



# Sense Research Report

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**Always On Energy in U.S. Homes:  
The Next Frontier in Home Energy  
Savings**



## Executive Summary

The “always-on” energy that lets you turn on consumer electronics instantly with a click and keep pool water clean has gone from a trickle to a flood that uses almost a quarter (23%) of home energy. Unnoticed by most homeowners, it costs U.S. households nearly \$41B and contributes 317M metric tons of carbon to the atmosphere annually.

Sense conducted a direct analysis of energy in more than 4000 homes combined with a homeowner survey and a separate consumer study conducted on their behalf by The Harris Poll. It found that :

- Filling a home with lots of consumer electronics--which stay on continuously--drives up energy bills dramatically
- While larger homes tend to have more gadgets, house size doesn't matter - the number and type of gadgets does
- Always on appliances like pool pumps and hot tubs are big drivers of energy waste, too
- Most homeowners don't know how much always-on energy they use and don't take simple steps to control it

The energy cost of always on devices varied widely, influenced by house size, proliferation of home electronics and ignorance about the energy drain imposed by certain appliances. For instance, the top 10% energy guzzling homes use 15x always on energy compared to energy sippers in the bottom 10%. The energy guzzlers have an average of 14 home electronics, as well as appliances like pool pumps and hot tubs. The top 10% of homes account for 30% of total Always On energy use across all 4000 homes sampled, pointing to the outsize impact of the most wasteful homes in the residential energy picture.

## Executive Summary

Looking at home electronics alone, homes with 15 home electronics had twice the energy consumption and quadruple the always on usage of homes with only two home electronics. This strong impact might surprise homeowners, many of whom have learned to look for efficient home appliances but don't analyze home electronics the same way.

Most homeowners don't understand the impact of Always On devices or take steps to control it. Findings from the survey conducted by The Harris Poll on behalf of Sense found that:

- The vast majority (82%) don't know how much of their total annual household electricity usage comes from consumer electronics and other appliances that use electricity continuously even when they are not in active use.
- Day-to-day habits undermine energy conservation. For instance, most homeowners (52%) sometimes/rarely/never check that the energy-saving mode is selected when they set up their home electronics and only 33% always/often put some of their network-connected devices on power strips and turn them off at night or when not in use.
- When it comes to purchasing gadgets, most homeowners don't consider energy an important buying criterion, with only 38% of saying that energy efficiency would be very important to them when selecting which models of consumer electronics to purchase.

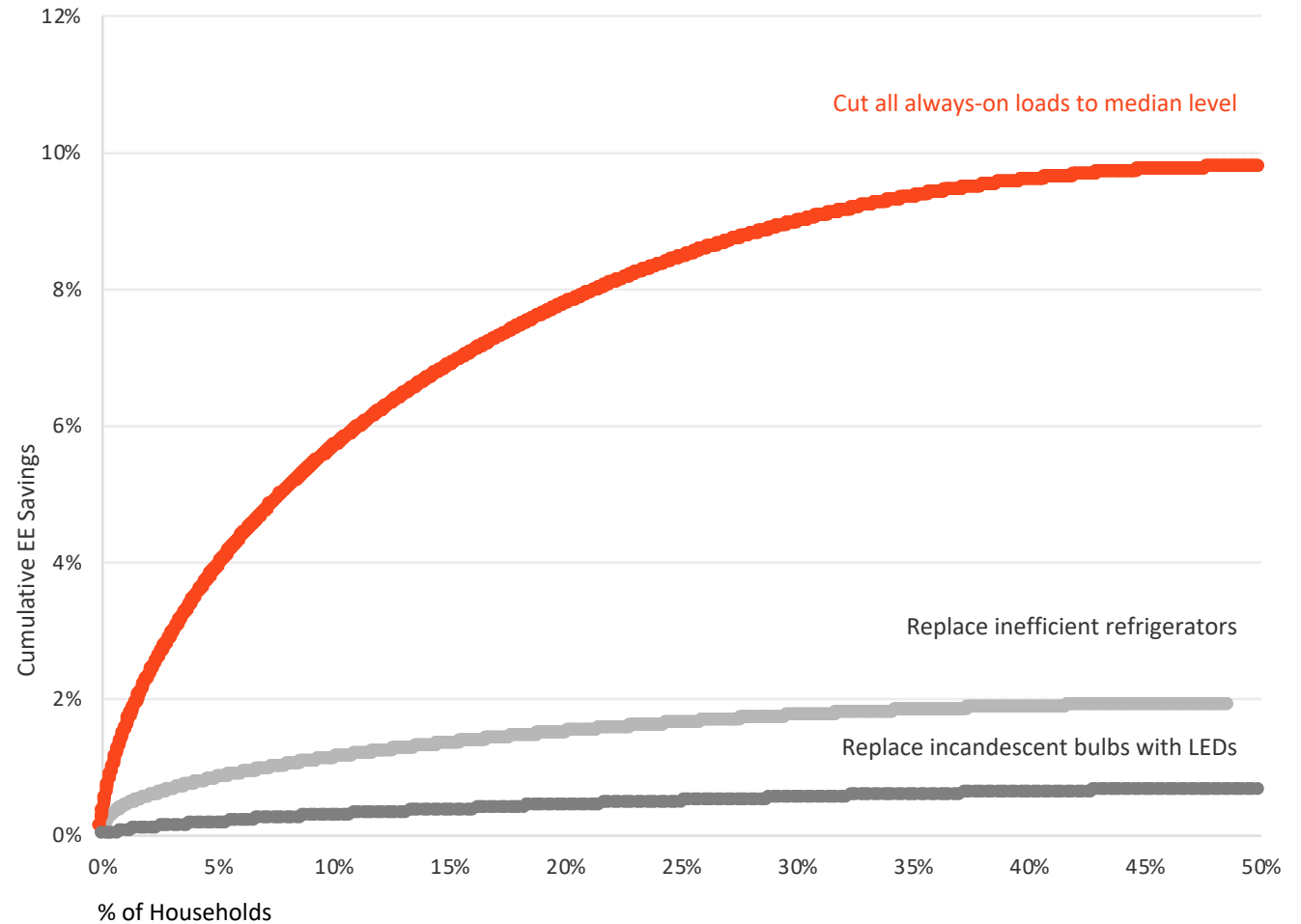
Habits that could reduce energy savings in the home are lacking and homeowners don't have the information they need about the impact of their Always On devices on both their home costs and the environment.

Do people care? Yes. The Harris Poll conducted for Sense showed that most American adults (74%) think the government should set stricter guidelines for manufacturers to make their products more energy efficient and 77% agree that carbon emissions from human activity cause climate change.

## Reducing Always On is the next frontier in home energy savings

Reducing higher-use homes to the median Always On rate of 350W would cut overall energy usage in the U.S. by 10%, making a bigger impact than replacing incandescent bulbs or inefficient refrigerators.

The 10% energy reduction translates into \$18B annual savings for US households and would move the country 2% closer to the goals set at the 2015 Paris Climate Agreement.



## Research Methodology

### Sense Survey and Analysis

Sense analyzed energy data from 4271 customers' homes whose owners responded to a brief survey conducted in September 2018. The survey asked homeowners their zip code, number of household members, the year their house was built and the total square footage. It also asked respondents to enumerate their consumer electronics and other electrical devices in their homes.

### Harris Survey

The survey was conducted online within the United States by The Harris Poll on behalf of **Sense** from September 18 to 20, 2018 among 2,006 U.S. adults ages 18 and older, among whom 1,374 are homeowners. This online survey is not based on a probability sample and therefore no estimate of theoretical sampling error can be calculated. For complete survey methodology, including weighting variables and subgroup sample sizes, please contact Sense.



