Climate change and energy efficiency: An analysis of the President's Climate Action Plan and public opinion

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Abstract

This paper explores the intersection between public opinion and public policy in the areas of energy efficiency and climate change, and makes federal policy implementation recommendations based on analysis of public opinion survey data.

Climate change is an important challenge, and energy efficiency across all sectors is a highly effective, actionable mitigation tool. This paper analyzes for the first time an Associated Press-NORC public opinion survey question: "What does the phrase 'energy efficiency' mean to you?" Analysis of this public opinion survey data and other published reports recognizes energy efficiency as a salient issue and also demonstrates that the American public is increasingly recognizing the importance and urgency of climate change. This paper finds that the public identifies energy efficiency as largely a behavioral issue, meaning that they believe their individual actions are directly linked to energy efficiency. However, the public demonstrates little clarity and consensus on the definition of energy efficiency, and does not link energy efficiency to climate change.

Experts agree that there is a direct link between public opinion and public policy: Opinion influences policy, and policy influences opinion. On June 25, 2013, President Obama unveiled the President's Climate Action Plan, the contents of which have been heavily influenced by public opinion. Following the Action Plan's release, there is an opportunity for federal environmental policy to influence public opinion, addressing the shortcomings illustrated in the AP-NORC survey results. Specifically, federal environmental policy on climate change should channel public opinion towards a more specific definition of energy efficiency, link energy efficiency in tangible ways to climate change, and provide specific behavior recommendations on which the American public can take personal, individual action.

Background

Climate Change

Global climate change and its consequences are some of the most important problems facing modern society. The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (AR4) states that there is "very high confidence that the global average net effect of human activities since the industrial revolution has been one of warming," and that the warming is "unequivocal."[1] The IPCC report asserts that global temperature increases since the 1950s are very likely due to the human-caused atmospheric release of greenhouse gasses, particularly carbon dioxide from burning fossil fuels.[1] According to the National Research Council and the U.S. Global Climate Research Program, global temperatures have risen approximately 0.8˚C over the last one hundred years, and 0.6˚C occurred during the last thirty years alone.[2] As further evidence, the 12 hottest years in recorded history have been in the last 15 years.[3]

Scientists predict that global temperatures will continue to rise in the next century. Global temperatures are projected to rise between 1˚C and 6˚C as compared with 1990 to 2000 temperatures, which could have significant consequences.[1] A warming of just a few degrees would have far-reaching economic, social, agricultural, and ecological repercussions. For example, millions of people living on the coasts would be forced from their homes due to sea level rise, agricultural production would decrease in many areas due to decreased rainfall, and many species would suffer from changing weather patterns and habitats.[1] Governmental responses to these problems would then cost the United States both time and money in mitigation and adaptation measures. Ultimately, all of these events are "almost certain to get much worse in the coming decades" with even a small further increase in global temperature.[1]

When looking to mitigate the effects of climate change, it is beneficial to look first at the causes. Scientists widely accept that climate change is caused by the greenhouse effect, which occurs when gasses such as carbon dioxide, methane, and nitrous oxide are added to the atmosphere and cause global temperatures to rise. Many of these gasses are added in unnaturally large quantities by humans, resulting in what is called anthropogenic climate change. These gasses then affect the balance of light entering and leaving Earth's atmosphere. Incoming short wavelengths of visible light are able to pass through Earth's atmosphere. After striking Earth's surface, these light waves bounce off and are re-radiated back into the atmosphere as infrared waves. Yet, they are unable to exit the atmosphere due to their wavelength and the atmospheric composition. These waves are confined within Earth's atmosphere, trapping additional energy and leading to higher temperatures.

Energy Efficiency and Climate Change

Most energy sources contribute to climate change. The combustion of fossil fuels, especially in transportation and the production of electricity, releases greenhouse gas emissions such as carbon dioxide. Therefore, efforts to improve energy efficiency can have a material impact on climate change.

