



# THE TRUTH ABOUT GREENHOUSE GASES

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# The Truth About Greenhouse Gases

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## **The Truth About Greenhouse Gases<sup>1</sup>**

“The object of the Author in the following pages has been to collect the most remarkable instances of those moral epidemics which have been excited, sometimes by one cause and sometimes by another, and to show how easily the masses have been led astray, and how imitative and gregarious men are, even in their infatuations and crimes,” wrote Charles Mackay in the preface to the first edition of his *Extraordinary Popular Delusions and the Madness of Crowds*. I want to discuss a contemporary moral epidemic: the notion that increasing atmospheric concentrations of greenhouse gases, notably carbon dioxide, will have disastrous consequences for mankind and for the planet. This contemporary “climate crusade” has much in common with the medieval crusades Mackay describes, with true believers, opportunists, cynics, money-hungry governments, manipulators of various types, and even children’s crusades.

### **Carbon dioxide**

I am a strong supporter of a clean environment. We need to be vigilant to keep our land, air and waters free of real pollution, particulates, heavy metals, pathogens, but carbon dioxide (CO<sub>2</sub>) is not one of these pollutants. Carbon is the stuff of life. Our bodies are made of carbon. Every day a normal human exhales around 1 kg of CO<sub>2</sub> – the simplest chemically stable molecule of carbon in the earth’s atmosphere. Before the industrial period, the concentration of CO<sub>2</sub> in the atmosphere was about 270 parts per million (ppm). At the present time, the concentration is about 390 ppm, 0.039% of all atmospheric molecules and less than 1% of that in our breath. About fifty million years ago, a brief moment in the long history of life on earth, geological evidence indicates, CO<sub>2</sub> levels were several thousand ppm, much higher than now. And life flourished abundantly.

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<sup>1</sup> “The Truth About Greenhouse Gases” appeared in the June/July issue of *First Things* ([www.firstthings.com](http://www.firstthings.com)) and a slightly revised version is published here with permission.

Now the Environmental Protection Agency wants to regulate atmospheric CO<sub>2</sub> as a “pollutant.” According to my Webster's New Collegiate Dictionary, to pollute is “to make or render unclean, to defile, to desecrate, to profane.” By breathing are we rendering the air unclean, defiling or desecrating it? Efforts are underway to remedy the old-fashioned, restrictive definition of pollution. The current Wikipedia entry on air pollution, for example, now asserts that pollution includes: “carbon dioxide (CO<sub>2</sub>)—a colorless, odorless, non-toxic greenhouse gas associated with ocean acidification, emitted from sources such as combustion, cement production, and respiration.”

Wallis Simpson, the woman for whom King Edward VIII renounced the British throne, supposedly said “A woman can't be too rich or too thin.” But in reality, you can get too much or too little of a good thing. Whether we should be glad or worried about increasing levels of CO<sub>2</sub> depends on quantitative numbers, not just qualitative considerations.

As far as green plants are concerned, CO<sub>2</sub> is not a pollutant, but part of their daily bread—like water, sunlight, nitrogen, and other essential elements. Most green plants evolved at CO<sub>2</sub> levels of several thousand ppm, many times higher than now. Plants grow better and have better flowers and fruit at higher CO<sub>2</sub> levels. Commercial greenhouse operators recognize this when they artificially increase the CO<sub>2</sub> concentrations inside their greenhouses to over 1000 ppm.