## Sense Survey: devices surveyed

### Appliances

Aquarium / Pet cage with heat lamp  
Attic / Basement fan(s)  
Computer Servers / Network Attached Storage  
Electric baseboard / radiant heat  
Basement dehumidifier  
Electric vehicle charger  
Hot tub with constant hot water  
Hot water recirculation systems (“instant hot water”)  
Pool pump  
Hot water recirculation pump  
Hot tub / Jacuzzi  
Security Cameras

### Consumer Electronics

Cable box  
DVD/Blu-ray player  
Game console  
TV  
Streaming device (Apple TV, Roku, etc)

# Sense Home Data





# How much energy does the average US home consume?

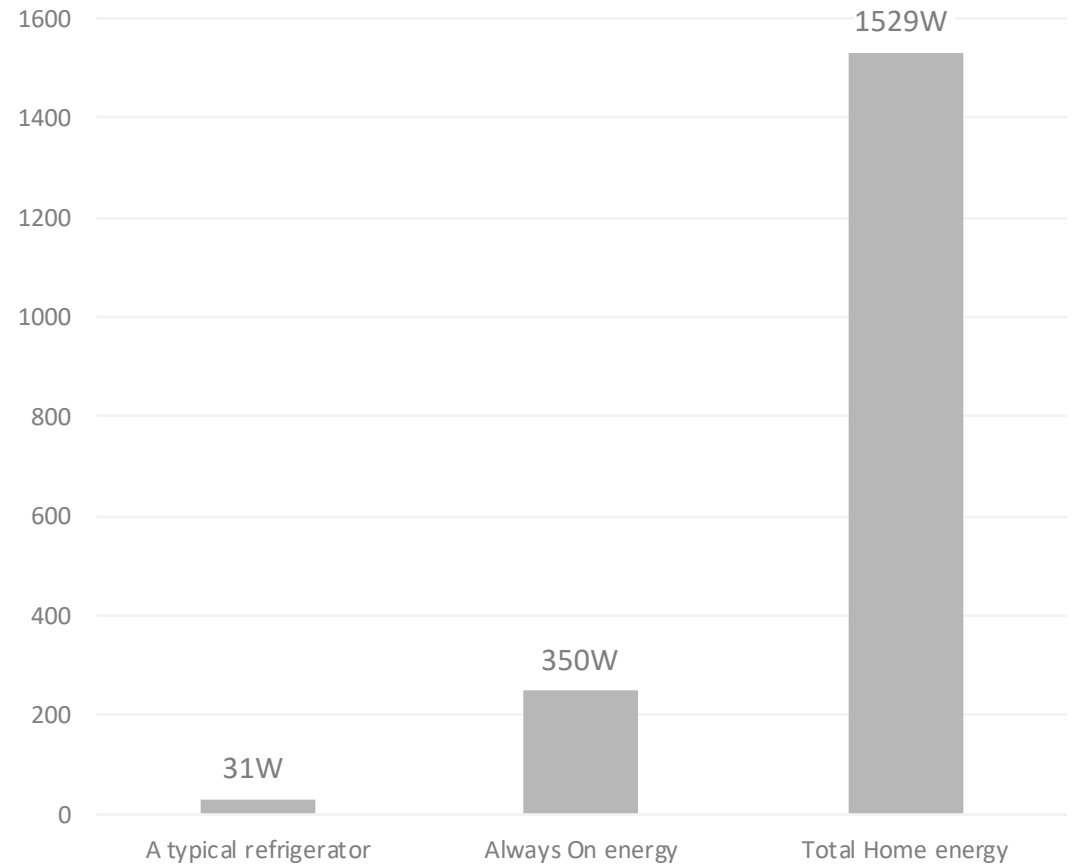
**Always On energy consumes 23% of overall energy consumption, or the equivalent of 11 refrigerators.**

Homes consume an average of 1529W, equivalent to 50 refrigerators at 31W each.

Sense analyzed energy data from more than 4000 homes across the continental U.S.\* These numbers closely match Sense's data for the entire customer base.

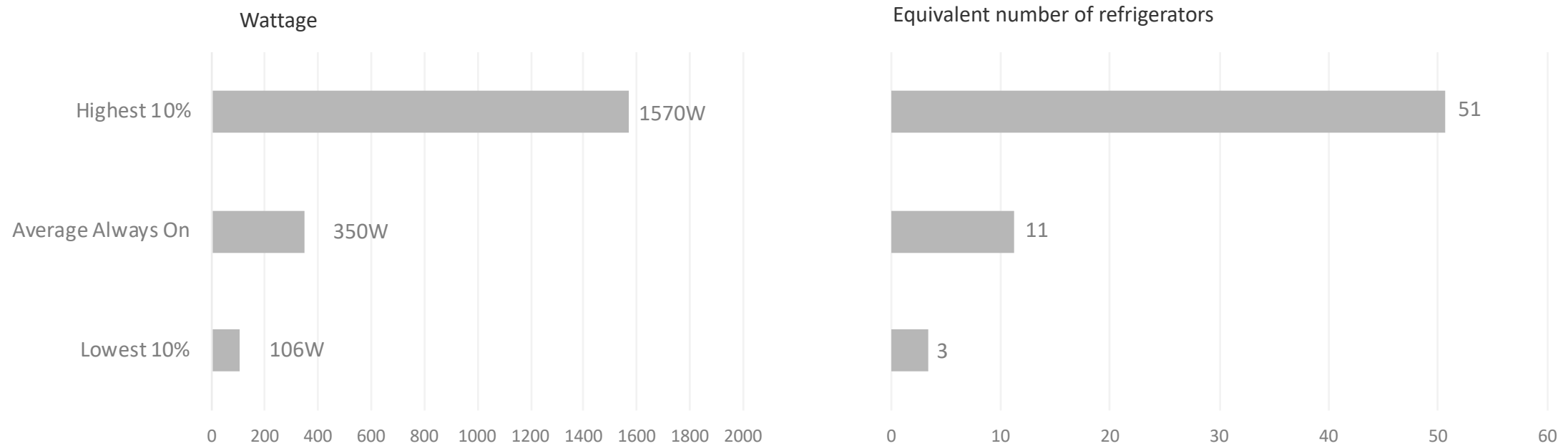
Note that this figure matches findings of a [2016 study by NRDC](#).

