Transforming Awareness into Action: Consumer Perceptions of Energy Use in the Chicago Metropolitan Area
Consumers experience a large amount of confusion when they try to identify behaviors, home renovations, and products that are energy efficient. Regardless of education, consumers view “efficiency” as an abstract concept and struggle to translate the language used by manufacturers and utilities into terms they understand.

When they do try to change their behaviors or purchase energy efficient appliances to lower their bill, they often cannot see the benefits directly, which leads them to question government ratings systems and marketing and ultimately decreases the relevance of the concept to their lives.

Consumers are more likely to address appliances and spaces in their home that are visible, audible, or affect quality of life. Addressing fundamental consumer values of need, comfort, appearance, and status are all paramount compared to saving money and environmental goals.

Visible Consumption

The most visible sources of energy consumption are top-of-mind. Turning off the lights after leaving a room, lowering the thermostat, and purchasing EnergyStar appliances and CFLs are the behaviors most mentioned when consumers are asked about efficiency. Although these behavioral changes result in only modest energy savings, doing them actively and regularly creates a halo effect that gives the false impression that “I’m doing my part” or “I’m doing all I can.”
New Appliances

When shopping for new appliances or planning a retrofit, most consumers perceive efficiency and saving money as only one feature of many. The benefits of purchasing an efficient product are often too abstract for consumers to grasp because the payoff period is perceived to be too long or difficult to measure. As a result, most retrofits are driven instead by products and features that serve a need or provide immediate benefits, such as comfort, appearance, and status.

Decision Fatigue

Doing research to get project ideas, pick the scope of a project, and decide on features is the longest and most difficult part of a retrofit. Decision fatigue is a real problem during the retrofit process, with some consumers delaying or stopping planned projects because they cannot compromise with a spouse, find a trusted source of information, narrow down their options, or the costs and benefits of a particular project.

Word-of-Mouth Most Trusted

For consumers doing a retrofit, the most trusted source of information is word-of-mouth, via sales people and friends and family, as well as project demonstrations, either on Youtube, TV, or in person. With many homeowners unfamiliar with technical construction terms, these sources of information tell them what they didn’t know, show them what it will look like, and provide encouragement to take on the project.

Target Demographics

Suburban male homeowners with household incomes between $75,000 -100,000 are most likely to implement retrofits. Almost all of the DIYers in our sample fit this demographic target. Consumers with lower income levels were more interested in making behavioral changes. Consumers with higher income levels were more likely to hire contractors and less interested in saving energy or money.

DIYers have a better understanding of insulation, air flow, and how their home works as a whole. They also do more retrofits than consumers who hire contractors because there is a lower cost and barrier to entry for them to do the work themselves. Rather than promoting retrofits as an environmental issue, DIYers respond to saving money, new trends in construction, the pride of a completed project, gaining more control over the temperature of their home, and the idea of sealing or protecting the home from insects and the elements.
Introduction

Under a Better Buildings grant from the US Department of Energy administered by the Chicago Metropolitan Agency for Planning (CMAP), Efficiency 2.0 has been tasked with launching EnergyImpactIllinois.org, a comprehensive online tool for engaging Chicago-area consumers with energy saving information, advice and resources.

Initial research, including a quantitative survey, was conducted by Fleishmann-Hillard and Booz and Company in order to develop a user segmentation model. Using a combination of in-home ethnographies, focus groups, and remote journaling exercises, Efficiency 2.0 has conducted a study to uncover key behavioral drivers and information sources underpinning energy behaviors, which can then be used to inform the design of the Energy Impact Illinois marketing efforts.
Ethnography is a qualitative research method for studying the beliefs and practices of a particular social group. The term can be used to describe either the process of observing a culture (i.e., fieldwork) or the written product of the process. Originally used by anthropologists, ethnography has spread to other fields, including sociology, political science, history, human computer interaction, and public health. In industry, companies including Intel, Proctor & Gamble, and Microsoft use it for new product development, design, and marketing.

In the area of energy and efficiency, ethnography is a powerful method because it identifies the emic perspective—or that of people within a culture—rather than the etic or outsider’s view. Folk beliefs and behaviors around energy are widespread, such as the belief that turning the furnace thermostat up increases the speed that a room warms up. There is also a big discrepancy between the language that consumers use and the language that the industry uses. By observing consumers in their homes and talking with them on their terms, ethnography brings these nuances of culture to light in a way that a survey or phone interview cannot.

The team initially recruited thirty homeowners, including a mix of men and women, suburban and urban dwellers, with incomes ranging from $35,000 per year to $199,000. Each participant had recently done home renovations and had a moderate level of techsavyness, primarily determined by smartphone ownership.

Combining multiple research methods provided the team with insight into both consumers’ perceptions of their energy use and their actual behavior. Over a two-week period, each participant used a remote journaling tool, EthOS (www.ethosapp.com), to photograph and film aspects of their energy use, such as their laundry routines. The team used the journaling data to pick eight participants for in-home interviews, aiming to collect a range of behaviors. Interviews lasted from three to four hours and included a tour of home renovations and exercises designed to capture their renovation process, as well as the importance of various features while shopping for appliances. After the in-home interviews were completed, focus groups were conducted with twenty-eight participants to capture attitudes towards
efficiency, various information sources, and attributes for the design of the website.

All interviews, journaling exercises, and focus groups were transcribed verbatim, producing 400 pages of transcripts. Following Corbin and Strauss (1998), analysis was conducted using Grounded Theory. This approach pays close attention to the participants’ word choice and language use, drawing codes and concepts inductively from the text. Rather than looking for evidence of pre-existing concepts in the data or using the interviews to test hypotheses, “ grounding” the analysis in the participants’ language generates new theories to explain behavior. Sample codes in [brackets]:

**Interviewer**
Have you ever had any problems with flooding or anything?

**Herman**
Not from that, but this wall, up until I did something last year, always leaked when it rained. [Code: retrofit delay] We’ve had to build her out and they wouldn’t do any more after it was built. It seemed rundown, the top of the foundation [Code: self-diagnosis, Code: unsure], and at one point water came over the wall into the basement. If we get a good, heavy rain for a couple of days, we’d be sitting in water right now, a good couple of inches, but what I did is, two years ago on the outside of the wall, I dug down four feet and put something on the wall. And last year, on this side. [Code: large effort] It seems to be where this beam hits the wall [Code: home knowledge]; I put something there too. So I got it about 99.5% cleared up. [Code: definition of success]

