

# Does the World Need Climate Insurance?

The Best Scientific and Economic  
Evidence Says NO

CO2 COALITION





A close-up photograph of several green leaves, likely from a maple tree, with prominent veins and serrated edges. The leaves are layered, with some in sharp focus and others blurred in the background, creating a sense of depth. The overall color palette is various shades of green, from light lime to deep forest green.

# Does the World Need Climate Insurance?

The Best Scientific and Economic  
Evidence Says NO



**CO2 COALITION**

[CO2Coalition.org](http://CO2Coalition.org)



## Preface

This white paper summarizes the views of the CO<sub>2</sub> Coalition, a new and independent non-profit organization that seeks to engage thought leaders, policy makers, and the public in an informed, dispassionate discussion of how our planet will be affected by carbon dioxide (CO<sub>2</sub>) emissions.

In our two previous white papers, *Carbon Dioxide Benefits the World; See for Yourself* and *A Primer on Carbon Dioxide and Climate* (both available at [www.co2coalition.org](http://www.co2coalition.org)), the Coalition set forth the argument that additional CO<sub>2</sub> emissions will be a net benefit, rather than a problem, for the world and explored the science behind the interaction between CO<sub>2</sub> and climate.

Our third major report—*A Climate Surprise*, an account of our first national conference, in NYC, March 29, 2016—offers added detail on issues such as the benefits to agriculture, along with climate economics and global temperature trends based upon the most reliable satellite instruments.

The present white paper is the first in a new ongoing series of special studies examining how CO<sub>2</sub> helps our world now and in the future. This analysis considers a major question raised by many people: “If there is uncertainty about the impacts of more CO<sub>2</sub> in the atmosphere, shouldn’t we buy insurance?” Just as the Coalition has urged in all of its work, please read the assessment here and “see for yourself” what path you prefer.

*Individuals and businesses routinely purchase insurance to guard against various forms of risk, such as fire, theft, or other loss. This logic of self-protection also applies to climate change.*

—“The Cost of Delaying Action to Stem Climate Change,” President’s Council of Economic Advisers, July 2014





## Executive Summary

President Obama's Council of Economic Advisers asserts that climate insurance, like fire insurance, is just common sense. Their analogy, however, is fundamentally wrong.

House fires are not only serious, but also common. We know what causes them, how often they occur, and the amount of damage that results. For a few hundred dollars a year, a homeowner can protect himself against a known risk of a catastrophic incident. Yet there is no empirical evidence that catastrophic climate change is a risk at all.

Many people refer to carbon dioxide (CO<sub>2</sub>) as a "pollutant;" in reality, CO<sub>2</sub> gas is a natural part of the ecosystem—and essential to life on Earth. CO<sub>2</sub> levels are currently at record low levels compared with those that prevailed over most of the Earth's history.

The modest increases in CO<sub>2</sub> levels that have occurred over the past century—thanks, in part, to the combustion of fossil fuels—have led to a pronounced and well-documented greening of the Earth. Plants grow better and are more drought resistant with more CO<sub>2</sub>. This greening has benefitted—and will continue to benefit—human society, particularly the world's poor, whose lives depend on productive agriculture.

The actions necessary to reduce CO<sub>2</sub> emissions by any meaningful amount as "insurance" against climate change would be painful for Western countries and devastating for poor countries. Sensible people spend their insurance dollars carefully to protect their families against real risks. "Climate insurance" would simply be a waste of scarce resources.



***There is no empirical evidence  
that catastrophic climate  
change is a risk at all.***



## I. Is Every Insurance Policy a Good Idea?

Insurance policies allow people to pool their funds to protect themselves against known risks. The risks associated with floods, fires, hurricanes, premature death, and other harmful events can generally be calculated from actual experience. People pay a premium for insurance coverage whose price is slightly above its statistical value; but in return, they receive peace of mind knowing that they will be covered if they are one of the unlucky few who suffer harm.

In 2015, for example, fire departments in the U.S. responded to 365,500 home fires, which caused \$7 billion in direct damage.<sup>1</sup> In any given year, roughly one in 265 insured homes suffers a fire-related loss.<sup>2</sup> The average loss is quite predictable: about \$19,000 for each fire, or roughly \$70 for each insured homeowner. This situation fits the insurance model perfectly.

Almost everyone buys insurance in one form or another; but most people treat insurance salesmen with understandable skepticism. Salesmen, after all, are trying to sell you something. Sensible people choose their policies carefully and buy insurance only under three circumstances:

- The risk must be real. Fire insurance makes sense. Yet suppose that your insurance agent offered you a policy to protect your home against a meteor strike. Even though such an event is unlikely, the salesman argues, the consequences would be disastrous—for this reason, you should buy insurance coverage.

According to the Planetary Science Institute, hundreds of thousands of meteors enter the Earth's atmosphere every year and about 500 hit the Earth's surface.<sup>3</sup> The probability that a meteor will strike your house in any given year is about one in ten billion. In other words, a meteor will hit some house in the U.S. roughly once every 140 years. The statistical value of such a policy would be a small fraction of a penny: insuring against such an event would be foolish.

- The policy must be priced fairly. If your house is worth \$250,000 and the chance of losing your home in a fire is one in 350, you would not pay \$10,000 a year for an insurance policy. If you did, you would give your insurance company the full value of your home every 25 years, even though the odds of a fire are less than one in fifteen over that period. Insurance costs real money and all but the wealthiest people need to budget their insurance dollars carefully.
- The policy must protect you. If your insurance agent offered you a homeowner's policy with a premium of \$100 per year—but a payout of only 1% of your house's value in the event of a fire—you would turn him down.



Climate “insurance” fails all three of these tests. Catastrophic climate change is a hypothesis without empirical support. Significant reductions in global CO<sub>2</sub> emissions would be enormously expensive, limiting living standards in the West and preventing the world’s poor from lifting themselves out of poverty.

Moreover, the policies that are under discussion in the United Nations negotiating framework would have virtually no impact on the amount of CO<sub>2</sub> in the atmosphere. Therefore, such policies would offer no protection against the catastrophic climate scenarios that these policies are intended to address.

## II. Are Precautions Always Sensible?

The insurance model doesn’t work for all possible risks. Hypothetical events, such as nuclear war or massive solar flares, are potentially catastrophic, but their probabilities are unknown. Furthermore, there is no way to accumulate sufficient cash to cover an event that would devastate society. We don’t buy insurance policies against nuclear war. We try to stop it from happening.

