

# An Issue of Science and Economics

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Abundant and affordable energy is one of the great boons of modern industrial civilization and the basis of our standard of living. Energy makes people's lives brighter, safer, more comfortable, and more mobile. Unfortunately, billions of people in poor countries still do not have access to energy. For example, India's per capita consumption of electricity is one-twentieth that of the United States. Hundreds of millions of Indians live "off the grid"—that is, without electricity—and many still use cow dung as a fuel for household cooking, a practice that contributes to half a million premature deaths every year. This continuing reliance on preindustrial energy sources is also one of the major causes of environmental degradation.

Whether poor people around the world ever gain access to energy depends on a number of factors, such as the development of secure property rights in developing countries and continuing technological progress. One potential obstacle, however, could thwart any efforts to provide more energy. That threat is political pressure to reduce energy use worldwide for fear of global warming. The hydrocarbons—coal, petroleum, and natural gas—that are the source of anthropogenic greenhouse gas emissions provide over three-fourths of the world's total energy. Although many alternative sources of energy exist, all of these sources combined cannot begin to substitute for hydrocarbons without further significant technological innovations and massive capital investments. This

is not the work of a few years, but of several decades.<sup>1</sup>

Yet environmental activist groups and their supporters in legislatures around the world, backed by activist scientists eager to use the political process to advance their ideological agendas, demand action *now*. They propose massive, mandated cutbacks in hydrocarbon use, while at the same time objecting to reliable, proven technologies, such as nuclear power, that could contribute to such cutbacks. Although even the European Union (EU) is failing to meet its targets under the Kyoto Protocol,<sup>2</sup> the activists and their political allies call for more ambitious targets. With every severe weather event touted as proof of global warming and shrill warnings about the world's being only a few years away from climate catastrophe, together with exploitation of national security worries, legislators are coming under extreme pressure to "do something."

Support for putting the world on an energy-starvation diet to avert catastrophic global warming has continued to gain traction among politicians, pundits, and public intellectuals in many countries. Notwithstanding this outcry, however, the scientific case for catastrophic global warming continues to be dubious. Moreover, environmental activists refuse to countenance adaptive strategies that would be demonstrably beneficial whether the world warms significantly or not.

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1. For a general discussion of these issues, see Robert L. Bradley Jr., *Julian Simon and the Triumph of Energy Sustainability* (Washington, DC: American Legislative Exchange Council, 2000).

2. See European Environment Agency, *Annual European Community Greenhouse Gas Inventory 1990–2004 and Inventory Report 2006*, EEA Technical Report 6/2006 (Copenhagen: European Environment Agency, 2006).

Alarm over the prospect of Earth's warming is not warranted by the agreed science or economics of the issue. Global warming is happening, and humans are responsible for at least some of it. Yet this fact does not mean that global warming will cause enough damage to Earth and to humanity to require drastic cuts in energy use, a policy that would have damaging consequences of its own. Moreover, science cannot answer questions that are at heart economic or political, such as whether the Kyoto Protocol is worthwhile.

Predictions of a global warming catastrophe are based on models that rely on economics as much as on science. If the science of the greenhouse theory is right, then we can assess its consequences only by estimating future production of greenhouse gases from estimates of economic activity. This policy brief addresses questions regarding global warming as a political and economic, as well as scientific, issue.

### **Isn't There a Scientific Consensus That Global Warming Is Real and Bad for Us?**

There is no scientific consensus that global warming will cause damaging climate change. Claims regarding a consensus mischaracterize the scientific research of bodies such as the United Nations Intergovernmental Panel on Climate Change (IPCC) and the U.S. National Academy of Sciences.

### **What Do Scientists Agree On?**

Scientists do agree on the following:

- Global average temperature is about 0.6°C—or just over 1°F—higher than it was a century ago.

