

SAVING ENERGY AT HOME AND ON THE ROAD:

A survey of Americans' energy saving behaviors, intentions, motivations, and barriers



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Executive Summary

Reducing energy use is near the top of the agenda at every level of government: President Obama, Congress, federal agencies, state and local government, as well as community organizations across the nation are currently considering a variety of policies and programs to encourage and help American families become more energy-efficient in their homes and travels. To be truly effective, however, a national strategy must take into account the energy efficiency and conservation actions Americans have already taken, the actions they intend to take (perhaps with some support), the reasons that motivate energy conservation, and the barriers that currently prevent Americans from saving more energy. This report begins to answer these questions through use of a nationally representative survey on Americans' energy-efficiency and conservation behavior as part of a broader study of their attitudes and behaviors regarding global climate change.

In September and October of 2008, a nationally representative survey of 2,164 American adults was conducted by researchers at Yale and George Mason Universities. Respondents were asked a series of questions about their energy-efficiency and conservation behaviors, including their current behaviors, future intentions, barriers, motivations, and beliefs about the impact of energy-saving actions on global warming and their own quality of life.

Overall, roughly half of Americans say they have already made energy-efficiency improvements to their homes, while many others say they intend to do so in the next 12 months. Substantial numbers also say that they would like to make energy-saving home improvements and buy fuel-efficient cars, but probably won't – in many cases because they can't afford to, or, in the case of home improvements, because they don't know how or are too busy. Very few Americans say that they are unwilling to spend money on energy-efficiency.

Energy conservation behaviors, however, are quite variable. More than 90 percent of Americans report that they regularly turn off unneeded lights, yet only about 20 percent say they always or often take public transportation, car pool, walk, or bicycle instead of driving. Many report that several barriers impede their ability to use transportation options other than their own automobile, including inconvenience and lack of access to alternatives.

As primary motivations to save energy, Americans most often cite the desire to save money and energy. Significant proportions, however, also say that reducing global warming, acting morally, and feeling good about themselves are also important motivations. A large majority also cites the health benefits of walking and bicycling as alternatives to driving.

These results demonstrate that while saving money remains the most common motivator of energy conservation, many Americans are also motivated by other values, including morality, health, and environmental protection. And by more than a 2-to-1 margin, Americans believe that making changes to reduce their energy use will improve the quality of their lives.

Interestingly, only 13 percent of respondents think that they can reduce their own contribution to global warming "a great deal." By contrast, 42 percent say that if most people in the United States took these actions, it would reduce global warming a great deal. Finally, 60 percent say

global warming could be reduced a great deal if most people in modern industrialized countries took these actions. These results suggest that Americans understand the collective nature of the climate change problem. Additionally, these results suggest that most Americans believe this is a solvable problem, if everyone contributes in some way to the solution.

Introduction

In these challenging times of turbulent energy costs, economic recession, and global climate change, the United States has many opportunities to greatly improve national energy efficiency and conservation, strengthen its economy, and reduce its emissions of greenhouse gases. This will entail significant changes in the energy behavior of individual Americans; the use of energy at home and on the road, for example, constitutes over a third of total U.S. carbon emissions.¹

Reducing energy use is near the top of the agenda at every level of government: President Obama, Congress, federal agencies, state and local government, as well as community organizations across the nation are currently considering a variety of policies and programs to encourage and help American families become more energy-efficient in their homes and travels. To be truly effective, however, a national strategy must take into account the energy efficiency and conservation actions Americans have already taken, the actions they intend to take (perhaps with some support), the reasons that motivate energy conservation, and the barriers that currently prevent Americans from saving more energy. This report begins to answer these questions through use of a nationally representative survey on Americans' energy-efficiency and conservation behavior as part of a broader study of their attitudes and behaviors regarding global climate change.

Methods

In September and October of 2008, a nationally representative survey of 2,164 American adults was conducted by researchers at Yale and George Mason Universities. Respondents completed two separate questionnaires, two weeks apart, using the nationally representative online panel of Knowledge Networks. The within-panel completion rate was 54 percent.²

Respondents were asked a series of questions about their own energy-efficiency and conservation behaviors.

Energy-efficiency behaviors here refer to several infrequent, but important actions that can significantly reduce household and transportation energy use and save energy over long periods of time, including:

¹ “U.S. households account for about 38 percent of national carbon emissions through their direct actions, a level of emissions greater than that of any entire country except China and larger than the entire U.S. industrial sector. By changing their selection and use of household and motor vehicle technologies, without waiting for new technologies to appear, making major economic sacrifices, or losing a sense of well-being, households can reduce energy consumption by almost 30 percent—about 11 percent of total U.S. consumption.” Gardner, G. & Stern, P. (2008). The short list: The most effective actions U.S. households can take to curb climate change. Available online at: <http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html>

² See <http://www.knowledgenetworks.com/ganp/index.html> for more information about the Knowledge Networks methodology.

- Insulating one's attic;
- Caulking and weather-stripping one's home;
- Buying an energy-efficient furnace;
- Buying an energy-efficient air conditioner;
- Buying an energy-efficient water heater;
- Replacing most or all light bulbs with energy-efficient compact fluorescents (CFLs);
- Buying a fuel-efficient vehicle (at least 30 miles-per-gallon).

Energy-conservation behaviors here refer to decisions and activities that must be performed frequently as part of everyday living, including:

- Turning off the lights when they're not needed;
- Lowering the thermostat to 68 degrees F or lower in winter;
- Raising the thermostat to 72 degrees F or higher, or using less air conditioning in summer;
- Using public transportation or car-pooling;
- Walking or biking instead of driving.

For each of the seven energy-efficiency and five energy conservation behaviors, respondents were asked:

- What actions they had already taken (in the case of energy efficiency) or were currently taking (in the case of energy conservation);
- What actions they intend to take over the coming year;
- What barriers prevent them from taking these actions;
- What reasons motivate them to take these actions in the coming year;
- Whether their own actions could help reduce their personal contribution to global warming;
- Whether the actions of other Americans or other people in the developed world could help reduce global warming; and,
- Whether energy efficiency and conservation behaviors would improve or harm their personal quality of life.

Questions about the barriers to specific energy efficiency behaviors were asked only of respondents who said (1) they had not done the specific behavior, *and* (2) said they did not intend to do it in the next year *or* said they'd like to do it, but probably wouldn't. Questions about the barriers to specific conservation behaviors were asked of respondents who said (1) they do not always engage in the conservation behavior, *and* (2) they intend to continue acting in the same way *or* they intend to engage in the conservation behavior less often over the next year. Respondents were asked to select all the barriers listed that were relevant to them; "other" responses were also permitted, although they are not reported here. The exact wording of all the survey questions is presented in Appendix B.

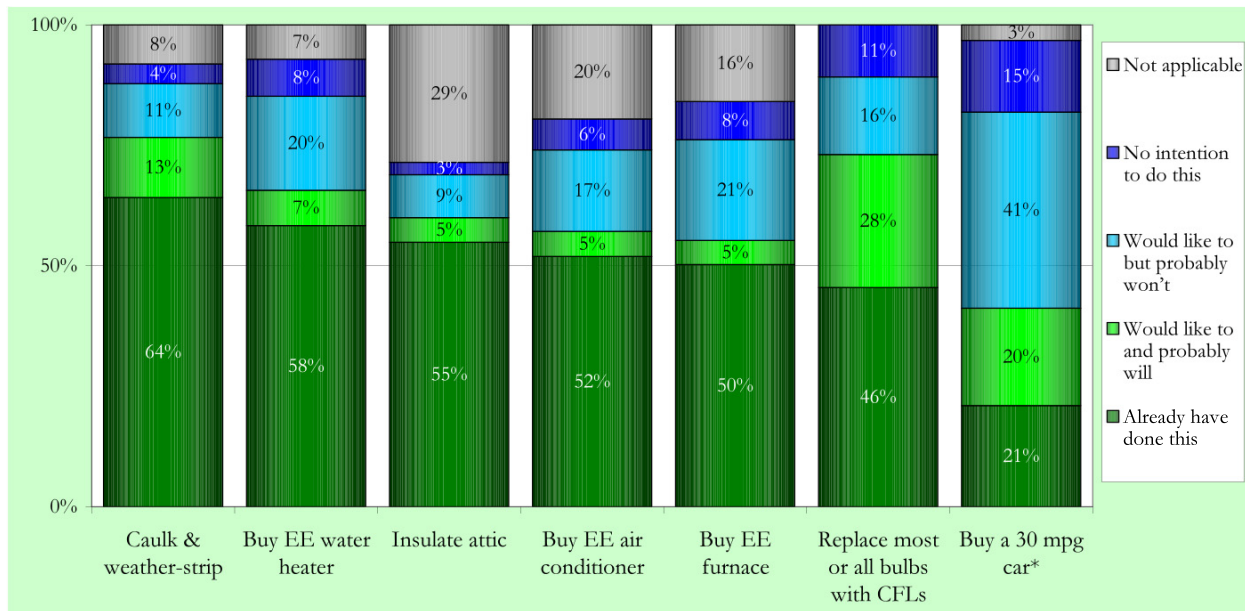
Part 1: What actions are Americans currently taking – and intending to take – to save energy?

Figure 1: Energy-Efficiency Actions & Intentions

“The following questions ask about some actions you may have taken to save energy.

- Is your attic well insulated?
- Has your home been caulked & weather-stripped to reduce drafts?
- Is your home furnace a high energy-efficiency model?
- Is your home air conditioner (AC) a high energy-efficiency model?
- Is your water heater a high energy-efficiency model?
- How many of the light bulbs in your home are high energy-efficiency compact fluorescents (CFLs)?”

“Which of the following best describes what you are likely to do (*with regard to the six actions listed above*) over the next 12 months?” (*This question was asked for the six actions listed above, plus: “Purchase a car that averages 30 miles per gallon or more.”*) *



Base = all respondents; N= 2,164.

*See Appendix B for the complete text of questions.

A majority of respondents say that they have already made energy efficiency improvements to their homes, with half or more saying they have installed efficient furnaces, air conditioners and water heaters, or that they have insulated their attics and caulked and weather-stripped their homes. Only 21 percent, however, say that they have already bought a car that gets 30 or more miles to the gallon.

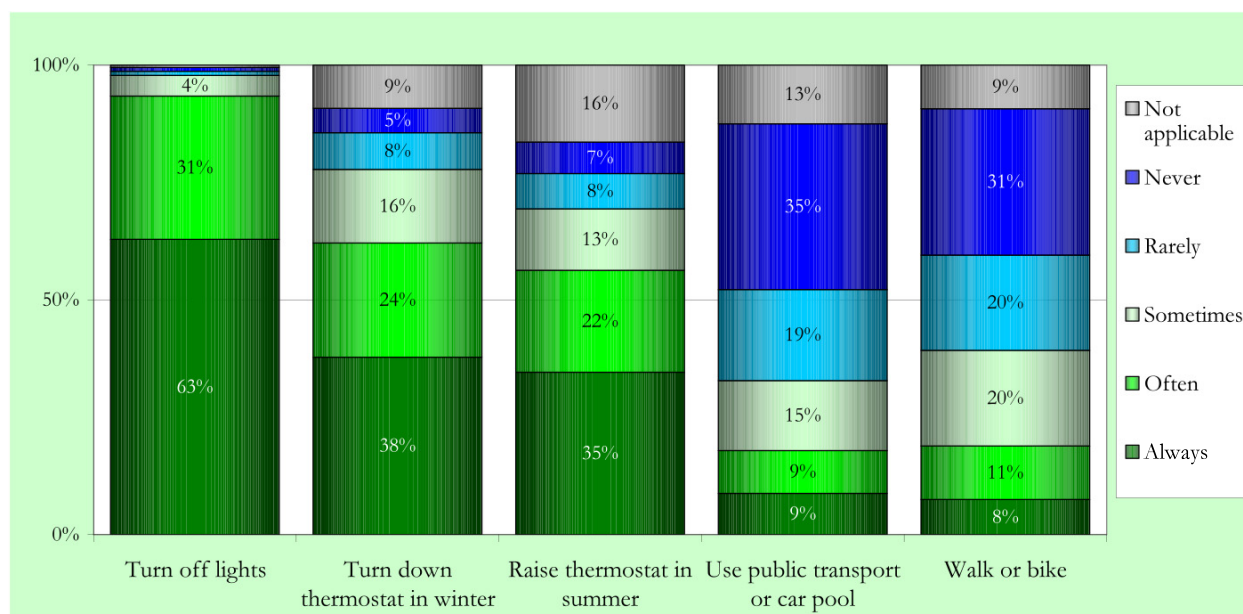
Of those Americans who have not already made energy efficiency improvements, many say that over the next 12 months they intend to replace most or all their light bulbs with compact fluorescent lights (CFLs) (28%), caulk and weather-strip their homes (13%), or buy fuel-efficient cars (20%). Even more people – 41 percent – say that they would like to purchase a fuel-efficient car, but probably won’t (mostly due to the expense; see the Barriers section below). Likewise, approximately 20 percent of Americans say that they would like to purchase an energy-efficient furnace, water heater, or air conditioner, but probably won’t (again, mostly due to cost; see the Barriers section below).

These results demonstrate that there is a very significant market for energy efficiency improvements, with large numbers of Americans already intending to take action in the next 12 months, and many more who are willing, if only they could afford it. These results therefore suggest that price discounts and/or government subsidies may be an effective means of encouraging Americans to make energy efficiency improvements.

Figure 2: Energy-Conservation Actions

“How often do you do the following things?”

- Turn off the lights when they are not needed.
- In the winter, set the thermostat to 68 degrees or cooler.
- In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning.
- Use public transportation or car pool.
- Walk or bike instead of driving.”



Base = all respondents; N= 2,164.