- Data sampled for an average of 207 days



## Homes differ widely in their average Always On energy use.

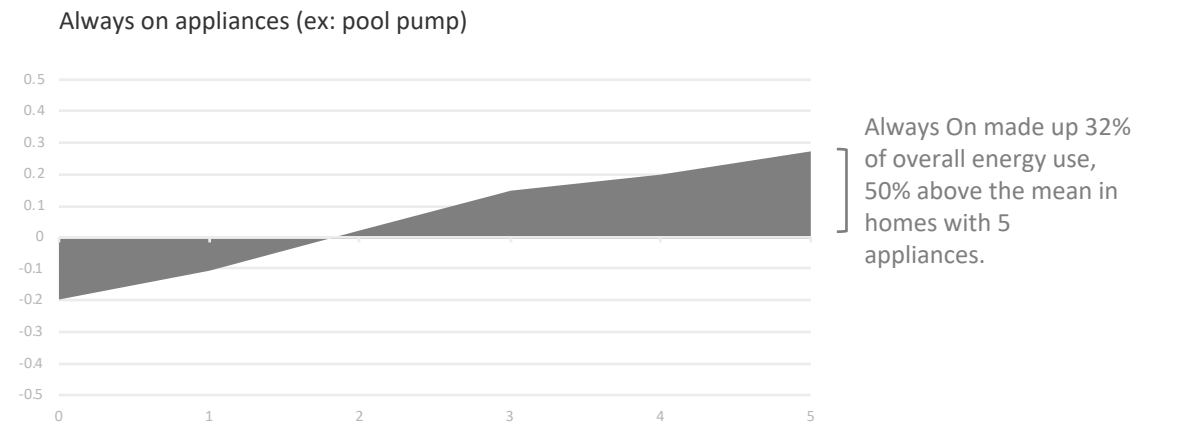
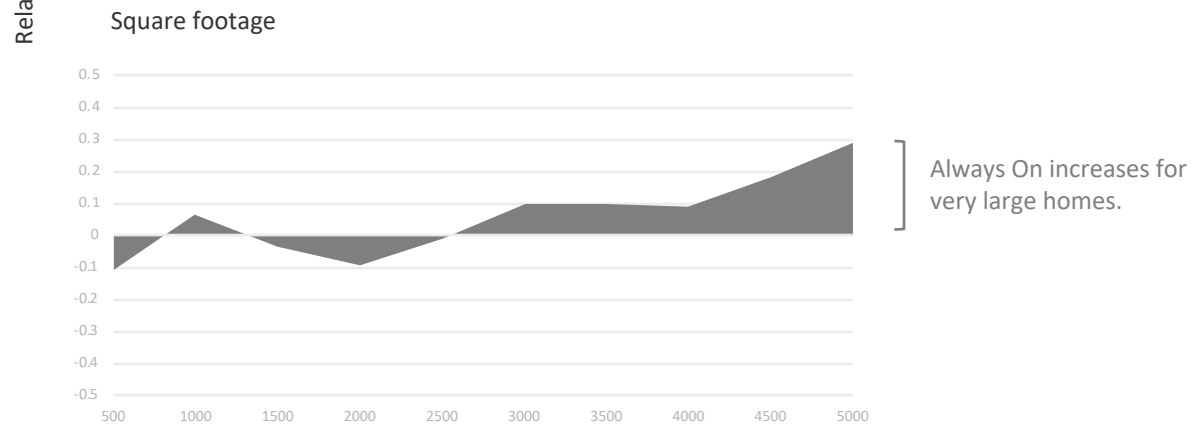
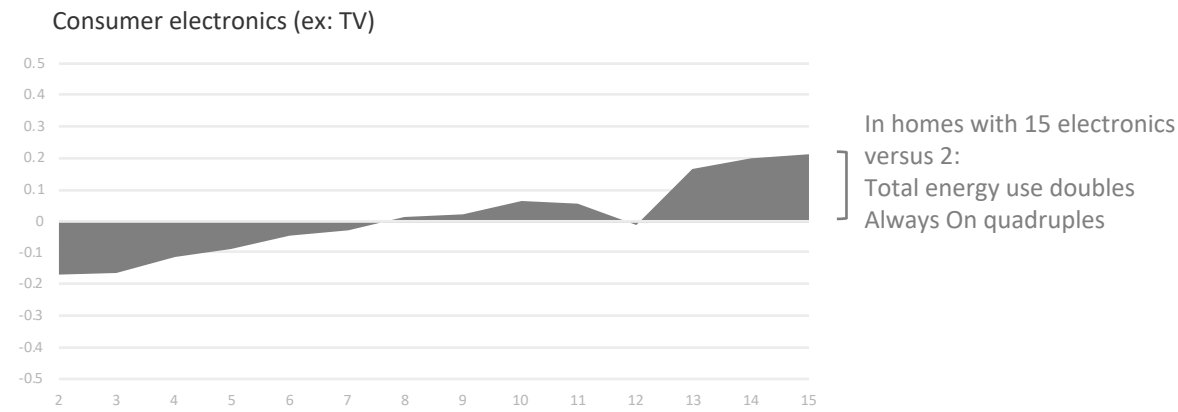
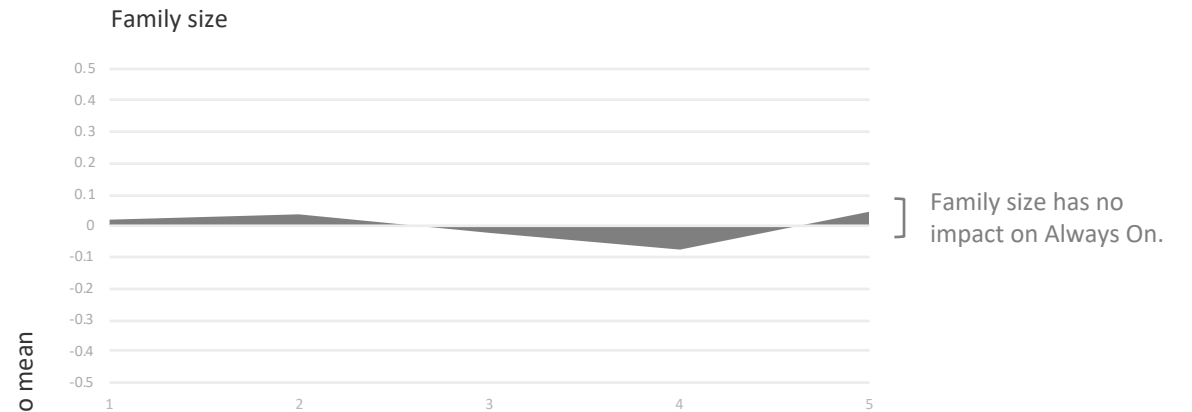
Homes in the top 10% of energy use had a higher Always On than the average home's **total** energy use (1570W vs 1529W). Their Always On is equivalent to the energy used by 51 refrigerators.



# What accounts for these differences?

Bigger houses, homes with many consumer electronics, and with a high number of Always On appliances have a disproportionate effect on Always On energy use compared with Total energy use.

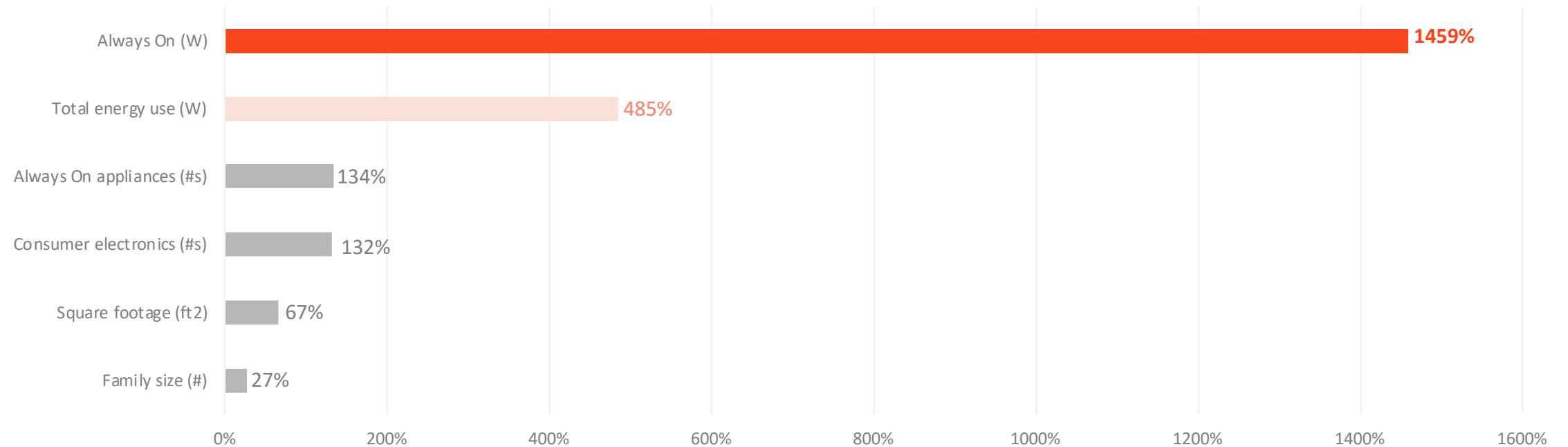
## Impact on Always On relative to Total energy use



## Always On grows disproportionately to total energy use.

Homes in the top 10% of energy use consume nearly 500% more energy than those in the bottom 10%, but have an Always On that is nearly 1500% higher. One would expect that as house and family size grow, homes will have more appliances and electronics and therefore energy use and Always On increase in tandem. Instead, Always On accelerates much more rapidly. This could be explained by homeowners filling large houses with many devices that constantly drain electricity even though they are not used by family members.