- Atmospheric levels of carbon dioxide have risen by about 30 percent over the past 200 years.
- Carbon dioxide, like water vapor, is a greenhouse gas whose increase is likely to warm Earth's atmosphere.<sup>3</sup>

### **Doesn't This Mean We Should Be Worried?**

As Richard Lindzen of the Massachusetts Institute of Technology (MIT) summarized in 2006,

These claims are true. However, what the public fails to grasp is that the claims neither constitute support for alarm nor establish man's responsibility for the small amount of warming that has occurred. In fact, those who make the most outlandish claims of alarm are actually demonstrating skepticism of the very science they say supports them. It isn't just that the alarmists are trumpeting model results that we know must be wrong. It is that they are trumpeting catastrophes that couldn't happen *even if the models were right* as justifying costly policies to try to prevent global warming.<sup>4</sup>

### **What Don't Scientists Know Yet?**

Scientists do not agree on whether:

- We know enough to ascribe past temperature changes to carbon dioxide levels.

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3. Richard Lindzen, testimony before the U.S. Senate Environment and Public Works Committee, May 2, 2001, <http://www-eaps.mit.edu/faculty/lindzen/Testimony/Senate2001.pdf>.

4. Richard Lindzen, "Climate of Fear," *Wall Street Journal*, April 12, 2006.

- We have enough data to confidently predict future temperature levels.
- At what level temperature change might be more damaging than beneficial to life on Earth.

### **Didn't the National Academy of Sciences Say Greenhouse Gases Cause Global Warming?**

Not quite. The National Academy of Sciences reported the following in 2001:

Because of the large and still uncertain level of natural variability inherent in the climate record and the uncertainties in the time histories of the various forcing agents ... a causal linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes during the 20th century cannot be unequivocally established.<sup>5</sup>

The academy also noted that 20 years' worth of data is not enough to estimate long-term trends.

### **Hasn't Earth Warmed Precipitously over the Past 100 Years?**

The temperature rise of 0.6°C over the past century is at the bottom end of what climate models suggest should have happened. This finding suggests either that the climate is less sensitive to greenhouse gases than previously

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5. Committee on the Science of Climate Change, National Research Council, *Climate Change Science: An Analysis of Some Key Questions* (Washington, DC: National Academies Press, 2001).

thought or that some unknown factor is depressing the temperature.<sup>6</sup>

### **Don't Climate Models Warn of Alarming Future Warming?**

Predictions of 6°C temperature rises over the next 100 years are at the extreme end of the IPCC range and are the result of faulty economic modeling, not science (discussed later in this brief).

### **What Are the Realistic Current Estimates of Future Warming?**

Both James Hansen of the National Aeronautics and Space Administration (NASA)—the father of greenhouse theory—and Richard Lindzen of MIT—the world's most renowned climatologist—agree that, even if nothing is done to restrict greenhouse gases, the world will see a global temperature increase of only about 1°C in the next 50 to 100 years. Hansen and his colleagues predict “additional warming in the next 50 years of  $0.5 \pm 0.2^\circ\text{C}$ , a warming rate of  $0.1 \pm 0.04^\circ\text{C}$  per decade.”<sup>7</sup>

### **What about Satellite Temperature Measurements?**

Evidence from satellite and weather balloon soundings suggests that the atmosphere

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6. See testimony of Richard Lindzen to the U.K. House of Lords Committee on Economic Affairs, “Aspects of the Economics of Climate Change,” January 21, 2005, <http://www.publications.parliament.uk/pa/ld/lduncorr/econ2501p.pdf>.

7. Shan Sun and James E. Hansen, “Climate Simulations for 1951–2050 with a Coupled Atmosphere-Ocean Model,” *Journal of Climate* 16, no. 17 (2003): 2807–26.

has warmed considerably less than greenhouse theory suggests.<sup>8</sup> These measurements, which cover the whole atmosphere and show only a very slight warming, show a disparity with the surface temperature measurements, which cover only a small fraction of Earth but show sustained warming.

### **Hasn't the Disagreement between Satellite and Surface Temperatures Been Resolved?**

No. Substantial disagreement still exists between the midrange of the satellite measurements and the midrange of the surface measurements. This discrepancy presents a problem for climate models.

### **Do Other Human-Made Factors Besides Greenhouse Gases Influence Temperature?**

New research suggests that the role of greenhouse gases in warming has been overestimated, because factors such as atmospheric soot,<sup>9</sup> land-use change,<sup>10</sup> and solar varia-

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8. John R. Christy and Roy W. Spencer, *Global Temperature Report: April 2003* (Huntsville, AL: Earth System Science Center, University of Alabama in Huntsville May 9, 2003).