Nearly all respondents (94%) say that they always (63%) or often (31%) turn off the lights when they are not needed. Over half are conserving on home heating and cooling, with 62% saying they always (38%) or often (24%) lower their thermostats to 68 degrees F in winter, and 57% saying they always (35%) or often (22%) raise the thermostat in summer to 76 degrees F. These

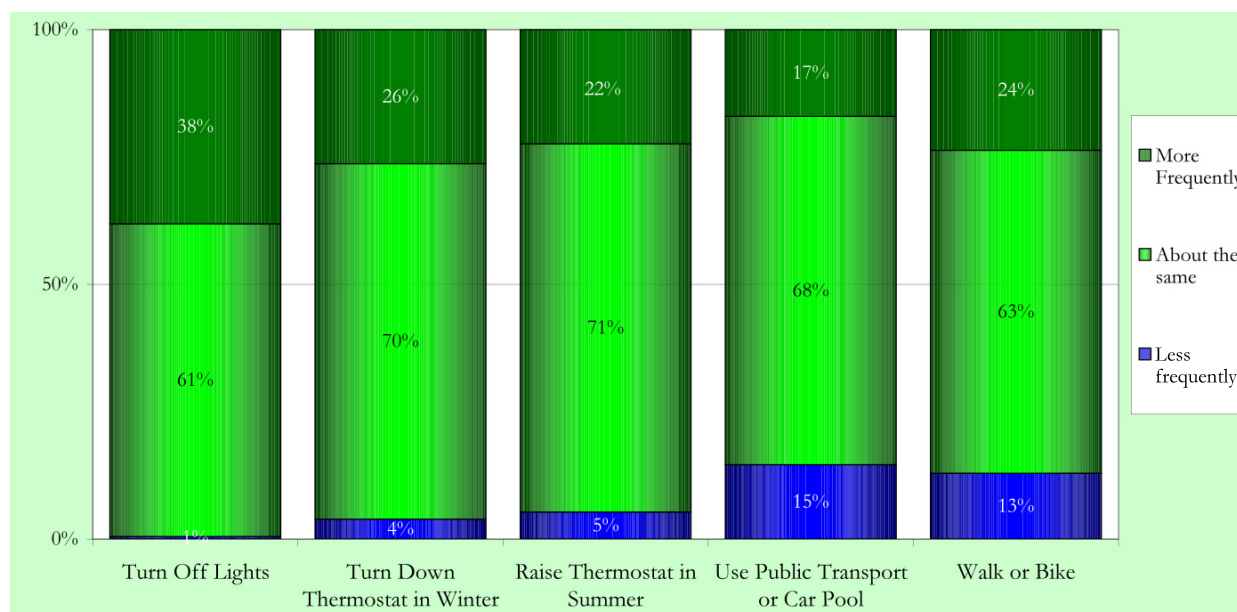
are high rates of reported conservation behavior, yet since approximately 4 in 10 people perform these latter two behaviors only sometimes or often, there still appears to be much room to encourage Americans to adjust their thermostats as a means to save energy.

By contrast, energy conservation in transportation is far less common. Only about a quarter of respondents say that they often or always use public transportation, car pools, walk, or bike, while majorities say that they rarely or never use these forms of alternate transportation. Yet transportation accounts for a substantial proportion of Americans' individual energy use and carbon emissions. Thus, encouraging Americans to change their transportation choices could potentially save a lot of energy and reduce emissions of carbon dioxide and air pollutants. Altering transportation behavior, however, is often a challenge because many Americans do not have access to public transportation or live too far away from work, school, and shopping to easily utilize these alternate forms of transportation (see the Barriers section below). Public investments to extend and improve public transportation, institution of higher fuel economy standards, and the establishment of "Smart Growth" zoning regulations to encourage mixed use development and the revitalization of city centers are thus crucial steps to more effectively tap the potential energy savings in transportation use.

Figure 3: Conservation Intentions

"For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?"

- Turn off the lights when they are not needed
- In the winter, set the thermostat to 68 degrees or cooler
- In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning
- Use public transportation or car pool
- Walk or bike instead of driving."



Base = all respondents; N=2,164

While 60 to 70 percent of respondents plan to continue conserving energy at the same rate over the next twelve months, significant numbers also plan to increase their conservation efforts. Approximately 2 out of 10 respondents indicate that they intend to conserve more on home heating and cooling, and plan to use public transportation and car pools more often; nearly 4 out of 10 say they intend to turn off their lights more often, in spite of the fact that most say they are already doing this all the time.

Of those respondents who say that they plan to continue turning out unneeded lights at the same rate over the coming year, 71 percent report that they *already always do this*. Likewise, of those who say that they plan to continue their current rates of home heating and cooling, over a third indicate they *already always do this* as well (42% for heating and 36% for cooling). These results demonstrate that many Americans are strongly committed to these energy conservation behaviors.

With transportation choices, however, fewer than 10 percent of those who intend to continue acting in the same way report that they always use public transportation or car pools or that they always walk or bike. Thus, only about 25 percent of Americans say they plan to use alternative transportation more often or exclusively in the coming year. These results suggest that many Americans currently plan to continue to use their automobiles much as they have in the past. Appendix A provides additional information about Americans' intended conservation actions based on their current rates of action.

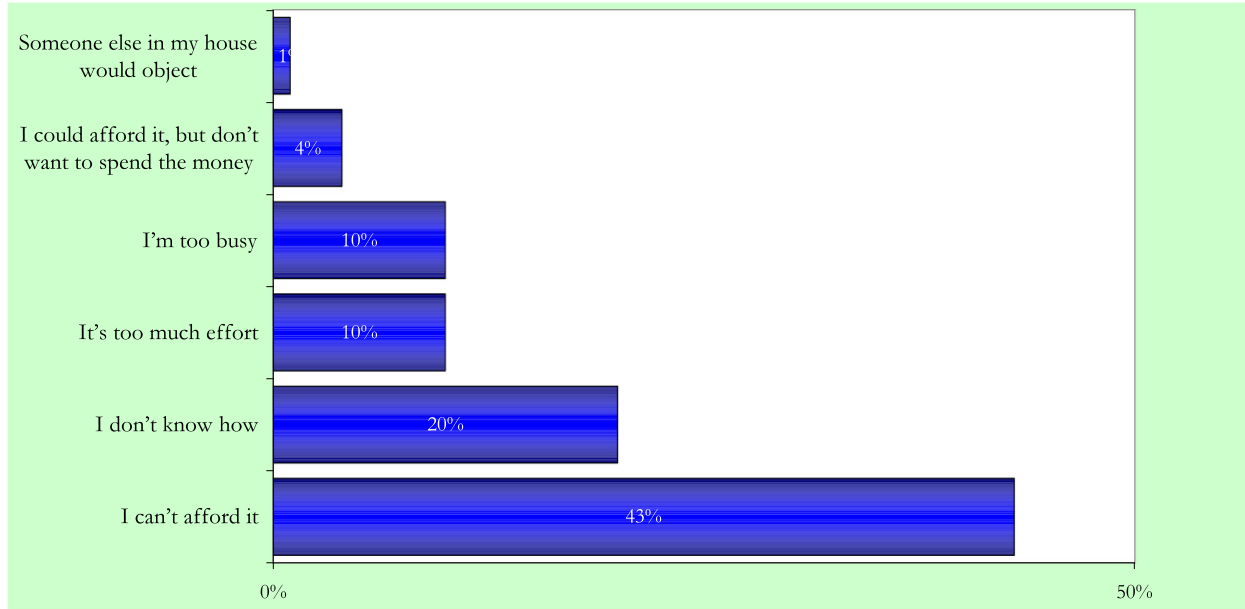
Part 2: What barriers prevent Americans from saving more energy?

Overall, “I can’t afford it”, or the expense, was the most frequently given reason for not taking each of the energy-efficiency actions. Very few Americans, however, say that they are simply unwilling to spend money on energy-efficiency (as indicated by the response “I could afford to, but don’t want to spend the money”). These results strongly suggest that homeowner tax breaks and subsidy programs to support the purchase and installation of energy efficient heating, cooling, and insulation systems could make a significant difference in reducing household energy use and carbon emissions.

Cost, however, is not the only barrier. Many Americans say they simply don’t know how to take some actions or don’t have the time to research the options or do the work. For example, for two actions – insulating one’s attic and caulking and weather-stripping one’s home – approximately 20 percent of Americans say they don’t know how (Figures 4 and 5). Furthermore, an additional 20 to 24 percent say they have not taken these two actions to save home energy because it would take too much effort or they were too busy. These results thus suggest that there is a large potential market in affordable retail home insulating services, especially if supported through homeowner tax breaks or subsidy programs. One-stop services that combine a home energy audit with a simple menu of affordable energy efficiency products and services throughout the home may find a significant market.

Figure 4: Barriers to Insulating the Attic

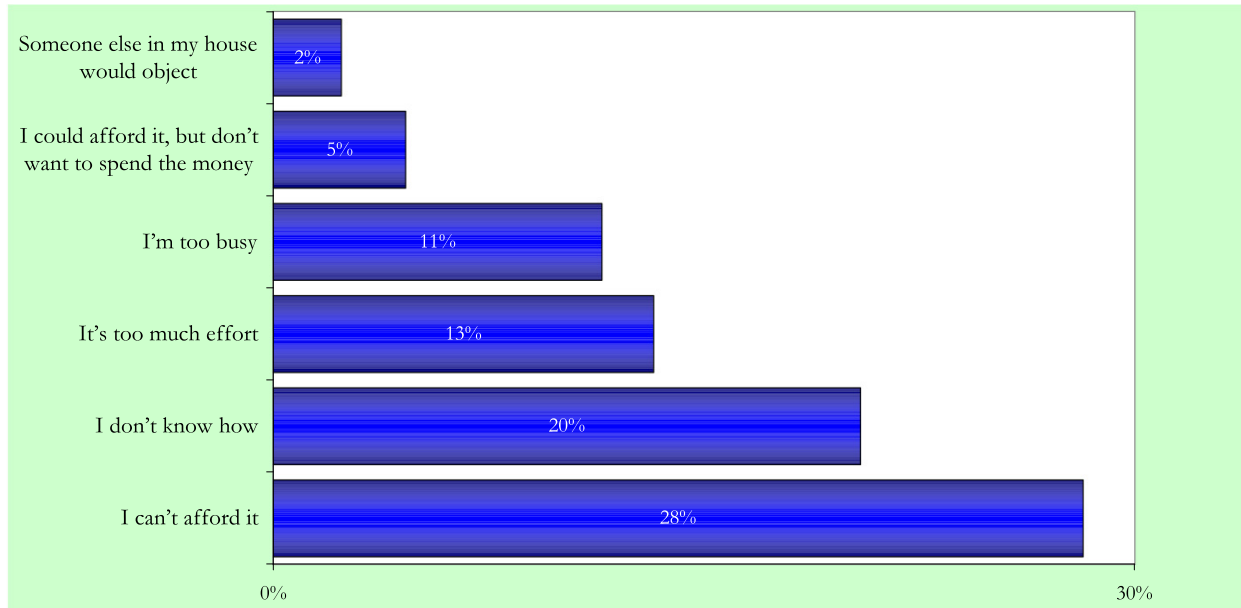
“There are many reasons why people don’t install new insulation in their attics. Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they have not insulated their attic or don't know, *and* (2) they do not intend to do it in the next year, would like to do it but probably won't, or don't know; N = 352

Figure 5: Barriers to Caulking & Weather-Stripping Home

“There are many reasons why people don’t caulk and weather-strip their homes to reduce drafts. Please check all of the reasons below that apply to you.”

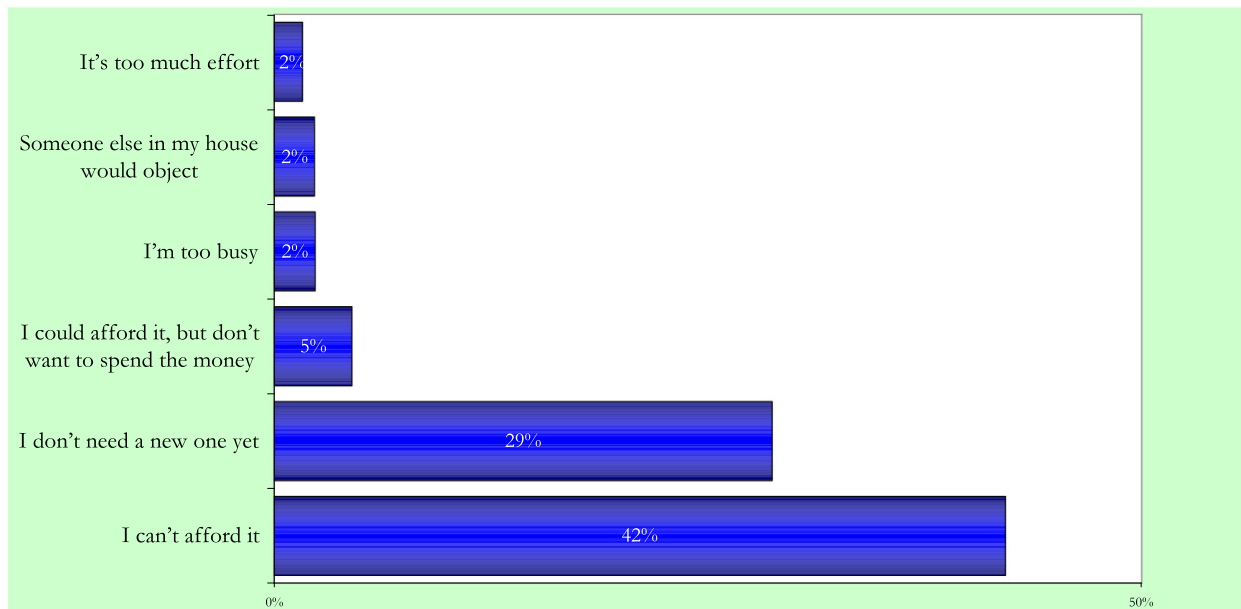


Base = respondents who say (1) they have not caulked and weather-stripped their home or don't know, *and* (2) they do not intend to do it in the next year, would like to do it but probably won't, or don't know; N = 492.

“I can’t afford it” is also the primary reason why many Americans have not purchased energy efficient furnaces, air conditioners, or hot water heaters (Figures 6, 7, 8). Notably, however, large numbers of Americans say that another important barrier is the fact that they don’t need a new one yet. This exemplifies a problem that occurs throughout the energy system. Many products (and power plants) are capital intensive and have long lifetimes. Unlike food or many consumer products, heating and cooling systems are relatively big-ticket items that are purchased infrequently, with product lifetimes that can last decades. While many inefficient heating and cooling systems are currently installed in American homes, and thus wasting energy and money, it will take several decades to turn over this stock, unless there are innovative government programs to accelerate this transformation. For example, some states have enacted innovative “cash for clunkers” programs to remove the oldest and worst polluting cars from the road, that are responsible for a disproportionate amount of air pollution. This same approach could potentially be adapted to more quickly replace the most wasteful home heating and cooling systems, which would have the added benefit of economically helping the poor, who are the most likely to own these inefficient systems.