Climate change science experts predict that carbon dioxide emissions must reach their peak by the year 2015 in order to significantly slow global climate change, and that energy efficiency will be an essential tool in reducing these harmful greenhouse gas emissions.[1] Goldman and colleagues noted

that energy efficiency is "our most important lever to climate stabilization efforts in the short and medium term."[1] Improving energy efficiency is a critical piece of slowing climate change, especially in the coming decades. Improvements in energy efficiency account for more than thirty-three percent of the potential low-cost greenhouse gas reductions around the world and have been shown to be among the cheapest possible courses of action.[5] Due to the relatively low cost of implementing energy efficiency improvements, energy efficiency "is one of very few tools in the climate adaptation toolbox that can claim to reduce climate change and save money."[2]

Energy efficiency not only mitigates climate change by reducing greenhouse gas emissions, but also results in financial benefits such as lowering energy bills.[1] Experts assert that promoting energy efficiency would also result in many "co-benefits," such as the alleviation of poverty in developing countries and employment benefits from new business activities in efficiency improvement.[1] Energy efficiency can also ease energy import dependence, improve energy security, reduce local and global air pollution, reduce vulnerability to weather extremes, improve health and quality of life, reduce pollutants and waste production, reduce maintenance and operating costs, and improve public image for efficient companies.[1] Therefore, energy efficiency is potentially a very powerful and beneficial tool to mitigate climate change.

Public Opinion and Policy

Recently, the American public has begun to realize the importance of the climate change problem. Chris von Borgstede, of the University of Gothenburg, and colleagues found that, since 2003, American public opinion has increasingly regarded climate change as a "real problem."[4] As a result, some Americans have started supporting more policies to mitigate the impacts of climate change, such as fuel economy and energy efficiency standards.[5] In order to form effective environmental policies, policy makers must understand what is necessary for people to accept and follow the policies, a factor of which is public opinion.[4] Also, the complex nature of climate change necessitates assessments of how the problem is viewed by the general public in order to determine what should be done to solve the problem.[4]

Public opinion and policy have been shown to have a cyclical relationship, with each impacting the other. The cycle generally starts when public opinion drives the creation of a public policy position. Then, public opinion reacts and allows for the policy to be modified, if necessary.[6]

In 1983, Benjamin Page and Robert Shapiro were among of the first to describe in detail the relationship between public opinion and public policy. They analyzed hundreds of national survey questions and determined when significant changes in public opinion occurred over time.[7] Then, they identified when policy changes on the same issues took place.[8] In their study, Page and Shapiro found remarkable consistency with changes in public opinion and changes in policy, and as a result they concluded that changes in public opinion cause corresponding policy to change.[7]

James Stimson, Michael MacKuen, and Robert Erikson reached the same conclusions in 1995 using a different methodology. Rather than reviewing survey questions, they measured public opinion by using Domestic Policy Mood, which they described as a sentiment underlying public policy preferences and being either in favor of an active or passive federal government.[8] To measure public policy changes, they examined congressional votes and categorized them as moving either to the left or to the right politically.[9] From their analysis, Stimson et al. definitively concluded that "policy is a simple and direct function of public opinion."[8] They found a one-to-one correlation of public opinion changes to public policy changes, from which they determined that policy is an indicator of the timing and range of opinion change in society. In explaining these results, they defined the term Dynamic Representation, in which public opinions change and politicians sense the change, causing them to adjust their policies. Ultimately, elections were the key to this phenomenon because opinions determine election outcomes, which in turn generate changes in policies.[6] It is important to keep in mind that the relationship between policy and opinion is neither simple nor perfect. Adopting a historical perspective, however, they concluded that for over forty years (the scope of their analysis), political figures have translated public opinion into policy changes, showing that public opinion causes significant changes in American public policy.[8]

Paul Burstein further specified the impact that public opinion has on policies in 2003, and notes, "Policy is affected by opinion most of the time…the impact really matters substantively."[9] Burstein found that public opinion affects policies three-quarters of the time, and that opinion is significantly influential at least one-third of the time.[9] Alan Monroe reasons that policy is not representative of public opinion more often because of the tendency in American politics to favor the status quo, making policy change a challenge.[10]

The reverse effect of public policy affecting public opinion has also been studied. Politicians' rhetoric has been found to cause widespread opinion changes by increasing the prominence of the issue in the public eye and bringing it to their attention.[11] Campaigning for a cause is an important way to raise the public's awareness on issues, and policy makers have the ability to purposefully put issues on the public's agenda.[6] Importantly, Page and Shapiro found that policy affects opinion by "citizens learning about a policy's impact, rationalizing its existence [by thinking that whatever the government does must be acceptable], or heeding the persuasive efforts of politicians, interest groups, or others…thus our data suggest that policy may affect opinion in close to half the cases of congruence between opinion and policy."[7] Policy makers can also teach the public about the merits of the policies, in a sense leading the public opinion.[7] Lastly, once a policy is made, the public is prone to accept it, especially if the policy brings good results.[6] The research on the opinion-policy link may be applied to both energy efficiency and climate change.

