



AN MPG FOR HOMES

DRIVING VISIBLE VALUE FOR HOME ENERGY PERFORMANCE IN REAL ESTATE

BY JACOB CORVIDAE AND RACHEL GOLD

HOME MPG
30
expected range
for most homes
24 to 36 mpg



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ABOUT ROCKY MOUNTAIN INSTITUTE

Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. The organization has offices in Basalt and Boulder, Colorado; New York City; Washington, D.C.; and Beijing.



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EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

HIGHLIGHTS

- **Major real estate platforms now feature energy data in their listings**, immediately and drastically scaling the availability of total cost of homeownership estimates on every single-family home in the U.S.
- Integrating energy data into listings is one critical step toward unlocking the residential home energy performance improvement market nationwide, but **it is not a silver bullet solution**; it's one of many steps toward this vision.
- Visible value must extend beyond the initial browsing environment on a portal to the entire real estate process and connect directly to conversations with real estate agents and actual valuation in appraisal, inspection, and underwriting.
- A new normal is needed to ensure that all consumers find the information provided on listings meaningful and a source of inspiration to invest in energy upgrades.
- Ready access to financing and streamlined contractor services need to be available to make it easy for consumers to translate their interest in buying or selling a home with improved energy performance into quality home energy upgrades.
- Real estate and energy industry stakeholders alike have the **opportunity to leverage this new, greater market transparency** to support their businesses and generate value for customers.

THE CHALLENGE

The process of purchasing a new home is one of the most important and exciting economic decisions someone will make in his or her lifetime, but the vast

array of steps involved can make it fraught with stress. The rise of online multiple listing services (MLS's) and real estate portals, like Zillow, Trulia, and Redfin, created a way to simplify the decision-making process by surfacing all of the potential homes a consumer might be interested in. Today, nearly all homebuyers begin their home search process online. These sites provide basic data about location, number of rooms, square footage, and, increasingly, specialized information like data on crime, schools, and commuting (in the form of WalkScores).

However, until recently, consumers have not had access to data about the full cost of homeownership because affordability estimates missed one of the largest operational costs: energy bills. Homeowners spend an **average of over \$2,500** per year on energy bills, often more than they spend on taxes or homeowner's insurance. However, it has been difficult to scale the availability of quality estimates of this important homeownership cost for the following reasons:

- **No public access to energy usage data:** Although most homes have energy meters that record actual energy usage, people use homes differently from each other, and utilities rarely share this data publicly.
- **Low uptake of energy audits:** Until now, the only way to get this information in most of the U.S. was to conduct an energy audit and receive a rating or score from a professional energy rater. These may be tied to rebate programs and contractor networks, but are expensive—typically costing **\$150–\$450** per audit, unsubsidized—and difficult to consistently scale beyond a small subset of high-performing homes. As a result, as of April 2017, fewer than 2 million audits have been completed to date.¹

¹ As of April 2017, 1,735,669 [RESNET](#) HERS Indexes completed since 2006 and 61,796 Department of Energy's [Better Buildings Initiative Home Energy Scores](#) since 2012.



- **Limited accessibility to audit data:** Even when an audit is conducted, the resulting data is rarely accessible for consumers in the places where they look for information about homes. Few MLS's have energy information fields, much less accurate data in them, and a complicated patchwork of privacy rules make it difficult to share utility information in public databases for comparison. Most of the [handful of cities and states](#) with energy disclosure mandates require information to be shared at time of sale—when it's generally too late to affect the decision-making process.
- **Limited accuracy of public data estimates:** Estimates based on publicly available data can approximate some key features that drive energy performance, but may miss or mischaracterize important factors like envelope characteristics (insulation, windows, etc.) and heating, cooling, and water heater systems, depending on the quality of the data.

Without this information, consumers lose out on opportunities to both improve the value of their home when selling and understand the true costs of a new home when purchasing. Unlike many home features, energy performance is something homeowners can change. For example, homeowners have greater ability on their own (at least in the short-term) to replace old appliances with efficient ones and improve insulation in their homes than to change the walkability of their neighborhood, local taxes, and public school quality. These renovations can alleviate as much as [20 to 45 percent](#) of a homeowner's energy costs, while creating other comfort, safety, and quality-of-life benefits.

Recent homebuyers who don't have this information miss out on an opportunity to more easily improve their

new home's energy performance by making upgrades when they're remodeling kitchens and bathrooms, adding home automation, or taking on curb appeal projects, among other changes.ⁱⁱ Unsurprisingly, recent homebuyers invest more in renovation and are more willing to take on large projects than other groups of homeowners. Further, consumers miss out on the opportunity to wrap the costs of efficiency upgrades into their mortgage, possibly making them cost-neutral.

Even where this data is available during a real estate transaction, it may not translate into action. Consumers are largely unmotivated to save energy because they think they've already done it—80 percent think they use less energy than they did five years ago, and 42 percent believe their home is [already energy efficient](#). Further, once they do make the decision to update their home, [consumers face fragmented, complicated, multistep contracting and financing](#).

THE SOLUTION

The solution is to make understandable, accessible, salient energy data available online that gives both consumers and industry actors throughout the real estate transaction the ability to compare home energy performance, assess property value, and (ultimately) connect to streamlined financing and energy upgrade services.