Figure 6: Barriers to Purchasing an Energy-Efficient Furnace

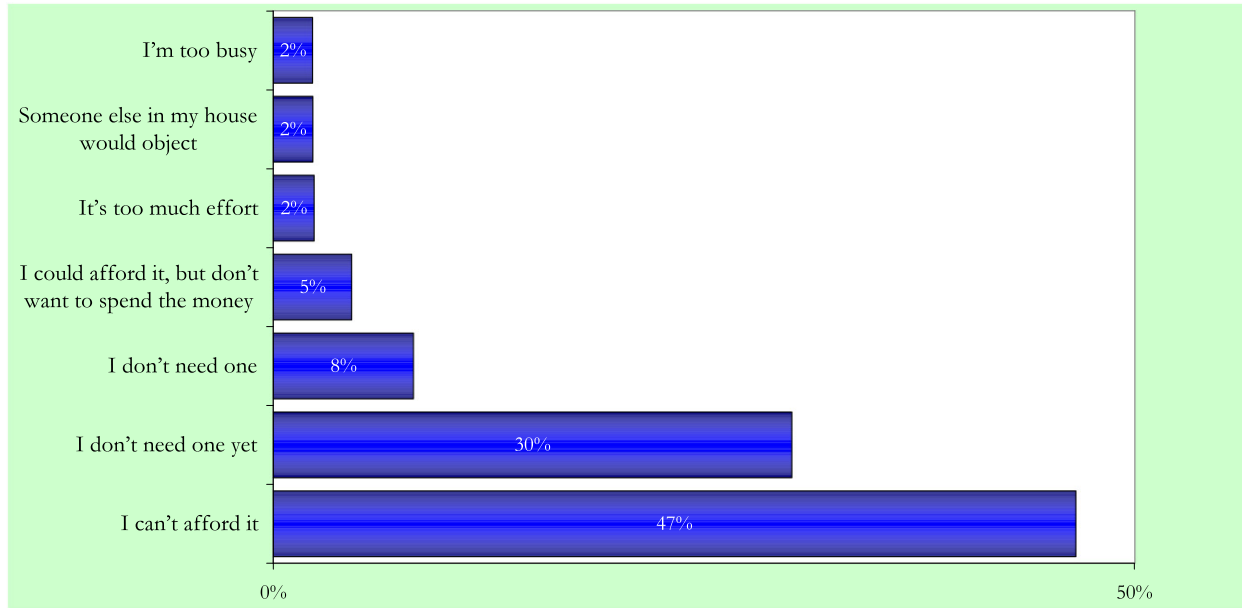
“There are many reasons why people don’t purchase an energy-efficient home furnace. Please check all the reasons below that apply to you.”



Base = respondents who say (1) they do not have an energy-efficient furnace or don’t know, *and* (2) they do not intend to buy one in the next year, would like to buy one but probably won’t, or don’t know; N=811.

Figure 7: Barriers to Purchasing an Energy-Efficient Air Conditioner

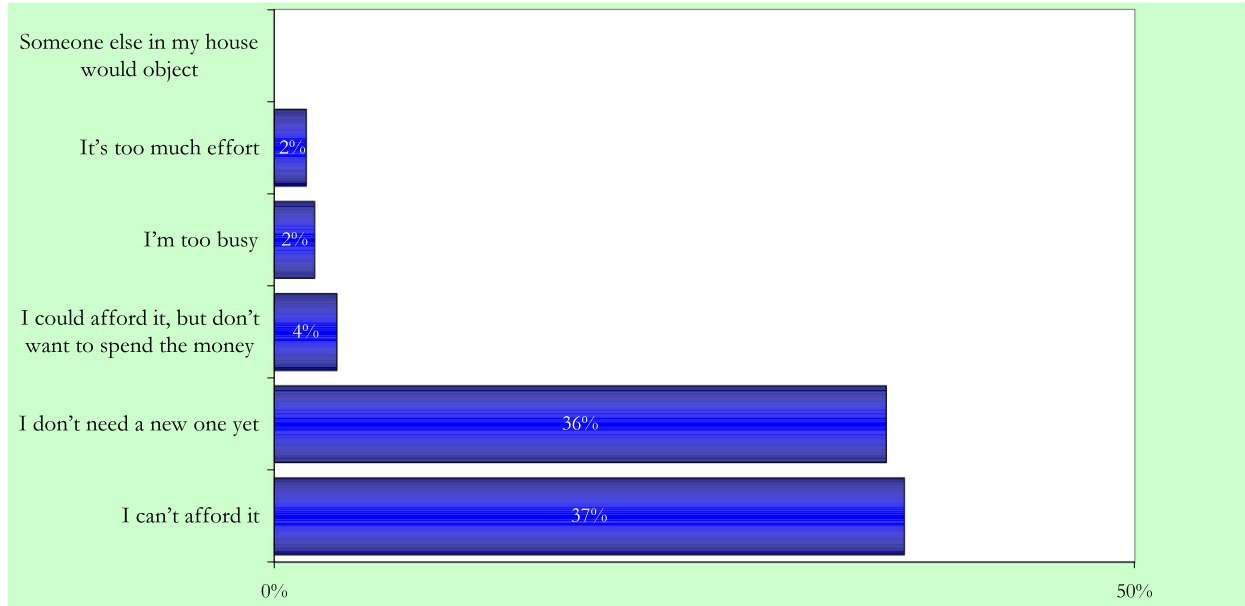
“There are many reasons why people don’t purchase an energy-efficient home air conditioner. Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they do not have an energy-efficient air conditioner or don't know, *and* (2) they do not intend to buy one in the next year, would like to buy one but probably won't, or don't know; N = 660.

Figure 8: Barriers to Purchasing an Energy-Efficient Water Heater

“There are many reasons why people don’t purchase an energy-efficient home water heater. Please check all of the reasons below that apply to you.”

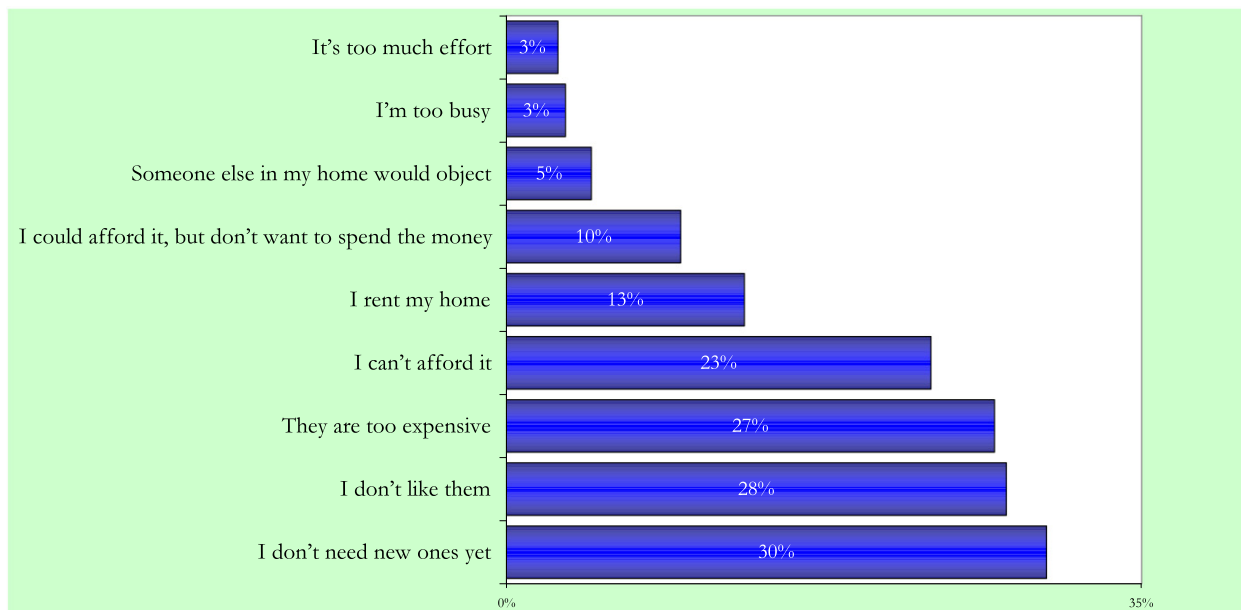


Base = respondents who say (1) they do not have an energy-efficient water heater or don't know, *and* (2) they do not intend to buy one in the next year, would like to buy one but probably won't, or don't know; N = 785.

The primary barrier to the purchase of highly energy efficient CFL light bulbs is their expense. A second important barrier, however, is fact that many Americans (28%) say they don't like them. This may be for a variety of reasons, including light quality, available shapes and sizes, or perceptions that they are dangerous. Nonetheless, manufacturers still have work to do to either make these lights more appealing or to dispel current concerns or misperceptions.

Figure 9: Barriers to Replacing Most or All Light Bulbs with Energy-Efficient Fluorescent Bulbs (CFLs)

“There are many reasons why people don't change most of the light bulbs in their homes to high energy-efficiency compact fluorescents (CFLs). Please check all of the reasons below that apply to you.”

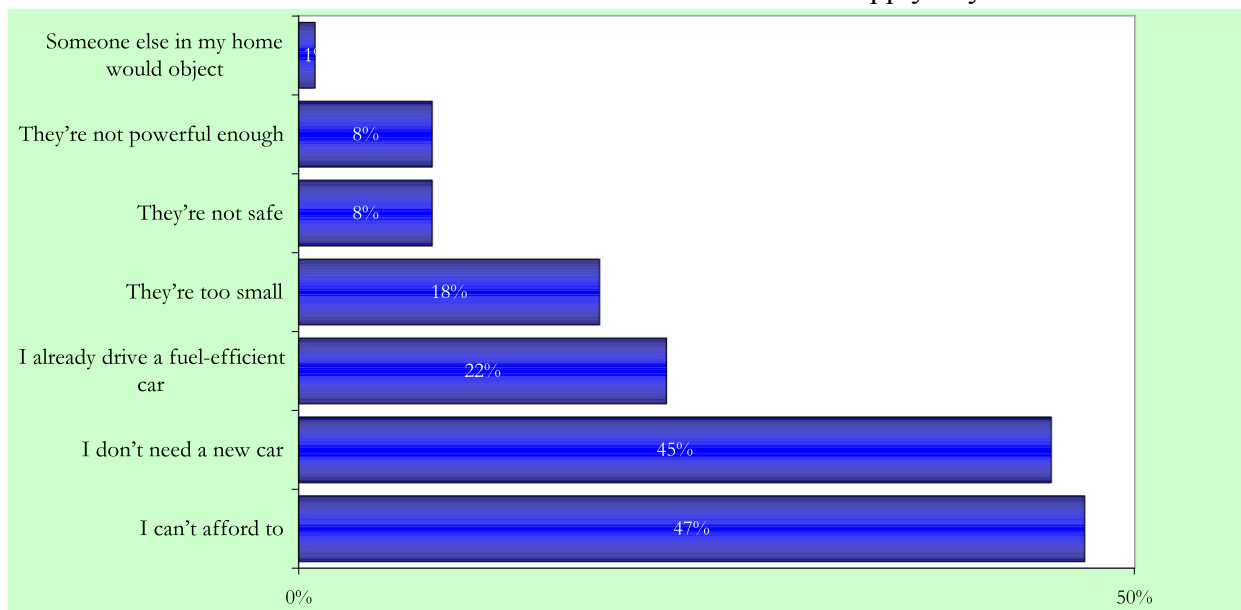


Base = respondents who say (1) they have no, few, or only some CFLs currently or don't know, and (2) they do not intend to replace their bulbs with CFLs in the next year, would like to but probably won't, or don't know; N = 667.

Regarding the purchase of more fuel-efficient cars, the primary barrier most Americans face is the cost. Likewise, nearly half (45%) say that they don't need a new car yet, which illustrates the difficulty in turning over the nation's car fleet quickly. Again, innovative government programs like the "cash for clunkers" programs described above may be required to get the worst gas guzzling and polluting vehicles off the road. Other notable barriers cited by many Americans are the perceptions that fuel-efficient cars are either too small (18%), not safe (8%), or not powerful enough (8%). Finally, however, 22 percent of respondents say that they already drive a fuel-efficient car that averages 30-miles-per gallon or more.

Figure 10: Barriers to Purchasing a Fuel-Efficient Car

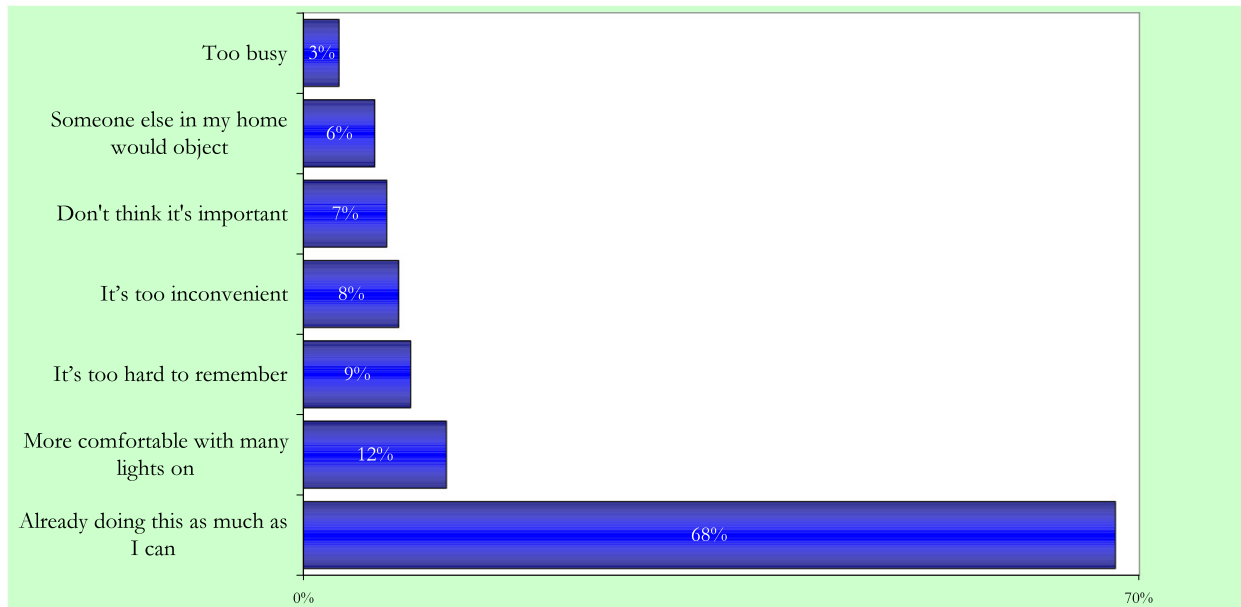
“There are many reasons why people don't purchase cars that average 30 miles per gallon or more. Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they do not have an fuel-efficient vehicle *and* (2) they do not intend to buy one in the next year, they'd like to but probably won't, or don't know; N = 1,773.

