

# The 80 Percent Challenge:

*A Survey of Climate Change  
Opinion and Action in Massachusetts*



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April 2011

Dear Friend:

MassINC and the MassINC Polling Group are proud to present *The 80 Percent Challenge*. This report, made possible with generous support from the Barr Foundation, represents the first in-depth look at how Massachusetts residents perceive the problem posed by global warming, as well as their willingness to embrace efforts to address this unprecedented challenge.

Scientists tell us that without action to address global warming in the near term, there will be major long-term costs for all of us. Coastal states like Massachusetts will be forced to divert significant public resources to protect against a rising sea level. Stronger storms, droughts, and heat waves will also have significant costs. These effects of global warming will present a serious challenge to our region; for other parts of the world, they could be devastating.

Massachusetts has taken bold steps to help solve its share of this worldwide problem. With the Global Warming Solutions Act of 2008, the state became one of the first in the nation to commit to reducing greenhouse gas emissions. Meeting the ambitious 80 percent reduction target codified in this legislation will require support and participation from a broad coalition of residents, business interests, and state leaders.

This report will help state leaders inform and educate residents in order to build this broad majority. It provides a barometer for where we are today and a benchmark for measuring future progress.

We thank the many advisors who helped design this poll and interpret the results. While they are too numerous to name individually, we are extraordinarily grateful for their time and insight. We would also like to express our gratitude for our sponsors at the Barr Foundation. Barr's leadership has helped MassINC and many civic organizations across Massachusetts to focus their resources on this vital issue.

MassINC's mission is to provide solid, objective research to inform critical public policy debates. We hope you find *The 80 Percent Challenge* a provocative and timely resource. As always, we welcome your feedback and invite you to become more involved in our work.

Sincerely,

A handwritten signature in black ink, appearing to read "Greg Torres". The signature is fluid and cursive, with the first name "Greg" being more prominent than the last name "Torres".

Greg Torres

*President*

MassINC

# The 80 Percent Challenge:

## *A Survey of Climate Change Opinion and Action in Massachusetts*

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# The 80 Percent Challenge:

## *A Survey of Climate Change Opinion and Action in Massachusetts*

### EXECUTIVE SUMMARY

The 2008 Global Warming Solutions Act set the ambitious goal of reducing greenhouse gas emissions 80 percent by the year 2050. With this groundbreaking legislation, the state's elected leaders put Massachusetts on the leading edge of American climate change policy.

Changes in federal regulations, combined with efforts to implement low- and no-cost measures, place the state on track to meet an interim goal of a 25 percent reduction in greenhouse gas emissions by 2020. But cutting emissions further will become more difficult as we exhaust relatively simple solutions.<sup>1</sup>

Much of the progress to date in Massachusetts has been driven by environmental leaders. Achieving the momentum needed to meet the 80 percent reduction target will require active support from a broad coalition of residents, businesses, and the public sector. To develop this level of engagement, the Commonwealth must build what we call a "culture of climate protection."

Creating this culture is essential, as environmental behavior is often driven by social norms. People act when they see others making an effort. This is especially true when acting requires sacrifices that might not provide immediate individual benefit.<sup>2</sup> Equally important, culture has a strong influence on what people believe and perceive. If global warming is seen as a problem with solutions directly opposed to our culture, achieving progress will be an uphill battle. For real change to occur, the public must view climate protection as integrally tied to maintaining the Bay State's unique culture and values.<sup>3</sup>

To learn more about the Commonwealth's progress toward a culture of climate protection,

MassINC surveyed 1,311 adult residents across the state. The poll measured the strength of this culture along three dimensions:

1. Recognition of global warming as a problem and priority
2. Support for policy efforts to reduce greenhouse gas emissions
3. Action to reduce personal greenhouse gas emissions

The results suggest that the qualities of a climate protection culture are taking hold in Massachusetts to varying degrees. While most residents still do not look at global warming as a high long-term priority, a majority sees it as a problem, supports policy efforts to curb greenhouse gas emissions, and takes steps as individuals to reduce their personal energy consumption.

#### *Dimension 1: Recognition of global warming as a problem and priority*

In a culture where climate protection is deeply ingrained, citizens recognize that global warming is both real and serious, and they make addressing it a long-term policy priority. Survey results show a majority of Massachusetts residents believe global warming is happening, but many discount the severity of the threat and few currently see global warming as a high policy priority for the state, even in the long term.

**Most residents believe global warming is happening and caused by human activity.** About three-quarters (77%) of respondents say global warming has "probably been happening," compared with just 17 percent who do not think the world's temperature has been going up slowly over the

past 100 years.<sup>5</sup> Among those who believe global warming is occurring, 74 percent connect it, at least partially, to human activity, while 21 percent say it is due to natural changes in the environment. In total, about six in ten (59%) Massachusetts residents see global warming as both occurring and at least partially caused by human pollution.

About half (54%) of residents say the effects of global warming are noticeable, and another 4 percent think they will be detectable within a few years. But awareness that climate change is already a reality does not mean residents believe it is too late to work to curb global warming. Nearly three-quarters (72%) of Massachusetts residents disagree with the statement, “It’s too late to reduce global warming, we should focus instead on adapting to climate change.”

**A majority of residents do not think global warming has very serious implications.** Only 42 percent of Massachusetts residents say global warming will have very serious consequences for Massachusetts if left unaddressed. Even among those who view global warming as real and attributable to human activity, just over half (56%) think the problem will have very serious consequences, which leaves about four in ten (42%) global warming believers seeing the consequences for Massachusetts as less severe.

This divide along the seriousness factor is very important in understanding global warming opinion. Throughout this report, we refer to residents who believe global warming is real, caused by man, and very serious as the Convinced. With one-third of Massachusetts residents, this is the

## KEY FINDINGS

- Three-quarters (77%) of Massachusetts residents believe global warming is occurring. Nearly 60 percent agree that it is both happening and at least partially the result of human activities.
- Younger residents (76% of the 18-29 age group) are significantly more likely to believe global warming is occurring and caused by humans than are older residents (43% of the 60+ age group).
- African-American (56%) and Latino residents (69%) are more likely than white residents (40%) to believe global warming will be a very serious problem if left unaddressed.
- A majority (57%) of Republicans say global warming is either not happening or is caused mostly by natural changes in the environment. This view is shared by just 22 percent of Democrats and 28 percent of independents.
- Three-quarters of state residents believe global warming is a “very serious” or “somewhat serious” problem for Massachusetts. However, when asked to name the biggest problem facing the state over the next two decades, only 2 percent mention global warming or any other issue related to the environment.
- Asked to choose from a list of long-term challenges before the state legislature, only one-third of survey respondents rate global warming as a high-priority issue. By contrast, 89 percent cite jobs and the economy, and 83 percent cite education, as high-priority long-term challenges.
- While most residents do not rank global warming as a top priority, they still want their state and local leaders to address the problem. Nearly half (47%) say the state should be doing “a lot” to deal with global warming, and few residents (6%) believe the state is already doing a lot.
- About three-quarters believe action to reduce global warming would either help the state’s economy (53%) or have no effect (23%). Only 16 percent think that taking steps



**ES Table 1:**

**Long-term priorities for the Massachusetts legislature by global warming segment**

PERCENT WHO SAY ISSUE IS A "HIGH" PRIORITY	OVERALL	CONVINCED	RECEPTIVE	DUBIOUS	DISMISSIVE
Jobs and the economy	89%	88%	89%	88%	93%
Education	83%	89%	88%	75%	72%
Health care	71%	76%	77%	68%	56%
Energy and fuel costs	57%	57%	54%	54%	64%
Taxes	49%	39%	42%	58%	67%
Global warming	32%	55%	28%	19%	8%

largest of the four global warming opinion segments presented. In contrast, residents who think global warming is real, caused by man, but less than very serious are termed the Receptive. They

are the second largest of the four segments at one-quarter of the Commonwealth's adult population (for more on segment definitions, see text box on page 9).

- to reduce global warming would hurt the state's economy. When economic growth and environmental protection conflict, 50 percent side with protecting the environment and 40 percent favor economic growth.
- Residents set a high standard for themselves. Forty-five percent say that people in Massachusetts need to do "a lot" to respond to global warming. However, they give their neighbors a low grade: Only 4 percent believe residents are now meeting that standard.
- Residents are less supportive of increasing the gas tax to raise funds for transportation improvements. About half (47%) support raising the gas by 10 cents per gallon; 38 percent support a 20-cent increase.
- Almost three-quarters (72%) of Massachusetts residents disagree with the statement "It's too late to reduce global warming, we should focus instead on adapting to climate change."
- Massachusetts residents are not well-informed about the strategies the state has adopted. Only 14 percent have heard "a lot" about the Global Warming Solutions Act, and the same figure applies to the Regional Green House Gas Initiative.
- Many residents are taking personal action to conserve energy, such as moderating home heating usage. However, there is no relationship between belief in global warming and personal conservation. Belief in the reality and seriousness of global warming does not appear to be sufficient motivation to reduce energy consumption.
- A majority of residents support state action to reduce global warming as an economic development strategy: 59 percent agree with the statement "Massachusetts will excel in the competition for green economy jobs by taking the lead in fighting global warming."
- A large majority of residents are willing to pay significantly more for green energy. Eighty percent would pay one dollar more per month for renewable power; 60 percent would pay five dollars more.

**Residents of Massachusetts do not view global warming as a long-term policy priority.** When asked to name the biggest problem facing the state over the next decade or two with an open-ended question, just 2 percent offer global warming or any other challenge related to the environment.

Even when probed about the problem directly, only about a third (32%) of residents rate global

warming as a high-priority long-term issue for the state legislature.<sup>6</sup> In contrast, large majorities grade jobs and the economy (89%), education (83%), and health care (71%) as high priorities.

It is difficult to say for certain why residents do not rank global warming highly as a long-term policy priority, but the segments suggest muted concern is an important factor. About half (55%) of the Convinced say global warming should be a high long-term priority, compared with only about a quarter (28%) of the Receptive. Again, the defining difference between these two groups is the Convinced see the global warming threat as very serious if left unaddressed, while most of the Receptive (79%) see it as just somewhat serious.

It is essential to develop a better understanding of how people come to view global warming as very serious. As presented in the findings below, these residents are much more likely to support state and local policies to reduce greenhouse gas emissions.

### *Dimension 2: Support for policy efforts to reduce greenhouse gas emissions*

While only a third of residents say global warming is a high long-term priority for Massachusetts, on the second dimension — support for efforts to reduce greenhouse gas emissions — survey results show more progress toward a culture of climate protection. A majority of residents support efforts to curb global warming, even when those policies require some financial sacrifice.

**Massachusetts residents want everyone to work harder to find solutions.** Most of the public believes that addressing global warming is a challenge each sector of society should work to address. More than half (56%) of Massachusetts residents think the federal government should be doing “a lot.” In each case, nearly half feel the same way about state government (47%), local

## **DEFINING A CULTURE OF CLIMATE PROTECTION**

Recognizing global warming as a problem and priority is the first dimension of a culture of climate protection. Given the many different challenges societies face at any point in time, it may never surface as a high priority in relation to other issues of the day. But in a state where climate protection is deeply rooted in the culture, residents would recognize global warming as a serious problem and rate it as a high priority among other long-term issues.

The second dimension, support for policy efforts to curb global warming, measures how much action residents believe government should take to solve the global warming challenge. In a state with a culture of climate protection, citizens would support specific policies that reduce greenhouse gas emissions.

Acting as individuals to bring down personal greenhouse gas emissions (i.e., reducing our carbon footprints) is the third dimension of a culture of climate protection. Behavior change at the household level can lead to significant greenhouse gas reductions, and a culture of climate protection helps foster the social norms that motivate many individuals to act accordingly.

MassINC defined these three dimensions of a climate protection culture after a thorough review of the literature on environmental behavior. Public policies to reduce greenhouse emissions (Dimension 2), either through incentives or regulations, have the greatest potential to prevent the worst effects of global warming. But studies show that personal action (Dimension 3) can also have a meaningful impact. With little or no reduction in personal comfort, citizens could cut greenhouse gas emissions in the US by more than 7 percent annually by taking simple steps, such as properly inflating a car’s tires and always turning off the engine when parked.<sup>4</sup>

governments (45%), businesses (48%), and citizens (45%). In addition, about one-third of state residents say they support “some” action from each of these groups.

Residents do not believe that any of these sectors is currently fulfilling its obligation to meet the global warming challenge. Just 4 percent say citizens are doing “a lot” right now, followed by businesses (5%), the state (6%), local governments (7%), and the federal government (7%).<sup>7</sup> These findings suggest that the public would generally favor each sector doing more than it does now.

**Many residents support specific policies to reduce global warming, even when these policies require financial sacrifice.** For example, survey

results show that most people in Massachusetts are willing to pay more for renewable energy. Eight in ten residents would spend one extra dollar per month on their electric bill for renewable energy; 69 percent would pay up to three dollars more. Even when asked about spending up to five dollars more per month, 60 percent say they are willing to do so.

Proposals to improve residential energy efficiency are also popular. Two-thirds of renters would pay more rent each month in exchange for energy conservation improvements to their apartments. A slight majority (55%) of homeowners who heat with oil would be willing to pay an extra two cents per gallon (around \$20 annually)

#### THE SPECTRUM OF GLOBAL WARMING OPINION AND FOUR KEY SEGMENTS

To describe opinions about global warming in ways that provide meaningful distinctions, this report presents four resident groupings, or segments, which are based on belief in global warming and its implications. This segmentation helps highlight areas where knowledge of global warming and its consequences is associated with the dimensions of a culture of climate protection. For a full demographic profile of these segments, see Table 2 on page 19.

	SEGMENT 1: CONVINCED	SEGMENT 2: RECEPTIVE	SEGMENT 3: DUBIOUS	SEGMENT 4: DISMISSIVE
<b>Happening</b>	Yes	Yes	Yes or don't know	No
<b>Cause</b>	At least part human activity	At least part human activity	Natural causes or don't know	N/A
<b>Seriousness</b>	“Very”	Less than “very”	N/A	N/A

**Convinced (33% of residents):** Convinced residents say global warming is caused at least partially by human activity, and they see it as a very serious threat. They are the only group to view global warming as a high priority for state government and they are the most supportive of policy efforts to reduce greenhouse gas emissions.

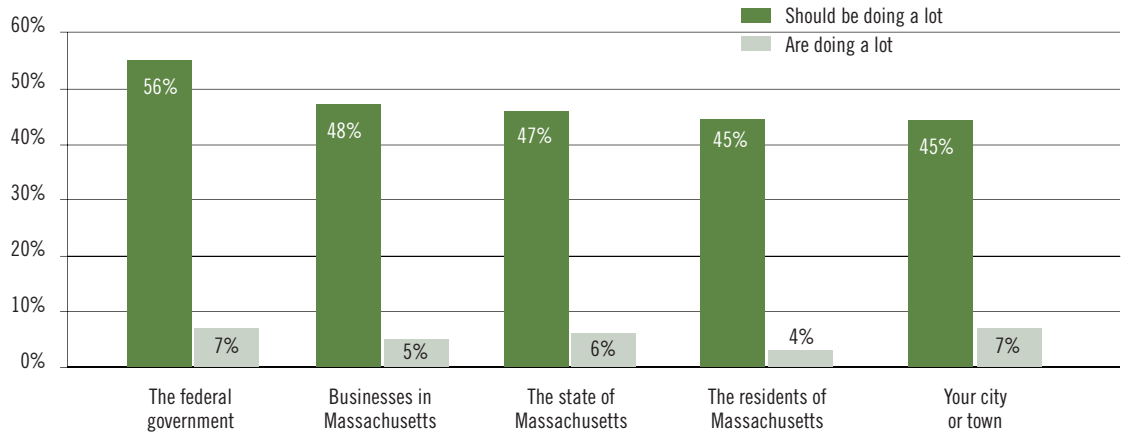
**Receptive (26% of residents):** Receptive residents think global warming is real and at least partially the result of human activity. However, they do not see it as a very serious threat, and they are much less supportive of policy efforts to reduce greenhouse gas emissions.

