

## Energy - Docket Optical System

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**From:** Francis Brandt [f.brandt@att.net]  
**Sent:** Sunday, May 12, 2013 3:26 PM  
**To:** Dana Hull; Green, Lynette@Energy  
**Subject:** Fw: Opposing Views on CO2 Concentrations in the Atmosphere(A-D)

Dana please pass on to Paul Rogers  
Lynetter please pass on to CEC Commissioners

----- Forwarded Message -----

**From:** ROGER BAIRD <rogbaird@pacbell.net>  
**To:** Roger and Donna Baird <rogbaird@pacbell.net>  
**Sent:** Sat, May 11, 2013 10:48:36 PM  
**Subject:** Opposing Views on CO2 Concentrations in the Atmosphere(A-D)

California Energy Commission

**DOCKETED**

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**MAY 15 2013**

**Dear Nuclear Folks and Others Interested in Atmospheric Phenomena:**

I have backed away from bringing articles to your attention related to CO2 concentrations in the earth's atmosphere and associated global warming. However, there have been a few articles lately that seem important to forward that highlight the issues. The following two articles seem diametrically opposed in the conclusions they induce in the reader. Seth Borenstein's article reports a measurement of 400 parts per million of CO2 in Hawaii "an amount never before encountered by humans". And he quotes Al Gore "we have been recklessly polluting the protective sheath of atmosphere that surrounds the Earth and protects the conditions that have fostered the flourishing of our civilization".

Then we read in the May 9th issue of the Wall Street Journal in an article by William Happer and Harrison Schmitt: "the conventional wisdom about carbon dioxide is that it is a dangerous pollutant. That's simply not the case. Contrary to what some would have us believe, increased carbon dioxide in the atmosphere will benefit the increasing population on the planet by increasing agricultural productivity." Further "The demonized chemical compound is a boon to plant life and has little correlation with global temperature".

The issue of global temperature correlation with CO2 concentration is definitely not settled and in a separate e-mail I have included a graph to illustrate the divergence of models vs reality. Please take a look.

Finally, the third article included below is an editorial from the Wall Street Journal which reports the collapse of the EU program for cap and trade for carbon emissions when the European Parliament rejected carbon price-fixing. As I recall, the State of California has a cap and trade program. It seems we Californians

should re-think the wisdom of a cap and trade program. As the Journal points out "Anticarbon crusaders never give up, however, so they wanted the (European)Parliament to intervene to prop up permit prices. They want higher-than-market prices for fossil fuels because they know that is only way they can force the production of renewable energy that is otherwise uncompetitive. The Parliament majority rightly judged that raising energy prices for companies and households is ludicrous when Europe is barely growing as it is." Are we Californians paying attention? Maybe we should change our path to higher energy prices and the potential for carbon taxation.

Roger

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## Greenhouse gas milestone; CO2 levels set record

**AP** By *SETH BORENSTEIN* | Associated Press – (Friday May 10, 2013)

WASHINGTON (AP) — Worldwide levels of the chief greenhouse gas that causes global warming have hit a milestone, reaching an amount never before encountered by humans, federal scientists said Friday.

Carbon dioxide was measured at 400 parts per million at the oldest monitoring station which is in Hawaii sets the global benchmark. The last time the worldwide carbon level was probably that high was about 2 million years ago, said Pieter Tans of the National Oceanic and Atmospheric Administration.

That was during the Pleistocene Era. "It was much warmer than it is today," Tans said. "There were forests in Greenland. Sea level was higher, between 10 and 20 meters (33 to 66 feet)."

Other scientists say it may have been 10 million years ago that Earth last encountered this much carbon dioxide in the atmosphere. The first modern humans only appeared in Africa about 200,000 years ago.

The measurement was recorded Thursday and it is only a daily figure, the monthly and yearly average will be smaller. The number 400 has been anticipated by climate scientists and environmental activists for years as a notable indicator, in part because it's a round number — not because any changes in man-made global warming happen by reaching it.

"Physically, we are no worse off at 400 ppm than we were at 399 ppm," Princeton University climate scientist Michael Oppenheimer said. "But as a symbol of the painfully slow pace of measures to avoid a dangerous level of warming, it's somewhat unnerving." Environmental activists, such as former Vice President Al Gore, seized on the milestone.

"This number is a reminder that for the last 150 years — and especially over the last several decades — we have been recklessly polluting the protective sheath of atmosphere that surrounds the Earth and protects the conditions that have fostered the flourishing of our civilization," Gore said in a statement. "We are altering the composition of our atmosphere at an unprecedented rate."

Carbon dioxide traps heat just like in a greenhouse and most of it stays in the air for a century; some lasts for thousands of years, scientists say. It accounts for three-quarters of the planet's heat-trapping gases. There are others, such as methane, which has a shorter life span but traps heat more effectively. Both trigger temperatures to rise over time, scientists say, which is causing sea levels to rise and some weather patterns to change.