### Differences between homes in top 10% of energy use as compared to the bottom 10%.



## A Tale of Two Homes

Large homes generally use more always-on energy, but they can be very efficient, and small homes can use a lot of energy. What matters is how many and what type of gadgets are running continuously. These are two actual homes whose total energy footprint is quite close but their always-on differs by 23x.

	5000 ft <sup>2</sup> Home with 52W Always On Energy	2000 ft <sup>2</sup> Home with 1230W Always On Energy
Square footage	5000	2000
Family size	4	2
Consumer electronics	3 (TV, Cable, Streaming)	14 (4 TVs, 4 Cable, 2 Game consoles)
Always On appliances	1 (Dehumidifier)	7 (Aquarium, Fan, Servers, Instant hot water, Pool pump, Security camera)
Energy use	3290W	3750W
Always On	52W	1231W

## The Always On Flood is not inevitable



Sense Community member markhavis73 reported 53W at his North Carolina home, one-seventh of average Always On.

My rule is to save energy without making any sacrifices to my lifestyle. For Always On energy, the first thing I encourage is to make note of the following vampire drains:

Anything with a programmable controller is drawing power.

Anything that uses a remote is drawing power.

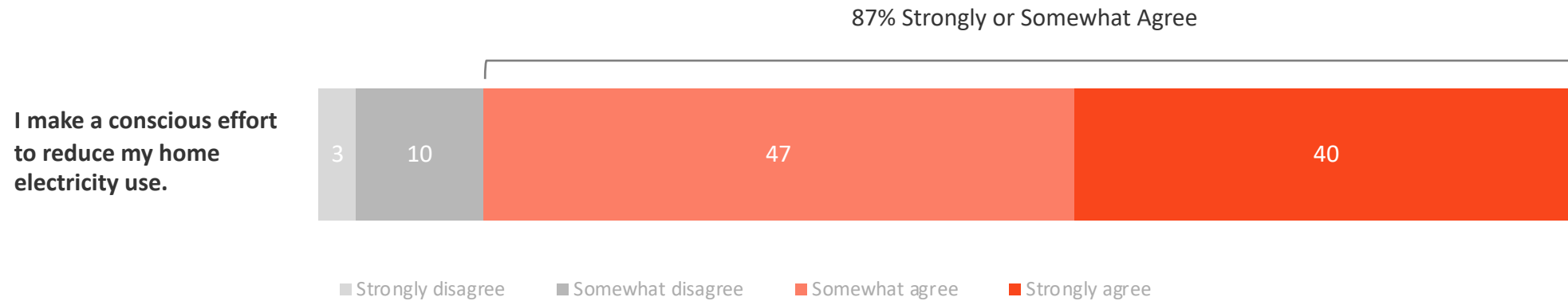
Anything with a DC transformer is drawing power.

# The Harris Poll on behalf of Sense



## Most homeowners say they make a conscious effort to reduce their home electricity use.

How much do you agree or disagree with the following statements?  
[Strongly disagree, Somewhat disagree, Somewhat agree, Strongly agree]



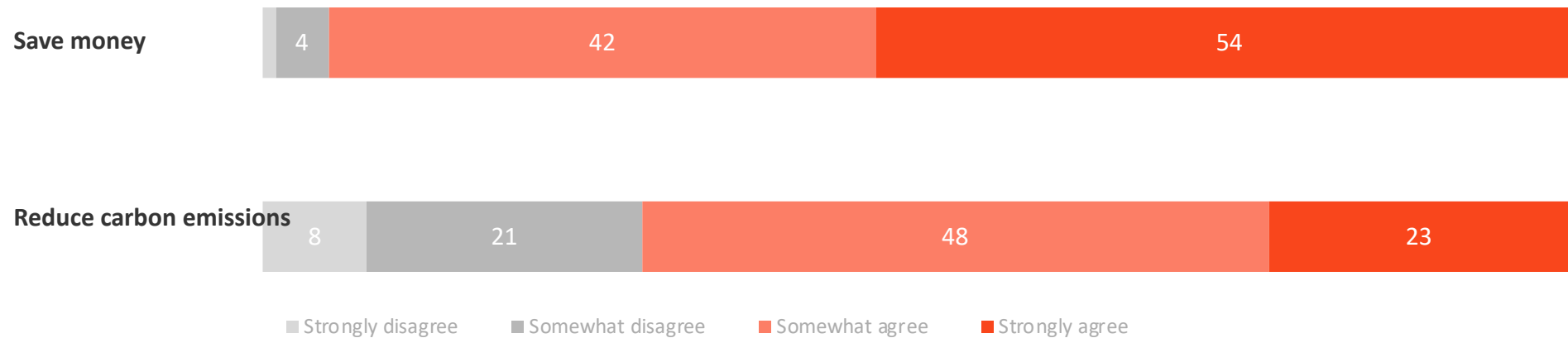
N = 1428 U.S. Homeowners



# Saving money is a stronger motivator than saving the planet.

How much do you agree or disagree with the following statements?  
[Strongly disagree, Somewhat disagree, Somewhat agree, Strongly agree]

I try to reduce my home electricity usage in order to...

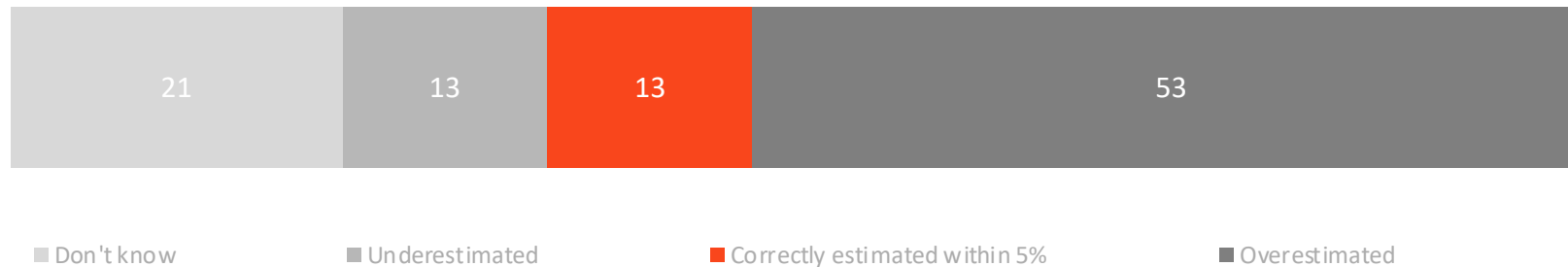


N = 1244 U.S. Homeowners who strongly/somewhat agree "I make a conscious effort to reduce my home electricity usage"

**When asked to estimate the Always On usage in an average household, only 13% of homeowners guessed within 5% of the correct answer: 23%.**

Thinking about the average U.S. household, about what percentage of their total annual household electricity usage do you think comes from consumer electronics and appliances that use electricity continuously, even when they are not in active use?

[Enter a number 0-100% or choose "Don't Know"]



N =1374 U.S. Homeowners



## 82% of U.S. homeowners don't know what percentage of their total household electricity usage comes from Always On usage.