**Dubious (24% of residents):** Dubious residents are unsure that global warming is real or they believe it is happening for reasons other than human activity. They are closely divided on a number of policy proposals.

**Dismissive (17% of residents):** Dismissive residents do not believe global warming is occurring. They are not supportive of policy efforts to reduce greenhouse gas emissions. They are, however, just as likely as others to engage in personal energy conservation.

ES Figure 1:

Resident support for action vs. resident perception of current level of effort



to support free energy assessments and rebates to help reduce the upfront cost of efficiency improvements. In Massachusetts, these services are currently only available to homes heated with natural gas.

Even raising the gas tax gets support from nearly half of all residents. Forty-seven percent would favor a 10-cent-per-gallon increase, with proceeds going to improvements in the roads and public transportation (though support drops to 38 percent when respondents are asked about a 20-cent increase).

**THE PUBLIC IS NOT WEIGHING ITS SUPPORT FOR CLIMATE CHANGE POLICY BASED ENTIRELY ON COST AND ABILITY TO PAY.**

Perhaps the most important lesson in these findings is that the public is not weighing its support for climate change policy based entirely on cost and ability to pay.<sup>8</sup> Whether residents are for or against a policy is only loosely related to how much income they have to cover additional costs. For the gas tax, support actually declines as family income rises after controlling for political affiliation. This income effect holds even when looking just at those who commute to work alone by car.<sup>9</sup>

**The public endorses these policies even though their awareness of the larger strategy is low.** Only 14 percent of residents have heard a lot about the landmark Global Warming Solutions Act or the state's participation in the Regional Greenhouse Gas Initiative. In Boston, just 3 percent of residents have heard a lot about the city's far-reaching climate action strategy, released in April 2010.

Research shows that people are more likely to act to improve environmental quality when they understand how their efforts contribute to a larger solution.<sup>10</sup> Given the complexity of the challenge, and the trade-offs associated with the various proposals to curb greenhouse gas emissions, educating the public on the components of state and local strategies designed to respond to global warming could lead to greater support for these policies.

**Residents who believe that global warming is a real and serious threat are more supportive of policy effort to reduce greenhouse gas emissions.** Looking at the four policy proposals together provides a way to measure how eager residents are for state and local governments to take specific steps to reduce greenhouse gas emissions. Doing so shows that support for policy efforts varies by segment, as expected. Convinced residents support an average of 2.9 proposals, and Dismissive residents endorse just 1.5 of them. The Receptive

fall in the middle, supporting 2.5 policies. These results suggest that reaching residents who recognize the problem, but not its consequences, could lead to increased support for state and local action.<sup>11</sup>

### Dimension 3: Action to reduce personal greenhouse gas emissions

To gauge how much effort residents are making to reduce greenhouse gas emissions, the survey included a series of questions about personal action to conserve energy. While the results show that a significant share of the public is conscientious about reducing energy usage, the findings also reveal little connection between energy savings behavior and belief that global warming is a concern.

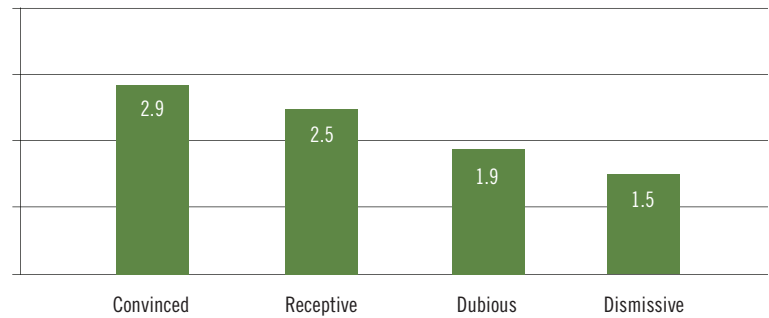
**Many residents are already taking steps to reduce their energy usage.** About half (52%) of residents say they take steps “very frequently” to use less energy. In terms of the five specific self-reported actions included in the survey, 53 percent say they always set their thermostats at or below 68 degrees in the winter; 48 percent always turn their engines off immediately when sitting in a parked car; 44 percent always wash all their clothes using the washer’s cold water setting; and 44 percent always check that their car tires are inflated properly.<sup>12</sup> Lowering air conditioning was the only uncommon action, with just one quarter (27%) of residents always setting the temperature at or above 76 degrees in the warmer months.

The survey also revealed that 44 percent of homeowners have had a home energy audit. When excluding those who say they live in new or already efficient homes, this figure rises to 52 percent.

**Residents are taking steps to conserve energy regardless of their belief in global warming.** Support for policy efforts in response to global warming is driven by belief in global warming as a very serious threat. But there does not appear to be a

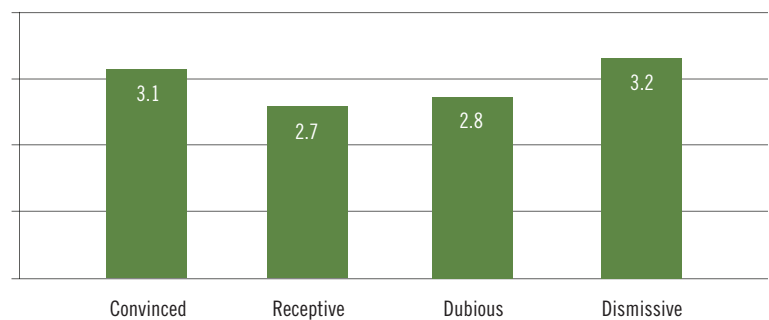
ES Figure 2:

Average number of policies supported by global warming segment



ES Figure 3:

Average number of conservation actions taken by global warming segment



similar link between an understanding of global warming and conservation behavior.

Convinced residents are more likely than the other segments to say that they take steps “very frequently” to reduce their energy usage. But when asked specific questions about behavior, they report levels of action similar to other residents. In fact, the Dismissive say they “always” or “often” carry out an average of 3.2 of the five energy conservation actions; this is a slightly higher number than among the Convinced.<sup>13</sup>

The same pattern is also present with transportation. There is no indication that residents concerned about global warming make an extra effort to carpool, walk, or ride public transportation. Not only does this suggest global warming is not influencing transportation choices, it also means that residents who are aware of the global warming threat are not making decisions about where to live based on a community’s walkability

or public transportation services.<sup>14</sup>

Sharp differences between support for policy efforts and personal action are particularly apparent among younger residents. For example, nearly two-thirds (65%) of respondents ages 18 to 29 say they would support a 10-cent increase in the gas tax, significantly higher than residents in other age groups. But only a third of these young residents say they take steps very frequently to reduce their energy use, the lowest of any age group.<sup>15</sup>

**Conservation behavior is difficult to explain.**

The connection between energy savings and financial savings seems like the most obvious reason why some would conserve more than others. However, the data suggest those living in higher-income households actually engage in more energy savings activity, even after controlling for age, education, and homeownership status. This suggests simple economics is not the most important motivator. No group of variables collected in this survey can accurately predict self-reported conservation behavior.

These results are consistent with hundreds of studies attempting to explain environmental behavior. These studies show that the decisions

warming suggests many are feeling that others are not fully committed to reducing their carbon footprints. This belief likely presents a significant obstacle to encouraging higher levels of individual action.

*Concluding Thoughts on Building a Culture of Climate Protection*

This survey offers several lessons for leaders working to help Massachusetts meet its 80 percent greenhouse gas reduction goal. These include lessons about communicating the challenge, groups to target, and frameworks for evaluating progress.

Communicating the threat posed by climate change is a challenge scientists have struggled with for decades. These survey results show that on one level their message has been heard in Massachusetts. A majority of residents believe that global warming is real and the result of human activity. On another level, however, their message has not resonated as well. Only a third of residents believe global warming is happening due to human activities and think it will be a very serious problem for Massachusetts if it is not addressed.

While there are some significant differences, in many respects these Convinced residents look very similar to the overall population. The diversity within this group suggests the greater support they voice for state and local policy efforts to address global warming is driven by their appreciation for the seriousness of the problem, as opposed to other social and economic factors. If this is the case, a focus on increasing the understanding of the severity of the problem, particularly among Receptive residents, is one strategy that could help Massachusetts build a broader culture of climate protection.

Successfully increasing awareness of the threat posed by global warming will be difficult. These survey results show a direct relationship between education and a belief that global warming is real. But while more educated resi-

**THERE IS NO INDICATION THAT RESIDENTS CONCERNED ABOUT GLOBAL WARMING MAKE AN EXTRA EFFORT TO CARPOOL, WALK, OR RIDE PUBLIC TRANSPORTATION.**

people make with respect to the environment are complex. Favoring the environment is often only weakly associated with acting on its behalf. Even when people intend to act in ways favorable to the environment, they often fall short of their goals. This body of research, however, does suggest that important cultural forces, such as social and moral norms, are at work in influencing environmental decisions.<sup>16</sup> The small number of Massachusetts residents who think other residents are currently doing a lot to reduce global

dents are more likely to think the earth is slowly warming, they are no more likely than others to think global warming is serious. This suggests cultural values may be impacting the way Massachusetts residents interpret the scientific consensus concerning global warming’s potential consequences. Research nationally shows that when problems involve risk, people rely on their core values to judge whether the threat is truly dangerous. Those who favor individual freedom, a trait residents of Massachusetts trace back to the Commonwealth’s founding principles, tend to discount risk.<sup>17</sup>

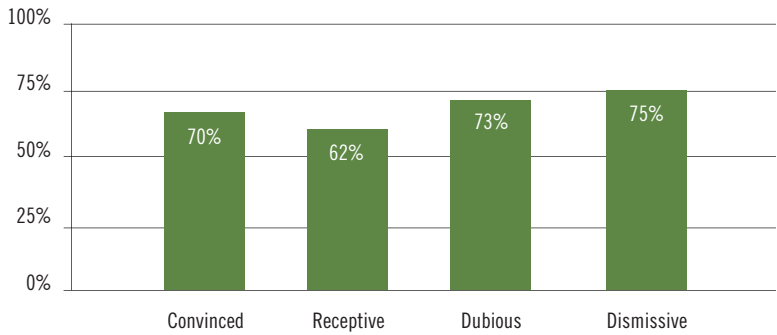
Communicating the problem of global warming as a threat can also trigger an emotional response. Research shows that residents overwhelmed by the challenge may simply attempt to evade it, particularly when they are not informed about how to solve the problem.<sup>18</sup> For this reason, it is critical that state and local governments effectively communicate global warming strategies and the role residents have in helping Massachusetts meet its greenhouse gas reduction targets.

The difficulty involved in communicating the global warming challenge is not an argument for abandoning the attempt altogether and pursuing other messages leading to energy reduction. But to be sure, other frames are valuable. The survey shows that 84 percent of residents think developing renewable energy is critical to our national security, and nearly 60 percent of residents think Massachusetts will create green jobs by taking the lead in efforts to curb global warming.

This economic development frame is particularly powerful. Studies show that what matters most in winning engagement on global warming is whether people think efforts to reduce it will harm them personally and weaken the economy.<sup>19</sup> A majority of residents (53%) think acting to curb global warming will help the Massachusetts economy; just 16 percent say the state’s climate change efforts are detrimental to the economy. Massachusetts residents are clearly

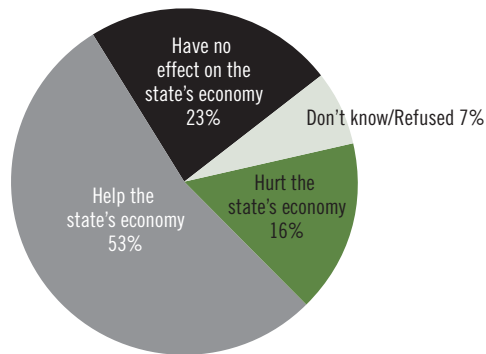
ES Figure 4:

Percent driving to work alone by global warming segment



ES Figure 5:

How residents view state efforts to fight global warming impacting the economy



inclined to think action to reduce global warming will lead to economic benefits to the state.

However, there is real risk that this message could also create fatigue around global warming as a priority for Massachusetts if the economic development benefits of green jobs are oversold. Similarly, interest in the national security angle could change dramatically based on shifting conditions in the Middle East or as nonrenewable domestic resources are discovered (e.g., natural gas captured through hydraulic fracturing).

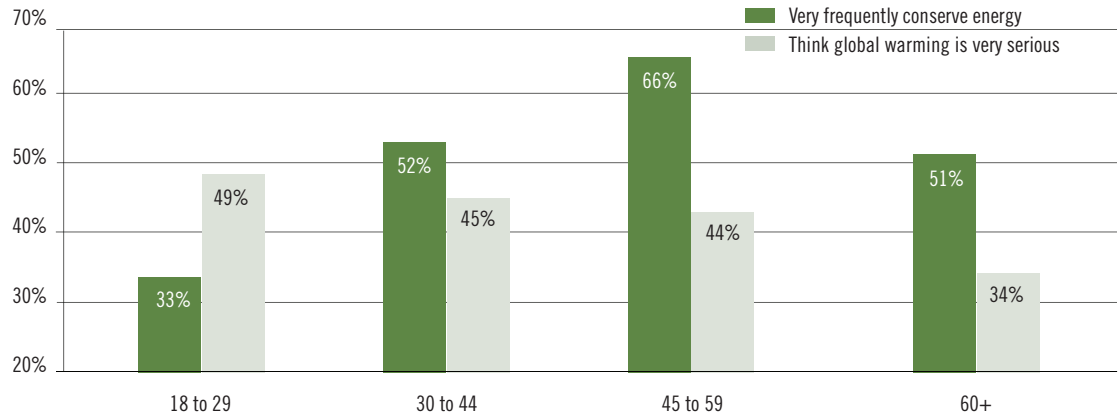
For these reasons, the primary message must be centered around the challenge posed by global warming, a problem recognized by a majority of residents.

Toward this end, working to integrate climate protection into our cultural fabric seems like the most promising avenue toward building the sup-



ES Figure 6:

Energy conservation vs. global warming consequences



port and action required to meet the state’s 80 percent goal. Like love for the Red Sox passed down from one generation to the next, residents must connect beloved Cape Cod beaches and snowy Berkshire peaks to a culture they want to preserve for their children.

Developing this culture is particularly important in encouraging more individuals to take personal action. The survey results show a close connection between belief that global warming is real and serious and support for policy efforts. However, with personal energy conservation, the connection between belief and action is noticeably absent — as if to say, “I think *we* should act, but personally *I* am waiting for others to reduce their energy usage before I moderate mine.”

This gap between belief and action is particularly striking among the state’s youngest residents, who think global warming will be very serious if left unaddressed and want the state to address it but report very modest energy conservation effort as individuals. Perhaps this is simply a sign of the liberalism of youth. Studies nationally have found that young adults are prone to want the government to take more action than they are willing to take personally.<sup>20</sup>

Reaching young residents is yet another challenge leaders must embrace. Students and young professionals are important generators of

culture, particularly in an age with so many new technologies that have the power to dramatically reshape society.

As the state works to build a culture of climate protection inclusive of all residents, it should use the findings provided in this survey as a benchmark. In addition to informing strategies to increase public engagement around this issue, a benchmarking effort could help communicate progress and reinforce the importance of building a broad culture of climate protection across the Commonwealth.

Leaders working to move the needle on this benchmark will certainly face challenges, but as these findings show, they have a significant foundation to build from. Many residents are aware of the severity of the problem. Even those who are not convinced the threat is very serious want state and local governments to find solutions to the problem. Although global warming is not rated as highly on the priority list as other issues, this does not indicate a lack of support for action. State and local officials who work effectively to build a culture of climate protection will be recognized by residents as effectively carrying out their responsibilities as leaders to tackle the full range of both immediate and long-term challenges that come before them.



## THE SURVEY DESIGN AND REPORTING IN BRIEF

This report presents the results of a new MassINC study about opinions regarding global warming among Massachusetts residents. A representative telephone survey of Massachusetts adults was conducted from February 8 to February 14, 2011. The survey was designed and managed by the MassINC Polling Group in conjunction with Princeton Survey Research Associates International (PSRAI).