How close is the current atmosphere to the upper or lower limit for CO<sub>2</sub>—or to some optimum intermediate level? Did we have just the right concentration of CO<sub>2</sub> at the preindustrial level of 270 ppm? Reading breathless media reports about CO<sub>2</sub> “pollution” and about minimizing our “carbon footprints,” one might think that the earth cannot have too little CO<sub>2</sub>, a bit like Wallis Simpson's view on thinness. This view was overstated, as we have seen from the sad effects anorexia in so many young women. Various geo-engineering schemes are being discussed for scrubbing CO<sub>2</sub> from the air. Why not scrub it all out? Humans would be perfectly healthy in a world with no atmospheric CO<sub>2</sub> -- except that we would have nothing to eat and a few other minor inconveniences -- most plants stop growing if CO<sub>2</sub> levels drop much below 150 ppm. If we

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want to continue to be fed and clothed by the products of green plants we can have too little CO<sub>2</sub>. The preindustrial value of 270 ppm CO<sub>2</sub> may well have been below the optimum level, we are probably better off with our current 390 ppm, and we would be better off with still more CO<sub>2</sub>. For example, there is evidence that California orange groves are about 30 percent more productive today than they were 150 years ago because of the increase of atmospheric CO<sub>2</sub>.

Although humans and many other animals would do just fine with no CO<sub>2</sub> at all in the air, there is an upper limit that we can tolerate. Inhaling air with a CO<sub>2</sub> concentration of a few per cent, similar to the concentration of the air we exhale, hinders the diffusional exchange of CO<sub>2</sub> between the blood and gas in the lung. Both the United States Navy (for submariners) and NASA (for astronauts) have performed extensive studies of human tolerance to CO<sub>2</sub>. As a result of these studies, the Navy recommends an upper limit of about 8000 ppm for cruises of ninety days, and NASA recommends an upper limit of 5000 ppm for missions of one thousand days, both assuming a total pressure of one atmosphere. Higher levels are acceptable for missions of only a few days.

We conclude that atmospheric CO<sub>2</sub> levels should be above about 150 ppm to avoid harming green plants and below about 5000 ppm to avoid harming people. That is a big range, and our atmosphere is much closer to the lower end than the upper end. We were not that far from CO<sub>2</sub> anorexia when massive burning of fossil fuels began. At the current rate of burning fossil fuels, we are adding about 2 ppm of CO<sub>2</sub> per year to the atmosphere, so getting from our current level to 1000 ppm would take about 300 years—and 1000 ppm is still less than what most plants would prefer, and much less than either the NASA or the Navy limit.

Yet there are strident calls for immediately stopping further increases in CO<sub>2</sub> levels and reducing the current level (with 1990 levels the arbitrary benchmark). As we have discussed, animals would not even notice a doubling of CO<sub>2</sub> and plants would love it. The supposed reason for limiting CO<sub>2</sub> is to stop global warming—or since the predicted warming has failed to be nearly as large as computer models forecast—to stop climate change. Climate change itself has been embarrassingly

uneventful, so another rationale for reducing CO<sub>2</sub> is now promoted: to stop the hypothetical increase of extreme climate events like hurricanes or tornados. But dispassionate data show that the frequency of extreme events has hardly changed and in some cases has decreased in the 150 years that it has taken CO<sub>2</sub> levels to increase from 270 ppm to 390 ppm.

### **The effects of CO<sub>2</sub>**

Let me turn to some of the problems the non-pollutant CO<sub>2</sub> is supposed to cause. CO<sub>2</sub> does indeed cause some warming of our planet, and we should thank Providence for that, because without the greenhouse warming of CO<sub>2</sub> and its more potent partners, water vapor and clouds, the earth would be too cold to sustain its current abundance of life. Other things being equal, more CO<sub>2</sub> will cause more warming. The question is how much warming, and whether the increased CO<sub>2</sub> and the warming it causes will be good or bad for the planet. More CO<sub>2</sub> is supposed to cause cities to flood, parched agriculture, tropical diseases in Alaska, etc., and even an epidemic of kidney stones.

The argument starts something like this. CO<sub>2</sub> levels have increased from about 270 ppm to 390 ppm over the past 150 years or so, and the earth has warmed by about 0.8 C during that time. Therefore the warming is due to CO<sub>2</sub>. But correlation is not causation. The local rooster crows every morning at sunrise, but that does not mean the rooster caused the sun to rise. The sun will still rise on Monday if you decide to have the rooster for Sunday dinner.