In other words, we talk about *precautions*, not *insurance*. The President’s Council of Economic Advisers is not really proposing a climate-insurance policy but rather a precautionary reduction of carbon-dioxide emissions to forestall a supposed catastrophe.

Even if the climate risk is unknown, shouldn’t we cut CO<sub>2</sub> emissions just in case? Aren’t we always better off reducing risk? The answer to both questions is no.

Modern industrial societies are remarkably safe by historical standards; but risks still abound, including from illness, war, accidents, crime, pollution, bad weather, and other hazards of our complex world. Intelligent people understand these risks and take sensible precautions for themselves and their progeny. The key word: sensible.

President Obama once said, “This is the only planet we’ve got. And years from now, I want to be able to look our children and grandchildren in the eye and tell them that we did everything we could to protect it.”<sup>4</sup> Our children and grandchildren want a world that’s not only safe, but also free and prosperous. If we squander our children and grandchildren’s economic and cultural inheritance chasing phantoms, they won’t thank us. For the sake of future generations, we need to make sound decisions about risks.

Most animals rely on instinct to avoid risks. They know what predators smell like and react quickly to the scent. When they hear a sudden noise, they run. Fortunately, humans are uniquely equipped to understand and manage risks by applying our innate intelligence—one of our major evolutionary advantages.

Intelligence, however, has its drawbacks. Most adults are smart enough to avoid sticking their hand in a tiger’s cage or standing in an open field during a thunderstorm. Our caution about reasonable fears is called “common sense.” Unfortunately, we also have the ability to see risks that do not exist, overestimate small risks, and take excessive measures to avoid perceived risks.





Successful risk management requires prioritizing the full range of possibilities; selecting for action those risks that are serious and avoidable; and rejecting action for those that are not. This process is not easy. Yet in addition to our individual brains, we have another crucial advantage. As a society, we can gather and share data regarding risks and then apply the most powerful tool that humans have developed: science.

Science allows us to discriminate among potential risks and take not every possible precaution but justified precautions. For example, should we take the train as a precaution against dying in a plane crash? After all, a simple steel machine moving along a fixed track at 60 miles per hour seems intuitively safer than a fragile and technologically complex aluminum tube hurtling through the air at 600 miles an hour six miles above the Earth.

Actual data, however, tell us that this intuition is wrong. The U.S. suffers one fatality for every 20 million passenger-miles traveled on trains but only one fatality for every 40 *billion* passenger miles on planes.<sup>5</sup> Even though planes are much safer than trains, 15%–20% of the population have a fear of flying and 2%–3% are sufficiently afraid that they avoid air travel altogether.<sup>6</sup>

***Science allows us to discriminate among potential risks and take not every possible precaution but justified precautions.***

John Madden, the Oakland Raiders coach and TV football commentator, famously preferred to travel around the U.S. by bus rather than by plane. Taking a bus might make sense for reasons of convenience—or even to avoid anxiety—but it’s a terrible risk-management strategy.

Today, Americans are bombarded with risk claims and accompanying demands for precautionary action. Do cell phones cause brain cancer? Do vaccines cause autism? Are genetically-modified foods dangerous? Do artificial sweeteners cause cancer? Has the Earth’s ozone layer disappeared? Can I get cancer from living near power lines? Do nuclear power plants emit harmful radiation? Is the Earth running out of mineral resources? Will burning fossil fuels make our planet unlivable?

Humans cannot function if we treat every possible risk as both real and catastrophic. We have limited resources of time and money: we must prioritize the risks that we wish to address. Infinite precautions are a recipe for paralysis. Furthermore, some precautions can cause severe damage, regardless of the good intentions of their promoters.

Consider the pesticide DDT. The successful drive to outlaw DDT began in 1962 with the publication of Rachel Carson’s book *The Silent Spring*, which claimed that DDT was carcinogenic and would devastate bird populations. A nascent environmental movement, fueled by the media, demanded a ban on DDT as a precaution against its supposedly severe environmental and health effects. The argument: caution demanded action, even if the science was not rock solid.





More than 50 years later, the science of DDT remains controversial. The pesticide may be carcinogenic and may cause problems among bird populations. The damage caused by our “precautions,” however, is undisputed.

Despite decades of efforts to find improved methods of preventing and curing mosquito-borne malaria, DDT remains the most effective weapon against this killer disease.<sup>7</sup>

According to the Centers for Disease Control and Prevention, 214 million people contracted malaria in 2015 and 438,000 people died, primarily African children.<sup>8</sup> Since the 1972 ban on DDT, roughly 20 million people have died from malaria.

Only recently have international bodies, such as the World Health Organization, reluctantly begun to accept the limited use of DDT as a life-saving approach to mosquito control.<sup>9</sup> The preemptive ban on DDT may not have been wise, after all.

### III. Is Climate Risk Real?

Media accounts of the present and future effects of human-caused climate change present a bleak picture. The message: human emissions of CO<sub>2</sub> are bringing rapidly rising seas, a dramatic increase in extreme weather events, widespread crop failures, climate refugees, and rising military tensions. Some U.S. political leaders have even called human-caused climate change the greatest threat to national security that our nation faces. Science, however, paints a dramatically different picture.

Carbon dioxide (CO<sub>2</sub>) is most assuredly not a “pollutant.” The combustion of fossil fuels and many other human activities—including every breath we exhale—do release carbon-dioxide gas into the atmosphere; but CO<sub>2</sub> is not a contaminant like oxides of sulfur and nitrogen, lead, or arsenic.

Instead, carbon dioxide is essential for—and a benefit to—life on Earth. Current CO<sub>2</sub> levels are about 400 ppm (parts per million), a record low level compared with those that prevailed over most of the Earth’s history. The modest increases of CO<sub>2</sub> that have already occurred over the past century (thanks, in part, to the combustion of fossil fuels) have led to a pronounced and well-documented greening of the Earth.

Plants grow better and are more drought resistant with more CO<sub>2</sub>. This greening has benefitted—and will continue to benefit—human society, particularly the world’s poor, whose lives depend on productive agriculture.