Public opinion polls can be valuable tools for policy makers. Previously, politicians had to guess about public opinion, but public opinion polls give policy makers valuable information about the public's views.[12] Greer asserted that, "armed with polls, parties should avoid such errors [in guessing about the public's preference]… rational parties should converge near the center of the distribution of public opinion."[12] He went further to say that improved sampling techniques and better question wordings in public opinion polls have been the most important innovations in providing instrumental information to policy makers since women were allowed to vote in the nineteenth century.[4] Accurate polls increase policy makers' knowledge of public preferences, which should affect their behavior to write policies that are well aligned with public opinions.[9]

Public Opinion on Energy Efficiency and Climate Change

In 2012, the Associated Press-NORC Center for Public Affairs conducted a nationally representative household survey of 1198 adults age eighteen or older between March 29 and April 25, 2012. The survey was given by telephone and contained 56 questions. The response rate was 19 percent, with an overall margin of error of +/- 3.1 percent. The data from all questions (except the fourth question) on the survey were analyzed in the final report entitled Energy Issues: How the Public Understands and

Acts. This paper analyzes for the first time the fourth question from the survey: "What does the phrase energy efficiency mean to you?"

Data for this question were collected from 1198 survey participants and analyzed using a standard spreadsheet tool. Ten base categories, which were mutually exclusive but not exhaustive, were identified for the data:

- **Choice or behavior**. Responses were placed in this category when they focused on using less energy and saw energy efficiency as a personal choice. For instance, one respondent defined energy efficiency as "making smart choices in your use of energy."
- **Economic**. When a response focused on the economic benefits or costs of energy efficiency, it was placed into this category. One example is that energy efficiency means "lower electricity bills."
- **Environment**. Responses were categorized as environmental when they discussed how energy efficiency would affect the environment. For instance, one survey participant said that energy efficiency means "having minimal impact on our environment through energy usage."
- **Politics or government**. This category was used when a respondent spoke about the role that politics or the government plays in energy efficiency. For example, "As far as I'm concerned, the US government isn't doing enough because we all know there are cars out there that get 100 miles per gallon. I think that US government buildings should be energy star efficiency and they are not."
- **Resource**. Responses were categorized as resource when they defined energy as a resource, an example being when energy efficiency was defined as "we are conserving our natural resources and that's really important."
- **Savings, waste, or conservation**. Responses that spoke about minimizing waste or conserving and saving energy were placed into this category. One example is that energy efficiency means "using less fuel, less fuel waste." Another example of a response in this category is "to save energy for the next generation."
- **Tautology**. Some respondents did not provide a personal definition of energy efficiency and merely repeated the idea back to the surveyor. One survey participant defined energy efficiency as "being efficient."
- **Technology or consumer products**. This category was used when a respondent emphasized products or technologies that result in increased energy efficiency. For instance, one respondent said, "it means using technology to limit the use of natural resources."
- **Cynical or skeptical**. Some respondents answered that they did not believe in energy efficiency and that it was a scam. For example, one person said that energy efficiency "doesn't mean much. I think it's another way for people to get your money. It's a big scam."
- **Don't know or no opinion**. This category was used when a respondent did not know what energy efficiency was or declined to answer the question, such as this response: "I'm not sure."

Each response was categorized and assigned to one of these ten base categories. The base categories were grouped together to create broader Tier Two groupings. Technology or consumer products, resource, and environment were grouped together to create the physical category; tautology, cynical or skeptical, savings, waste, or conserve, choice or behavior, and politics or government made the behavioral group; and economic was kept separate as its own group, as was don't know or no opinion. An inter-rater reliability test was performed with three additional coders, and inter-rater reliability was 87.5 percent.

The most frequent response from individuals in the Tier One classification scheme was a response focusing on the economic consequences of being energy efficient, with 276 responses in this category. The next largest response focused on savings, waste, and conservation, with 225 responses.

In Tier Two, the largest response was of the behavior category, with 545 responses. The next largest category was physical, followed by economic.

Salience of an issue is essential in determining the effect that public opinion has on public policy. Through his study, Burstein concluded that the impact that public opinion has on public policy increases as the salience of the issue increases. This is due to the fact that there may be electoral consequences for legislators' inactivity.[9] Burstein noted that salient issues create a stronger relationship between public opinion and public policy, and salience is "a key element of democratic responsiveness."[9] Monroe, Page, and Shapiro reached similar results in their studies. The more important an issue is to the policy makers' constituency, the more congruence there is between opinion and policy on that issue.[7] On the other hand, if legislators do not think that an issue is important to the public or if the public does not seem to care, then policy makers will not feel obligated to take public opinion into account and their policies are much less likely to reflect public opinion on that issue.[6]