Figure 11: Barriers to Turning Off Unneeded Lights More Frequently

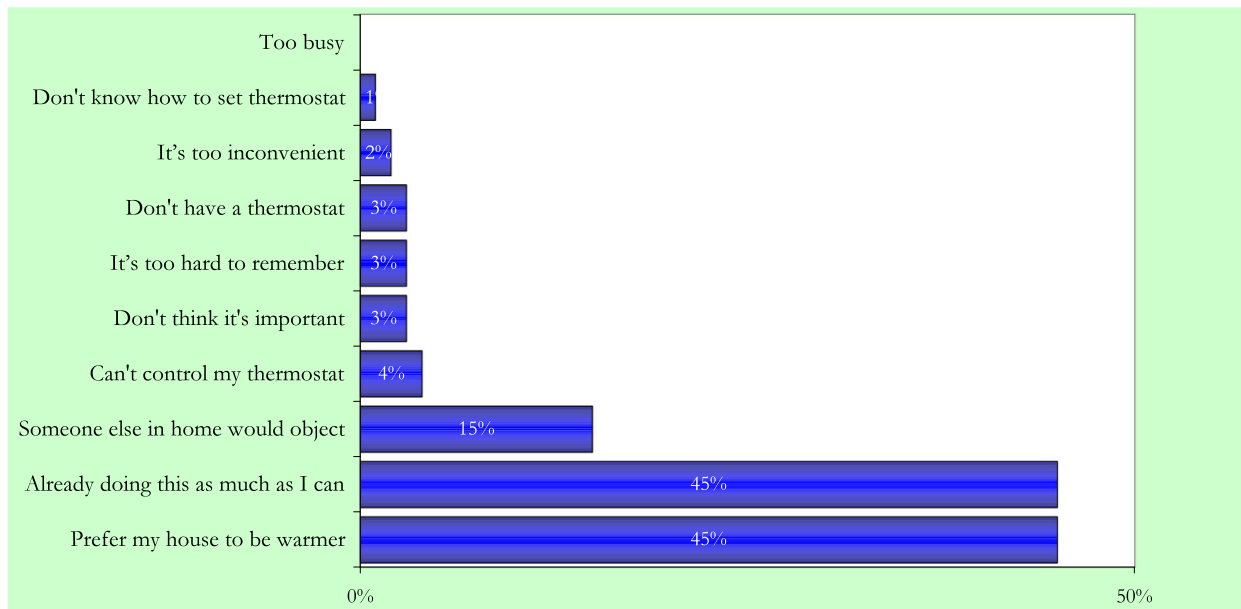
“There are many reasons why people don’t turn off lights when they’re not needed. Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they never, rarely, sometimes, or often turn off the lights, and (2) they intend to continue to do the same or to do so less frequently; N = 393.

Figure 12: Barriers to Lowering Thermostat in Winter More Frequently

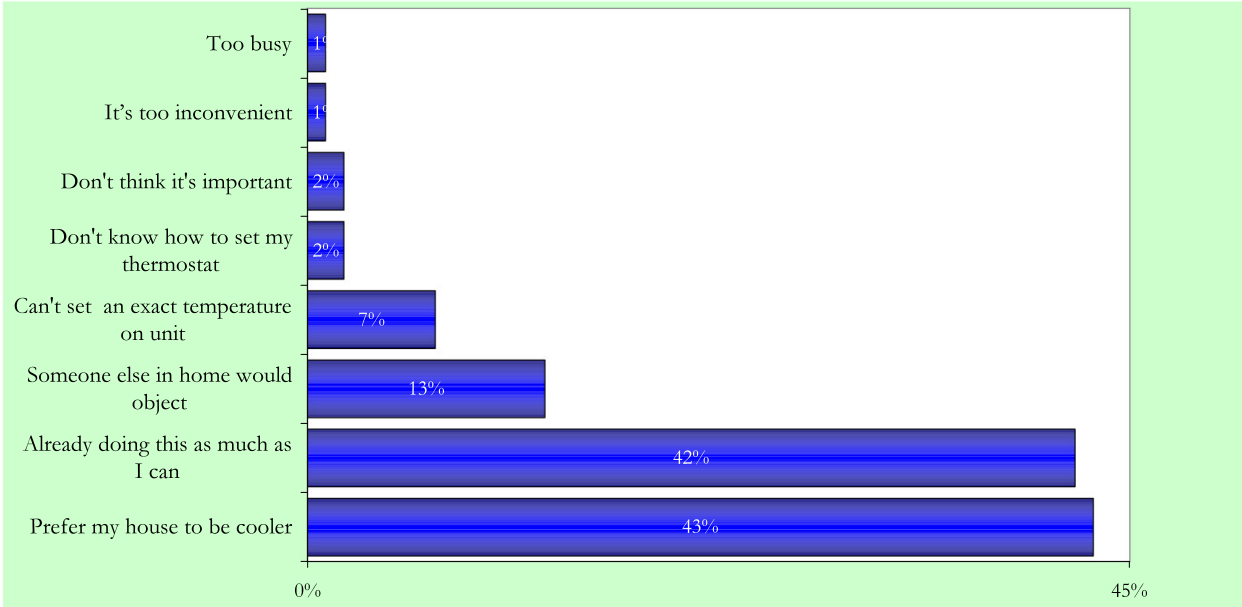
“There are many reasons why people don’t set the thermostat to 68 degrees or cooler in the winter. Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they never, rarely, sometimes, or often turn down the thermostat, and (2) they intend to continue to do the same or to do so less frequently; N = 803.

Figure 13: Barriers to Raising Thermostat in Summer More Frequently

“There are many reasons why people don’t set the thermostat to 76 degrees or warmer or use less air conditioning in the summer. Please check all of the reasons below that apply to you.”

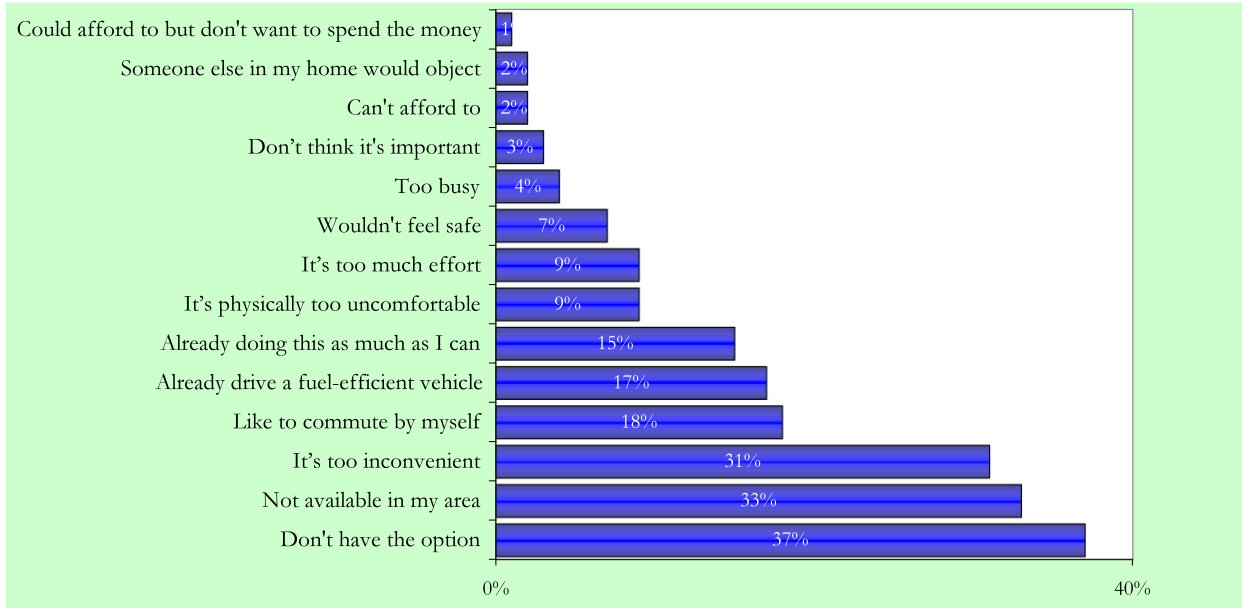


Base = respondents who say (1) they never, rarely, sometimes, or often raise the thermostat in summer, and (2) they intend to continue to do the same or to do so less frequently; N = 792.

The most commonly cited barriers to the use of alternative forms of transportation – mass transit, car pools, biking, and walking – are long travel distances, lack of availability, and inconvenience. Some respondents also say that that alternative means of transportation take too much time, are unsafe, or that they enjoy commuting by themselves. The barriers impeding each of these alternative forms of transportation are described below.

Figure 13: Barriers to Using Public Transportation and Car Pools

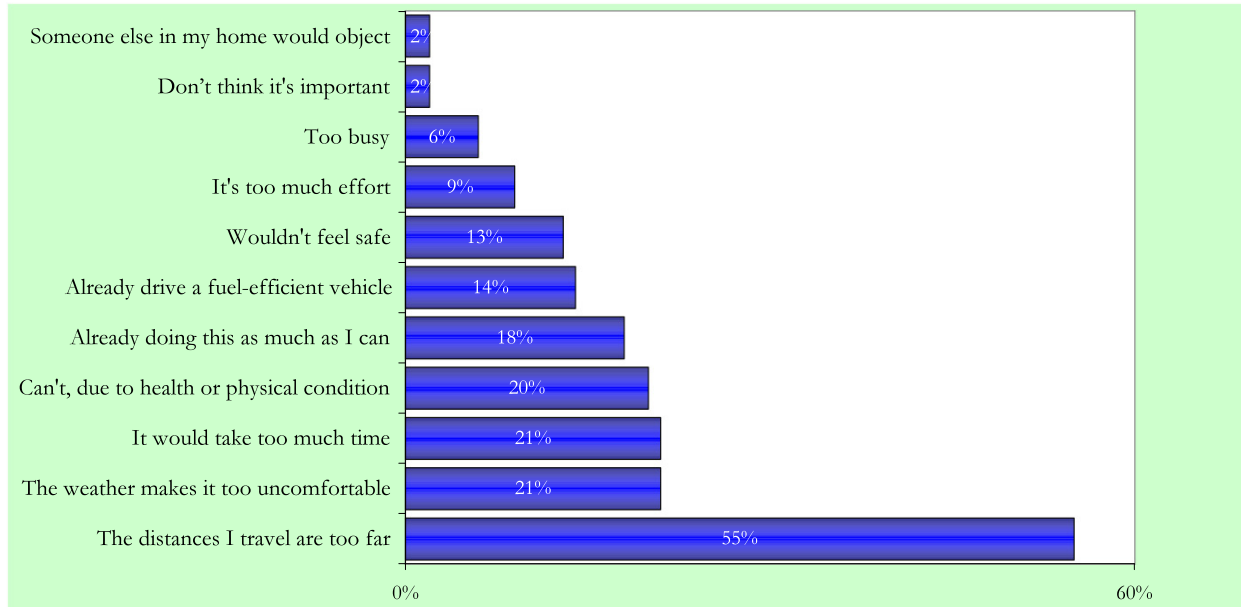
“There are many reasons why people don’t use public transportation or car pool. Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they never, rarely, sometimes, or often use public transportation or car pools, and (2) they intend to continue to do the same or to do so less frequently; N = 1,416.

Figure 14: Barriers to Walking or Biking Instead of Driving

“There are many reasons why people don’t walk or bike instead of driving.
Please check all of the reasons below that apply to you.”



Base = respondents who say (1) they never, rarely, sometimes, or often walk or bike instead of driving, and (2) they intend to continue to do the same or to do so less frequently; N = 1,379.

Part 3: What Motivates Americans to Save Energy?

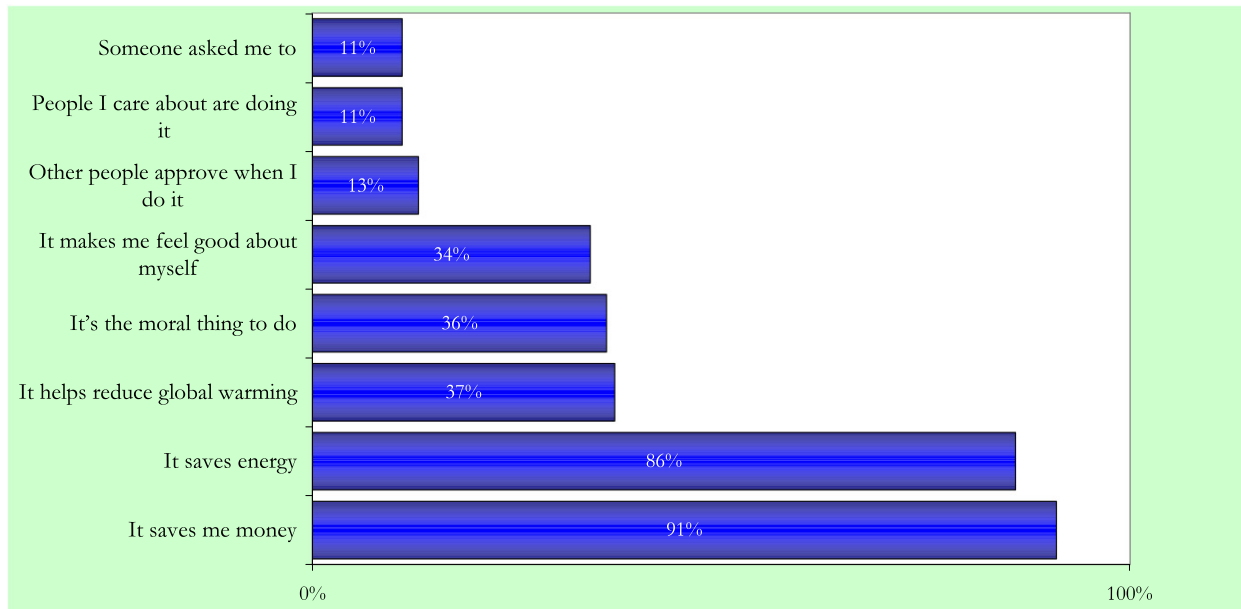
This study also investigated the reasons why many Americans say they are willing to conserve more energy. Of those respondents who said that they intend to take energy conservation measures more frequently over the coming year, very large majorities say that saving money and energy are their primary motivations (Figures 16 to 20).

Interestingly, however, over a third of these respondents say that helping to reduce global warming is an important motivation for them to turn off the lights, lower the thermostat in winter, or raise it in summer. Surprisingly, an even larger proportion cite global warming as a motivation to take public transportation or car pool more often (57%) or to walk or bike more instead of driving (48%).

There are some other notable findings about people's motivations to save energy. Roughly 25 percent or more of the respondents who intend to conserve more in the coming year say that taking these actions is a moral thing to do. Significant numbers of these Americans – between 20 and nearly 50 percent, depending on the action – also say that conserving energy makes them feel good about themselves. Finally, 76 percent of these respondents say that walking or bicycling is good for their own or someone else's health – the single most cited motivation for this action. By contrast, relatively few respondents say that social pressures are important motivators for the broad range of conservation actions.