There have been many warmings and coolings in the past when the CO<sub>2</sub> levels did not change. A well known example is the medieval warming, about the year 1000, when the Vikings settled Greenland (when it was greener) and wine was exported from England. This warm period was followed by the "Little Ice Age" when the Thames would frequently freeze over during the winter. There is no evidence for significant increase of CO<sub>2</sub> at the Medieval Warm Period, nor for a significant decrease at the time of the subsequent Little Ice Age. Documented famines with millions of deaths occurred during the Little Ice Age because of crop failures due

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to cold weather. The earth has been warming in fits and starts since the end of the Little Ice Age, a few centuries ago, and humanity's quality of life has improved accordingly.

A rare case of good correlation between CO<sub>2</sub> levels and temperature is provided by ice-core records of the cycles of glacial and interglacial periods of the last million years or so. But these records show that changes in temperature preceded changes in CO<sub>2</sub> levels, so that CO<sub>2</sub> levels were an effect of temperature changes. Much of this was probably due to outgassing of CO<sub>2</sub> from the warming oceans or the reverse on cooling. The most recent continental ice sheets began to melt some twenty thousand years ago. During the "Younger Dryas" some 12,000 years ago, the earth very dramatically cooled and warmed -- as much 10 C in fifty years -- with no apparent change in CO<sub>2</sub> levels, and with life -- including our human ancestors -- surviving the rapid change in temperature just fine.

The earth's climate has always been changing. Our present global warming is not at all unusual by the standards of geological history, and the mild warming is probably benefiting the biosphere. Indeed, there is very little correlation between the estimates of CO<sub>2</sub> levels in the atmosphere and the estimates of the earth's temperature over the past 550 million years (the "phanerozoic" period). The message is clear that several factors must influence the earth's temperature, and that while CO<sub>2</sub> is one of these factors, it is seldom the dominant one. Other factors that influence the earth's temperature are spontaneous variations of the complicated fluid flow patterns in the oceans and atmosphere of the earth (perhaps influenced by continental drift), volcanoes, variations of the earth's orbital parameters (ellipticity, spin-axis orientation, etc.), asteroid and comet impacts, variations in the sun's output (not only the visible radiation but the amount of ultraviolet light, and the solar wind with its magnetic field), variations in cosmic rays leading to variations in cloud cover, and other causes.

## The Hockey Stick

The existence of the Little Ice Age and the Medieval Warm Period was an embarrassment to the global-warming establishment because it showed that the current warming is almost indistinguishable from previous warmings and coolings that had nothing to do with burning of fossil fuels. The organization charged with producing scientific support for the climate crusade, the Intergovernmental Panel on Climate Change (IPCC), finally found a solution. They rewrote the climate history of the past 1000 years with the celebrated “hockey stick” temperature record. The first IPCC report, issued in 1990, showed both the Medieval Warm Period and the Little Ice Age very clearly. In the IPCC’s 2001 report was a graph that purported to show the earth’s mean temperature since the year 1000. A yet more extreme version of the hockey stick graph made the cover of the 50th Anniversary Report of the United Nation’s World Meteorological Organization. To the surprise of everyone who knew about the strong evidence for the Little Ice Age and the Medieval Warm Period, the graph showed a nearly constant temperature from the year 1000 until about 150 years ago, when the temperature began to rise abruptly like the blade of a hockey stick. The inference was that this was due to the anthropogenic “pollutant” CO<sub>2</sub>.

This *damnatio memoriae* of inconvenient truths was simply expunged from the 2001 IPCC report, much as Trotsky and Yezhov were removed from Stalin’s photographs by accommodating dark-room specialists in the later years of the dictator’s reign. There was no explanation for why both the Medieval Warm Period and the Little Ice Age, very clearly shown in the 1990 report, had simply disappeared eleven years later.