It begins by putting a home energy performance metric in the hands of all consumers, not just those who have data from a recent energy audit. Rather than creating stand-alone energy-focused sites, energy data should be incorporated into total cost of homeownership calculations on the online real estate platforms consumers use so it's easy to appropriately weight energy costs and make informed financial decisions. These platforms should also connect users

ⁱⁱ Recent home purchases drove 26% of home renovations, and preparation for resale led to 13% of renovations, Houzz and Home: Overview of Renovation in 2015 (June 2016).



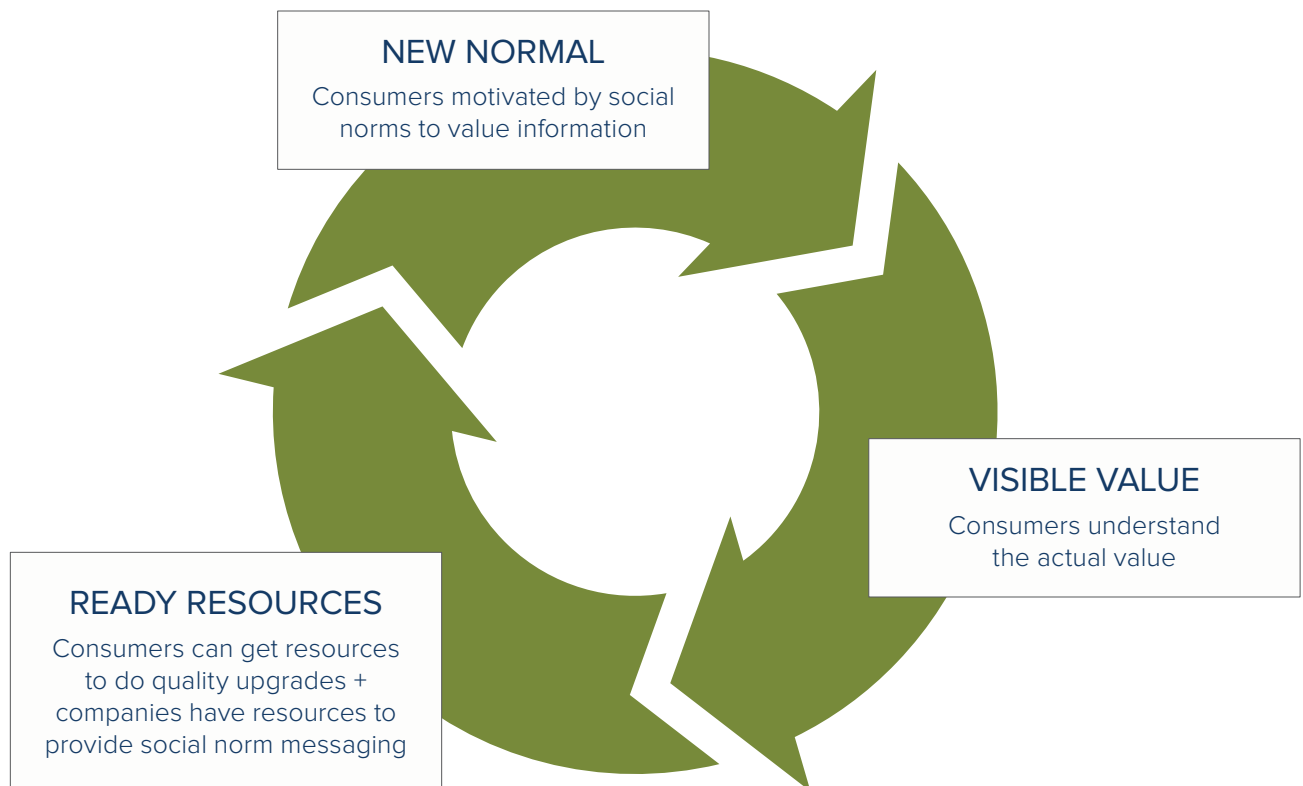
to lenders and contractors, who often lack the ability to target their services to homeowners when they're ready to do a renovation project.

Although the initial search is critical, home energy performance will need to be made visible throughout the real estate transaction in order to turn data about operational costs into direct equity value at the point of sale. With changes to standards of practice in appraisal, inspection, and underwriting, the lower ongoing costs reflected in home performance metrics should result in higher home appraisals and more positive inspections, and eventually, a lower risk of default for lenders that's taken into account in mortgage underwriting.

Armed with a better understanding of the value of

home energy performance, consumers choosing to change their homes should have streamlined access to knowledgeable service providers, both during the real estate transaction and later once they are settled in their homes.

As service providers leverage energy performance data to improve how they promote and deliver energy upgrades, they'll be better positioned to drive consumer engagement and grow their businesses. Moreover, companies that draw the link between energy performance and value will be able to engage more consumers and help them view high energy performance as the "new normal"—resulting in a positive cycle whereby consumers attribute greater importance to energy performance and are more motivated to make energy upgrades.



01

A MAJOR LEAP FORWARD TO CREATING VISIBLE VALUE FOR HOME ENERGY PERFORMANCE



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In the last month, two of the largest U.S. real estate portals partnered with energy data providers UtilityScore and Tendril to include estimated utility costs and improve affordability calculations so that they account for energy costs on all listings (see Figure 1 for an example of these estimates).

- The newly re-launched RealEstate.com, a Zillow Group property focused on millennial homebuyers, will have UtilityScores available for all active listings.
- Redfin, the #4 U.S. real estate portal market share of visits, launched Tendril Energy Scores for all property pages (non-listed homes).

This market development presents a major step toward transforming residential real estate transactions: a universally available home energy performance metric.

