

## **Trends in Public Attitudes on Global Warming**

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Any attempt by industry or governments to address greenhouse gas emissions and global warming will require wide public understanding or recognition of this problem and willingness to bear the costs of remedies. With that end in mind, MIT has instituted a cross-national survey research program aimed at tracking public understanding of this problem and support for and opposition to policies that may be required in order to lessen emissions.

The first of these surveys was conducted in 2003 in the United States. It showed a relatively low level of public recognition of the problem and willingness to bear costs of a remedy. That survey was replicated in the United Kingdom, Sweden, and Japan. Across all four nations we found varying degrees of acceptance of the problem and varying beliefs about what national government would do. We did find a unified response in one critical aspect – willingness to pay. In no country was the median person willing to pay 10 percent more a month on electricity bills in order to lower carbon emissions. That was 2003.

The first effort to track changes in public attitudes has come in 2006. We have replicated the 2003 survey in October 2006 using the same survey design

and same questionnaire as we administered three years ago. Little has changed in public policies concerning global warming. However, there has been considerable public discussion in the United States of this problem. We offer the first evidence from any survey organization that there has been a real change in public attitudes on this issue. Because we use the same survey design and questionnaire we can compare directly the public attitudes today with those just three years ago.

Americans' attitudes have changed in two key respects. A sizable majority now recognizes global warming as a problem, and the salience of that problem has grown. And, perhaps more importantly, the willingness to pay for remedies has risen 50 percent.

### Public Understanding

In 2003, we asked people which activities emitted carbon, which absorbed carbon, and which were relatively neutral. These activities included generating electricity by burning fossil fuels, breathing, growing trees, and generating electricity from nuclear power. Of ten possible activities the average American correctly answered 6 of these questions. These questions sought to probe public understanding of the science behind global warming.

We also asked about technologies, most notably carbon capture and sequestration. We asked respondents whether they had heard anything about a list of energy and environmental technologies, ranging from biofuels to nuclear

power to hybrid cars. The main technologies of interest from our perspective were technologies to capture and store carbon.

Public understanding of the science and technologies was relatively low and unchanged. Importantly for MIT's technological research interests in this area, almost no one had heard of carbon capture or sequestration. Even bio fuels were relatively unknown, though their salience rose. Ten percent had heard about such fuels in 2003; twenty percent in 2006. Hybrid cars, solar power, and nuclear power were recognized by the large majority of the American public.

### Public Recognition

While public understanding of the technology choices was low and changed little, public recognition that global warming is a problem has risen dramatically in just three years.

Today, global warming is the number one environmental concern in the U. S. Better than one in three chose global warming as the nations top environmental priority from a list of ten key environmental problems. By contrast, in 2003, global warming ranked 6<sup>th</sup> on this same list of environmental problems. Only about 10 percent of the public felt that global warming was the primary environmental problem facing the country. It lagged far behind clean water, the number one concern. The number ranking global warming as the top environmental problem tripled over the last 36 months.

A clear majority now feel that scientific evidence warrants action. In 2003, barely 50 percent of the respondents agreed that the scientific evidence was sufficiently strong to warrant some action now, and 17 percent of Americans agreed that it was a scientifically established fact. Today, 61 percent feel that there is enough evidence that we should act now, and 28 percent characterized it as a scientific fact that demands immediate action. In 2006, fully 71 percent of the American public felt that the government should do more to address global warming.

#### Carbon Taxes: A Way Out?

Every serious policy study of global warming agrees that either a cap and trade system or a carbon tax is the optimal way to address the problem. Such taxes may either be explicit in the form of excise taxes on electricity and transportation and heating fuels, or the taxes may be implicit, as would occur with regulations on carbon emissions (Poterba 1990; Goulder 1995; Bovenberg and Goulder 1996, 2000). Recent public policy studies suggest that a tax in the range of \$30 per ton of carbon is necessary to reduce U. S. carbon emissions significantly and to reduce worldwide emissions of greenhouse gases (MIT Coal Studies forthcoming).

The practical difficulties with such a tax lie in public acceptance. Our surveys of the US, the UK, Japan, and Sweden in 2003 show a low willingness to pay higher electricity bills in order to “solve global warming” (Reiner, et al,

2006). In the US, the UK, Japan, and Sweden, a majority of people would be unwilling to spend more than \$10 more a month on electricity bills (a 10 percent increase or less) to address problems of climate change. Public resistance to tax increases has led many policy analysts to seek more subtle ways of introducing regulatory controls, such as cap and trade systems, but analysis shows these to be less efficient than an outright tax increase.

The 2006 survey shows a striking change in the American public's willingness to pay to remedy this problem. In 2003, the median percent was willing to pay only approximately \$10 more per month on their electricity bill, and the average amount that the public was willing to pay came to just \$14 more a month.

The willingness to pay grew 50 percent over just 36 months. We asked the same question in 2006 as we did in 2003. The median respondent stated that he or she would be willing to pay \$14 more a month, and the average amount that the sample was willing to pay came to \$21, compared with \$14 in 2003. This is a remarkable increase, and suggests that there has been a substantial change in the public's willingness to address this problem.

There are, of course, many implications of such sizable taxes and different ways that the public may experience them. The 2003 and 2006 surveys asked about electricity bills, but carbon taxes would affect other activities. We have

some evidence that gasoline taxes may be the most unfavorable tax, and that explaining the implications for other taxes makes carbon taxes more popular.

In a separate survey conducted in May, 2006, we asked whether people would be willing to pay \$25 more a month on their electricity bills and \$1.00 more a gallon on of gasoline. Only 9 percent of the sample said they would support such a tax to reduce greenhouse gas emissions. (See Ansolabehere, “U.S. Public Attitudes on Swapping Carbon Taxes for Income Taxes” MIT-PORTL Release May, 2006) However, when we reframed the question so that the carbon tax was tied to a reduction in income taxes, a much higher fraction of the sample supported the carbon taxes. Twenty-eight percent of the sample supported swapping a relatively high gasoline and electricity tax for an equivalent income tax cut.

By way of contrast, in the October 2006 study, fully 30 percent of the respondents supported paying \$25 more a month on their electricity bills alone. And that question did not tie the carbon tax to an income tax reduction. The additional gasoline tax seems to account for the differential in support between the May and October survey questions in which the questions did not offer a “tax swap.” The May survey indicates that such a swap may make a substantial carbon tax increase politically feasible today.

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<http://sequestration.mit.edu/research/survey2006.html>.