The sample was made up of two components:

- A statewide sample of 710 adults
- An oversample in Suffolk County of 601 adults

The intent of oversampling in this study was to ensure adequate sample size to allow separate analysis of Boston residents. For results based on the total sample, the overall margin of sampling error is plus or minus 3.8 percent. In this report, differences between groups are included only if they are statistically significant at the 95 percent confidence level. It will be noted whenever a difference is not statistically significant at this level but is reported for other reasons.

Other important notes on the findings in this report include the following:

- The four segments of Massachusetts adults (Convinced, Receptive, Dubious, and Dismissive) were defined using a set of questions on global warming opinions developed exclusively for this survey research project. As a result, the size of the segments among the state's population cannot be confirmed through analysis of Census data. However, since the survey data were weighted to Census parameters for sex, age, race/ethnicity, education, and region of state, each of the key group's percentage of the total adult population should be accurate within the survey's margin of sampling error.
- Regional differences are cited throughout the report. For the purposes of this analysis, Massachusetts is divided into six distinct regions: Boston, the Inner Suburbs, the Outer Suburbs, Southeastern Massachusetts, Central Massachusetts, and Western Massachusetts. These regions were defined using zip code and county lines.

A more detailed description of the survey methodology and the regional definitions is included in the Appendix of this report.



## I. INTRODUCTION

The 2008 Global Warming Solutions Act set the ambitious goal of reducing greenhouse gas emissions by 80 percent by the year 2050. With this groundbreaking legislation, the state's elected leaders put Massachusetts on the leading edge of American climate change policy. Achieving these targets will require continued commitment on Beacon Hill, in addition to real action in communities, businesses, and households across the Commonwealth. To build and maintain this level of public engagement, Massachusetts must foster a lasting culture of climate protection.

To measure the state's progress toward developing this culture of climate protection, MassINC surveyed 1,311 adult residents across the Commonwealth. The poll gauged the strength of this culture along three dimensions:

1. Recognition of global warming as a problem and priority
2. Support for policy efforts to reduce greenhouse gas emissions
3. Action to reduce personal greenhouse gas emissions

As summarized below, the results suggest that the qualities of a climate protection culture are taking hold in Massachusetts to varying degrees:

### Recognition of global warming as a problem and priority

Massachusetts residents are focused on the economy at the moment and want their leaders to set the economy as their highest priority. The strong focus on the economy will challenge leaders who seek to take action on global warming. When asked about priorities for the state legislature, nine in ten (89%) residents think the economy should be a "high" long-term priority — more than any other issue and far more than the 32 percent who say the same of global warming.

### Support for policy efforts to reduce greenhouse gas emissions

Bay State residents see global warming as a serious threat and would like leaders at all levels to address it. The survey examined support for climate change policy in general, and it also tested support for a range of specific policy actions. In terms of general support, about eight in ten (83%) residents would like the state to take "some" or "a lot" of action to address global warming. Support for specific policy initiatives is lower, but many receive approval from more than a majority of residents. There is a strong relationship between the perception of the seriousness of the threat posed by global warming and support for policies to remedy it.

### Action to reduce personal greenhouse gas emissions

The portion of greenhouse gas emissions that could be reduced with personal behavior change is often called the "behavioral wedge." To assess the challenge of addressing the behavioral wedge, the survey explored the relationship between belief in global warming and personal energy conservation behaviors. Massachusetts residents are already engaged in substantial energy conservation. However, there is generally no relationship between belief or concern over global warming and personal action to reduce energy consumption. Believing global warming is a problem is not sufficient motivation to spur personal behavior change.

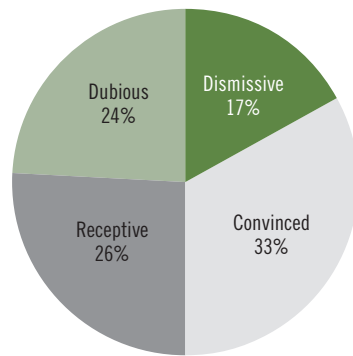
### Understanding Public Engagement and Action

To develop a more nuanced understanding of where the public is within the dimensions of a culture of climate protection, it is helpful to group Massachusetts residents in ways that facilitate

**Table 1:**  
Global warming segments defined

	CONVINCED	RECEPTIVE	DUBIOUS	DISMISSIVE
Happening	Yes	Yes	Yes or don't know	No
Cause	At least part human activity	At least part human activity	Natural causes or don't know	N/A
Seriousness	"Very"	Less than "Very"	N/A	N/A

**Figure 1:**  
Global warming segments by share of respondents



meaningful distinctions. Throughout this report, residents are sorted into four segments based on their belief in global warming and its implications. This segmentation helps highlight areas where belief in global warming is associated with the

dimensions of a culture of climate protection. The segments are defined as follows:

**Convinced (33% of residents):** At one-third of the population, the Convinced think global warming is real, say it is caused by human activity, and see it as a very serious threat. They tend to be most supportive of policy action and are the only segment with a majority who see global warming as a high priority for state government.

**Receptive (26% of residents):** While this group shares with the Convinced the belief in the existence and cause of global warming, they do not see it as a very serious threat. The Receptive are far less supportive of policy efforts than the Convinced. They think addressing global warming could deliver economic benefits in terms of green jobs, but they are less willing to make economic sacrifices for environmental benefits.

**Dubious (24% of residents):** This group is

#### GLOBAL WARMING VS. CLIMATE CHANGE

“Global warming” and “climate change” are the two wordings most commonly used to describe slow changes in the earth’s temperature. Research suggests that these two terms can have different effects on public opinion.<sup>21</sup> For example, one recent study found that Republican respondents were more likely to say “climate change” is happening rather than global warming, while Democrats and independents were unaffected by word choice.<sup>22</sup> To reduce the impact of language, base belief in global warming and its causes were measured using the wording “You may have heard about the idea that the world’s temperature has been going up slowly over the past 100 years.” After the questions determining belief and cause, the phrase “global warming” was used throughout the rest of the survey.

**Table 2:**

**Demographic profile of global warming segments**

	OVERALL	CONVINCED	RECEPTIVE	DUBIOUS	DISMISSIVE
<b>EDUCATION</b>					
Less than high school	9%	6%	6%	17%	8%
H.S. grad	32%	26%	31%	35%	40%
Some college	20%	24%	16%	19%	20%
College grad	39%	44%	48%	29%	32%
<b>PARTY IDENTIFICATION</b>					
Republican	28%	13%	22%	38%	53%
Democrat	54%	70%	60%	41%	33%
Independent/other	16%	15%	16%	20%	11%
<b>INCOME</b>					
<\$50K	37%	37%	39%	38%	32%
\$50-\$100K	29%	34%	26%	26%	27%
>\$100K	20%	17%	24%	16%	23%
<b>RACE/ ETHNICITY</b>					
White	81%	77%	84%	78%	88%
African-American	5%	7%	5%	6%	4%
Latino	6%	10%	3%	5%	2%
All others	8%	6%	9%	10%	4%
<b>SEX</b>					
Male	47%	42%	45%	49%	53%
Female	53%	58%	55%	51%	47%

Note: Don't know/refused responses not shown.

a mix of those unsure of the existence of global warming and those who believe it exists but is not caused by human activity. The Dubious are closely divided on a number of policy proposals and are skeptical of the economic benefits of combating global warming.

**Dismissive: (17% of residents):** This group does not believe global warming is occurring at all. The Dismissive are not supportive of policy efforts, new taxes or surcharges, or any of the other mechanisms by which the state may seek

to address global warming. They are, however, just as likely as the other segments to engage in personal energy conservation.

## II. RECOGNITION OF GLOBAL WARMING AS A PROBLEM AND PRIORITY

Positioning global warming as a problem and priority is the first dimension of a culture where climate protection is deeply ingrained. Survey results show a majority of residents believe global warming is occurring, but only about one-third think of the issue as a high long-term policy priority. Residents who believe global warming will have very serious consequences if unaddressed are more likely to view it as a long-term policy priority, but even these residents see the economy as the top long-term issue. And many other residents simply discount the immediacy of the threat posed by global warming.

### *Belief in Global Warming*

Most Massachusetts residents believe global warming is both real and caused at least partially by human activities. Majorities also believe that the effects of global warming have already begun (or will soon) and, if left unchecked, these effects will pose serious problems for Massachusetts.

- About three-quarters (77%) say global warming has “probably been happening,” and 17 percent say it probably has not. In a June 2010 nationwide poll, 74 percent of adults agreed with the former statement in a similarly worded question.<sup>23</sup>
- Among those who think global warming has probably been happening, 74 percent say the warming trend is caused entirely or partially by human activity.
- Combining belief and cause, a total of 59 percent think global warming is occurring and caused at least partially by human activity.

### *Global Warming as a High Policy Priority*

The survey measured support for global warming as a long-term policy priority both by using an open-ended question (asking residents to name the biggest problem facing the state) and by asking residents to rate global warming and other issues as low, medium, or high long-term priorities for the Massachusetts state government.

### *The Biggest Problem Facing the State of Massachusetts*

When asked on an open-ended basis for the state’s number one long-term priority, 41 percent cite the economy, while less than 10 percent mention any other single issue. Even among the Convinced, just 3 percent mention global warming or any other environmental issue as the state’s top long-term issue.

Given the financial difficulties families have experienced in recent years, this response is not surprising. In another recent survey, almost half (45%) of Massachusetts residents reported feeling worse off financially than in the previous year, and just 28 percent expected their family’s financial situation to improve in the year ahead.<sup>24</sup> Surveys also indicate that the public expects economic problems will linger as a long-term challenge. In late 2010, just 20 percent of respondents in one Massachusetts survey believed that the next generation would surpass them and do better in economic terms.<sup>25</sup>

### *Global Warming vs. Other Long-Term Issues*

Despite widespread acceptance of the reality and immediacy of global warming, survey results still show that residents are far more concerned with the state of the economy. Nine in ten (89%) say jobs and the economy should be a “high” long-term priority for state leaders, compared with 32 percent who say the same of global warming.

**Table 3:**

**Profile of Massachusetts residents by belief in global warming and its cause**

	HAPPENING, CAUSED AT LEAST PARTIALLY BY HUMANS	HAPPENING, CAUSED BY NATURAL CHANGES IN ENVIRONMENT	HAPPENING, DON'T KNOW CAUSE	NOT HAPPENING	UNSURE IF HAPPENING
<b>ALL RESIDENTS</b>	59%	16%	2%	17%	6%
<b>AGE</b>					
18 to 29	76%	13%	1%	8%	2%
30 to 44	65%	13%	1%	17%	4%
45 to 59	61%	16%	2%	18%	3%
60+	43%	19%	5%	21%	11%
<b>PARTY ID</b>					
Republican	35%	24%	3%	33%	5%
Democrat	71%	11%	3%	11%	4%
Independent/other	57%	16%	2%	12%	12%
<b>EDUCATION</b>					
Less than high school	39%	26%	6%	16%	13%
H.S. grad	53%	16%	2%	21%	8%
Some college	61%	15%	3%	17%	4%
College grad	69%	13%	1%	14%	3%
<b>RACE</b>					
White	59%	15%	2%	19%	5%
African-American	63%	17%	1%	13%	6%
Latino	75%	5%	4%	6%	11%
All others	58%	27%	1%	10%	5%

The four segments are unified in their view that the economy and education should be the top two priorities for state leaders, with 70 percent or more among all segments saying they are each a high priority. Even among the Convinced, far more call the economy a high priority than they do global warming. But although there is unanimity that the economy is very important, members of the different segments disagree over other issues.

The two issues that prompt the most disagreement between segments are taxes and global warming. Among Convinced residents, 55 percent call global warming a high priority, compared with just 28 percent of the Receptive and still less among the other two segments. Notably, the four segments also give different priority levels to taxes; two-thirds (67%) of the Dismissive said taxes should be a high priority, compared with 39 percent of the Convinced. While polar-

**Table 4:**  
**Long-term priorities for the Massachusetts legislature**

PERCENT WHO SAY ISSUE IS A "HIGH" PRIORITY	OVERALL	CONVINCED	RECEPTIVE	DUBIOUS	DISMISSIVE
Jobs and the economy	89%	88%	89%	88%	93%
Education	83%	89%	88%	75%	72%
Health care	71%	76%	77%	68%	56%
Energy and fuel costs	57%	57%	54%	54%	64%
Taxes	49%	39%	42%	58%	67%
Global warming	32%	55%	28%	19%	8%

ization on global warming would be expected, the differences between segments on taxes are indicative of the degree to which belief in global warming has become a partisan issue. Global warming is now enmeshed in a constellation of politically charged issues far larger than a simple evaluation of whether the science is true or not.

### *Global Warming's Consequences*

Forty-two percent of residents think global warming will be a "very serious" problem for Massachusetts if left unaddressed, while about one-third (32%) believe the consequences will be "somewhat serious" if solutions are not found. Only about one in five residents think it would be "not too serious" (12%) or "not at all serious" (9%) for the Bay State if steps are not taken to reduce global warming.

Over half (57%) of Massachusetts residents say the effects of global warming have either already begun or will begin within a few years; 29 percent think the effects will come later, while 11 percent say the effects will never be felt. Not surprisingly, 81 percent of Convinced residents see the effects already happening or anticipate they will be felt soon. A smaller percentage of the Receptive (69%), though still a majority, see global warming's effects occurring in the near term.

A large majority (72%) of Massachusetts residents say it is not too late to stop global warm-

ing. This figure is significantly higher among those who think human activity has created the problem, including Convinced (83%) and Receptive (82%) residents.

### *Variation in Global Warming Opinion*

Outside of the four segments, the survey also captured significant variations in opinions about global warming among social and demographic groups based on age, race and ethnicity, income, region, and political affiliation. These variations provide another important view of how the culture of climate protection is evolving in Massachusetts.

### *Age*

About three-quarters (76%) of residents between ages 18 and 29 think global warming is real and at least partially the result of human activity. The proportion of residents that hold this view declines with each age group; just 43 percent of residents aged 60 and over believe global warming is happening and at least partially caused by human pollution. The same pattern holds with seriousness. About half of residents (49%) aged 18 to 29 think global warming will be a very serious problem for Massachusetts if left unaddressed, compared with only about one-third (34%) of residents aged 60 and over. While those



who think global warming should be a high priority for the state also declines with age, the trend line is not as steep. Just 35 percent of residents aged 18 to 29 think it should be a high priority, falling to 26 percent of residents aged 60 and over.<sup>26</sup>

### Race and Ethnicity

More than half of white residents (59%) think global warming is both real and caused at least partially by human activity, compared with 63 percent of African-American and 75 percent of Latino residents. African-American and Latino residents are also more alarmed about the prospect of global warming than are white residents. About seven in ten (69%) Latino residents and 56 percent of African-American residents think it will be a very serious problem for Massachusetts if left unaddressed; 40 percent of white residents have a similar level of concern.

