

Borrello- Carbon dioxide effect constant, irrespective of concentration

CARBON DIOXIDE CONSTANT: A LETTER IN THE DALLAS MORNING NEWS

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> Clark Whelton [cwhelton@mindspring.com]

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> Dallas Morning News

> Sunday Letters,

> page 3P, March 4, 2007:

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> Carbon Dioxide Constant

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> ... I did research on carbon dioxide infrared absorption about 10 years ago

> for Texas Instruments and Raytheon as a carbon dioxide detection project

> under contract to Carrier Corp.

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> The importance of carbon dioxide to global heat retention can be determined

> by examining the atmospheric infrared absorption data reported on by the

> Environmental Research Institute of Michigan more than 50 years ago.

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> Its data show that carbon dioxide absorbs 8 percent of the heat radiated by

> our planet, and that the absorption is complete in a path length of only 300

> meters. Thus the overall heat retention of carbon dioxide is 8 percent.

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> Since the heat absorption is complete for carbon dioxide in its absorption

> band, adding more carbon dioxide to the atmosphere does not increase its

> global heat retention effect. Carbon dioxide gives us a constant warming

> effect over a wide range of concentration, which now is about 380 parts

> carbon dioxide to one million parts of air. The point is that carbon

> dioxide's "greenhouse effect" is constant and cannot increase with more

> carbon dioxide. It has been constant for millions of years.

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> Sebastian Borrello

> Allen, Texas

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From: [J.E.Tilsley](#)

To: [Norm Kalmanovitch](#)

Sent: Friday, March 23, 2007 10:42 PM

Subject: Re: CO2 and its greenhouse contribution

I have sent a request to Mr Borrello for the data he alludes to in this letter to the Dallas Morning News, published on March 4th, 2007.

Clark Whelton gave me a rather complicated routine to contact him, so expect there may be some delay in receiving a reply.

If we review his text as set out below there are several rather interesting implications.

1. The data we need has been available for 50 years.
2. The long-wave IR attenuated by CO2 is 8% of the re-radiated long wave IR.

3. The IR in the band width attenuated by CO2 is 'trapped' within 300m of the radiating source (the 'ground')

This suggests that only the first ~1000 feet of the atmosphere would be heated courtesy of CO2. I wonder if that factor is in any GCMs?

- 4 8% of the GHE of 33°C would be 2.64°C.

- 5 This would fit very well with the graph given in the attachment - I'll try to paste it here as well:

(Sometimes this works - sometimes the graph does not transmit)

GHG Forcing

unknown.gif "

The above graph shows total downward forcing due to all greenhouse gasses in the atmosphere (the blue line) plotted against increasing CO2 content.

A rough conversion of watts/m2 to greenhouse temperature - (remember that the global temperature would be -18°C without the approximately +33°C difference

due to greenhouse gasses): $258/33 = 7.8$ watts/square metre for each degree of greenhouse temperature rise.

Why is CO2 not the most important greenhouse gas?:

Because water vapour does that job. CO2 may be responsible for as much as 2.6°C of the total ~33°C greenhouse effect.

Why would doubling of the CO2 concentration in the atmosphere not lead to doubling of CO2's contribution to the GHE?:

Because the GHE of CO2 is not linear. This is due to saturation of the one 'heat-trapping' band it

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Borrello: **Carbon dioxide as a greenhouse gas**

From: [SEBASTIAN BORRELLO](#)

To: J.Tilsley@aci.on.ca

Sent: Friday, March 23, 2007 11:07 PM

From the absorption model (Beer's Law) and the measured value of the normalized absorption length (nal) (from standard spectroscopy data) one can calculate the absorption by CO2 as a function of path length through the atmosphere. The value of nal for CO2 is approximately 1E5 cm ppm in both the 4.2 micron band and the 13.5 to 15.5 micron band. It is a strong absorber in these bands and transparent elsewhere. But one can go directly to the published Yates and Taylor data for absorption by CO2 and gauge its effects as a greenhouse gas.

According to the atmospheric transmission data (H.W. Yates and J. H. Taylor, "Infrared Transmission of the Atmosphere," U.S. Naval Research Laboratory, Washington, DC, NRL Report 5453, 1960) carbon dioxide has a very strong absorption band between 13.5 and 15.5 microns wavelength. Earth radiates as a blackbody with a mean surface temperature near 300K and has a peak energy wavelength at 10 microns. Earth's radiation energy in the 13.5 to 15.5 band is 8.4% of Earth's total blackbody radiation. Since CO2 absorbs all radiation in this band it absorbs and reradiates 8.4% of the total energy within 200 meters of the surface. Adding more CO2 does not increase this effect because it is at its maximum. Using the absorptivity function (Beer's Law) for a gas, CO2 would only begin to lose this impact if CO2 concentration dropped below a few parts per million. It has been above

200 ppm for over a million years according to geophysicists. Thus I claim the heat retention as a percentage of Earth's total radiation by CO2 is constant. Since water vapor clouds have such a high impact on day and night temperatures, I would study the clouds to see if the day to night ratio is slowly decreasing.

You can find the Yates and Taylor absorption curves in "The Infrared Handbook," published by The Infrared and Analysis Center, Environmental Research Institute of Michigan, 1978, Page 5-92. They published a revised handbook in the 1980s.

I hope this is of some help to you.

Sincerely,

Sebastian Borrello

TI retiree, 1994, consulting gas sensors until 1998.

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from Jim Tilsley: 24/3/07

I have proposed 'Borrello's Constant' for the observation. Perhaps it should be 'Limit' or 'Limits' since the effect has a fuzzy element and there is some 'edge effect' associated with increase in CO2 concentration. For all practical applications the generalization of 'Constant' may apply, but purists could argue about the words - such as lawyers are prone to do - reduce reality to words and then argue about the words.

If we were to fly an IR spectrometer over, say, an abandoned airport at a low altitude - 10 metres - and then make several passes at progressively higher altitudes - 100m, 200m, 300m and higher if necessary - on a still day, we should see a decrease in the intensity of IR radiation in the CO2 attenuation band(s).

If we could confirm Borrello's 'Limit' by this method we would have powerful evidence to put up against the warmers and the opportunists.

Comments??