Figure 16: Motivations for Turning Off The Lights

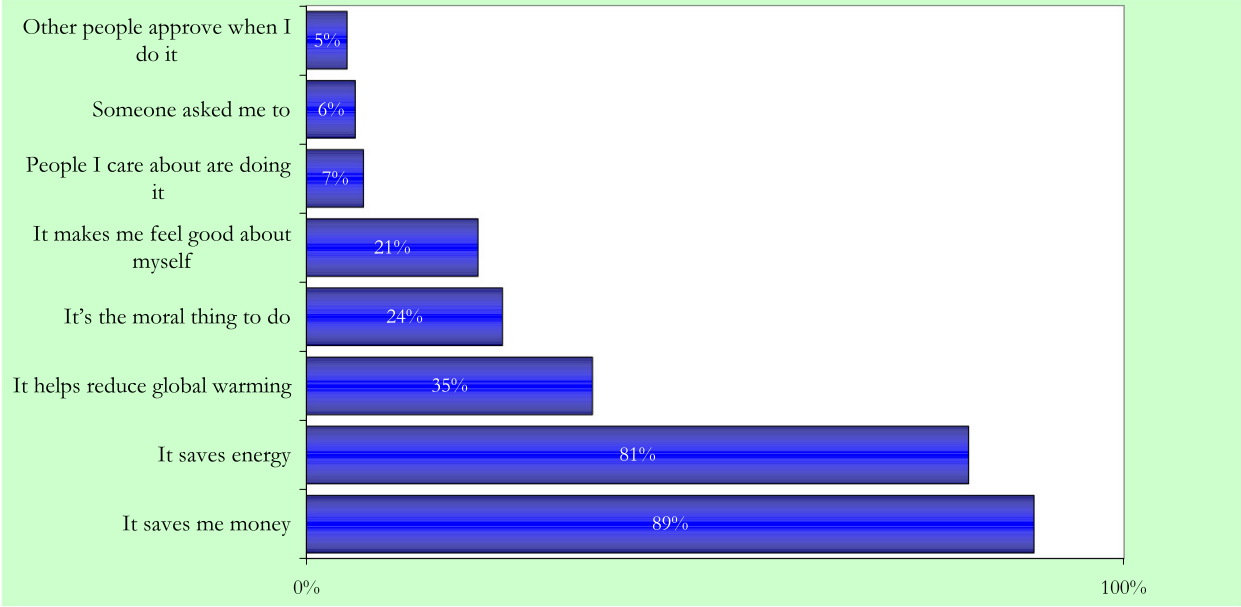
“Why do you want to do these things more frequently?
....Turn off the lights when they are not needed.”



Base = respondents who say they intend to turn unneeded lights off more frequently over the coming year; N = 820.

Figure 17: Motivations for Lowering the Thermostat in Winter

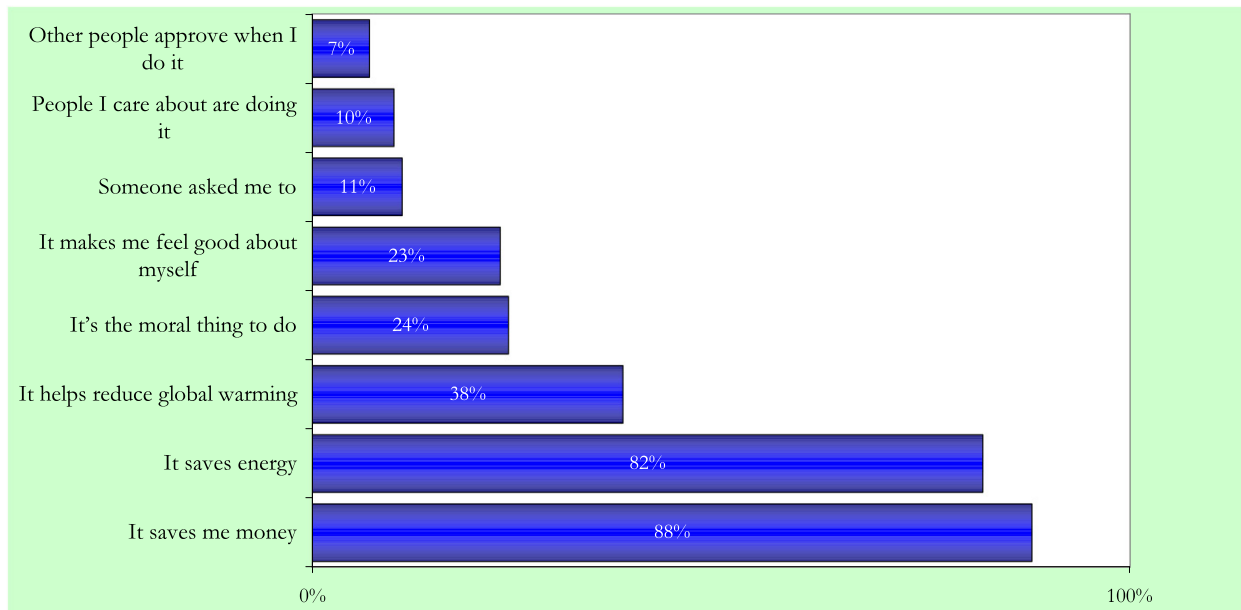
“Why do you want to do these things more frequently?
...Set the thermostat in winter to 68 degrees or cooler.”



Base = respondents who say they intend to lower their thermostat more in winter over the coming year; N = 558.

Figure 18: Motivations for Raising the Thermostat in Summer

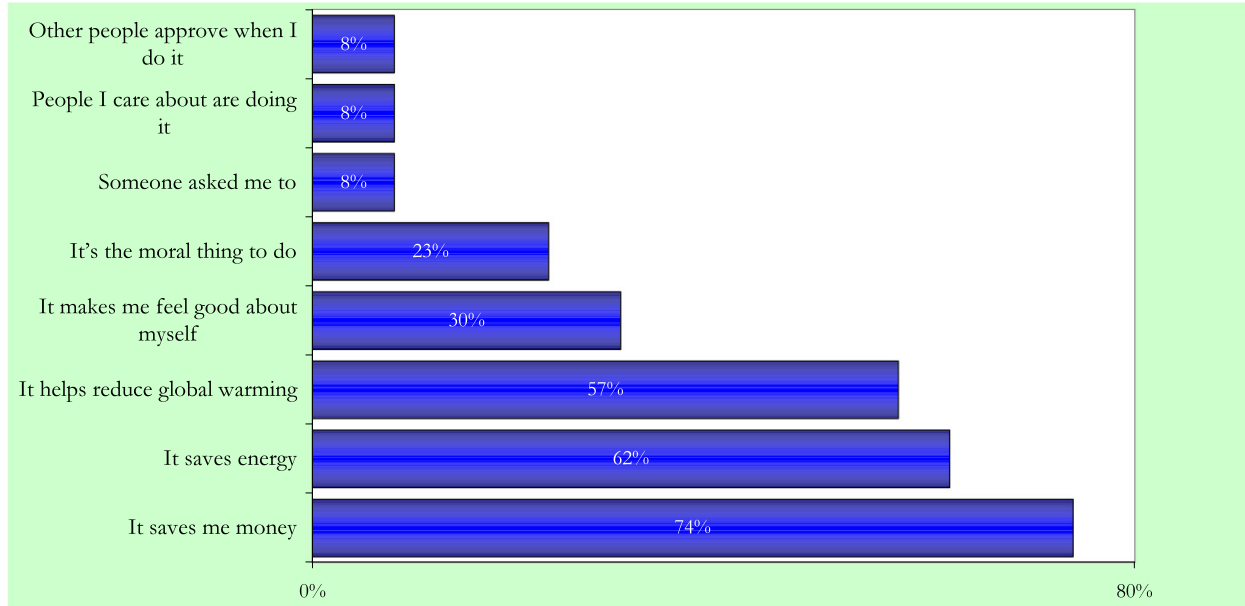
“Why do you want to do these things more frequently?
...Set the thermostat in summer to 76 degrees or warmer or use less air conditioning.”



Base = respondents who say they intend to raise their thermostat more in summer over the coming year; N = 477.

Figure 19: Motivations for Using Public Transportation or Car Pools

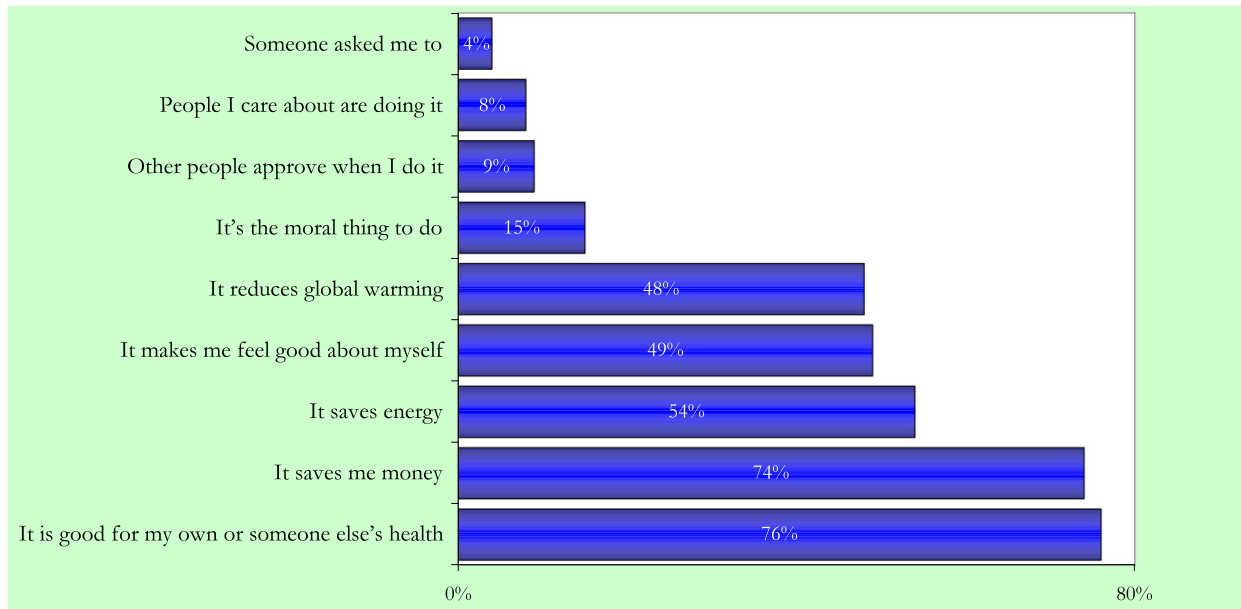
“Why do you want to do these things more frequently?
...Use public transportation or car pool.”



Base = respondents who say they intend to use public transportation or car pool more over the coming year; N = 364.

Figure 20: Motivations for Biking or Walking Instead of Driving

“Why do you want to do these things more frequently?
... Walk or bike instead of drive.”



Base = respondents who say they intend to walk or bicycle instead of drive more frequently over the coming year; N = 507

Part 4: Do Americans think their efforts to save energy will help reduce global warming? Do they think energy conservation will improve or harm their quality of life?

This survey also asked Americans how much they believe they could reduce their own personal contribution to global warming, if they took most of the energy-saving actions they are currently doing or intend to do.³ Respondents were also asked how much global warming could be reduced if most people in the United States or in other developed countries took these same actions (Figures 21-23).

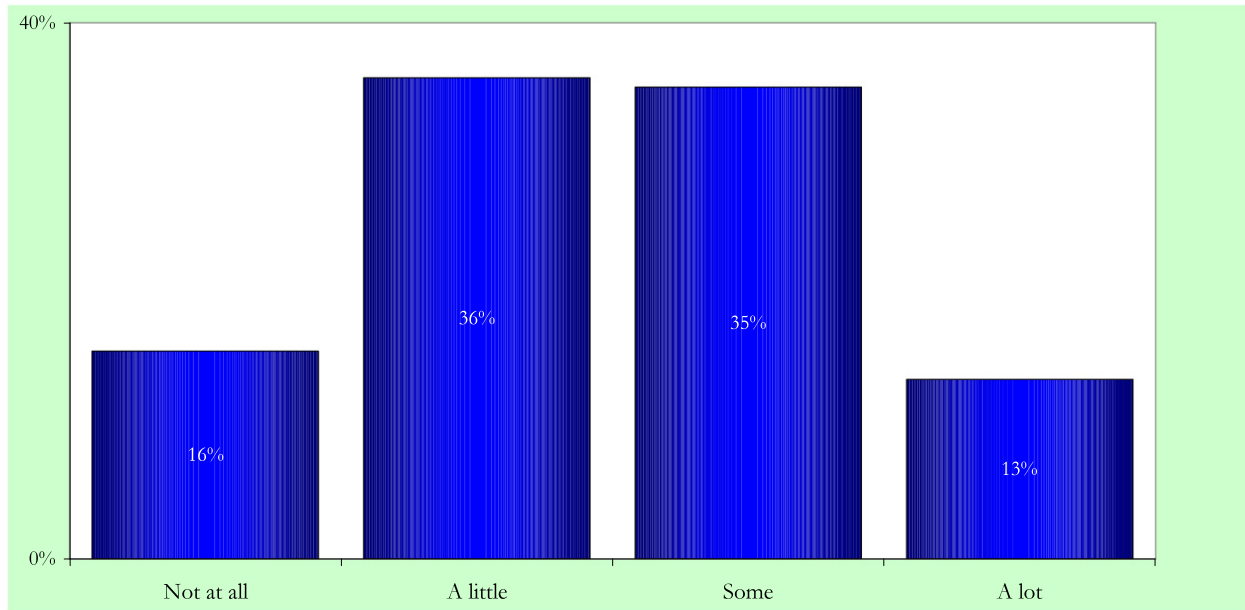
Interestingly, only 13 percent of respondents think that they could reduce their own contribution to global warming “a great deal.” By contrast, 42 percent say that if most people in the United States took these actions it would reduce global warming a great deal. Finally, 60 percent say global warming could be reduced a great deal if most people in modern industrialized countries took these actions.

These results suggest that Americans understand the collective nature of the climate change problem. While any individual can significantly reduce their own carbon footprint, successfully addressing climate change will require the concerted efforts of the entire country and indeed the whole world. Additionally, these results suggest that most Americans believe this is a solvable problem, if everyone contributes in some way to the solution.

³ These questions were not asked of respondents who said they were certain that global warming is not occurring.

