Fact or Fiction?

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Carbon Dioxide and Climate Change

Since 1900, the Earth has warmed by 0.5°C (0.9°F) and continued increases are predicted. Is this as serious as the doomsayers would have us believe? If you accept what you read in the newspapers or hear on TV, we are in deep trouble. But are we really, and is carbon dioxide the culprit? Here is some information you may have not heard from the doomsayers, and then if you are still concerned, some new ways to help minimize CO_2 generation are presented.

Most folks attribute the rise in temperature to growth in fossil fuel usage. However, the temperature data don't support this fact. About half of the observed warming took place before 1940, yet it wasn't until after 1940 that the amounts of greenhouse gases produced by fossil fuel burning rose rapidly as a result of the heavy industrial expansion of World War II and the postwar boom, reports Jack Hollander.[1]

In fact, during the period from about 1940 to 1980, which saw a rapid increase in fossil fuel burning, global surface temperatures actually went into a slight cooling trend rather than an acceleration in temperature. Perhaps some of you remember that time. Richard Lindzen notes, "The global cooling trend of the 1950s and 1960s led to a minor global cooling hysteria in the 1970s."[2]

We were headed for an ice age! Here's what Newsweek added in 1975: "There are ominous signs that the earth's weather patterns have begun to change dramatically and that these changes may portend a drastic decline in food production—with serious political implications for just about every nation on earth. The drop in food output could begin quite soon, perhaps only ten years from now."[3] Although the ice age didn't come, the three consecutive winters ending in 1979 were the worst string of winters in the modern American record.[4]

And, here we are less than 30 years later worrying about runaway temperature increases. Not everyone believes this is as severe as we've been told, nor does everyone agree that carbon dioxide is the culprit. If you look at the timetable of the Earth's 4.5 billion year history, apes were transmogrified into humans some 20 seconds ago, and modern civilization into existence in less than 1/10 of a second. So, 30 years (even 100 years) for a massive weather change is considerably less than a blink of an eye in Mother Earth's history.[5]

Robert Essenhigh, Professor of Energy Conservation at Ohio State University, believes that global warming is not the result of human activity but a natural occurrence within a 100,000 year planetary cycle. He states that scientists have vastly underestimated the significance of water in the atmosphere as a radiation absorbing gas, and that humans are responsible for less than five percent of the atmospheric carbon dioxide. He does not believe this percentage can be driving the rise in temperature.[6] Essenhigh isn't the only one to suggest that carbon dioxide from human activities is low. C.R. de Freitas reports that carbon dioxide emissions are only about three percent of the natural cycle,[7] as does James Collman.[8] Think about this for a moment. Nature, via the belching of volcanoes and decay of plants, is responsible for sending about 200 billion tons of carbon dioxide into the atmosphere yearly, and this is nearly 30 times as much as we provide with our cars and factories.[9]

As I mentioned in a previous column, peat burning can also spew massive amounts of carbon into the atmosphere.[10] Emissions from the 1997–1998 wildfires in Indonesia consumed vast amounts of peat and released a total of 0.81 to 2.57 billion tons of carbon into the air. This amounts to 13 to 40 percent of the average annual amount produced globally from combustion of fossil fuels and contributed greatly to the largest annual increase in atmospheric carbon dioxide concentration detected since records began in 1957.[11]

What About Past History?

Patrick Michaels reports, "Some fossil records suggest the earth's carbon dioxide concentration in the geologic past was nearly 15 times what it is today, and yet the temperature was less than 10°C (18°F) warmer than today. Contrary to current hype, this planet cannot undergo a 'runaway' greenhouse effect from human emissions of carbon dioxide. We won't double carbon dioxide from its background value until late in this century (if we continue to intensively use fossil fuels, which is a dubious assumption for 100 years form now), and that's a far cry from a 15-fold increase."[12]

James Hansen, whom many credit with lighting the fire over the greenhouse issue in 1988, went on to write the following in the online journal *Natural Science* in 2003: "Emphasis on extreme scenarios may have been appropriate at one time, when the public and decision-makers were relatively unaware of the global warming issue. Now, however, the need is for demonstrably objective climate … scenarios consistent with what is realistic under current conditions."[13] Ho-hum—we've all heard this type of thing before. The way to get the attention of the masses and politicians is to scare the daylights out of them. If it bleeds, it leads.