There are other indications that African-American and Latino residents give greater weight to environmental concerns than do white residents. For example, two-thirds (65%) of Latino and 58 percent of African-American residents choose the environment when it conflicts with economic growth, compared with 48 percent of

Figure 2:

Percent who think global warming will be a “very serious” problem if nothing is done

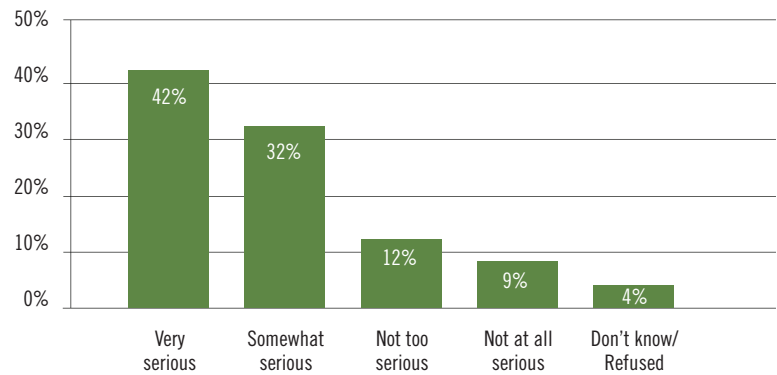


Figure 3:

Percent who think global warming will be “very serious” by age

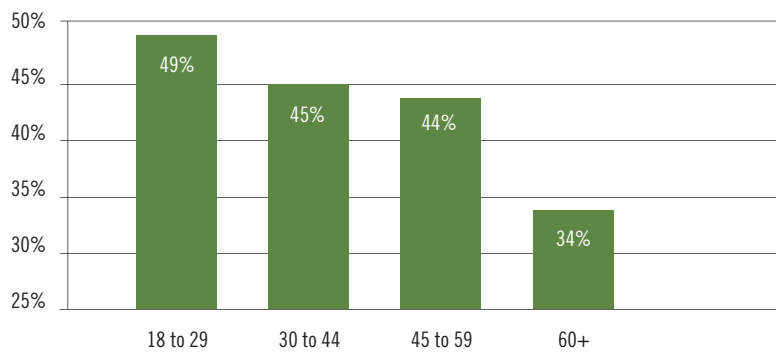


Table 5:

Global warming opinion by race and ethnicity

PERCENT WHO SAY	ALL RESPONDENTS	WHITE	AFRICAN-AMERICAN	LATINO	ALL OTHERS
Global warming is occurring and caused at least partially by humans	59%	59%	63%	75%	58%
Global warming will be a “very serious” problem for MA if nothing is done	42%	40%	56%	69%	37%
Protect the environment over economic growth when the two conflict	50%	48%	58%	65%	55%
Global warming should be a “high” long-term priority for the state	32%	29%	37%	61%	29%

white residents.

These differences in opinion with respect to the environment extend to views of global warming as a high long-term policy priority for the state. Just 29 percent of white residents say global warming should be a high priority, versus 37 percent of African-Americans and 61 percent of Latinos.

Nationally, other surveys have found similar dynamics, with racial and ethnic minorities showing substantially higher levels of acceptance of global warming and concern about its impact.<sup>27</sup>

### Income

While residents of all incomes are about equally likely to believe global warming is occurring due to human activity, higher-income residents are less likely to believe the effects will be seri-

## SUPPORT FOR GLOBAL WARMING AS A HIGH LONG-TERM PRIORITY FOR THE STATE DECLINES AS INCOME RISES.

ous. For instance, only a third of residents with annual income above \$100,000 say it will be a very serious problem for Massachusetts if left unaddressed, compared with half (49%) of residents with annual income between \$50,000 and

Figure 4:

Percent who say global warming should be a “high” long-term priority for state government by income



\$100,000.

Support for global warming as a high long-term priority for the state declines as income rises. Forty percent of residents with annual income below \$50,000 say it should be a high long-term priority, versus 30 percent of residents in the middle-income category and only 18 percent of residents in the highest income group.

### Political Affiliation

Global warming has become a highly partisan issue. Republicans and Democrats are polarized over whether it is occurring at all, possible causes, and what should be done about it. Looking outside of Massachusetts, this dynamic is apparent in many national polls, with Republicans far more skeptical of global warming than Democrats are.

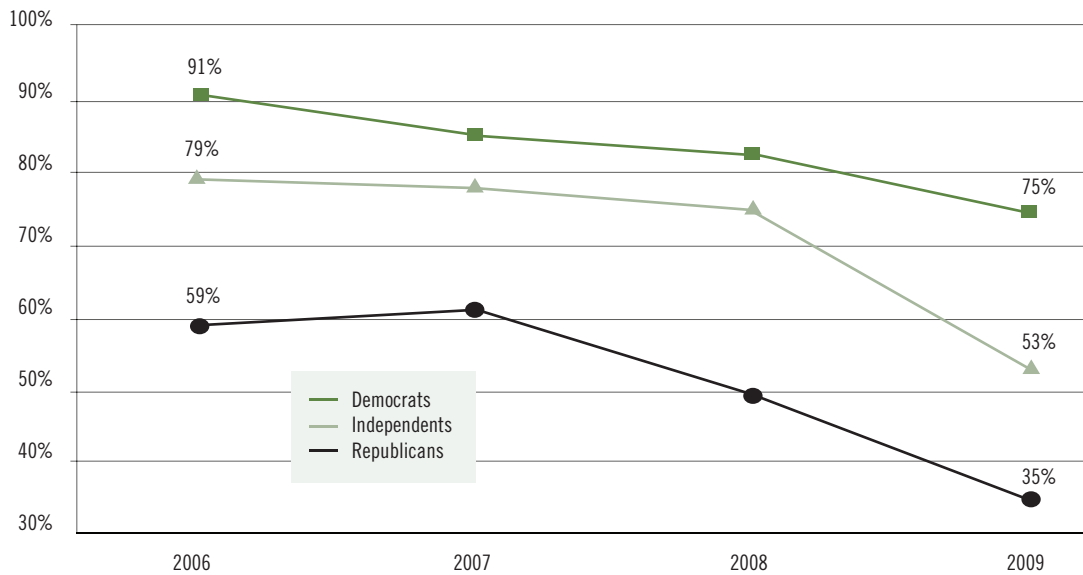
This partisan gap has grown in recent years amid a broader decline in acceptance of global warming. The percentage of Republicans and independents who see “solid evidence” of global warming has fallen 24 points, and there has been a 16-point drop among Democrats.<sup>28</sup> Between 2008 and 2009, the percentage of self-identified conservatives who believe global warming is already occurring fell by 20 points, while the percentage of liberals who said the same ticked up by 2 points.<sup>29</sup>

The survey revealed a similar partisan divide in Massachusetts:

- More than two-thirds (71%) of Democrats believe global warming is happening and that it is caused at least partially by man. About two-thirds of Democrats say the effects can already be seen. About half of Democrats in Massachusetts also believe global warming will be a very serious problem (51%) if it is not addressed.
- A majority of Republicans in Massachusetts believe global warming is either not happening (33%) or is happening due to natural causes (24%). Only about one in five (22%) believe global warming will have very seri-

Figure 5:

Percent of Americans who see solid evidence of global warming by political affiliation



Source: Pew Research Center

ous consequences if left unaddressed.

- Independents in Massachusetts fall between the views of those who associate with the two major parties. A majority of independents (57%) think global warming is occurring and caused at least partially by human activities; 43 percent think it will be a very serious problem for Massachusetts if it is not addressed.

### III. SUPPORT FOR POLICY EFFORTS TO REDUCE GREENHOUSE GAS EMISSIONS

While Massachusetts residents do not see global warming as the state’s top long-term priority, they still want far more action on the issue than they perceive now. With three-quarters of residents feeling global warming will be a problem if left unaddressed, it is not surprising that many do not want action on this issue to be interrupted by the need to focus on rebuilding the economy.

#### *Support for Collective Action in General Terms*

The survey first tested support for collective action by asking respondents how much effort they thought state and local governments, businesses, and residents should be making to curb global warming.

Residents expected the most action from the federal government, with more than half (56%) saying they would like to see “a lot” of action on global warming from Washington. Between 45 percent and 48 percent thought the other sectors — including state and local governments, businesses, and citizens — should be doing a lot to reduce global warming. In each case, these figures

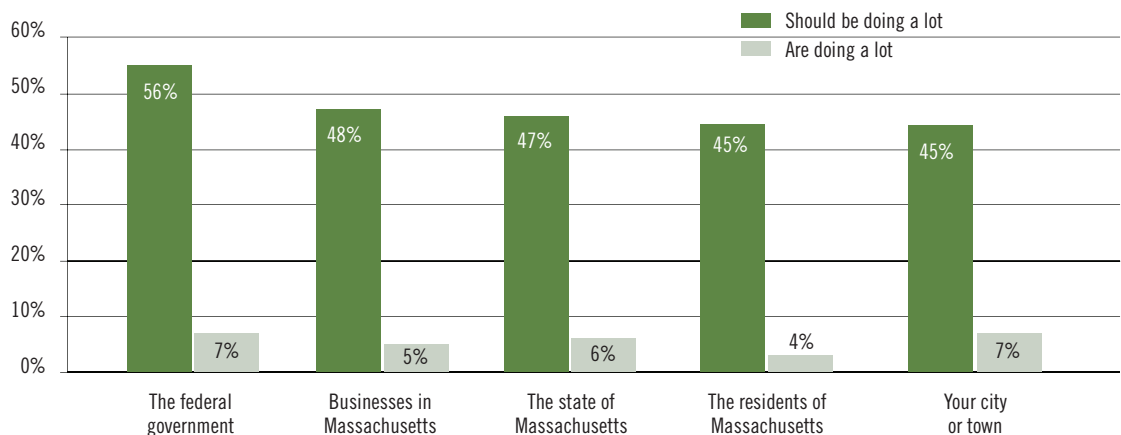
are far higher than the percentages who perceive these levels of action as currently happening.

This gap suggests how much more action on global warming residents would support before seeing leaders as too focused on this issue. Based on this data, if leaders take action on global warming-related issues, they should expect to receive support from their constituents. Even among those who say the economy should be the top issue for state leaders, 84 percent say state leaders should take “some” or “a lot” of action on global warming.

#### *Support for Specific Policy Alternatives*

To assess public support for specific interventions, the survey tested a variety of policy alternatives that could be implemented by the state and local governments to reduce greenhouse gas emissions. As with general support for action, approval is strongly related to the belief that global warming is a problem with serious consequences. This pattern is clearly revealed by looking at the segments, with Convinced residents the most likely and the Dismissive the least likely to support specific policy interventions.

**Figure 6:**  
Support for action vs. perception of current efforts



## Renewable Energy

Renewable energy, which generates strong support across the spectrum, is the one exception to this finding. Eight in ten would be willing to pay an extra one dollar per month on their electric bill for renewable energy, and 69 percent would pay three dollars more. Even when asked about paying up to five dollars more per month, 60 percent say they are willing to do so.

Among Republicans, half (49%) say they are willing to pay up to five dollars more per month, rising to 69 percent who say they would pay one dollar more per month. This agreement across party lines likely has to do with the many arguments that can be made for renewable energy. Democrats and independents are sold on the idea of green tech jobs. Strong majorities across the partisan divide believe renewable energy is important to our national security.

- Young residents are more willing to pay for renewable energy than older residents. For example, 73 percent of residents between ages 18 and 29 would pay an additional five dollars per month for renewable energy compared with only 49 percent of residents age 60 and over.
- Residents with annual income below \$50,000 are about as willing as higher-income residents to pay one dollar more per month for renewable energy. These lower-income residents are less willing to pay three or five dollars extra than are higher-income residents.
- White residents are more open than Latino or African-American residents to paying three or five dollars a month; however, when asked about paying one extra dollar per month, this difference disappears.

When asked about support for paying higher amounts on monthly electric bills to reduce global warming, residents may form opinions based on the specific explanation given. A 2010 study in Massachusetts found strong resistance to the idea of taxes on energy bills simply to curb power

Figure 7:

Percent who think the state should do “a lot” by global warming segment

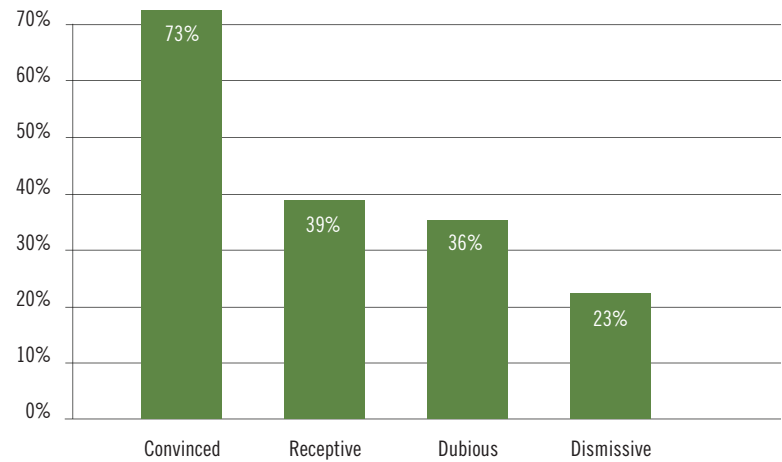
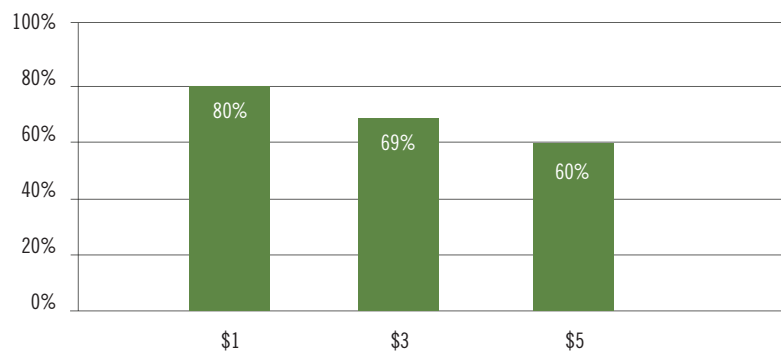


Figure 8:

Percent willing to pay more each month for renewable power



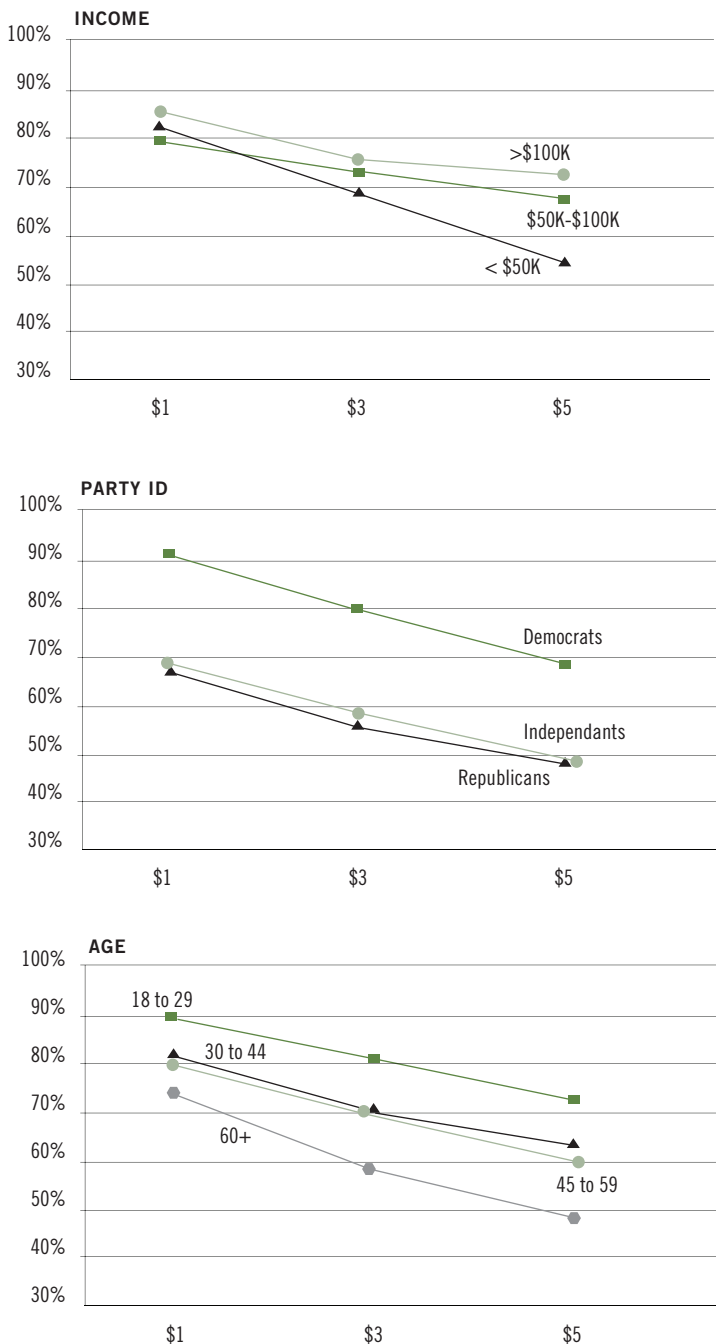
usage.<sup>30</sup> Just 26 percent were in favor of the idea, with 72 percent opposed. The same study found majorities willing to pay up to \$200 per year in extra taxes in exchange for large reductions in air pollution over the next several decades.