Figure 21: Reductions in Personal Contribution to Global Warming

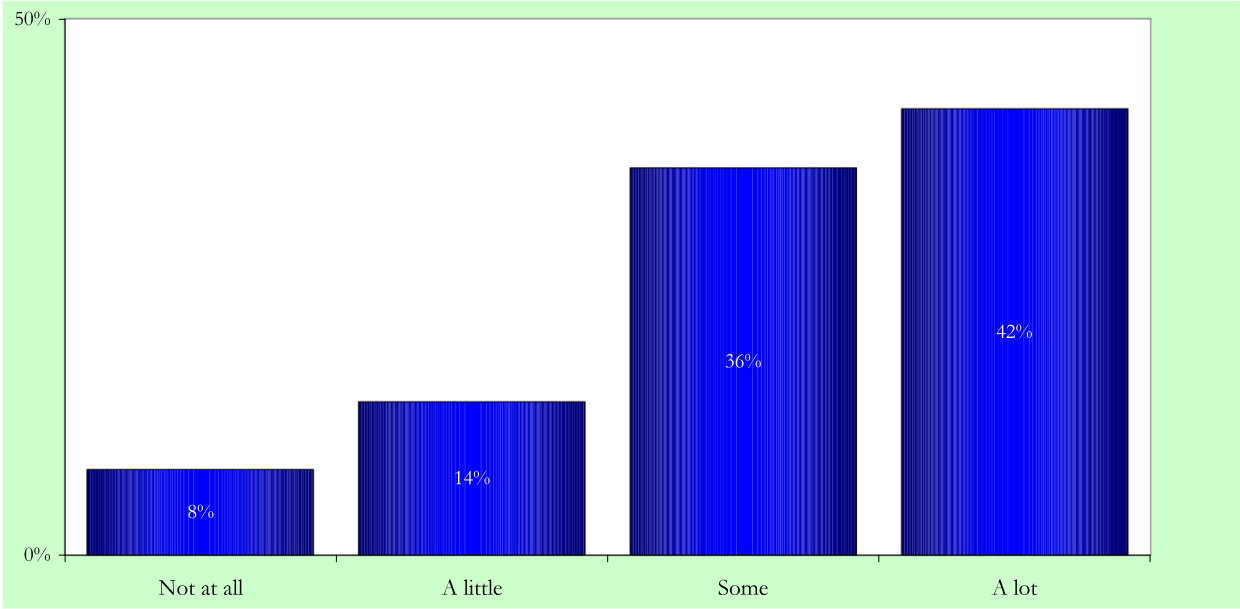
“Think back to the energy-saving actions you’re already doing and those you’d like to do over the next 12 months. If you did most of these things, how much do you think it would reduce **your personal contribution** to global warming?”



N = 2,035

Figure 22: Potential Impact of Actions on Global Warming, If Performed Nationally

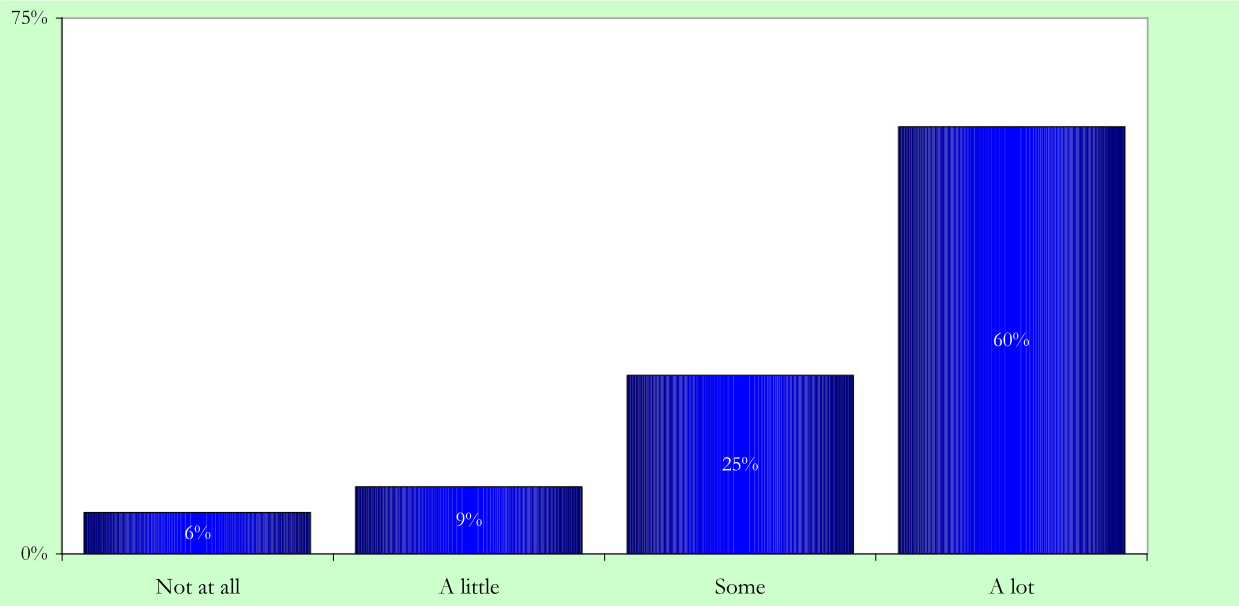
“If most people in the **United States** did these same actions, how much would it reduce global warming?”



N = 2,030

Figure 23: Potential Impact of Actions on Global Warming, If Performed by Industrial Nations

“If most people in the modern industrialized countries around the world did these same actions, how much would it reduce global warming?”

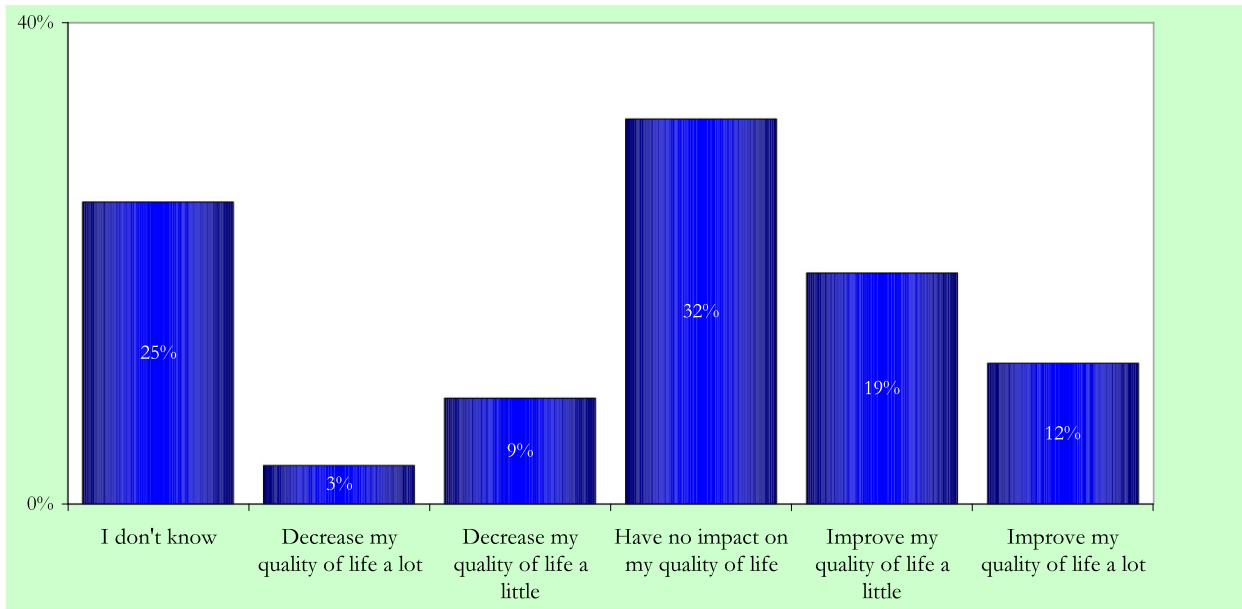


N = 2,026

Finally, respondents were asked whether changing their lifestyle to reduce their own contribution to global warming would have a positive or negative impact on their quality of life. Nearly a third (32%) say these actions would have no impact on their quality of life (Figure 24). Another third (32%) say that these changes would actually improve their quality of life. By contrast 25 percent simply say they don't know, while only 12 percent say that these changes would decrease their quality of life. These results demonstrate that most Americans do not believe that taking individual action on global warming will cause hardship.

**Figure 24: Impact of Mitigation Lifestyle Changes
On Personal Quality of Life**

“If you were to change your lifestyle to reduce your personal contribution to global warming, how do you think it would affect your quality of life?”



N = 2,143

Conclusions

Overall, these results demonstrate that roughly half of Americans say they have already made a number of energy-efficiency improvements to their homes, while many others say they intend to do so in the next 12 months. Substantial numbers also say that they would like to make energy-saving home improvements, but probably won't – in many cases because they can't afford to, or because they don't know how or are too busy. Likewise, many Americans would like to buy a more fuel-efficient car, but can't afford one. The long lifetimes and large capital costs of heating and cooling systems, insulation, and vehicles are also significant barriers to the achievement of major savings from energy efficiency. Innovative government programs and incentives are needed to accelerate the diffusion of energy efficient products throughout American society and to gain the potential energy, cost, and carbon emission savings. Companies offering one-stop shopping for the retrofit of existing homes may find a lucrative market with the right combination of energy prices and government incentives for energy efficiency.

Energy conservation behaviors are more variable, with more than 90 percent of Americans reporting that they turn off unneeded lights, while only about 20 percent say they always or often take public transportation or car pool, or walk or bicycle instead of driving. Large numbers of people report that important barriers impede their ability to use transportation options other than their own automobile, including inconvenience and lack of access to alternatives. Achieving energy savings from transportation will require a coordinated set of policies, ranging from higher fuel-economy standards to investments in public transportation, "cash for clunkers" programs, and mixed-use urban development and zoning.

These data show that there is ample opportunity to promote a wide range of energy efficiency and conservation actions in American homes and on our roads. Government agencies and non-profit organizations that develop initiatives to advance these opportunities should focus their programs and policies in ways that will lead to the greatest energy savings in the shortest period of time. Such a focus entails targeting the specific energy-saving actions that have the highest potential yield on a population-wide basis. The data reported here provide a basis for estimating the number of households currently interested in taking a range of specific energy-efficiency and conservation actions. These data can then be combined with estimates of the energy-saving potential of each action – such as the estimates recently published by Gardner & Stern (2008)⁴ – to identify the specific actions that will likely yield the greatest energy savings, in the short run, on a population-wide basis.⁵

An exception to this approach, however, may be the small number of important energy-saving actions that fewer people are currently interested in taking, perhaps because they believe they have already completed the action – including using highly energy efficient attic insulation, and caulking and weather-stripping one's home. If market demand for home weatherization is needlessly low because large numbers of people erroneously believe that they already have high

⁴ Available online at: <http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html>

⁵ McKenzie-Mohr, D. (2008) Fostering sustainable behaviors: Beyond brochures. *International Journal of Sustainability Communication*, 3: 108-118. Available online at: www.ijsc-online.org | *IJSC* 3 (2008): 108-118

efficiency insulation, public education campaigns may be necessary to help people understand that they can gain even greater benefits by taking additional action.

While respondents most often cite the desire to save money and energy as their primary motivations for conservation, significant proportions also say that reducing global warming, acting morally, and feeling good about themselves are also important motivators. A large majority of Americans also point to improved health as an important motivation to walk or bike as an alternative to driving. These findings demonstrate that while money remains the most common motivator, many Americans are also motivated to save energy by other values, including environmental protection, morality, and health, all of which may provide useful frames for promotional campaign messages.

The academic literature on social marketing,⁶ behavior change,⁷ and even commercial branding⁸ suggests that people are motivated to purchase products and/or change their behaviors based on three broad categories of benefits: functional benefits (i.e., what the product or behavior will do for me), self-expressive benefits (i.e., what the product or behavior says about me), and self-evaluative benefits (i.e., how the product or behavior makes me feel about me). Organizations seeking to promote product purchases and/or behavior change should think seriously about which benefits to promote.

Functional benefits are relatively simple to promote (at least for products and behaviors that legitimately offer functional benefits), because promotional communication campaigns need only invoke the functional benefits of the product or the behavior that members of the target audience find most compelling. Conversely, self-expressive and self-evaluative benefits are more challenging to promote, because communications must successfully invoke a type of person who has attractive qualities (in the case of self-expressive benefits) or the audience members' own sense of right and wrong, success or failure (in the case of self-evaluative benefits). Although more challenging to promote, self-expressive and self-evaluative benefits are often more powerful – and longer-lived – motivators of behavior change.

These data show that the functional benefits of saving energy (“It will save me money”) are a nearly universal motivation for Americans who intend to take new energy saving actions over the next year. They also show, however, that many Americans are motivated to save energy for self-expressive (“I’m the kind of person who cares about helping to reduce global warming”) and self-evaluative reasons (“I feel good about myself when I do this because it’s the moral thing to do”). American’s willingness to embrace these deeper motivations represents an important opportunity to promote energy-efficiency and conservation actions.

One additional finding about the motivations for energy-saving actions is well worth noting. By more than a 2-to-1 margin, Americans believe that making changes to reduce their use of energy will improve – not undermine – the quality of their lives. This suggests that programs to promote energy savings should not be framed as requiring sacrifice, but rather should be framed

⁶ Andreasen A (1995) Marketing social change. San Francisco: Jossey-Bass.

⁷ Bandura, A. (2006). Going global with social cognitive theory: From prospect to paydirt. In S. I. Donaldson, D. E. Berger, & K. Pezdek (Eds.). *Applied psychology: New frontiers and rewarding careers* (pp. 53-79). Mahwah, NJ: Lawrence Erlbaum.

⁸ Aaker D. (1996) Building strong brands. New York: The Free Press.

as an important opportunity to accrue many compelling benefits, some of which will benefit us personally, and others of which will benefit the nation and the world.

The academic literature on social marketing⁹ and behavior change¹⁰ is quite clear on one final important point: population behavior change programs succeed or fail in direct proportion to their ability to remove the important barriers that currently impede target audience members from performing the recommended behavior (or acquiring the recommended product or service). In other words, while enhancing people's motivations for behavior change is necessary, it is typically not sufficient. To achieve meaningful levels of population-wide behavior change one must also remove the barriers of greatest concern to members of the target audience.

