

# Survey of Michigan Residents on the Issue of Global Warming and Climate Policy Options: Key Findings Report

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## Summary

### KEY FINDINGS:

- 1) Michigan residents overwhelmingly believe that the earth's climate has become warmer over the past four decades and that this constitutes a serious problem.
- 2) A substantial majority of Michiganders believe that global warming is at least partially the result of human activities.
- 3) Numerous factors have combined to convince residents of Michigan that the earth's climate is warming. Diminishing glaciers and personal observations of warmer temperatures in Michigan have had the largest impact on individual perceptions of these changes. Heavily-publicized events such as Hurricane Katrina and the film "An Inconvenient Truth" have had considerably less impact.
- 4) Michigan residents believe that both federal and state governments have a responsibility to take actions to reduce global warming.
- 5) Residents of the Great Lakes state have extremely varied levels of support for various policy approaches to reduce greenhouse gas emissions.
- 6) Michiganders strongly support government requirements for vehicle manufacturers to increase the fuel efficiency of their products. This is surprising given the pivotal role of the industry in Michigan and its continuing difficulties, as well as historic opposition by members of the state's Congressional delegation to such a policy.
- 7) There is strong opposition in Michigan to either a tax on gasoline or a broader carbon tax as a means of reducing fossil fuel consumption.
- 8) Michigan residents are very supportive of government policies that would require a specific portion of electricity production to be derived from renewable sources.
- 9) A substantial majority of Michigan residents support increased use of nuclear power to reduce greenhouse gas emissions.
- 10) Michigan residents are decidedly divided over their support for a market-based policy that would allow trading of permits for carbon emissions.
- 11) About half of all Michiganders indicate a willingness to pay at least 50 dollars per year in order to increase the production of renewable energy sources.



## OVERVIEW

The year 2007 was a monumental one for the issue of climate change. During this period, climate change rose to the forefront of the national agenda. The International Panel on Climate Change (IPCC) released a major report on the increasing body of evidence regarding global warming and former Vice President Al Gore won the Nobel Peace Prize for his efforts to educate the public on this issue.

The Supreme Court ruled in April that the U.S. Environmental Protection Agency needed to reconsider its decision to refrain from designating carbon dioxide as an air pollutant under the Clean Air Act. President Bush approved legislation in December that mandated the first statutory increase in Corporate Average Fuel Economy in decades. Dozens of states intensified their earlier involvement on this issue, reflected in a wave of new state and regional efforts to reduce greenhouse gases. The early stages of the 2008 Presidential campaign indicated that this will be the first such race in which climate change policy proposals are a central concern and Congress has launched a wide-ranging series of hearings on possible next legislative steps. In short, climate change has moved rapidly from the back-burner toward the front of the American public policy agenda at multiple levels of government. Interestingly, Michigan has continued to rank among the least active states in policy development in any of the areas relevant to climate change. However, there has been increased discussion in the current legislature

about expanded commitment to renewable energy and Governor Jennifer Granholm has begun to negotiate with neighboring governors the outline of a regional program to reduce carbon emissions.

These significant events corresponded with a dramatic shift in terms of public opinion in the United States regarding climate change. A number of national surveys during 2007 have shown significant increases in public attention and concern regarding the effects of human activities on the earth's climate. However, there has been very limited research on the views and attitudes of Michigan residents or those of any other individual state regarding this key issue. This study seeks to provide detailed data on the perspectives of Michiganders regarding global warming and various policy options available to reduce human impacts on the earth's climate.

## SECTION ONE: PERCEPTIONS OF THE PROBLEM

During the last year, it has become evident that significant percentages of the American citizenry perceive average temperatures as increasing, attribute this phenomenon at least in part to human activity, and view this development as a serious problem. This has been reflected in a number of surveys conducted nationally during 2007, many of which have been widely reported in the media. Our Michigan findings generally follow the pattern seen nationally, with some exceptions noted below.

### STUDY METHODOLOGY

This key findings report summarizes data collected in a telephone survey of residents of the state of Michigan between October 10 and November 26, 2007. The surveys are based on stratified random samples of adults age 18 and older who reside in Michigan. Interviewing and sampling was conducted by the Institute for Public Policy & Social Research's Office for Survey Research at Michigan State University as part of their fall 2007 State of the State Survey (SOSS). A detailed description of the SOSS methodology can be found at [www.ippsr.msu.edu/SOSS/SOSS.HTM](http://www.ippsr.msu.edu/SOSS/SOSS.HTM). The final number of completed surveys was 1001 with a resulting margin of error of +/- 3% at the 95% confidence interval. However the margins of error for sub groups (i.e. women, Republicans, Catholics) are larger due to smaller sample sizes. Percentages throughout the survey have been rounded upward at the .5 mark, thus many totals in the results will not equal 100%. The survey questionnaire was designed by Dr. Barry Rabe of the Gerald R. Ford School of Public Policy at the University of Michigan and Dr. Christopher Borick of the Muhlenberg College Institute of Public Opinion, in some instances linked directly with prior national survey questions to allow for comparison across various audiences. We are grateful for the constructive support during this project of Dr. Brian Jacob and Thomas Ivacko of the Center for Local, State, and Urban Policy (CLOSUP) at the University of Michigan and Karen Clark at Michigan State University. We also appreciate the technical assistance of Matthew Rabe in latter stages of the project. Financial support from CLOSUP was essential to the completion of this survey and is gratefully acknowledged.