HOW IT WORKS

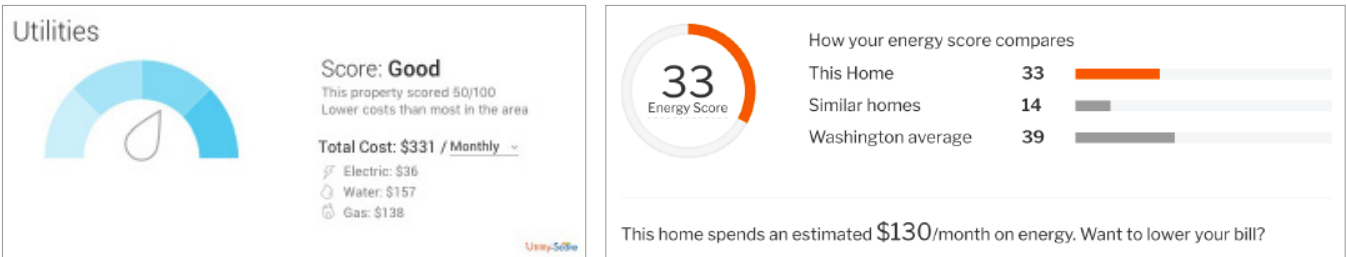
Both Utility Score and Tendril calculate utility cost estimates using datasets with information about home size and age, climate, and local utility rates. Each company’s data scientists use different algorithms and modeling methods to arrive at estimates in “scores” from one to 100—with 100 representing very low utility bills and one

representing very high utility bills—to give customers an understanding of likely bills based on a home’s features. RMI recommends that portals transparently cite the sources for scores, so that prospective buyers can compare and discuss differences between calculated and owner-modified scores.

In addition to the sources of the data, portals will need to transparently communicate the likely accuracy of their estimates. No score—algorithm or home-based—is entirely free of potential errors. In-person assessments can suffer from data management and recording issues and rate errors, and remote, algorithm-based scores can also experience errors from data quality and the ability of the algorithms to estimate the utility-cost estimates. Some portals are experimenting with “Claim Your Home” features so that the homeowner or listing agent of record can provide more detail about a particular property and modify the score with an implied responsibility for accuracy. Although a combination of algorithm-based scores and self-reported adjustments may not deliver the level of accuracy required for some transactions, like mortgage-lending decisions, the existence of baseline estimates for all homes can be a driver for more intensive home assessments.

However, energy bills are influenced by more than the features included in a score such as a home’s physical features or “assets”—they’re also determined by how a home is used by its occupants. Utility bills can vary

FIGURE 1. EXAMPLES OF UTILITYSCORE HOME ENERGY PERFORMANCE ESTIMATE ON REALESTATE.COM LISTINGS, AND TENDRIL HOME ENERGY PERFORMANCE ESTIMATE ON REDFIN LISTINGS



drastically depending on the number of people in the home, when the home is occupied, use of appliances and electronics, and thermostat settings.ⁱⁱⁱ In the case of UtilityScore, these energy usage estimates can be adjusted by homeowners on MyUtilityScore.com to better understand their family’s likely operational costs in \$/month—but the underlying “asset” score can only change when a home is “claimed” using the online tool.

WHAT THIS MEANS

Each time a new portal makes this data available to customers, it rapidly scales the availability of energy data from the 2 million homes with professional, auditor-based ratings (which are not readily available to homebuyers) to all single-family homes, now with algorithm-estimated data.

Redfin is the fourth-largest real estate portal based on market share of visits as of [November 2016](#). However realestate.com is relaunching as a Zillow Group property focused on a key new homebuying