The data reported here reveal much about the energy-efficiency and energy conservation barriers of greatest concern to large numbers of Americans. The significant upfront financial costs – simply not being able to afford to take the recommended action – is by far the most pervasive barrier to improving energy efficiency in American homes and cars. This is especially true for people who currently have completely serviceable, albeit energy-inefficient, heating and cooling units in their home or cars in their driveway. Lack of “know how” and time to attend to the issue are also important barriers. None of these are barriers that can be reduced, or better yet eliminated, with easy fixes. For example, while implementing an information campaign is often an attractive approach – largely because it's easy to do (“Let's hire an ad agency”) – it is likely to have little or no impact on these important barriers to behavior change. It may require developing a different financial model – for example, the way mobile phone providers eliminate the upfront costs by financing the cost of the phone through the monthly service fees – and significantly expanding the availability of service providers to help Americans implement energy-saving “fixes” in their homes.

Fortunately, many such creative barrier-reduction solutions appear to be under consideration at all levels of government and in myriad non-profit organizations across America. If these policies and programs succeed in reducing the barriers to saving energy experienced by large numbers of Americans, there is much reason to believe that America's transition into a new era of energy efficiency and conservation will be greatly accelerated.

⁹ McKenzie-Mohr, D (2009; forthcoming) *Fostering sustainable behavior: An introduction to community-based social marketing*. 3rd edition. Gabriola Island, BC: New Society Publishers.

¹⁰ Maibach E, Roser-Renouf C & Leiserowitz A (2008) Communication and Marketing as Climate Change Intervention Assets: A Public Health Perspective. *American Journal of Preventive Medicine* 35: 488-500.

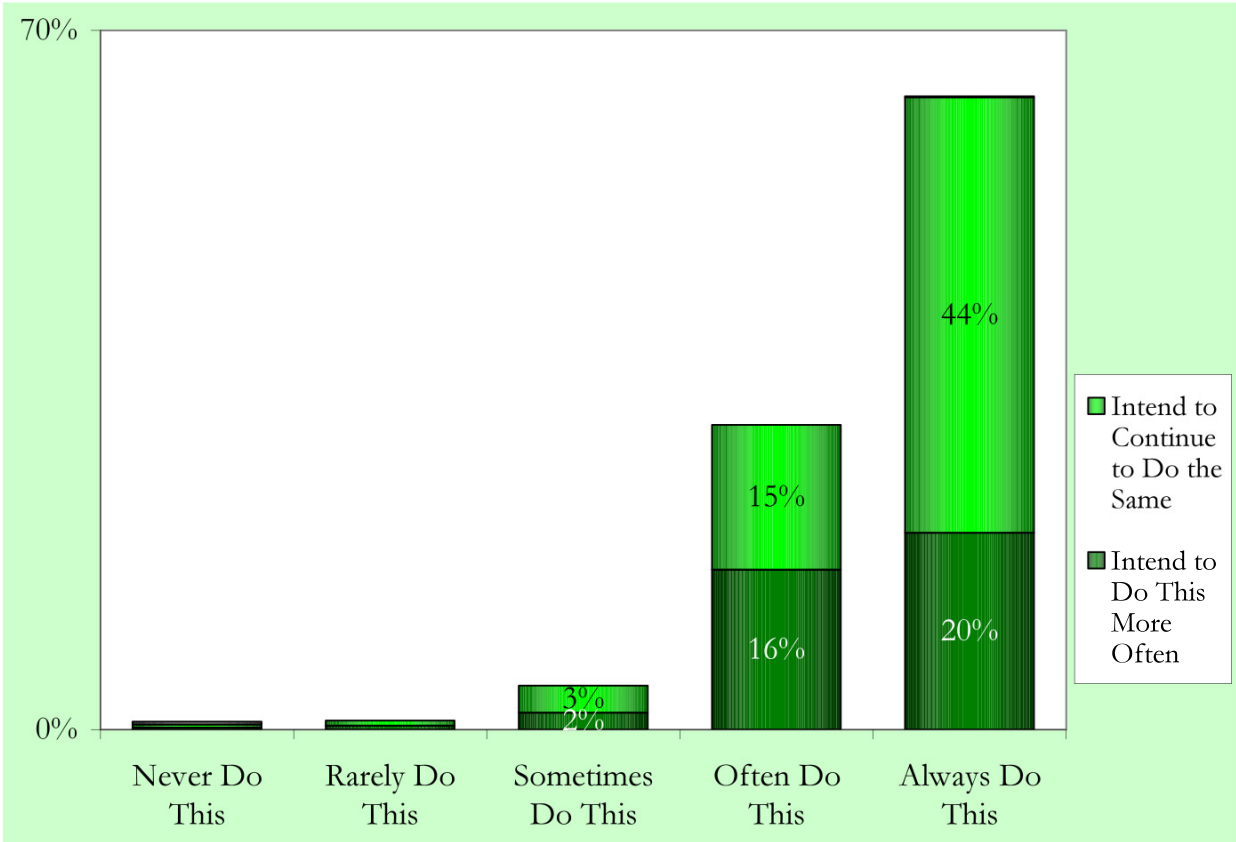
Appendix A: People's Conservation Intentions Based on Their Current Level of Action

Figure 25: Turning Off Unneeded Lights: Actions and Intentions

- “How often do you do the following things?
Turn off the lights when they are not needed.”

“For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?”

- Turn off the lights when they are not needed.”



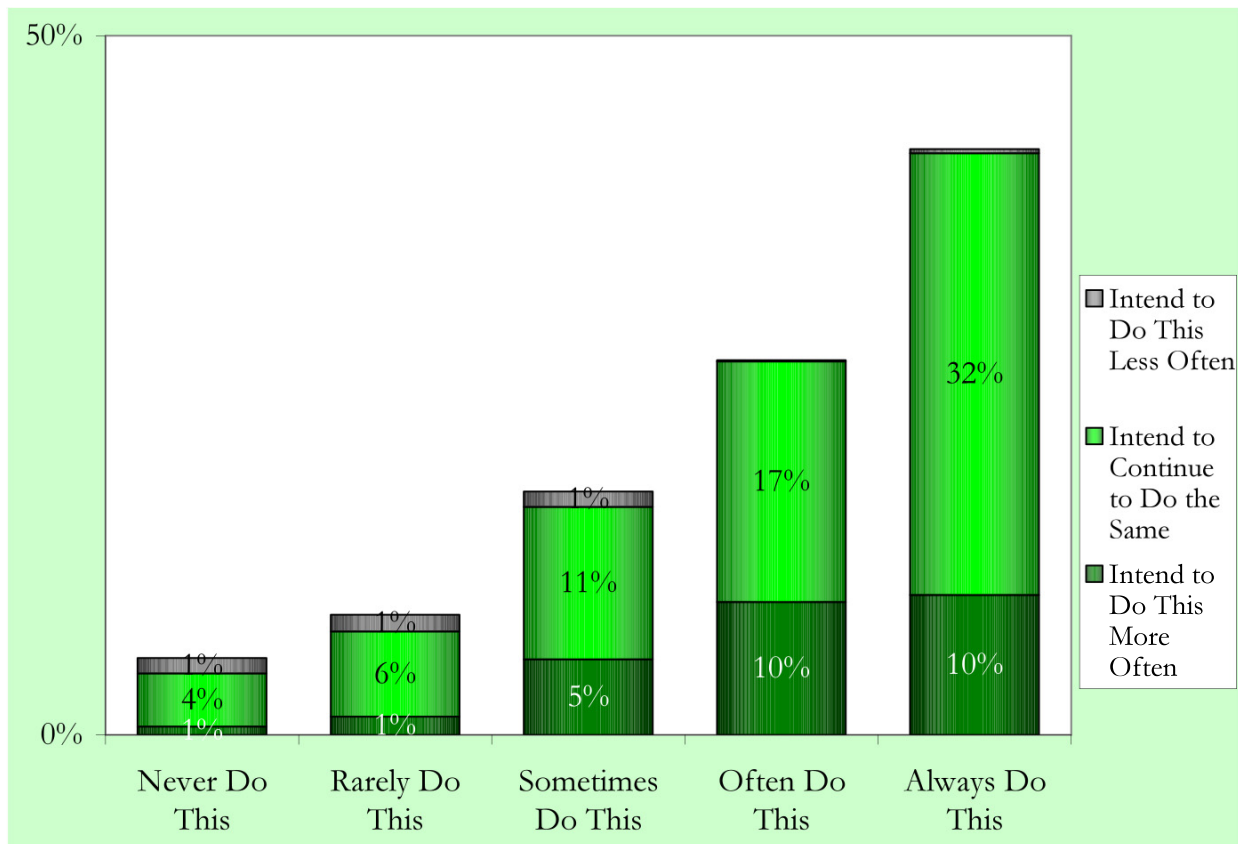
Base = all respondents; N= 2,164.

Figure 26: Lowering the Thermostat in Winter: Actions and Intentions

- “How often do you do the following things?
In the winter, set the thermostat to 68 degrees or cooler

“For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?”

- In the winter, set the thermostat to 68 degrees or cooler.”



Base = all respondents; N= 2,164.

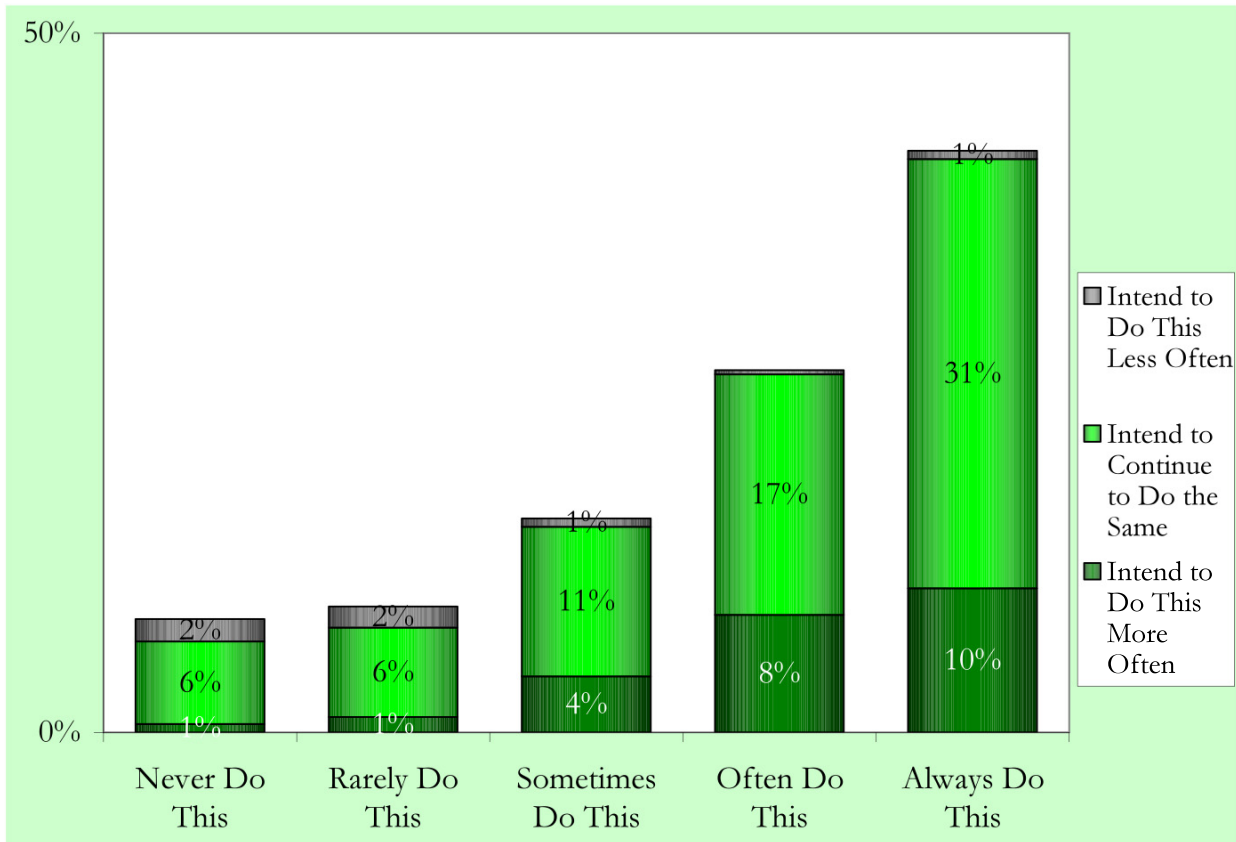
Figure 27: Raising the Thermostat in Summer: Actions and Intentions

“How often do you do the following things?”

- In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning

“For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?”

- In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning.”



Base = all respondents; N= 2,164.

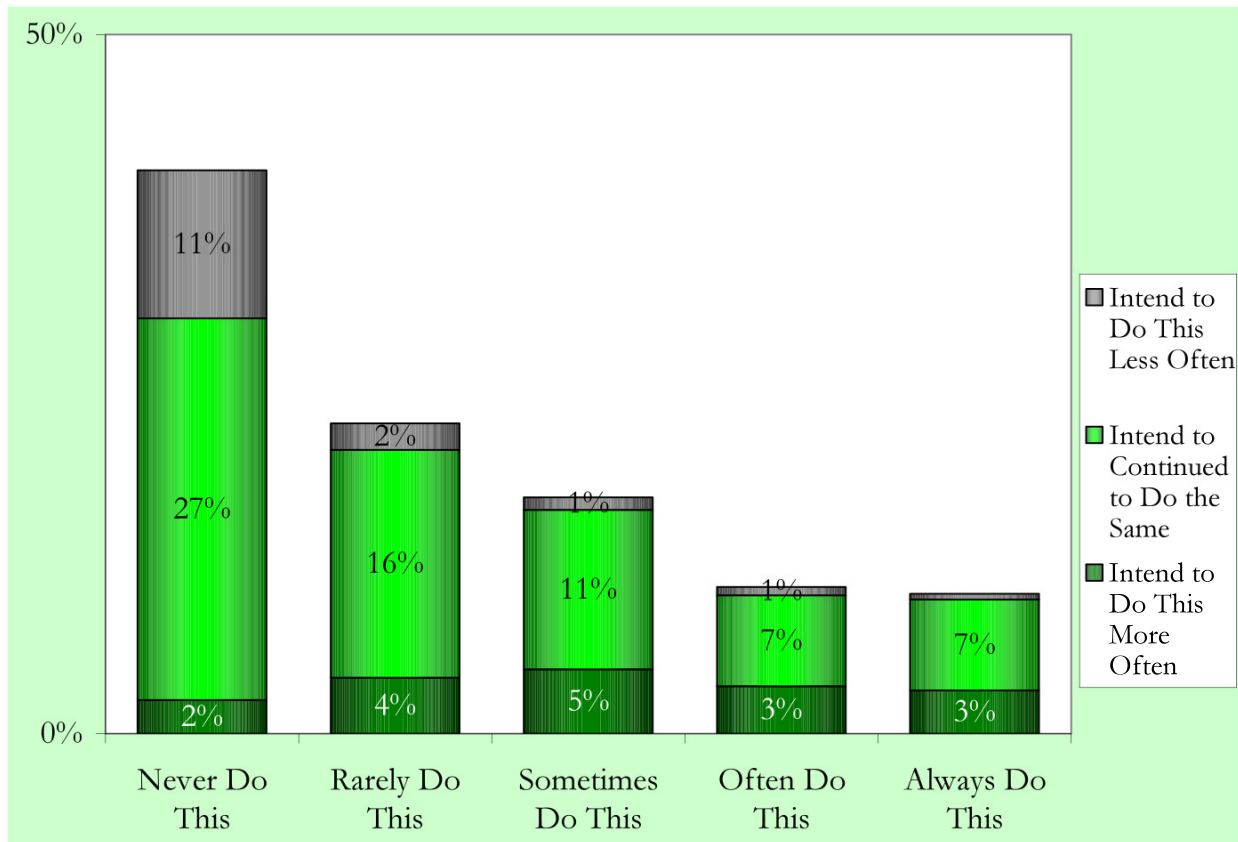
Figure 28: Using Public Transportation and Car Pools: Actions and Intentions

“How often do you do the following things?”