The public recognizes energy efficiency as a salient issue, with 94.6% of respondents providing a definition. The AP-NORC survey also found that 78% of the public rates energy issues as extremely or very important to them personally. This means that the public is paying attention to energy efficiency. The public also believes that energy efficiency is a behavioral issue, evidenced by the largest Tier Two category. People have an understanding that they need to take action to impact climate change, and they seem willing to take that action. However, they seem to be at a loss as to what kinds of actions they should take. The diversity of responses to this question shows the multi-faceted nature of energy-efficiency, and that the public struggles to coherently define energy efficiency. This data also reveals that the public does not connect energy efficiency to climate change. In all 509 responses, there was only one mention of global warming, and only 75 responses (6.3 percent) mentioned the link between energy efficiency and the environment. This could be due to the open-ended nature of the question, but the link between energy efficiency and climate change was not represented in this data. Instead, the data shows a disconnection between climate change and energy efficiency.

Though the public does not connect energy efficiency directly to climate change, increasing numbers of people believe that climate change is occurring. Additionally, surveys conducted at Stanford University by Krosnick and MacInnis found that in 2010, 75% of people believed that climate change is occurring; in 2011, that number rose to 83%.[14] There was also an increase in the number of people who think that the United States should take political action on climate change regardless if other countries do, from 67% in 2008 to 71% in 2010.[13] From 2005 to 2010, there was also an increase in the awareness of the need for individuals to change their lifestyles to mitigate climate change.[4] The AP-NORC study data support this finding and show that the American public is aware of the behavioral aspects of energy efficiency. In fact, the largest Tier Two category for the definition of energy efficiency was behavioral.

The climate change opinion surveys show that most Americans believe that anthropogenic climate change is taking place, and that climate change will threaten Americans if action is not taken.[5] This increasing awareness of energy efficiency and climate change "may constitute a foundation for acceptance of the implementation of more strict policy measures instead of relying on voluntary and 'softer' policies, such as

Base Category: Tier One Groupings	Number of Respondents	Percentage of Total Responses
Tautology	95	7.9
Technology or Consumer Products	188	15.7
Economic	276	23.0
Cynical or Skeptical	31	2.6
Savings, Waste, or Conservation	225	18.8
Resource	49	4.1
Environment	75	6.3
Choice or Behavior	183	15.3
Politics or Government	11	0.9
Don't Know or No Opinion	65	5.4
Total	1198	100

Table 1. Tier One Response Table

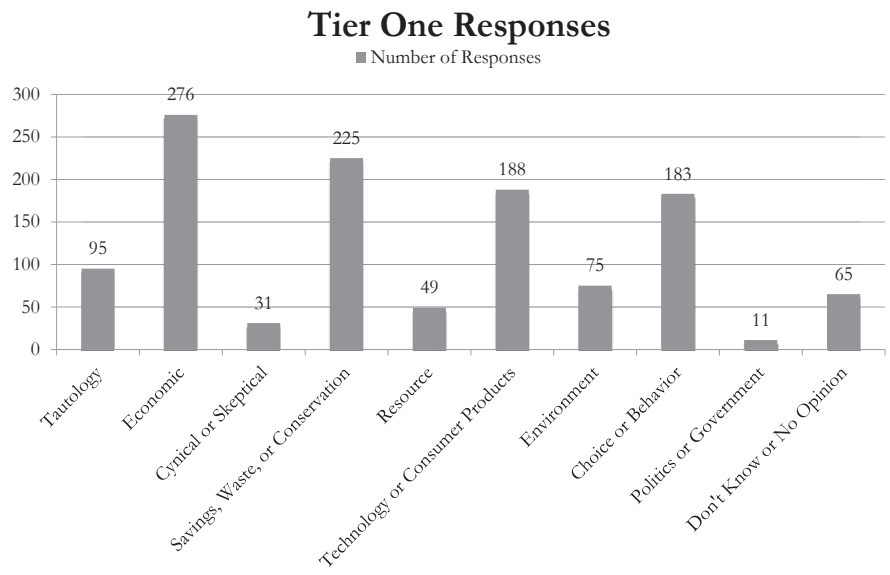

Figure 1. Tier One Responses Graph

information. An increase in awareness for the necessity of life style changes may make the public prepared for introducing stricter policy measures which will have life-style implications."[4]

Energy Efficiency, Climate Change, and the President's Climate Action Plan

Due to the complex nature of causes and effects, climate change has been a continual challenge for policy makers. Elaine Sharp describes global climate change as a classic case where improved information affects policy and public opinion.[15] In regard to climate change, "initially, scientists and environmentalists lobbied, but the public was unresponsive, uninterested and, perhaps, skeptical. However, as new information emerged, the public has become more aware and less skeptical, which encourages policy responses."[6] The partisan congress has made congressional action difficult and has prevented President Obama from taking action to mitigate climate change, so executive action was necessary to address this pressing issue.