9. Makiko Sato, James Hansen, Dorothy Koch, Andrew Lacis, Reto Ruedy, Oleg Dubovik, Brent Holben, Mian Chin, and Tica Novakov, “Global Atmospheric Black Carbon Inferred from AERONET,” *Proceedings of the National Academy of Sciences* 100, no. 11 (2003): 6319–24.

10. Roger A. Pielke, Gregg Marland, Richard A. Betts, Thomas N. Chase, Joseph L. Eastman, John O. Niles, Devdutta S. Niyogi, and Steven W. Running, “The Influence of Land-Use Change and Landscape Dynamics on the Climate System: Relevance to Climate-Change Policy beyond the Radiative Effect of Greenhouse Gases,” *Philosophical Transactions of the Royal Society of London* 360, no. 1797 (2002): 1705–19.

tion<sup>11</sup> all appear to have contributed significantly to recent warming.

### Is Earth Continuing to Warm?

The global average temperature has seen no net increase since 1998 in four of the five generally accepted measurement series (the exception being NASA's). Three of the series suggest Earth is even cooling.<sup>12</sup> Recent articles have admitted that natural processes are currently overwhelming anthropogenic climate forcings but have asserted that global warming will resume in 2009 or even 2015. Such findings strongly suggest that not enough is known about natural forcings to allow confidence in future projections of temperature.

### Is the World in Danger of Plunging into a New Ice Age?

No. The scenario presented in *The Day after Tomorrow* is physically impossible. Although research does suggest that the Gulf stream has switched on and off in the past, causing temperature drops in Europe, oceanographers are convinced that global warming does not present any such danger.<sup>13</sup>

11. Eigil Friis-Christensen and Knud Lassen, "Length of the Solar Cycle: An Indicator of Solar Activity Closely Associated with Climate," *Science* 254, no. 5032 (1991): 698–700. See also Peter Thejil and Knud Lassen, *Solar Forcing of the Northern Hemisphere Land Air Temperature: New Data*, DMI Report 99-9 (Copenhagen: Danish Meteorological Institute, 1999).

12. See Roger A. Pielke, "How to Make Two Decades of Cooling Consistent with Warming," Prometheus science policy blog, University of Colorado at Boulder, May 12, 2008, [http://sciencepolicy.colorado.edu/prometheus/archives/climate\\_change/001425how\\_to\\_make\\_two\\_deca.html](http://sciencepolicy.colorado.edu/prometheus/archives/climate_change/001425how_to_make_two_deca.html).

13. Andrew J. Weaver and Claude Hillaire-Marcel, "Global Warming and the Next Ice Age," *Science* 304,

### Is the World in Severe Danger from Sea-Level Rise, Perhaps by as Much as 20 Feet This Century?

No. Recent research from French scientists indicates that sea levels have risen steadily over the past 50 years at a rate of 1.5 millimeter per year, which translates to just 15 centimeters per century.<sup>14</sup> The IPCC foresees sea-level rise of between 0.18 and 0.59 meters this century and regards higher figures as unlikely. Earth experienced a sea-level rise of 0.2 meters over the past century with no noticeable ill effects.

Another study relevant to this controversy examined changes in ice mass "from elevation changes derived from 10.5 years (Greenland) and 9 years (Antarctica) of satellite radar altimetry data from the European Remote-sensing Satellites ERS-1 and -2."<sup>15</sup> The researchers report a net contribution of the three ice sheets to sea level of  $+0.05 \pm 0.03$  millimeters per year. CO2Science.Org puts this finding in perspective: "At the current sea-level-equivalent ice-loss rate of 0.05 millimeters per year, it would take a full *millennium* to raise global sea level by *just 5 cm*, and it would take fully *20,000 years* to raise it a *single meter*."

no. 5669 (2004): 400–2. See also Carl Wunsch, "Gulf Stream Safe If Wind Blows and Earth Turns," *Nature* 428, no. 6983 (2004): 601.

14. Muriel Bergé-Nguyen, Anny Cazenave, Alix Lombard, William Llovel, J. Viarre, and Jean-François Cretaux, "Reconstruction of Past Decades Sea Level Using Thermosteric Sea Level, Tide Gauge, Satellite Altimetry and Ocean Reanalysis Data," *Global and Planetary Change* 62, nos. 1–2 (2008): 1–13.