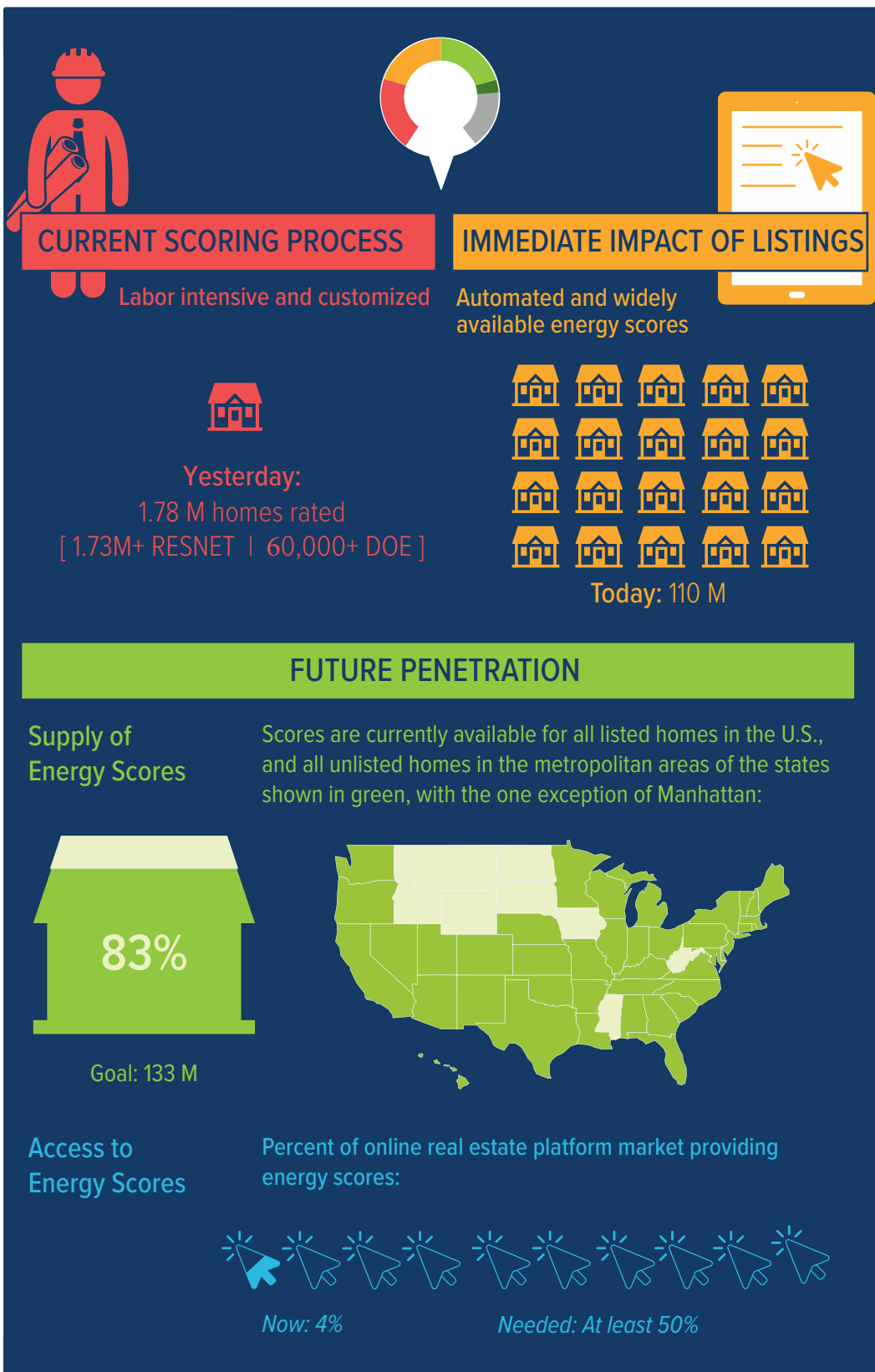
market—millenials—offering the promise of a large, engaged market. Energy data was already available for single-family rental properties on the Zillow Group property platform Hotpads (1.6 percent of real estate portal market share of visits), the listing portal [Estate.ly](#), as well as for Chicago properties on both Homes.com and realtor.com. Although this still leaves most online listings without the critical, basic energy information data that makes affordability calculators meaningful, promising trends suggest expansion to more online portals soon:

- **Competitive vendor ecosystem:** A robust, competitive ecosystem of vendors is developing energy cost estimates for real estate portals, MLS’s, and individual real estate agents. Vendors include ClearlyEnergy, EnerScore, Tendril, UtilityScore, and others.
- **Tendency for industry to converge:** Real estate portals and MLS’s form a similarly vigorous competitive market and have a history of adopting new sets of data—following their competitors



ⁱⁱⁱ For example, a study that plotted the actual energy usage of 17 identically built houses in Oklahoma found a range of 50%–180% of the prediction. (Building Science Corporation. 2010. “BSD-152: Building Energy Performance Metrics”)

INCREASING THE AVAILABILITY OF MPGS FOR HOMES



*The current way scoring happens is labor intensive and done on a home by home basis with a home energy audit. This approach means that home energy ratings haven't scaled. Automated scores show home energy performance in one step. However, on-site energy assessments are more accurate and are a recommended step to support homeowners in deciding what measures to undertake.

over time—to ensure that consumers return to their site. For example, the top portals all adopted educational data over a short period from 2012 to 2013, many using the common nonprofit resource GreatSchools to source the data.^{iv}

- **Existing plans for expansion:** UtilityScore will be expanding to the other Zillow Group brands (Zillow, StreetEasy) in the future, which means that half of all portal page views will go to listings with energy data. Other energy data vendors report they are working with the other top portals and data analytics providers for MLS's to provide energy cost estimates in 2017.

The availability of this data will have an immediate positive impact for consumers. Homebuyers can use this information to compare homes and as a data point for negotiation with sellers. Already, [81 percent of people](#) who expect to buy a new home in the next two years say higher energy efficiency would cause them to choose one home over another, so this information will likely be put into practical use right away. Over time, home sellers will be able to ask their real estate agents how an energy upgrade could help them sell their homes faster and at a higher price. In fact, an Elevate Energy analysis of a disclosure ordinance in Chicago suggests that single-family real estate listings that disclosed energy costs spent less time on the market.

Despite this major market development, ample opportunity remains for industry actors to develop and capture profitable solutions that enhance energy performance data sharing and deliver value to consumers:

- **Online portals and MLS's** can earn revenue as a lead generation source for contractors and financiers by partnering with energy data vendors to add quality data to listings, and by testing the best ways to drive motivated consumers to quality service providers. They can also align early with “Data Dictionary” standards developed by the Real Estate Standards Organization (RESO). This will enable the transfer of verified energy data from utility programs and professional raters, along with estimated scores, to their sites. Sharing access to value-added, quality information will also improve the “stickiness” of their sites and services. With a longer view to customer retention, portals may be able to earn loyalty by helping customers avoid drafty homes or the unexpected problems often associated with low-performing homes.
- **Energy data vendors** can continue to improve their accuracy through machine learning and new scalable data sources. They can also test new business models to add value for actors in the real estate and energy ecosystems. As new competitors integrate energy data into listings across the web, vendors and the portals they work with will need to be highly transparent about their data inputs and methodologies to avoid confusing consumers who look at multiple sites.

