Introduction

> The whole aim of practical politics is to keep the populace alarmed (and hence clamorous to be led to safety) by menacing it with a series of hobgoblins.
>
> H. L. Mencken

Does a Saturday afternoon barbecue, driving to church on Sunday, or enjoying a heaping plate of risotto contribute to the destruction of civilization, the ecology, and human life? Many of our most distinguished leaders, illustrious periodicals, and eminent scientists profess so. Vice President Al Gore has divined that the threat of global warming, resulting from human production of greenhouse gases, is ''the most serious problem our civilization faces'' (Healy 1994). (I wonder where he ranks nuclear proliferation, rising ethnic tensions, and the escalating gap between the world's rich and poor.) President Bill Clinton has warned:

> We simply must halt global warming. It is a threat to our health, to our ecology and to our economy. The problem frankly affects every sector of the economy (Clinton 1993).

A media chorus, led by such prestigious organizations as the *New York Times*, the Public Broadcasting System, and *Scientific American*, has fanned the fear of climate change. Reputable scientists, including Bert Bolin (Stockholm University), Benjamin Santer (Lawrence Livermore National Laboratory), Robert Watson (Office of Science and Technology Policy, White House), and Stephen Schneider (Stanford University) have claimed that the climate is changing or will shift and that measures are urgently needed to head off potential disaster. If these prophets are accurate, we must move quickly to slash the emission of greenhouse gases. Before we leap, however, we should be clear that such policies, which may be unnecessary, would be inordinately expensive and would lead to worldwide recession, rising unemployment, civil disturbances, and increased tension

between nations as accusations of cheating and violations of international treaties inflamed passions.

If the United States heeds those advocates, the risks will be exorbitant. Potential policies to reduce emissions threaten the energy that propels our economy, our cars, and our factories while heating and cooling our homes and making life easier, safer, and more humane. Those prophets would have us burn less fuel, give up our autos, turn down our thermostats in winter, turn them up in summer, travel less, and spend vast amounts of money on new and unproved technologies to cut the use of fossil fuels.

Strangely enough, if you believe the prognosticators right now, we live in the ''best of all possible worlds,'' at least as far as climate goes. In the 1970s, many scientists worried about global cooling (Rasool and Schneider). The Department of Transportation organized a multiyear research effort involving hundreds of scientists and economists to evaluate its effects. The researchers found that a cooling of the world would reduce living standards. Since many of those same forecasters now predict doom from warming, we are obviously living on the edge between a world that is too hot and one that is too cold. Given that mankind, over the last million or so years, has evolved in climates that were both hotter and colder than today's, how is it that we in the 20th century are so fortunate as to have been born into the ideal global climate?

Many environmentalists have recommended that the United States and other nations adopt ''no-regrets'' policies that supposedly make sense in and of themselves, such as encouraging energy conservation, more fuel-efficient vehicles, and greater use of public transit (NRC 1991). They claim that energy-saving steps and greater efficiency would more than pay for themselves. Experience with similar initiatives, however, proves that they would be far from the free lunch suggested.

If a no-regrets policy were adopted and failed to make much of an impact on emission of greenhouse gases, as seems likely, environmental activists would push for stronger steps. How could they do otherwise if the effects of global climate change are as grim as they suggest? Consequently, a no-regrets program will be the first expensive and ineffectual step down the road to programs that will cripple one of the most vital foundations of modern civilization—our energy supplies.

Even if significant warming were to occur, public policymakers could, at the time it became evident, launch programs to adapt to the change, such as building dikes, increasing air conditioning, and aiding farmers and ecosystems to adjust to the new weather. To justify adopting policies now to abate the emission of greenhouse gases, proponents must show that, after programs to mitigate any damage are adopted, the resulting costs in lower living standards for Americans will be less than the costs of warming. What is often overlooked is the strong possibility that global warming would turn out to be beneficial. If climate change actually makes people better off, spending now to slow emissions would be wrong-headed.

Whether mankind should take steps to reduce the emission of greenhouse gases, such as carbon dioxide, methane, and nitrous oxides—under the Montreal Protocol, chlorofluorocarbons are already being phased out—depends on an uncertain future. What is the probability that such emissions will affect the global climate? How might the climate change and by how much? Given a menu of expected changes in typical weather, what are the probable effects on humans?