The IPCC and its worshipful supporters did their best to promote the hockey-stick temperature curve. But as John Adams remarked, “Facts are stubborn things, and whatever may be our wishes, our inclinations, or the dictates of our passion, they cannot alter the state of facts and evidence.” The hockey stick curve caught the attention of two Canadians, Steve McIntyre, a retired mining consultant, and an academic statistician, Ross McKittrick. As they began to look more carefully at the original data—much of it from tree rings—and at the

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analysis that led to the hockey stick, they became more and more puzzled. By hard, remarkably detailed, and persistent work over many years, consistently frustrated in their efforts to obtain original data and data-analysis methods, they showed that the hockey stick was not supported by observational data. An excellent, recent history of this episode is Andrew Montford's *The Hockey Stick Illusion*.

About the time of the Copenhagen Climate Conference in the fall of 2009, another nasty thing happened to the global-warming establishment. A Russian server released large numbers of e-mails and other files from computers of the Climatic Research Unit (CRU) of the University of East Anglia. Among the files released were e-mails between members of the power structure of the climate crusade, "the team." These files were, or should have been, very embarrassing to their senders and recipients. A senior scientist from CRU wrote, for example: "PS, I'm getting hassled by a couple of people to release the CRU station temperature data. Don't any of you three tell anybody that the UK has a Freedom Of Information Act." One of the most consistent themes of the e-mails is the need to hide raw data from anyone outside the team. Why the obsession on withholding data? Because the hockey stick lost credibility when it was possible to see the raw, unmanipulated data on which it was based.

### **Peer review**

A traditional way to maintain integrity in science is through peer review, the anonymous examination of a scientific paper by qualified, competing scientists before publication. In a responsible peer review, the authors may be required to make substantial revisions to correct any flaws in the science or methodology before their paper is published. But peer review has completely failed in climate science. Global warming alarmists have something like Gadaffi's initial air superiority over rag-tag opponents in Libya. Consider this comment from one of the most respected IPCC leaders, as revealed in the CRU e-mails: "I can't see either of these papers being in the next IPCC report. Kevin [Trenberth] and I will keep them out somehow—even if we have to redefine what

the peer-review literature is." And consider the CRU e-mail comment on a journal that committed the mortal sin of publishing one of the heretical papers: "I think we have to stop considering *Climate Research* as a legitimate peer-reviewed journal. Perhaps we should encourage our colleagues in the climate research community to no longer submit to, or cite papers in, this journal."

Peer review in climate science means that the "team" recommends publication of each other's work, and tries to keep any off-message paper from being accepted for publication. Why this obsession with cleansing the "scientific" literature of any opposing views? Because it allows climate extremists to claim that they represent all of science and anyone who questions their message is at war with all of science, except for a few "flat-earthers", "deniers," or others scorned with carefully researched epithets, designed to discredit dissenting scientific opinion. All of this reminds me of the opposition in medieval Western Europe to the translation of the Bible into the vernacular. The Scriptures were useless for the large numbers of people who could read their own language, but who had not been privileged to learn to read Latin, Greek or Hebrew. The Climategate e-mails show the same fierce determination of "the team" to deny the general scientific public the chance to form their own conclusions about raw data --the old and the new testaments of science.

In the last half of the 18th century, "the Age of Enlightenment," the founding fathers of the United States studied all political systems known to them, from the classical Greek city states to the Dutch republic. They hoped to select the best form of government for their new nation. One of them, James Madison, reminds his fellow citizens in *The Federalist Papers*: (*The Federalist* 10) "No man is allowed to be a judge in his own cause, because his interest would certainly bias his judgment, and, not improbably, corrupt his integrity. With equal, nay with greater reason, a body of men are unfit to be both judges and parties at the same time." Madison goes on to observe that the smaller the community, the more likely that parties and judges will be one and the same. Climate scientists are trying to convince the world that they are so righteous that they can judge their own cause. The notion that climate science should

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be immune to criticism from anyone outside of the “team” is warmly supported by the large numbers of people who stand to benefit from global warming hysteria, as well as by a few who have a sincere and touching faith in the incorruptibility of science.