In response, President Obama unveiled the Climate Action Plan on June 25th, 2013 at Georgetown University. According to the AP-NORC and Krosnick and MacInnis surveys, energy efficiency is a salient issue, and the salience of climate change has been increasing in the public opinion. Therefore, there is public support in the public opinion for action to be taken. Krosnick and MacInnis say, "Not surprisingly, these beliefs appear to have been important drivers of public support for policies" designed to mitigate climate change and improve energy efficiency.[5]

Energy efficiency is a key element of the Climate Action Plan, and the Action Plan established a clear connection between energy efficiency and climate change: "Roughly 84 percent of current carbon dioxide emissions are energy-related and about 65 percent of all greenhouse gas emissions can be attributed to energy supply and energy use. The Obama Administration has promoted the expansion of renewable, clean, and efficient energy sources and technologies worldwide."[3]

It is not surprising that the recent policy on the salient issues of climate change and energy efficiency is in line with public opinion. Stimson, MacKuen, and Erikson found that "each point movement in public opinion produces about .74 points movement in presidential policy position."[8] They also state that presidential policy "reacts mostly to the public opinion of the previous year and (almost) entirely to the public opinion of the past four years."[8] In this case, it appears as if the public opinion shifts on the topic of climate change from 2008–2012 and the energy efficiency opinion of 2012 have influenced and encouraged the public policy on the issues through the described opinion-policy link.

The opinion results from the AP-NORC and Krosnick and MacInnis surveys show that both climate change and energy efficiency are salient issues, but that energy efficiency is a multifaceted problem that is not well defined in the public opinion. The resulting policy would be expected to follow this public opinion trend, as does President's Climate Action Plan. For example, the Action Plan discusses energy efficiency and focuses on the prevailing opinions of what energy efficiency is, according to the AP-NORC data. The Climate Action Plan, like the public opinion, also does not clearly define energy efficiency, but rather treats it as a problem that can be thought of in several different ways.

Economic

The AP–NORC survey data reveal that the economic costs and benefits of being energy efficient are important to many Americans (the number one response with 23.0%), and the President's Climate Action Plan addresses this concern directly. The Action Plan focuses on the economics of energy efficiency in a sub-section entitled,

Report Level: Tier Two Groupings	Base Categories	Number of Respondents	Percentage of Total Responses
Physical	Technology or Consumer Products, Resource, Environment	312	26.0
Behavioral	Tautology, Cynical or Skeptical, Savings, Waste, or Conservation, Choice or Behavior, Politics or Government	545	45.5
Economic	Economic	276	23.0
Don't Know/No Opinion	Don't Know or No Opinion	65	5.4
Total		**1198**	**100**

Table 2. Tier Two Responses Table

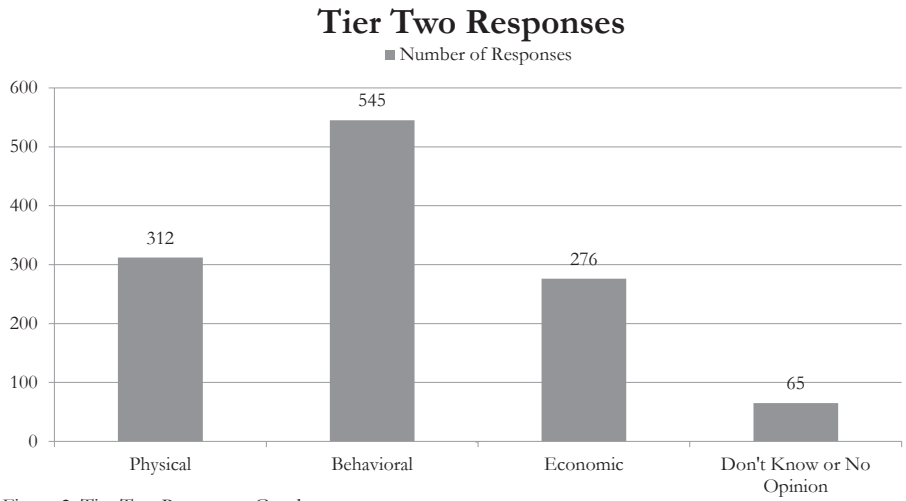

Figure 2. Tier Two Responses Graph

"Reducing Energy Bills for American Families and Businesses."[3] This section discusses the following:

- The Department of Energy's new minimum efficiency standards will reduce electricity bills by hundreds of billions of dollars;
- The Department of Agriculture's Rural Utilities Service's Energy Efficiency and Conservation Loan Program will provide up to $250 million in loans to rural America to invest in energy efficiency;
- The Department of Housing and Urban Development's Multifamily Energy Innovation Fund will supply $23 million for innovations in providing cost-effective residential energy;
- The Clean Energy Ministerial and key bilateral programs cost-effective opportunities are "enormous" by reducing energy waste; and
- The Better Buildings Challenge will produce $58 million in energy savings per year.

