Ohio Senate Considers Alternative Power Mandate

By E. Jay Donovan

The Ohio State Senate Energy and Public Works Committee is considering the pros and cons of a proposed alternative power mandate in the wake of recent hearings on the issue. The renewable power industry claimed such a mandate would fight global warming while creating wealth and new jobs for Ohioans. Heartland Institute Senior Fellow James M. Taylor, managing editor of Environment & Climate News, presented data from many of the world’s leading economists demonstrating the mandate would be a mere symbolic gesture.

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Scientists have cast doubt on high-profile accusations that industrial chemicals are causing an elevated number of cases of a rare disease, known as polycythemia vera (PV), in eastern Pennsylvania.

Chemicals Not to Blame for Cancer Cluster

By John Dale Dunn, M.D., J.D.

Scientists have cast doubt on high-profile accusations that industrial chemicals are causing an elevated number of cases of a rare disease, known as polycythemia vera (PV), in eastern Pennsylvania.

GAO: Renewable Fuels Receive Big Subsidies

By James M. Taylor

The share of federal energy subsidies received by renewable electricity production is far greater than its market share would justify, according to a study by the Government Accountability Office.

Questions Plague Efforts to Grow Wind Power Use

By Cheryl K. Chumley

Interest in wind power production seems to be on the rise, with recent numbers from the American Wind Energy Association (AWEA) predicting a continuing growth in wind power capacity.

Inside:

Robinson, Robinson, and Soon’s new critique of global warming alarmism

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Vaclav Klaus’s Presentation to the United Nations

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Global Warming

Free DVD Enclosed

Vaclav Klaus’s Presentation to the United Nations

Inside:

Robinson, Robinson, and Soon’s new critique of global warming alarmism
Welcome to this special issue of Environment & Climate News.

January would ordinarily be a “skip month” for ECN, but a last-minute development made us change our mind.

Three respected scientists, Arthur B. Robinson, Noah E. Robinson, and Willie Soon, have written a review article on climate change that is generating considerable “buzz” in the scientific community. The essay, published originally in the peer-reviewed Journal of American Physicians and Surgeons, could fundamentally change the world-wide debate on global warming.

Dr. Arthur Robinson is cofounder and professor of chemistry with the Oregon Institute of Science and Medicine and editor of Access to Energy, a highly respected and influential newsletter on energy and environmental topics. Dr. Robinson directed the Petition Project, which has obtained the support and signatures of more than 19,000 American scientists for a petition opposed to the hypothesis of anthropogenic global warming.

Dr. Noah Robinson is also professor of chemistry with the Oregon Institute of Science and Medicine and conducts research and coauthors books and articles with his father.

Dr. Willie Soon is an astrophysicist at the Solar and Stellar Physics Division of the Harvard-Smithsonian Center for Astrophysics, science director and contributor at Tech Central Station, and a fellow with the George C. Marshall Institute.

Their article appears in full on pages 6-17 of this special edition of ECN. We are thankful to the authors and Dr. Jane Orient, president of the Association of American Physicians and Surgeons, for permission to reprint it.

This is the first time in ECN’s 11-year history that an issue has been devoted largely to reprinting a scholarly article. If you take the time to read it—and of course, I urge you to do so—I think you’ll understand why we made this choice.

Global warming is mentioned in at least one article in nearly every daily newspaper in the U.S. nearly every day. The typical reader with little scientific background might easily believe that “the debate is over,” that human activity is causing global warming, and that something must be done soon to “stop global warming.”

The truth is, of course, much more complicated than that. More importantly, the truth also points in a very different direction. Most scientists believe most of the modern warming is of natural origin, not man-made. They believe the warming will be moderate and produce more beneficial than negative effects. And they believe there is little humans can do to alter the natural fluctuation of climate.

Robinson, Robinson, and Soon do a terrific job dissecting the myths and mistakes contained in the mainstream media’s portrayal of climate change issues. We hope that by reprinting their essay we change some minds on this important topic. This issue of ECN, like all previous issues, is available for free online in PDF and html formats at www.heartland.org.

More information about the Oregon Institute of Science and Medicine—and information about the aforementioned Petition Project—can be found at its Web site at www.oism.org. For information about the Association of American Physicians and Surgeons, please visit www.aaps.org.
Global Warming Health Fears Are Unsupported by Science

By James M. Taylor

University of Wisconsin-Madison professor Jonathan Patz published a paper in the November 12 issue of the journal EcoHealth asserting carbon dioxide emissions from the United States are causing great harm in the world’s poorest nations.

The paper claims global warming is devastating the world’s poorest children with the negative impacts of “climate-sensitive diseases, such as malaria, malnutrition, and diarrhea.”

In fact, however, science has proven none of these diseases has any significant link to global warming.

The spread of malaria, for example, is not constrained by cooler temperatures. Before the disease was effectively eradicated in the U.S. through the use of DDT in the mid-twentieth century, outbreaks occurred across the country, even as far north as Minnesota. Malaria outbreaks were common even in such northern climates as Canada, Scandinavia, and Siberia before the widespread use of DDT.

Malaria was also effectively eliminated throughout much of Africa just a few decades ago—until environmental activists had DDT banned because of scientifically flimsy environmental allegations. Now malaria is back with a vengeance, killing millions of Africans each and every year.

Similarly, malnutrition is caused by a lack of food, not a lack of cold weather. Far from hampering food production, the modest recent global warming has resulted in shrinking deserts, more global precipitation, moister soils, and record-setting crop production.

The September 18, 2002 issue of New Scientist reports, “Africa’s deserts are in ‘spectacular’ retreat” with farming becoming possible again in areas that were abandoned to the desert decades ago.

The January 1, 2007 issue of Geology reports under recent, warmer conditions Central Africa is “experiencing an unusually prolonged period of stable, wet conditions in comparison to previous centuries of the past millennium.” Moreover, “the patterns and variability of 20th century rainfall in central Africa have been unusually conducive to human welfare in the context of the past 1400 years,” Geology reports.

The final fear raised by the news release, diarrhea, is also not a temperature-dependent disease. Diarrhea among Third World children is most strongly linked to poor water quality, which can be addressed far more directly and effectively than by efforts to reduce carbon dioxide emissions.

James M. Taylor (taylor@heartland.org) is a senior fellow of The Heartland Institute and managing editor of Environment & Climate News.

Global Warming Causing Fewer Droughts, Scientists Conclude

By James M. Taylor

Speaker of the U.S. House Nancy Pelosi (D-CA) and Rep. Ed Markey (D-MA) convened hearings November 1 to investigate an alleged connection between global warming and the recent California wildfires.

But scientists have already determined global warming is resulting in more prevalent precipitation, moister soils, and less drought than has occurred in cooler climates.

The May 25, 2007 issue of Geophysical Research Letters reports, “An increasing trend is apparent in both model soil moisture and runoff over much of the U.S.” The study adds, “Droughts have, for the most part, become shorter, less frequent, and cover a smaller portion of the country over the last century.”