Do you know what percentage of your total annual household electricity usage comes from consumer electronics and appliances that use electricity continuously, even when they are not in use? [Yes/No]

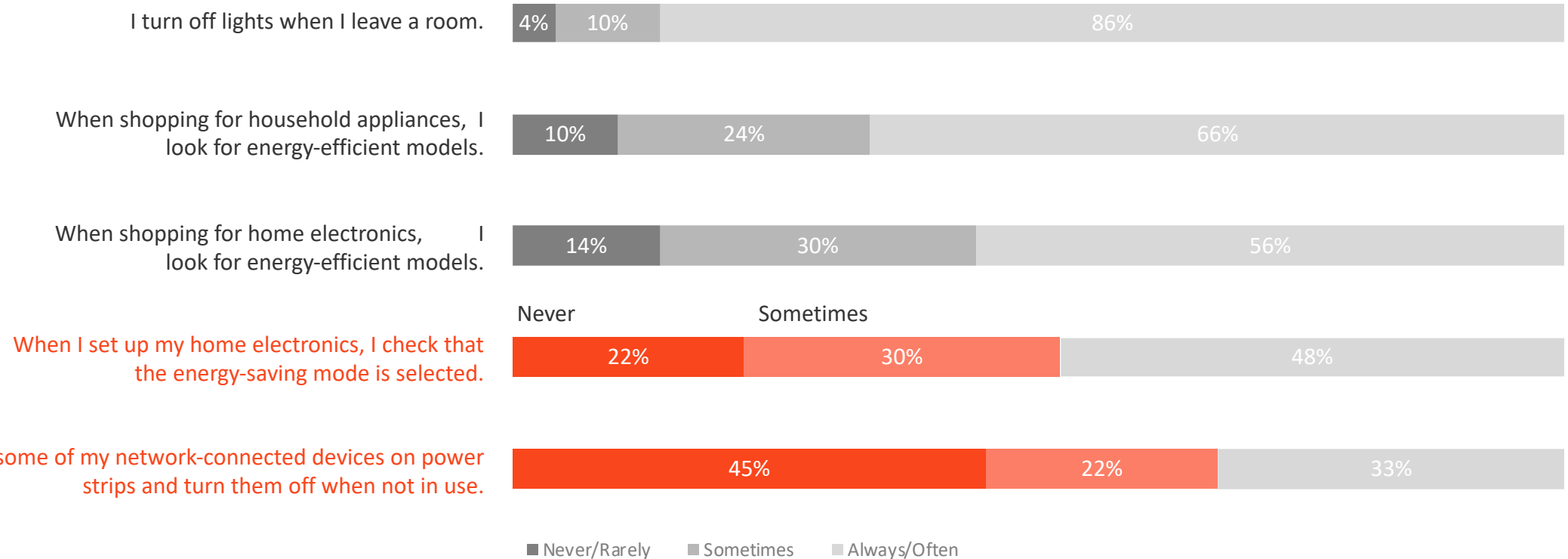


N = 1374 U.S. Homeowners

# Homeowners often don't use simple best practices to reduce always on energy consumption.

Please tell us how often the following statements apply to you.

[Never, Rarely, Sometimes, Always]



N = 1374 U.S. Homeowners

# Nearly a third of U.S. homeowners are not aware that home electronics like TVs continue using electricity after being turned off by the remote.

To the best of your knowledge, is the following statement true or false?  
[True, False, Not at all sure]

When I turn off my TV using the remote, it stops using electricity.



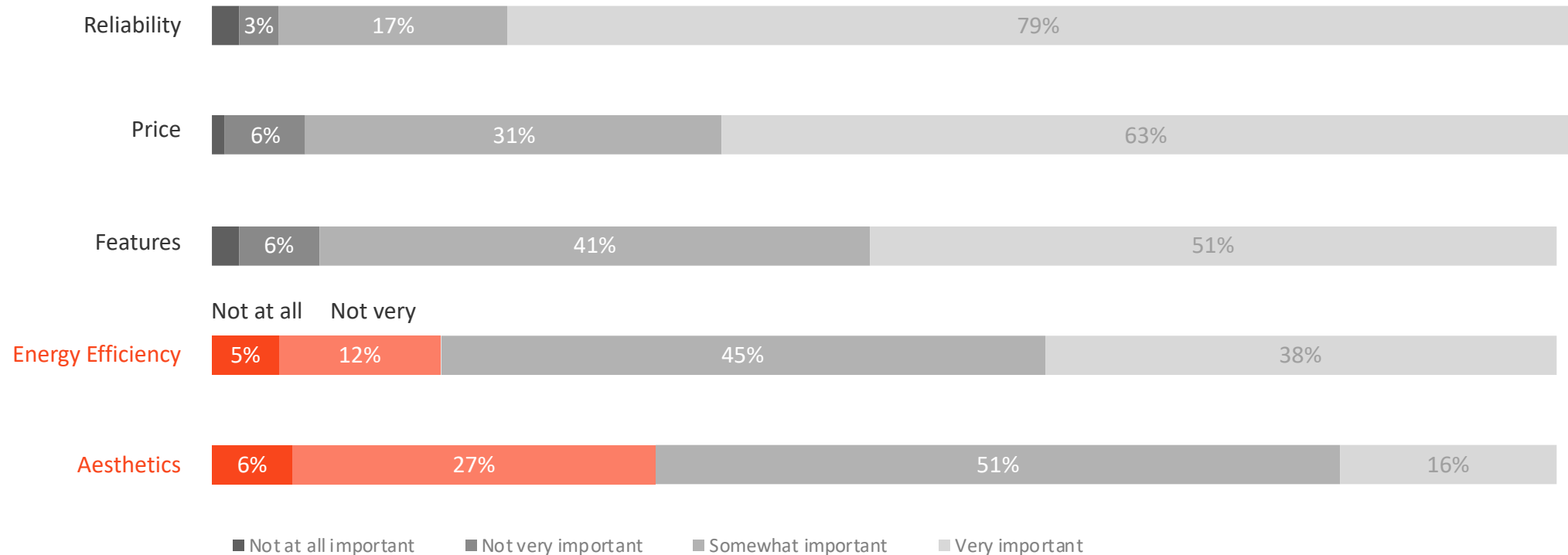
N = 1374 U.S. Homeowners



# Energy efficiency is not a top priority for consumer electronics purchases.

Please think about how you shop for consumer electronics (e.g. TVs, DVD/Blu-Ray players, computers, printers). How important would each of the following be to you when choosing which model to purchase?

[Not at all important, Not very important, Somewhat important, Very important]



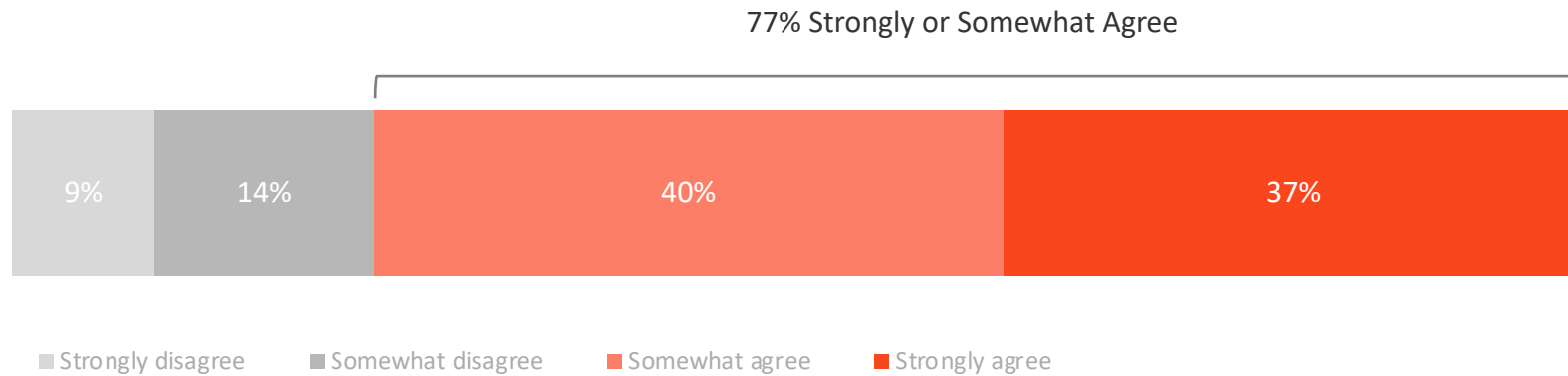
N = 1374 U.S. Homeowners

# 77% of U.S. homeowners generally agree that climate change is caused by human activity.

How much do you agree or disagree with the following statements?