**INCREASING GLOBAL TEMPERATURES**

On the question of increasing global temperatures, an ABC News/*Washington Post*/Stanford University survey released in April 2007 showed a 10% increase from the

**Table 1. "From what you've read or heard, is there solid evidence that the average temperature on earth has been getting warmer over the past four decades?"**

Description	Yes	No	Not Sure/ Refused
Michiganians (Nov., 2007)	80%	16%	6%
Americans (Jan., 2007)	77%	16%	7%

MI results from University of Michigan CLOSUP; National results from Pew Research Center.

prior year in the belief that global temperatures have been increasing over the past four decades. This is consistent with findings from a range of other national surveys conducted during 2007 that reflect increases in these beliefs from previous years. In our survey of Michigan residents, 8 out of 10 respondents indicated that the average temperature on earth has been getting warmer over the past four decades. This mark is nearly identical to the results of a national survey by the Pew Research Center in January of 2007 that used identical question wording.

While belief in global warming among Michiganians largely transcends demographic factors such as gender, age and religion, there are significant differences among individuals in terms of political party affiliation. As can be seen in Table Two there is a fairly large gap between Democrats and Republicans regarding the existence of global warming. More specifically, while 9 of 10 Michi-

**Table 2. "From what you've read or heard, is there solid evidence that the average temperature on earth has been getting warmer over the past four decades?"**

	Yes	No	Not Sure/ Refused
Michigan Democrats	90%	3%	7%
Michigan Republicans	63%	30%	7%
Michigan Independents	84%	14%	1%

Results from University of Michigan CLOSUP.

gan Democrats in the state believe there is solid evidence the average temperatures on earth are warming, only about 6 out of 10 Michigan Republicans share this view. Michigan Independents fall in between, although closer to the levels of Michigan Democrats.

**SOURCE OF INCREASING GLOBAL TEMPERATURES**

National surveys conducted during 2007 generally concur that majorities attribute global temperature increase either to human activity or some combination of human activity and natural patterns. Among the 8 out of 10 Michigan residents that indicated the earth is getting warmer, the clear majority believe that humans are at least in part responsible for the increase in temperature. Some 46% of Great Lakes state residents who believe the earth is getting hotter identified human activity as the primary

**Table 3. "Is the earth getting warmer because of human activity such as burning fossil fuels, or mostly because of natural patterns in the earth's environment?"**

	Human Activity	Natural Patterns	Combination of Human and Natural Causes	Not Sure/ Refused
Michiganians (Nov., 2007)	46%	25%	19%	10%
Americans (Jan., 2007)	47%	20%	33%	<1%

MI results from University of Michigan CLOSUP; National results from Pew Research Center. Note: This question was only posed to respondents who indicated there is solid evidence that the earth is warming.

source of global warming, with an additional 19% saying the increased temperature was caused by a combination of human activity and natural patterns. These findings are fairly consistent with those of a January 2007 survey conducted by the Pew Research Center.

**PROBLEM SEVERITY**

In addition to a belief that the planet is getting warmer and that human activity is causing the increase, most residents of Michigan see global warming as a serious problem. Over 7 out of 10 residents identified global warming as either a very serious (47%) or somewhat serious (30%) problem with less than 1 in 10 indicating that it does not constitute a problem. The Michigan results

**Table 4. “In your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?”**

	Very Serious	Somewhat Serious	Not Too Serious	Not a Problem	Not Sure/Refused
Michiganians (Nov., '07)	46%	29%	12%	8%	<1%
Americans (Jan., '07)	45%	31%	12%	8%	3%

MI results from University of Michigan CLOSUP; National results from Pew Research Center.

tightly mirror national tendencies from the Pew Research study in January of 2007.

Michigan views on the seriousness of global warming as a problem vary significantly according to the age of state residents. While 63% of state residents under the age of 30 indicated that global warming is a very serious problem, only 39% of Michiganians between 30 and 49 and 41% of those 50 and over rated the problem at this level.

**Table 5. “In your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?”**

	Very Serious	Somewhat Serious	Not Too Serious	Not a Problem	Not Sure/Refused
18-29 Age Group	63%	15%	11%	12%	0%
30-49 Age Group	39%	34%	12%	14%	<1%
50 and Over Age Group	41%	33%	14%	11%	2%

MI results from University of Michigan CLOSUP.