The July 2004 issue of International Journal of Climatology reported global rainfall and soil moisture have both risen dramatically during the past 50 to 100 years. “The terrestrial surface is both warmer and effectively wetter,” the journal reported. The wetter trend is especially well documented in North America, where “a good analogy to describe the changes is... that the terrestrial surface is literally becoming more like a gardener’s greenhouse.”

The National Oceanic and Atmospheric Administration reports, “A number of tree-ring records exist for the last two millennia which suggest that 20th century droughts may be mild when evaluated in the context of this longer time frame.”

Earth has a dynamic atmosphere, and there will always be periodic, localized droughts, scientists note. Southern California is one of the few regions that has recently experienced more drought than usual.

The droughts that occur in our current period of moisture and warmth are decidedly short term, limited in geographic reach, and quite minor when compared to those that have dominated colder climatic periods, scientists have learned.

It is disingenuous, to say the least, to blame localized drought conditions on global warming.

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Ohio

Continued from page 1

ture that would punish working families across the state.

Renewables More Expensive

Invited to testify at the October 23 hearing on Senate Bill 221, which would attempt to fight global warming by requiring Ohio consumers to purchase 25 percent of their electricity from alternative power sources, Taylor reported consumers pay 42 percent more for their electricity in states with renewable power mandates than in states without them.

Taylor also cited studies from many of the world’s leading economists and economic institutions finding global warming legislation similar to SB 221 would take a substantial toll on electricity prices, jobs, and consumers’ standard of living.

Taylor also presented data from the U.S. Energy Information Administration documenting Ohio has remarkably poor potential for the development of solar and wind power. The toll on Ohio residents of a renewable power mandate would therefore likely be even worse than indicated by the national studies Taylor presented.

Reliance on Science Criticized

Dismissing the studies cited by Taylor, state Sen. Lance Mason (D-Cleveland) asked if Taylor had read the only study that examined the economic of renewable power in an Ohio-specific context. When Taylor said he was unaware of such a study, Mason stated it contradicted all the studies Taylor cited and was more reliable because it was Ohio-specific.

“[C]onsumers pay 42 percent more for their electricity in states with renewable power mandates than in states without them.”

A review of the economic literature after the hearings uncovered the Ohio-specific study Mason had asserted was more credible than those Taylor cited. It was written and conducted by the American Solar Energy Society.

Putting itself in the enviable position of determining whether its members should receive government subsidies and states should pass laws forcing consumers to purchase its members’ products, the American Solar Energy Society study predictably answered “yes.”

MIT vs. Solar Today

“Obscure, self-serving studies published by industry groups in their own professional trade journals often don’t make it to the forefront of my research efforts,” Taylor said in an interview for this article.

“A study reported in the trade journal Solar Today that the renewable energy industry employs X number of people and would employ even more if laws forced people to buy their products is less relevant to an objective examination of renewable power economics than studies conducted by the Congressional Budget Office, U.S. Energy Information Administration, and leading economics professors at MIT and Yale University,” Taylor continued.

Jobs-Killing Legislation

In his testimony, Taylor explained why renewable power mandates eliminate some jobs in the narrow sector of renewable power generation while eliminating a greater number of jobs in other sectors of the economy, sectors that would have enhanced the standard of living for the citizens of Ohio,” Taylor explained.

Taylor concluded, “Simple common sense tells us that if a product makes economic sense, you don’t have to subsidize it to make people produce it, and you don’t have to pass a law to force somebody to purchase it.

“The unavoidable reason why renewable and alternative power comprises such a small percentage of U.S. power generation is because it is significantly more expensive to produce than conventional power generation,” Taylor said. “If indeed it were otherwise, rather than coming here with their hats in their hands lobbying for government intervention, activist groups and the renewable power industry would raise their own money and go make a killing in the electricity production business.”

E. Jay Donovan (edonovan@gte.net) writes from Tampa, Florida.

Global Warming or Global Governance?

The most powerful DVD available today that explains the science of global warming and the political agenda driving the man-caused hysteria

Using stunning graphics and animations, leading climate and biological scientists explain why the man-caused global warming alarmists are wrong, and that carbon dioxide could be considered a miracle gas, not a pollutant. Leading politicians and experts explain why this agenda is being promoted to the tune of tens of billions of dollars when the science is so thin. This video is converting former alarmists into skeptics.

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Continued from page 1

(GAO).

Moreover, most subsidies even for fossil fuel energy production are directed to “alternative energy” programs that benefit fossil fuel replacement technologies or are aimed at environmental goals rather than electricity production, GAO reported.

Power Production by Sector
According to the GAO report, coal accounts for 50 percent of the nation’s electricity production; natural gas, 19 percent; nuclear, 19 percent; hydropower, 8 percent; oil, 3 percent; renewables, 2 percent; and other minor sources, the remaining 1 percent.

Fossil fuels cumulatively account for 72 percent of electricity production. The numbers do not add up to 100 percent due to GAO rounding of the numbers.

Production Subsidies
According to the report, renewable power receives 15 percent of federal subsidies for electricity production, although it accounts for only 3 percent of national electricity production.

Most subsidies for fossil fuel power production are directed to alternative fuel production credits, which are primarily awarded for the production of synthetic fuels from coal or natural gas, and provide few if any benefits to conventional coal power.

“The share of federal energy subsidies received by renewable electricity production is far greater than its market share would justify ...”

R&D Subsidies
In addition to the direct government support, renewable power receives 12 percent of research and development subsidies for energy production, with solar and wind power receiving most.

Fossil fuels receive 27 percent of federal government research and development expenditures, but most of those subsidies fund R&D for projects aimed at carbon dioxide reduction and other environmental goals rather than electricity production.

Renewable Advocates Refuted
The GAO report, released October 26, directly contradicts assertions by renewable power advocates who claim fossil fuels receive disproportionately favorable federal subsidies.

“GAO is to be complimented for finally exposing the folly of excessive subsidies to the renewable energy industry,” said Jay Lehr, science director for The Heartland Institute. “Wind, solar, and biofuels have been around and in use for nearly a century, and if renewable power could have been made economically feasible for large-scale use, entrepreneurs and industries would already have created a successful renewable power industry.”

“It would be bad enough if these heavy subsidies were simply inefficient,” observed Tom Tanton, vice president of the Institute for Energy Research. “Worse, the subsidies to renewables are actually counterproductive.

“Originally intended to spur innovation and bring these ‘infant’ technologies to market,” Tanton explained, “the subsidies are so fat—actually morbidly obese—that any incentive to innovate has long gone.

“When the government is paying upwards of 65 percent of your operating costs, it is hardly worthwhile to look for 2 or 3 percent gains on margin from improved efficiency or technology,” said Tanton. “By propping up inefficient and ineffective producers, at the expense of both consumers and the few efficient producers, innovation is stifled rather than encouraged.”

“The laws of physics are what make renewable energy noncompetitive,” Lehr said. “Renewable power is energy-intensive, materials-intensive, and most of all, space-intensive.

“The prodding of clever marketing voices in the employ of the renewable energy industry appears to make these widespread poor decisions seem wise to politicians and even the public,” Lehr noted, “when in fact they are wasting very valuable human and economic resources.”

