decision making if it is provided for all available properties. Presenting the information using context-rich labels (facilitating comparison to other home options) maximizes the impact of the information. Based on our findings, we have the following recommendations for policymakers:

Require disclosure of energy-use information at the time of listing for both home sales and rentals. The fact that homebuyers and renters selected efficient homes more frequently and inefficient homes less frequently demonstrates that they value energy efficiency and would use this information in their decision making if it were given to them. Without policies, home sellers and landlords will not provide this information, as demonstrated by the lack of labeling on listing websites today. Local policymakers are in the unique position to require the disclosure of this information in local housing markets. ACEEE provides several research reports and policy toolkits to local policymakers about the best practices for creating and implementing local time-of-listing disclosure policies (ACEEE 2018; Samarripas and Jarrah 2021). Adding an assessment requirement to obtain energy scores will place an extra burden on building owners. Therefore, local policymakers should establish processes and procedures to streamline this step, alongside disclosure policies. Policymakers can also provide financial and technical support to help owners get energy audits through new or existing local efficiency programs. Monitoring the reactions of realtors and owners over the next several years in regions that have implemented disclosure policies will be important for developing implementation guidelines.

Use intuitive, context-rich labels. Both homebuyers and renters respond best to intuitive energy labels that sufficiently contextualize the energy information. Labels that provided prospective renters and buyers with enough information about how each home's performance compared to similar homes were most effective. Similarly, our research showed that energy labels need to be intuitive to have an impact. We used the HES in all three experiments and the BAS in the rental listing website. Despite participants being unfamiliar with these labels prior to the experiment, they were able to intuitively understand the rating system and use that information when making decisions. Notably, validity of the scores is also important; energy scores may be better indicators of efficiency than costs because they are not dependent on occupant behavior or energy prices, and policymakers should be wary of energy labels that merely “greenwash” without providing helpful information. Energy cost information, although potentially less indicative of efficiency, can be effective as well, but costs should be put alongside the range of possible costs in the same region. We recommend that policymakers consider using these labels in their policies since they have proven to be effective even if someone is not familiar with the rating system.

Use a multipolicy approach to overcome the split incentive in rental housing. While homebuyers are willing to increase their purchase price significantly (2–11%), renters were willing to increase the monthly rent price by only 1.4–2.5%). A standalone time-of-listing policy may be sufficient to drive energy efficiency investments in the home-selling market because of the potentially high price premium for efficient homes. However, this is likely not the case in the rental market since renters are willing to increase their rent price only slightly for a more-efficient home, and the increase is small enough that it may not be enough to motivate landlords to make investments in efficiency. Mandating assessments on all properties should go hand in hand with assistance to property owners to improve scores and financial assistance for renters with low incomes who may have to pay more for efficient homes. A multipolicy approach can drive meaningful investment in rental housing energy improvements, which could include financing options, incentive programs, and building performance requirements (Samarripas and Jarrah 2021). Given the severity of the affordable housing crisis in America, ACEEE recommends all policies lead with equity and include specific considerations for affordable housing and low- to moderate-income communities like extended timelines to comply with regulations or rent price protections for rental housing.

Conclusion

Our three experiments on energy labels in real estate listings are some of the first that demonstrate how much prospective homebuyers and renters value energy efficiency. We found that if prospective renters and buyers are given energy information for each property, they will use that information to choose more-efficient homes and avoid less-efficient homes. This effect might vary by region and time (e.g., perhaps being less effective in “sellers’ markets”), but labels will still have an overall positive influence on decision making. Furthermore, homebuyers are willing to pay significantly more for efficient homes, and renters are willing to pay slightly more for efficient rentals. Our research suggests that the current information gap is hindering accurate accounting of energy information in the housing market today.

We recommend that local policymakers implement time-of-listing policies for both the home sale and rental markets. Without this intervention, residents are unable to properly evaluate their prospective homes and they undervalue energy efficiency. Without this clear signal of consumer preference for efficient homes, home sellers and landlords are more likely to underinvest in efficiency upgrades. Time-of-listing policies can close this information gap and correct the current market failure to accurately account for the value of home energy performance in purchase and rental choices.

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