Partisanship also plays a role in the views of Michigan residents on the seriousness of global warming, with Democrats and Independents substantially more likely than Republicans to rate this issue as very serious. As can be observed in Table Six, Michigan Democrats are four times more likely than Republicans in the state to

**Table 6. “In your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?”**

	Very Serious	Somewhat Serious	Not Too Serious	Not a Problem	Not Sure/Refused
Democrat	64%	26%	5%	4%	1%
Republican	16%	36%	19%	29%	<1%
Independent	51%	30%	14%	6%	<1%

MI results from University of Michigan CLOSUP.

say global warming is a very serious problem, and Independents in Michigan are slightly over three times as likely as their Republican counterparts to indicate that the problem is very serious.

## SECTION TWO: FACTORS THAT SHAPE BELIEFS ABOUT GLOBAL WARMING

As the previous section has shown, most Michigan residents believe that the earth is warming and that human activities have contributed to these changes. National polls also show that the number of Americans who acknowledge global warming has grown significantly over recent years. What is not clearly known are the reasons that individuals in Michigan and beyond believe that the earth is warming. Thus this project attempts to measure the impact that a number of factors may have played in influencing Michiganians’ views of the existence of global warming.

In particular, five factors were selected as possible contributors to one’s belief in the existence of global warming. These factors were chosen because of their prominent role in the scientific theories of climate change, as reflected in the IPCC reports, or their key role in the ongoing public discourse and media coverage over the issue. While these factors are clearly not inclusive of all reasons that may cause an individual to believe the earth is warming, the selected options provide an initial test of the factors that underlie beliefs on this matter. In Table Seven, the five factors included in this study are listed.

The results of the survey indicate substantial variation in the impact that each factor plays in determining individual

**Table 7. “For each factor that I mention please indicate if it has had a strong effect, moderate effect, small effect, or no effect on your view that the earth is getting warmer.”**

1. Declining glaciers and polar ice throughout the globe
2. Warmer temperatures in your area during recent years
3. Computer models that indicate the earth is getting warmer
4. The strength of Hurricane Katrina
5. Al Gore’s documentary, “An Inconvenient Truth”



**Table 8. “For each factor that I mention please indicate if it has had a strong effect, moderate effect, small effect, or no effect on your view that the earth is getting warmer.”**

	Strong Effect	No Effect
Declining glaciers and polar ice	57%	6%
Higher temperatures in local area	42%	12%
Computer modeling	39%	11%
Hurricane Katrina	33%	23%
“An Inconvenient Truth”	28%	30%

Results from University of Michigan CLOSUP.

views on global warming. In particular, Michigianians indicate that longer term observations of changes at both the local and global level have a greater effect on their views about global warming than other factors included in the study. For example, a majority (57%) of survey respondents who believe the earth is getting warmer indicated that declining glaciers and polar ice levels had a strong effect on their view of this matter. Also playing a strong role in convincing Michigan residents that the earth is warming was their personal observation of increasing temperatures in their area. Over 4 out of 10 Michigianians said that higher temperatures in their localities strongly effected their belief that the earth is warming. Of less importance in terms of shaping beliefs about global warming were singular events such as Hurricane Katrina and Al Gore’s documentary “An Inconvenient Truth.” Only 1 out of 3 survey respondents stated that the 2005 hurricane that struck the Gulf Coast had a strong effect on their beliefs that the earth was warming, with the Gore documentary strongly effecting slightly over 1 in

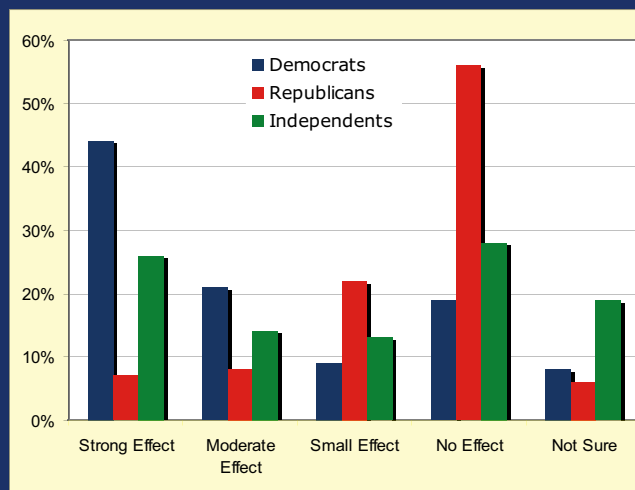
4 Michigan residents. It should be noted that the survey took place shortly after Gore was selected as the winner of the Nobel Peace Prize in October, which resulted in renewed media coverage of the film and his views on global warming.

While Republicans were less likely than both Democrats and Independents to be persuaded by all the factors tested in this study, the greatest variation was found in reference to former Vice President Gore’s film on climate change. Only 7% of Michigan Republicans indicated that “An Inconvenient Truth” had a strong effect on their views about global warming in comparison to 44% of

Democrats and 26% of Independents in the state. Conversely, 56% of GOP affiliates in Michigan said Gore’s film had no effect on their perceptions of global warming compared to only 19% of Democrats and 28% of Independents.