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Wind
Continued from page 1

boost in wind power production thanks to increasing government subsidies and mandates.

AWEA’s third quarter market report on the industry, released November 7, paints a rosy future for the alternative energy source. The group finds “over 2,300 megawatts of new wind energy capacity” were generated in 2007, and “by the end of the year, the (AWEA) expected a total of over 4,000 megawatts to have been brought online.”

But a verdict on the long-term viability of wind as an energy source has yet to be reached, and no hope is in sight for the scores of birds and bats meeting grisly fates among the turning turbine blades.

Bird Deaths Documented
At the Altamont, California wind farm, an estimated “22,000 birds, including some 400 golden eagles, have collided with wind turbines or been electrocuted by power lines there, leading some to call the machines ‘Cuisinarts of the air,’” according to the Sierra Club’s Sierra magazine.

The death toll reported at Altamont and other wind farms has slowed the growth of wind energy nationwide. In Lake Township, Michigan, officials are considering “banning wind turbines within township boundaries, saying they disrupt the idyllic countryside and put wildlife at risk,” according to a report in the November 15 edition of The Detroit News. Township officials and residents strongly oppose DTE Energy’s plans to place 40-plus windmills on 4,300 acres in the township.

Concerns Swept Aside
Industry representatives say the concerns of wind energy opponents are exaggerated.

“I think so,” said AWEA’s assistant director for communication, Christine Real de Azua. “For birds, the data shows it’s overblown. That’s not to say there are not some impacts... but out of every 10,000 bird deaths from human causes, I think it’s less than one that is from a turbine.”

[Industry officials] say the bird and bat problem has been solved,” said Sterling Burnett, a senior fellow specializing in energy and environment for the National Center for Policy Analysis.

But that’s not true, he said. “They’ve just made bigger turbines that turn slower. So they’re still whacking birds, just not as many.”

Blighted Landscapes
In addition to bird and bat deaths, plenty of other issues fuel widespread concern about wind power production.

“The reality is... you’re not just talking about a wind farm. You’re also talking about transmission lines,” said Shalini Vajjhala, Ph.D., a fellow with Resources for the Future specializing in energy issues. Vajjhala favors wind as a viable energy source, but he recognizes there are many obstacles, real or perceived, that must be overcome.

“There’s a list of usual suspects... who are opposed,” Vajjhala said, “and they generally talk about the negative aesthetics... and the damage to the ecosystems that comes by locating [the wind farm] on mountaintops or by water.”

Wisconsin Citizens Take Action
Wisconsin Independent Citizens Opposing Windturbine Sites (WINDCOWS), a grassroots group formed to fight the development of 49 windmills that would span three townships, decries a lot more than aesthetics.

The WINDCOWS Web site protests excessive wind turbine noise, flickering lights, toxic fluid leaks from generators, and well and groundwater contamination resulting from grading during construction and operation of the windmills.

Unreliable Source
Underlying all of those concerns is the question of whether wind power is a long-term energy alternative that can survive without taxpayer subsidies.

“The biggest problem is the unreliability,” said Ben Lieberman, a senior energy and environment policy analyst with The Heritage Foundation. “With wind power, you just don’t know when the wind will be blowing.”

Importantly, Lieberman noted, it’s on the hottest days—the time of greatest energy demand—when wind power is most likely to fail.

Cheryl Chumley (ckchumley@aol.com) is a Virginia-based journalist who specializes in land-use issues.
Environmental Effects of Increased Atmospheric Carbon Dioxide

ARTHUR B. ROBINSON, NOAH E. ROBINSON, AND WILLIE SOON
Oregon Institute of Science and Medicine, 2251 Dick George Road, Cave Junction, Oregon 97523 [artr@oism.org]

ABSTRACT A review of the research literature concerning the environmental consequences of increased levels of atmospheric carbon dioxide leads to the conclusion that increases during the 20th and early 21st centuries have produced no deleterious effects upon Earth’s weather and climate. Increased carbon dioxide has, however, markedly increased plant growth. Predictions of harmful climatic effects due to future increases in hydrocarbon use and minor greenhouse gases like CO2 do not conform to current experimental knowledge. The environmental effects of rapid expansion of the nuclear and hydrocarbon energy industries are discussed.

SUMMARY Political leaders gathered in Kyoto, Japan, in December 1997 to consider a world treaty restricting human production of “greenhouse gases,” chiefly carbon dioxide (CO2). They feared that CO2 would result in “human-caused global warming” – hypothetical severe increases in Earth’s temperatures, with disastrous environmental consequences. During the past 10 years, many political efforts have been made to force worldwide agreement to the Kyoto treaty.

When we reviewed this subject in 1998 (1,2), existing satellite records were short and were centered on a period of changing intermediate temperature trends. Additional experimental data have now been obtained, so better answers to the questions raised by the hypothesis of “human-caused global warming” are now available.

The average temperature of the Earth has varied within a range of about 3°C during the past 3,000 years. It is currently increasing as the Earth recovers from a period that is known as the Little Ice Age, as shown in Figure 1. George Washington and his army were at Valley Forge during the coldest era in 1,500 years, but even then the temperature was only about 1°C Centigrade below the 3,000-year average.

The most recent part of this warming period is reflected by shortening of world glaciers, as shown in Figure 2. Glaciers regularly shorten and shorten in delayed correlation with cooling and warming trends. Shortening lags temperature by about 20 years, so the current warming trend began in about 1800.

Atmospheric temperature is regulated by the sun, which fluctuates in activity as shown in Figure 3; by the greenhouse effect, largely caused by atmospheric water vapor (H2O); and by other phenomena that are more poorly understood. While major greenhouse gas H2O substantially warms the Earth, minor greenhouse gases such as CO2...
have little effect, as shown in Figures 2 and 3. The 6-fold increase in hydrocarbon use since 1940 has had no noticeable effect on atmospheric temperature or on the trend in glacier length.

While Figure 1 is illustrative of most geographical locations, there is great variability of temperature records with location and regional climate. Comprehensive surveys of published temperature records confirm the principal features of Figure 1, including the fact that the current Earth temperature is approximately 1 °C lower than that during the Medieval Climate Optimum 1,000 years ago (11,12).

Surface temperatures in the United States during the past century reflect this natural warming trend and its correlation with solar activity, as shown in Figures 4 and 5. Compiled U.S. surface temperatures have increased about 0.5 °C per century, which is consistent with other historical values of 0.4 to 0.5 °C per century during the recovery from the Little Ice Age (13-17). This temperature change is slight as compared with other natural variations, as shown in Figure 6. Three intermediate trends are evident, including the decreasing trend used to justify fears of “global cooling” in the 1970s.

Between 1900 and 2000, on absolute scales of solar irradiance and degrees Kelvin, solar activity increased 0.19%, while a 0.5 °C temperature change is 0.21%. This is in good agreement with estimates that Earth’s temperature would be reduced by 0.6 °C through particulate blocking of the sun by 0.2% (18).

Solar activity and U.S. surface temperature are closely correlated, as shown in Figure 5, but U.S. surface temperature and world hydrocarbon use are not correlated, as shown in Figure 13.