Let me summarize how the key issues appear to me, a working scientist with a better background than most in the physics of climate. CO<sub>2</sub> really is a greenhouse gas and, other things being equal, adding CO<sub>2</sub> to the atmosphere by burning coal, oil, and natural gas will modestly increase the surface temperature of the earth. Other things being equal, doubling the CO<sub>2</sub> concentration, from our current 390 ppm to 780 ppm will directly cause about one degree Celsius warming. At the current rate of CO<sub>2</sub> increase in the atmosphere—about 2 ppm per year—it would take about 195 years to achieve this doubling. The combination of a slightly warmer earth and more CO<sub>2</sub> will greatly increase the production of food, wood, fiber, and other products by green plants, so the increased CO<sub>2</sub> will be good for the planet, and will easily outweigh any negative effects. Supposed calamities like the accelerated rise of sea level, ocean acidification, more extreme climate, tropical diseases near the poles, etc. are greatly exaggerated.

“Mitigation” and control efforts that have been proposed will enrich a favoured few with good political ties—at the expense of the great majority of mankind, including, especially, the poor and the citizens of developing nations. These efforts will make almost no change in earth’s temperature. Spain’s recent experiment with green energy destroyed several pre-existing jobs for every green job it created, and it was one of the reasons for the near bankruptcy of the country.

### **Climate models**

The frightening warnings that alarmists raise about the effects of doubling CO<sub>2</sub> are based on computer models. These models assume that the direct warming effect of CO<sub>2</sub> is multiplied by a large and positive “feedback factor” from CO<sub>2</sub>-induced changes in water vapor and clouds, which supposedly contribute much more to the greenhouse

warming of the earth than CO<sub>2</sub>. But there is observational evidence that the feedback factor is small and may even be negative. Climate models appear to fit the temperature rise over the last 150 years very well. But the values of various parameters like clouds and the concentrations of anthropogenic aerosols are adjusted to get the best fit to past observations. The real values of most parameters, and the physics of how they affect the earth's climate, are in most cases only roughly known, too roughly to supply data accurate enough for computer predictions. The great mathematician John von Neumann once said, "With four parameters I can fit an elephant, and with five I can make him wiggle his trunk." Climate models have dozens of parameters, not unlike the epicycles of Ptolemaic astronomy. And they have done poorly at predicting the future. No model predicted the lack of net warming of the earth's temperature that we have experienced over the past ten years.

In my judgment, and in that of many other scientists familiar with the issues, the main problem with models could well be their treatment of clouds and water vapor, changes of which can affect the earth's temperature as much or more than changing levels of CO<sub>2</sub>.

### **What is wrong with climate science?**

What, besides the bias toward a particular, desired result, is wrong with the science? Scientific progress proceeds by the interplay of theory and observation. Theory explains observations and makes predictions about what will be observed in the future. Observations anchor our understanding and weed out the theories that do not work. This has been the scientific method for more than three hundred years. Recently, the advent of the computer has made possible another branch of inquiry: computer simulation models. Properly used, computer models can enhance and speed up scientific progress. But they are not meant to replace theory and observation and to serve as an authority of their own. We know they fail in economics. All of the proposed controls that would have such a significant impact on the world's economic future are based on computer models that are so complex and chaotic that many runs are needed before we can get an "average" answer. Yet the models

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have failed the simple scientific test of prediction. We don't even have a theory for how accurate the models should be.

There are many honest, hardworking climate scientists who are trying to understand the effects of CO<sub>2</sub> on climate, but their work has fallen under suspicion because of the hockey-stick scandal and many other exaggerations about the dangers of increasing CO<sub>2</sub>. What has transformed climate science from a normal intellectual discipline to a matter of so much controversy?

