

**GLOBAL WARMING AND
THE DEMISE OF RATIONAL ENVIRONMENTALISM
*AN OPEN LETTER FROM
SIXTEEN CONNECTICUT ENVIRONMENTAL REALISTS***

INTRODUCTION

The 16 signatories of this letter have long been active in the fields of science and engineering, and most of us have special expertise in meteorology, climatology, air pollution control, air quality measurement, and allied topics. The names of these Concerned Scientists and Engineers and brief statements of their credentials are at the end of this letter.*

Based on our knowledge of each other's backgrounds, and in some cases our working relationships on environmental problems, we have joined forces to voice our concern about the direction our elected officials and government bureaucrats are taking to control "global warming" (GW). The actions to develop and enforce restrictions on the release of carbon dioxide (CO₂), the dreaded "greenhouse gas" believed by some to be the principal cause of GW, are based on political motivation, media frenzy, and hysteria — as well as shoddy science. Therefore they should be opposed.

A Bit of History on Environmentalism

For more than half a century the citizens of this country have been concerned about the environment, primarily air and water pollution. Over this period EPA and predecessor agencies developed and implemented programs for developing pollutant emission and air quality standards, followed by mandated application of emission control systems on various classes of sources. This application of effective, unbiased science, engineering, and enlightened legislation has greatly reduced such pollution and its harmful effects on people and the natural environment. In spite of the significant costs of implementing pollution control programs, the public seems to be pleased with the results. The improvement in air quality and the reduction of its undesirable effects on air pollution have been dramatic. Several of our signatories were heavily involved in

* Our group is entirely made up of volunteers. We neither receive nor solicit aid (financial or otherwise) from any commercial enterprise or from any government agency.

environmental science and engineering for all or most of this important half century.

Over the past 10 or more years, however, many citizens have — through insistent media focus — been sensitized to a newly perceived or imagined environmental problem: “global warming” (GW). Spurred by claims of impending disaster from politicians, from uninformed celebrities, and from a biased media, we are led to believe that the release of carbon dioxide (CO₂) from the combustion of carbon-containing fuels (coal, oil, natural gas) for the benefit of humanity is the primary cause of GW. We are being told by those in government and the mass media that a hypothetical near-future warming of the climate will cause massive floods due to melting ice in Greenland, in Antarctica, and in high mountain glaciers; and that drastic, coerced reduction in the use of carbon-based energy is the only way to avert this impending disaster. Even our formerly well-respected EPA has succumbed to the myth of anthropogenic GW and plans to set enforceable limits — through costly and wasteful schemes such as “cap and trade” — on emissions of CO₂ from fuel burning sources. All of this is based on a supposed finding of “endangerment” from this benign gas.

CLIMATE CHANGE AND THE ASSUMED ROLE OF CO₂

The Nature of Global Warming (and Cooling)

Cycles of global warming and cooling have been occurring naturally over the eons since the earth cooled sufficiently to support life. These cycles extend over long periods, spanning hundreds or thousands of years. Historical evidence shows that the world climate from about AD 950 through 1320 was warmer than it is today. Early in this Medieval Warm Period the Vikings colonized a territory they named Greenland, where they farmed and raised sheep and goats. During the 14th century, the climate grew sharply colder, forcing the Vikings to abandon Greenland. The Ancient Romans cultivated vineyards in England yet, in contrast, during the 17th and 18th centuries the River Thames regularly froze over in London. These periods of warming and subsequent cooling were due to natural, not man-made causes.

Data have been compiled on global temperatures and concurrent CO₂ concentrations in the atmosphere. Data for periods prior to the development of reliable thermometers (about 1600) are based on proxies such as the analysis of tree ring data and ice cores.