Climatologists do not agree on the effect of greenhouse gases on climate. For an effective doubling of CO_2, the United Nations' Intergovernmental Panel on Climate Change (IPCC) and many other experts predict a likely increase in average temperatures from 2.5° to 6.5° Fahrenheit, with the most likely boost being 4.5°. Other climatologists, such as Richard Lindzen (MIT), S. Fred Singer (Science and Environmental Policy Project), and Patrick Michaels (University of Virginia), predict negligible or only small warming. Nevertheless, most researchers do believe that, if man continues to seed the atmosphere with CO_2, climate change will occur, if it has not already started. Change is normally feared, thus many are apprehensive at the prospect. It is also true that people believe what it is in their interest to believe. If global climate change is viewed as a threat, environmental organizations can raise more support from the public; politicians can posture as protectors of mankind; newspapers can write more scary stories, thus increasing circulation; and scientists, even those most skeptical, can justify research grants to study the issue.

Economic forecasts of the influence of climate change on human activity also vary considerably. Some predict that people will benefit

from any such change while others view the possibility with great alarm. As noted, Vice President Gore imagines the direst of consequences. Many of those who calculate small effects in the long run assert that the rate of climate change is unprecedented, at least in recorded history, and may create havoc over the next century. Apocalyptic forecasts catch people's attention; predictions of good weather elicit no more than a yawn.

As an economist, I will not attempt to judge the argument over the effect of greenhouse gases on the climate. The contention that more of those gases will lead to warming seems plausible, but the magnitude of the change appears uncertain. Every few years the major forecasts of warming over the next century have been revised downward. This book assumes that warming may occur over the next hundred years and will focus, consequently, on evaluating the effects of possible changes in climate and the costs of various strategies to slow any shifts in weather patterns. Although some Cassandras have projected rising greenhouse gas emissions for the next two or three hundred years to depict the dire consequences of scorching temperatures, this book will ignore such very, very long run potential apocalypses. We have no idea what the world will be like in a hundred years, much less two or three hundred. There is no sensible way to plan for such periods.

Furthermore, history and research support the proposition that a warmer climate is beneficial. Past warm periods have seen dramatic improvements in civilization and human well-being. Fortunately, President Clinton is wrong: our modern industrial economy is less affected by weather than are societies heavily dependent on nature. Higher average temperatures can bring many benefits, including longer growing seasons, a healthier and longer-lived population, and reduced transportation and communication costs. Although not everyone will find a warmer climate in his or her interest, the evidence shows that most individuals, especially those living in higher latitudes, will experience a gain. Climate change will probably be small in tropical areas, so the population of equatorial regions will be largely unaffected.

International Actions

Notwithstanding the evidence that a warmer climate might be beneficial and the absence of strong indications that the climate is

changing, international pressures to stem greenhouse gas emissions are growing. At the Rio conference in 1992, most nations of the world signed the United Nations Framework Convention on Climate Change (FCCC), pledging themselves to voluntary steps to curb carbon emissions at 1990 levels by the year 2000. Although the Bush administration refused to commit to the goals and timetables of the convention, it signed the agreement and proposed a ''no-regrets'' policy. The Senate ratified the Convention in October of 1992.

Upon taking office in 1993, the Clinton administration quickly agreed to the aims of the Convention and, in the fall of 1993, issued a *Climate Change Action Plan* to meet the goals set forth at the Rio ''Earth Summit,'' which were to stabilize ''greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.'' The Clinton plan relied on an extensive list of voluntary actions by industry, public utilities, and major energy consumers. The administration also proposed new building codes to save on energy as well as the planting of trees to absorb CO_2 emissions. The EPA Administrator, Carol M. Browner, promised the imposition of mandatory measures if the voluntary steps failed.

The Convention divides the world into three categories: the advanced industrialized countries, who are members of the OECD; those countries which were formerly part of the Soviet Empire and are currently transitioning to a market economy; and the rest of the world, that is, the Third World. The agreement required that the OECD countries take the most stringent steps, reducing their emissions of CO_2 to 1990 levels, while those who are ''transitioning to a market economy'' were given more latitude. The Third World, which includes such giants and fast growing states as China, Indonesia, India, Brazil, and Mexico, need not make any commitments. The industralized West must also furnish technology and funds to developing countries to encourage them to reduce emissions.

The 1992 Climate Change Convention created the Conference of Parties (COP), consisting of all states that ratified the agreement, to monitor compliance and adopt amendments and protocols to further the objectives of the treaty. The Convention provided for an international secretariat, a new UN bureaucracy, to administer the COP. (Governments love new organizations, more faceless bureaucrats, and new opportunities to find work for their supporters.)

At COP's first meeting in the spring of 1995, the ''Berlin Mandate,'' which specifically excludes developing countries from any controls, laid out a path for negotiations toward a protocol on future greenhouse gas emissions restrictions. The agreement, signed in December of 1997, aims to cut emissions below 1990 levels, at least for the advanced industrialized countries.