So what exactly is the supposed risk of climate change? Is it true, as some claim, that the adverse effects of atmospheric warming will ultimately overwhelm the clear and present benefits of CO<sub>2</sub>? The argument here is not whether carbon dioxide warms the atmosphere. Physics tells us that CO<sub>2</sub> is a greenhouse gas, and virtually everyone agrees on this point. The critical questions are *how much* warming will occur and what the consequences of that warming will be.

*Carbon dioxide is  
essential for—and a  
benefit to—life on Earth*





Straightforward calculations show that if atmospheric carbon-dioxide levels were doubled, with no changes in the relative humidity, cloudiness, or other atmospheric properties, the Earth's surface would warm by about 1° C, a critical parameter known as the feedback-free equilibrium climate sensitivity. A temperature increase of this magnitude over the course of the twenty-first century would be highly beneficial to mankind. The U.N. Intergovernmental Panel on Climate Change (IPCC), however, argues that equilibrium climate sensitivity is much higher: 1.5°–4.5° C.

Why this discrepancy? The high IPCC sensitivities are generated by climate models, which make assumptions that lead to feedback effects from humidity and other properties of the atmosphere that amplify the warming effect of greenhouse gases.

According to NASA, atmospheric CO<sub>2</sub> concentrations have increased from about 290 ppm in 1880 to about 400 ppm today, an increase of nearly 40%.<sup>10</sup> But CO<sub>2</sub> is not the only greenhouse gas. Other anthropogenic greenhouse gases—mainly methane (CH<sub>4</sub>), halocarbons, and nitrous oxide (N<sub>2</sub>O)—have increased the warming effect, “radiative forcing,” by about the same amount as CO<sub>2</sub>.

If human activity were responsible for all the observed warming, the total temperature increase since 1880 should thus be close to what we would see from a doubling of CO<sub>2</sub> in the atmosphere. NASA data indicate that average surface temperatures have increased by only about 1° C between 1880 and 2015.<sup>11</sup> These observations offer no support for high sensitivity.

The high-sensitivity climate models used by the IPCC can reproduce observational data only with major *ad hoc* analytical contortions, such as the assumption that aerosols—such as sulfate particles in the upper atmosphere—reflect enough sunlight back into space to act as a massive offset to warming from more greenhouse gases. If only ‘most’ of the warming since 1960 is due to human activity (which is what the IPCC claims), then the task of making high sensitivity compatible with empirical observations becomes even more difficult and implausible.

The predictions of catastrophe contradict the geological record, too. The Earth has already experienced much higher CO<sub>2</sub> levels than those prevailing today, and life flourished on the land and in the oceans. A doubling or even quadrupling of CO<sub>2</sub> levels over the next century or two would likely produce positive results for humankind.

Some argue that the complete lack of empirical evidence for accelerated warming is irrelevant; 97% of scientists, they point out, believe that climate change is “real.” This famous 97% figure is based on literature reviews or surveys asking broad questions, such as whether the respondent agrees that man-made CO<sub>2</sub> contributes to warming.

Virtually everyone agrees that climate change is “real” in the sense that the Earth's climate changes over time and that CO<sub>2</sub> has some influence on that change. Still, surveying opinions on vague questions adds nothing to a reliable understanding of climate science.

Too often, observers attribute every variation in local weather patterns to sweeping human-induced climate change. NASA, for example, cites as evidence of man-made climate change the observed rise in sea levels, the observed increase in the temperature of the atmosphere and the oceans, shrinking





ice sheets, declining Arctic sea ice, glacial retreat, extreme weather events, ocean acidification, and decreased snow cover.<sup>12</sup>

But this evidence supports such a sweeping assertion only if we really know how to distinguish anomalies from natural variability. The geologic record shows that climate has varied greatly over time. We are only now beginning to understand cyclical variations in ocean currents, for example, which may explain much, or even all, of the warming observed in recent years.

Some of these ocean cycles operate over periods of years; some work over decades, centuries, and even millennia. No individual—whether a trained scientist or an average citizen—can conclude from personal experience that the climate is changing outside natural variability without much stronger evidence than exists today.

The high climate sensitivities required to support claims of catastrophic effects are a *prediction* about future developments, not a *description* of the present condition of the climate. There is no convincing evidence that these predictions will come true.

Debunking catastrophic climate predictions has been likened to the stance of tobacco companies denying that smoking is hazardous. This charge fails. The correlation between smoking and lung cancer is so strong that it can no longer be dismissed as coincidence.

According to the American Lung Association, in 2015, lung cancer accounted for the deaths of 158,000 Americans—27% of all cancer deaths. More than 130,000, or 82%, of those who died of lung cancer were smokers.<sup>13</sup> Actual deaths are evidence; predicted deaths are not. The conclusion that smoking is dangerous is based on science, not on opinion and certainly not on computer models.

There is no comparable evidence for the possibility of catastrophic climate change. In healthy scientific fields, the estimated uncertainty of key parameters decreases with time as our understanding grows. The link between smoking and lung cancer grew stronger with each passing year, but the evidence for catastrophic global warming has become weaker over time.

Warming, especially over the past 20 years, has been much less than originally predicted. The key parameter of climate sensitivity—the equilibrium temperature rise from doubling CO<sub>2</sub> concentrations—has also become less certain. In fact, the IPCC has increased its range of uncertainty for this critical parameter, from 2.0–4.5°C in its 2007 report to 1.5–4.5° C in its latest 2014 report.

***Catastrophic effects are a prediction about future developments, not a description of the present condition of the climate. There is no convincing evidence that these predictions will come true.***





## IV. How Much Would a “Climate-Insurance Policy” Cost?

Even if the risk of climate catastrophe is very small, couldn't we reduce carbon-dioxide emissions with minimal cost while creating positive economic and environmental benefits for society? The answer is no: the costs of carbon reduction are high and the collateral damage would be significant.

Fossil fuels are woven into the fabric of modern economic life. Oil, coal, and natural gas account for over 85% of total world primary energy supply and are likely to remain the dominant energy sources for decades to come.<sup>14</sup> The World Bank estimates current global GDP at about \$73 trillion per year.<sup>15</sup> The total market value of all fossil fuels sold in the world today is \$5 trillion–6 trillion per year<sup>16</sup>—or 6%–8% of world economic output.

Energy is an essential input: its cost and performance affect everything we do. Economists call this a “multiplier” effect, and the multiplier for energy is very large, indeed.