Generally (and without considering complications), in the study of ice cores, a cylindrical layer is analyzed: the distance to the layer is a proxy for the time that layer was formed, isotopes of certain gases in the layer are a proxy for temperature, and the air bubbles in the layer are a proxy for CO₂ concentrations. It is of interest to note that these data indicate strongly that peak values in CO₂ concentrations follow peak temperature values, not the other way around as the “Global Warming Alarmists” (GWA) hope for. What this relationship seems to indicate is that increasing temperatures from natural causes raise ocean temperatures, thus reducing the solubility of this gas in water. This phenomenon, together with the small fraction of total atmospheric CO₂ represented by human activities, indicates that human production of this “greenhouse gas” has little or no effect on global warming. Thus the expensive and disruptive conversion to “green energy” will be pointless.

Al Gore’s film ‘An Inconvenient Truth’ shows the effects of a hypothetical 20-foot (6 meters) rise in sea level. According to data from the United Nation’s Intergovernmental Program for Climate Change (IPCC), sea levels are currently rising — on average — by about 2 millimeters per year so that it would take almost 3,000 years for Al Gore’s flood to inundate those of us living near the ocean’s shorelines (if sea levels uniformly rose at the same rate). But since the climate has sharply cooled naturally at least twice over the past 2,000 years, it would be reasonable to expect another natural cooling trend within the next 3,000 years, reducing any sea level rise during this period.

It is clear from the historical evidence cited that drawing conclusions about the inevitability of global warming based on short-term observations is extremely misleading. Observations about phenomena such as the melting of some glaciers, or arguing about which year had the warmest day on record and ascribing them to carbon dioxide emissions, is sheer folly. In fact, the global average temperature has either shown no trend of increase or has been decreasing since 1998, despite continued CO₂ emissions; yet this has seldom been reported by the mass media, the government, or the IPCC.

The Principal Causes of Climate Change

Historical analysis over hundreds of years has shown that air temperatures do not correlate with CO₂ concentrations; instead, there are strong correlations with sunspot

activity (more frequent sunspots tend to indicate a warmer climate, less frequent sunspots a cooler climate), volcanic activity (which causes cooling), and cycles in the Pacific Ocean currents (El Nino/La Nina). There is no evidence that any of these events could have been caused or affected by mankind's activities.

The Perceived Issue with CO₂

First of all let us make clear that CO₂ is not an air pollutant, as contrasted with those health-threatening and damaging air pollutants we spent the past half century controlling. Furthermore all vegetation requires CO₂ for its growth.

The current justification for controlling emissions of CO₂ is its ability to absorb infrared radiation escaping from the earth thereby trapping heat and presumably contributing to global warming. But CO₂ absorbs infrared radiation in only two very narrow bands of wavelength, while water vapor absorbs infrared over the entire spectrum and has concentrations 10 to 100 times higher than carbon dioxide in the air (depending on humidity). Thus, CO₂, including that from natural causes such as the oceans' release of the gas, represents a tiny fraction of the heat-trapping effects of the atmosphere. In addition, infrared light in those narrow bands is almost totally absorbed by carbon dioxide at current levels. The additional heat-trapping effect of any CO₂ increase (such as that from human activities) is sharply reduced as the concentration increases. Furthermore, that portion of atmospheric CO₂ contributed by human activities is only a few percent of the total atmospheric CO₂ present. Therefore, believing that even a major reduction in this tiny fraction of CO₂ in the atmosphere will have a measurable effect on global temperatures makes no sense.

The Benefits of CO₂

Before condemning CO₂ as an air pollutant, as EPA is currently attempting, let us consider the following: CO₂, a gas normally harmless to humans, is vital for plant growth and thus necessary for life on earth. Plants need CO₂ to make food and, in the process, give off oxygen. In addition, hundreds of experiments have shown that plants grown in an atmosphere with artificially higher CO₂ concentrations grow faster, give higher crop yields, and are more resistant to drought than plants grown in ordinary air. Higher CO₂

concentrations in the future could therefore result in a greener, more fertile, earth. This is certainly encouraging; but even more important is that enhanced production of food can respond to the needs of an expanding population. If the climate were to turn colder due to other natural causes, faster plant growth could become indispensable during shorter growing seasons.