Savings, Waste, or Conservation

The savings, waste, and conservation category represented the second largest Tier One response in the AP-NORC data, representing 18.8% of the total responses. The Climate Action Plan addresses this area as well. For example, one of the main goals of the plan is to conserve natural resources in the face of a changing climate.[3] The Action Plan also specifies how fuel economy standards for heavy-duty trucks, buses, and vans will save the equivalent of 530 million barrels of oils and 270 million metric tons of greenhouse gas emissions.[3] Reducing waste is also something that the Action Plan addresses directly:

- Section 3.1 contains a section called Expanding Clean Energy Use and Cut Energy Waste, which describes how the Administration will reduce energy waste. This includes financing and regulatory support for renewable and clean energy projects, actions to promote fuel switching from oil and coal to natural gas or renewables, support for the safe and secure use of nuclear power, cooperation on clean coal technologies, and programs to improve and disseminate energy efficient technologies.[3]
- Section 1.3, entitled Cutting Energy Waste in Homes, Businesses, and Factories, explains how the Administration will expand the Better Buildings Challenge to cut energy waste.[3] Also, the Better Buildings Accelerators will support and encourage adoption of State and local policies to cut energy waste.[3]
- Section 1.3 also explains out how the Ministerial's Super-Efficient Equipment and Appliance Deployment Initiative and its Global Superior Energy Performance Partnership are helping to accelerate the global adoption of standards and practices that would cut energy waste equivalent to more than 650 mid-size power plants by 2030. Also, the section entitled Phasing Out Subsidies that Encourage Wasteful Consumption of Fossil Fuels describes how the Administration estimates that phasing out fossil fuel subsidies would result in a ten percent reduction in greenhouse gas emissions by 2050. These subsidies promote wasteful use of fossil fuels, so by phasing them out, the Administration will reduce waste.[3]

Technology

A significant number of Americans (the third most popular response, at 15.7%) define energy efficiency as related to technological advancements, and the Action Plan also focuses on technological improvement in energy efficiency to mitigate climate change. Experts agree with the public opinion: "At least over the coming decades, new technologies, including energy efficiency measures, will be the main means to solve the problems related to global warming."[4] The Department of Energy has created new minimum efficiency standards for appliances, such as dishwashers, refrigerators, and other products, and plans to create similar standards for federal buildings through 2030. These standards focus on the energy efficiency of technology, and will reduce carbon pollution by at least three billion metric tons by 2030, cumulatively.[3] President Obama plans to lead international efforts to address climate change by expanding clean energy use and cutting energy waste through programs to improve and distribute energy efficient technologies.[3] The plan also describes how

the government will develop and deploy advanced transportation technologies, such as biofuels, advanced batteries, and fuel cell technologies, in order to improve energy efficiency.[3]

Environment

Overall, 6.3% of respondents defined energy efficiency as an environmental concern. The President's Climate Action Plan addresses the major environmental effects of global climate change, such as sea level rise, ecosystem deterioration, and biodiversity loss:

- Section 2.2's section entitled Conserving Land and Water Resources notes that America's ecosystems are critical to both the economy and the lives and health of American citizens. The Action plan shows how the Administration has invested significantly in conserving ecosystems by working with Gulf State partners and implementing climate adaptation strategies to promote ecosystem resilience.[3]
- In the Climate Action Plan, the President directs federal agencies to identify and evaluate creative approaches to protect biodiversity in the face of a changing climate.[3] He has also implemented adaptation strategies to promote resilience in fish and wildlife populations, forests and other plant communities, freshwater resources, and the ocean.[3] The Department of the Interior will launch a $100 million competitive grant program to foster partnerships and promote resilient natural systems while enhancing green spaces and wildlife habitat near urban populations.[3]
- In order to prepare for sea level rise, the Action Plan identifies how federal agencies will update their flood-risk reduction standards to account for sea-level rise. This effort will incorporate the most recent science on expected rates of sea-level rise (which vary by region) and build on work done by the Hurricane Sandy Rebuilding Task Force. The Environmental Protection Agency is working with low-lying communities in North Carolina to assess the vulnerability to sea level rise and to identify solutions and reduce risks.[3]

