Moving the Market: Energy Cost Disclosure in Residential Real Estate Listings

Deborah Philbrick, Elevate Energy
Rachel Scheu, Elevate Energy
John Blaser, Elevate Energy

ABSTRACT

Homeowners who invest in energy efficiency hope to recoup at least some of the expense through savings on their utility bills and a higher home sales price when they move. Home buyers are increasingly savvy about understanding the total cost of homeownership, including operational costs such as electricity and natural gas. Sellers and buyers cannot make informed decisions about the value of energy efficiency investments in a real estate transaction if energy costs are not available. "Energy cost disclosure" – adding historical energy cost information to a real estate listing – fills the data gap between buyers and sellers. It also has the potential to create a "virtuous cycle" that increases market demand for energy efficient homes. In 2013, Chicago became the first municipality to enable listing agents to disclose residential energy costs (gas and electric) when a single-family home goes up for sale on a multiple listing service. Preliminary analysis shows that homes that disclosed energy costs sold at a higher percentage of the asking price than those that did not disclose energy costs at the time of listing. The keys to an effective energy cost disclosure process is to involve all stakeholders, disclose the information in an MLS at the point of listing so it can be factored into decision making, disclose energy cost *and usage* data, and to employ a data intermediary to ensure data flows smoothly from utility to MLS.

Introduction

The demand for energy efficient upgrades in single family homes is growing. According to the National Association of REALTORS®' annual Home Buyer/Seller Profile, 87 percent of people surveyed believed a home's heating and cooling costs were "important" or "very important (NAR 2012)." These costs have been seen as important since it was first surveyed in 2008. Respondents, 70 percent, also recognize the importance of costs incurred from appliances and lighting. The National Association of Home Builders has also recognized the demand for energy efficient homes stating that efficiency is one of the most-wanted features for home buyers (NAHB 2015).

The value energy efficiency improvements add to a home is becoming increasingly apparent. In 2016, for the first time, Remodeling's *Cost vs Value Report*, an influential report put out by the remodeling industry magazine, included an energy efficiency measure in its annual round-up of the most popular remodeling projects in 100 markets across the United States. The industry standard report helps business owners and homeowners understand how different real estate markets value common upgrades. A bathroom upgrade, for instance, might yield a better return on investment in Los Angeles than New York, while the opposite might be true of a kitchen renovation. The lone energy efficiency project—adding fiberglass attic insulation—had the highest return of all home improvement projects in Chicago and across the nation (Figure 1). The value is likely greater than the 117.5% payback found in Chicago as shown in Figure 1,

given that the recouped cost did not account for utility bill savings over the life of the insulation. Although inherent regional differences would affect the return on investment for this project, the report demonstrates not only that there is value in energy efficiency measures, but that the market is prioritizing them.

PROJECT TYPE	CHICAGO		
MIDRANGE	Job Cost	Resale Value	Cost Recouped
Attic Insulation (fiberglass)	$1,329	$1,562	117.5%
Backup Power Generator	14,345	7,384	51.5%
Basement Remodel	84,241	47,359	56.2%
Bathroom Addition	52,311	25,079	47.9%
Bathroom Remodel	22,213	13,126	59.1%
Deck Addition (composite)	19,165	11,677	60.9%
Deck Addition (wood)	13,300	9,643	72.5%
Entry Door Replacement (fiberglass)	3,282	2,869	87.4%
Entry Door Replacement (steel)	1,434	1,205	84.0%
Family Room Addition	105,741	67,739	64.1%
Garage Door Replacement	1,973	1,635	82.8%
Major Kitchen Remodel	68,874	39,682	57.6%
Manufactured Stone Veneer	7,554	7,720	102.2%
Master Suite Addition	137,229	81,262	59.2%
Minor Kitchen Remodel	23,760	17,196	72.4%
Roofing Replacement	26,224	16,795	64.0%
Siding Replacement (vinyl)	15,350	10,983	71.5%
Two-Story Addition	198,925	136,294	68.5%

Figure 1. 2016 Cost vs Value Report in Chicago. *Source:* Remodeling Magazine

The energy efficiency industry has responded to this growing demand. The Home Performance with ENERGY STAR® program, administered nationally by the DOE with the U.S. Environmental Protection Agency, is now available in 35 states and, since 2002, the approach has been used on more than 300,000 projects (USDOE 2014). The program's goal is to help homeowners increase the efficiency and comfort of their homes using whole-home energy upgrades. 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.