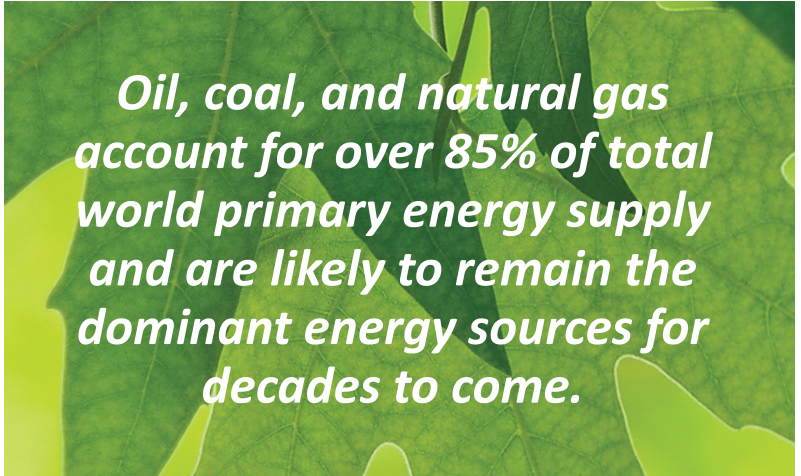
Oil provides critical mobility for people and freight. Coal generates the low-cost electricity that supports an industrial base and a modern living standard, particularly in countries such as China and India. Natural gas heats our homes and generates electric power cleanly and efficiently. Oil and natural gas provide feedstocks for plastics and other essential products.

When energy prices rise, the prices of everything we buy rise, too. These negative effects cascade through the economy, affecting productivity, output, and employment. By the same token, declining energy prices spur economic growth.

The process of economic development itself and the rise out of soul-crushing poverty in developing countries are, in large measure, driven by the substitution of chemical energy for human and animal power. A key component of any economic-growth strategy, for rich and poor countries alike, is access to low-cost, high-performance sources of energy.

Meaningful reductions in carbon-dioxide emissions would mean converting the global economy to renewable wind and solar power. Unfortunately, renewables are expensive and unreliable.

Today, the lowest-cost source of large-scale electric power in the U.S. is advanced combined-cycle generation fueled by low-priced natural gas. Onshore wind power costs about 2½ times as much, offshore wind power 6 times as much, solar photovoltaic power 5 times as much, and solar thermal power 8 times as much.<sup>17</sup> Widespread use of these energy sources to reduce carbon-dioxide emissions would place a severe burden on the budgets of middle-class Americans and would seriously hamper the ability of the world's poor to escape poverty.



*Oil, coal, and natural gas account for over 85% of total world primary energy supply and are likely to remain the dominant energy sources for decades to come.*



Wind and solar energy are also “intermittent” (i.e., power is available only when nature provides it). The old proverb, “make hay while the sun shines,” embodies some ancient truths about solar power. You only get power when the sun shines, none at all at night, and not much on a cloudy day. If necessary, a combined-cycle natural gas plant can operate 85% of the time or more. Overall, solar-energy systems operate only around 15% of the time; wind-power systems, which operate about 25% of the time, are not much better.

This lack of predictability and reliability is unmanageable for modern electric grids except in very small doses and with significant transmission and dispatch costs. Today’s modern economy relies on electricity available not only in large quantities but when needed and at precise voltages and frequencies. Renewable energy cannot currently—or foreseeably—meet these technical needs.

In addition to its high cost, renewable electricity’s role in the energy economy is severely constrained by the lack of storage technology. Batteries are particularly critical to the use of electricity in transportation. Today’s electric-car batteries cost thousands of dollars yet provide only limited range. Battery and other electricity-storage technologies have improved in recent years; but they are still inadequate to support large-scale renewable-energy use.

The case for deploying wind and solar energy rests on five major fallacies:

**1. “Renewable energy sources are free.”** While the fuel cost of wind and solar power is zero, the capital/maintenance costs of the machines that convert wind and sun into stable, usable electricity are prohibitively high.

**2. “Fossil fuels appear less expensive than renewables only because of heavy subsidies to fossil fuels.”** In some countries, primarily oil- and gas-exporters, fuel is sold at artificially low prices to local citizens. For example, gasoline costs \$0.02 per gallon in Venezuela, \$0.88 per gallon in Kuwait, and \$1.49 per gallon in Iran.<sup>18</sup>

In the industrialized countries, however, fossil fuels are heavily taxed. For example, the Organisation for Economic Co-operation and Development (OECD) identified about \$54 billion in fossil-fuel tax breaks and subsidies in its member states in 2013,<sup>19</sup> but neglected to mention the \$475 billion in excise taxes that these same countries imposed on fossil fuels—above and beyond the normal levels of consumer taxation (general sales taxes or value-added tax). One cannot reasonably argue that wind turbines are having trouble competing in Illinois because the mullahs sell cheap gasoline in Tehran.

Contrary to the arguments of renewable-energy manufacturers, wind and solar power benefit from substantial federal, state, and local subsidies that give them a competitive advantage over conventional energy sources. According to the U.S. Department of Energy’s Energy Information Administration, wind and solar power each receives more federal subsidies than coal, oil, natural gas, and nuclear power combined.

On the more meaningful measure of subsidies per unit of energy consumed, fossil fuels receive about \$0.10 per million Btu<sup>20</sup> while wind and solar enjoy subsidies averaging \$1.90 per MBtu. State and local subsidies add still more to government-bestowed wind and solar favoritism.<sup>21</sup>





**3. “Air pollution from fossil fuels is a killer.”** The International Monetary Fund (IMF), for example, estimates that fossil fuels cost the global economy \$2.2 trillion annually in air pollution, 60% of which is in China.<sup>22</sup> Since renewable electricity emits no air pollutants, the implication is that the rapid elimination of fossil fuels must carry major public-health benefits.

It’s certainly true that burning fossil fuels emits real pollutants—such as oxides of sulfur and nitrogen, carbon monoxide, and particulates (soot)—but energy is, as noted, a critical element of economic growth. Low cost, high-performance energy brings substantial benefits as well as drawbacks.

Until the 1980s, for example, China was a country of generalized misery—a vast home not to U.S.-style poverty (where the annual poverty-income threshold for a family of four is now \$24,300)<sup>23</sup> but abject poverty (defined by the World Bank as living on less than \$1.90 per day). In Communist China, a life of malnutrition, backbreaking labor, disease, infant mortality, constant worry, and an early grave were the rule, not the exception.