**Interviewer**
What did you put on the wall?

**Herman**
A liquid sealer and then what’s on the wall inside, I put it on outside. It’s a rubbery tarp-like substance. If you stick it on, it will stick. [Code: retrofit improvisation] With the liquid sealer and that, I went the whole depth of the house on the outside wall, down four feet. That was a job. That was a real job. [Code: type of renovation “real job”]

**Interviewer**
How did you find out about doing that?

**Herman**
Just went to Home Depot and asked questions. [Code: trusted source]
After identifying initial themes for each participant, we looked at the collection of themes across participants to discern whether behaviors and perceptions varied by factors like attitude towards efficiency or demographic profile. For instance, we noticed that consumers who did their own retrofits mentioned being proud when they discussed every project, whereas those that hired outside contractors were only proud of a few of their retrofits. This indicated that not only did these two groups have different behaviors, but also different motivations for doing home retrofits. After finishing this stage of the coding, the team discussed early findings to cross-validate. Then we created conceptual models (see below) to visualize key findings and make them more accessible to readers.
Reliable Products = Efficiency

According to the Lawrence Berkeley National Laboratory, energy efficiency is “using less energy to provide the same service.” (http://eetd.lbl.gov/ee/ee-1.html) When asked to write their own definition of energy efficiency, consumers use language that indicates a product perspective: they view efficiency as a function of active work done by a product. In their words, something is efficient if it “runs cleanly,” “operates at full capacity,” or is a “product that gets the most out of the least energy.” While not incorrect by any means, this perspective indicates that consumers focus on energy efficient products or appliances, such as light bulbs and appliances, and overlook passive improvements such as sealing and insulation.

When asked to state things they’ve done to save energy, the home improvements mentioned most frequently include changing light bulbs, replacing old appliances, adjusting the thermostat, and unplugging appliances when not in use.

...Except Do-It-Yourself Consumers

The exception to the above are individuals who do a lot of home improvement projects on their own (DIYers). Either through familiarity with home construction or greater exposure to information about retrofitting, these individuals define efficiency as “anything that’s going to save money” or “reduce energy usage.” While a subtle semantic difference, this indicates that DIYers are able to look past individual products to consider the energy footprint of their home as a whole.
Efficiency Means “Easy-to-Use”

There is an additional difference in how consumers view efficiency—those who are not DIYers incorporate the concept of “easy-to-use” when they provide a definition. In their words, energy efficiency is “working and performing with ease and perfection,” “easy to use/understand,” and “working properly and smoothly at lower cost.”

The incorporation of this concept highlights the barrier between DIYers and other homeowners: those who do their own renovations know that projects can be time-consuming and at times frustrating but they don’t let this prevent them from doing the work. For non-DIYers, a potential renovation may save electric or gas energy, but if it requires too much of their own personal energy, in terms of effort or cost, then they won’t consider it.
Consumers Distrust Efficiency Claims

Though they have an understanding of what energy efficiency means, owners of energy efficient products still have doubts about the claims. When demonstrating the most efficient appliances in their own homes, participants used a lot of hedging language (italics), indicating that they have doubts about their actual energy usage.

**Jack, who has a front-loading washer:** “We try to wash when we can do a full load, *it’s supposed to be more energy efficient, I hope it is.* We generally just do the normal wash cycle, delicate for delicate items. That’s about it. Dryer’s also the same model. Front loading’s more efficient so, *I guess they are [energy efficient].*

**Joan, who replaced a large sliding glass door:** “It happens to be an energy efficient sliding glass door made by Pella. We used to have a metal door which was from 1978. It is an oversized door (96 inches wide) and *I’m not completely sure if this is the reason* but my electric bill went down by around $35 last month compared to last year at this time. Considering we had an extremely hot July we were very happy.

**Mary:** “*I believe* the hot water heater and the dishwasher are also very energy efficient based on our water bills and the lack of service we have had on the water heater and dishwasher. Both are energy saving appliances and seem to live up to the claim.”

To some extent, these doubts are evidence of wider consumer distrust of marketing, advertising, and government claims. During several of the focus groups, participants also voiced distrust of the nutrition labels on prepared foods as well as the DOT/EPA stickers displaying city and highway mpg ratings for new cars.

**Keith:** “When people started looking into what they’re actually getting for their gas mileage, they’ve said that their car doesn’t even come close to [the sticker]. Now they’ve redone it and you’ve seen the labels on new cars drop dramatically. If you take out a new car, you can even get a rental car, that new car in the show room, we’re still about 15-20% off that revised sticker, so we don’t really know who’s conducting the test and what their variables are on the test.”
Consumers Don’t Use or Understand Efficiency Guidelines or Ratings

When purchasing new appliances or monitoring their own energy use, consumers have access to a wide range of metrics and ratings systems including terms like therms, kilowatts, EnergyStar, and EnergyGuide labels that manufacturers post on their appliances at the point-of-sale. Even appliance settings and displays, such as the “least cold – most cold” dial on a fridge or the digital screen on a programmable thermostat are a point of confusion. While all of these ratings provide consumers with information that they can use to adjust their energy consumption, we observed that consumers rarely look at them and largely don’t know what they mean.

When examining their utility bills, consumers look first at the amount they owe and then they look at the graph showing their usage over the past 13 months to judge whether they are trending up or trending down. They gloss over terms like therms and kilowatt-hours. One participant, Amanda, explained her bill this way:

“The left side of the bill of course is small and reserved for the portion that is important to the customer/consumer, what we’ve used & when over the past year... but the majority of the bill (the right side) is what is important to the electric company -- how they justify billing.”
When purchasing new appliances, consumers struggle to incorporate the EnergyStar and EnergyGuide labels into their shopping process. One participant, Jill, had just bought a new refrigerator. She opened up her freezer and showed us the EnergyStar label during her interview, explaining that she didn’t look at it until the fridge was installed and she opened it to start putting things away. She read the label, which said “Estimated Yearly Operating Cost: $45. Estimated Yearly Electricity Use: 424 kilowatt-hours,” and then said “it has an energy star. I don’t know what that means.”

If consumers do look at the labels during their shopping process, they assume that anything with a label is efficient. Another participant, Keith, replaced his appliances. While he wasn’t able to verify any savings on his bill, he said “at least it has the little Energy Star that makes me feel better about it. The little logos on the appliance means I’m trying to be good.”

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At home, consumers generally keep appliances such as refrigerators and freezers on the factory setting. For the most part, they don’t notice the dials or they don’t think to change them, so long as the setting it came on continues to keep their food cold. Asked about the settings on his refrigerator, Dave explained, “I don’t the change the temperature [on the refrigerator], but I guess you can change it... it usually seems to be pretty good. Most of the food stays the way it should be, which is the important part.”