Yet, there's no standard, easy way to share information about energy efficiency in a real estate transaction. Efficiency improvements that homeowners make to an existing house remain invisible during key steps of any home sale or refinance transaction. One result is that energy efficiency investments are overlooked or inaccurately valued at the time of a home sale.

Energy cost disclosure in a multiple listing service helps solve this problem. Energy cost disclosure is the process by which a homeowner shares utility bills, showing historic energy usage and costs, to potential home buyers. Including energy cost disclosure in home listings in a multiple listing service (MLS) bridges an information gap between buyer and seller and

increases the chances of assigning value to energy efficiency investments[1]. When energy efficiency features are fairly valued, homeowners are encouraged to invest in efficiency improvements because they know they can recover costs when they sell their home, creating a virtuous cycle that drives the entire existing single family market to become more energy efficient.

The real estate and energy efficiency industries have turned their attention to addressing this information gap, but they haven't universally provided a way for energy cost information to be transparent in a real estate transaction. Much of the current research is focused on investigating whether or not homes with high end energy efficiency upgrades or renewables perform better on the market (Lawrence Berkeley National Lab 2015). These upgrades might be communicated to home buyers with third party certificates or by notes in the MLS listing. In fact, there has been significant headway in bringing third party certificates, such as a HERS rating for new construction into some MLSs. However, many ratings apply only to new construction and leave existing homes without an easy way to communicate how much energy they use.

The power of disclosing energy costs is its universality. While not every home may have solar panels, practically every home has a utility bill. Therefore, in the race to make individuals more aware of a home's energy performance in the home buying process, it is advantageous to disclose energy cost in the listing.

This paper looks at the first-in-the-nation energy cost disclosure ordinance in Chicago, the impact the ordinance has had on common real estate metrics in the first 18 months of its enactment, and the factors necessary for other cities and multiple listing services to adopt energy cost disclosure best practices.

Energy Cost Disclosure in Chicago Real Estate Listings

Chicago passed an energy cost disclosure ordinance[2] in 1987 (City of Chicago 2015). The ordinance applied to single family and two- to four-unit homes and required sellers to disclose the previous 12 months of a building's heating costs, usually gas. The information was required at point of sale rather than when the seller originally put the building on the market. The disclosure process often took two weeks to complete. The seller's agent would fax in a written request to the utility, and the utility would fax the information back to the seller or their agent.

Twenty-five years later, the City of Chicago Office of the Mayor, Chicago MLS Midwest Real Estate Data (MRED), and Elevate Energy partnered to update and improve the ordinance with the intention of providing buyers a more accurate cost of homeownership, recognizing sellers who invested in efficiency, and laying the groundwork to value investments in energy efficiency.

On July 1, 2013, the City of Chicago became the first municipality in the United States to allow immediate disclosure of residential energy costs (gas and electric) when a single family or two- to four-unit home was listed for sale on MRED. Previously, there was no language in the ordinance that allowed for disclosure via a website, and in turn, the MLS. The updated ordinance, which applies to both attached (condos) and detached homes, expanded the original mandate to include electricity costs, regardless of heating fuel, in addition to gas and permits

[1] Cadena and Thompson (2015) found that the presence of an energy efficient feature in a home's listing increased the selling price by 6 percent.

[2] A red-lined version of the original ordinance can be found in the references.

automated population of energy costs directly to the MLS via a third party. Additionally, the updated ordinance and the disclosure via the MLS allow sellers to disclose their energy costs at point of listings as opposed to the previously defined "before the home was sold."