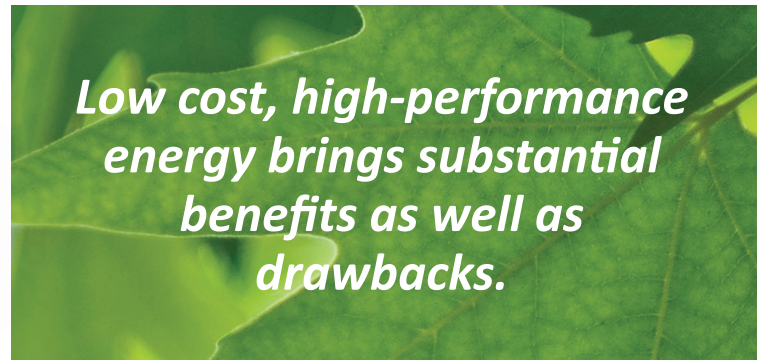
China’s post-Mao economic reforms, which allowed substantial parts of the country to enjoy the benefits of freer markets and international trade, have brought extraordinary results. According to the World Bank, the number of Chinese living below the \$1.90/day line decreased, from 66% (750 million people) in 1990 to 11.2% (150 million people) in 2010.<sup>24</sup>

The availability of low-cost electricity has supported rapid industrial growth in China, including export industries that currently generate over \$2 trillion annually in foreign exchange, as well as industries that have attracted over \$100 billion annually in foreign direct investment. These earnings have created several hundred million modern jobs, which provide sufficient income to allow a Chinese worker to have quality housing, a balanced diet, medical care, mobility, and leisure time.

A direct result of increased wealth is an improvement in general health and a longer life expectancy. According to the UN, average life expectancy in China increased from 59 years in 1970 to about 75 years today.<sup>25</sup> Low-cost electricity using inexpensive coal cannot account for all of that improvement, but its contribution is significant.

Life expectancy is not the only metric of well-being. Living even a modest middle-class lifestyle, as many hundreds of millions of Chinese can now do, is vastly superior in terms of human welfare than living as a subsistence peasant.

Since China began its economic reforms in 1979, 170 million–340 million Chinese migrated from farms to cities in search of economic opportunity, despite urban air pollution.<sup>26</sup> The IMF study cited above implies that China’s economic-development process—and the decisions of several hundred million Chinese—have been deeply irrational, and that these people would have been better off in poverty, but with cleaner air.







**4. “Scaling-up wind- and solar-power systems will drive their costs down a steep curve, ultimately making them less expensive than fossil fuels.”** Not all technologies enjoy economies of scale. Solar panels have gotten cheaper in recent years largely because of rapid growth in Chinese manufacturing, spurred by low labor costs and supportive government policies.

Although solar-equipment manufacturers often point to a high growth rate as a sign of success, solar energy remains a negligible component of world energy supply—with only about 1% of the global electricity market in 2015<sup>27</sup>—despite several decades of government subsidies.

Wind power has done somewhat better, with about 4% of the world electricity market.<sup>40</sup> Wind turbines have also gotten less expensive, but not primarily through improved technology. Wind farms and individual wind turbines have simply gotten bigger; as a result, they have become highly controversial in many places.

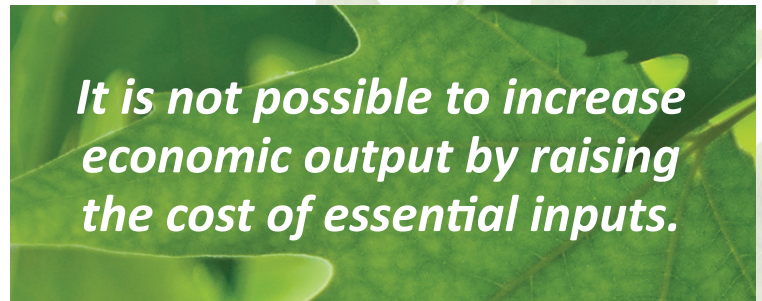
At least in the U.S., scale-up is likely to be a limitation, not a boost, for wind power. Moreover, wind power is available disproportionately at night, when electricity demand is low and other power plants are idle.

**5. “The high costs of renewable energy will be offset by the growth and employment benefits of developing a new industry.”** It is not possible to increase economic output by raising the cost of essential inputs. Otherwise, the government could improve our economy by outlawing power tools and earthmoving machines.

Some workers might benefit from the resulting increased employment; but the cost of everything we build would go up, and everyone else would suffer. Living standards come from productivity, not the number of jobs.

The employment/growth argument assumes that government planning is superior to free markets in allocating capital and generating employment. Yet central planning didn’t work for the Soviet Union in the twentieth century; it won’t work anywhere else in the twenty-first century.

The above fallacies for renewable energy aim to convince the public that eliminating fossil fuels would be relatively painless, and, therefore, easy to accept as a precaution against catastrophic climate change. In reality, real reductions in fossil-fuel use would have a severe adverse effect on the living standards of low- and middle-income Americans, as well as a devastating impact on the world’s poorest, most vulnerable people.





## V. The Politicians' Dilemma

Elected leaders are well aware of the potential negative consequences of climate policy for economic growth. In the political arena, calls to phase out fossil fuels are inevitably limited to long-term aspirations unaccompanied by any discussion of means and the consequences of those means.

For example, in May 2015, President Obama said: “I am working internationally to reduce our carbon emissions and to replace over time fossil fuels with clean energies. ... But I think that it is important also to recognize that that is going to be a transition process. In the meantime, we are going to continue to be using fossil fuels.”<sup>28</sup>

The President's caution makes good sense; but how meaningful are the “transitional” steps that he is proposing? The IPCC argues that—to avoid what has been characterized as “dangerous warming,” defined as 2° C above pre-industrial levels—CO<sub>2</sub> emissions must be reduced by 40%–70% below 2010 levels by 2050.<sup>29</sup> Global CO<sub>2</sub> emissions in 2010 were about 31.5 billion metric tonnes (mt) per year.<sup>30</sup>

A 40% reduction would require emissions in 2050 to be no more than about 19 billion mt, a decrease of 12.5 billion mt. Since 2010, however, global emissions have *increased* to 33.5 billion mt, so the IPCC's suggested reduction is, at a minimum, 14.5 billion mt from today's level.