The Bias in Blaming CO₂ for Global Warming

Much of the impetus for identifying CO₂ as the culprit in the GW issue is the United Nations' IPCC. The UN's mandate to this group was to determine what portion of GW is attributed to the human-caused generation of CO₂. There is a hidden bias in this mandate since the IPCC focused on possible human causes, such as the burning of carbon containing fuels, and placed little emphasis on defining and quantifying the much larger natural causes of global warming and cooling. It gives the impression that the UN was convinced that mankind's activities are the primary cause of global warming and the IPCC was assigned the task of proving it. This is not science.

Inaccuracy of Computer Climate Models

The models used by the IPCC introduce bias to both enhance the effects of CO₂ and downgrade the effects of water vapor — which absorbs much more infrared over a wider spectrum and is present in much higher concentrations in the air than CO₂. The models also assume that increased evaporation from oceans would amplify the warming trend; but investigations have shown that increased cloud cover would have a net cooling effect. The relationships — between water vapor, cloud cover, and solar activity and their influence on air temperatures — are extremely complex. Models that ignore these complexities cannot accurately predict future climate.

When actual weather conditions are compared with the predictions of short-term forecasting models used by the National Weather Service, the model predictions will differ from eventual reality after about 5 to 10 days. Seasonal climate models show little capability for predicting conditions for the following season. If our best computer weather models, written by our best meteorologists, cannot accurately predict the weather 10 days into the future, how can anyone expect computer models — which have failed to

predict major climate changes — to accurately predict the weather and climate 100 years into the future? Even the IPCC admits that long-range prediction is not possible (p. 774 of the Third Assessment Report).

Bias in Temperature Data

Global climate is extremely complex, and it is naïve to believe that a simplistic theory will sufficiently explain our climate. For example, it is far too easy to say that CO₂ traps heat, *ergo*, more CO₂ means more heat so we have global warming. But the complexity of the atmosphere does not lead to a simple, one-parameter solution for predictions.

The historic data on temperatures have been “tweaked” and “cherry-picked” to make it appear that temperatures have risen with increases in human activity, especially fuel burning. Temperature trends that show cooling or no change tend to be ignored. For example, the “Medieval Warm Period“ (*ca.*, A.D. 950 to 1320) and the more recent satellite data showing cooling have been ignored in many of IPCC’s analyses.

Another example of data bias occurred after 1990 when data from areas with some of the coldest temperatures were dropped from the global averages. This tended to increase the averages recorded from the remaining stations, artificially increasing the mean global surface temperature.

Finally, many weather-measuring sites placed in rural areas many years ago are now in the midst of urban and industrial areas affected by heat radiating surfaces such as asphalt, brick, and concrete. Current photographs of such sites also show temperature monitoring stations directly in the path of exhausts from air conditioners and building ventilation systems, or on the south sides of buildings, which reflect solar radiation onto the monitors, especially in the winter. These location issues contribute to false warmer temperature readings.

Complexity of and Exorbitant Costs for Controlling CO₂ Emissions

Aside from the draconian order to convert completely from carbon-based energy production, various government and private organizations are discussing other options for curbing CO₂ emissions. The Federal government is pursuing a Carbon Tax and Cap-and-

Trade legislation. Other groups are considering ways to remove and/or “sequester” (bury) CO₂ emissions underground. But the Chemical Engineers in our group have serious doubts whether such schemes are feasible and cost effective.