Additionally, the Climate Action Plan shows how energy efficiency can be used to improve the state of the environment. It says, "We can protect our children's health and begin to slow the effects of climate change so that we leave behind a cleaner, more stable environment."[3] Instituting a Federal Quadrennial Energy Review that will be led by the While House Domestic Policy Council and Office of Science and Technology Policy will ensure that federal energy policy meets environmental goals.[3] Improving energy efficiency in transportation and curbing emissions of hydroflourocarbons and methane will protect the environment nationwide.[3] Lastly, preserving forests will help to mitigate climate change and improve environmental heath by removing 12% of total US carbon greenhouse gas emissions each year.[3] Climate change increases the risk of wildfire, drought, and pests, which diminish the capacity of forests to sequester carbon. Pressures to develop forests for urban or agricultural uses are also increasing. Conservation and sustainable management can help to ensure that America's forests continue to remove carbon from the atmosphere while also improving soil and water quality, reducing wildfire risk, and otherwise managing forests to be more resilient in the face of climate change. The Administration is working to identify new approaches to protect and restore America's forests, as well as other critical landscapes including grasslands and wetlands.[3]

Resource

Although only 4.1% of respondents defined energy efficiency as related to resources, the Climate Action Plan discusses resources extensively. In the introduction, the Action Plan asserts that if Americans embrace the challenge of mitigating climate change, it will enable us to preserve our treasured natural resources for future generations.[3] Already, states, cities, and communities are changing the way they manage natural resources, and the Action Plan directs Agencies to ensure that climate risk-management considerations are fully integrated into federal infrastructure and natural resource management planning.[3] Section 2.2 of the Action Plan is dedicated to protecting our economy and natural resources. This section declares that current activities are depleting our nation's resources, and climate change threatens the health and safety of these resources. Natural resources such as barrier islands, marshes, forests, and plant communities can help to mitigate the impacts of Climate Change, so The Climate Action Plan declares that actions to protect these resources must be taken.[3]

Cynical or skeptical

According to the AP-NORC data, 2.6% of Americans are cynical or skeptical about energy efficiency. The Climate Action Plan takes steps to convince the skeptics of the importance of energy efficiency in climate change mitigation and adaptation. For example, the Action Plan states, "Energy efficiency is one of the clearest and most cost-effective opportunities to save families money, make our businesses more competitive, and reduce greenhouse gas emissions [that produce climate change]."[3] The plan focuses on the benefits of energy efficiency, such as significant cost savings, mitigating climate change through reduced carbon pollution, health benefits, encouraged business innovation and jobs, and decreased dependence on foreign energy supplies in order to convince the skeptics.[3]

Politics or government

Although only 0.9% of respondents connected energy efficiency to the government, The Climate Action Plan states that the Obama Administration will prepare the United States for the impacts of global climate change by working with and helping state and local governments.[3] The Action plan recognizes that the government must play a central role in energy efficiency and climate change, and dedicates Section 1.5 to Leading at the Federal Level. This section identifies the role that the Federal Government will play:

- President Obama believes that the Federal government must be a leader in clean energy and energy efficiency. Federal agencies have reduced greenhouse gas emissions by more than 15%, which is the equivalent of permanently removing 1.5 million cars from roads. To continue these efforts, the Climate Action Plan establishes a new goal for the Federal government: to have 20% of its electricity consumption come from renewable energy sources by 2020.[3]
- In 2011, President Obama signed a memorandum entitled "Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Savings," challenging federal agencies to enter into $2 billion worth of performance-based contracts within two years to promote energy efficiency at the federal level. Federal agencies have committed to nearly $2.3 billion from over 300 reported projects. In the near future, the Administration will take a number of actions to strengthen efforts to promote energy efficiency, including through performance contracting.
- The federal government must also lead in actions to prepare for the impacts of climate change that are too late to avoid. The Action Plan states, "The federal government has an important role to play in supporting community-based preparedness and resilience efforts, establishing policies that promote preparedness, protecting critical infrastructure and public resources,

> supporting science and research germane to preparedness and resilience, and ensuring that federal operations and facilities continue to protect and serve citizens in a changing climate."[3]