In order for the energy cost information to get into the MLS, an "Energy eCompliance" tool called MyHomeEQ[3] was utilized to provide the seller's agents and buyers with immediate online access to an energy cost disclosure report for listed properties. The tool also enabled listing agents and sellers to comply with the City's energy cost disclosure requirements at time of list before the stated deadline of compliance needing to happen before there is a written contract. When a home in the City of Chicago was listed for sale on MRED, the listing agent could use the tool to access past utility bill data, in this case ComEd and Peoples Gas, and then automatically add monthly and annual electricity and gas costs into the home's MRED listing. Sellers and their agents can still comply with the ordinance via the original compliance mechanism, although it is unknown how many people comply via the traditional route historically or currently. Furthermore, if the owner, or listing agent, does not comply with the ordinance, they are subject to a fine from the city no greater than $500. An added benefit to the ordinances clause that allows individuals to pull utility data from a website is that sellers and their agents do not have to request the data individually from each utility. Below is an image of part of the pdf that is generated and attached to the MLS listing (Figure 2). This is provided to home buyers in addition to the autopopulated energy cost fields.

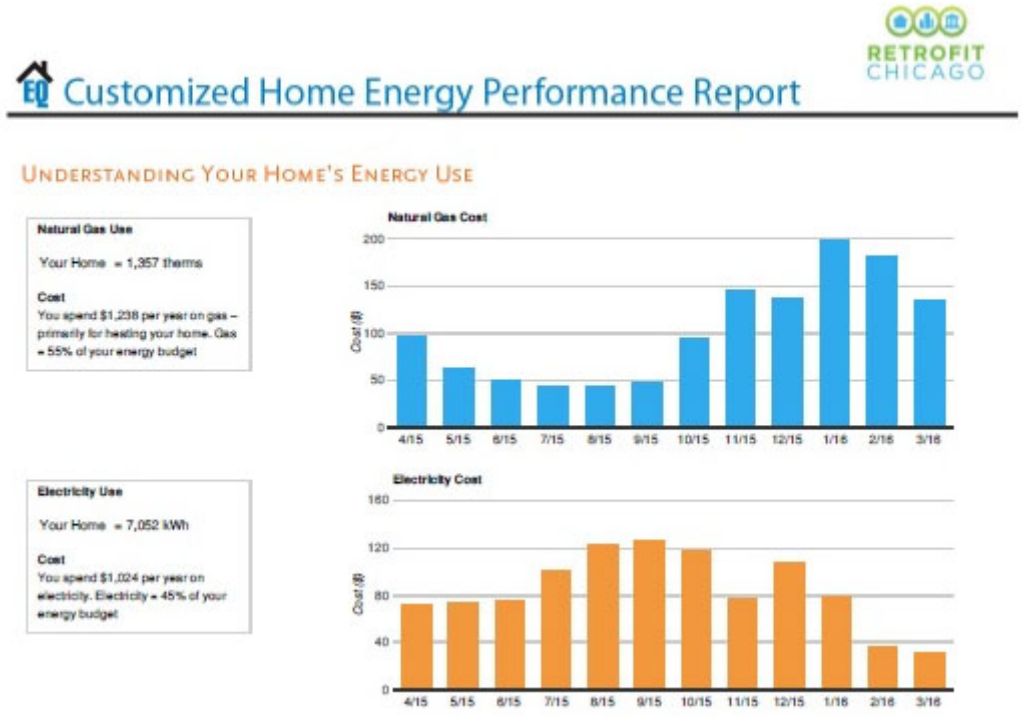

Figure 2. Part of a MyHomeEQ generated report that agents attach as a pdf to home listing.
Source: MHEQ

[3]MyHomeEQ was created and is owned by Elevate Energy.

The third party platform, MyHomeEQ, aggregates all of the information needed and autopopulates the fields for the listing agent to report monthly and annual electricity and gas costs (Figure 3) as well as generates a pdf that includes the natural gas and electricity usage and cost, which is then attached to the MLS listing.