- Use public transportation or car pool

“For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?”

- Use public transportation or car pool.”



Base = all respondents; N= 2,164.

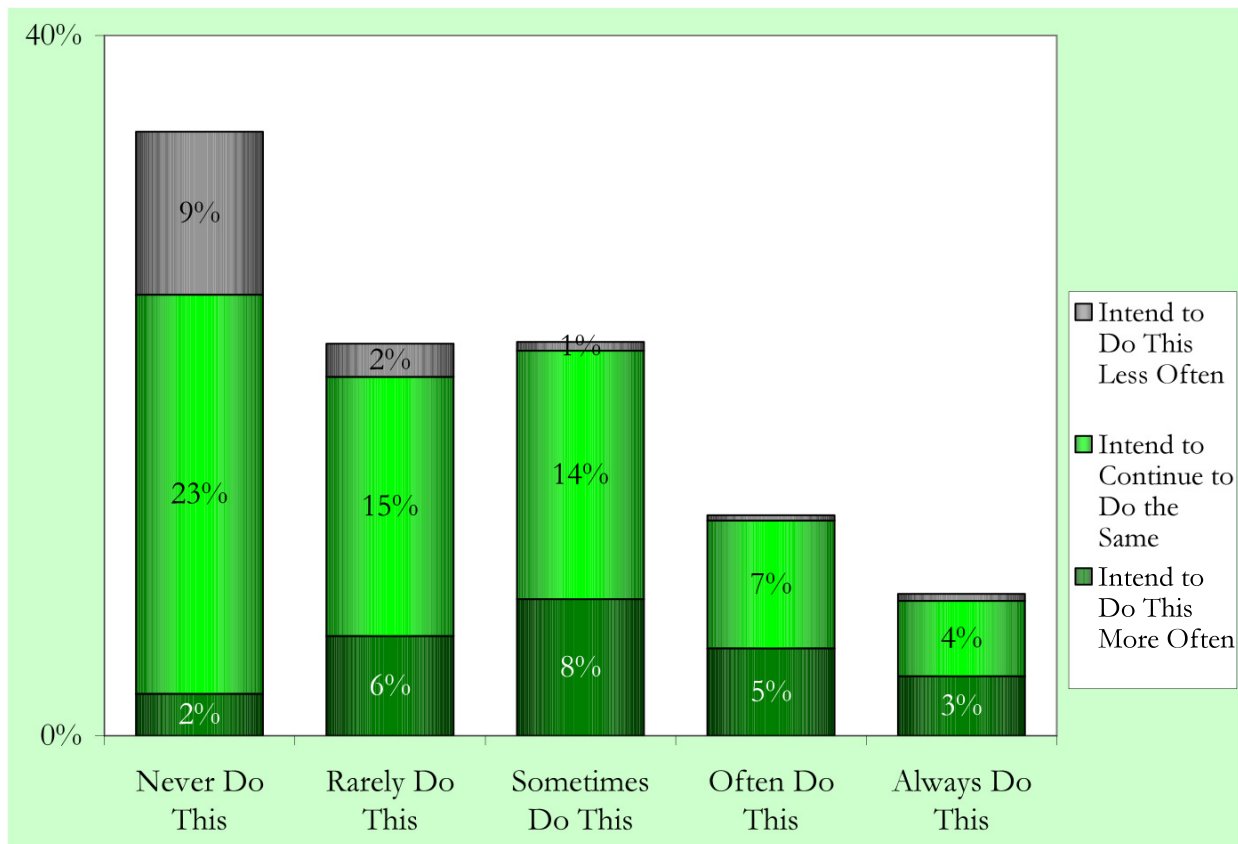
Figure 29: Walking or Biking Instead of Driving: Actions and Intentions

“How often do you do the following things?”

- Walk or bike instead of driving.”

“For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?”

- Walk or bike instead of driving.”



Base = all respondents; N= 2,164.

Appendix B: Survey Questions

Energy Efficiency Actions and Intentions

Actions: Respondents were asked about six actions that lead to increased efficiency in energy use:

“The following questions ask about some actions you may have taken to save energy.

- Is your attic well insulated?
- Has your home been caulked & weather-stripped to reduce drafts?
- Is your home furnace a high energy-efficiency model?
- Is your home air conditioner (AC) a high energy-efficiency model?
- Is your water heater a high energy-efficiency model?
- How many of the light bulbs in your home are high energy-efficiency compact fluorescents (CFLs)?”

Response options for these questions were:

- Yes
- No
- Don’t know
- Not applicable.

Intentions: Respondents who said they had not taken an action or they didn’t know received a follow-up:

“The next questions ask about energy-related actions you might like to do. Which of the following best describes what you are likely to do over the next 12 months?

- Install new insulation in your attic
- Caulk and weather-strip your home to reduce drafts
- Purchase an energy-efficient home furnace
- Purchase an energy-efficient home air conditioner
- Purchase an energy-efficient home water heater
- Change most of the light bulbs in your home to high energy-efficiency compact fluorescents (CFLs) (*Asked of respondents who said they had ‘none,’ ‘a few,’ or ‘some.’*)
- Purchase a car that averages 30 miles per gallon or more.” (*Respondents who said they don’t intend to purchase a fuel-efficient car were asked about barriers to this purchase. “Already drive a fuel-efficient car,” was one of the response options, and was used as our measure of current action.*)

Response options for the intention questions were:

- Yes, I’d like to and probably will.
- Yes, I’d like to but probably won’t.
- No, I don’t want to.
- I don’t know.

Conservation Actions and Intentions

Respondents were asked about five conservation actions:

“How often do you do the following things?

- Turn off the lights when they are not needed
- In the winter, set the thermostat to 68 degrees or cooler
- In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning
- Use public transportation or car pool
- Walk or bike instead of driving.”

Future conservation intentions were asked of all respondents, regardless of their prior action:

“For each of the actions below, over the next 12 months, would you like to do this more frequently than you are now, less frequently than you are now, or about the same as you are now?

- Turn off the lights when they are not needed
- In the winter, set the thermostat to 68 degrees or cooler
- In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning
- Use public transportation or car pool
- Walk or bike instead of driving.”
-

Barriers to Energy-Efficiency Actions

Questions on the barriers to energy-efficiency actions were asked only of respondents who said (1) they had not undertaken the efficiency action or didn't know, and (2) they did not intend to do it in the next year, they'd like to do it but probably wouldn't, or they didn't know.

Attic Insulation

“There are many reasons why people don't install new insulation in their attics. Please check all of the reasons below that apply to you.

- I don't know how
- It's too much effort
- I'm too busy
- I can't afford it
- I could afford it, but don't want to spend the money
- Someone else in my home would object
- I rent my home*.”

Caulking and Weather-Stripping

“There are many reasons why people don't caulk and weather-strip their homes to reduce drafts. Please check all of the reasons below that apply to you.

- I don't know how
- It's too much effort
- I'm too busy

- I can't afford it
- I could afford it, but don't want to spend the money
- Someone else in my home would object
- I rent my home*.”

Purchasing an Energy-Efficient Furnace

“There are many reasons why people don't purchase an energy-efficient home furnace. Please check all the reasons below that apply to you.

- It's too much effort
- I'm too busy
- I can't afford it
- I could afford it, but don't want to spend the money
- Someone else in my home would object
- I don't need a new one yet
- I rent my home.”*

Purchasing an Energy-Efficient Air Conditioner

“There are many reasons why people don't purchase an energy-efficient home air conditioner. Please check all of the reasons below that apply to you.

- It's too much effort
- I'm too busy
- I can't afford it
- I could afford it, but don't want to spend the money
- Someone else in my house would object
- I don't need a new one yet
- I don't need one
- I rent my home.”*

Purchasing an Energy-Efficient Water Heater

“There are many reasons why people don't purchase an energy-efficient home water heater. Please check all of the reasons below that apply to you.

- It's too much effort
- I'm too busy
- I can't afford it
- I could afford it, but don't want to spend the money
- Someone else in my house would object
- I rent my home*
- I don't need a new one yet.”

Switching to Compact Fluorescent Light Bulbs

“There are many reasons why people don't change most of the light bulbs in their homes to high energy-efficiency compact fluorescents (CFLs). Please check all of the reasons below that apply to you.

- I don't like them
- It's too much effort
- I'm too busy
- I can't afford it
- I could afford it, but don't want to spend the money

- Someone else in my home would object
- I rent my home
- They are too expensive.”

Purchasing a Fuel-Efficient Car

“There are many reasons why people don’t purchase cars that average 30 miles per gallon or more. Please check all of the reasons below that apply to you.

- They’re too small
- They’re not safe
- I can’t afford to
- They’re not powerful enough
- I don’t need a new car
- Someone else in my home would object
- I already drive a fuel-efficient car.”
-

Barriers to Conservation Actions

Barriers to conservation actions were asked of people who said either they intended to continue acting in the same way over the next year, or that they intended to engage in the conservation action less often.

Turning Off Unneeded Lights

“There are many reasons why people don’t turn off lights when they’re not needed. Please check all of the reasons below that apply to you.

- I’m too busy
- It’s too hard to remember
- I’m more comfortable with many lights on
- It’s too inconvenient
- I don’t think it’s important
- Someone else in my home would object
- I’m already doing this as much as I can.”

Using Less Heat in Winter

“There are many reasons why people don’t set the thermostat to 68 degrees or cooler in the winter. Please check all of the reasons below that apply to you.

- I’m too busy
- It’s too hard to remember
- I prefer my house to be warmer than 68 degrees in winter
- It’s too inconvenient
- I don’t think it’s important
- I don’t know how to set my thermostat
- Someone else in my home would object
- I’m already doing this as much as I can
- I can’t control my thermostat
- I don’t have a thermostat.”

Using Less Air Conditioning in Summer

“There are many reasons why people don’t set the thermostat to 76 degrees or warmer or use less air conditioning in the summer. Please check all of the reasons below that apply to you.

- I’m too busy
- I can’t set an exact temperature on my AC unit
- I prefer my home to be cooler than 76 degrees in the summer
- It’s too inconvenient
- I don’t think it’s important
- I don’t know how to set my thermostat
- Someone else in my home would object
- I’m already doing this as much as I can
- I don’t have air conditioning.”

Public Transportation and Car Pools

“There are many reasons why people don’t use public transportation or car pool. Please check all of the reasons below that apply to you.

- It’s too much effort
- I’m too busy
- I can’t afford to
- I could afford to, but don’t want to spend the money
- I wouldn’t feel safe
- It’s physically too uncomfortable
- It’s too inconvenient
- I don’t think it’s important
- I don’t have the option
- Someone else in my home would object
- I’m already doing this as much as I can
- They are not available in my area
- I like to commute by myself
- I already drive a fuel-efficient vehicle.”

Walking and Biking

“There are many reasons why people don’t walk or bike instead of driving. Please check all of the reasons below that apply to you.

- It would take too much time
- It’s too much effort
- I’m too busy
- I wouldn’t feel safe
- The weather makes it too uncomfortable
- The distances I travel are too far
- I don’t think it’s important
- I can’t, due to my health or physical condition
- Someone else in my home would object
- I’m already doing this as much as I can
- I already drive a fuel-efficient vehicle.”

Motivations for Conserving Energy

For each of the conservation actions that respondents said they intend to do more frequently in the coming year, they were asked the following:

“Why do you want to do these things more frequently?”

Turning Off the Lights

“Turn off the lights when they are not needed

- It saves me money
- It helps reduce global warming
- It saves energy
- Someone asked me to
- It’s the moral thing to do
- People I care about are doing it
- It makes me feel good about myself
- Other people approve when I do.”

Turning Down the Thermostat in Winter

“Set the thermostat in winter to 68 degrees or cooler

- It saves me money
- It reduces global warming
- It saves energy
- Someone asked me to
- It’s the moral thing to do
- People I care about are doing it
- It makes me feel good about myself
- Other people approve when I do it.”

Raise the Thermostat in Summer or Use Less Air Conditioning

“Set the thermostat in summer to 76 degrees or warmer or use less air conditioning

- It saves me money
- It reduces global warming
- It saves energy
- Someone asked me to
- It’s the moral thing to do
- People I care about are doing it
- It makes me feel good about myself
- Other people approve when I do it.”

Use Public Transportation or Car Pool

“Use public transportation or car pool

- It saves me money
- It reduces global warming
- It saves energy
- Someone asked me to
- It’s the moral thing to do

- People I care about are doing it
- It makes me feel good about myself
- Other people approve when I do it.”

Walk or Bike Instead of Drive

“Walk or bike instead of drive.

- It saves me money
- It reduces global warming
- It saves energy
- It is good for my own or someone else’s health
- Someone asked me to
- It’s the moral thing to do
- People I care about are doing it
- It makes me feel good about myself
- Other people approve when I do it.”

Impact of Energy-Saving Actions on Global Warming & Own Quality of Life

The first three measures in this section were skipped if the respondent was very sure or extremely sure that global warming is not occurring. This eliminated 115 respondents, and small additional numbers refused to respond, further reducing the number of responses. All respondents were asked the final question regarding the impact of behavior change on their quality of life.

“Think back to the energy-saving actions you’re already doing and those you’d like to do over the next 12 months. If you did most of these things, how much do you think it would reduce **your personal contribution** to global warming?”

“If most people in the **United States** did these same actions, how much would it reduce global warming?”

“If most people in the modern industrialized countries around the **world** did these same actions, how much would it reduce global warming?”

“If you were to change your lifestyle to reduce your personal contribution to global warming, how do you think it would affect your quality of life?”