The U.S. temperature trend is so slight that, were the temperature change which has taken place during the 20th and 21st centuries to occur in an ordinary room, most of the people in the room would be unaware of it.

During the current period of recovery from the Little Ice Age, the U.S. climate has improved somewhat, with more rainfall, fewer tornados, and no increase in hurricane activity, as illustrated in Figures 7 to 10. Sea level has trended upward for the past 150 years at a rate of 7 inches per century, with 3 intermediate uptrends and 2 periods of no increase as shown in Figure 11. These features are confirmed by the glacier record as shown in Figure 12. If this trend continues as

Solar activity and U.S. surface temperature are closely correlated, but U.S. surface temperature and world hydrocarbon use are not correlated.
did that prior to the Medieval Climate Optimum, sea level would be expected to rise about 1 foot during the next 200 years.

As shown in Figures 2, 11, and 12, the trends in glacier shortening and sea level rise began a century before the 60-year 6-fold increase in hydrocarbon use, and have not changed during that increase. Hydrocarbon use could not have caused these trends.

During the past 50 years, atmospheric CO₂ has increased by 22%. Much of that CO₂ increase is attributable to the 6-fold increase in human use of hydrocarbon energy. Figures 2, 3, 11, 12, and 13 show, however, that human use of hydrocarbons has not caused the observed increases in temperature.

The increase in atmospheric carbon dioxide has, however, had a substantial environmental effect. Atmospheric CO₂ fertilizes plants. Higher CO₂ enables plants to grow faster and larger and to live in drier climates. Plants provide food for animals, which are thereby also enhanced. The extent and diversity of plant and animal life have both increased substantially during the past half-century. Increased temperature has also mildly stimulated plant growth.

Does a catastrophic amplification of these trends with damaging climatological consequences lie ahead? There are no experimental data that suggest this. There is also no experimentally validated theoretical evidence of such an amplification.

Predictions of catastrophic global warming are based on computer climate modeling, a branch of science still in its infancy. The empirical evidence – actual measurements of Earth’s temperature and climate – shows no man-made warming trend. Indeed, during four of the seven decades since 1940 when average CO₂ levels steadily increased, U.S. average temperatures were actually decreasing.

Mild ordinary natural increases in the Earth’s temperature have occurred during the past two to three centuries.

While CO₂ levels have increased substantially and are expected to continue doing so and humans have been responsible for part of this increase, the effect on the environment has been benign.

There is, however, one very dangerous possibility.

Our industrial and technological civilization depends upon abundant, low-cost energy. This civilization has already brought unprecedented prosperity to the people of the more developed nations. Billions of people in the less developed nations are now lifting themselves from poverty by adopting this technology.

Hydrocarbons are essential sources of energy to sustain and extend prosperity. This is especially true of the developing nations, where available capital and technology are insufficient to meet rapidly increasing energy needs without extensive use of hydrocarbon fuels. If, through misunderstanding of the underlying science and through misguided public fear and hysteria, mankind significantly restricts the use of hydrocarbons, the worldwide increase in prosperity will stop. The result would be vast human suffering and the loss of hundreds of millions of human lives. Moreover, the prosperity of those in the developed countries would be greatly reduced.

Mild ordinary natural increases in the Earth’s temperature have occurred during the past two to three centuries. These have resulted in some improvements in overall climate and also some changes in
the landscape, such as a reduction in glacier lengths and increased vegetation in colder areas. Far greater changes have occurred during the time that all current species of animals and plants have been on the Earth. The relative population sizes of the species and their geographical distributions vary as they adapt to changing conditions.

The temperature of the Earth is continuing its process of fluctuation in correlation with variations in natural phenomena.  Man, meanwhile, is moving some of the carbon in coal, oil, and natural gas from below ground to the atmosphere and surface, where it is available for conversion into living things. We are living in an increasingly lush environment of plants and animals as a result. This is an unexpected and wonderful gift from the Industrial Revolution.

ATMOSPHERIC AND SURFACE TEMPERATURES

Atmospheric and surface temperatures have been recovering from an unusually cold period. During the time between 200 and 500 years ago, the Earth was experiencing the “Little Ice Age.” It had descended into this relatively cool period from a warm interval about 1,000 years ago known as the “Medieval Climate Optimum.” This is shown in Figure 1 for the Sargasso Sea.

During the Medieval Climate Optimum, temperatures were warm enough to allow the colonization of Greenland. These colonies were abandoned after the onset of colder temperatures. For the past 200 to 300 years, Earth temperatures have been gradually recovering (26). Sargasso Sea temperatures are now approximately equal to the average for the previous 3,000 years.

The historical record does not contain any report of “global warming” catastrophes, even though temperatures have been higher than they are now during much of the last three millennia.

The 3,000-year range of temperatures in the Sargasso Sea is typical of most places. Temperature records vary widely with geographical location as a result of climatological characteristics unique to those specific regions, so an “average” Earth temperature is less meaningful than individual records (27). So called “global” or “hemispheric” averages contain errors created by averaging systematically different aspects of unique geographical regions and by inclusion of regions where temperature records are unreliable.

Three key features of the temperature record – the Medieval Climate Optimum, the Little Ice Age, and the Not-Unusual-Temperature of the 20th century – have been verified by a review of local temperature and temperature-correlated records throughout the world (11), as summarized in Table 1. Each record was scored with respect to those queries to which it applied. The experimental and historical literature definitively confirms the primary features of Figure 1.

Most geographical locations experienced both the Medieval Climate Optimum and the Little Ice Age – and most locations did not experience temperatures that were unusually warm during the 20th century. A review of 23 quantitative records has demonstrated that mean and median world temperatures in 2006 were, on average, approximately 1 °C or 2 °F cooler than in the Medieval Period (12).

World glacier length (4) and world sea level (24,25) measurements provide records of the recent cycle of recovery. Warmer temperatures diminish glaciers and cause sea level to rise because of decreased ocean water density and other factors.

These measurements show that the trend of 7 inches per century increase in sea level and the shortening trend in average glacier length both began a century before 1940, yet 84% of total human annual hydrocarbon use occurred only after 1940. Moreover, neither of these trends has accelerated during the period between 1940 and 2007, while hydrocarbon use increased 6-fold. Sea level and glacier records are offset by about 20 years because of the delay between temperature rise and glacier and sea level change.

If the natural trend in sea level increase continues for another two centuries as did the temperature rise in the Sargasso Sea as the Earth entered the Medieval Warm Period, sea level would be expected to rise about 1 foot between the years 2000 and 2200. Both the sea level and glacier trends – and the temperature trend that they reflect – are

<table>
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<th>Yes/No</th>
<th>Two-Tailed Probability</th>
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<td>&gt; 99.99</td>
</tr>
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<td>2</td>
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<td>20th Century Warmest in Individual Record?</td>
<td>7</td>
<td>64</td>
<td>14</td>
<td>&lt; 0.0001</td>
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</tbody>
</table>

Table 1: Comprehensive review of all instances in which temperature or temperature-correlated records from localities throughout the world permit answers to queries concerning the existence of the Medieval Climate Optimum, the Little Ice Age, and an unusually warm anomaly in the 20th century (11). The compiled and tabulated answers confirm the three principal features of the Sargasso Sea record shown in Figure 1. The probability that the answer to the query in column 1 is “yes” is given in column 5.
Contrary to the CO2 warming climate models, tropospheric temperatures are not rising faster than surface temperatures.