^{iv} For example, Redfin adopted this data in [October 2012](#), and Zillow included it in [July 2013](#).

EXTENDING VISIBLE VALUE BEYOND ONLINE SEARCH



EXTENDING VISIBLE VALUE BEYOND ONLINE SEARCH

Consumers, newly armed with data from online portals, can now be better prepared to compare the true affordability and value of homes and capture cost savings from lower utility bills. At the same time, the rest of the home purchase process needs to be transparent in order to unlock the value of investments in energy upgrades nationwide. Eventually, consumers will encounter a world where real estate agents provide advice about the true cost of homeownership, appraisers account for energy performance in valuation, and lenders give more favorable rates to consumers less likely to default on mortgages because their homes have lower operating costs and are more durable.

Unfortunately, consumers currently have limited influence over the array of market actors that help support their home purchase process. Although they can ask questions about energy features, consumers generally don't choose their appraiser or inspector, and few demand green-competent professionals. Traditionally, real estate agents have seen energy performance as a niche or high-end product, and have not supported mandates for energy information that might reveal energy "clunkers" and potentially make properties harder to sell. However, new collaboration and business opportunities are emerging to make the value of energy performance clear throughout real estate transactions.

GROWTH IN COLLABORATION AROUND ENERGY PERFORMANCE DATA

The real estate market is increasingly recognizing need for enhanced energy performance data, and this recognition is creating momentum for new cross-industry, voluntary collaboration in the U.S.:

- **Leveraging utility programs:** U.S. utilities spend \$2.27 billion per year on residential energy efficiency programs, but real estate agents rarely have access to the information from these audits and upgrades when they're selling homes.

The Department of Energy's Home Energy Information Accelerator has led the charge to standardize data collection from these programs and use the data at relevant points in real estate transactions through pilots across the country.

- **Standardizing MLS fields:** RESO is working with MLS's to create a standard "Data Dictionary" for data across markets, which will require energy fields by 2018.
- **Scaling through innovation:** New technologies that combine big data with remote monitoring, like Essess' thermal imaging and Weatherbug's enhanced weather data, provide new opportunities to more accurately score homes and target energy-saving measures at scale.
- **Recognizing value in appraisals:** Green designations, which demonstrate completion of a package of energy performance measures through a label or certification, positively impact asset value, with premiums of 2 to 9 percent depending on the certification and market.
- **Creating new financial products that value energy performance:** Government entities are finding new ways to account for the value of energy performance, typically in niche products like the Fannie Mae HomeStyle mortgage loans or the Federal Housing Administration's (FHA's) Single-Family Energy Efficient Home (EEH) program. Local governments are also expanding the applicability of property assessed clean energy (PACE) financing, with FHA's announcement last fall that it will underwrite residential mortgages with existing PACE loans associated with the property as long as they are subordinate to the mortgage. Additionally, the recent Federal Housing Finance Agency (FHFA) Duty to Serve Rule opened a conversation about more broad inclusion of these costs in all underwriting.
- **Tracking value for real estate agents:** Last year, the National Association of Realtors (NAR)



Remodeling Impact Survey and *Remodeling* magazine's *Cost vs. Value* report began documenting their first energy efficiency measure—attic insulation—helping real estate agents and remodelers understand the resale benefit of this particular energy upgrade.

EMERGENCE OF ENERGY PERFORMANCE DATA-DRIVEN BUSINESS OPPORTUNITIES

The emergence of energy data and these near-term changes to the market create immediate commercial opportunities for real estate market actors throughout the process to grow their business:

- **Real estate agents** will increasingly face a marketplace of consumers who view energy performance as valuable. In the short term, real estate agents can differentiate themselves through training and certification, like the NAR Green Designation. At a minimum, they can provide more value to buyer decision making than a past utility bill from a previous owner, who might have had different usage patterns. Asset-based energy data enables real estate agents to help explain a home's likely energy performance and what it means for thermal comfort, ongoing bills, and the future resale value of improvements like insulation.

Real estate agents with seller clients can field questions about how to improve energy scores, especially if the property has poor energy performance, or how to highlight the energy performance features of the home online or in-person. For enterprising real estate agents, energy data can serve as an opening to re-engage previous customers and forge connections for the next sale.

- **MLS's** can add fields to be compliant with forthcoming RESO standards and can create trainings and tools for their local real estate

agents to accurately use energy fields. A [2015 study](#) of home valuation in the Pacific Northwest found the MLS systems in the region are inaccurately documenting the prevalence of energy efficiency and green certifications—with 29 to 90 percent of homes incorrectly reporting third-party certification as a green home.

- **Government underwriters** like Freddie Mac and Fannie Mae, and their regulator FHFA, can enforce existing appraisal competency standards in their standard lending documents, incentivizing appraisers to complete energy performance training. They can also modify standard underwriting, which uses an applicant's housing-cost-to-income ratio, debt-to-income ratio, and loan-to-home-value ratio, but does not take into account the monthly costs associated with owning the home. When owners of high-performance homes spend less on monthly utility bills, they have more funds available to make mortgage payments, reducing the [risk of default](#) and enabling them to pay off a larger mortgage.
- Eventually, these actions will create incentives for **lenders** to provide loan terms and offerings that reflect the increased value and reduced default risk of high-performance homes and for **appraisers** to attribute more accurate property values that account for energy performance. In the interim, enterprising appraisers and **inspectors** can establish niches by marketing their ability to help real estate agents populate energy performance fields using existing tools and training like the Green and Energy Efficient [Addendum](#).