Most consumers who have upgraded to programmable thermostats set different temperatures for daytime and evening. However, they recognized that setting the thermostat at 75 degrees does not create a “true 75.” Rather than providing an actual reading of home temperature, the thermostat display is used more as a guideline or gauge, to be adjusted depending on how they, or their family members, feel.

**Jill:** “It seems pretty comfortable on 72 and I’ve noticed that he’ll put it down to 68 or 70. And in the winter, I think it’s funny because people say 72 is the perfect temperature, so that number sticks in my mind. We put it at 72 during the day, and at night we put it down to 65, maybe, and then in the morning put it back up to 72... I’m hoping it’s 72 somewhere. But it’s interesting that with all of this cold air blowing on it down here that it’s 72 and still cold down here. But for the rest of the house it can probably be kept higher.”
In the summer, David sets his thermostat at a high enough number that the air conditioner won’t turn on. When he comes home and wants to cool off the apartment, he’ll then lower the number to turn the a/c on. As he described it, “Usually with the presets, at ten o’clock it goes to eighty degrees instead of seventy-eight or something. Most of the time I’ll just go higher or lower if I’m at home or want it on. Then I’ll hit the hold button. That’s about it.”

Consumers Have Their Own Systems for Measuring Usage and Efficiency

Because current systems don’t offer constant feedback in an understandable format, consumers rely largely on their own senses—what they can see, hear, or feel—to measure their energy consumption and the efficiency of their homes.

For Timothy, who installed argon-filled windows, he noticed that:

“During the winter time - when it’s sub-zero temps outside we have no drafts, very little noise - and when you put your hand up against the inside of the glass it appears to be warm and not cold like the old windows used to be. They don’t sweat and they don’t get any kind of frost on the inside.”

Justin felt that one of his neighbors used too much energy, an impression formed in large part through sound:

“I can’t say anything good about one of my neighbors over here... I always hear his a/c running, whenever I go outside I can hear it.”

For Patrick and Crystal, they got a sense of their energy use based on going outside and looking at their meter. Crystal’s is located conveniently near her driveway, so she can take a peak when entering or leaving her home.

“See how it’s turning really slow? That’s a good thing. When it’s going really fast it means you go find out what is on and you turn it off.... If I’m passing by I look to see how fast it’s going. If it’s going fast, too many appliances are on.”


**Consumers Focus on Tangible, Active Sources of Energy Use**

Just as they define “energy efficiency” as a property of an appliance, most consumers believe that most of their energy use is due to their heating, cooling, and lights. When their utility bill is higher or lower than the previous month, they explain the difference largely in terms of the weather. This reasoning leads to two behaviors: it reinforces their perception that their energy use varies primarily with their thermostat and it also creates a fatalistic attitude towards their bill. “If a hot summer or a cold winter causes a high bill, and I can’t control the weather, then how can I control my bill?”

**Jeff:** “I typically expect higher electric bills in the summer months due to the use of the air conditioning, and corresponding high gas bills in the winter to pay for gas to heat the home. Beyond that, I don’t typically do much analysis of my bill, and simply pay it when it is due.”

Additionally, when consumers feel that they can control their utility bill only through their thermostat, then they begin to believe that they can’t lower their bill once they’ve adjusted their thermostat to the limits of their comfort level.

**Joann:** “My February bill was high... that’s when we had that storm, so I think we were home more and the temp was colder. I love the winter so I was out there in it, so when I came home it was nice to come home and be warm and all that. That’s also when I had my beer tasting party so I know I had the whole place heated cause I know people are not like me and get cold so I wanted it nice and warm for guests.”

Consumers frequently address energy sources they can see, feel, or hear more readily than not easily accessible parts of the home.

**Efficiency Behaviors are a Source of Household Tension**

Within the household, individual members of the family have different comfort levels and habits. Each household generally has a member who pays more attention to energy use and the utility bill, and tries to encourage or nag the other family members to turn off lights or unplug appliances.

**Mary:** “I have 2 boys, 9 and 16, they walk out of a room, they leave the TV on, the lights on. I’m constantly on them, ‘shut it off, shut it off.’ That’s our biggest thing in the house. They’re getting there. They’re not there yet.”

**Amanda:** “I don’t think I’ve ever run a half load [in the dishwasher]. It drives my husband crazy. I’ll leave dirty dishes in the dishwasher overnight and for a day if I think we can add another meals worth of dishes to it before running them.”
When one of the members of the household is a DIYer, they will often spearhead the ideas about energy efficiency improvements, though these still need to be approved by the other partner. While Justin’s wife has gone along with the ceiling fans and insulation that he added to their home, she held the line at installing a rain barrel. Justin lamented, “the ideal place to position one is right next to our front step, which you would have seen driving by... we would have realized a lot of water conservation but she didn’t want that, it would have been an eyesore.”

In homes like Crystal’s, where the husband, wife, and children are very close, the desire to be more efficient meshes well with a close family life. During her interview, we observed that her college-aged daughters spent a good deal of their time hanging out in their parents’ room, which was cooled by breezes coming off Lake Michigan, making it less of a problem that Crystal refused to turn the air conditioning on. In several other homes, where there were some marital tensions, each partner’s desire for different temperature and their own space in the home led to increased energy use, as they needed to cool the entire house.

Consumers Think of Efficiency as Part of their Values System

While making efficiency improvements is in part about getting more value for their energy dollar, consumers believe that efficiency and avoiding waste are also components of their values system. But instead of using the word “efficiency,” consumers more frequently characterized an ideal behavior as one of being “aware,” “conscious,” or “conscientious” about energy use. The mantra of “turn off the lights when you leave the room” is something that most of the participants’ parents instilled in them at a young age. As Mark described it:

Mark: “I was raised with an ethic of saving, or just not wasting. That’s just ingrained. My parents taught me that, so I’m just not naturally a wasteful person. I’m careful about how much I drive, just don’t let the water run all the time. It’s really just habit or just being a good person or doing the right thing.”
This early training has several consequences on their current perceptions. For one, the activities that people most commonly associate now with energy use—the lights and the thermostat—are also the ones that their parents nagged them about the most at a young age. In addition, learning efficiency behaviors from one’s parents creates the perception that the generation that grew up during the Great Depression is better at saving energy than the current generation. The downside of this is that while senior citizens on a fixed budget often live more simply, limiting their driving and their consumption of electronic gadgets, they also tend to have older less energy-efficient appliances.