When measurements of carbon dioxide were first taken in 1958, it measured 315 parts per million. Some scientists and environmental groups promote 350 parts per million as a safe level for CO<sub>2</sub>, but scientists acknowledge they don't really know what levels would stop the effects of global warming.

The level of carbon dioxide in the air is rising faster than in the past decades, despite international efforts by developed nations to curb

it. On average the amount is growing by about 2 parts per million per year. That's 100 times faster than at the end of the Ice Age. Back then, it took 7,000 years for carbon dioxide to reach 80 parts per million, Tans said. Because of the burning of fossil fuels, such as oil and coal, carbon dioxide levels have gone up by that amount in just 55 years.

Before the Industrial Revolution, carbon dioxide levels were around 280 ppm, and they were closer to 200 during the Ice Age, which is when sea levels shrank and polar places went from green to icy. There are natural ups and downs of this greenhouse gas, which comes from volcanoes and decomposing plants and animals. But that's not what has driven current levels so high, Tans said. He said the amount should be even higher, but the world's oceans are absorbing quite a bit, keeping it out of the air.

"What we see today is 100 percent due to human activity," said Tans, a NOAA senior scientist. The burning of fossil fuels, such as coal for electricity and oil for gasoline, has caused the overwhelming bulk of the man-made increase in carbon in the air, scientists say.

The world pumps on average 2.4 million pounds of carbon dioxide into the air every second for a total of 38.2 billion tons in 2011, according international calculations published in a scientific journal in December. China spews 10 billion tons of carbon dioxide into the air per year, leading all countries, and its emissions are growing about 10 percent annually. The U.S. at No. 2 is slowly cutting emissions and is down to 5.9 billion tons per year.

The speed of the change is the big worry, said Pennsylvania State University climate scientist Michael Mann. If carbon dioxide levels go up 100 parts per million over thousands or millions of years, plants and animals can adapt. But that can't be done at the speed it is now happening.

Last year, regional monitors briefly hit 400 ppm in the Arctic. But those monitoring stations aren't seen as a world mark like the one at Mauna Loa, Hawaii.

Generally carbon levels peak in May then fall slightly, so the yearly average is usually a few parts per million lower than May levels.

Online:

NOAA monitoring at Mauna Loa:

<http://www.esrl.noaa.gov/gmd/ccgg/trends/weekly.html>

Seth Borenstein can be followed at <http://twitter.com/borenbears>

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## Harrison H. Schmitt and William Happer: In Defense of Carbon Dioxide

*The demonized chemical compound is a boon to plant life and has little correlation with global temperature.*

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By [HARRISON H. SCHMITT](#) [AND WILLIAM HAPPER](#)

Of all of the world's chemical compounds, none has a worse reputation than carbon dioxide. Thanks to the single-minded demonization of this natural and essential atmospheric gas by advocates of government control of energy production, the conventional wisdom about carbon dioxide is that it is a dangerous pollutant. That's simply not the case. Contrary to what some would have us believe, increased carbon dioxide in the atmosphere will benefit the increasing population on the planet by increasing agricultural productivity.

The cessation of observed global warming for the past decade or so has shown how exaggerated NASA's and most other computer predictions of human-caused warming have been—and how little correlation warming has with concentrations of atmospheric carbon dioxide. As many scientists have pointed out, variations in global temperature correlate much better with solar activity and with complicated cycles of the oceans and atmosphere. There isn't the slightest evidence that more carbon dioxide has caused more extreme weather.

The current levels of carbon dioxide in the earth's atmosphere, approaching 400 parts per million, are low by the standards of geological and plant evolutionary history. Levels were 3,000 ppm, or more, until the Paleogene

period (beginning about 65 million years ago). For most plants, and for the animals and humans that use them, more carbon dioxide, far from being a "pollutant" in need of reduction, would be a benefit. This is already widely recognized by operators of commercial greenhouses, who artificially increase the carbon dioxide levels to 1,000 ppm or more to improve the growth and quality of their plants.

Using energy from sunlight—together with the catalytic action of an ancient enzyme called rubisco, the most abundant protein on earth—plants convert carbon dioxide from the air into carbohydrates and other useful molecules. Rubisco catalyzes the attachment of a carbon-dioxide molecule to another five-carbon molecule to make two three-carbon molecules, which are subsequently converted into carbohydrates. (Since the useful product from the carbon dioxide capture consists of three-carbon molecules, plants that use this simple process are called C3 plants.) C3 plants, such as wheat, rice, soybeans, cotton and many forage crops, evolved when there was much more carbon dioxide in the atmosphere than today. So these agricultural staples are actually undernourished in carbon dioxide relative to their original design.

[Enlarge Image](#)



Corbis

At the current low levels of atmospheric carbon dioxide, rubisco in C3 plants can be fooled into substituting oxygen molecules for carbon-dioxide molecules. But this substitution reduces the efficiency of photosynthesis,

especially at high temperatures. To get around the problem, a small number of plants have evolved a way to enrich the carbon-dioxide concentration around the rubisco enzyme, and to suppress the oxygen concentration. Called C4 plants because they utilize a molecule with four carbons, plants that use this evolutionary trick include sugar cane, corn and other tropical plants.