The education level of Michigan residents also appears to affect how much their views on global warming are influenced by various factors. For example, individuals with college degrees are more likely than those without to indicate that their belief

**Figure 1. The Effect of “An Inconvenient Truth” on the Perceptions of Michigan Residents Regarding Global Warming, by Party Affiliation**



Results from University of Michigan CLOSUP.

**Table 9. The Percent of Michigan Residents whose Views on Global Warming are Strongly Effected by Selected Factors: Controlling for Educational Attainment of Respondent .**

	Declining Glaciers and Polar Ice	Warmer Temperatures in Your Area	Computer Models	Strength of Hurricane Katrina	An Inconvenient Truth
College Degree	61%	34%	44%	23%	20%
No College Degree	54%	48%	35%	40%	34%

Results from University of Michigan CLOSUP.

in global warming is strongly influenced by computer models. Conversely, personal observations of warming temperatures in Michigan had a greater effect on state residents without college degrees in comparison to Michiganians who have attained college diplomas. These findings suggest that educational attainment may both increase and decrease one’s likelihood of accepting various types of evidence related to global warming.

### SECTION THREE: RESPONSIBILITY FOR DEALING WITH GLOBAL WARMING

The study examined the views of Michigan residents on the responsibility of various levels of government for dealing with global warming. In recent years many state governments have taken an increased role in adopting policies that are aimed to curb climate change. Twenty-five states, for example, have enacted policies that mandate increased use of renewable energy and fifteen are formally pledged to develop a carbon cap-and-trade system for emissions reduction. Numerous other policies are being enacted in statehouses across the country, including many within the Great Lakes Basin. In contrast, Michigan has generally been among the least active states in the nation in this regard. This increased activity in many states has occurred at the same time that there has been growing criticism of limited national efforts to address global warming and unprecedented attention to the issue through hearings during the first year of the 110th Congress. Thus respondents were asked to express their views on the responsibility of the various levels of government in the United States for dealing with global warming.

As can be seen in Table Ten, Michigan residents place the greatest responsibility for dealing with global warming on the federal government, with almost half of respondents indicating the government in Washington D.C. has a great deal of responsibility on this matter. While not placing as much responsibility on state governments, a vast majority of Michigan residents placed at least some

**Table 10. “For each type of government that I mention please tell me what level of responsibility it should have for addressing global warming.”**

	A Great Deal of Responsibility	Some Responsibility	No Responsibility	Not Sure / Refused
Federal Government	48%	36%	13%	2%
State Governments	33%	49%	15%	3%

Results from University of Michigan CLOSUP. Note: This question was only posed to respondents who indicated there is solid evidence that the earth is warming.

responsibility in dealing with global warming at the state government level.

### SECTION FOUR: RESPONSE TO ALTERNATIVE POLICY OPTIONS

While a majority of Michigan residents are in agreement that global warming is occurring and that it is a serious problem facing the nation, there is substantially less agreement among them on some of the prominent policy alternatives that are being proposed to address global warming. This section reviews the divergent responses to these policy alternatives.

#### CARBON AND ENERGY TAXES AND FEES TO REDUCE CONSUMPTION

Because most leading climate scientists believe emissions from fossil fuel use are a primary cause of global warming, it is frequently argued that government needs to create financial disincentives in order to reduce consumption. The most basic form of an economic disincentive is a tax applied to the use of carbon emitting products, although this could take multiple forms, including taxation of the carbon content of various fossil fuels. This approach has broad support from diverse economists and policy

**Table 11. Levels of Support for Energy Taxes Among Michigan Residents**

	Strongly Support	Somewhat Support	Somewhat Oppose	Strongly Oppose	Not Sure / Refused
Gasoline Tax Increase	7%	16%	18%	58%	1%
Fossil Fuel Tax Increase	7%	23%	20%	46%	4%

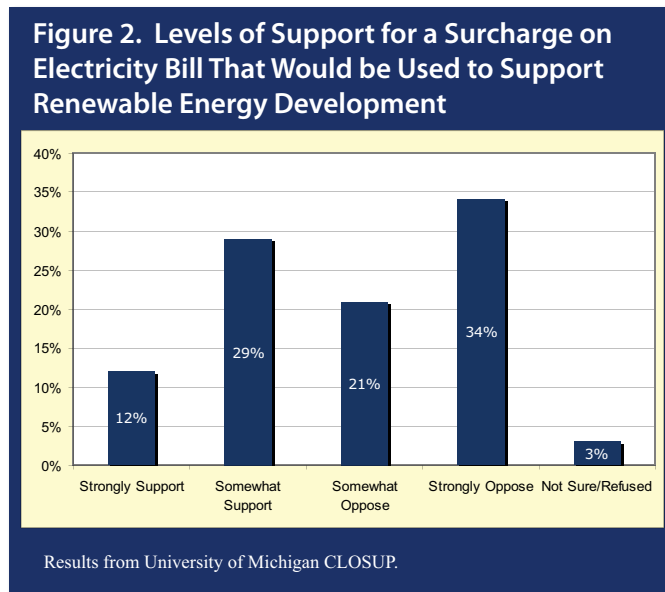
Results from University of Michigan CLOSUP.