In various other sections, the Climate Action plan acknowledges that the government will need to play a critical role in the success of energy efficiency as a strategy to mitigate and adapt to climate change. The Administration will expand climate change and energy efficiency efforts in three major initiatives to better prepare America for the impacts of climate change: building stronger and safer communities and infrastructure, protecting our economy and natural resources, and using sound science to manage climate impacts.[3] With a variety of clean energy options available and building on the leadership of states and local governments, the federal government can make continued progress in reducing power plant pollution to improve public health and the environment while supplying the reliable, affordable power needed for economic growth. By doing so, the government will continue to drive American leadership in clean energy technologies, such as efficient natural gas, nuclear, renewables, and clean coal technology.[3]

Conclusions and Recommendations

Global climate change is a severe and pressing issue, and energy efficiency is an important tool for climate change mitigation. The salience of the issue of anthropogenic climate change in the public opinion has been increasing since 2005. The 2012 Associated Press-NORC Center for Public Affairs data clearly show that energy efficiency is also salient issue, with 94.6% of respondents able to provide a definition for it when asked the question, "What does energy efficiency mean to you?" However, the wide diversity of responses to the question demonstrates a lack of consensus, and therefore the lack of focus in rallying public support for a specific energy efficiency policy objective. These data also reveal that the public is not making a connection between energy efficiency and climate change. While the AP-NORC survey results indicate that the public understands energy efficiency to be a behavioral or personal choice issue, with 45.5% of responses categorized as behavioral, they lack clarity on what actions they can take and how those actions can help address climate change.

There is a strong opinion-policy link, with each influencing the other. Public opinion has substantially influenced President Obama's Climate Action Plan, as to be expected from the opinion-policy link, and the policy is in line with public opinion. Given that public policy lags public opinion several years, and given that support for efficiency programs has increased, the President now finds himself in the right place for enacting change. The Climate Action Plan highlights energy efficiency, using it as a tool to reduce greenhouse gas emissions. It also addresses the salient issues and focuses on the prevailing opinions about what energy efficiency is, widespread and unfocused as they are. The Climate Action Plan treats energy efficiency as a multi-faceted concept, reflecting the dispersed perspectives of the American public.

Van Borgstede, Anderrson, and Johnson concluded that policy action is necessary in order to improve energy efficiency, and the Climate Action Plan is an important first step. They asserted that, "without policies which give immediate feedback on environmental behavior, individuals are generally reluctant to a voluntary change in their behavior."[4] They went on further to add, "The challenge for policy makers will be to implement and communicate a program for improving energy efficiency and reducing energy use."[4] President Obama confronted this challenge by issuing his Climate Action Plan. Research has shown that public response to a policy is greater when the President makes it, rather than Congress, and this plan was a perfect opportunity.[7]

While it is an important step in the right direction, the Climate Action Plan is incomplete. The plan did not fully capitalize on the public's awareness that energy efficiency is strongly impacted by personal behavior and choice. Further, it was a missed opportunity to use policy as a tool to lead public opinion in key areas, particularly as it relates to clarity about energy efficiency and its role in climate change. This paper offers the following recommendations for future climate and energy efficiency policy.

Clarify and define energy efficiency

Federal policy can help the public establish clarity on a more focused definition of energy efficiency. If the public's definition is very broad, as it is today, policy-makers will have a difficult time rallying them around a key message. Policy should focus on defining energy efficiency for the public in easily accessible, relatable ways. For example, it will be easier to rally the general public behind the idea of more efficient personal behaviors, cars, and appliances, rather than behind more efficient industrial power plants.

Emphasize the link between energy efficiency and climate change

Though experts agree that there is a strong link between energy efficiency and climate change, the public does not make this connection. Future policies should emphasize how energy efficiency can be a powerful and cost-effective tool to mitigate climate change.

Address personal choice and behavior

The terms "behavior" or "choice" do not appear in the Climate Action Plan, despite the fact that the public recognizes their personal behavior and lifestyle choices are key aspects to energy efficiency. Moving forward, policy-makers should capitalize on this public awareness, reinforce how important personal choices are, and offer specific actionable steps that the Americans can take.

Factoring these recommendations into environmental and energy policy efforts can promote policies that leverage the value of existing public opinion, while also influencing public opinion in positive ways.

This study is limited by the relative size of the data and the means used to acquire it. While it was a nationally representative survey of 1198 adults, individual responses were almost certainly shaped by issues of race, class, gender, and political affiliation. Further studies could benefit from collecting more varied raw data on this subject. Additionally, all data was collected by telephone, which may have impacted the results. Future studies may consider conducting in-person interviews to enhance the depth and thoughtfulness of the responses. Climate change and energy efficiency are vital topics that will impact many generations to come. Therefore, more research on this topic is necessary to fully understand the interaction between climate change, energy efficiency, and public opinion.

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