Kristin: “My mom is a huge influence when it comes to energy. She is 89 and she went through the depression, growing up we always had the temperature really low in the wintertime, and we had no A/C... she’ll get a bread wrapper when she finishes a loaf of bread, she’ll take it, fold it up, and then when she needs something for covering up she’ll take the bread wrapper and use it.... she’s my role model for that kind of thing.”
One of the side effects of efficiency being part of one’s value system is that consumers judge and criticize people, including friends and neighbors, whose values do not line up with their own.

**Crystal:** “We have a girlfriend who I love. They keep their house at 67 [during the summer]. We were freezing in the basement. And I had to have on a sweater and socks. It was 80 outside and it was cold. She keeps her house at a certain temperature no matter what time of year. She wants to be comfortable. I think that when they were younger they didn’t have parents like mine who told you that a little sweat’s good for you.”

Interestingly, consumers are actually more aware of their neighbor’s energy use than they are of their friends and family members. While they may have spent more time in their friends and family members’ homes, they observe what their neighbors are doing more frequently. Consumers are also tuned in to fairly subtle signals.

**Herman:** “In this immediate area right here, I would say everybody is pretty conservative and cheap. Like, this house next door has a sprinkler system; they don’t over water. The fellow right across the street is an older man who’s a widow. He doesn’t over water. I know he has an above ground pool in the back, but that’s primary for his grown kids and grandchildren to come over.”

**Dave:** “There’s this one [neighbor], his TV is always on, whether he’s there or not. It’s always on. He just has the basic seven channels. No cable. We can tell what he’s watching.”

Participants in this study were loath to impose their own values on their more profligate neighbors. Though they noticed if their neighbors and friends consumed more energy than they did, they neither chided them for their use nor gave them recommendations for how they could save. For most consumers, this is because there is a belief that both one’s home and one’s comfort level are personal choices.

**Joann:** “[My neighbor] Samantha just asked me what my ComEd bill was this month, we were talking about it. She has a one bedroom and her bills are higher than mine are. She does work from home and she has a cat, so she’s more consistent with her heating and A/C than I am… But I didn’t really give her any advice besides that I thought she needed to look into it and start paying more attention to when she has [the A/C] on and when she doesn’t.”

For the participants who were a little more extreme in the lengths they went to save on their utility bills, there also was an additional fear of embarrassment at being viewed as either cheap or a bit odd. Justin, who kept his thermostat at 57 in the winter said:
For many consumers, this desire not to impose one’s own personal comfort level on other people extends to guests. When they have visitors, many of the participants turn their air conditioning down, turn their heat up, open blinds and shades, and turn on additional lights.

Justin: “I realize some people might not want to live like that and I don’t hold that against them. I realize if you don’t want to put plastic on your windows, that’s an extreme. Keeping the house that cold I don’t fault someone for not choosing to do that and a lot of these things. And some things I’m almost embarrassed to share my, with certain people, I might even hide the plastic on the windows in certain rooms if someone were to come over.”

Joann: “If you weren’t here and I was in there working, I wouldn’t have them on at all and I’d probably have the blinds down. Since you were coming, I had them on 72, which is what I usually have them on, but when you got here I thought it was a little warm and I put them down to 68.”

### Efficiency Segmentation & Opportunities in Chicagoland Area

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<th>Behavior</th>
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<td>&quot;Efficiency is something I don’t think about.&quot;</td>
<td>Makes renovations but never considers impact on energy use. Few behavioral adaptions.</td>
<td>This segment is prevalent in Chicago. High income and desire for comfort means that saving money on retrofits is not important. Little awareness of the environment. They may respond to incentive programs.</td>
<td>These consumers are aware, able to do DIYs or hire contractors, and just need to be pushed to make efficiency a more important feature during a project.</td>
<td>This segment requires a slow sale because of a lack of interest and a lower income. Opportunity exists through education with homeowners with more time on their hands and more exposure to information.</td>
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<td>&quot;Efficiency is something I do.&quot;</td>
<td>Does regular renovations, both DIY and with a contractor. Does some moderate behavioral adaptions to save money.</td>
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<td>Renovations are larger and efficiency is a key driver and feature - lighting, tankless water heater, new windows. Behavioral adaptions are extreme.</td>
<td>This segment is rare in Chicago and suburbs. In Chicago, most young, affluent, liberal home owners either live in newer condos (little opportunity for retrofits) or are too busy.</td>
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<td>&quot;Efficiency is part of who I am.&quot;</td>
<td>Behavioral adaptions are moderate and intended to save money. Makes exceptions for guests and some comforts.</td>
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<td>Renovations are smaller and DIY but with efficiency as a key driver - low flow plumbing, insulating curtains, lighting. Behavioral adaptions are extreme and intended to save energy and money.</td>
<td>This segment is rare in Chicago and suburbs.</td>
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Detailed Findings: Baseline Energy Use

Comfort Level and Awareness Drive Energy Use

Across participants, the amount of energy consumed varied by the individual’s desired level of personal comfort as well as the extent to which they attempted to limit their use.

- Donna: Low Tolerance for Discomfort, Low Level of Awareness
- Kristin: High Level of Awareness
- Jill: Low Level of Awareness
- Joanne: Low Tolerance for Discomfort
- David: High Level of Awareness
- Justin: High Tolerance for Discomfort
- Krystal: Low Level of Awareness
- Herman: Low Tolerance for Discomfort
- Joanne: High Level of Awareness

Their desired comfort level, or tolerance for discomfort, varies primarily as a function of income, with higher income participants having greater amenities, such as lighting and modern appliances in their homes.

Though not a definitive sample, the individuals living on tighter budgets, who included Herman, Jill, and Justin, had older appliances, less lighting, and used their windows for ventilation less frequently than the other participants.

In terms of how engaged or aware participants were with their energy consumption, participants ranged on a spectrum, from Unaware to Aware to Second Nature.

Individuals who are Unaware don’t think a lot about their energy usage. Although they may complain about the cost when they pay their bill, they pay little attention to their consumption or areas where they could save. For example, Donna may make small adjustments in response to cost, such as limiting her use of her gas fireplace in the winter, but for the most part she is focused on her comfort and lifestyle over any savings.

**Donna:** “I guess we use a ton of electricity, I never even paid attention to it. I probably have more control over it than I think I do... We have three fridges, we have five TVs, they’re always plugged in.”

Individuals who are Aware do think about their energy usage and have learned to make a conscious effort to do things like turning their lights off when they leave a room, using curtains to keep rooms from heating up in the sun, and lowering their thermostat at night. For some, they have developed these habits in response to higher bills or smaller household budgets. For others, like Susan, family or peer pressure led them to become more aware of their consumption.