analysts and has been endorsed by Rep. John Dingell (D-MI). Perhaps the most commonly known example of a disincentive to fossil fuel use is the gasoline tax. Although not originally conceived as a solution to global warming, nonetheless the gasoline tax is currently applied by both federal and Michigan authorities and is also operational at varying levels in the remaining 49 states. Although the most familiar form of carbon taxation to the general citizenry, the gasoline tax option is also the least supported method of addressing climate change among the various policy options that we examined. As can be seen in Table Eleven only about 1 in 4 residents of Michigan support increasing gasoline taxes to reduce consumption. Conversely, about 6 in 10 Michiganians indicated that they strongly oppose this approach. The survey results also show very low levels of support for a broader tax increase on all fossil fuels. Only about 3 out of 10 Great Lakes state residents indicated any level of support for this policy option that would place taxes on fossil fuels such as natural gas and coal. These findings may explain why, during the 2007 fiscal crisis in the state and the search for alternative revenue sources to close state deficits, energy taxes never emerged as a serious alternative, despite their potential to generate revenue and deter fossil fuel use contributing to global warming.

In addition to using taxes to reduce the consumption of carbon emitting fossil fuels, governments may also levy energy taxes to build a fund to support the development of renewable energy resources. This has been explored most commonly in electricity, where 15 states have some form of an electricity tax (most commonly known as a “public benefit charge”), intended both to reduce consumption

of this energy source and to create a pool of funds necessary to promote greater use of renewable energy sources such as wind or solar power. The results of the Michigan survey indicate that electricity surcharges receive slightly more support than direct taxes on gasoline and other fossil fuels, but are opposed by a majority of Michigan residents. The breakdown of support levels for this policy option is presented in Figure Two.



**GOVERNMENTAL SUBSIDIES FOR NON-FOSSIL FUELS AND CLEAN COAL**

With fossil fuel use identified as the primary cause of global warming, there has been an increased focus on developing fuels that are derived from alternative sources. Thus energy sources such as nuclear power and bio-fuels such as corn-based ethanol have been advanced as part of the solution to the climate dilemma. Nuclear energy generates virtually no greenhouse gases, although

it presents a number of environmental concerns which have contributed to a virtual halt of new facility development since the 1970s. Bio-fuels and ethanol have begun to play a larger role as supplemental transportation fuels, but many questions have been raised about the large levels of governmental subsidies already being allocated and the actual environmental benefits of these alternatives given the high energy levels required to produce these fuels from crops. We tested the level of support that Michigan residents have for the development of non-fossil fuel sources. The results indicate overwhelming support from Michiganians for increased government support for the development of ethanol, with three out of four residents of the state either strongly or somewhat supporting this policy option. The results also show significant levels of support for reducing greenhouse gas emissions through

**Table 12. Levels of Public Support for Government Efforts to Increase Use of Non-Fossil Fuels and Clean Coal Technology**

	Strongly Support	Somewhat Support	Somewhat Oppose	Strongly Oppose	Not Sure / Refused
Ethanol	39%	36%	8%	12%	3%
Nuclear Power	25%	34%	19%	15%	6%
Clean Coal	42%	45%	4%	4%	4%

Results from University of Michigan CLOSUP.

increased use of nuclear power. Nearly 60% of Michigan residents indicated that they support increased government assistance to expand production of nuclear power.

In addition to fairly strong support for government efforts to develop nuclear power and ethanol, Michigan residents are favorably disposed towards government efforts to support the development of clean coal technology. As the most abundant fossil fuel found in the United States and a key source of electric power, coal plays an important role in meeting the nation’s power needs. However, coal is also one of the most significant sources of carbon emissions, with the highest carbon content per unit of energy produced of any fossil fuel source. It is, therefore, a major contributor to global warming and there is no existing technology to reduce or capture carbon emissions once coal is ignited. The federal government has supported research on “clean coal” technology which is intended to allow the fuel to be used while also limiting its impact on global warming and other aspects of the environment. This technology remains experimental and is not in operation yet in the United States. Michigan residents offer great levels of support for increasing government assistance to the development of clean coal technology with 87% either strongly supporting or somewhat supporting this policy option.