When real estate actors extend the visibility of energy performance value for homebuyers and sellers, they help to correct market failures that hide monetary value from consumers. Nevertheless, consumers aren't influenced by money alone; efforts that make visible the nonmonetary social factors influencing consumer behavior are also critical to establishing a new normal for home energy performance.



03

CULTIVATING (NEW) SOCIAL NORMS TO INCREASE THE USE AND MEANING OF ENERGY DATA FOR CONSUMERS



CULTIVATING (NEW) SOCIAL NORMS TO INCREASE THE USE AND MEANING OF ENERGY DATA FOR CONSUMERS

Although clear dollars-and-cents information about the costs of homeownership is necessary, it's insufficient on its own to support consumers in making the decision to invest in energy upgrades for their homes. Despite growing pressure to act on climate change, rising costs of living, and increasing energy prices, reductions in homeowner energy use intensity (EUI) have slowed over time. The number of home energy upgrades has fallen, and current retrofit programs reach less than 5 percent of eligible homes.

Fundamentally, homeowners and homebuyers often have pressing concerns other than home energy performance. In other words, they don't think they have an energy problem because they largely think their homes are already energy efficient, and there aren't yet social expectations from peers that could make energy performance a larger priority. This suggests an opportunity for the wider use of a whole range of social science tools that are often used in programs that change an individual's routine energy-related behaviors (like thermostat adjustments), but are underapplied to home energy upgrade investments (like whole house envelope improvements) that lead to deeper savings for consumers.

To create social motivations that complement financial motivations to inspire investments in energy upgrades, energy performance must become the expected and aspired-to standard in U.S. homes from a social perspective. Applying these social science tools to investments will require the use of techniques that make invisible energy efficiency improvements into visible improvements, as through the addition of energy data to real estate portals. Each of the new features supports techniques to make higher energy performance a social norm: on Redfin, you can claim your unlisted home and compare the utility estimates to other homes in the neighborhood and state; and on RealEstate.com, you can click through the UtilityScore logo to find a bar chart comparison and a map

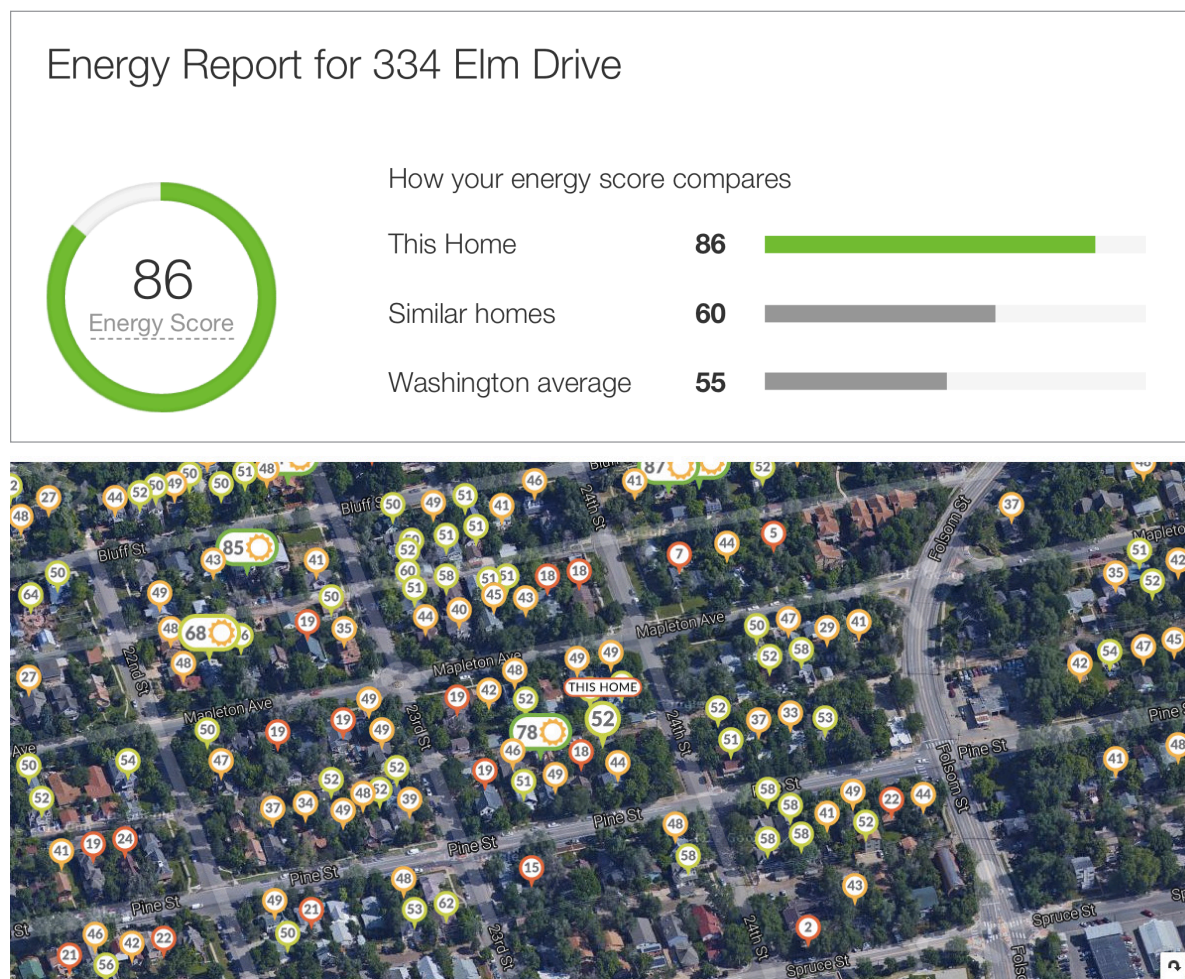


comparison to other homes in the neighborhood (see Figure 2 below).