15. H. Jay Zwally, Mario B. Giovinetto, Jun Li, Helen G. Cornejo, Matthew A. Beckley, Anita C. Brenner, Jack L. Saba, and Donghui Yi, "Mass Changes of the Greenland and Antarctic Ice Sheets and Shelves and contributions to Sea-Level Rise: 1992–2002," *Journal of Glaciology* 51, no. 175 (2005): 509–27

### **Are Extreme Weather Events Directly Attributable to Global Warming?**

No provable link has been established between weather events such as Hurricane Katrina and global warming. Research by German scientists has demonstrated that the devastating floods in central Europe in 2002 were perfectly normal events when compared with the historical record.<sup>16</sup> Allegations that extreme weather has been more damaging recently do not take into account the fact that humans are now living and investing resources in more dangerous areas. Moreover, the World Meteorological Organization has acknowledged that increases in the recorded number of extreme weather events may be caused by better observation and reporting.<sup>17</sup> A top expert from the IPCC, Christopher Landsea, resigned in January 2005 to protest the misrepresentation of IPCC science by claims that the previous hurricane season was exacerbated by global warming.<sup>18</sup> Most hurricane

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16. Manfred Mudelsee, Michael Börngen, Gerd Tetzlaff, and Uwe Grünwald, "No Upward Trends in the Occurrence of Extreme Floods in Central Europe," *Nature* 425, no. 6954 (2003): 166–69.

17. Ken Davidson, director of the World Climate Program for the World Meteorological Organization, replied to a questioner in Geneva in 2003 as follows: "You are correct that the scientific evidence (statistical and empirical) are not present to conclusively state that the number of events have increased. However, the number of extreme events that are being reported and are truly extreme events has increased both through the meteorological services and through the aid agencies as well as through the disaster reporting agencies and corporations. So, this could be because of improved monitoring and reporting." See "WMO Joins the IPCC Mantra," *"Stop Press" Stories*, <http://www.john-daly.com/press/press-03b.htm>.

18. See "Chris Landsea Leaves IPCC," open letter posted on the Prometheus science policy blog, University of Colorado at Boulder, January 17, 2005, [http://sciencepolicy.colorado.edu/prometheus/archives/science\\_policy\\_general/000318chris\\_landsea\\_leaves.html](http://sciencepolicy.colorado.edu/prometheus/archives/science_policy_general/000318chris_landsea_leaves.html).

scientists agree that Hurricane Katrina can in no way be blamed on global warming.

Other recently published research casts extreme doubt on the influence of warming on hurricanes. Philip Klotzbach of Colorado State University finds the following:

The data indicate a large increasing trend in tropical cyclone intensity and longevity for the North Atlantic basin and a considerable decreasing trend for the Northeast Pacific. All other basins showed small trends, and there has been no significant change in global net tropical cyclone activity. There has been a small increase in global Category 4–5 hurricanes from the period 1986–1995 to the period 1996–2005. Most of this increase is likely due to improved observational technology. These findings indicate that other important factors govern intensity and frequency of tropical cyclones besides SSTs [sea surface temperatures].<sup>19</sup>

### **Is the Snow on Kilimanjaro Really Disappearing Because of Global Warming?**

Not according to scientists who study Mount Kilimanjaro most closely. Kaser and colleagues "develop[ed] a new concept for investigating the retreat of Kilimanjaro's glaciers, based on the physical understanding of glacier–climate interactions." They write:

The concept considers the peculiarities of the mountain and implies that climatological processes other than air temperature

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19. Philip J. Klotzbach, "Trends in Global Tropical Cyclone Activity over the Past Twenty Years (1986–2005)," *Geophysical Research Letters* 33 (2006): L10805.

control the ice recession in a direct manner. A drastic drop in atmospheric moisture at the end of the 19th century and the ensuing drier climatic conditions are likely forcing glacier retreat on Kilimanjaro.<sup>20</sup>

### **Is Global Warming Causing the Spread of Malaria?**

Climate is not a significant factor in the recent growth of vector borne diseases such as malaria. Most experts on this subject agree that malaria is more closely correlated with other factors. Deforestation, migration of lowland people (who have higher immunities but bring unknown diseases with them into their new areas of residence), construction of roads and dams, and proliferation of pools and ditches are much more important in predicting the future spread of these diseases.<sup>21</sup>