**REGULATORY OPTIONS TO INCREASE EFFICIENCY AND EXPAND RENEWABLE ENERGY USE**

In December 2007, the United States Congress enacted an 800-page energy bill, featuring several provisions that could serve to reduce greenhouse gases in coming decades. Perhaps most significantly, the legislation established increased fuel efficiency standards for motor vehicles sold in the United States. For the first time in

a generation Congress increased Corporate Average Fuel Economy (CAFE) standards, thus mandating automakers to produce more fuel efficient vehicles during upcoming years. Given Michigan’s strong connection to the auto industry and the expressed concerns that increased CAFE standards would damage auto sales, it is valuable to measure the level of support among residents of the Great Lakes state for this policy approach. The survey was completed during the latter stages of Congressional deliberation over this legislation. The results indicate very high levels of support for increasing vehicle fuel efficiency standards, with almost 2 out of 3 Michiganians strongly supporting this policy option.

**Table 13. Levels of Public Support for Increasing Fuel Efficiency Standards in Vehicles**

	Percent of Respondents
Strongly Support	63%
Somewhat Support	23%
Somewhat Oppose	6%
Strongly Oppose	7%
Not Sure / Refused	1%

Results from University of Michigan CLOSUP.

Another major focus of the 2007 congressional energy debates revolved around the issue of requiring portions of electricity production to come from renewable energy sources through so-called renewable portfolio standards (RPS). Congress debated extensively proposals that mandated electricity producers to include renewable energy sources such as wind and solar power. In the end Congress did not pass a renewable requirement as part of the energy bill, but many states are already actively involved in this arena. At the time of the survey, twenty five states representing approximately 60% of the American population had adopted legislation that requires a portion of their electricity portfolios to be generated from renewable sources. For example, Pennsylvania requires a steady increase in its level of renewable-based electricity, climbing from 1.5% in 2007 to 18% in 2020. Michigan is not among the states with an RPS. However, such legisla-



tion was endorsed by Governor Granholm in her January 2008 State of the State address.

Our survey examined the knowledge and views of Michiganders regarding RPSs. First, survey respondents were asked whether or not they thought Michigan had such a standard, in order to test awareness of the current status of state policy. Almost half (49%) of the Michigan residents who were interviewed correctly stated that Michigan did not have a renewable electricity requirement, while only 15% of respondents incorrectly reported that the state did have such a standard.

In turn, the survey results indicate that Michiganders overwhelmingly support the establishment of a state RPS. More specifically, 85% of Michigan residents support a renewable energy standard, with 46% of respondents strongly supporting this option. While a majority of respondents of every major political affiliation supported a mandate to expand renewable energy, the intensity of support did vary across partisan identification. As can be seen in Table Fourteen, Democrats and Independents in Michigan are about twice as likely as their Republican counterparts to strongly support renewable requirements, and are also significantly less likely to offer any opposition to this policy option in comparison to GOP loyalists in the state.

### MARKET-BASED EMISSIONS TRADING

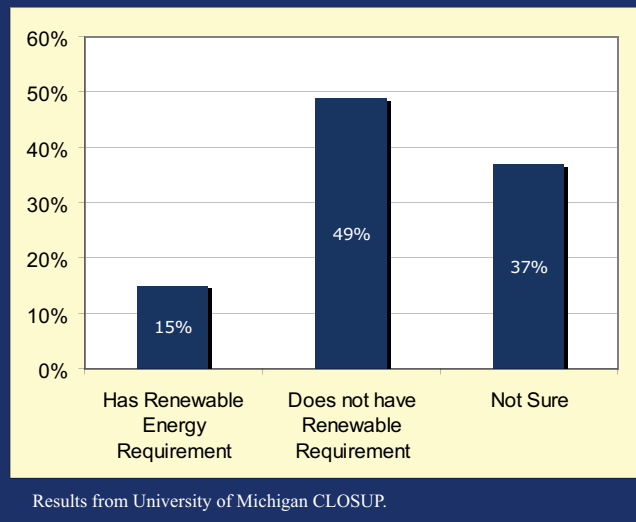
A final category of policy that is designed to address climate change relies on the development of markets in which the right to emit greenhouse gases can be bought and sold by businesses and other parties. The establishment of so-called emissions trading markets to trade carbon emission

allowances has been supported by many economists and policy analysts who contend that this approach can decrease greenhouse gases at lower cost than through more traditional regulatory means. This approach is currently being used across the European Union and is being developed among collaborating states in the northeastern and far western regions of the United States. In turn, there have been numerous proposals introduced in the current Congress to establish such a system nationally and this very issue surfaced in the recent Michigan Presidential Primary between one of its strongest proponents (Senator John McCain) and an increasingly vocal critic (former Governor Mitt Romney).