**Susan:** “I had a light bulb to replace and didn’t have the size, [and my daughter said] ‘I saw this article that you buy these light bulbs once every five years and they’re really good for the environment.’ I wouldn’t have actively searched out those light bulbs. She’s the one that’s running around and shutting the TV off behind me. That kind of family pressure.”
Individuals in the Second Nature category are fundamentally different. Whereas Unaware consumers rarely think about their consumption and aware consumers actively think about theirs, these participants have such deeply ingrained routines towards conservation that they no longer think about their behavior as behavior—it’s part of who they are.

During the home tour portion of the interview, we asked participants to turn the lights on in each room for the camera. Those in the Unaware category would sometimes forget to turn them back off again or leave them on. Those in the Aware category would ask if we were done before switching them off.

During an interview with Justin, one of the Second Nature participants, we left an extra light on and he noticed it from a different room. Although he was in the middle of answering questions, he became physically very agitated and got up to switch it off. While he hates wasting money, Justin is also an engineer, and doing things efficiently is just part of his mindset.

“We’re always looking for ways to save money, especially in this economy, but on top of that I do feel it’s part of my mindset, how I’m programmed.

It’s not like I wake up and say ‘what can I do more efficient,’ things just like come to me or I’ll read about it and just do it. It’s not something I have to make a big effort to do a lot of times but I’ll think about something and see that it’s a better way of approaching it.”
Two Different Strategies for Managing Home Temperature

During the home tours, we observed that consumers essentially had two strategies for heating and cooling their homes—either they treated their homes as a single environment with one temperature setting or they used a segregation strategy, where they actively managed the temperature in only the space they were actively using.

Consumers in the first group wanted their entire home to be the same temperature. If they had poor insulation or rooms, such as basements, that felt cooler, they often blamed temperature variation on the ductwork. Herman and Jill, among other participants, adjusted their ducts seasonally to push warm or cool air to the rooms or floors that varied the most from the set temperature.

Herman: “I play with the ductwork all the time with the movers and all that. There are parts of the house that are cooler than others. That’s due to the ductwork.”

Jill, who lives in a three-story town home, has an old furnace, some gaps in her windows and doors, and a $700 per month electric bill in the winter. She has ceiling fans in her home but doesn’t use them to redistribute air. She and her husband close the vents in the basement in the summer, but they don’t want to spend the money to replace their old windows, doors, and furnace.

Most households had an upstairs bedroom or two with poor insulation. It was often located over the garage and usually given to one of the children. In these homes, households sometimes supplement the central heating and cooling system by using a window fan, window air conditioner, and/or a space heater.
Households that use the second strategy, segregation, take a more active role in managing their comfort level. Joann has a two-bedroom condo in a Chicago high-rise building and four heating and cooling units. She only turns the units on when she is using a room and keeps her doors closed and shades drawn to limit her energy use.

Beginning in the morning, she cools her bedroom so that it is comfortable when she comes back from a run. During the day, she works at a desk in the second bedroom, which allows the temperature of the rest of the apartment to fluctuate. Only in the evening while she is cooking and watching television will she adjust the temperature in the main living space of the apartment.

Crystal and her husband Jim have a 3,600 square foot house with a large number of windows without curtains. They both work outside the home and keep their thermostat set at 67 during the winter. Their bedroom, where they spend most of their time, has a space heater, so they are able to limit heating the rest of the house. Justin, his wife, and son employ a similar strategy, maintaining their thermostat at 53 at night during the winter. In addition to a space heater, they also use electric blankets. Although their home is smaller than Crystal’s, they have old windows that they have sealed with plastic and covered with insulated curtains.

Compared to Jill’s $700 winter electric bill, Crystal and Justin, who each have larger homes, pay around $100 in the winter. In these cases using a segregation strategy saves money by reducing the use of the furnace. It also saves Crystal and Justin from having to replace old windows or poor insulation.
Comfort While Sleeping is the Most Important

In response to higher energy bills, most participants said they had begun adjusting their comfort level to reduce their usage. But while they were willing to lower their consumption during the day, they would not compromise their comfort while sleeping. Their sleeping habits, such as the use of a fan or other source of ventilation, had been developed at a young age, and they wouldn’t consider changing them. These routines are so ingrained that even participants who were otherwise very careful about conservation would use excess energy to ensure the sleeping environment to which they have become accustomed to at an early age.

The most surprising of these was Dave, who generally limited his use of his furnace and air conditioner but slept with his window open—and the heat on—in the winter. Unfortunately for his heating bill and his wife, Dave hasn’t been able to change this routine.

**Dave:** “Even during the winter the window is open... at least five, six inches. Get a big down comforter and just snuggle and that’s it.... Growing up, my side of the house was really cold... I grew up that way and got used to it.”

Justin, who is fastidious about his energy usage, runs an empty humidifier at night in the hallway outside his son’s room to create white noise and help him sleep. Another participant, Kristin, used air conditioning and a fan in an open bedroom window during summer nights.
Households Are Switching to Cold Water Loads But Not for Energy Reasons

During the in-home research consumers expressed that they wash all of their clothes on a cold setting or use cold for everything except sheets and towels. Several consumers even went through the process of purposely over-drying their towels to get them soft and dry enough for their particular taste. They expressed the need as strictly comfort based to meet their expectations.

Therefore, even though using cold water saves energy, the primary consumer driver is related to comfort and clothing quality. Washing in cold water was rarely cited as an energy-related behavior change compared to turning off the lights or adjusting the thermostat. Reasons given for washing in cold water include saving money as well as protecting delicate clothing, maintaining colors, and limiting effort—some participants did not sort their clothes and washed everything on a cold/cold setting.


While Chicago-area consumers still believe this, continuing to wash their sheets and towels in hot or warm water, several trends hint that laundry habits may be changing. A 2007 Gallup poll showed that in only 10% of married households were men “most likely” to do the laundry [http://www.gallup.com/poll/106249/wives-still-laundry-men-yard-work.aspx]. In our study, around a third to a half of all households had men taking responsibility for the laundry. In addition, many of the households had runners or fitness enthusiasts with nylon, lycra, spandex, and wool exercise clothing, much of it instructing users to wash cold. With new fabrics, more chore sharing, and households switching from top-loading to front-loading washers, it seems that there are more chances for consumers to re-think established routines and question what they’ve learned from mom.
Retrofits are Done Primarily to Improve Chicago Homeowners’ Quality of Life

In addition to being expensive and time-consuming, renovations can also mean weeks or months of stress, noise, and mess in one’s home. These projects are particularly daunting for non-DIYers, who worry that they will be overcharged or receive poor quality work from a contractor. Without experience doing their own projects, they also fear that trying it for themselves will end up costing them money rather than saving it.