## The Gas Tax

When survey respondents are asked whether they would support an increase in the gas tax to improve roads and public transportation, 47 percent support a 10-cent-per-gallon increase from the current 23.5 cents per gallon; 38 percent support raising the tax by 20 cents per gallon.

Among the Convinced, 64 percent support

**Figure 9:**  
**Willingness to pay more each month for renewable power by selected demographics**



increasing the gas tax by 10 cents, and 55 percent support a 20-cent increase. The Receptive are split, with about half open to raising the tax by either amount. Dubious and Dismissive residents are opposed to any increase.

- About twice as many residents strongly oppose increasing the gas tax by 10 cents (32%) as strongly support the idea (15%). When looking at a 20-cent increase, 40 percent strongly oppose the idea and just 10 percent strongly favor it.
- Looking at the partisan split, Democrats are narrowly in favor of a 10-cent increase and narrowly opposed to a 20-cent increase. Both Republicans and independents are opposed to either by wide margins.
- A majority (56%) of those with a college degree support a 10-cent increase and oppose a 20-cent increase (57%); people without a college degree oppose either amount.
- Residents of Boston (58%) and the Inner Suburbs (54%) favor an increase of 10 cents in the gas tax, while a majority of residents living in the rest of the state oppose it.
- All income levels are narrowly split on a 10-cent increase and opposed to a 20-cent increase in the gas tax.
- Young residents are the only group that shows a strong willingness to pay 10 cents more. Two-thirds (65%) of those under 29 support a 10-cent increase in the gas tax, more than twice the level of support among residents over 60 years of age (31%).

### Energy Efficient Homes

A majority (70%) support the idea of requiring apartments to have energy efficiency ratings so potential tenants can learn how much they might spend on utilities before signing a lease. About two-thirds (67%) of renters would be willing to pay their landlords slightly more to make energy efficiency upgrades.

Just 39 percent support the idea of requiring

homeowners to make energy efficiency upgrades prior to selling their home. Renters are far more likely than homeowners to support both ideas, which is expected given the nature of the proposals. (They would not bear the cost of upgrading homes but would benefit from the apartment efficiency ratings.)

At the moment, homes that use heating oil are not eligible for the same free home energy audits available to customers that heat with natural gas. Some have proposed a per-gallon surcharge on heating oil to pay for energy assessments for heating oil users.

When asked about supporting this type of surcharge, heating oil customers are narrowly in favor of paying an additional two cents per gallon. They split fairly evenly on a five-cent-per-gallon charge and are opposed to a 10-cent-per-gallon surcharge.

### Explaining support for collective action

Additional survey questions reveal more about factors shaping resident support for collective action. These include familiarity with current climate action strategies, access to information about global warming, and opinions on the economic development benefits of state efforts to curb global warming.

### Familiarity with State and Local Climate Action Strategies

Just 6 percent believe the state of Massachusetts is taking “a lot” of action on global warming right now. The perceived lack of action may be partially due to a lack of familiarity with what state and local government are doing to deal with global warming.

Less than half statewide are familiar with either the Regional Greenhouse Gas Initiative (RGGI) or the Global Warming Solutions Act (GWSA), landmark initiatives undertaken at the regional and state levels. Among Boston residents, just 16 percent say they have heard either

Figure 10:

Percent who “somewhat support” or “strongly support” a 10-cent-per-gallon gas tax increase by age

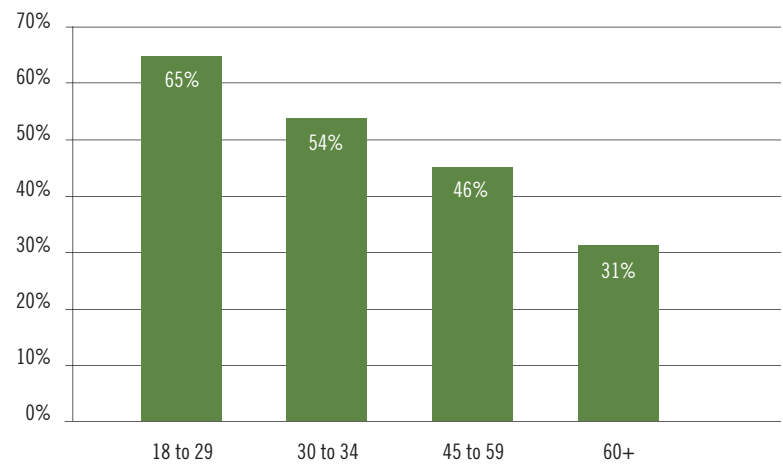
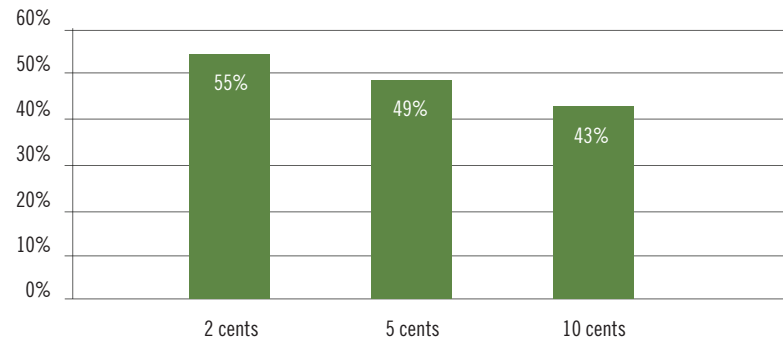


Figure 11:

Percent who support a per-gallon heating oil surcharge to fund free energy audits and retrofit rebates



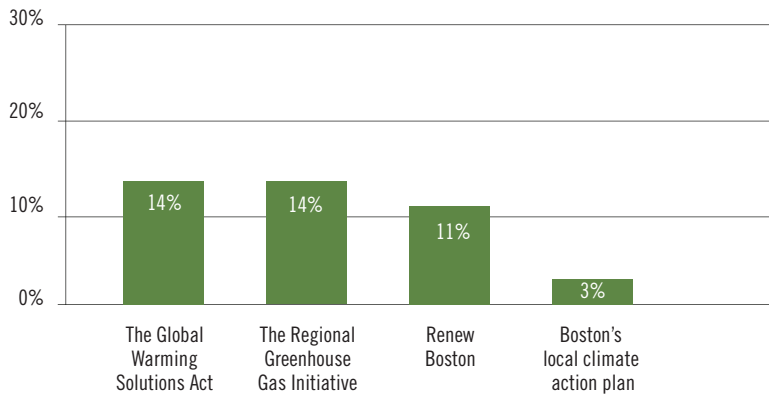
a lot or some about the city’s climate action plan.

Support for state government action is only weakly related to familiarity with what actions the state is taking (i.e., GWSA, RGGI), meaning that many potential strong supporters of current initiatives are not even aware of the initiatives. Publicizing these efforts, the foundations of which are viewed favorably by many residents, may increase the perception that the state government is addressing the issue.

- A July 2010 study showed a majority of Massachusetts residents (77%) are in favor of cap and trade, the centerpiece of the

Figure 12:

Percent who have heard “a lot” about selected climate change efforts



RGGI initiative.<sup>31</sup>

- Looking at the GWSA, a state initiative to address global warming, 83 percent favor at least some state government action on global warming.
- In Boston, 85 percent favor “a lot” or “some” local action to address global warming, as in Renew Boston and the local climate action plan.

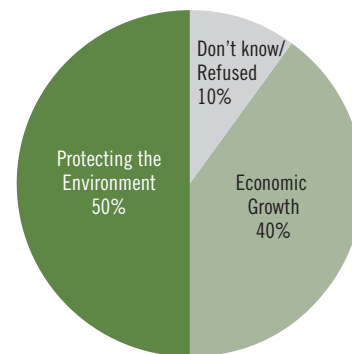
### The Environment and the Economy

Part of the desire for action is a belief that addressing global warming will be good for the economy. National- and state-level political dialogues often treat improving the economy and protecting the environment as opposing goals. Residents do not perceive these goals as conflicting. When asked whether addressing global warming would help or hurt the state’s economy, 53 percent say it would help the state’s economy, 23 percent say it would have no effect, and just 16 percent say it would hurt the state’s economy.

More specifically, 59 percent believe Massachusetts will see growth in green jobs by leading efforts to address global warming. Young and lower-income residents are particularly likely to anticipate benefits from pursuing green jobs. There is also a strong partisan divide, with 71 per-

Figure 13:

Percent who favor protecting the environment or economic growth when they conflict



cent of Democrats seeing the benefits of green jobs, compared with 40 percent of Republicans.

Even in cases where economic development and protecting the environment are in conflict, protecting the environment enjoys a slight edge in support. Half say protecting the environment is more important when it conflicts with economic development, compared with 40 percent who believe economic development is more important. The partisan divide is sharp, with majorities of Democrats choosing the environment and Republicans choosing the economy.

Favoring the environment over the economy has historically been common beyond Massachusetts as well, though this may be changing. Gallup has tracked a similar statistic in its national polling since 1984, with the environment receiving greater weight through 2008. Since 2008, the economy has more often been favored in Gallup polling.<sup>32</sup> Partisan differences on this issue are strong nationwide as well, and appear to be only getting stronger in recent years.

### Segment views of collective action

Belief in the reality and seriousness of global warming bring stronger support for collective action, with differences even between the Con-



**Table 6:****Support for policy by global warming segments**

	ALL RESPONDENTS	CONVINCED	RECEPTIVE	DUBIOUS	DISMISSIVE
<b>GAS TAX INCREASE</b>					
% who support a 10 cent increase in the gas tax	47%	64%	51%	35%	23%
% who support a 20 cent increase in the gas tax	38%	55%	45%	23%	17%
<b>RENEWABLE ENERGY</b>					
% who say they would pay \$5 more per month for renewables	60%	76%	72%	41%	35%
% who say they would pay \$3 more per month for renewables	69%	82%	78%	56%	46%
% who say they would pay \$1 more per month for renewables	80%	91%	88%	69%	64%
<b>HOME ENERGY UPGRADES</b>					
% who support requiring energy efficiency ratings for apartments	70%	85%	72%	64%	44%
% who support requiring home energy efficiency upgrades prior to selling a home	39%	49%	42%	32%	24%

vinced and the Receptive. For instance, 73 percent of the Convinced think the state of Massachusetts should be doing a lot versus just 39 percent of Receptive residents. By comparison, the gaps between Receptive and Dubious residents are rather modest. This pattern of large drops between the first two segments holds when looking at the need for action at the federal and city government levels, among businesses, and among individuals. Believing global warming is real and very serious is the threshold that brings substantially higher support for collective action in generic terms.

When looking at specific policy alternatives, the decline in support between segments is somewhat more gradual. For each of the policies we included, the Convinced are the strongest supporters, followed by a steady decrease among the other segments. Majorities among the Convinced segment support each of the ideas we studied — with the exception of requiring home energy upgrades, which drew support from only 49 percent of Convinced residents. Among

Receptive residents, support remains strong for renewable energy surcharges and apartment efficiency ratings. Dismissive residents are the least supportive of any of the policies we discussed. The only idea favored by a majority of this segment is a one-dollar monthly increase on electricity bills to pay for renewable energy.

## IV. ACTION AS INDIVIDUALS TO REDUCE PERSONAL GREENHOUSE GAS EMISSIONS

Many Massachusetts residents are engaged in an array of energy saving activities, from limiting heat and air conditioning use to obtaining home energy audits. However, it appears that belief in global warming has little to do with these activities. It is unclear whether this is due to individuals not making the connection between energy use and global warming, or whether there are other barriers at work. Research into motivations behind specific energy reducing activities is needed to explain why those alarmed by the prospect of global warming are no more likely to limit energy use.

### *Energy conservation behavior*

The survey examined whether residents take action to conserve energy generally and also asked about specific energy saving behaviors.

#### *General Energy Conservation Behaviors*

A large majority of residents say they make an effort in their daily lives to conserve energy either “very frequently” (52%) or “somewhat frequently” (38%); just 8 percent make no or infrequent attempts to save energy.

This was the only energy conservation question that revealed a small difference among the segments. Sixty-three percent of Convinced residents say they try to save energy very frequently, compared with about half of residents in the other three segments.

#### *Adoption of Specific Energy Savings Behaviors*

Respondents were asked several questions on general energy conservation as well as specific things people do to save energy at the beginning of the survey (before the subject of global warming was introduced). This was to determine how engaged Massachusetts residents are in addressing the “behavioral wedge,” or the share of the necessary

carbon reduction that could come from changes in individual behavior.<sup>33</sup>

- About half (53%) say they “always” keep the thermostat at 68 degrees or less during the winter, the most common of the energy saving activities we studied.
- At the other end of the spectrum, just 27 percent report “always” setting the thermostat at 76 or higher in the summer.
- Forty-eight percent always turn their engines off immediately when sitting in a parked car; 44 percent always wash all their clothes using the washer’s cold-water setting; and 44 percent always check that their car tires are inflated properly.

The motivation for taking these actions is unclear, though it does not appear to be tied to belief in the existence or seriousness of global warming. For example, even among Dismissive residents, 57 percent keep their thermostat under 68 in the winter, and 45 percent keep their tires properly inflated. Both items, as well as the other specific actions tested, are very similar to the levels among Convinced residents. Statistical tests showed no clear relationship between belief in global warming and engaging in energy saving activities.

### *Home energy audits*

Electricity and natural gas ratepayers are eligible for free home energy audits through MassSave, a program overseen by the Massachusetts Department of Energy Resources. Among eligible homeowners, 44 percent say they had already received such an audit, and another 11 percent say their home is already energy efficient.

Residents with low income are more likely than middle-income residents to have had an audit (51% with income below \$50,000 versus 31% with income between \$50,000 and \$100,000).

**Table 7:**  
**Energy conservation behavior by global warming segment**

BEHAVIOR	ALL RESPONDENTS	CONVINCED	RECEPTIVE	DUBIOUS	DISMISSIVE
Always/Often in the winter, set the thermostat to 68 degrees or cooler	67%	71%	62%	64%	69%
Always/Often in the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning	43%	47%	37%	37%	51%
Always/Often wash all of your clothes using the washing machine's cold water setting	60%	62%	57%	58%	64%
Always/Often ensure your car tires are inflated properly	64%	66%	60%	62%	70%
Always/Often turn off the engine immediately when waiting with the car parked	65%	70%	58%	64%	66%

Common explanations for not receiving audits include inconvenience (10%) and not knowing about home energy audits (10%), though a variety of other explanations were also offered. Given this variety of answers, as well as the host of factors that influence participation in the audit program, specific research would be needed to understand these motivations in sufficient detail to increase participation levels.

### Transportation

Opinions and use of public transit are substantially influenced by proximity to transit. Those in the Greater Boston area are much more likely than those in the rest of the state to use public transit, given easier access. As such, they are also more likely than other residents to support funding for public transit, and they put public transit funds on par with roads and bridges. Residents of other parts of the state tend to favor funding for roads and highways more than public transportation, likely given the lack of perceived benefits from public transportation funding.

Views of global warming do not have clear ties to transportation choices. While transportation is a significant contributor to overall greenhouse gas emissions, individuals are not making their transportation choices based on environmental

considerations. Among Convinced residents, 70 percent say they drive to work alone, similar to the 75 percent of Dismissive residents who say the same. Even when controlling for income, region, and availability of public transit, the relationship between transportation choices and belief in global warming is weak at best. This is similar to other personal conservation actions in that environmental views appear to have little effect.

Transportation choices are largely a function of where you live. While more precise data on transportation choices and commute times are available through the U.S. Census, the survey shows the following transportation choices among commuters.

- In Boston, 30 percent of workers say they use public transportation for their daily commute. Another 15 percent walk, and 8 percent participate in a carpool. Less than half (38%) drive alone. Those in the Boston area who do not take public transit mainly cite the time it takes as the barrier to using public transit.
- The Inner Suburbs are similar to Boston in terms of public transit use. More Inner Suburbanites drive alone (52%), and somewhat fewer say they walk (7%) or carpool (5%).
- In the rest of the state, driving to work alone

**Table 8:****Reasons for not taking public transit**

	BOSTON AND INNER SUBURBS	REST OF STATE
Takes longer than driving / takes too long	34%	7%
It is not available in your community	17%	38%
You have a car and want to drive	16%	13%
It is not in a convenient location	13%	13%
You need your car	11%	20%
Not available where needed	3%	1%
The system is too confusing	2%	1%
It is too expensive	1%	2%
Not available when needed	1%	2%
Other / Don't Know	2%	3%

is the choice of approximately eight in ten residents, presumably due in large part to the lack of alternatives.