Industry can leverage this newly visible data and encourage investment by:

- Promoting a belief that homeowners have an energy problem that is a priority to resolve in comparison to other home-related problems on their to-do list.
- Making home energy performance conversational, relatable, and mainstream—in part by leveraging the influence of mass broadcast, online, mobile, and print media.
- Enabling real estate industry actors to leverage in-person and online platforms before, during, and after projects that foster “[peer diffusion](#)”—a phenomenon whereby the communication (i.e., the display, comparison, and interpretation) of knowledge, attitudes, behaviors, and technologies cultivates their dispersed adoption within and between networks of people. Peer diffusion can help make energy performance, the uptake of energy upgrades, and the benefits of these upgrades visible at a personal and social level for those who choose to show off their energy upgrade investments.

FIGURE 2. SOCIAL MOTIVATION THROUGH COMPARISON ON REDFIN AND UTILITYSCORE SITES



The real estate and energy services industries have a key role to play here. By taking fresh approaches to help create a new normal for home energy performance, they can help strengthen the real estate market and enhance the quality of the U.S. housing stock.

- The more energy information drives action from customers, the more consumers will consider a given **real estate portal** or **MLS** an important source of information. Therefore, it's important to present this information in a way that connects to the specific process for taking action (after testing the best social and behavioral tactics to cultivate energy upgrade adoption). Portals can also echo national or regional messaging about energy that emerges from energy service providers in their listings.
- **Real estate agents** often serve as trustworthy messengers and advisors to their clients, giving them significant influence in the real estate transaction process. They can help create a

new normal by showing sellers the value of investing in energy upgrades and how they could promote these upgrades by tying more readily available energy information to deeper concerns like comfort, health, and peace of mind; they can encourage buyers to make strong energy performance part of their “must-have” list. In addition, real estate agents can add value for clients by keeping a pulse on how industry and their local market communicate, changing expectations around energy performance.

- **Energy service providers**, including contractors and utility program managers, can use in-person and online platforms to encourage customer participation in peer diffusion activities before, during, and after projects. These marketing tools can give residential customers choosing to participate the ability to share and display their own home energy upgrades, which in turn will likely inspire increased energy upgrades among their family, friends, and neighbors.



CREATING READILY ACCESSIBLE RESOURCES TO TURN INFORMATION AND INSPIRATION INTO ACTION



CREATING READILY ACCESSIBLE RESOURCES TO TURN INFORMATION AND INSPIRATION INTO ACTION

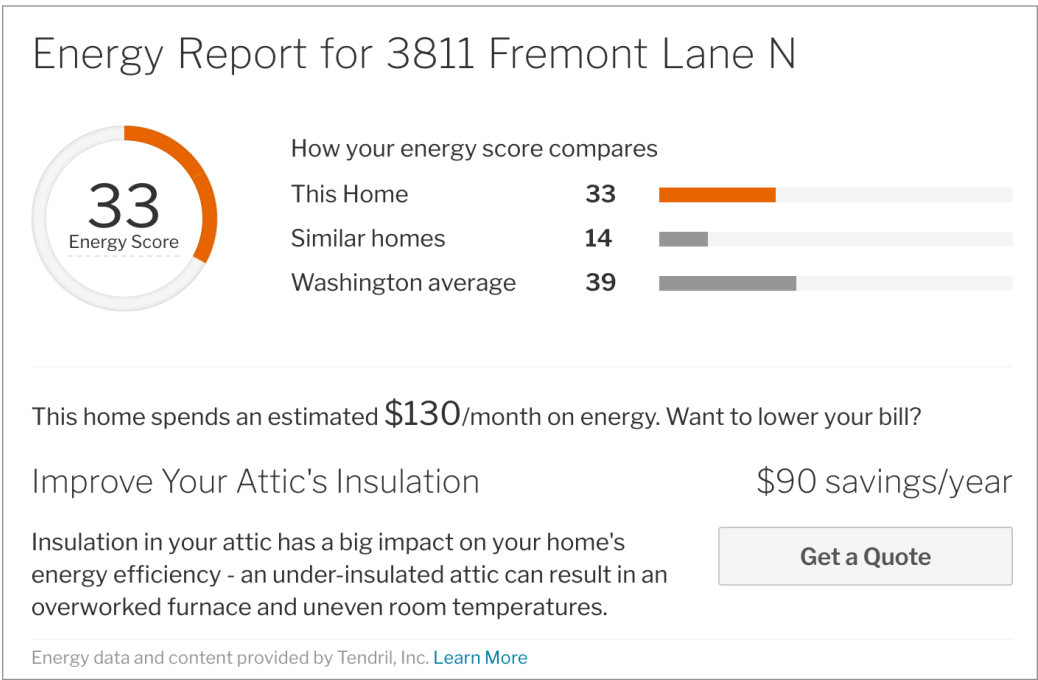
Even with a new, universally adopted standard and transparent energy data at key junctures—plus supportive social norms—consumers still need access to streamlined, hassle-free resources to take them to the finish line. Otherwise, consumers may never initiate the energy upgrade process or, if they find the process cumbersome, they may give up trying. What’s more, if poor quality work or the wrong work happens, they’ll become frustrated and won’t get the promised benefits.