In this study, residents of Michigan were asked to identify their levels of support for this policy option. The results from the survey indicate Michiganders are evenly split between support and opposition for a policy

that would allow businesses to buy and sell carbon permits. While 44% of Michigan residents support the creation of such a carbon emissions trading market, 45% oppose such

**Figure 3. Public Beliefs Regarding the Existence of Renewable Energy Requirements in Michigan**



**Table 14. "The government should require a set portion of all electricity to come from renewable energy sources such as wind and solar power."**

	Strongly Support	Somewhat Support	Somewhat Oppose	Strongly Oppose	Not Sure / Refused
Overall	46%	39%	7%	6%	2%
Democrats	51%	41%	5%	<1%	1%
Republicans	27%	45%	11%	16%	<1%
Independents	56%	32%	7%	2%	2%

Results from University of Michigan CLOSUP.

an option. The findings also suggest that support for the development of greenhouse gas emission markets is associated with certain characteristics of Michigani- ans. For example, younger residents of Michigan were less likely to support allowing businesses to buy and trade greenhouse gas permits than their older counterparts. Similarly, union members are less supportive of emission trading than non-union members and Republicans are more likely than Democrats to strongly oppose allowing businesses to trade greenhouse gas credits. The lack of support among Republican respondents for a market approach to fighting global warming is notable given the positive reactions GOP voters often have for policy options that don't involve mandates.

**SUMMARY OF SUPPORT FOR AND OPPOSITION TO COMPETING POLICY OPTIONS**

As can be seen in the preceding discussion, there are substantial differences among Michigan residents regard-

**Table 15. "The government should allow businesses to buy and sell permits to release greenhouse gases as a means of reducing emissions."**

	Strongly Support	Somewhat Support	Somewhat Oppose	Strongly Oppose	Not Sure / Refused
Union	6%	31%	27%	22%	14%
Non-union	14%	34%	18%	26%	8%
Democrat	18%	34%	15%	24%	8%
Republican	10%	27%	22%	28%	13%
Independent	8%	32%	26%	21%	14%
18 - 29	12%	23%	30%	31%	4%
30 - 49	13%	36%	15%	26%	11%
50 and up	12%	31%	21%	21%	16%

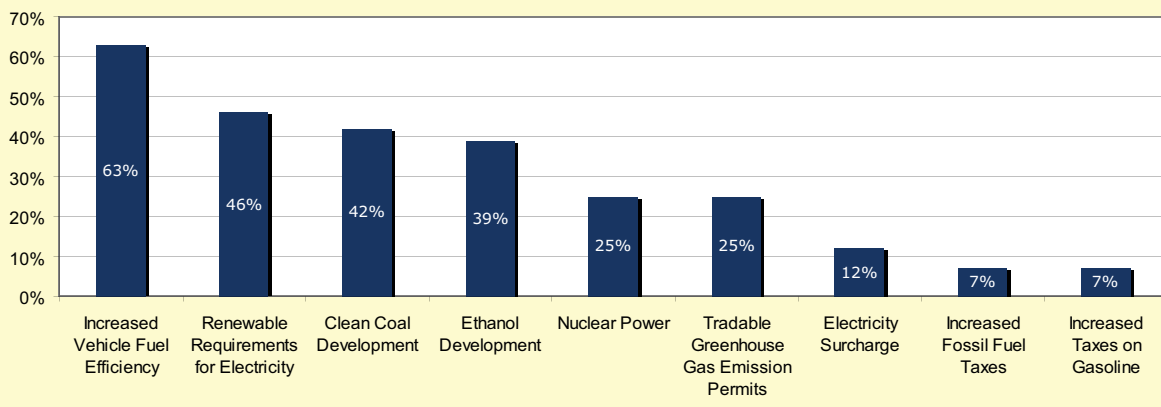
Results from University of Michigan CLOSUP.

ing the various options to address global warming. One way to examine the differing views on the policy options is to focus on the intensity of support and opposition for the varied approaches presented to survey respondents. The results presented in Figure Four clearly display the very large variation between levels of support for the options given to Michigan residents. While almost two out

of three state residents offer strong support for increasing vehicular fuel efficiency standards, for example, a mere seven percent of Michigani- ans strongly support gasoline taxes or broader fossil fuel levies.