### *Explaining Willingness to Act as Individuals*

Looking at the actions taken by members of the four segments reveals an irregular pattern not closely tied to the beliefs of members of each segment. Table 7 displays the lack of a clear connection between belief and concern over global warming, and energy conserving actions.

This is both good and bad news for groups seeking to encourage energy conservation. The lack of a clear link between belief in global warming and conservation behavior means there are other motivations driving people to reduce energy use. As such, convincing the public of the reality of global warming is not a prerequisite to driving conservation behavior. Understanding what is motivating these individuals to conserve energy could be helpful in crafting messages to increase this behavior, even without increasing belief in global warming.

On the downside, those who do believe in global warming, who should be motivated to do

more to prevent it, are not doing more. The simple belief that global warming is real and serious is not sufficient motivation to conserve energy. This could be attributed to a lack of knowledge of the effectiveness of individual action, or to a lack of belief in the effectiveness of individual action. Determining which is more prominent would require additional research. One way of identifying specific energy saving actions that could be taken in a given household is through home energy audits. Adoption of these audits has been broad among those eligible, but more work remains to bring eligible homeowners into the program.

One potential (though mistaken) explanation for saving energy would be economic, with lower-income people more likely to save energy than those with higher incomes. As it turns out, just the opposite is true. The higher your income, the more likely you are to save energy, even when controlling for age and education. Lower-income people are not realizing the potential economic benefits that would come from everyday actions such as keeping tires properly inflated, turning off the car when parked, and moderating temperature settings in the home.

### *Partisan Differences in Behavior*

Despite broad partisan differences in opinions on global warming, there are similarities in the ways Republicans and Democrats approach energy use. Republicans and Democrats show no systematic difference in their likelihood to engage in any of the energy saving actions, including home heating, hot water usage, car maintenance, engine idling, and home energy audits. Independents actually show a slightly higher propensity toward energy conservation than those who identify as either Republicans or Democrats.

## V. BUILDING A CULTURE OF CLIMATE PROTECTION

To address global warming as a society, more action is needed from federal, state, and local leaders, the business community, and citizens throughout Massachusetts. As we have reported, residents are supportive of additional action from each of these groups, which is an encouraging first step toward developing a culture of climate protection. Spurring the desired additional actions from each component of society will require a separate sets of ideas and actions, as well as a different set of motivations.

### *Personal Action: Searching for What Motivates Us*

Reductions in personal contributions to greenhouse gas emissions will only occur with changes in the activities that cause emissions, changes which are not driven merely by changes in belief. As this report has demonstrated, the connections between belief, concern, and personal action are tenuous at best. As such, addressing global warming will require far more than convincing the Dismissive that it is occurring, caused by human activity, and a serious threat. Moving people between global warming opinion segments will have little impact on energy conservation behavior. Shrinking the behavioral wedge will only occur when residents broadly adopt the behavioral changes necessary to reduce greenhouse gas emissions.

Other research has suggested that barriers and benefits to conservation behaviors vary by both the individual and the behavior.<sup>34</sup> This supports the finding of this study that belief in global warming is insufficient to spur energy conservation. Shrinking the behavioral wedge must, therefore, include a better understanding of each desired behavior, from proper tire inflation to home energy audits, and the other energy saving activities which could make up the reduction in energy usage that comes from personal conservation. Only then can policies be changed

and campaigns be constructed to move people to take necessary actions.

### *Communications: Strategies for reaching Residents*

Part of addressing the behavioral wedge will be reducing personal energy consumption, which will require communication strategies to reach residents. With this in mind, the survey looked at who is now communicating with consumers on energy conservation issues. A majority of residents (62%) say they have received information on energy conservation from their utility companies. This is far more than other sources; cities and towns are the next most common, at 40 percent. One-third or less say they have received information from any of the other sources listed. Given utility companies' current place as the leading communicator on energy conservation, their ability to reach a wide audience could be helpful in spreading conservation-related messaging.

In addition to energy conservation, we examined what sources consumers turn to for information about global warming specifically. A media strategy to push messages related to global warming will need to account for the substantial variations in information sources between demographic groups. People seeking information about global warming tend to turn primarily to television, newspapers, and magazines. For most demographic groups, these are the top sources of information on global warming. Fewer turn to books, the radio, friends and family, or the government.

- Young people are more likely than other residents to report learning about global warming from the Internet. Among residents under 30 years of age, 86 percent say they learned "a lot" or "some" about global warming from the Internet. Just 29 percent of residents over 60 years of age say the same.

Figure 14:

How much learned about global warming from each source

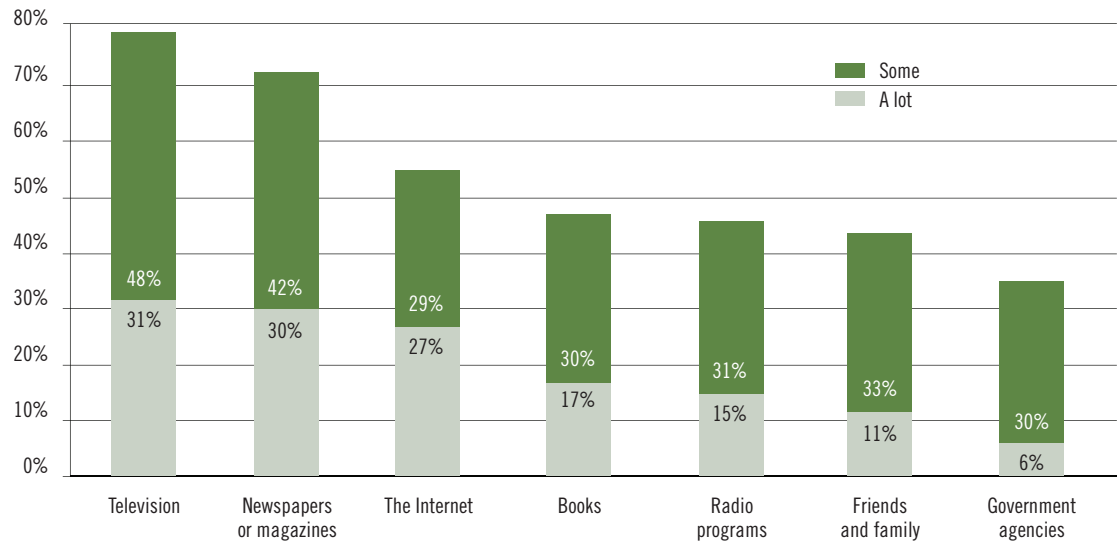
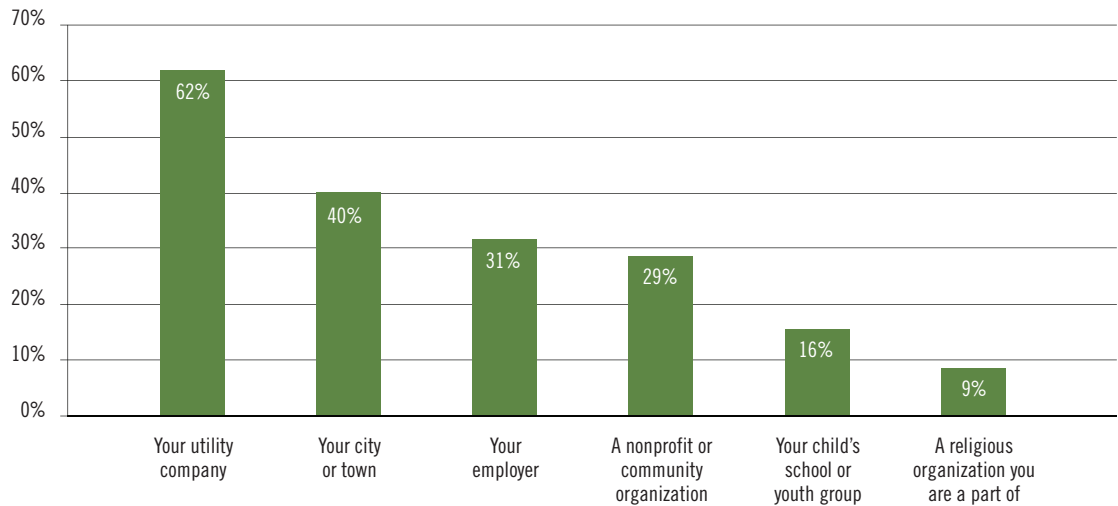


Figure 15:

Percent of residents receiving information about conserving energy in the past 12 months by source



- College graduates, upper-income individuals, young people, and Latinos seek information on global warming from the widest array of sources. Older people, those with less education, and the unemployed seek information from the fewest number of sources.

One potential topic for future communi-

cations is information about current efforts to address global warming at the legislative level. A lack of familiarity with current state and local initiatives to address climate change likely contributes to the sense that not a lot is being done to address the issue. Informing residents of these efforts could help develop the notion that action is already underway.

### *The Business Community: Action Wanted*

Businesses are a necessary part of the culture of climate protection given their role as both significant consumers of energy and resources. Residents also believe businesses have an obligation to play an increased role in efforts to address global warming. About half (48%) of residents believe businesses should be doing “a lot” to address global warming, compared to just 5 percent who think they are doing a lot right now. These figures are comparable to the numbers seeking action from the government, which demonstrates that residents see the two as similarly responsible for addressing global warming. Residents do not view business interests and environmental interests as necessarily opposed to one another. More say addressing global warming will be good for the economy (53%) or have no effect (23%) than say it will hurt the economy (16%).

Even in cases where green business means higher cost, consumers will not necessarily be turned off. In some cases, consumers are willing to pay a premium for environmental sensitivity, as demonstrated by the 80 percent who say they are willing to pay a dollar more per month for renewable energy.

Depending on their target markets, businesses that have a plausible pro-environment message to offer their customers stand to benefit. Young people and Latinos are two groups who place a particularly heavy emphasis on environmental responsibility.

### *The Policy Angle: Leadership Needed*

Although the behavioral wedge is important, addressing global warming will also require further action by political leaders. At the state level, leaders will be disappointed if they wait either for popular demand for action or for a pat on the back when action is taken. Residents are focused on the economy right now, with 89 percent calling it a high priority for state leaders, compared

to 32 percent who say the same of global warming. However, although there may not be pressure for action, there is support for action — far more action than residents perceive right now. In addition to general support for action (47 percent think the state should be doing “a lot”), majorities of residents support policy initiatives ranging from paying more for renewables to requiring apartment efficiency ratings.

Part of the perception of inaction is an overall lack of familiarity with current efforts by state leaders to address global warming. With only 14 percent familiar with the GWSA or RGGI, it is no wonder that just 6 percent think the state is taking “a lot” of action to address global warming at the moment. The essential components of the legislation that has already been passed are popular among Massachusetts residents, even though residents are unaware of the legislation itself. Demonstrating to residents that more action is underway at the state level is an important component of developing a culture of climate protection, where each sector does its part.

## SURVEY METHODOLOGY AND REGIONAL DEFINITIONS

The 2011 Global Warming Survey conducted for MassINC obtained telephone interviews with a representative sample of 1,311 adults living in Massachusetts. Telephone interviews were conducted by landline (1,005) and cell phone (306, including 112 without a landline phone). The survey was conducted by Princeton Survey Research Associates International (PSRAI). Interviews were done in English and Spanish by Princeton Data Source from February 8-14, 2011. Statistical results are weighted to correct known demographic discrepancies. The margin of sampling error for the complete set of weighted data is  $\pm 3.8$  percentage points.

Details on the design, execution, and analysis of the survey are discussed below.

### *Design and Data Collection Procedures*

#### *Sample Design*

A combination of landline and cellular random digit dial (RDD) samples was used to represent all adults in Massachusetts who have access to either a landline or cellular telephone. Both samples were disproportionately-stratified to oversample Suffolk County. The samples were provided by Survey Sampling International, LLC (SSI) according to PSRAI specifications.

Numbers for the landline sample were drawn with equal probabilities from active blocks (area code + exchange + two-digit block number) that contained one or more residential directory listings. The cellular sample was not list-assisted, but was drawn through a systematic sampling from dedicated wireless 100-blocks and shared service 100-blocks with no directory-listed landline numbers.

#### *Contact Procedures*

Interviews were conducted from February 8-14, 2011. As many as three attempts were made to contact every sampled telephone number. Sample was released for interviewing in replicates, which are representative subsamples of the larger sample. Using replicates to control the release of sample ensures that complete call procedures are followed for the entire sample. Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. Each phone number received at least one daytime call when necessary.

For the landline sample, interviewers asked to speak with the youngest adult male or female currently at home based on a random rotation. If no male/female was available, interviewers asked to speak with the youngest adult of the other gender. This systematic respondent selection technique has been shown to produce samples that closely mirror the population in terms of age and gender when combined with cell interviewing.

For the cellular sample, interviews were conducted with the person who answered the phone. Interviewers verified that the person was an adult and in a safe place before administering the survey. Interviewers verified that all respondents currently lived in Massachusetts.

#### *Weighting and analysis*

Weighting is generally used in survey analysis to compensate for sample designs and patterns of non-response that might bias results. The sample was weighted to match Massachusetts adult general population parameters. A three-stage weighting procedure was used to weight this dual-frame sample.

The first stage of weighting adjusted for the oversampling of Suffolk County respondents imposed by the disproportionate sample design.



**Table 1:**  
**Computation of SAMPWT**

	STATEWIDE SAMPLE		STATEWIDE SAMPLE PLUS SUFFOLK OVERSAMPLE		SAMPWT = [A]/[B]
		[A]		[B]	
<b>LANDLINE SAMPLE</b>					
Suffolk County	37	6.5%	472	47.0%	0.14
Rest of State	533	93.5%	533	53.0%	1.76
<b>CELL SAMPLE</b>					
Suffolk County	34	24.3%	200	65.4%	0.37
Rest of State	106	75.7%	106	34.6%	2.19

The adjustment, called SAMPWT, weighted down Suffolk County respondents and weighted up all other respondents to match their proportions in the statewide sample. Table 1 outlines the sample weight computation.

The second stage of weighting corrected for different probabilities of selection associated with each respondent’s telephone usage patterns.<sup>1</sup> This weighting also accounts for the overlapping landline and cell sample frames and the relative sizes of each frame and each sample.

This weight for the *i*th case can be expressed as:

$$WT_i = \frac{1}{\left(\frac{S_{LL}}{S_{CP}} \times LL\right) + (R \times CP)}$$

Where

$S_{LL}$  = size of the landline sample

$S_{CP}$  = size of the cell phone sample

LL = 1 if respondent has a landline phone

= 0 if respondent has no landline phone

CP = 1 if respondent has a cell phone

= 0 if respondent has no cell phone

R = Estimated ratio of the land line sample frame to the cell phone sample frame

The equations can be simplified by plugging in the values for  $S_{LL} = 1005$  and  $S_{CP} = 306$ . Additionally, we estimate of the ratio of the size of land-

line sample frame to the cell phone sample frame to be  $R = 1.19$ .

The final stage of weighting balanced sample demographics to population parameters. The sample is balanced to match Massachusetts adult population parameters for sex, age, education, race, Hispanic origin, region (U.S. Census definitions), and telephone usage. The basic weighting parameters came from a special analysis of the Census Bureau’s 2010 Annual Social and Economic Supplement (ASEC) that included all households in Massachusetts. The telephone usage parameter was derived from recent dual-frame telephone surveys conducted by PSRAI and from estimates provided by the National center for Health Statistics.<sup>2</sup>

Weighting was accomplished using Sample Balancing, a special iterative sample weighting program that simultaneously balances the distributions of all variables using a statistical technique called the *Deming Algorithm*. Weights were trimmed to prevent individual interviews from having too much influence on the final results. The use of these weights in statistical analysis ensures that the demographic characteristics of the sample closely approximate the demographic characteristics of the target population. Table 2 compares weighted and unweighted sample distributions to population parameters.