[Strongly disagree, Somewhat disagree, Somewhat agree, Strongly agree]

**The earth's climate is changing due to carbon emissions from human activity.**



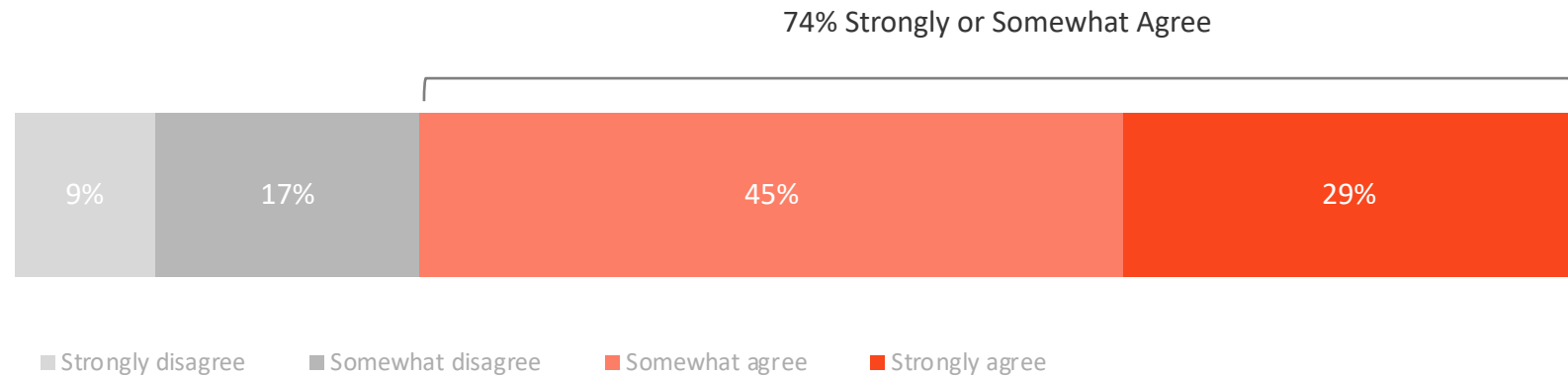
N = 1374 U.S. Homeowners

# 74% of U.S. homeowners generally agree that the government should take a role in energy savings.

How much do you agree or disagree with the following statements?

[Strongly disagree, Somewhat disagree, Somewhat agree, Strongly agree]

**The government should set stricter guidelines requiring appliance and consumer electronics manufacturers to make their products more energy efficient.**



N = 1374 U.S. Homeowners

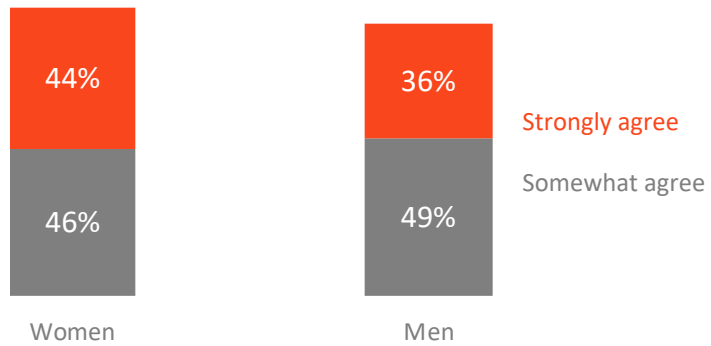


# Demographic break-outs

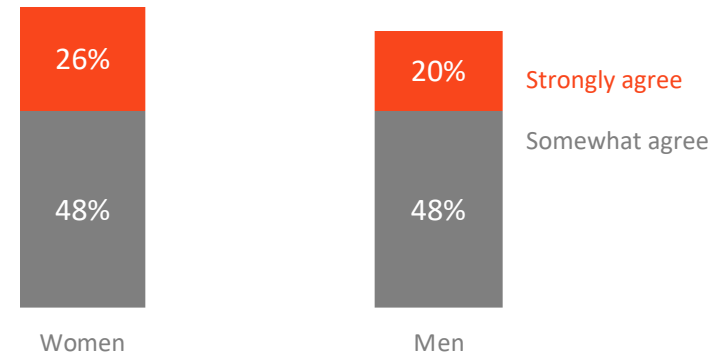


# Women are more energy-conscious and more likely to engage in energy saving practices.

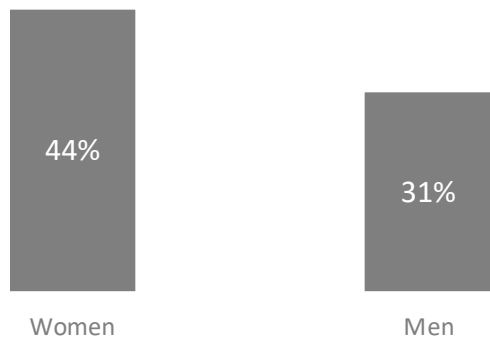
I make a conscious effort to reduce my home electricity usage.



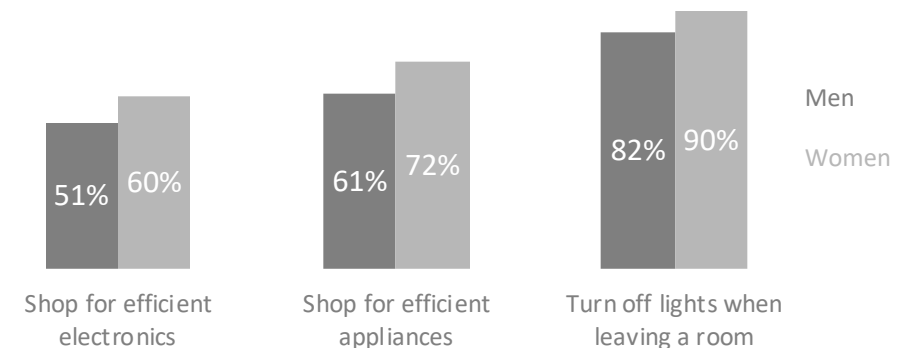
I try to reduce my home electricity usage in order to reduce carbon emissions.\*



When shopping for consumer electronics, how important is energy efficiency to you when choosing which model to purchase? (% Very Important)



How often do the following statements apply to you? (% Always/Often)