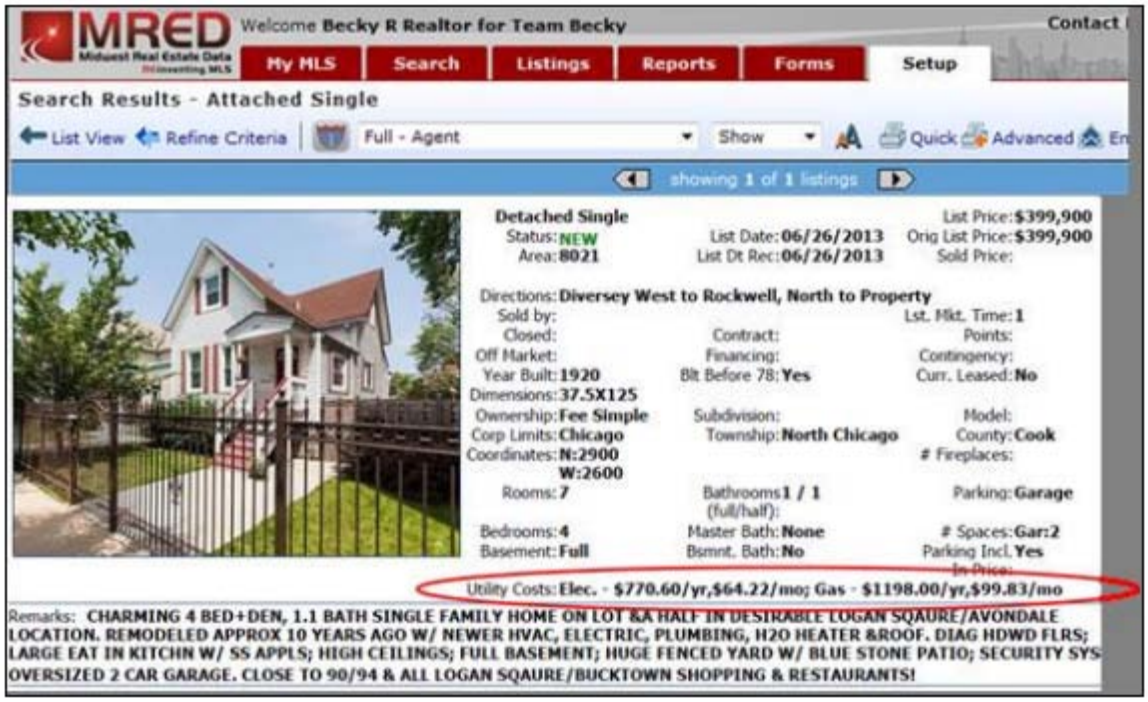

Figure 3. Annual and monthly gas and electricity costs displayed in MRED's MLS. *Source*: MRED.

Effect of Energy Cost Disclosure in First 18 Months of Ordinance

Elevate Energy reviewed the first 18 months of MRED data to provide insight into how the updated energy cost disclosure ordinance has performed in the real estate market. The analysis pertains only to single family homes that were listed between July 1, 2013, and December 31, 2014. The analysis excludes homes with two to four units, homes that were listed on auction, and homes listed before the updated ordinance took effect. Both single-family homes and attached homes, such as condominiums and townhomes, were included in the analysis. A preliminary analysis of the energy cost disclosure ordinance included homes that were listed during the first seven months of its enactment was finished earlier in 2014 and the most recent analysis builds on this earlier work. The greater sample size due to a greater percentage of home disclosing as well as a longer time of the ordinance being in effect, allowed us to uncover new findings as well as confirm the encouraging results of the first study.

The findings presented here describe attributes of the homes that disclosed energy costs (ECD homes) and those that did not disclose energy costs (non-ECD homes), including the ratio of sales price to original price and the length of time a listing spends on the market before it is sold. These metrics are generally considered to be key indicators for the health of the real estate market. As of December 31, 2014, 13 percent of real estate listings used the automated energy

cost disclosure fields. With the updated ordinance, there was not significant investment in training or education for sellers or real estate agents.