### **Are Claims Real That the U.S. Department of Defense Has Concluded Global Warming Poses a National Security Threat?**

The Pentagon is not convinced that global warming represents a major security threat to the United States. The “secret paper” that garnered much publicity in Europe was a self-admittedly speculative exercise that went beyond the bounds of measured research and had been

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20. Georg Kaser, Douglas R. Hardy, Thomas Molg, Raymond S. Bradley, and Tharsis M. Hyera, “Modern Glacier Retreat on Kilimanjaro as Evidence of Climate Change: Observations and Facts,” *International Journal of Climatology*, 24, no. 3: 329–39.

21. Paul Reiter, Christopher J. Thomas, Peter M. Atkinson, Simon I. Hay, Sarah E. Randolph, David J. Rogers, G. Dennis Shanks, Robert W. Snow, and Andrew Spielman, “Global Warming and Malaria: A Call for Accuracy,” *Lancet Infectious Diseases* 4, no. 6 (2004): 323–24.

released to the press long before the sensationalist stories surfaced in Europe. Nor did the paper recommend “immediate action” beyond better climate modeling.<sup>22</sup>

### **Do Climate Models Show That We Are in Danger of Reaching a Tipping Point, Where Global Warming Will Become Much Worse?**

All the major climate models show that, once global warming starts, it will progress steadily, essentially in a straight line. They do not show exponential growth or any increased effect after certain temperatures are reached.

### **Haven’t the National Academies of All the Major Industrial Countries Agreed That Global Warming Is a Serious Threat?**

Claims have been made that the scientific consensus is represented by a statement drafted by the Royal Society of London and signed by the national scientific academies of the Group of Eight, plus those of India, Brazil, and China. But such claims ignore the politicized nature of the statement. The climate change committee of the Russian Academy of Sciences later said that its president should not have signed the statement, and the use to which the statement was put was condemned by the outgoing president of the U.S. National Academy of Sciences, Bruce Alberts, who called the Royal Society’s presentation of the statement “quite misleading.”<sup>23</sup>

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22. Peter Schwartz and Doug Randall, “An Abrupt Climate Change Scenario and Its Implications for United States National Security,” paper submitted to the U.S. Department of Defense, October 2003.

23. Sam Knight, “Anti-Bush Gibe by Royal Society Sparks Climate Change Row,” *Times Online*, July 5, 2005.

### **Aren't Polar Bears Drowning Because of Melting Ice?**

These claims are overblown. A leading Canadian polar bear biologist wrote recently:

Climate change is having an effect on the west Hudson population of polar bears, but really, there is no need to panic. Of the 13 populations of polar bears in Canada, 11 are stable or increasing in number. They are not going extinct, or even appear to be affected at present.<sup>24</sup>

### **Isn't There a Scientific Consensus Such That One Researcher Found No Disagreement about Global Warming in the Literature?**

The research by Naomi Oreskes of the University of California, published in the journal *Science* in December 2004, was flawed.<sup>25</sup> She studied about 1,000 scientific abstracts but admitted to a sympathetic journalist that she made a major mistake in her search terms. In fact, she should have reviewed about 12,000 abstracts. Even taking her sample, another researcher who tried to replicate her study came to quite different conclusions.<sup>26</sup> In addition, the most recent survey of climate scientists

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[http://business.timesonline.co.uk/tol/business/markets/united\\_states/article540543.ece](http://business.timesonline.co.uk/tol/business/markets/united_states/article540543.ece).

24. Mitchell Taylor, Department of the Environment, Government of Nunavut, as quoted by the *Toronto Star*, May 1, 2006.

25. Naomi Oreskes, "Beyond the Ivory Tower: The Scientific Consensus on Climate Change," *Science* 306 (5702): 1686.

26. Benny J. Peiser, Liverpool John Moores University, unpublished letter to *Science*, January 4, 2005, <http://www.staff.livjm.ac.uk/spsbpeis/Scienceletter.htm>.

