

CONGRESS MUST TAX CARBON

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If you take a quick look at the global temperature record over the past 15 years, you'd think that global warming has stopped, or at least slowed drastically, and that burning fossil fuels isn't a problem. But you'd be wrong. The atmosphere isn't warming as fast but the planet is still warming, with most of the heat going into the deep oceans. This is a result of natural cycles in ocean currents and winds. As these cycles continue, atmospheric temperatures will rise again because the cause of global warming, increased concentrations of carbon dioxide (CO₂) and other greenhouse gases in the atmosphere, has not been addressed.

Satellite measurements show clearly that more heat is coming into Earth from the sun than is leaving as outgoing radiation. We all know from experience that when more heat comes in than goes out, the temperature rises, and this is true of Earth just as it is true for any other object. The cause is the increased concentrations of greenhouse gases, which decrease outgoing radiation. It raises the temperature of the air, the land, and the oceans. It also melts the ice in Earth's ice caps and glaciers.

Even though we know that about 90 percent of the additional heat enters the oceans, surface air temperatures are used as evidence for global warming. This would be fine if the air temperature accurately reflected the heat content of the oceans, but it doesn't because of their depth and the huge amount of water contained in them.

The amount of heat transferred to the oceans is determined by the combined effects of winds and ocean currents and as these vary, the climate changes. One combination forms the El Niño-Southern Oscillation in the Pacific Ocean. During El Niño periods, Earth's surface is warmer and during the opposite La Niña phase, it is cooler. A major El Niño event occurred in 1997-98, resulting in a record high global mean temperature that wasn't surpassed until 2010 when another major event occurred.

Unlike ENSO, which occurs with a frequency of 5 to 7 years, several other oscillations occur over periods of decades. These include the Atlantic Multidecadal Oscillation, and the Pacific Decadal Oscillation. These influence sea level pressure as well as sea surface temperature so they affect both trade winds and up-wellings from the deep ocean, as well as the down-wellings that help transfer heat to the deep ocean.

Climate scientists are gaining a much better understanding of how these oscillations impact climate and the variability we see in it. For example, from 1943 to 1976 and from 1999 to the present, both periods of pauses in global warming, the PDO was in a negative phase. When it returned to a positive phase in 1977, rapid atmospheric warming was observed. Because of the continued buildup in CO₂ in the atmosphere during the current pause (from 368 to 398 parts per million), the imbalance between incoming and outgoing heat has increased. This means that once the PDO returns to a positive phase and a smaller fraction of incoming heat is stored in the oceans, Earth will be in for a rapid rise in air temperature. This will not be good for crops, for forests, for animals, or for people.

The only way to combat global warming and its associated climate change is to address the root cause, the increase in atmospheric CO₂ concentration caused by the burning of fossil fuels. This needs to be done globally, but because the USA has contributed more CO₂ than any other nation, the world looks to us to take the lead.

Although a legislative approach to reducing CO2 emissions is preferable, Congress has failed to act, and thus the EPA is acting through regulation. This would not be necessary if Congress would enact a steadily increasing revenue-neutral carbon tax. Passing such a tax would make the price of fossil fuels reflect their true cost to society, including health and environmental effects, as well as global warming and climate change. It would allow market forces to solve the problem. Call on Congress to act.

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