The most recent analysis also found that 94.8 percent of Chicago neighborhoods had at least one home that disclosed energy costs. This indicates that compliance is not limited to affluent neighborhoods with strong real estate markets.

Homes that Sold: Ratio of Sales Price to Original List Price

On average, attached ECD homes sold at a higher percentage of their original list price (97.2%) than non-ECD homes (95.9%) (Table 1).[4] The average sales price in Chicago for an attached home during the analysis period was $352,000, which means the average seller who disclosed energy costs received an additional $4,576 compared to the seller who did not disclose energy costs. The differences highlight how great the disclosure effect can be. Condos and townhomes in the Uptown neighborhood, for instance, sold at 97.6 percent of their original list price and non-ECD attached homes sold at 94.6% of their original list price. The difference for detached homes was not statistically significantly.

	Percentage of Original List Price
Disclosed in the MLS	97.2%
Did Not Disclose in MLS	95.9%

Table 1. Difference in the percentage of the original list price secured for attached homes.

Homes that Sold: Time Spent on Market

While a home that sells too quickly might indicate that it is priced too low, neither real estate agents nor owners want a home to sit on the market for long periods of time. Both attached and detached homes in Chicago that disclosed energy costs spent fewer days on the market than their counterparts that did not disclose costs. Attached ECD homes were on the market for 69 days compared to 93 days for homes that did not disclose costs via the MLS. Detached homes also stayed on the market for less time when they disclosed (111 days compared to 104 days), although the difference is noticeably smaller. Both of these findings are statistically significant at a p-value of <.01.

Homes Sold: Does Disclosure Make a Difference?

Elevate Energy studied not only the homes that sold, but also whether or not homes that were listed ultimately sold. The results of the chi-square test demonstrated that more homes that disclosed energy costs ultimately sold than would have been expected if the two variables were not interconnected. While causation has not yet been determined, it is encouraging to see successful closings occur in cases where the energy costs were disclosed at point of listing. These successes could have propelled by two items. Second, successfully sold homes that

[4] The mean attached home in this area sold for less than the Chicago average, at $233,800, but the increased percentage of the asking price translates to an extra $6,850 for homes that complied with the ordinance.

disclosed energy costs suggests that sharing energy cost information up front might aid the homebuyer's decision-making process rather than constrain it. This analysis showed that homes that disclosed energy costs that were high still had a greater likelihood of selling that those that did not disclose. In other words, there was no penalty for disclosing high costs.

Future Research

Future research should focus on establishing causation between the aforementioned real estate metrics and disclosing energy costs in the MLS. Additionally, researchers should consider the types of analysis that are considered standard in the real estate industry. Paired sales are common place because they can be performed at a hyper local level and help control for some geographical variance. A hedonic price model would be appropriate for this dataset because it would normalize potentially confounding housing variables such as the existence of a hot tub or close proximity to a park or good school.

Access to energy cost disclosure data could also provide a unique opportunity to confirm whether homes with third party certifications or homes with specific features such as solar panels are realizing expected energy costs.

Conditions for Automated Energy Cost Disclosure

This paper discussed why creating a streamlined way to disclose energy usage and costs in the MLS is a smart way to prioritize energy costs to consumers and draw attention to high performance homes. It also recounted how Chicago implemented its energy cost disclosure ordinance and its impact in the 18 months after its enactment. This section outlines what's needed to create an environment where automated energy cost disclosure is possible.

Everyone at the Table

Energy cost disclosure requires a willingness and participation of all stakeholders, including energy efficiency implementers, real estate professionals, home buyers and sellers, gas and electric utilities, and all levels of government. In theory, all that is needed to disclose energy cost at scale is an MLS willing to create energy cost fields, utilities that will provide energy data, a third party to process and transfer the data, and a seller that will provide consent to access the data. In reality, the process can be much more complicated, requiring the will of real estate agents and homeowners to build momentum and the permission of public utility commissions to access utility data. Figure 4 illustrates one model in an automated energy disclosure system and the interconnectedness of all involved. Sellers work in conjunction with their agents to communicate cost data to buyers via the utility, a third party, and the MLS. However, none of this happens in a vacuum and the position of government, whether local, state, or federal can facilitate or impede this flow of information.