by Dennis Bray of Cambridge University and Hans von Storch of Germany's Institute for Coastal Research, following the same methodology as a published study from 1996, found that although a move had occurred toward acceptance of anthropogenic global warming, only 9.4 percent of respondents "strongly agree" that climate change is mostly the result of anthropogenic sources. A similar proportion "strongly disagree." Furthermore, only 22.8 percent of respondents "strongly agree" that the IPCC reports accurately reflect a consensus within climate science.<sup>27</sup>

There is scientific agreement that the world has warmed and that humans are at least partly responsible for the warming—although no consensus exists on the precise extent of human-kind's effect on the climate. Scientific debate is ongoing about the parameters used by the computer models that project future climatic conditions. We cannot be certain whether the world will warm significantly, and we do not know how damaging—if at all—even significant warming will be.

### **Why Is Economics Important to the Study of Global Warming?**

Predictions of a global warming catastrophe are based on models that rely on economics as much as on science. If the science of the greenhouse theory is right, then we can assess its consequences only by estimating future production of greenhouse gases from estimates of economic activity.

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27. Dennis Bray, "The Not So Clear Consensus on Climate Change," Heartland Institute, Chicago, <http://www.heartland.org/Article.cfm?artId=21311>.



## **Haven't Economists Agreed That Not Reducing Carbon Emissions Now Is More Costly Than Doing So?**

This common assertion is based on the report of Sir Nicholas Stern to the U.K. government on the economics of global warming, which is seriously flawed. It relies on a social cost of carbon emission that is considerably greater than the average of all the other literature in the field and also uses a very small discount rate, exaggerating the costs of future damages as well as the benefits of early action.<sup>28</sup>

Dr. Richard Tol of Hamburg University, the leading expert on the social cost of greenhouse gases, estimates the cost of carbon dioxide emissions at about \$2 per ton, not the \$86 per ton used by Stern. Even at a higher estimate of \$12 per ton, this translates to just 12 cents on a gallon of gasoline, far less than the dollar-a-gallon figure commonly suggested.

Dr. William Nordhaus of Yale estimates that 3°C of global warming would cost the world \$22 trillion this century. Stern's recommendations, based on immediate deep reductions in emissions on the basis of intergenerational equity, would reduce Nordhaus's estimate to \$9 trillion, but at a cost of \$26 trillion. Al Gore's package of measures, which calls on the United States to "join an international treaty within the next two years that cuts global warming pollution by 90 percent in developed countries and by more than half worldwide in time for the next generation to inherit a healthy Earth,"

28. See, for example, Richard S. J. Tol, "The Stern Review of the Economics of Climate Change: A Comment," Economic and Social Research Institute, Hamburg, Vrije, and Carnegie Mellon Universities, November 2, 2006, <http://www.fnu.zmaw.de/fileadmin/fnu-files/reports/sternreview.pdf>.

would reduce warming costs to \$10 trillion, at a cost of \$34 trillion.<sup>29</sup>

## **What Will the Kyoto Protocol Do to Reduce Warming?**

The Kyoto Protocol, most observers agree, will have virtually no effect on temperature increase, because it imposes no greenhouse gas emissions restrictions on major developing nations such as China and India. These nations have publicly refused to accept any restrictions now or in the future.<sup>30</sup>

## **Can't We Reduce Emissions without Affecting the Economy?**

Greenhouse gas emissions derive from energy use, which in turn derives from economic growth. Therefore, nations that restrict emissions are almost certain to reduce their rate of economic growth.

## **Isn't Global Warming All Cost and No Benefit?**

No. Even substantial global warming is likely to benefit the United States. Eminent Yale professor Robert Mendelsohn wrote this advice to the Senate in 2000:

Climate change is likely to result in small net benefits for the United States over the

29. William Nordhaus, *The Challenge of Global Warming: Economic Models and Environmental* (Yale University, New Haven, CT, 2007).

30. "CEI Drops Junk Science Lawsuit after White House Acknowledgment; Chinese Emissions Skyrocket; India Rejects Emissions Restrictions," *Cooler Heads Digest*, November 12, 2003, <http://www.globalwarming.org/article.php?uid=233>.