Although consumers in some parts of the country have access to utility rebates lowering the cost of upgrades, energy concierges that simplify this process, and attractive financing products like PACE financing (attached to property tax bills) and on-bill financing (attached to utility bills), most consumers who want energy upgrades must be willing to serve essentially as their own general contractor from start to finish and must be able to fund their upgrades through a combination of [cash, credit cards, and home equity](#)

[loans](#). The overall energy upgrade process thus remains much too cumbersome for most consumers, especially given the need for quick, easy solutions at the times when consumers are most likely to make updates to their homes: when they’re buying or selling, or when something in their home breaks.

The emergence of scalable energy data in real estate listings creates a trigger and success metric for those in the home search or selling process to upgrade their homes. Each of the data vendors emerging in the marketplace has or is building features to suggest specific projects to improve the utility cost estimates and scores they list, either directly on real estate portals or on click-through partner sites. For example, Redfin directly embeds suggestions for potential projects, an estimate of the impact on energy bills, and a place to get a quote for the services on the page for the home (see Figure 3 below).

FIGURE 3. ENERGY EFFICIENCY PROJECT SUGGESTIONS FOR HOME ON REDFIN PAGES



The availability of this new data creates an opportunity for the energy and financial services industry to translate anticipated heightened consumer interest into demand that builds the industry, reduces fragmentation among service providers, and supports the delivery of consistent, quality upgrades.

- **Energy service contracting companies** and **utility programs** can use this data as an energy upgrade lead generation mechanism by targeting marketing efforts at the times when consumers are more likely to make home improvements rather than relying on word-of-mouth referrals or utility programs to generate leads. To close more deals with homeowners, they can work with energy data vendors to design simple, one-click means of connecting interested consumers to customer service representatives or energy concierges that walk them through the upgrade progress. In addition, they can streamline the data permissions from consumers as well as use standards like HPXML and databases like BEDES to share information about installed upgrades back to MLS's and portals—ensuring consumers that the market recognizes the asset value of their upgrades.

- The integration of energy performance data also creates targeted lead generation opportunities for **financiers and lenders**, whereby lenders focus on the consumers most likely to use renovation products. Similarly, upstream actors like **government-sponsored entities** can use this to drive consumers to the HomeStyle loan or other energy-enhancing loan products.
- Both **lenders** and **energy service providers** can offer programs and packages linked to improving consumer scores, which creates a direct connection between energy upgrade work and value for homeowners, and which may drive deeper savings.

Although these industry announcements can help drive energy upgrade business to this wide range of companies, their ability to leverage this opportunity largely depends on customers being offered streamlined services and having a pleasant experience. Although this world is becoming increasingly possible—as seen in nascent efforts across the industry to bundle steps in the process and industrialize home retrofits through targeted bundling of energy-saving measures, lower cost manufacturing, and faster turnarounds in homes—there remains work to do.





LOOKING FORWARD

Consumers in the home purchase process have the immediate opportunity to benefit from recent announcements that leading real estate portals now include energy data on their listings and property pages. This data opens up market transparency, enabling buyers to choose homes with a full understanding of likely utility bills, and enabling sellers and buyers alike to make informed decisions about the renovations they want to put into their for-sale or new homes.

A wide range of industries across the energy services, finance, and real estate spaces have the opportunity to benefit from this announcement as

well. The table below shows the many kinds of value different businesses can capture now as a result of this market transparency.

However, the full promise of visible value for homeowners won't be realized without concerted work across industries to extend value throughout the real estate transaction, establish a new normal, and enable ready resources for consumers. When that happens, we'll realize the dream of energy upgrades in every home that needs them, creating [billions of dollars of value](#); good, local, well-paying jobs; and healthier environments for individuals, their communities, and the planet.

NEW VALUE-CREATION OPPORTUNITIES FROM ENERGY DATA AVAILABILITY FOR SINGLE-FAMILY U.S. HOMES

ACTOR	OPPORTUNITY
Real estate portals	<ul style="list-style-type: none"> • Competitive advantage—encourages consumers to stay on sites that provide more robust information • Lead generation revenue from energy efficiency financiers/lenders and service providers
Multiple listing services	<ul style="list-style-type: none"> • Competitive advantage—for real estate agent clients that want to use it as a source of information
Realtors	<ul style="list-style-type: none"> • Differentiation—through training and certification, like the NAR Green Designation • Support for client decision making, for both buyers and sellers • Opportunity to reengage previous customers and forge connections for the next sale • Potential for decreased time on market
Energy data vendors	<ul style="list-style-type: none"> • Increased revenue from data/API purchase and/or lead generation
GSEs (Fannie Mae, Freddie Mac)	<ul style="list-style-type: none"> • Reduced default risk
Appraisers	<ul style="list-style-type: none"> • Differentiation—through training and certification, and marketing the ability to help real estate agents populate energy performance fields
Energy service providers	<ul style="list-style-type: none"> • Lead generation—by targeting marketing efforts at the times when consumers are more likely to make a change • More successful sales—through increased responsiveness to new consumer data by offering packages linked to improving scores
Lenders and energy efficiency financiers	<ul style="list-style-type: none"> • Lead generation—by targeting marketing efforts at the times when consumers are more likely to make a change





HOME MPG
30
expected range
for most homes
24 to 36 mpg



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