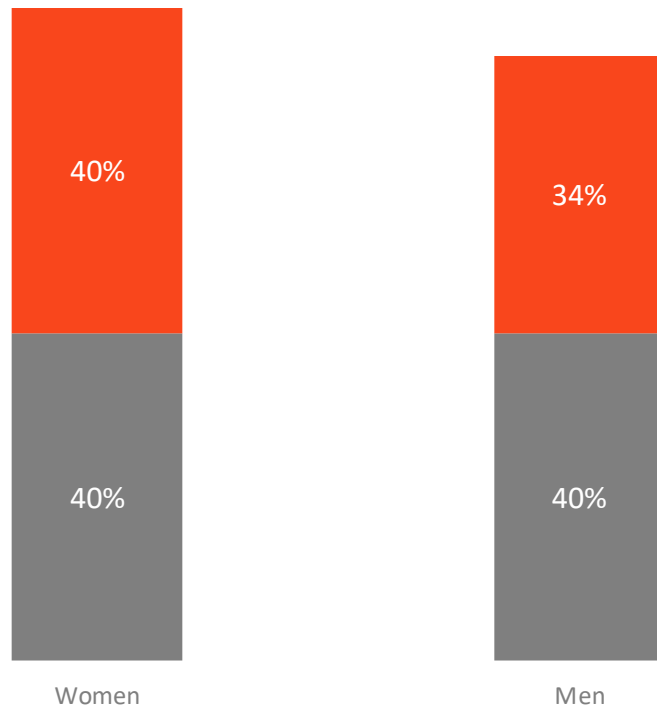


N = 1374 U.S. Homeowners

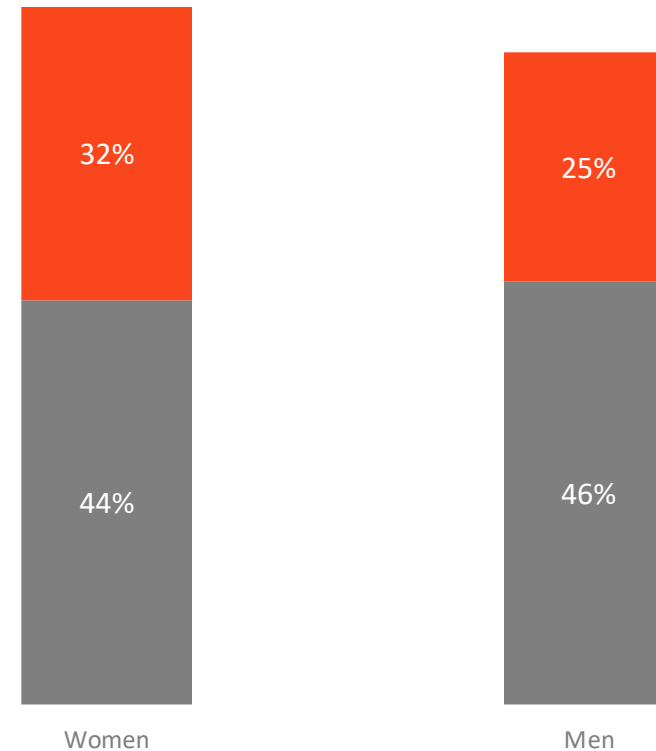
\*Response by 1244 homeowners who somewhat/strongly agree to: "I make a conscious effort to reduce my home electricity usage."

## Women are more likely to believe that climate change is caused by human activity and that the government should take a role in energy savings.

The earth's climate is changing due to carbon emissions from human activity.

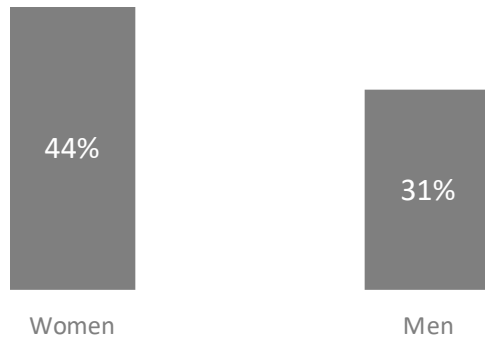


The government should set stricter guidelines requiring appliance and consumer electronics manufacturers to make their products more energy efficient.

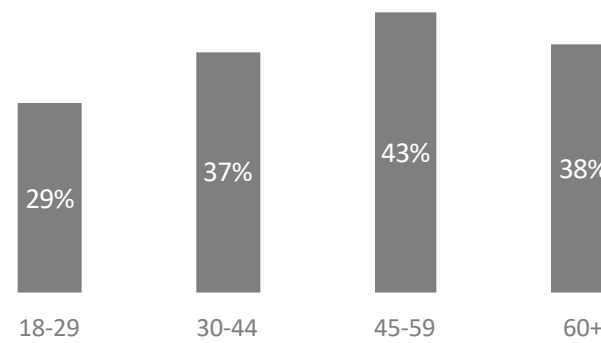


# Choosing energy efficient electronics is...

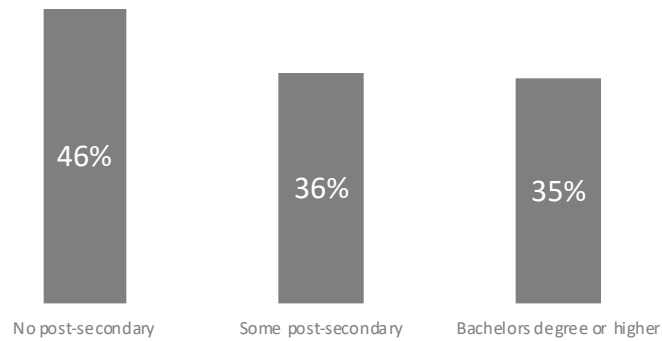
More important to women



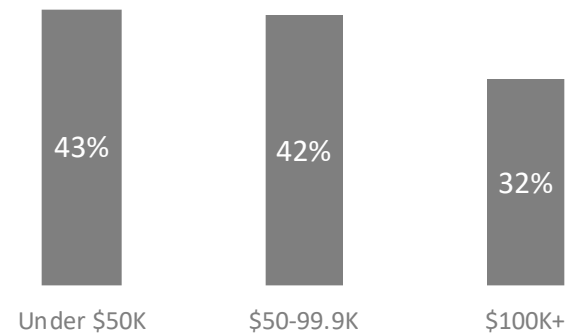
Less important among ages 18-29



More important to those with no post-secondary education



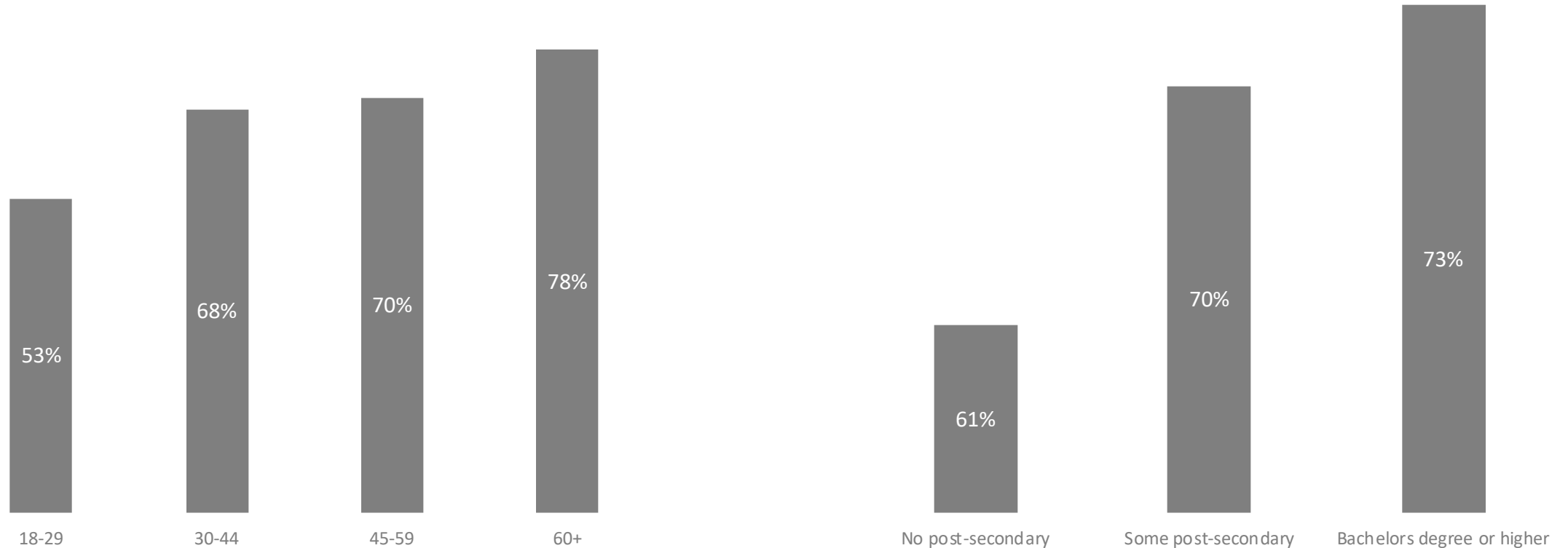
Less important to high-income respondents



# Older and more highly educated homeowners were more likely to know that when they turn their TV off using the remote, it continues to use electricity.