A major problem has been the co-option of climate science by politics, ambition, greed, and what seems to be a hereditary human need for a righteous cause. What better cause than saving the planet, especially if one can get ample, secure funding at the same time? Huge amounts of money are available from governments and wealthy foundations for climate institutes and for climate-related research. Funding for climate studies is second only to funding for biological sciences. Large academic empires, prizes, elections to honorary societies, fellowships, consulting fees and other perquisites go to those researchers whose results may help "save the planet." Every day we read about some real or contrived environmental or ecological effect "proved" to arise from global warming. The total of such claimed effects now runs in the hundreds, all the alleged result of an unexceptional century-long warming of less than one degree Celsius. Government subsidies, loan guarantees, and captive customers go to green companies. Carbon-tax revenues flow to governments. As the great Russian poet Pushkin said in his novella *Dubrovsky*, "If there happens to be a trough, there will be pigs." Any doubt about apocalyptic climate scenarios could remove many troughs.

Many Americans still remember the wise words of President Eisenhower in his farewell address of 1960, where he warned us against the "military-industrial complex." Few remember the following paragraphs in the same speech:

"Akin to, and largely responsible for the sweeping changes in our industrial-military posture, has been the technological revolution during recent decades. In this revolution, research has become central; it also becomes more formalized, complex, and costly. A steadily increasing

share is conducted for, by, or at the direction of, the Federal government. Today, the solitary inventor, tinkering in his shop, has been overshadowed by task forces of scientists in laboratories and testing fields. In the same fashion, the free university, historically the fountainhead of free ideas and scientific discovery, has experienced a revolution in the conduct of research. Partly because of the huge costs involved, a government contract becomes virtually a substitute for intellectual curiosity. For every old blackboard there are now hundreds of new electronic computers. The prospect of domination of the nation's scholars by Federal employment, project allocations, and the power of money is ever present and is gravely to be regarded. Yet, in holding scientific research and discovery in respect, as we should, we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite. It is the task of statesmanship to mold, to balance, and to integrate these and other forces, new and old, within the principles of our democratic system -- ever aiming toward the supreme goals of our free society."

Does this sound familiar? What would Eisenhower say about the frenzy over supposed human-induced climate change and the amazing scientific, industrial and governmental crusade that has coalesced around it?

What about those who doubt the scientific basis of these claims, or who simply don't like what is being done to the scientific method they were taught to apply and uphold? Publications of contrary research results in mainstream journals are rare. The occasional heretical article is the result of an inevitable, protracted battle with those who support the dogma and who control the levers of peer review. As mentioned above, we know from the Climategate emails that the team conspired to prevent contrary publications from seeing the light of day and even discussed getting rid of an editor who seemed to be inclined to admit such contentious material.

Skeptics' motives are publicly impugned; denigrating names are used routinely in media reports and in the blogosphere; and we now see attempts to use the same tactics that Big Brother applied to Winston

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Smith in Orwell's 1984. In 2009, a conference of "ecopsychologists" was held at the University of West England to discuss the obvious psychological problems resident in those who do not adhere to the global warming dogma. These ecopsychologists, who knew almost nothing themselves about climate science, told us that scientists and members of the general population who express objective doubt about alarmist views of global warming are suffering from a kind of mental illness. We know from the Soviet experience that a totalitarian society can find it convenient to consider dissidents to be mentally deranged and act accordingly.

### **The role of scientific societies**

The management of most scientific societies has enthusiastically signed on to the global warming bandwagon. This is not surprising, since government, as well as many states and foundations, generously fund those who reinforce their desired outcomes under the cover of saving the planet. Certain private industries are also involved: those positioned to profit from enacted controls as well as financial institutions heavily invested in "green technologies" – technologies whose rationale disappears the moment global warming is widely understood to be a non-problem. There are known connections and movements of people involved in government policy, scientific societies, private industry and foundations -- all with the common thread of influencing the outcome of a set of programs and investments underpinned by the supposed threat of global warming.

My own trade union, the American Physical Society (APS), is a good example, but hardly the worst. An APS Council statement issued on November 18, 2007 states: "The evidence is incontrovertible: Global warming is occurring. If no mitigating actions are taken, significant disruptions in the Earth's physical and ecological systems, social systems, security and human health are likely to occur. We must reduce emissions of greenhouse gases beginning now." This is pretty strong language for physicists, for whom skepticism about evidence was once considered a virtue, and nothing was incontrovertible.