The exhaust gases from a typical combustion process, for example an efficient coal fired power plant, normally contain no more than about 10 or 12 percent by volume of CO₂. Most of the remainder of this gas mixture is nitrogen, unconsumed oxygen and some water vapor. Even now, the exhaust gases from such power plants must comply with EPA and State environmental agencies that require such exhausts be cleaned of the particulate matter (fly ash), sulfur dioxide, and nitrogen oxide emissions. But removing CO₂ from the exhaust stream is an entirely different matter. CO₂ is not particularly reactive, although it will react with sodium hydroxide to produce sodium carbonate and bicarbonate, but these compounds are soluble and capable of contaminating ground and surface water. Thus such chemical means of removal do not appear promising. If the CO₂ cannot be removed from the exhaust gases economically, the only possible alternative is to pump the total effluent from the power plant underground at high pressure. This will require finding earthquake-free areas, where large leak-proof underground caverns are available, or burying the extremely large volumes of exhaust gas. But, over time such caverns are susceptible to cracks and other leaks, allowing CO₂ to escape to the atmosphere or contaminate ground water; otherwise, extremely large leak-proof tanks must be buried to receive these exhaust gases. In the long run this does not seem to be a technically and economically feasible scheme, given that the large volumes of gases to be treated will continue to increase for the life of the power plant. Furthermore, sites with favorable geology for underground sequestration of CO₂ containing exhaust gases may be many miles away from plants located near areas needing power so the costs of pumping exhaust gases to these favorable sites may be out of the question. We wonder if anyone has made an honest calculation to determine the volume of underground gas storage that will be needed for sequestering the exhaust gases from a typical coal-fired power plant at present and far into the future. We ask further if it is even worthwhile to consider any means of controlling CO₂ emissions, once they have been produced in a combustion reaction.

International Effects of Controlling CO₂ Emissions

Currently, China and India have about 40% of the world's population. To date, these countries cannot be persuaded to limit their use of fossil fuels because they (correctly) believe that cheaply produced electric power will help lift their huge populations out of poverty. China now emits more CO₂ than the United States, and is rapidly building many inefficient, coal-fired power plants that release more CO₂ per kilowatt-hour than American power plants. A tax on American CO₂ emissions without a comparable tax in China and India would make electric power cheaper in those countries. Such a cost discrepancy would encourage American businesses to relocate, causing further losses of millions of American jobs.

AN INTELLIGENT ENERGY POLICY

It has been estimated that cap-and-trade legislation on CO₂ emissions, which is essentially an energy tax, would raise the average family's electric bill within the range of \$1,600 to \$3,100 per year. This will be a devastating blow for low-income families. Retail stores would also pay higher electricity bills for lighting and refrigeration, necessitating a price increase in basic goods such as food and clothing. Similarly, many other industries require the burning of fossil fuels to provide heat for processes to produce their products. Any tax on CO₂ emissions would be passed along to the consumer indirectly in the form of higher prices for their products. The cumulative consequence of an energy tax could end up costing the average family more than \$3,000 per year.

In spite of all of the conflicting demands to change energy policy, we still need to increase use of domestic sources of fuel to meet the increasing demands for power. Many of those in the "Green Movement" insist that we immediately wean ourselves away from all carbon containing fuels; initially to reduce global warming from that small fraction of CO₂ produced by human activities. But buried in this demand is the hoped-for benefit of reducing dependency on foreign oil. This is an extremely naïve view. The principal non-carbon methods for generating power desired by those in the Green Movement are windmills and solar cells. Hydroelectric power from dams as well as nuclear power —

neither of which produce CO₂ emissions — are rejected by them because of possible environmental and safety issues. Yet they do not seem to realize that in all utility systems there is a base load that needs to be met 24 hours a day, every day of the year; with the consequence that, because of the lack of reliability of wind and solar, you can not depend on them for this base load.

Generation of power by large, central power plants burning carbonaceous fuels and utilizing nuclear power has developed over the years as an extremely efficient means of producing and distributing power to the areas requiring it. Such fuels can be transported to central power plants located in areas where the power is needed. Our power distribution networks are based on this scenario, and have worked quite well over the years.

Power generated by the sun, wind, geothermal sources and flowing water is limited to those areas where such sources and accompanying favorable conditions exist. Power from these sources is usually located great distances from the urban and industrial areas where the power is needed. Furthermore (to stress what has been mentioned above), most of these methods of generating power tend to be intermittent and often inefficient based on a number of environmental factors: The sun has to shine and the wind must blow. In the case of centralized generation of power by windmills and solar cells require vast areas of real estate. Gathering energy from such facilities and distributing it to concentrated urban and industrial locations where there is a pressing need for the energy will be extremely costly.