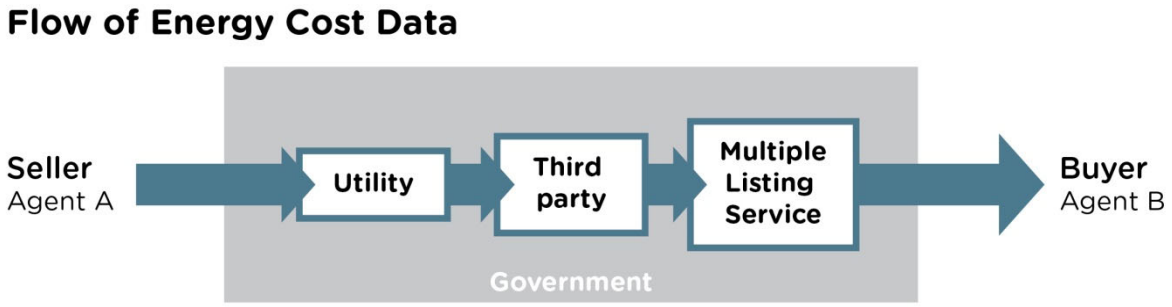

Figure 4. The flow of energy cost data from homeowner to the buyer can flow from the utility to the third party and then the MLS. This process happens inside a policy environment influenced by government. *Source:* Elevate Energy

The Supportive Role Government Can Play

Theoretically, energy cost disclosure does not require a government mandate. In an ideal world, home buyers would demand access to energy cost information of the homes under consideration with enough intensity that automated disclosure would become standard, akin to providing photographs and narrative descriptions of the house for sale. In practice, however, a mandate can serve to accelerate and standardize disclosure. Local, state and federal government have all taken steps to facilitate energy and other "green" information in the real estate transaction. All efforts are promising and promote increased transparency around home energy information; however, policies and initiatives are implemented differently.

In 2015, Berkeley, California, added a new chapter to their municipal code that required homeowners to submit an energy use report to the city when a single family home was sold. While this is an instance of energy disclosure, the energy report does not help a potential buyer factor in this cost in his or her decision making given that it is submitted *after* the buyer has already made a commitment to the home. In fact, the Berkeley code does not require that the energy report get conveyed to the new owner at all.

Colorado has helped most of the state's multiple listing services add a similar set of green fields, including common third-party certifications, fields related to solar energy, and several energy efficiency measures (Scheu et al 2014). Although useful, this information is often descriptive of the physical asset of the home and not necessarily indicative of a home's current energy use and cost.

Jurisdiction	Effective Date	Disclosure Requirement	Property Type	Time of Disclosure
Hawaii	2009	3 months utility usage	Single-family homes at time of sale	Time of Sale, no later than 10 days after a purchase contract is accepted
Alaska	2008	Average yearly utility cost	Single-family homes at time of sale	Time of Sale, before a written statement/offer has been made
Montgomery County, MD	2009	12 months of utility usage	Single-family homes at time of sale	Time of sale, before a purchase contract is signed
Chicago, IL	1987	Projected annual and avg. monthly cost	Single-family, multifamily properties at time of sale, rental properties at time of rental	Time of listing
New York State	1987	2 years of utility bills	Single-family homes at time of sale	Time of sale, before a purchase contract is signed

Figure 5. Utility bill disclosure policies in the United States *Source*: Cluett and Amman 2013

Figure 5 shows the utility bill disclosure policies in place across the United States. Hawaii, Alaska, Montgomery County, Maryland, and New York State have required disclosure of utility bills (Cluett and Amman 2013). However, only Chicago has a process in which the data can be automatically integrated into the MLS, which makes it possible for the information to be available at time of listing.