Although C4 plants evolved to cope with low levels of carbon dioxide, the workaround comes at a price, since it takes additional chemical energy. With high levels of carbon dioxide in the atmosphere, C4 plants are not as productive as C3 plants, which do not have the overhead costs of the carbon-dioxide enrichment system.

That's hardly all that goes into making the case for the benefits of carbon dioxide. Right now, at our current low levels of carbon dioxide, plants are paying a heavy price in water usage. Whether plants are C3 or C4, the way they get carbon dioxide from the air is the same: The plant leaves have little holes, or stomata, through which carbon dioxide molecules can diffuse into the moist interior for use in the plant's photosynthetic cycles.

The density of water molecules within the leaf is typically 60 times greater than the density of carbon dioxide in the air, and the diffusion rate of the water molecule is greater than that of the carbon-dioxide molecule.

So depending on the relative humidity and temperature, 100 or more water molecules diffuse *out* of the leaf for every molecule of carbon dioxide that diffuses *in*. And not every carbon-dioxide molecule that diffuses into a leaf gets incorporated into a carbohydrate. As a result, plants require many hundreds of grams of water to produce one gram of plant biomass, largely carbohydrate.

Driven by the need to conserve water, plants produce fewer stomata openings in their leaves when there is more carbon dioxide in the air. This decreases the amount of water that the plant is forced to transpire and allows the plant to withstand dry conditions better.

Crop yields in recent dry years were less affected by drought than crops of the dust-bowl droughts of the 1930s, when there was less carbon dioxide. Nowadays, in an age of rising population and scarcities of food and water in some regions, it's a wonder that humanitarians aren't clamoring for more atmospheric carbon dioxide. Instead, some are denouncing it.

We know that carbon dioxide has been a much larger fraction of the earth's atmosphere than it is today, and the geological record shows that life flourished on land and in the oceans during those times. The incredible list of supposed horrors that increasing carbon dioxide will bring the world is pure belief disguised as science.

*Mr. Schmitt, an adjunct professor of engineering at the University of Wisconsin-Madison, was an Apollo 17 astronaut and a former U.S. senator from New Mexico. Mr. Happer is a professor of physics at Princeton University and a former director of the office of energy research at the U.S. Department of Energy.*

*A version of this article appeared May 9, 2013, on page A19 in the U.S. edition of The Wall Street Journal, with the headline: In Defense of Carbon Dioxide.*

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# Cap and Trade Collapses

**Even the European Parliament rejects carbon price-fixing.**

THE WALL STREET JOURNAL.

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# Cap and Trade Collapses

**Even the European Parliament rejects carbon price-fixing.**

One of the great policy bubbles of our times has been cap and trade for carbon emissions, and on Tuesday it may have popped for good. The European Parliament refused to save the EU's failing program, which is the true-believer equivalent of the pope renouncing celibacy. The Parliament in Strasbourg voted 334-315 (with 63 abstentions) against propping up the price of carbon credits in the EU Emissions Trading System. The failed proposal would have delayed the scheduled sale of 900 million ETS permits over the next seven years, thereby suppressing supply. After carbon traders realized they weren't getting more artificial scarcity, they drove the price of emissions permits down by 40% at one point on Tuesday. EU carbon permit prices have collapsed as the Continent's economic crisis curbs energy demand. Utilities and industrial firms have less need to emit CO2 above their statutory limits. Total emissions in the EU fell by nearly 10% between 2007-2011, according to the most recent data. The low price of carbon allowances is good for consumers who don't have to absorb the extra regulatory cost in what they pay for energy. Anticarbon crusaders never give up, however, so they wanted the Parliament to intervene to prop up permit prices. They want higher-than-market prices for fossil fuels because they know that is only way they can force the production of renewable energy that is otherwise uncompetitive. The Parliament majority rightly judged that raising energy prices for companies and households is ludicrous when Europe is barely growing as it is. This failed political intervention also gives the lie to the claim that cap and trade is a "market solution" to climate change. Proponents only like the market in permits when it keeps carbon emissions prices high. Cap and trade is an attempt to use brute political force to limit the supply of carbon energy. All of which vindicates the Bush Administration and others who opposed cap and trade in the Kyoto Protocol. Aided by Al Gore, Europe tried to turn cap and trade into a global policy. The hot air started to go out of Kyoto after its early backers refused to implement job-killing legislation to meet emissions targets. It lost further support when it became clear that financial firms were gaming the system. With the U.S. shale fracking revolution, it's now clear that the fastest way to reduce greenhouse gases is to let private drillers expand natural gas production. When even Europe recognizes the folly of artificially raising energy prices, the anticarbon obsessives have lost in their own climate-change temple. A version of this article appeared April 20, 2013, on page A14 in the U.S. edition of The Wall Street Journal, with the headline: Cap and Trade Collapses.