If the Arctic air temperature data before 1920 were not available, essentially no uptrend would be observed.

Figure 14: Satellite microwave sounding unit (blue) measurements of tropospheric temperatures in the Northern Hemisphere between 0 and 82.5 N, Southern Hemisphere between 0 and 82.5 S, tropics between 20S and 20N, and the globe between 82.5N and 82.5S between 1979 and 2007 (29), and radiosonde balloon (red) measurements in the tropics (29). The balloon measurements confirm the satellite technique (29-31). The warming anomaly in 1997-1998 (gray) was caused by El Niño, which, like the overall trends, is unrelated to CO2 (32).

unrelated to hydrocarbon use. A further doubling of world hydrocarbon use would not change these trends.

Figure 12 shows the close correlation between the sea level and glacier records, which further validates both records and the duration and character of the temperature change that gave rise to them. The U.S. temperature record has two intermediate uptrends of comparable magnitude, one occurring before the 6-fold increase in hydrocarbon use and one during it. Between these two is an intermediate temperature downturn, which led in the 1970s to fears of an impending new ice age. This decrease in temperature occurred during a period in which hydrocarbon use increased 3-fold.

Seven independent records – solar irradiance; Arctic, Northern Hemisphere, global, and U.S. annual average surface air temperatures; sea level; and glacier length – all exhibit these three intermediate trends, as shown in Figure 13. These trends confirm one another. Solar irradiance correlates with them. Hydrocarbon use does not.

The intermediate uptrend in temperature between 1980 and 2006 shown in Figure 13 is similar to that shown in Figure 14 for balloon and satellite tropospheric measurements. This trend is more pronounced in the Northern Hemisphere than in the Southern. Contrary to the CO2 warming climate models, however, tropospheric temperatures are not rising faster than surface temperatures.

Figure 6 illustrates the magnitudes of these temperature changes by comparing the 0.5 °C per century temperature change as the Earth recovers from the Little Ice Age, the range of 50-year averaged Atlantic ocean surface temperatures in the Sargasso Sea over the past 3,000 years, the range of day-night and seasonal variation on average in Oregon, and the range of day-night and seasonal variation over the whole Earth. The two-century-long temperature change is small.

Tropospheric temperatures measured by satellite give comprehensive geographic coverage. Even the satellite measurements, however, contain short and medium-term fluctuations greater than the slight warming trends calculated from them. The calculated trends vary significantly as a function of the most recent fluctuations and the lengths of the data sets, which are short.

Figure 3 shows the latter part of the period of warming from the Little Ice Age in greater detail by means of Arctic air temperature as compared with solar irradiance, as does Figure 5 for U.S. surface temperature. There is a close correlation between solar activity and temperature and none between hydrocarbon use and temperature. Several other studies over a wide variety of time intervals have found similar correlations between climate and solar activity (15, 34-39).

Figure 3 also illustrates the uncertainties introduced by limited time records. If the Arctic air temperature data before 1920 were not available, essentially no uptrend would be observed.

This observed variation in solar activity is typical of stars close in size and age to the sun (40). The current warming trends on Mars (41), Jupiter (42), Neptune (43,44), Neptune’s moon Triton (45), and Pluto (46-48) may result, in part, from similar relations to the sun and its activity – like those that are warming the Earth.

Hydrocarbon use and atmospheric CO2 do not correlate with the observed temperatures. Solar activity correlates quite well. Correlation does not prove causality, but non-correlation proves non-causality. Human hydrocarbon use is not measurably warming the earth. Moreover, there is a robust theoretical and empirical model for solar warming and cooling of the Earth (8,19,49,50). The experimental data do not prove that solar activity is the only phenomenon responsible for substantial Earth temperature fluctuations, but they do show that human hydrocarbon use is not among those phenomena.

The overall experimental record is self-consistent. The Earth has been warming as it recovers from the Little Ice Age at an average rate of about 0.5 °C per century. Fluctuations within this temperature trend include periods of more rapid increase and also periods of temperature decrease. These fluctuations correlate well with concomitant fluctuations in the activity of the sun. Neither the trends nor the fluctuations within the trends correlate with hydrocarbon use. Sea level and glacier length reveal three intermediate uptrends and two downturns since 1800, as does solar activity. These trends are climatically benign and result from natural processes.

Figure 15: Surface temperature trends for 1940 to 1996 from 107 measuring stations in 49 California counties (51,52). The trends were combined for counties of similar population and plotted with the standard errors of their means. The six measuring stations in Los Angeles County were used to calculate the standard error of that county, which is plotted at a population of 8.9 million. The “urban heat island effect” on surface measurements is evident. The straight line is a least-squares fit to the closed circles. The points marked “X” are the six unadjusted station records selected by NASA GISS (53-55) for use in their estimate of global surface temperatures. Such selections make NASA GISS temperatures too high.
ATMOSPHERIC CARBON DIOXIDE

The concentration of CO₂ in Earth’s atmosphere has increased during the past century, as shown in Figure 17. The magnitude of this atmospheric increase is currently about 4 gigatons (Gt C) of carbon per year. Total human industrial CO₂ production, primarily from use of coal, oil, and natural gas and the production of cement, is currently about 8 Gt C per year (7,56,57). Humans also exhale about 0.6 Gt C per year, which has been sequestered by plants from atmospheric CO₂. Office air concentrations often exceed 1,000 ppm CO₂.

To put these figures in perspective, it is estimated that the atmosphere contains 780 Gt C; the surface ocean contains 1,000 Gt C; vegetation, soils, and detritus contain 2,000 Gt C; and the intermediate and deep oceans contain 38,000 Gt C, as CO₂ or CO₂ hydration products. Each year, the surface ocean and atmosphere exchange an estimated 90 Gt C; vegetation and the atmosphere, 100 Gt C; marine biota and the surface ocean, 50 Gt C; and the surface ocean and the intermediate and deep oceans, 40 Gt C (56,57).

So great are the magnitudes of these reservoirs, the rates of exchange between them, and the uncertainties of these estimated numbers that the sources of the recent rise in atmospheric CO₂ have not been determined with certainty (58,59). Atmospheric concentrations of CO₂ are reported to have varied widely over geological time, with peaks, according to some estimates, some 20-fold higher than at present and lows at approximately 200 ppm (60-62).

Ice-core records are reported to show seven extended periods during 650,000 years in which CO₂, methane (CH₄), and temperature increased and then decreased (63-65). Ice-core records contain substantial uncertainties (58), so these correlations are imprecise. In all seven glacial and interglacial cycles, the reported changes in CO₂ and CH₄ lagged the temperature changes and could not, therefore, have caused them (66). These fluctuations probably involved temperature-caused changes in oceanic and terrestrial CO₂ and CH₄ content. More recent CO₂ fluctuations also lag temperature (67,68).