**Steve:** “You watch those home improvement shows and it makes it seem like anyone could do it... One of the things that keeps me from doing much is that I’m not that handy and there’s the chance that I could screw something up and turn a minor repair into a major expense.”

For the same reason, retrofits are rarely undertaken solely to take advantage of incentives or rebates. The exception is if a home fixture, such as a furnace or windows, needs replacing and the consumer is facing a large, unavoidable expense. In this case, a consumer will try to utilize a rebate or incentive program to offset an expense that had to happen anyway. This is not to say that homeowners do not take efficiency or saving money into account when planning a retrofit, but these gains are more abstract and secondary to the goal of improving the experience of living in one’s home.

One participant’s situation illustrates non-DIYers’ inability, through either lack of information or lack of skill, to undertake projects to save them money.

Mary Kay’s electric bill in her four-story townhome recently increased several fold to over $1,000 per month. While she has placed several calls to ComEd to try to figure out why her bill changed, her efforts to reduce her usage have been limited to things that she could easily do herself, including putting her appliances on power strips that could be turned off, changed her light bulbs, and being more aware of turning lights out. For Mary Kay, following these recommendations “provided by ComEd on the bills have not resulted in lower costs.”

For most consumers, the benefit of a payback period or a rebate is abstract, uncertain, or too far in the future, while the up-front cost of doing a project is concrete and immediate.

The housing crisis has worsened this perception—some people don’t know whether they will still live in their home by the time the improvement has been paid back. Additionally, some have come to doubt the extent to which improvements will increase a home’s worth and then be paid back at the time of sale.
Keith: “I’ve got several rental properties here and I put new windows in all of them. A few of them were vacant for a while and I was paying the heat and power bills for those and they were driving me crazy. I put new windows in them and it has so far not paid back very much. And they’re gas-charged windows and all of that other high-end junk that I got sold and I don’t really see the payback so far.”

Justin: “I’m resigned to the fact that I’m going to be out some money if I spend $1000 on a water heater. But even that supposedly you do reach a point where it would pay for itself after however many years. Personally though with the longer span to realize the savings I don’t tend to do the calculation.”

Because of the effort and investment required, both DIYers and non-DIYers rarely undertake home improvement projects unless they address a pressing need or provide immediate benefits. In ascending order, there are four main reasons why consumers undertake a retrofit—need, comfort, appearance, and status.

Research: During the research phase, homeowners first determine they need a retrofit and gather information about possible changes.

Then they learn what they don’t know about the renovation, including the cost, effort and time required. Once they have decided to do the project, they’ll choose a contractor and/or the specific materials used for the project.

Work/Do: If the research was successful, this stage is straightforward and the project is completed. If not, consumers may have to buy additional materials and seek additional advice and help.

Enjoy: After the project is completed, homeowners savor their success, particularly if they did it themselves. When the next utility bill comes, they check to see if the retrofit affected their energy usage. A successful project often inspires them to start another one.
In order to inspire consumers to make purchase decisions based on abstract values, new technology and marketing initiatives also need to fulfill homeowners' basic needs for function and comfort—or target consumers whose basic needs have already been met. For instance, in the focus groups, some consumers complained about CFLs having a poor quality of light and a slow turn-on time. While CFLs almost always make economic sense, their adoption has been slow because some consumers perceive CFLs not to meet their needs.

A corollary for the green energy industry is the food industry, where restaurants and grocery stores have been able to convince consumers to spend more money for ingredients that are organic, sustainable, local, or raised humanely. This diffusion has operated in two ways. First, some consumers have adopted organic products because they view them as aspirational, a status symbol, and a reflection of their values. But more mainstream consumers are beginning to eat organic because they have become convinced that conventionally grown food is unhealthy and unsafe and thus doesn’t meet their basic needs anymore. In order for the energy industry to move consumers up the value pyramid, they need to convince them that efficient products address the concrete needs better while providing the abstract benefits. If consumers believe that inefficient technology does not meet their needs and is not comfortable, then it will be easier for them to invest the money in more efficient products.

An increase in education and a change in tastes has led consumers to move from eating fast food to eating local, organic foods. Likewise, some homeowners are beginning to consider more abstract values when making decisions about renovations.
Three Types of Homeowners

Homeowners fall into three separate categories—those who do not do renovations or retrofits, those who hire contractors, and those who DIY.

The first category includes people like Jill, who have a limited budget, as well as renters who are not allowed to make improvements to their home. On the rare occasion when these consumers spend money on home improvements, it is only because something is broken beyond their tolerance level for discomfort. Their retrofits are motivated by need.

We observed that in several cases, the participants in this category had lived in their homes for decades and had gone “house blind,” where they became oblivious to the wear and tear that had accumulated over the years. Kristin’s husband, Craig, had lived in his home for twenty years and hadn’t made any changes. When he started dating Kristin, he began to plan renovations and make improvements. As she explained, when they started dating:

“He started to be more aware of what’s going on in his kitchen... becoming aware of what condition everything is in. We actually have 2 toilets that aren’t working right now, they just run, they work, but they run and run so you have to turn the water off and then when you want to flush you have to wait and let it fill and then flush, so for 4 years I’ve been telling him to fix it, and he finally got up there and goes, ‘I can’t get it apart. We’ll have to call a plumber.’”

In our sample, the consumers who were DIYers were primarily suburban men with household incomes between $75-99k. The projects they did on their own included installing ceiling fans, replacing toilets, installing digital thermostats, caulking windows, installing insulation, painting, and doing tuckpointing. They still hired professionals for windows, roof repairs, moving gas lines, electric repairs, and most plumbing. When they describe their retrofits, a key difference between the DIY mindset and that of other consumers is not so much actual ability as much as it is the desire to do research. When embarking on a project, DIYers take the time to figure out what they don’t know by asking friends and Home Depot employees for tips, watching home renovation TV shows, and searching online. Once they have figured out the scope of the project, then they decide whether to tackle it on their own or start searching for a contractor. When considering installing a vent fan in the attic, Crystal described how her husband Jim “would look at the [online] shopping results for attic fans... he would look to see if it was something he could do himself. He would go up in the attic and see if he was able to access it through there, if it was something he could cut a hole in and put in power... And if it was too big of a project, he’d probably call and see if he could find someone to come out and do the estimate.”