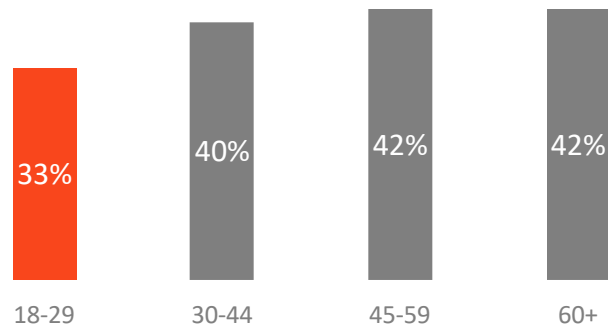
When I turn my TV off using the remote, it stops using electricity.

Percent correctly answering False:

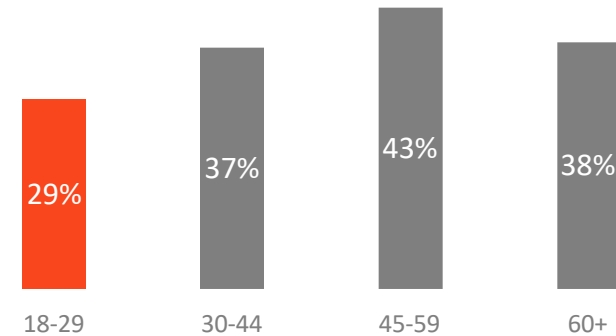


## Homeowners ages 18-29 are less likely to make energy efficient choices.

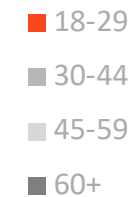
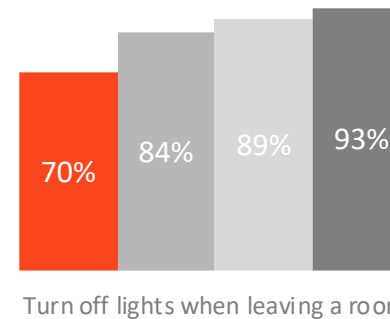
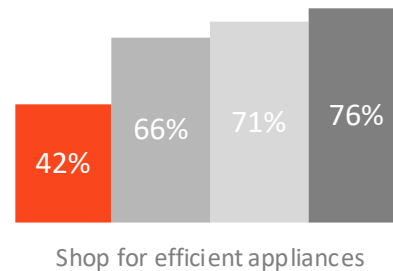
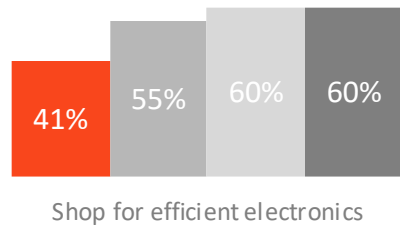
They are **less** likely to make conscious efforts to reduce home electricity usage.  
(% Strongly agree)



They are **less** likely to say that choosing energy efficient electronics is very important.



They are **less** likely to shop for efficient electronics and appliances and to turn off lights when leaving a room.  
(% Always/Often)

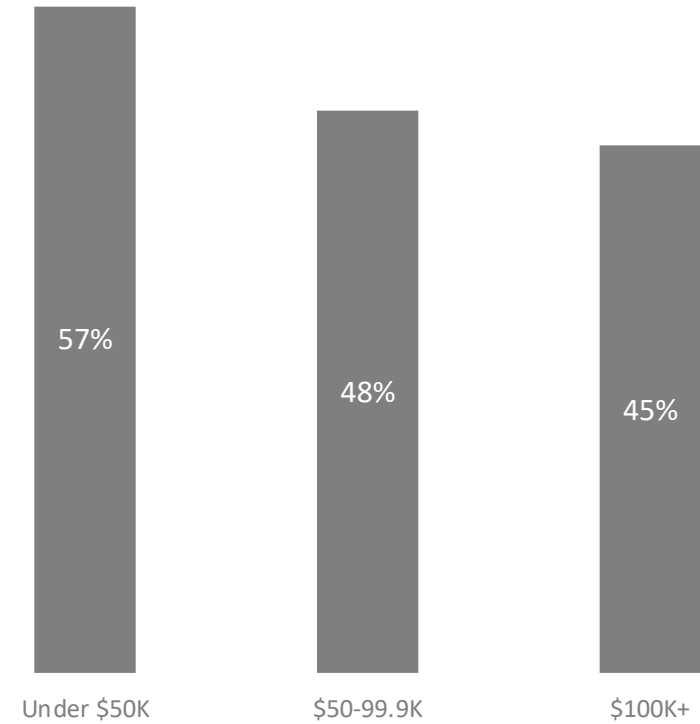


## People with incomes below \$50K are more likely to reduce electricity usage for the purpose of saving money.

How much do you agree or disagree with the following statements?

% responding Strongly Agree

I try to reduce my home electricity usage in order to save money.

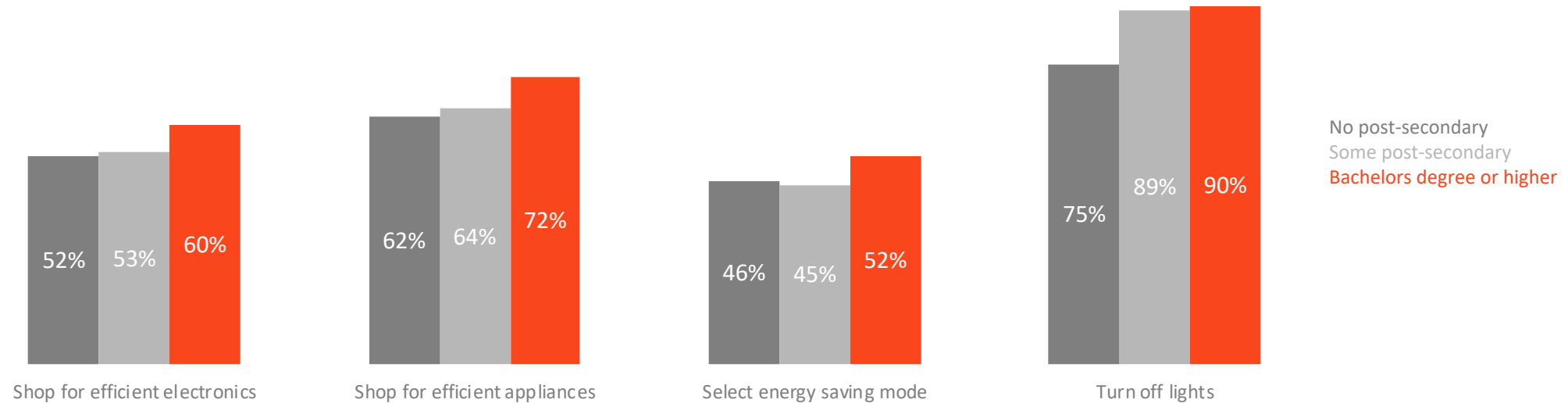


N = 1374 U.S. Homeowners

## Those with more education are more likely to engage in energy-saving practices.

Those with Bachelors degrees or higher are more likely to shop for efficient electronics and appliances and to set up their home electronics on energy-saving mode. Those with no post-secondary education are less likely to turn off the lights when leaving a room.

% responding Always or Often



N = 1374 U.S. Homeowners





**Thank you**

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