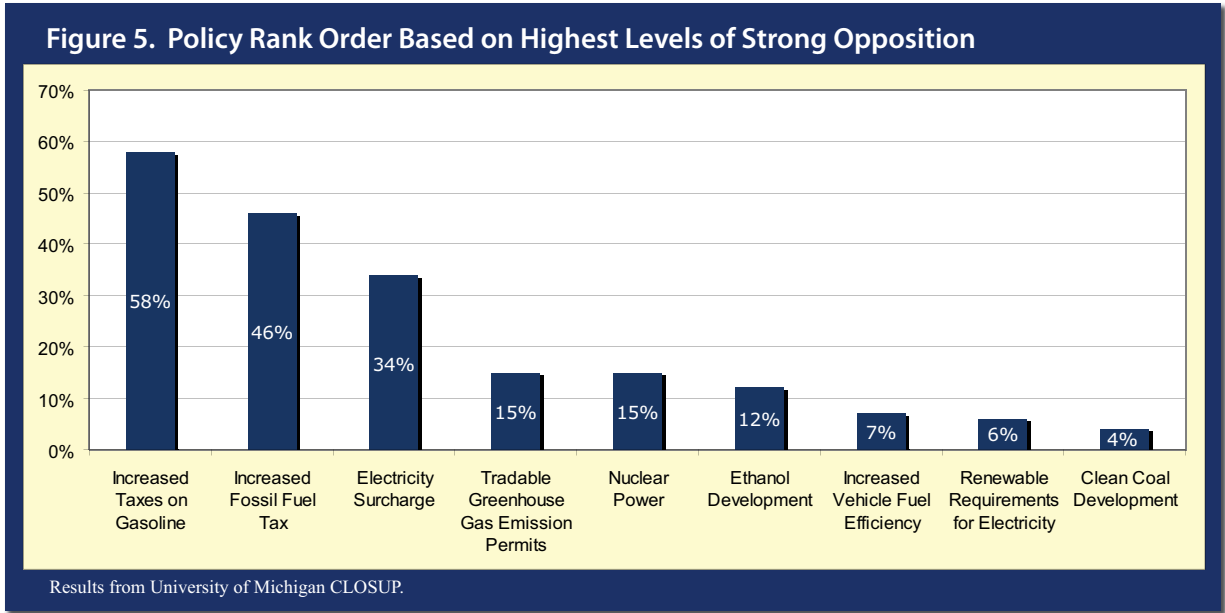
As Figure Five demonstrates, the highest levels of opposition are linked with those policies that would impose direct costs on citizens through their energy consumption. Policies that impose costs more indirectly, such as through mandating renewable energy development, consistently engender greater support.

**Figure 4. Policy Rank Order Based on Highest Levels of Strong Support**



Results from University of Michigan CLOSUP.





## SECTION SIX: WILLINGNESS TO PAY FOR INCREASED RENEWABLE ENERGY

All of the options to reduce global warming could entail significant economic costs in the event that they would be implemented. While cost estimates vary considerably across the options being discussed, it is clear that public willingness to pay for policies that reduce greenhouse gases will largely determine the likelihood that any option is adopted by government. In this survey, we asked Michigan residents how much they are willing to pay each year for more renewable energy to be produced. The

results of the survey indicate that about 3 of 4 Michiganians are willing to pay extra money each year in order to increase renewable energy production. Nearly one half of Michigan residents are willing to pay at least fifty dollars annually to foster the production of more renewable energy. Slightly less than one in four state residents indicate an unwillingness to pay anything extra to assist with this endeavor. At the same time, willingness to pay declines markedly beyond the level of \$100 per year. A breakdown of willingness to pay for renewable energy development can be observed in Table Sixteen below.

As with many other aspects of global warming and energy policy the willingness of Michiganians to pay for alternative energy is strongly related to their partisan affiliation, as shown in Table Seventeen. The survey findings indicate that Michigan Democrats are more willing to pay additional annual funds for renewable energy development

**Table 16. "If it required you to pay extra money each year in order for more renewable energy to be produced, how much would you be willing to pay?"**

	Percent Responding
Nothing	23%
1 to 50 Dollars	25%
50 to 100 Dollars	22%
100 to 250 Dollars	16%
250 to 500 Dollars	6%
Over 500 Dollars Per Year	4%
Not Sure / Refused	4%

Results from University of Michigan CLOSUP.

**Table 17. "If it required you to pay extra money each year in order for more renewable energy to be produced, how much would you be willing to pay?"**

	Percent Responding						Not Sure / Refused
	Nothing Each Year	1 - 50 Dollars	50 - 100 Dollars	100 - 250 Dollars	250 - 500 Dollars	Over 500 Dollars	
Democrat	12%	23%	30%	19%	5%	8%	4%
Republican	27%	33%	15%	10%	8%	4%	2%
Independent	26%	24%	18%	19%	7%	2%	5%

Results from University of Michigan CLOSUP.

than their Republican and independent counterparts. For example, Republicans and Independents were more than twice as likely as Democrats to indicate that they would not pay any extra money for the development of renewable energy. Conversely, Democrats were more likely than Republicans and Independents in Michigan to indicate that they would pay up to 100 dollars a year to develop more renewable energy.

## SECTION SEVEN: LOOKING AHEAD

This report is intended to provide the first examination of the views of Michigan residents on a wide range of issues related to global warming. The Michigan survey was conducted alongside a similar survey of approximately 600 Pennsylvania residents during the same time period. This will allow for formal comparison of public opinion in these two states that will be presented in subsequent analyses. In many respects, Pennsylvania presents an interesting comparison with Michigan. Both states have long traditions of manufacturing and reliance on fossil fuels, with the Michigan emphasis on oil and vehicles matched by Pennsylvania mining and use of coal. But Pennsylvania differs markedly from Michigan in that it has been one of the more active states on policy development related to global warming. Our next report will formally compare these findings across the two states and relate this to national trends.

## ABOUT THE AUTHORS

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