DIYers take a lot of pride in their finished work. Part of this is seeing the physical evidence of their efforts, but there is also the satisfaction of saving money. Just like coupon clippers, DIYers believe that through their own savvy they’ve managed to save hundreds or even thousands of dollars while others might pay a contractor full price.
Consumers who hire contractors included people who lived in condos, single women, and households with incomes higher than $99k. At this income level, their time was more valuable to them than the cost of hiring someone to do a project. Whereas DIYers used resources like This Old House and handy friends to help them figure out what they didn’t know about a potential project, the consumers who hired contractors educated themselves primarily by interviewing multiple contractors. They used word-of-mouth referrals to find contractors and would then get bids that helped them understand what a project required and what price range to expect. Unlike DIYers, who were proud about every project they had done, consumer who hire contractors only feel a sense of pride about very visible, “showcase” projects, such as remodeled kitchens, painting, and new floors. In describing having her bedroom painted, Joann explained that:

“I’m not good at this, I’m not a decorator, I don’t get it, I can walk into a room and say that looks great but I’m not the kind of person who can figure it out at all so I started talking to my sister, getting some ideas from her because she likes to paint. I got some [paint swatches] from True Value and had 4 or 5 of those here. Then one day I asked one of the doormen, ‘Do you know somebody who paints?’ and he said, ‘Yeah, one of the maintenance guys.’ I showed him kind of what I was thinking about and he made a recommendation because of the windows and the lights you may want to go one shade darker and keep this shade for the bathroom and I said ok.”

**Retrofit Process**

When planning and conducting a renovation, homeowners go through an eight-stage process. The process can be as short as a few hours for something like a light bulb or can extend for years, in the case of a large addition.

**Home Retrofit**

Conducting research and making decisions is the largest component of a retrofit. Consumers often halt or delay a project when the options and process become overwhelming.

![Diagram of the retrofit process](image-url)
Define “Broken”
Consumers don’t want to replace appliances and home features that work because they feel that it is wasteful. In order to make a change to their home, either something has to break or their perceptions need to change so that they begin to view something as broken. For example, if they decide to put their home on the market, they may decide to repaint rooms because their color scheme will turn off potential buyers. This stage of the process can be the longest one, as consumers may be unaware of problems, like old windows, or may continue tolerating a broken appliance because they don’t want to pay to replace it.

Get Ideas
During their early research, consumers seek to understand what they don’t know. They may not know the technical terms for their problem, which can limit their ability to search online. As a result, many seek word-of-mouth advice at this point, either at a hardware store or by asking a handy friend, neighbor, or family member.

Determine Scope
Once they have a rough notion of their options, consumers then want to determine the cost, effort, and time required for the renovation. For DIYers, this stage is where they figure out if they can do something themselves or if they need to hire an outside contractor. As they have already learned the technical terms for what they need done, they can then use a search engine to seek out more detailed information and advice.

Shop
During the final stage of the research process, homeowners price shop for materials or contractors and decide between features and finishes. Consumer reviews are important during this stage, either via word-of-mouth recommendations for brands and contractors or through resources like Consumer Reports.

Do
Compared to the research process, the stage where the work is done is relatively short. All of the hard decisions about what to do, who to hire, and what to buy have been made, so only the work is left. That said, DIYers sometimes jump into projects without doing all of their research, which can mean multiple trips back and forth to the Home Depot, asking friends for advice, or if all else fails, hiring a contractor to finish or fix something.

Share
Once the project is finished, homeowners like to share the results with friends and family members. If it’s a DIY project, they will tell someone, regardless of the size and effort required. If they hired a contractor, homeowners will only share if the effort and cost was significant and the results visible, such as new carpets, new windows, or a new kitchen.

Evaluate
After living with the renovation, consumers have a chance to assess the
work. They may make additional adjustments, beginning the process over again. In the months after the project, they begin to look at their utility bills and see if the changes have made a difference.

Next Project
Every homeowner learns from going through the renovation process. If the results were successful, it will often inspire them to start researching the next thing on their list.

Appliance Shopping Process

Appliance Breaks
We observed that some homeowners continue to live for years with broken appliances, like bad windows, inefficient furnaces, and leaking washers. Some consumers recognize that their appliances are broken but delay purchasing a replacement while others are completely unaware.

Repair/Adapt
As an appliance like a furnace gets older, homeowners hire contractors to make repairs or adapt to its limited function. This can extend the life of the machine and delay shopping, but it can result in higher utility bills and thus a higher cost over the long run.

Define Broken
Eventually, a homeowner will have the financial resources and motivation to replace a broken appliance. Or a catastrophic failure, such as becoming sick from spoiled food caused by a broken refrigerator, will initiate the shopping process.

Appliance Shopping
Homeowners often limp along with broken appliances for years because the replacement cost is high. But when something finally fails completely, shopping for a replacement happens very quickly, often within a few weeks.
Upgrade
The exception is homeowners who are replacing working appliances as part of a remodel or upgrade. This type of purchasing was more popular during the housing boom, when credit was more available. When consumers do an appliance upgrade, they skip the first two steps.

Discover Options
Because homeowners shop for appliances so infrequently, the first stage is discovering how features and technology have changed since their last purchase. One of the surprising findings of the research was that many consumers remembered their sales person’s name years later. Especially for this older market segment, word-of-mouth and seeing the product in person remains vital to the shopping process.

Reassess Needs
Finding out about new features, like the convection feature on an oven or seeing a bigger television in the store can lead to consumers reassessing and redefining their needs. An appliance is an expensive purchase, so consumers seek to upgrade when replacing, rather than buying similar features.

Trade-Offs
As they get closer to making the purchase, consumers take their budget into account and have to choose which features they can afford. This step is much more difficult when a couple is making the decision, as both parties will value features differently.

Repeat
If the homeowner is replacing a suite of appliances, as in a kitchen remodel, they will then repeat the shopping process for the other appliances on their list. They usually begin with the most expensive appliance, such as the refrigerator. The remaining appliances are easier to pick after choosing the refrigerator because consumers have a smaller budget to work with and need to match the finish and handles of the remaining appliances to that of the refrigerator.

Install
The homeowner installs the appliance in their home or, more frequently, has the store deliver and install it. While consumers may use online resources, store websites, and reviews to help them pick an appliance, the need to see it in person and have it installed keeps most consumers from purchasing appliances online.

Learn
After the homeowner has their new appliance installed, they then learn how to use it. As few read manuals or adjust factory settings, this is clearly an improvisational process.
The Role of Incentives and Rebates

Overall, few homeowners in the study had a positive view of rebates and government incentives. Their perception of rebates was colored by their experience with the paperwork hoops and long waiting periods required by private rebates. It appeared that rebate and incentive programs rewarded purchases that consumers were already planning to make rather than motivating new purchases. An appliance purchase is a significant investment, so a government incentive or rebate can dull the pain of the cost but not offset it.