In 1957, Revelle and Seuss (69) estimated that temperature-caused out-gassing of ocean CO₂ would increase atmospheric CO₂ by about 7% per °C temperature rise. The reported change during the seven interglacials of the 650,000-year ice core record is about 5% per °C (63), which agrees with the out-gassing calculation. Between 1900 and 2006, Antarctic CO₂ increased 30% per 0.1 °C temperature change (72), and world CO₂ increased 30% per 0.5 °C. In addition to ocean out-gassing, CO₂ from human use of hydrocarbons is a new source. Neither this new source nor the older natural CO₂ sources are causing atmospheric temperature to change.

The hypothesis that the CO₂ rise during the interglacials caused the temperature to rise requires an increase of about 6 °C per 30% rise in CO₂ as seen in the ice core record. If this hypothesis were correct, Earth temperatures would have risen about 6 °C between 1900 and 2006, rather than the rise of between 0.1 °C and 0.5 °C, which actually occurred. This difference is illustrated in Figure 16.

The 650,000-year ice-core record does not, therefore, agree with the hypothesis of “human-caused global warming,” and, in fact, provides empirical evidence that invalidates this hypothesis.

Carbon dioxide has a very short residence time in the atmosphere. Beginning with the 7 to 10-year half-time of CO₂ in the atmosphere estimated by Revelle and Seuss (69), there were 36 estimates of the atmospheric CO₂ half-time based upon experimental measurements published between 1957 and 1992 (59). These range between 2 and 25 years, with a mean of 7.5, a median of 7.6, and an upper range average of 10. Of the 36 values, 33 are 10 years or less.

Many of these estimates are from the decrease in atmospheric carbon 14 after cessation of atmospheric nuclear weapons testing, which provides a reliable half-time. There is no experimental evidence to support computer model estimates (73) of a CO₂ atmospheric “lifetime” of 300 years or more.

Human production of 8 Gt C per year of CO₂ is negligible as compared with the 40,000 Gt C residing in the oceans and biosphere. The reported changes in CO₂ and CH₄ (methane) lagged the temperature changes and could not, therefore, have caused them.
CLIMATE CHANGE

While the average temperature change taking place as the Earth recovers from the Little Ice Age is so slight that it is difficult to discern, its environmental effects are measurable. Glacier shortening and the 7 inches per century rise in sea level are examples. There are additional climate changes that are correlated with this rise in temperature and may be caused by it.

Greenland, for example, is beginning to turn green again, as it was 1,000 years ago during the Medieval Climate Optimum (11). Arctic sea ice is decreasing somewhat (75), but Antarctic ice is not decreasing and may be increasing, due to increased snow (76-79).

In the United States, rainfall is increasing at about 1.8 inches per century, and the number of severe tornadoes is decreasing, as shown in Figures 7 and 8. If world temperatures continue to rise at the current rate, they will reach those of the Medieval Climate Optimum about 2 centuries from now. Historical reports of that period record the growing of warm weather crops in localities too cold for that purpose today. It is expected that a warm greenhouse effect, the Earth climate will expand as it did then. This is already being observed, as studies at higher altitudes have reported increases in amount and diversity of plant and animal life by more than 50% (12,80).

Atmospheric temperature is increasing more in the Northern Hemisphere than in the Southern, with intermediate periods of increase and decrease in the overall trends.

There has been no increase in frequency or severity of Atlantic hurricanes during the period of 6-fold increase in hydrocarbon use, as is illustrated in Figures 9 and 10. Numbers of violent hurricanes vary greatly from year to year and are no greater now than they were 50 years ago. Similarly, maximum wind speeds have not increased.

All of the observed climate changes are gradual, moderate, and entirely within the bounds of ordinary natural changes that have occurred during the benign period of the past few thousand years.

There is no indication whatever in the experimental data that an abrupt or remarkable change in any of the ordinary natural climate variables is beginning or will begin to take place.

GLOBAL WARMING HYPOTHESIS

The greenhouse effect amplifies solar warming of the earth. Greenhouse gases such as H2O, CO2, and CH4 in the Earth’s atmosphere, through combined convective readjustments and the radiative blanketing effect, essentially decrease the net escape of terrestrial thermal infrared radiation. Increasing CO2, therefore, effectively increases radiative energy input to the Earth’s atmosphere. The path of this radiative input is complex. It is redistributed, both vertically and horizontally, by various physical processes, including advection, convection, and diffusion in the atmosphere and ocean.

When an increase in CO2 increases the radiative input to the atmosphere, how and in which direction does the atmosphere respond? Hypotheses about this response differ and are schematically shown in Figure 18. Without the water-vapor greenhouse effect, the Earth would be about 14 ºC cooler (81). The radiative contribution of doubling atmospheric CO2 is minor, but this radiative greenhouse effect is treated quite differently by different climate hypotheses. The hypotheses that the IPCC (82,83) has chosen to adopt predict that the effect of CO2 is amplified by the atmosphere, especially by water vapor, to produce a large temperature increase. Other hypotheses, shown as hypothesis 2, predict the opposite – that the atmospheric response will counteract the CO2 increase and result in insignificant changes in global temperature (81,84,85,91,92). The experimental evidence, as described above, favors hypothesis 2. While CO2 has increased substantially, its effect on temperature has been so slight that it has not been experimentally detected.

The computer climate models upon which “human-caused global warming” is based have substantial uncertainties and are markedly unreliable. This is not surprising, since the climate is a coupled, non-linear dynamical system. It is very complex. Figure 19 illustrates the difficulties by comparing the radiative CO2 greenhouse effect with correction factors and uncertainties in some of the parameters in the computer climate calculations. Other factors, too, such as the chemical and climatic influence of volcanoes, cannot now be reliably computer modeled.

In effect, an experiment has been performed on the Earth during the past half-century – an experiment that includes all of the complex factors and feedback effects that determine the Earth’s temperature and climate. Since 1940, hydrocarbon use has risen 6-fold. Yet, this rise has had no effect on the temperature trends, which have continued their cycle of recovery from the Little Ice Age in close correlation with increasing solar activity.

Not only has the global warming hypothesis failed experimental tests, it is theoretically flawed as well. It can reasonably be argued that cooling from negative physical and biological feedbacks to greenhouse gases nullifies the slight initial temperature rise (84,86).

The reasons for this failure of the computer climate models are subjects of scientific debate (87). For example, water vapor is the largest contributor to the overall greenhouse effect (88). It has been suggested that the climate models treat feedbacks from clouds, water vapor, and related hydrology incorrectly (85,89-92).

The global warming hypothesis with respect to CO2 is not based upon the radiative properties of CO2 itself, which is a very weak greenhouse gas. It is based upon a small initial increase in temperature caused by CO2 and a large theoretical amplification of that temperature increase, primarily through increased evaporation of H2O, a
Figure 20: Global atmospheric methane concentration in parts per million between 1982 and 2004 (94).

strong greenhouse gas. Any comparable temperature increase from another cause would produce the same calculated outcome.