**Table 1. Effects of Kyoto Protocol on European Economies as Predicted by a General Equilibrium Model**

Country	Percentage of lost GDP	Jobs lost
Germany	5.2	1,800,000
Spain	5.0	1,000,000
United Kingdom	4.5	1,000,000
Netherlands	3.8	240,000

Source: Margo Thorning, *Kyoto Protocol and Beyond: Economic Impacts on EU Countries* (Brussels: International Council for Capital Formation, October 2002).

next century. The primary sector that will benefit is agriculture. The large gains in this sector will more than compensate for damages expected in the coastal, energy, and water sectors, unless warming is unexpectedly severe. Forestry is also expected to enjoy small gains. Added together, the United States will likely enjoy small benefits of between \$14 [billion] and \$23 billion a year and will only suffer damages in the neighborhood of \$13 billion if warming reaches 5°C over the next century. Recent predictions of warming by 2100 suggest temperature increases of between 1.5°C and 4°C, suggesting that impacts are likely to be beneficial in the U.S.<sup>31</sup>

### **Haven't Economic Models Predicted No Effect on Growth from Reducing Emissions?**

The models of the effect of greenhouse gas emission restrictions on the economy that suggest no effect are mostly European. They are sectoral models that look at the effects on

only one economic sector and therefore badly underestimate the negative effects of emission restrictions throughout the economy. General equilibrium models, which take into account the effects of emissions restrictions on other economic sectors, show much greater negative economic effects than do sectoral models.<sup>32</sup>

### **What Do the Better Economic Models Say Kyoto Will Do?**

Research from general equilibrium models suggests strongly negative impacts on European economies from adopting Kyoto targets (or going beyond the targets, as in the case of the United Kingdom). One model (see table 1) shows the economic effects by 2010 of adopting Kyoto targets. Remember that the protocol achieves virtually nothing in reducing global temperature.

The most recent measure proposed in the United States, the Lieberman-Warner Climate Security Act 2008, would have had the following effects, according to a detailed study by the Heritage Foundation:

31. Robert Mendelsohn, letter to Sen. John McCain, July 12, 2000, <http://64.233.179.104/search?q=cache:ctDw6sczNv0J:www.senate.gov/~commerce>.

32. Michael Canes, *Economic Modeling of Climate Change Policy* (Brussels: International Council for Capital Formation, October 2002).

- Cumulative gross domestic product (GDP) losses are at least \$1.7 trillion and could reach \$4.8 trillion by 2030 (in inflation-adjusted 2006 dollars).
- Single-year GDP losses hit at least \$155 billion and realistically could exceed \$500 billion (in inflation-adjusted 2006 dollars).
- Annual job losses exceed 500,000 before 2030 and could approach 1,000,000.
- The annual cost of emission permits to energy users will be at least \$100 billion by 2020 and could exceed \$300 billion by 2030 (in inflation-adjusted 2006 dollars).
- The average household will pay \$467 more each year for its natural gas and electricity (in inflation-adjusted 2006 dollars). That means that the average household will spend an additional \$8,870 to purchase household energy over the period 2012 through 2030.<sup>33</sup>

### **Isn't Europe on Track to Meet Its Kyoto Targets?**

Europe has found that the Kyoto targets are unrealistic. Regardless of announced targets, 11 of the 15 pre-enlargement EU countries are on course to increase their greenhouse gas emissions well beyond their individual Kyoto targets.<sup>34</sup> Those that are on track are largely

33. William W. Beach, David Kreutzer, Ben Lieberman, and Nick Loris, "The Economic Costs of the Lieberman-Warner Climate Change Legislation," Center for Data Analysis Report 08-02, Heritage Foundation, Washington, DC, May 12 2008, <http://www.heritage.org/research/EnergyandEnvironment/cda08-02.cfm>.

34. European Environment Agency, "EU15 Greenhouse Gas Emissions Decline after Two Years of Increases," press release, European Environment Agency, Copenhagen, July 15, 2004.

there because of economic decisions made before the signing of the Kyoto treaty, which was signed in 1997 but which uses 1990 as its baseline year.