Meeting this target would require annual emissions reductions averaging about 1.5% per year—not too difficult at first blush. But U.S. Energy Information Administration projections show carbon-dioxide emissions continuing to increase by about 1% per year for the foreseeable future, assuming climate policies in place today.<sup>31</sup>

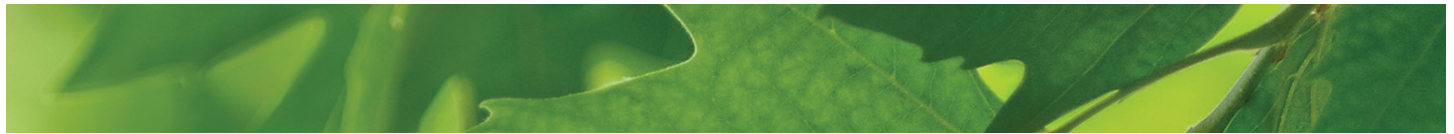
This growth does not come from rich Americans wasting energy, but from the world's poor working their way out of poverty. Compared with the above projection, meeting the IPCC's precautionary target would require reductions of about 2.5% per year—a significantly more challenging feat. For example, an annual 2.5% reduction implies global CO<sub>2</sub> emissions of no more than 27 billion mt by 2030, a 12 billion mt reduction compared with the EIA projection for that year.

At the December 2015 UN Paris Conference, delegates claimed a major breakthrough in emissions reductions by agreeing to a set of Intended Nationally Determined Contributions. In reality, INDCs are nothing more than “promises to make future promises.” But take the delegates at their word.

The American pledge was a 26%–28% reduction from the 2005 level of 6.1 billion mt by 2025, which translates into a reduction of only about 1 billion mt by 2025, compared with the EIA projection. The selection of 2005 as the base year is instructive. U.S. CO<sub>2</sub> emissions peaked in that year and have been on a downward trend since, thanks largely to the replacement of coal by low-cost natural gas, which emits about 40% less CO<sub>2</sub> per unit of electrical-energy generated as coal.

How about China—now the world's largest emitter, at 9.2 billion mt per year, or 27% of the global total? China's INDC<sup>32</sup> promises that by 2030, China will (a) reduce carbon intensity (kilograms of CO<sub>2</sub> per dollar of GDP) by at least 60% compared with 2005; (b) increase the share of non-fossil energy to 20%; and (c) reach its peak carbon-dioxide emissions.





Interestingly, these promises are all in line with projections of Chinese economic growth made before the Paris talks started. In essence, the Chinese government has committed to nothing more than continued economic growth; in return, it received congratulations and high praise from around the world. The U.S. and China, which account for about 45% of total global CO<sub>2</sub> emissions, have together committed to nothing more than slightly slower growth in carbon-dioxide emissions—not much of a precaution.

Political leaders know that serious carbon reductions would bring higher energy prices, economic recession, and a premature end to their careers. According to the World Bank, U.S. economic growth has averaged 1.2% per year over the past eight years, compared with a 2.8% average over the past 50 years.

The European Union has managed only 0.4% annual growth over the past eight years;<sup>33</sup> the World Bank does not expect much improvement in the E.U.'s economic-growth rate in the next few years, either.<sup>34</sup> This dismal economic situation leaves little political maneuvering room for severe carbon reductions.

Many of our leaders are attempting to square this circle by offering lofty rhetoric and symbolic actions, hoping that their environmental constituents will be mollified while the economy is allowed to grow. Still, many of these symbolic actions, such as tax credits for wind power, preferential prices for wind and solar, and renewable portfolio standards, cost real money and hit the pocketbooks of middle-class families—through direct taxes or higher utility bills.

Spain and Germany, for example, have spent billions of dollars on renewable-energy programs, which now contribute 11% and 12% of their energy requirements respectively, while their consumers endure residential electricity prices 2-3 times higher than those in the United States.

The proposed American climate policies are no more than a rounding error on global atmospheric CO<sub>2</sub> concentrations. Recalling that the IPCC wants to limit the global temperature rise to 2° C and assuming climate sensitivity at the high end of the IPCC range (4.5° C), a 20% cut in U.S. carbon-dioxide emissions would reduce global temperatures by only 0.02° C by 2100<sup>35</sup>—hardly a precaution against alleged climate risk.

***Political leaders know that serious carbon reductions would bring higher energy prices, economic recession, and a premature end to their careers.***

## VI. Real Precautions

Drastic reductions in fossil-fuel use should not be seen as a simple precaution against climate catastrophe. As shown above, such a policy would be a cost without benefit.





Consider other instructive cases. Start with house fires. In addition to buying insurance to protect against fire losses, we also take steps to minimize kitchen dangers. Good-quality appliances, smoke detectors, ground-fault interrupters, and proper electrical wiring and gas supply are all sensible steps. What we don't do: ban kitchens as a precaution against kitchen fires. Kitchens are too useful and necessary.

Next, consider road accidents. In 2013, the U.S. suffered 35,500 automobile-related deaths.<sup>36</sup> We all buy automobile insurance to protect against loss; but we don't ban automobiles as a precaution. Instead, we work to make cars safer, with considerable success.

***Confusing carbon dioxide with real pollutants will impede—not advance—environmental progress.***

According to the National Safety Council, the risk of death in motor-vehicle accidents fell from 7.6 fatalities per 100,000 vehicle-miles in 1950 to 1.2 in 2013—while total vehicle-miles driven increased more than six-fold.<sup>37</sup> The U.S. and most other countries have made great progress by focusing on safety improvements, including seat belts, air bags, better road design, stricter enforcement of traffic laws, improved vehicle crash-resistance, and other useful steps.

Finally, consider fossil fuels, which have shown similar successes in implementing genuinely effective precautions. Between 1980 and 2015, U.S. consumption of fossil fuels (oil, natural gas, and coal) grew from 69.8 quadrillion Btu (Q) to 79.3 Q, an increase of about 14%.<sup>38</sup>

According to the Environmental Protection Agency, emissions of critical pollutants in the U.S. declined as follows over the same period: sulfur dioxide was down 85%, carbon monoxide, 85%, nitrogen dioxide, 60%, and particulates, 40%.<sup>39</sup> These accomplishments are impressive.