### *Effects of Sample Design on Statistical*

**Table 2:**  
**Weight Summary**

	PARAMETER	UNWEIGHTED	WEIGHTED
<b>SEX</b>			
Male	48.8	45.8	46.6
Female	51.2	54.2	53.4
<b>AGE</b>			
18-24	12.6	6.8	10.4
25-34	15.7	11.2	13.9
35-44	18.2	14.3	17.9
45-54	20.5	21.5	21.7
55-64	13.5	21.4	14.6
65+	19.5	24.8	21.4
<b>EDUCATION</b>			
Less than HS grad.	10.5	6.7	9.0
HS grad.	32.9	24.3	31.8
Some college	19.4	20.1	19.8
College grad.	37.1	48.8	39.4
<b>RACE/ETHNICITY</b>			
White, not Hispanic	80.9	75.4	82.8
Black, not Hispanic	5.5	11.2	5.5
Hispanic	7.0	8.2	5.7
Other, not Hispanic	6.6	5.2	6.0
<b>REGION</b>			
West/Central	23.0	16.2	22.9
Southeast	12.0	8.1	11.6
Outer suburbs	29.0	22.3	30.4
Inner suburbs	23.0	17.0	21.5
Boston proper	13.0	35.9	12.8
<b>PERSONAL TELEPHONE USE</b>			
LLO	12.5	13.9	13.3
Dual	65.5	77.6	69.5
CPO	22.0	8.5	17.2

### Inference

Post-data collection statistical adjustments require analysis procedures that reflect departures from simple random sampling. PSRAI calculates the effects of these design features so that an appropriate adjustment can be incorporated into tests of statistical significance when using these data. The so-called “design effect” or *deff* represents the loss in statistical efficiency that results from a disproportionate sample design and systematic non-response. The total sample design effect for this survey is 2.01.

PSRAI calculates the composite design effect for a sample of size *n*, with each case having a weight, *w<sub>i</sub>* as:

$$deff = \frac{n \sum_{i=1}^n w_i^2}{\left( \sum_{i=1}^n w_i \right)^2} \quad \text{formula 1}$$

In a wide range of situations, the adjusted standard error of a statistic should be calculated by multiplying the usual formula by the square root of the design effect ( $\sqrt{deff}$ ). Thus, the formula for computing the 95% confidence interval around a percentage is:

$$\hat{p} \pm \left( \sqrt{deff} \times 1.96 \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right) \quad \text{formula 2}$$

where  $\hat{p}$  is the sample estimate and *n* is the unweighted number of sample cases in the group being considered.

The survey’s *margin of error* is the largest 95% confidence interval for any estimated proportion based on the total sample — the one around 50%. For example, the margin of error for the entire sample is ±3.8 percentage points. This means that in 95 out every 100 samples drawn using the same methodology, estimated proportions based on the entire sample will be no more than 3.8 percentage points away from

their true values in the population. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as respondent selection bias, questionnaire wording, and reporting inaccuracy, may contribute additional error of greater or lesser magnitude.

### Response Rate

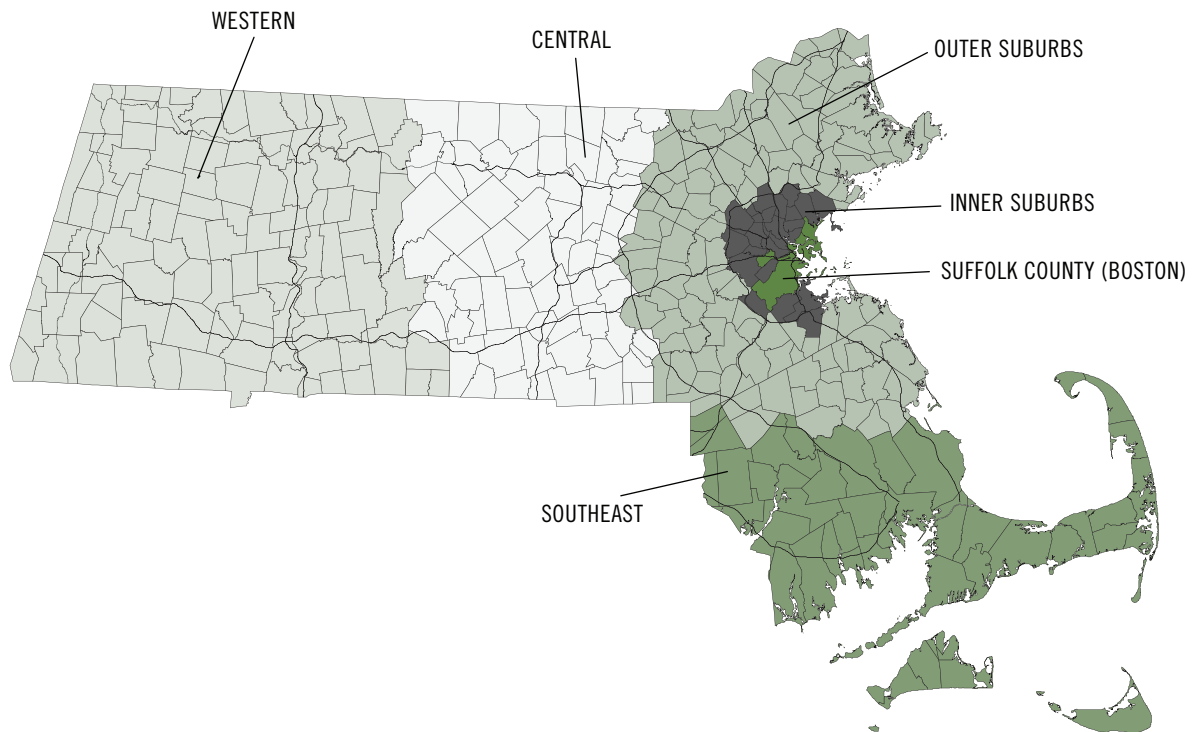
Table 2 reports the disposition of all sampled telephone numbers ever dialed from the original telephone number samples. The response rate estimates the fraction of all eligible sample that was ultimately interviewed. At PSRAI it is calculated by taking the product of three component rates:<sup>3</sup>

- Contact rate – the proportion of working numbers where a request for interview was made<sup>4</sup>
- Cooperation rate – the proportion of contacted numbers where a consent for interview was at least initially obtained, versus those refused
- Completion rate – the proportion of initially cooperating and eligible interviews that were completed

Thus the response rate for the land line samples was 8 percent. The response rate for the cellular samples was 12 percent.

**Table 2:**  
**Sample Disposition**

LANDLINE	CELL	
51045	9887	T Total Numbers Dialed
3661	192	OF Non-residential
2032	5	OF Computer/Fax
9	0	OF Cell phone
28096	3116	OF Other not working
2795	118	UH Additional projected not working
14452	6456	Working numbers
28.3%	65.3%	Working Rate
932	39	UH No Answer / Busy
5754	2752	UO <sub>nc</sub> Voice Mail
43	6	UO <sub>nc</sub> Other Non-Contact
7723	3659	Contacted numbers
53.4%	56.7%	Contact Rate
925	720	UO <sub>r</sub> Callback
5584	2178	UO <sub>r</sub> Refusal
1214	761	Cooperating numbers
15.7%	20.8%	Cooperation Rate
162	43	IN1 Language Barrier
18	405	IN2 Not MA resident/Child's cell phone
1034	313	Eligible numbers
85.2%	41.1%	Eligibility Rate
29	7	R Break-off
1005	306	I Completes
97.2%	97.8%	Completion Rate
8.2%	11.5%	Response Rate



## Regional Definitions

### Boston Suffolk County

**Inner Suburbs** (inside Route I-95) ZIP codes 01801, 01867, 01880, 01890, 01901-06, 01908, 01940, 02026, 02045, 02108-11, 02113-16, 02118-22, 02124-32, 02134-45, 02148-53, 02155, 02163, 02169-71, 02176, 02180, 02184, 02186, 02191, 02199, 02210, 02215, 02420-21, 02445-46, 02451-53, 02458-62, 02464-68, 02472, 02474, 02476, 02478, 02481, 02492, 02494

**Outer Suburbs** (inside Route I-495, outside Route I-95) ZIP codes 01460, 01581, 01701-02, 01718-21, 01730-31, 01741-42, 01745-46, 01748-49, 01752, 01754, 01757, 01760, 01770, 01772-73, 01775-76, 01778, 01803, 01810, 01821, 01824, 01826, 01843-45, 01850-54, 01862-64, 01876, 01886-87, 01907, 01915, 01921, 01923, 01929, 01938, 01944-45, 01949, 01960, 01969-70, 01982-84, 02019, 02021, 02025, 02030, 02032, 02035, 02038, 02043, 02048, 02050, 02052-54, 02056, 02061-62, 02066-67, 02071-72, 02081, 02090, 02093, 02188-90, 02301-02, 02322, 02333, 02339, 02341, 02343, 02351, 02356-57, 02359, 02368, 02370, 02375, 02379, 02382, 02482, 02493, 02762, 02766

**Southeastern Massachusetts** Bristol and Plymouth Counties, excluding ZIP codes listed for the Outer Suburbs, plus all of Barnstable, Dukes, and Nantucket Counties.

**Central Massachusetts** Worcester County, excluding Southborough and Fayville, and portions of northwestern Middlesex County not included in the ZIP code listings for the Outer Suburbs

**Western Massachusetts** Berkshire, Franklin, Hampden, and Hampshire Counties

## THE 80 PERCENT CHALLENGE SURVEY TOPLINE RESULTS

N= 1,311 Massachusetts adults, 18+  
 1,005 landline/306 cell phone interviews  
 Field period: February 8-14, 2011

**INTRODUCTION:** Hello, my name is \_\_\_\_\_ and I'm calling for Princeton Survey Research. We're conducting a research study in Massachusetts and would like to include your household.

1. Thinking long term, what is the biggest problem facing the state of Massachusetts over the next decade or two?  
 (OPEN ENDED)

	PERCENT
The economy/jobs	41%
State budget shortfalls/deficit	9%
Taxes	8%
Health care	7%
Education	5%
Elected officials	3%
Cost of living	3%
Transportation	2%
Crime /public safety	2%
Environmental issues	1%
Energy /fuel	1%
Social services	1%
Illegal immigration	1%
Global warming/climate change	<1%
Other (specify:)	5%
Don't know/Refused (Vol.)	11%

2. I'd like to ask you about long term issues the Massachusetts State Legislature could focus on. As I read from a list, please tell me if you think each should be a high priority, a medium priority, or a low priority for the State Government over the long term? First, should (RANDOMIZE) be a high priority, medium priority, or a low priority for the State Government over the long term? What about...

	HIGH PRIORITY	MEDIUM PRIORITY	LOW PRIORITY	DON'T KNOW / REFUSED (VOL.)
Jobs and the economy	89%	7%	2%	1%
Education	83%	14%	3%	1%
Health care	71%	22%	6%	1%
Energy and fuel costs	57%	35%	7%	2%
Taxes	49%	37%	11%	3%
Global warming	32%	35%	29%	4%

3. Now I'd like to ask you some questions about some things you may or may not be doing. First, how often do you (RANDOMIZE)? Always, often, sometimes, or never? How about...

	ALWAYS	OFTEN	SOMETIMES	NEVER	DON'T KNOW / REFUSED (VOL.)
In the winter, set the thermostat to 68 degrees or cooler?	53%	13%	16%	14%	3%
Turn off the engine immediately when waiting with the car parked?	48%	16%	20%	12%	3%
Ensure your car tires are inflated properly?	44%	20%	19%	12%	4%
Wash all of your clothes using the washing machine's cold water setting?	44%	16%	26%	11%	2%
In the summer, set the thermostat to 76 degrees or warmer, or use less air conditioning?	27%	15%	25%	26%	7%

4. In cases where there is a conflict between (ROTATE OPTIONS ), which do you think is more important?

Economic growth (OR)	40%
Protecting the environment (OR)	50%
Don't know/Refused (VOL.)	10%

5. In your daily life, how often do you intentionally take steps to conserve energy?

Very frequently	52%
Somewhat frequently	38%
Not too frequently (OR)	5%
Not at all?	3%
Don't know/Refused (VOL.)	2%

6. You may have heard about the idea that the world’s temperature has been going up slowly over the past 100 years. Do you think this

Has probably been happening (OR)	77%
Has probably NOT been happening?	17%
Don't know/Refused (VOL.)	6%

IF YES OR DON'T KNOW ASK:

7. Do you believe increases in the Earth’s temperature are due more to (ROTATE)?

The effects of pollution from human activities (OR)	61%
Natural changes in the environment (OR)	21%
Both (VOL.)	13%
Don't know/Refused (VOL.)	5%

READ: As you may know, the idea that the earth’s temperature is slowly increasing is often called global warming

8. Which of the following reflects your view about the effects of global warming? The effects have already begun to happen. They will start happening within a few years. They will start happening within your lifetime. They will not happen within your lifetime, but they will affect future generations. OR, They will never happen?

Already begun to happen	54%
Within a few years	4%
Within your lifetime	10%
Will affect future generations	18%
Will never happen	11%
Don't know/Refused (VOL.)	3%

9. If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for Massachusetts? (REVERSE ORDER FOR HALF OF SAMPLE)

Very serious	42%
Somewhat serious	32%
Not too serious (OR)	12%
Not at all serious?	9%
Don't know/Refused (VOL.)	4%

10. Please tell me how much you have heard or read about each of the following? A lot, some, not too much or nothing at all? (First/Next), how about (ROTATE)?

	A LOT	SOME	NOT TOO MUCH	NOTHING AT ALL	DON'T KNOW/ REFUSED (VOL.)
The Global Warming Solutions Act	14%	26%	24%	35%	1%
The Regional Greenhouse Gas Initiative	14%	31%	24%	29%	1%
"Renew Boston," an energy savings program for Boston homeowners	11%	29%	18%	39%	3%
Boston's Local Climate Action Plan	3%	13%	24%	57%	3%

11. I will now read you a series of statements some people have made about global warming. After I read each one, please tell me if you agree or disagree with the statement. (First/Next), how about (RANDOMIZE)?

	AGREE	DISAGREE	DON'T KNOW/ REFUSED (VOL.)
Developing renewable energy sources is critical to our national security	84%	13%	3%
We have a moral obligation to do what we can to reduce global warming	83%	15%	2%
Massachusetts will excel in the competition for green economy jobs by taking the lead in fighting global warming	59%	30%	11%
We will develop better technologies to reduce global warming in the future so there's no need to act now	27%	71%	2%
It's too late to reduce global warming, we should focus instead on adapting to climate change	23%	72%	5%

12a. Moving on, how much do you think (RANDOMIZE) SHOULD be doing right now to deal with global warming — a lot, some, not too much or nothing at all? How about...?

Ask half...

	A LOT	SOME	NOT TOO MUCH	NOTHING AT ALL	DON'T KNOW/ REFUSED (VOL.)
The Federal Government	56%	30%	6%	7%	1%
Businesses in Massachusetts	48%	34%	7%	8%	2%
The State of Massachusetts	47%	36%	8%	8%	1%
The Residents of Massachusetts	45%	36%	8%	8%	3%
Your City or Town	45%	36%	9%	9%	2%



12b. And how much do you think (RANDOMIZE) is/are doing right now to deal with global warming — a lot, some, not too much or nothing at all? How about ...

	A LOT	SOME	NOT TOO MUCH	NOTHING AT ALL	DON'T KNOW/ REFUSED (VOL.)
The Federal Government	7%	47%	31%	8%	6%
Your City or Town	7%	40%	39%	8%	5%
The State of Massachusetts	6%	50%	32%	4%	7%
Businesses in Massachusetts	5%	41%	38%	7%	9%
The Residents of Massachusetts	4%	49%	40%	3%	3%

13. Do you think that Massachusetts doing things to reduce global warming would (READ AND ROTATE) or would it have no effect on the state’s economy?