At the federal level, U.S. Dept. of Energy has invested in multiple recent efforts to bring energy information to consumers. Most recently, the agency launched the Home Energy Information Accelerator (HEIA), which is a collaboration of national organizations, federal agencies, and regional, state, and local leaders in real estate and energy efficiency to expand the access and utilization of home energy information in residential real estate transactions (USDOE 2016). HEIA was launched in August 2015 and is helping coordinate 29 partners across the country and is quickly acting to foster the relationship between the real estate and energy efficiency industries, which demonstrates the leadership that the federal government can provide to help smaller geographies prioritize the inclusion of energy information.

Data Access Intermediaries Facilitate Disclosure

A third party acting as a data access intermediary between utility companies and the MLS is not required but valuable in making energy cost disclosure become a reality. While in theory utilities could send data directly to the MLS, in practice it is simpler to go through an intermediary.

Green Button's "Connect My Data" can foster the smooth and secure transfer of data from third parties to an MLS. Green Button is a technical standard owned by the North American Energy Standards Board developed for exchanging energy usage data, and Connect My Data is the mechanism in which data is transferred from utilities to third parties after being authorized by

the utility customer. The Green Button standard, in conjunction with the Connect My Data transfer mechanism could provide useful and standardized data for an MLS from utilities.[5] However, as of January 2016, there were only five American utilities that use Connect My Data (Mission:Data, 2016). This is largely due to consumer privacy and data access concerns that limit the availability of data to third parties, but is also likely an issue with utilities not being incented to make the technology changes necessary to support Connect My Data. In practice, the ability for utility data to transfer seamlessly to third parties and then on to the MLS is essential for an easy energy disclosure mechanism. Regardless of the mechanism, it is essential that that customer's data be accessed under consent and only transferred to authorized parties.

A significant challenge is for the third party to keep up to date with changes in utility data systems. For example, a Chicago area natural gas company is currently undergoing a company-wide change in the way they number their accounts due to a recent merger. It is the third party's responsibility to work with the utility to ensure that during the transition time, when real estate agents input the old form account number, the correct data can still be accessed. While these types of companywide changes don't happen very often, the increasing number of utility mergers suggests that third parties need to be able to handle these transitions.

The Ideal: Disclose Energy Cost *and Use*

Ideally, both energy usage and cost data would be disclosed in MLS listings. Costs are more digestible by the general public than therms and kilowatt hours, but the reality of price volatility means that disclosure of both cost and usage would be most informative. Energy use in homes varies because of occupancy, maintenance, operations and behavior. The variation is present both within and among similar home types. For example, an analysis of the energy use of more than 400,000 homes in Illinois found that there was consistently approximately 30 kBtu/square foot/year range between 25th percentile and the median energy use, and the 75th percentile and the median for all home ages and construction types. The median energy use between housing types also varied, as expected, and the variation was based on size, age, and construction type. This same analysis showed that one of the most common home types with the highest gas energy use intensity in the Chicagoland area is a masonry home less than two stories built before 1942. It is unlikely that a home buyer will suddenly shift from looking for a 1920s bungalow to a modern condo simply because of the energy costs, but that buyer would still benefit from the knowledge of their potential costs.

Conclusion

Chicago was able to create a smooth process for homeowners to disclose energy costs, not only before a home is sold, which is required by the ordinance, but at point of listing, when consumers still have an opportunity to consider energy costs in their decision. This feat was accomplished through a network of dedicated partners in MLS, municipal government, and real estate and energy efficiency communities. While engaged and motivated stakeholders made a difference, it was also instrumental that there was an existing ordinance that only needed to be modernized. Data analysis of those homes that disclosed energy costs in Chicago in the MLS is

[5] There is an initial 12 to 24 month transfer of historical data and then a daily transfer thereafter.

encouraging. Attached homes sell at a greater percentage of their listing price than those that did not disclose in the MLS and, on average, these homes also sold more quickly. Further research should focus on establishing causation.

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