### **Isn't President Bush to Blame for Holding Up Kyoto?**

President George W. Bush has not unilaterally held up ratification of the Kyoto treaty. The U.S. Senate must ratify any treaty signed by a president. In 1997, during Bill Clinton's presidency, the Senate voted 95 to 0 not to accept any Kyoto-style treaty that would significantly harm the U.S. economy and that did not include participation by major developing countries.<sup>35</sup> The U.S. president has no power to impose the Kyoto Protocol, or any other treaty, on an unwilling Senate.<sup>36</sup>

### **Isn't Global Warming a Worse Threat Than Terrorism?**

The charge that global warming is worse than terrorism in terms of damage to the world is pure hyperbole. The implausible and unverifiable claim of a large number of deaths owing to global warming each year—the figure is often put at 150,000—ignores the fact that most of those alleged deaths are caused by diseases such as malaria, which have historically existed even in cold climates and could easily be controlled if the environmental lobby dropped its opposition to the use of the pesticide DDT (dichloro-diphenyl-

35. Senate Resolution 98, 105th Congress, First Session, "Expressing the Sense of the Senate Regarding the Conditions for the United States Becoming a Signatory to Any International Agreement on Greenhouse Gas Emissions under the United Nations," 1997.

36. U.S. Constitution, article II, section 2, clause 2.

trichloroethane).<sup>37</sup> Moreover, that number is itself dwarfed by the number of people who meet early deaths because of poverty—a number that will increase if governments around the world suppress the use of energy. Moreover, given the clear and demonstrated link between wealth and health, replacing coal-generated electricity with more expensive alternatives would lead to almost 200,000 extra premature deaths in the United States alone.<sup>38</sup>

### **Can't We Replace Fossil Fuels Cheaply and Effectively with Renewable Energy?**

Alternative sources of energy, such as wind and solar power, are not yet cost-effective and come with environmental costs of their own (the veteran British environmentalist David Bellamy is leading opposition to wind farms).<sup>39</sup> The only currently cost-effective alternative to fossil fuel use is nuclear power, which produces nearly no emissions but which environmental activists continue to oppose in direct contradiction to their assertions that global warming is the gravest danger facing the planet.

### **Aren't Market-Based Solutions the Way to Reduce Emissions?**

“Cap and trade” schemes that allow firms and governments to trade the right to emit greenhouse gases up to certain limits are not economically efficient. By creating rent-seeking

opportunities, they promote the development of a carbon cartel seeking to exploit the system to make profits, as politically connected firms lobby for greater allocation of emission credits. The volatility of the carbon market in Europe shows how dependent such markets are on political considerations. A simple carbon tax would be much more economically efficient, although likely to prove unattractive to voters in democracies.<sup>40</sup>

### **Conclusion**

The world faces severe economic consequences from currently proposed strategies to deal with global warming. These approaches will produce job losses and consume scarce resources that could be better spent on handling other global problems, such as AIDS or lack of access to clean drinking water.<sup>41</sup> The economic consequences of the global warming mitigation strategies currently proposed will probably be worse than the effects of global warming itself. Therefore, adaptation and resiliency strategies should be considered as a more cost-effective alternative. In addition, “no regrets” strategies that will provide benefits from greater economic growth—especially greater resilience against natural disasters—whether global warming proves to be a problem or not, should be adopted at once.<sup>42</sup>

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37. Reiter et al., “Global Warming and Malaria.”

38. M. Harvey Brenner, “Health Benefits of Low-Cost Energy: An Econometric Case Study,” *EM* magazine, November 2005.

39. Glenn R. Schleede, “Facing up to the True Costs and Benefits of Wind Energy,” paper presented at the 2004 Annual Meeting of the Associated Electric Cooperative, St. Louis, MO, June 24, 2004.

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40. Ross McKittrick, “What’s Wrong with Regulating Carbon Dioxide Emissions?” briefing at the U.S. Congress, October 11, 2001, <http://www.cei.org/gencon/014,02191.cfm>.

41. See the work of the Copenhagen Consensus Center at <http://www.copenhagenconsensus.com>.

42. See, for example, Jonathan Adler, with Clyde Crews, Paul Georgia, Ben Lieberman, Jessica Melugin, and Mara-Lee Seivert, *Greenhouse Policy without Regrets: A Free Market Approach to the Uncertain Risks of Climate Change* (Washington, DC: Competitive Enterprise Institute, 2000).

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### **Recommended Reading**

Marlo Lewis. 2006. *A Skeptic's Guide to An Inconvenient Truth*. Washington, DC: Competitive Enterprise Institute. <http://ff.org/centers/csspp/pdf/skepticguide.pdf>.

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