Of the more than thirty consumers who participated in the research, approximately four had experience with government incentives. Keith, who owns several investment properties, had claimed a tax refund of 20% on the $6,500 that he invested in insulation and new doors. Kristin’s husband Craig saw a news report about the “Cash for Appliance Clunkers” program just as his washing machine started to malfunction, so he was able to claim the reimbursement. Isekial also used the program and received a matching rebate from Home Depot. Finally, Laurie received a tax break when she purchased a Toyota Prius.

Donna: “No one ever pays rebates. I feel rebates are a joke. To get them you have to make 100 phone calls, you have to bug people. I’ve rarely found that they’re, I want to see the savings now. I’m against rebates.”

Caroline: “I feel like rebates are a little manipulative, because they hope that you’re not going to send them in.”

Andrea: “They don’t care. They’re hoping you don’t send [the rebate] in.”

Jill: “We did not get a rebate. I don’t like them unless they’re instant.”

The amount of effort required by the consumer to submit their incentive or rebate often outweighs the amount of money offset by the rebate or incentive, curtailing participation. Consumers identified these rebates as being similar to rebates offered at big-box retail stores aimed at discouraging fulfillment.

Choosing a Refrigerator Drives Appliance Decisions

When homeowners shop for a new suite of kitchen appliances, they end up choosing the refrigerator first.

“We decided on the fridge first, and it was a decision. Refrigerators are pretty expensive.”

As the largest, most expensive, and most frequently used kitchen appliance, refrigerators are the centerpiece of the kitchen. While consumers can use workarounds if their stove or dishwasher breaks, a broken refrigerator has no backup. When it fails, consumers will move to replace it as soon as possible.
Unlike the oven or stove top, all members of the household use the refrigerator. During the appliance shopping process, multiple family members will give their opinion on possible features, such as a preference for an in-door icemaker. They have weaker preferences, if any, towards specific oven, stove, microwave, or dishwasher features.

During the shopping process, homeowners want to make sure that they budget for all of the appliances that they need. By buying the refrigerator first, it makes it easier to then divide the remaining funds among the other appliances. Unfortunately, the price, pressure to replace a broken appliance, opinions from family members, and the number of options can make this decision difficult. But once they have chosen the size, features, finish, brand, model, and price of the refrigerator, it then becomes much easier to choose the remaining appliances. Having chosen the refrigerator, consumers use its finish and handle design as a heuristic or quick-problem solving strategy to choose the remaining appliances. If they want all of the finishes and handles to match on their appliances—and most consumers do—there are then only two or three models to choose from for the stove, oven, microwave, and dishwasher.

“For the fridge, the number one feature my husband wanted was to have the water and ice on the outside. Which I didn’t want to do at all. I gave in on that one. So we chose the fridge first, and then chose the rest of the appliances based on if they matched. Same lines and handles and things like that.”
Conclusions

Substantial Barriers

Citing global warming and electricity prices, consumers are reporting small changes. Many consumers are installing CFLs when their old light bulbs burn out and making adjustments to their thermostats. Substantial barriers exist that prevent many consumers from making more significant energy efficiency retrofits to their homes. These include:

- Consumers focus on the tangible sources of energy use but overlook the costlier, hidden areas of their home.

- Homeowners recognize that saving money and energy is a good thing, but it is not something that is aspirational or motivating.

- The benefits of efficiency and the terms and language that communicate them are too abstract to change consumer behavior.

- Consumers have a lack of knowledge about retrofits and often perceive them as being too difficult, time-consuming, and/or expensive.

- Consumers don’t want to do retrofits or replace products if the existing situation “works” or “isn’t broken,” as they perceive that as being wasteful.

- Efficiency is just one product feature out of many and it can be subsumed by the desire to purchase something that is cheaper or offers other benefits.

- Few consumers read brochures and savings tips included with their electric and gas bills.
Tactics for Influencing Retrofits

Tactics to address the above barriers as a first step towards changing consumer behavior. Based on research these include:

- **Recognize Different Consumer Drivers**
  Segment consumers depending on their propensity to do retrofits and DIY projects. Consumers who undertake their own projects also recognize that they can do more themselves. The best tactic for informing these DIY consumers is communicating the ease and process of retrofits. Consumers who do not undertake do-it-yourself projects need to be educated about the consumer values of a particular product, or retrofit. Education around consumer values should reframe the question for consumers as one of need in contrast to focusing on the environmental or energy savings benefit.

- **Define “Broken” For The Consumer**
  Spark the retrofit process by helping consumers to diagnosis existing problems and understand that their current situation is broken. Consumers commonly think their products are not broken when in reality they are working significantly less efficiently. For instance, redefining an inefficient furnace that has increased ongoing monthly costs as a broken furnace that needs replacement may be more persuasive than showing the payback period and monthly savings of the new furnace installation. Highlighting individual examples of these energy hungry products, and providing personalized ways to address those problems are the most effective ways to connect with the consumer.

- **Focus on Comfort, Appearance and Social Norms Before Energy Savings**
  Target consumers’ unmet needs as they perceive and experience them, which could be an upstairs bedroom that feels cold, a loud furnace, or a gusty living room. Consumers identify and understand home comfort, temperature, and sounds significantly more than energy savings. Address the immediate, concrete benefits of doing a retrofit, such as appearance and comfort, rather than focusing on one-year or ten-year savings that are harder for homeowners to conceptualize. Give inspiration by making retrofits “sexier” and more aspirational. Using gorgeous photos, before and after shots, and DIY project guides may offer more aspirational and motivational value to consumers than showing them savings on their electric and gas bills.

- **“Show” Retrofits Before You “Tell”**
  Consumers perceive retrofits as being complicated, requiring expertise throughout the process. Demonstrations and personal advice are powerful for consumers who encounter them. Try to drive consumers to video sharing sites, knowledgeable friends, free classes, and hardware stores to get their questions answered. Help them to see that a DIY efficiency project can be easier than they think.

- **Make It Personal**
  Consumers are skeptical about efficiency ratings and the motivations of utilities. Consumers have more interaction with their regular handyman than a home energy auditor. Consider methods to reach handymen and contractors as a channel for sparking efficiency projects. Personalized tools and tailored advice based on their own home and circumstances are perceived as more trustworthy. For this reason, diffuse marketing efforts such as television, radio and print may have less of an impact than reallocating marketing resources to change agents on the ground, like trusted community leaders, retailers, contractors and others.