Confusing carbon dioxide with real pollutants will impede—not advance—environmental progress. Policies to reduce CO<sub>2</sub>, an essential component of life on Earth, carry no benefit. After all, babies breathe out CO<sub>2</sub>, not sulfur or fly ash. Our environmental policy should continue to focus squarely on reducing contaminants that harm public health.

History demonstrates that wealthy countries have the resources to clean up their environments, while poor countries do not. According to a 2014 report by the World Health Organization, six of the world's 10 most polluted cities are in India, three are in Pakistan, and one is in Iran.

Los Angeles now ranks as the world's 605th most polluted city, London is 829th, and New York is 918th.<sup>40</sup> Shouldn't developing countries have the same chance for success as Western countries?

## VI. Conclusion

Two different salesmen are urging the world to purchase "climate insurance." One wants to sell a policy with an exorbitant premium to protect against a non-existent risk. The second, mostly political leaders, offers an expensive policy that provides zero protection against any risk. The Coalition's advice? Decline both offers.



## Endnotes

1. National Fire Protection Association, <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fires-by-property-type/residential/home-fires>.
2. Insurance Information Institute, <http://www.iii.org/fact-statistic/homeowners-and-renters-insurance>.
3. Planetary Science Institute, <https://www.psi.edu/epo/faq/meteor.html>.
4. President Obama, weekly radio address, Apr. 18, 2015.
5. U.S. Department of Transportation, Bureau of Transportation Statistics, [http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national\\_transportation\\_statistics/index.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/index.html).
6. Matthew Laker, "Specific Phobia: Flight", *Activitas Nervosa Superior* 54, no. 3–4 (2012), <http://www.activitas.org/index.php/nervosa/article/viewFile/138/175>.
7. Editorial, *British Medical Journal*, Nov. 15, 2007, <http://www.bmj.com/content/335/7628/1001>.
8. "Malaria", Centers for Disease Control and Prevention, <https://www.cdc.gov/malaria>.
9. "The Use of DDT in Malaria Vector Control: WHO Position Statement," World Health Organization, 2011, [http://apps.who.int/iris/bitstream/10665/69945/1/WHO\\_HTM\\_GMP\\_2011\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/69945/1/WHO_HTM_GMP_2011_eng.pdf).
10. National Aeronautics and Space Administration, Goddard Institute for Space Studies, <http://data.giss.nasa.gov/modelforce/ghgases/Fig1A.ext.txt>.
11. "Global Climate Change, Vital Signs of the Planet," National Aeronautics and Space Administration, <http://climate.nasa.gov/vital-signs/global-temperature>.
12. National Aeronautics and Space Administration, <http://climate.nasa.gov/evidence>.
13. "Lung Cancer Fact Sheet," American Lung Association, <http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/lung-cancer/learn-about-lung-cancer/lung-cancer-fact-sheet.html>.
14. Statistical Review of World Energy, BP, 2016, <http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.
15. "World DataBank," World Bank, <http://databank.worldbank.org/data/download/GDP.pdf>.
16. Bruce M. Everett, "Are Fossil Fuels Subsidized?" Working Paper, The Fletcher School, Tufts University.
17. "Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2016," Energy Information Administration, [http://www.eia.gov/forecasts/aeo/assumptions/pdf/table\\_8.2.pdf](http://www.eia.gov/forecasts/aeo/assumptions/pdf/table_8.2.pdf).
18. "Gasoline Prices Around the World: The Real Cost of Filling Up," Bloomberg, Jul. 18, 2016, <http://www.bloomberg.com/graphics/gas-prices>.
19. "Fossil Fuel Support," Organisation for Economic Co-operation and Development, [http://stats.oecd.org/Index.aspx?DataSetCode=FFS\\_AUS](http://stats.oecd.org/Index.aspx?DataSetCode=FFS_AUS).
20. British thermal unit—equal to the amount of energy required to raise one pound of water by one degree Fahrenheit.
21. "Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2013," U.S. Department of Energy, Energy Information Administration, Mar. 23, 2015, <https://www.eia.gov/analysis/requests/subsidy>.



- 
22. "How Large Are Global Energy Subsidies?" International Monetary Fund, 2015, [www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf#page=7&zoom=auto,-170,420](http://www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf#page=7&zoom=auto,-170,420).
  23. "U.S. Federal Poverty Guidelines Used to Determine Financial Eligibility for Certain Federal Programs," U.S. Department of Health and Human Services, Office of The Assistant Secretary for Planning and Evaluation, <https://aspe.hhs.gov/poverty-guidelines>.
  24. World Bank, <http://povertydata.worldbank.org/poverty/country/CHN>.
  25. "Poverty and Equity, Country Dashboard, China" World Bank, [http://data.un.org/Data.aspx?d=WDI&f=Indicator\\_Code%3ASP.DYN.LE00.IN](http://data.un.org/Data.aspx?d=WDI&f=Indicator_Code%3ASP.DYN.LE00.IN).
  26. Kam Wing Chan, "China, Internal Migration", University of Washington, 2011.
  27. "Statistical Review of World Energy," BP, 2016, <http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.
  28. Remarks by President Obama in Press Conference after GCC Summit, May 14, 2015, <https://www.whitehouse.gov/the-press-office/2015/05/14/remarks-president-obama-press-conference-after-gcc-summit>.
  29. "Synthesis Report, Summary for Policy Makers," U.N. Intergovernmental Panel on Climate Change, 2014, [https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5\\_SYR\\_FINAL\\_SPM.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf).
  30. "Statistical Review of World Energy, 2016," BP, <http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.
  31. "International Energy Outlook, 2016," U.S. Department of Energy, Energy Information Administration, <http://www.eia.gov/forecasts/ieo/pdf/appa.pdf>.
  32. Climate Action Tracker, <http://climateactiontracker.org/countries/china.html>.
  33. "GDP at Market Prices (Constant 2010 US\$)," World Bank, <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD>.
  34. "Global Economic Prospects: Divergences and Risks," World Bank, 2016, <http://www.worldbank.org/en/publication/global-economic-prospects>.
  35. "Current Wisdom: We Calculate, You Decide—A Handy-Dandy Carbon Tax Temperature-Savings Calculator," Cato Institute, <http://www.cato.org/blog/current-wisdom-we-calculate-you-decide-handy-dandy-carbon-tax-temperature-savings-calculator>.
  36. "Injury Facts, 2015 Edition," National Safety Council, [http://www.nsc.org/Membership%20Site%20Document%20Library/2015%20Injury%20Facts/NSC\\_InjuryFacts2015Ed.pdf](http://www.nsc.org/Membership%20Site%20Document%20Library/2015%20Injury%20Facts/NSC_InjuryFacts2015Ed.pdf).
  37. National Safety Council, 'Injury Facts, 2015 Edition', at [http://www.nsc.org/Membership%20Site%20Document%20Library/2015%20Injury%20Facts/NSC\\_InjuryFacts2015Ed.pdf](http://www.nsc.org/Membership%20Site%20Document%20Library/2015%20Injury%20Facts/NSC_InjuryFacts2015Ed.pdf)
  38. "Monthly Energy Review," U.S. Department of Energy, Energy Information Administration, Aug. 2016, [http://www.eia.gov/totalenergy/data/monthly/pdf/sec1\\_3.pdf](http://www.eia.gov/totalenergy/data/monthly/pdf/sec1_3.pdf).
  39. "National Air Quality: Status and Trends of Key Air Pollutants," U.S. Environmental Protection Agency, <https://www.epa.gov/air-trends>.
  40. "Ambient (Outdoor) Air Pollution in Cities Database 2014 Measured by PM2.5," World Health Organization, [http://www.who.int/phe/health\\_topics/outdoorair/databases/cities-2014/en](http://www.who.int/phe/health_topics/outdoorair/databases/cities-2014/en).