Thus, the 3,000-year temperature record illustrated in Figure 1 also provides a test of the computer models. The historical temperature record shows that the Earth has previously warmed far more than could be caused by CO2 itself. Since these past warming cycles have not initiated water-vapor-mediated atmospheric warming catastrophes, it is evident that weaker effects from CO2 cannot do so.

Methane is also a minor greenhouse gas. World CH4 levels are, as shown in Figure 20, leveling off. In the U.S. in 2005, 42% of human-produced methane was from hydrocarbon energy production, 28% from waste management, and 30% from agriculture (95). The total amount of CH4 produced from these U.S. sources decreased 7% between 1980 and 2005. Moreover, the record shows that, even while methane was increasing, temperature trends were benign.

The “human-caused global warming” – often called the “global warming” – hypothesis depends entirely upon computer model-generated scenarios of the future. There are no empirical records that verify either these models or their flawed predictions (96).

Claims (97) of an epidemic of insect-borne diseases, extensive species extinction, catastrophic flooding of Pacific islands, ocean acidification, increased numbers and severities of hurricanes and tornados, and increased human heat deaths from the 0.5 °C per century temperature rise are not consistent with actual observations. The “human-caused global warming” hypothesis and the computer calculations that support it are in error. They have no empirical support and are invalidated by numerous observations.

WORLD TEMPERATURE CONTROL

World temperature is controlled by natural phenomena. What steps could mankind take if solar activity or other effects began to shift the Earth toward temperatures too cold or too warm for optimum human life?

First, it would be necessary to determine what temperature humans feel is optimum. It is unlikely that the chosen temperature would be exactly that which we have today. Second, we would be fortunate if natural forces were to make the Earth too warm rather than too cold because we can cool the Earth with relative ease. We have no means by which to warm it. At tempting to warm the Earth to satisfy human needs is optimum. It is unlikely that the chosen temperature would ever reach this level.

Inexpensively blocking the sun by means of particles in the upper atmosphere would be effective. S. Penner, A.M. Schneider, and E. M. Kennedy have proposed (98) that the exhaust systems of commercial airliners could be tuned in such a way as to eject particulate sun-blocking material into the upper atmosphere. Later, Edward Teller similarly suggested (18) that particles could be injected into the atmosphere in order to reduce solar heating and cool the Earth. Teller estimated a cost of between $500 million and $1 billion per year for between 1 °C and 3 °C of cooling. Both methods use particles so small that they would be invisible from the Earth.

These methods would be effective and economical in blocking solar radiation and reducing atmospheric and surface temperatures. There are other similar proposals (99). World energy rationing, on the other hand, would not work.

The climate of the Earth is now benign. If temperatures become too warm, this can easily be corrected. If they become too cold, we have no means of response – except to maximize nuclear and hydrocarbon energy production and technological advance. This would help humanity adapt and might lead to new mitigation technology.

FERTILIZATION OF PLANTS BY CO2

How high will the CO2 concentration of the atmosphere ultimately rise if mankind continues to increase the use of coal, oil, and natural gas? At ultimate equilibrium with the ocean and other reservoirs there will probably be very little increase. The current rise is a non-equilibrium result of the rate of approach to equilibrium.

One reservoir that would moderate the increase is especially important. Plant life provides a large sink for CO2. Using current knowledge about the increased growth rates of plants and assuming increased CO2 release as compared to current emissions, it has been estimated that atmospheric CO2 levels may rise to about 600 ppm before leveling off. At that level, CO2 absorption by increased Earth biomass is able to absorb about 10 Gt C per year (100). At present, this absorption is estimated to be about 3 Gt C per year (57).

About 30% of this projected rise from 295 to 600 ppm has already taken place, without causing unfavorable climate changes. Moreover, the radiative effects of CO2 are logarithmic (101,102), so more than 40% of any climatic influences have already occurred.

As atmospheric CO2 increases, plant growth rates increase. Also, leaves transpire less and lose less water as CO2 increases, so that plants are able to grow under drier conditions. Animal life, which depends upon plant life for food, increases proportionally.

Figures 21 to 24 show examples of experimentally measured increases in the growth of plants. These examples are representative of a very large research literature on this subject (103-109). As Figure 21 shows, long-lived 1,000- to 2,000-year-old pine trees have shown a sharp increase in growth during the past half-century. Figure 22 shows the 40% increase in the forests of the United States that has
Trees respond to CO₂ fertilization more strongly than do most other plants, but all plants respond to some extent.

Plants under stress from less-than-ideal conditions — a common occurrence in nature — respond more to CO₂ fertilization.

Figure 22: Inventories of standing hardwood and softwood timber in the United States compiled in Forest Resources of the United States, 2002, U.S. Department of Agriculture Forest Service (111,112). The linear trend cited in 1998 (1) with an increase of 30% has continued. The increase is now 40%. The amount of U.S. timber is rising almost 1% per year.

taken place since 1950. Much of this increase is due to the increase in atmospheric CO₂ that has already occurred. In addition, it has been reported that Amazonian rain forests are increasing their vegetation by about 900 pounds of carbon per acre per year (113), or approximately 2 tons of biomass per acre per year. Trees respond to CO₂ fertilization more strongly than do most other plants, but all plants respond to some extent.

Since plant response to CO₂ fertilization is nearly linear with respect to CO₂ concentration over the range from 300 to 600 ppm, as seen in Figure 23, experimental measurements at different levels of CO₂ enrichment can be extrapolated. This has been done in Figure 24 in order to illustrate CO₂ growth enhancements calculated for the atmospheric increase of about 88 ppm that has already taken place and those expected from a projected total increase of 305 ppm.

Wheat growth is accelerated by increased atmospheric CO₂, especially under dry conditions. Figure 24 shows the response of wheat grown under wet conditions versus that of wheat stressed by lack of water. The underlying data is from open-field experiments. Wheat was grown in the usual way, but the atmospheric CO₂ concentrations of circular sections of the fields were increased by arrays of computer-controlled equipment that released CO₂ into the air to hold the levels as specified (115,116). Orange and young pine tree growth enhancement (117-119) with two atmospheric CO₂ increases – that which has already occurred since 1885 and that projected for the next two centuries – is also shown. The relative growth enhancement of trees by CO₂ diminishes with age. Figure 24 shows young trees.

Figure 23 summarizes 279 experiments in which plants of various types were raised under CO₂-enhanced conditions. Plants under stress from less-than-ideal conditions – a common occurrence in nature – respond more to CO₂ fertilization. The selections of species in Figure 23 were biased toward plants that respond less to CO₂ fertilization than does the mixture actually covering the Earth, so Figure 23 underestimates the effects of global CO₂ enhancement.

Clearly, the green revolution in agriculture has already benefited from CO₂ fertilization, and benefits in the future will be even greater. Animal life is increasing proportionally, as shown by studies of 51 terrestrial (120) and 22 aquatic ecosystems (121). Moreover, as shown by a study of 94 terrestrial ecosystems on all continents except Antarctica (122), species richness – biodiversity – is more positively correlated with productivity – the total quantity of plant life per acre – than with anything else.