Timothy Wirth, the undersecretary of state for global affairs, admitted in Berlin that the United States in the year 2000 might be 30 percent over the 1990 level. Notwithstanding his admission, Wirth in July 1996 asserted in Geneva the need for ''binding targets.'' During 1997, the diplomatic circuit was extraordinarily busy attempting to negotiate a protocol to be signed in Kyoto at the end of the year. Whether anything should have been signed and whether the agreement should be ratified by the U.S. Senate is the subject of this book.

Costs versus Costs

This book evaluates public policy options, especially those being supported by the IPCC and environmental organizations. In considering what steps, if any, should be taken, the costs of acting must be weighed against the costs of continuing as normal. If the calculus shows that governments should adopt policies to cut the emission of greenhouse gases, the stringency of such programs must be determined. Cost/benefit analysis constitutes the only rational approach.

Although many environmentalists oppose cost/benefit analysis, it is the one sensible method of approaching public policy issues. If the cost of acting exceeds the gain from doing so, no steps are warranted. On the other hand, if the benefits from initiating a program to reduce the possibility of warming are greater than the expenses, the policy should be adopted. Logically, no reasonable being can oppose cost/benefit analysis; but environmentalists assert that the benefits, typically stated in monetary terms, overlook many ecological effects. How can one measure the value of a trout stream, winter snow in the Rocky Mountains, or a particular species of snail in New England? Can government bureaucrats put a price on human health, ecological vibrancy and species diversity, or the survival of tropical reefs? Although valuing these nonmarket concerns is extraordinarily difficult, consideration of the issues is vital. Environmentalists couch their appeals in emotional or religious terms; the ''dismal science'' should redress the balance.

Moreover, if steps are taken to reduce the emission of greenhouse gases, whether justified or not, they should be taken worldwide. A pound of CO_2 produced by backyard barbecues in Iowa has the same effect as a pound of CO_2 emitted from cooking stoves in India. The greenhouse gas problem is an example par excellence of a global commons issue. If China exploits its mammoth coal reserves to provide needed electricity for its billion people over the next century, the actions of the United States can have only a small effect on any future warming.

Even if society believes that warming will, on net, be harmful, restraining the emission of greenhouse gases by any one country or small group of countries makes sense only if most other nations follow suit. Should the United States impose taxes to reduce the use of fossil fuels, the benefit of doing so would be greater, the larger the number of other major nations joining in the restrictions. Free rider problems—that is, the temptation to leave the burden to others—may make international agreement to abate emissions difficult if not impossible.

Unfortunately, the expectation that climate change would have a differential effect on various nations exacerbates the free rider problem. The Russians, for example, have indicated that they would probably do well in a warmer world. On the other hand, island nations and countries with extensive low-lying land, such as Bangladesh, fear that global warming would be devastating. Certain poor nations, such as China, for example, consider economic development more important than warding off possible climate change.

At the Rio meeting in 1992, most industrialized countries agreed that steps to mitigate warming by slowing the emission of greenhouse gases were warranted. Serious disputes remain, however, over the measures necessary to cut emissions and the extent to which they should be cut. The most efficient method of meeting the Kyoto limits on emissions would require taxes on emissions of carbon; but problems would arise immediately. Since each country would have to impose its own levy, presumably in its own currency, the issue of comparability would be compounded by the need to determine appropriate exchange rates and to adjust for future market fluctuations in such rates. Moreover, nations with high existing tariffs on energy would demand that such levies be taken into account in setting the new charges.

Marketable quotas of carbon emissions could also be an efficient and low-cost method of reducing greenhouse gases and would, in principle, make meeting a particular emissions standard achievable. Jockeying over the initial allocation of those quotas, however, might undermine any accord. No single basis would command universal assent. Some nations would advocate reductions on a per-person basis; others, on existing emissions; and still others would claim credit for existing policies that restrict fossil fuel use.

As the reader will note, the subject of global climate change is far from simple. Not only must policymakers decide whether steps should be taken now to cut CO_2 emissions; but, should the political powers deem that necessary, they must reach an accord on the mechanisms and policies required. Agreement will be neither straightforward nor easy to implement.

Such policies would be extraordinarily expensive and would be likely to cause large-scale dislocations, unemployment, and economic stagnation. Fortunately, adopting such a program is unnecessary. For most people in the United States, Western Europe, Russia, and Japan, any climate change would probably be beneficial. A few poor countries that might suffer from rising sea levels or be unable to adjust their agriculture might suffer. If emissions controls are intended to protect those countries, it might be better to forgo the controls and target aid to promoting their economic development. However calculated, the cost of slowing warming exceeds by a substantial margin the benefits projected by even the most environmentally minded economists. Consequently the best strategy is to maintain the status quo, continue research on climate, and help poor countries improve their economies.