## CO2 Coalition Board of Directors

**Bruce Everett, PhD:** Faculty, Tufts University's Fletcher School; over forty years of experience in the international energy industry. (Moved from Advisory Committee)

**Will Happer, PhD:** Cyrus Fogg Brackett Professor of Physics (emeritus) Princeton University, former Director Office of Energy Research Director of Research, U.S. Department of Energy, co-founder Magnetic Imaging Technologies.

**Richard Lindzen, PhD:** Emeritus Alfred P. Sloan Professor of Meteorology, member National Academy of Sciences, fellow of the American Meteorological Society and American Association for the Advancement of Science, author of 200 scientific articles and books.

**Patrick Moore, PhD:** Co-founder and 15-year leader of Greenpeace (1971-1986). Chairman and Chief Scientist, Ecosense Environmental. Leader, Campaign to Allow Golden Rice Now.

**Rodney Nichols:** former Chief Executive Officer of the New York Academy of Sciences; Scholar-in-Residence at the Carnegie Corporation of New York, former Executive Vice President Rockefeller University.

**Norman Rogers:** Founder of Rabbit Semiconductor company; policy advisor to The Heartland Institute; member of the American Geophysical Union and the American Meteorological Society.

**Harrison Schmitt, PhD:** geologist, astronaut and last man to walk the moon (Apollo 17), adjunct professor physics University of Wisconsin-Madison, and former U.S. Senator from New Mexico.

**Leighton Steward:** geologist, former Chairman, Louisiana Land and Exploration Company; chair, Institute for the Study of Earth and Man Southern Methodist University, author.

### *Founder*

**Roger Cohen, PhD:** fellow of the American Physical Society. Former Manager Strategic Planning Exxon-Mobil Research and Engineering.



## CO2 Coalition Advisory Committee

**Larry Bell, PhD:** Professor University of Houston, established the research program in space architecture, author of *Climate of Corruption: Politics and Power Behind the Global Warming Hoax*.

**Edward Bohn, PhD:** Co-founder and first president of Tempres Technologies, Inc., former Director for Planning and New Business Ventures for the TRW Space and Defense Group; former nuclear reactor research scientist at Argonne National Laboratory

**Jan Breslow, MD:** Senior Attending Physician, Frederick Henry Leonhardt Professor, Laboratory of Biochemical Genetics and Metabolism, Rockefeller University.

**Bruce Everett, PhD:** faculty Tufts University's Fletcher School, over forty years of experience in the international energy industry.

**Gordon Fulks, PhD:** University of Chicago Laboratory for Astrophysics, Mission Research Corporation, Corbett, Oregon.

**Kathleen Hartnett-White:** distinguished fellow and director of the Armstrong Center for Energy and the Environment, Texas Public Policy Foundation, former chair Texas Commission on Environmental Quality.

**Craig Idso, PhD:** founder Center for the Study of Carbon Dioxide and Global Change, member American Association for the Advancement of Science, American Geophysical Union, and the American Meteorological Society.

**Wallace Manheimer, PhD:** Naval Research Laboratory, Plasma Physics Division (retired).

**Pat Michaels, PhD:** director of the Center for the Study of Science, Cato Institute, past president American Association of State Climatologists, former Virginia state climatologist, program chair American Meteorological Society.

**Mark Mills:** senior fellow Manhattan Institute, CEO Digital Power Group, a tech-centric capital advisory group, faculty Fellow McCormick School of Engineering and Applied Science at Northwestern University.

**Norman Rogers:** founder of Rabbit Semiconductor company, policy advisor to The Heartland Institute, member of the American Geophysical Union and the American Meteorological Society.

**Roy Spencer, PhD:** Principal Research Scientist at the University of Alabama Huntsville; served as Senior Scientist for Climate Studies at NASA's Marshall Space Flight Center; co-developer of satellite temperature measurement system.

**Lorraine Yapps Cohen:** former communications & marketing manager ExxonMobil, columnist Examiner newspapers.

Published October 2016

The Mission of the Coalition is to promote an understanding of the beneficial role of Carbon Dioxide (CO<sub>2</sub>) to life on Earth. There is a critical need to counter the demonization of CO<sub>2</sub>. Scientific evidence shows that more CO<sub>2</sub> is benefitting life on Earth that the additional greenhouse warming it produces will be modest and beneficial. Computer predictions of harmful effects have already been invalidated by recent observations and by geological history.

To achieve Coalition objectives, it will enlist individuals with the expertise to effectively and objectively refute the assertions of climate alarmists and to demonstrate the benefits of CO<sub>2</sub> and fossil energy.



**CO<sub>2</sub> COALITION**

1621 North Kent Street, Suite 603  
Arlington, Virginia 22209  
[www.co2coalition.org](http://www.co2coalition.org)  
[info@co2coalition.org](mailto:info@co2coalition.org)  
571-970-3180





CO2 COALITION