In the fall of 2009 a petition, organized by a Fellow of the American Physical Society, Roger Cohen, and containing the signatures of hundreds of distinguished APS members, was presented to the APS management with a request that at least the truly embarrassing word “incontrovertible” be taken out of the statement. The APS management’s response was to threaten the petitioners, while grudgingly appointing a committee to consider the request. It was exactly what James Madison warned against. The committee included members whose careers depended on global warming alarmism, and the predictable result was that not one word was changed. Bad as the actions of the APS leadership were, they were far better than those of most other scientific societies -- that rejected any reconsideration of extreme statements by the society leadership on climate.

The situation is even more lamentable for the general public, which is fed a constant stream of propaganda by specialists in environmental issues from the mainstream media and well-funded alarmist blogs. Not unlike functionaries of Orwell’s Ministry of Truth in 1984, with its motto “Ignorance is Strength,” many of the environmental news media dutifully and uncritically promote the party line of the climate crusade.

But Abraham Lincoln got it right when he (supposedly) said, “You can fool all of the people some of the time, and some of the people all of the time, but you cannot fool all of the people all of the time.” The situation is slowly getting better. Skeptics are more numerous and better organized than before. In a few cases, leading former adherents have publicly and courageously spoken out against the dogma and its core of establishment promoters. The IPCC itself has come under severe criticism by the international scientific establishment for its series of bizarre errors and organizational failings. Under pressure from a dissident group of Fellows, the Royal Society moved to meaningfully moderate its former radically alarmist position on global warming. And perhaps most important of all, public skepticism has increased significantly, and with it has come a major drop in support of the climate crusade’s attempt to seize control of the “pollutant,” CO<sub>2</sub>.

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## Conclusion

I began with a quote from the preface of the first edition of Mackay's *Extraordinary Popular Delusions and the Madness of Crowds*, and I will end with a quote from the preface of the second edition: "Men, it has been well said, think in herds; it will be seen that they go mad in herds, while they only recover their senses slowly, one by one." In our efforts to conserve the beautiful planet that is our home, we should not fixate on CO<sub>2</sub>. We should instead focus on issues like damage to local landscapes and waterways by strip mining, inadequate cleanup, hazards to underground miners, the excessive release of real pollutants such as mercury, other heavy metals, organic carcinogens, etc. Much of the potential harm from strip mining can be eliminated, for example, by requirements that the land be restored to a condition that is at least as good as, and preferably better than, when the mining began. And it is high time that we assess great expanses of windmills and solar-panels in the previously unspoiled open spaces of the world with the same objectiveness that we apply to other human perturbations of nature. Looking at once beautiful hilltops, now cluttered with windmills, I am reminded of an exchange between Winston Churchill and a woman who indignantly said, "Sir, you are drunk." Churchill responded, "Madam, you are ugly. In the morning I shall be sober." The hilltops will be ugly for a long, long time.

Life is about making decisions and decisions are about trade-offs. We can choose to promote investment in technology that addresses real problems and scientific research that will let us cope with real problems more efficiently. Or we can be caught up in a crusade that seeks to suppress energy use, economic growth, and the benefits that come from the creation of wealth for all of mankind.

The Global Warming Policy Foundation is an all-party and non-party think tank and a registered educational charity which, while open-minded on the contested science of global warming, is deeply concerned about the costs and other implications of many of the policies currently being advocated.

Our main focus is to analyse global warming policies and their economic and other implications. Our aim is to provide the most robust and reliable economic analysis and advice.

Above all we seek to inform the media, politicians and the public, in a newsworthy way, on the subject in general and on the misinformation to which they are all too frequently being subjected at the present time.

The key to the success of the GWPF is the trust and credibility that we have earned in the eyes of a growing number of policy makers, journalists and the interested public.

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