

**S**CIENTISTS have been warning the world for years about the climate dangers linked to our continued heavy reliance on fossil fuels. Why haven't policymakers heeded their warnings and acted long ago? The answer lies in the fossil fuel industry's successful campaign to obfuscate the causes and effects of global climate change. This effort has been modeled on cigarette companies' efforts to convince Americans that tobacco is not a health hazard. It operated to sow doubt about climate change through a network of prominent proxy organizations. The leaders included people who had fought pesticide, asbestos, and chlorofluorocarbon regulation.

From denial of global warming, the industry now has shifted to claiming that, while climate change may be real, it remains controversial, gradual, and, above all, far too costly to fix. Such divisive tactics have brought us to an impasse: national and international policy processes virtually have been paralyzed, with significant portions of the American public deeply confused about critical climate issues. We thus have been left vulnerable to extreme weather, as epitomized by 2012's Superstorm Sandy.

In the political arena, the energy company campaign not only succeeded in confusing facts about climate change, but managed to undermine U.S. participation in the 1997 Kyoto Protocol, a precedent-setting international climate protection treaty. The fossil fuel industry achieved this political triumph by providing the arguments that were used in turning congressional sentiment against the Protocol.

Earlier, in 1993, industry opposition halted the Clinton Administration's efforts to pass a modest tax on the energy content of fuels, which would have helped control carbon emissions. This intervention set back the nation's efforts to control its emissions by at least 20 years.

The industrial opposition to climate science and climate-safe energy policies has grown more sophisticated over the past decade. The campaign operates through dozens of industry-funded institutes, policy centers, councils, research foundations, and societies that speak for industry on climate and energy.

The climate "skeptics," as they like to be called, include anti-government and -regulation conservatives and libertarians who oppose government action on ideological grounds. Their strategy often has been to hide ideologically based misrepresentations of climate science beneath a mantle of science. A review of scientific publications on climate, however, reveals that, whereas many thousands of high-quality scientific papers validated by peer review have been published documenting all phases of global warming, only a trivial number of dissenters who dispute the evidence have published in similar journals. Almost without exception, the deniers' reports appear in publications that are not peer reviewed, since their objections to climate science have been refuted repeatedly; thus, they are of little interest to responsible, well-respected scientific publications. Finally, the national academies of science of most na-

# HOT UNDER THE COLLAR OVER GLOBAL WARMING

BY JOHN J. BERGER

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tions of the world have passed resolutions affirming that we are warming the planet.

Although climate change is a scientific issue, it has been adopted as a "litmus test" issue by certain Republican Party spokesmen. Public opinion surveys show that more Republicans than Democrats characterize themselves as "climate skeptics." These individuals appear less focused on disparaging climate science than in the past, when climate science was less settled. Nowadays, they seem to have shifted tactics to focus more attention on defeating the environmental and energy policies implied by climate change concerns.

For instance, industrial critics of decisive action on climate change (such as the National Association of Manufacturers) made a case in Congress and with the public in 2009 that effective measures to reduce carbon emissions would bring economic disaster in the form of high tax-

es, lost jobs, lower productivity, and reduced competitiveness for the U.S. in world markets. Since their arguments were not gaining traction in the world of science, industry-funded think tanks then spent millions of dollars making their case against climate science to more gullible media members, government officials, opinion leaders, students, and the general public. Climate skeptics and their allies have become a major presence on the Internet, over radio, and on TV airwaves, as well as through industry-sponsored books, magazines, articles, reports, and press releases.

Anyone who uses an Internet search engine and enters terms commonly associated with climate change will be hard pressed to discern the truth amid the plethora of misleading information many of these organizations provide. Since some of the most effective arguments consist of deceptive statements wrapped in layers of truth,





it can be very challenging for students and others without advanced scientific training or sophisticated rhetorical and analytical skills to sift truth from falsity without investing lots of time.

Because of the resulting confusion over now clear-cut scientific issues, much of the public still denies global warming or does not take it seriously. For example, many believe industry-sponsored myths that we are in a natural warming cycle that has little or nothing to do with human influence, or that the scientific foundation for concern about climate change is uncertain and unproven.

Time is of the essence in keeping heat-trapping gas emissions from getting dangerously higher. A report to The World Bank by the Potsdam Institute for Climate Impact Research and Analytics concluded that the world is on a path to an average temperature rise of more than 7°F by 2100. This puts the climate at great risk of

reaching a “tipping point” at which large, irreversible climate changes amplify the initial human-induced warming in a positive feedback cycle to create uncontrollable planetary overheating.

The European Commission’s Joint Research Centre and PBL Netherlands Environmental Assessment Agency have found that human-induced global carbon dioxide emissions grew 45% from 1990-2010. According to the U.S. Department of Energy’s Energy Information Administration, global carbon emissions will be almost twice 1990 levels by 2035. This assumes continued increases in energy use and a failure to shift significantly from fossil to renewable energy. Acting promptly to lower emissions rates now, however, will reduce risk, provide economic benefits, and mitigate damage.

Of course, it is not enough merely to halt the increase in carbon dioxide emissions. The cli-

mate cannot tolerate the stabilization of carbon emissions at current levels without producing more powerful storms, tornadoes, droughts, and floods. Not only are current emissions rates too high, but even if we were to hold current emissions steady, which would be a big improvement, the concentration of carbon dioxide and other greenhouse gases in the atmosphere would continue to rise for hundreds of years, since they already are pouring into the atmosphere far faster than natural processes can remove them. Furthermore, even if the concentration of carbon dioxide magically could be lowered to a historically safe level, the Earth still would continue getting warmer for centuries because of stored heat the oceans will be releasing gradually.

It also should be clear that, if the concentration of carbon dioxide is stabilized at a level that substantially is above values found during the past 10,000 years, then that new atmosphere simply is not compatible with our continuing enjoyment of the familiar climate that has endured for all of recorded human history. If the carbon dioxide level in the atmosphere is abnormal, the climate will be abnormal. A stable—but elevated—concentration of carbon dioxide relative to the 10,000-year norm will force the temperature to rise.

About half of the carbon dioxide humans pump into the atmosphere is removed by natural processes in about 30 years, with about 30% staying in the atmosphere for a few hundred years, and about 20% remaining for thousands of years. By contrast, to get the atmospheric carbon dioxide level back to safer and more normal levels (300-350 parts per million) as quickly as possible, man-made carbon dioxide emissions virtually need to be eliminated.

That means shifting with all deliberate speed largely to noncarbon and carbon-neutral renewable energy systems, while actively removing carbon from the atmosphere into long-term storage and preventing its escape back into the air. However, we are nowhere near either a political consensus that this should be done, or the adoption of an action plan to accomplish it.

We must not assume that just because energy technology will advance the reduction of carbon emissions will become easier. Unless we alter our energy technology mix to rely more heavily on renewables as well as improve the efficiency with which we use energy, our children will have to make drastic cuts in fossil energy use on a shorter timetable—and without the benefit of today’s still relatively inexpensive fossil fuels for building the alternative global energy system needed.

Now that the key scientific facts are in, and the increasingly dire consequences of climate change are becoming more clear and alarming, it is unconscionable to continue circulating misleading, discredited information. People who knowingly do so need to be held accountable in the court of public opinion. ★

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*John J. Berger is author of Climate Change—The Dangers of Denial, from which this article is adapted.*