Reducing the demand for foreign oil will require further exploitation of known domestic sources and exploration for additional sources. There are vast deposits of shale oil buried under the southern Rockies and northern Midwest that can be extracted without major environmental damage for less than the price of foreign oil. We should also consider continuing to drill for oil off our shores (as Cubans are currently doing in the Florida Straits) if precautions are adequately taken, and there is a high benefit-to-cost ratio for doing so. Thousands of existing oil rigs in the Gulf of Mexico resisted four major hurricanes in 2005 without any oil spills. Such spills are more frequent from tankers importing foreign oil than spills from American offshore drilling rigs, subject to EPA regulations.

We have coal deposits that are adequate for many years into the future at our present rate of consumption, and oil and gasoline can be produced from coal. This well-developed process was used by the Germans at the end of World War II when they no longer had access to the Romanian oil fields. At present, a limited “Clean Coal” activity in the United States is carrying on work in this area. Let us hope that such development will accelerate in the future. All efforts to extract energy from domestic American sources will create jobs for thousands of American workers in American companies and will reduce the amount of American money sent to oil-producing countries not friendly to the United States.

SUMMARY OF OUR CONCLUSIONS

Despite the hype and spin by the mass media and the IPCC, it cannot be demonstrated, from scientific data and historical records, that human emissions of CO₂ have a significant or even a measurable effect on world climate. Instead, facts show that climate has been overwhelmingly influenced by natural cycles of warming and cooling over which we have no control.

Any attempt by Congress to tax American CO₂ emissions will significantly increase the cost of electricity and basic necessities, which would penalize low-income families the worst. Countries not limiting their CO₂ would enjoy a competitive advantage and provide American corporations with a cost-saving incentive to move their operations away from our country, causing job losses here. If cap-and-trade legislation is passed, the United States and its citizens will waste many trillions of dollars and lose millions of jobs for a tiny non-existent “benefit.”

We hope that Congress will not be foolish enough to enact regulations to require these monstrous, ineffective, and wasteful programs. The tragic irony is that, once implemented, these costly measures will have little or no measurable effect on global temperatures. This tremendous outlay of money would be much better spent helping humans to adapt to whatever climate (warmer or colder) Nature will dictate. In addition, there is much we can do to further exploit domestic sources of energy producing materials utilizing methods that minimize impact on the environment.

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A big environmental problem is global warming. In this article, the causes, effects and solutions to the problem are presented. Global warming is a serious problem for humanity as well as to the whole environmental system. There were always periods of global warming in the history of the earth, however, since the mid of the 20th century, changes in global temperature have increased much faster than in previous periods. In the following, the causes and effects of global warming are displayed. Moreover, solutions to the global warming problem are given at the end. Audio Lesson. Preface Global warming has been portrayed recently as the greatest crisis in the history of civilization. As of this writing, stories on it occupy the front pages of Time and Newsweek and are featured prominently in countless media around the world. In the face of this level of unmitigated despair, it is perhaps surprising—and will by many be seen as inappropriate—to write a book that is basically optimistic about humanity’s prospects. But we have to act on the best available data from both the natural and the social sciences. The title of this book has two meanings: the first and obvious one is that we have to set our minds and resources toward the most effective way to tackle long-term global warming. But the second refers to the current nature of the debate. Global Warming is already affecting the human kind, plant and animals in a number of ways through increased ocean levels, droughts and changed weather patterns. It is well recognized by scientists around the world as serious public health and environmental concern. Here are 24 effects of global warming on the environment. More from global warming: Various global warming facts. With the demise of coral reefs and the ecosystems therein, less fresh water will flow into lakes and tributaries. 24. Disappearing Countries. Countries like Greenland are deteriorating at a highly elevated rate.