Help the state’s economy (OR)	53%
Would have no effect	23%
Hurt the state’s economy (OR)	16%
Don’t know/Refused (VOL.)	7%

14. Massachusetts law requires utilities to produce more energy from renewable sources each year. If providing this renewable power increases your monthly electric bill by (REVERSE ORDER FOR HALF OF SAMPLE), would you favor or oppose such a policy? What if it increased your monthly bill by...

	FAVOR	OPPOSE	DON'T KNOW/ REFUSED (VOL.)
\$1	80%	17%	2%
\$3	69%	28%	3%
\$5	60%	35%	5%

15a. Some communities have laws requiring homeowners selling their homes to make upgrades if the home doesn’t meet minimum energy efficiency standards. Would you support or oppose a similar law in your community?

Support	39%
Oppose	55%
Don’t know/Refused (VOL.)	5%

15b. Some communities require apartments to have energy efficiency ratings so tenants can see how much they might spend on utilities. Would you support or oppose such a requirement in your community?

Support	70%
Oppose	25%
Don't know/Refused (VOL.)	6%

16. Do you own or rent your home?

Own	61%
Rent	36%
Don't know/Refused (VOL.)	3%

IF HOMEOWNER ASK:

17. What fuel do you use most to heat your home? (READ IF NECESSARY)

Oil	43%
Gas	43%
Wood	6%
Propane	2%
Electricity	5%
Other (VOL., SPECIFY)	1%
Don't know/Refused (VOL.)	1%

IF HEAT WITH OIL ASK:

18. Would you be willing to pay a surcharge of (INSERT IN ORDER) on your bill so that oil heat customers could receive free energy audits and rebates on heating equipment and insulation to retrofit their homes and make them more efficient? What about a surcharge of (INSERT NEXT ITEM)?

	YES	NO	DON'T KNOW / REFUSED (VOL.)
2 cents per gallon	55%	43%	2%
5 cents per gallon	49%	49%	2%
10 cents per gallon	43%	54%	2%

IF HEAT WITH ASK:

19. Have you ever had a home energy audit or home energy assessment on your current residence?

Yes	44%
No	52%
Don't know/Refused (VOL.)	4%

IF NO AUDIT/ASSESSMENT ASK:

20. What would you say are the main reasons you have not gotten a home energy audit? (OPEN ENDED)

Home is already energy efficient	22%
Don't believe there would be any benefits	13%
Don't know what an energy audit/assessment is	10%
Inconvenient	10%
Too busy	9%
Too expensive	7%
Just moved in	4%
Don't know how	2%
Planning to	1%
Never thought of it	1%
Other (specify:)	7%
Don't know/Refused (VOL.)	14%

IF RENT AND IN BOSTON ASK:

21. Do you pay for heat or is it included in your rent?

Pay for heat	37%
Included in rent	61%
Don't know/Refused (VOL.)	3%

IF PAY FOR HEAT:

22. Would you be willing to pay your landlord a little more each month if they agreed to make improvements that save you money on your utility bills?

Included in rent	61%
Pay for heat	37%
Don't know/Refused (VOL.)	3%
Total	105

23. I'm going to read you a few ideas some people say would improve the transportation system here in Massachusetts. For each one, please tell me whether you think the state should make it a high priority, medium priority, or low priority. First, (ROTATE)?

	HIGH PRIORITY	MEDIUM PRIORITY	LOW PRIORITY	DON'T KNOW/ REFUSED (VOL.)
Improving streets, roads, and highways	69%	27%	4%	1%
Improving local public transportation, such as buses and trains	62%	28%	9%	2%

24. Right now Massachusetts collects a tax of 23.5 cents per gallon when people buy gasoline. One idea to raise money for transportation is to increase this amount by (SPLIT) per gallon and use the funds to improve roads, highways, and public transportation systems. Would you strongly support, somewhat support, somewhat oppose, or strongly oppose this increase?

	STRONGLY SUPPORT	SOMEWHAT SUPPORT	SOMEWHAT OPPOSE	STRONGLY OPPOSE	DON'T KNOW/ REFUSED (VOL.)
a. SPLIT F1, ASK ½ (GAS10) 10 cents	15%	32%	19%	32%	2%
b. SPLIT F2, ASK ½ (GAS20) 20 cents	10%	28%	20%	40%	2%

25. Which one of the following best describes your work situation — employed full time, employed part time, or not currently employed?

Employed full time	42%
Employed part time	18%
Not currently employed	39%
Disabled (VOL.)	1%
Don't know/Refused (VOL.)	0%

IF UNEMPLOYED

26. Are you a student, a homemaker, retired, or temporarily unemployed?

A student	7%
A homemaker	14%
Retired	52%
Temporarily unemployed	25%
Don't know/Refused (VOL.)	2%

IF EMPLOYED

27. How do you get to work most of the time? Do you drive by yourself, carpool, walk, or take public transportation such as a bus or subway?

Drive alone	69%
Public transportation	15%
Carpool	7%
Walk	5%
Other	4%
Don't know/Refused (VOL.)	0%

28. On average, about how long does it take for you to get from home to work, door to door?

Less than 15 minutes	38%
16 to 30 minutes	32%
31 to 45 minutes	15%
46 minutes up to 1 hour	7%
More than 1 hour but less than 1½ hours	2%
1½ hours or more but less than 2 hours	3%
Approximately 2 hours	0%
More than 2 hours	1%
Don't know/ Refused (VOL.)	2%

29. What is the main reason you do not use public transportation? Is it because...? (Note: Some responses in “other” category have been recoded into categories)

It is not available in your community	33%
You need your car	18%
You have a car and want to drive	14%
It is not in a convenient location	13%
Takes longer than driving / takes too long	10%
You have to wait too long for the bus or train to come	4%
It is too expensive	2%
Not available when needed	2%
Not available where needed	1%
The system is too confusing	1%
Other (specify:)	2%
Don't know/Refused (Vol.)	1%

30. Moving on, please tell me how much you have learned about global warming from each of the following sources — a lot, some, not too much, or nothing at all? First, how about from (RANDOMIZE)?

	A LOT	SOME	NOT TOO MUCH	NOTHING AT ALL	DON'T KNOW/ REFUSED (VOL.)
(TV) Television	31%	48%	11%	9%	1%
(NEWSPAPER) Newspapers or magazines	30%	42%	13%	13%	1%
(INTERNET) The Internet	27%	29%	14%	30%	1%
(BOOK) Books	17%	30%	22%	32%	0%
(RP) Radio programs	15%	31%	24%	30%	1%
(FNF) Friends and family	11%	33%	29%	27%	0%
(GOV) Government agencies	6%	30%	31%	31%	1%

31. In the past 12 months, have any of the following groups provided you with information about conserving energy, or not? First, how about (RANDOMIZE)?

	YES	NO	DON'T KNOW/ REFUSED (VOL.)
(UTIL) Your utility company	62%	36%	2%
(CITYTWN) Your city or town	40%	58%	2%
(EMPL) Your employer	31%	68%	1%
(NONPR) A nonprofit or community organization	29%	70%	1%
(SCHOOL) Your child's school or youth group	16%	80%	3%
(RELORG) A religious organization you're a part of	9%	91%	0%

## DEMOGRAPHICS

D1. Record Respondent's Sex:

47% Male

53% Female

### ASK ALL LANDLINE SAMPLE

D3. Now thinking about your telephone use... Do you have a working cell phone?

Yes, have cell phone	80%
No, do not	20%
Don't know/Refused (VOL.)	0%

### ASK IF DO NOT PERSONALLY HAVE CELL PHONE:

D4. Does anyone else in your household have a working cell phone?

Yes, someone in household has cell phone	40%
No	59%
Don't know/ Refused (VOL.)	1%

### ASK ALL CELL PHONE SAMPLE

D5. Now thinking about your telephone use...Is there at least one telephone INSIDE your home that is currently working and is not a cell phone?

Yes, has a home telephone	48%
No, no home telephone	51%
Don't know/Refused (VOL.)	1%

D6. What is the last grade or class you completed in school?

Less than high school	9%
High school graduate	32%
Some college	20%
College or university graduate	39%
Don't Know/Refused (VOL.)	0%

D7. Are you currently registered to vote in Massachusetts?

Yes	87%
No	13%
Don't know/Refused (VOL.)	0%

ASK IF REGISTERED/DK:

D8. In politics TODAY, do you consider yourself a Republican, Democrat, or Independent?

Republican	14%
Democrat	32%
Independent/Unenrolled	50%
No party/Not interested in politics (VOL.)	2%
Other party (VOL.)	0%
(DO NOT READ) Don't know/Refused (Vol.)	2%



**IF ANSWERED NO PARTY, OTHER PARTY, DON'T KNOW ASK:**

D9. As of today do you lean more to the Republican Party or more to the Democratic Party?

Republican	27%
Democratic	41%
(DO NOT READ) Other/Don't know/Refused (Vol.)	32%

TOTAL PARTY SELF-IDENTIFICATION, INCLUDING LEANERS	
Republican	28%
Democrat	54%
Independent/Unenrolled/Other	16%
(DO NOT READ) Don't know/Refused (Vol.)	2%

D10. Last year, that is in 2010, what was your total family income from all sources, before taxes? Just stop me when I get to the right category.

> \$50,000	37%
\$50,000-\$100,000	29%
>\$100,000	20%
Don't Know/Refused (Vol.)	14%

D11. What is your age?

18-29 years	17%
30-44	25%
45-59	29%
60+	29%
Don't know/Refused (Vol.)	1%

D12. Are you of Hispanic or Latino origin, such as Mexican, Puerto Rican, Cuban, or some other Spanish background?

White, not Hispanic	83%
Black, not Hispanic	6%
Hispanic	6%
Other, not Hispanic	6%

D13. What is your race? Are you white, black, Asian, or some other race?

White	84%
Black or African-American	6%
Asian or Pacific Islander	4%
Mixed race	1%
Native American/American Indian	1%
Other	0%
Don't know/Refused	3%

COMBINED RACE AND ETHNICITY	
White, not Hispanic	83%
Black, not Hispanic	6%
Hispanic	6%
Other, not Hispanic	6%

## ENDNOTES

- 1 Reduction targets are from 1990 levels. According to a report by Eastern Research Group, the state is on track to reduce GHG emissions 19 percent below 1990 levels with existing policies by 2020. The state has set an interim goal of a 25 percent reduction by 2020. See “Cost-Effective Greenhouse Gas Mitigation in Massachusetts” (Boston, MA: Eastern Research Group, Inc., 2010).
- 2 Vldas Griskevicius and others, “Social Norms: An Underestimated and Underemployed Lever for Managing Climate Change,” *International Journal for Sustainability Communication* 3 (2008); Robert B Cialdini, “Crafting Normative Messages to Protect the Environment,” *American Psychological Society* 12(4) 2003.
- 3 Dan Kahan and others, “Cultural Cognition of Scientific Consensus,” *Journal of Risk Research* 14 (2011).
- 4 Thomas Dietz and others, “Household actions can provide a behavioral wedge to rapidly reduce U.S. carbon emissions,” *Proceedings of the National Academy of Sciences* 106(44) (2009).
- 5 To avoid partisan differences in interpretation over the terms “global warming” and “climate change”, survey respondents were asked whether they thought a slow rise in the earth’s temperature was occurring.
- 6 In determining priority, the survey used long term language to provide for a fairer comparison with other public policy challenges unfolding over a number of years.
- 7 Differences among these groups are not statistically significant.
- 8 There is a significant difference with wealthier residents more open to paying the highest levels tested with both renewable energy and fuel oil surcharge. However, in terms of willingness to pay any amount more, income is not a significant predictor.
- 9 Unlike the other policies examined, where the negative relationship with income disappears after controlling for political views, opposition to the gas tax is significant in statistical models after controlling for Republican Party affiliation.
- 10 Research also shows that people are more likely to act in environmentally responsible ways when they understand the contribution of their actions. See Sebastian Bamberg and Guido Moser, “Twenty Years After Hines, Hungerford, and Tomera: A New Meta-Analysis of Psycho-Social Determinants of Pro-Environmental Behavior,” *Journal of Environmental Psychology* 27 (2007).
- 11 The four policies include: Willingness to pay at least one dollar more per month for renewable energy; offering “support” for a law requiring homeowners selling their homes to make upgrades if the home does not meet minimum energy efficiency standards; offering “support” for a law that requires apartments to have energy efficiency ratings so tenants can see how much they might spend on utilities; and “somewhat” supporting or “strongly” supporting an increase in the gas tax by at least 10 cents to pay for improvements in the roads and public transportation.
- 12 These five actions are each components of the behavioral wedge – an estimated 7 percent of total greenhouse gas reduction needed to reduce global warming that could come from changes in individual behavior. See Thomas Dietz and others (2009).
- 13 The five energy savings actions include: always setting the thermostat to 68 degrees or cooler in the winter; always setting the thermostat to 76 degrees or warmer or using less air conditioning in the summer; always using a washing machine’s cold-water setting to clean clothes; always ensuring that car tires are inflated properly; and always turning off the engine when waiting in a parked car.
- 14 Statistical tests of association between global warming belief and living in an urban area are mixed and weak at best. Controlling for age, income, education, race, and political affiliation, urban residents seem more likely to believe global warming as real and at least partially caused by human activity. But they are also seem less likely to view global warming as a high priority, and no more likely to say it is a very serious problem for Massachusetts.
- 15 Even residents in this age group who commute to work alone support a higher gas tax. After controlling for homeownership and renters not responsible for paying utility bills, young residents are still less likely to conserve energy.
- 16 Bamberg and Moser (2007).
- 17 Kahan and others (2011).
- 18 See Doug Mackenzie-Mohr and others, *Fostering Sustainable Behavior* (New Society Publishers, 1999); and Doug Mackenzie-Mohr and James Dyal, “Perceptions of Threat, Tactical Efficacy, and Competing Threats as Determinants of Pro-Disarmament Behavior,” *Journal of Social Behavior and Personality* 6 (1991).
- 19 Robert O’Connor and others, “Who Wants to Reduce Greenhouse Gas Emissions?” *Social Science Quarterly* 83(1) (2002).
- 20 Laura Wray-Lake and others, “Examining Trends in Adolescent Environmental Attitudes, Beliefs, and Behaviors Across Three Decades,” *Environmental Behavior* 42(1) (2010).
- 21 Ana Villar and others, “Global Warming vs. Climate Change, Taxes vs. Prices: Does Word Choice Matter?” (Stanford, CA: The Woods Institute for the Environment, 2010).
- 22 Jonathan Schuldt and others, “ ‘Global Warming’ or ‘Climate Change’ ? Whether the planet is warming depends on question wording,” *Public Opinion Quarterly* 75(1) (2011).
- 23 “Stanford Global Warming Poll” (Stanford, CA: GfK Roper, 2010).
- 24 MassINC Polling Group, January 2011 Statewide Poll.
- 25 MassINC Polling Group, September 2010 Statewide Poll.
- 26 While this difference is not statistically significant at the 95 percent level of confidence, the difference between age groups is reflected in many other questions throughout the survey.
- 27 “Less than Half of Americans Blame Global Warming on Human Activity; Over One Quarter Do Not Think Global Warming Is Happening at All” (Washington, DC: Ipsos Public Affairs, 2009); “Increasing Partisan Divide on Energy Policies: Little Change in Opinions about Global Warming” (Washington, DC: PEW Research Center, 2010).
- 28 “Fewer Americans See Solid Evidence of Global Warming” (Washington, DC: PEW Research Center, 2009).
- 29 “Conservatives’ Doubts About Global Warming Grow” (Princeton, NJ: Gallup Poll, 2010).
- 30 “Stanford Global Warming Poll” (Stanford, CA: Abt SRBI, 2010).
- 31 “Stanford Global Warming Poll” (Stanford, CA: Abt SRBI, 2010).
- 32 “Americans Increasingly Prioritize Economy Over Environment” (Princeton, NJ: Gallup Poll, 2010).
- 33 Thomas Dietz and others, “Household actions can provide a behavioral wedge to rapidly reduce U.S. carbon emissions,” *Proceedings of the National Academy of Sciences* 106(44) (2009).
- 34 Doug Mackenzie-Mohr and others, *Fostering Sustainable Behavior* (New Society Publishers, 1999).

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