Anyhow, if you subscribe to the 'extreme scenarios' and believe our human contribution is enough to tip the scales in favor of temperature increase, here are some things you can do to minimize CO_2 generation, other than the conventional items like driving energy-efficient cars, not burning fossil fuels, recycling, etc.

Suggestions To Minimize CO_2 Generation

Item 1—Read your daily newspaper via a handheld electronic device, such as a personal digital assistant (PDA). Two University of California researchers have estimated that production and disposal of a one year subscription to the New York Times is responsible for adding about 702 kg (>1,500 pounds) of carbon dioxide. Assuming 2.6 readers per copy, each reader is responsible for 270 kg of carbon dioxide per year. Receiving the news on a PDA results in the release of 32–140 times less CO_2, several orders of magnitude less NO_x and SO_x, and the use of 26–67 times less water. Carrying this a step further, wireless teleconferencing results in 1–3 orders of magnitude lower CO_2, NO_x and SO_2 emissions than business travel.[14]

Item 2—Start a protest movement directed at replacing all products of carbonated beverages, including soda pop, beer, and champagne with substitutes that are flat (no little bubbles). A bottle of soda pop has about two grams of carbon dioxide in it, and that amount will eventually be released into the atmosphere one way or another. This can translate into several hundred thousand tons of carbon dioxide every year.[15] So get out there and march in favor of requiring all producers of these products to sell them 'flat.'

Item 3—If you're planning a wedding follow the lead of John Peterson who said "I Do Minus the CO_2".[16] He and his wife-to-be decided to have a climate neutral-wedding. They wanted to balance the amount of CO_2 released into the atmosphere with all wedding-related activities with an equivalent reduction in CO_2. With the aid of students at Oberlin College they came up with the following carbon budget:

- Total expected attendees: 170
- Total guest travel by air: 208,760 miles = 42.6 tons of CO_2
- Total guest travel by car: 19,158 miles = 8.6 tons of CO_2
- Other activities (invitations, food, flowers, electricity, honeymoon, etc.) = 6.4 tons of CO_2
- Total carbon budget for the event: 58 tons of CO_2

Clearly, the largest single component of the budget was transporting family and friends across the country. As Peterson reports, "On average, almost a pound of CO_2 is released into the atmosphere for each mile driven per car or each mile flown per person."[16]

How did they balance a 58 ton carbon budget? Two weeks before the wedding they held a 70 person backyard wedding bash for all their local friends. This reduced the number of folks who had to travel to Cape Cod for the official ceremony. Then to show all guests how they could be part of the solution they provided each attendee with two gifts, a bag of wildflower seeds and an eleven watt compact fluorescent light. The seeds were sufficient to plant a 50 square foot meadow which would replace a patch of lawn with wildflowers and thereby reduce CO_2 emissions by decreasing lawn mower use. The fluorescent light would last as long as 13 incandescents and requires only 20 percent as much energy to power. Over the life of the bulb, this alone would save 50 tons.[16]

Item 4—to help reduce CO_2 related to cats. A previously unconsidered carbon sink is cat hair, which is almost entirely the protein keratin.[17] Peter Ades and Trevor Rock report that since protein is approximately 54% carbon, it is not difficult to calculate the amount of carbon that is trapped annually in feline hair, which serves as a 'carbon sink,' hence limiting the amount released into the atmosphere as CO_2. They estimate that a world population of approximately one billion cats, each shedding, about five grams/day prevents over three million kg of CO_2 from being released into the atmosphere. Therefore, the more cats, the less CO_2 generated.

So there you have it if you're concerned about CO_2 emissions. Personal actions you can take that are above and beyond all the conventional items include reading your newspaper using a personal digital assistant while you gaze at your backyard, formerly a lawn, but now a massive patch of wildflowers being roamed by 10 or more cats. If you are invited to a wedding, buy CO_2 friendly gifts via Future Forests (www.futureforests.com). Lastly, if you are planning to be married, rather than have a big bash, which will consume so much CO_2, simply elope.

References

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Correction

In the "Fact or Fiction" column that appeared in the March, 2005, issue of *P&SF*, an error appeared in the text under the sub-head "Only What Suits the Purpose." The column states the "1 ppm is equivalent to finding 1 second in 12 years." It should have stated that "1 ppm is equivalent to finding 1 second in 12 days."