Atmospheric CO₂ is required for life by both plants and animals. It is the sole source of carbon in all of the protein, carbohydrate, fat, and other organic molecules of which living things are constructed. Plants extract carbon from atmospheric CO₂ and are thereby fertilized. Animals obtain their carbon from plants. Without atmospheric CO₂ none of the life we see on Earth would exist.

Water, oxygen, and carbon dioxide are the three most important substances that make life possible.

They are surely not environmental pollutants.
ENVIRONMENT AND ENERGY

The single most important human component in the preservation of the Earth’s environment is energy. Industrial conversion of energy into forms that are useful for human activities is the most important aspect of technology. Abundant inexpensive energy is required for the prosperous maintenance of human life and the continued advance of life-enriching technology. People who are prosperous have the wealth required to protect and enhance their natural environment.

Currently, the United States is a net importer of energy as shown in Figure 25. Americans spend about $300 billion per year for imported oil and gas – and an additional amount for military expenses related to those imports.

![Figure 25: In 2006, the United States obtained 84.9% of its energy from hydrocarbons, 8.2% from nuclear fuels, 2.9% from hydroelectric dams, 2.1% from wood, 0.8% from biofuels, 0.4% from waste, 0.3% from geothermal, and 0.3% from wind and solar radiation. The U.S. uses 21 million barrels of oil per day – 27% from OPEC, 17% from Canada and Mexico, 16% from others, and 40% produced in the U.S. (95). The cost of imported oil and gas at $60 per barrel and $7 per 1,000 ft³ in 2007 is about $300 billion per year.](Image 58x474 to 334x663)

Political calls for a reduction of U.S. hydrocarbon use by 90% (123), thereby eliminating 75% of America’s energy supply, are obviously impractical. Nor can this 75% of U.S. energy be replaced by alternative “green” sources. Despite enormous tax subsidies over the past 30 years, green sources still provide only 0.3% of U.S. energy.

Yet, the U.S. clearly cannot continue to be a large net importer of energy without losing its economic and industrial strength and its political independence. It should, instead, be a net exporter of energy.

There are three realistic technological paths to American energy independence – increased use of hydrocarbon energy, nuclear energy, or both. There are no climatological impediments to increased use of hydrocarbons, although local environmental effects can and must be accommodated. Nuclear energy is, in fact, less expensive and more environmentally benign than hydrocarbon energy, but it too has been the victim of the politics of fear and claimed disadvantages and dangers that are actually negligible.

For example, the “problem” of high-level “nuclear waste” has been given much attention, but this problem has been politically created by U.S. government barriers to American fuel breeding and reprocessing. Spent nuclear fuel can be recycled into new nuclear fuel. It need not be stored in expensive repositories.

Reactor accidents are also much publicized, but there has never been even one human death associated with an American nuclear reactor incident. By contrast, American dependence on automobiles results in more than 40,000 human deaths per year.

All forms of energy generation, including “green” methods, entail industrial deaths in the mining, manufacture, and transport of resources they require. Nuclear energy requires the smallest amount of such resources (124) and therefore has the lowest risk of deaths.

Estimated relative costs of electrical energy production vary with geographical location and underlying assumptions. Figure 26 shows a recent British study, which is typical. At present, 43% of U.S. energy consumption is used for electricity production.

To be sure, future inventions in energy technology may alter the relative economics of nuclear, hydrocarbon, solar, wind, and other methods of energy generation. These inventions cannot, however, be forced by political fiat, nor can they be wished into existence. Alternatively, “conservation,” if practiced so extensively as to be an alternative to hydrocarbon and nuclear power, is merely a politically correct word for “poverty.”

The current untenable situation in which the United States is losing $300 billion per year to pay for foreign oil and gas is not the result of failures of government energy production efforts. The U.S. government does not produce energy. Energy is produced by private industry. Why then has energy production thrived abroad while domestic production has stagnated?

This stagnation has been caused by United States government taxation, regulation, and sponsorship of litigation, which has made the U.S. a very unfavorable place to produce energy. In addition, the U.S. government has spent vast sums of tax money subsidizing inferior energy technologies for political purposes.

It is not necessary to discern in advance the best course to follow. Legislative repeal of taxation, regulation, incentives to litigation, and repeal of all subsidies of energy generation industries would stimulate industrial development, wherein competition could then automatically determine the best paths.

Nuclear power is safer, less expensive, and more environmentally benign than hydrocarbon power, so it is probably the better choice for increased energy production. Solid, liquid and gaseous hydrocarbon fuels provide, however, many conveniences, and a national infrastructure to use them is already in place. Oil from shale or coal liquefaction is less expensive than crude oil at current prices, but its ongoing production costs are higher than those for already developed oil fields. There is, therefore, an investment risk that crude oil prices could drop so low that liquefaction plants could not compete. Nuclear energy does not have this disadvantage, since the operating costs of nuclear power plants are very low.

Figure 27 illustrates, as an example, one practical and environmentally sound path to U.S. energy independence. At present 19% of U.S. electricity is produced by 104 nuclear power reactors with an average generating output in 2006 of 870 megawatts per reactor, for a total of about 90 GWe (gigawatts) (125). If this were increased by 560 GWe, nuclear power could fill all current U.S. electricity requirements and have 230 GWe left over for export as electricity or as hydrocarbon fuels replaced or manufactured.

Thus, rather than a $300 billion trade loss, the U.S. would have a $200 billion trade surplus – and installed capacity for future U.S. re-

![Figure 26: Delivered cost per kilowatt hour of electrical energy in Great Britain in 2006, without CO2 controls (126). These estimates include all capital and operational expenses for a period of 50 years. Micro wind or solar are units installed for individual homes.](Image 360x95 to 629x287)
In distinguishing the practical from the futuristic, a free market in energy is absolutely essential. There need be no vast government program to achieve this goal. Energy is the foundation of wealth. Inexpensive energy allows people to do wonderful things.

Figure 27: Construction of one Palo Verde installation with 10 reactors in each of the 50 states. Energy trade deficit is reversed by $500 billion per year, resulting in a $200 billion annual surplus. Currently, this solution is not possible owing to misguided government policies, regulations, and taxation and to legal maneuvers available to anti-nuclear activists. These impediments should be legislatively repealed. Moreover, if heat from additional nuclear reactors were used for coal liquefaction and gasification, the U.S. would not even need to use its oil resources. The U.S. has about 25% of the world’s coal reserves. This heat could also liquify biomass, trash, or other sources of hydrocarbons that might eventually prove practical.

The Palo Verde nuclear power station near Phoenix, Arizona, was originally intended to have 10 nuclear reactors with a generating capacity of 1,243 megawatts each. As a result of public hysteria caused by false information—very similar to the human-caused global warming hysteria being spread today, construction at Palo Verde was stopped with only three operating reactors completed. This installation is sited on 4,000 acres of land and is cooled by waste water from the city of Phoenix, which is a few miles away. An area of 4,000 acres is 6.25 square miles or 2.5 miles square. The power station itself occupies only a small part of this total area.

If just one station like Palo Verde were built in each of the 50 states and each installation included 10 reactors as originally planned for Palo Verde, these plants, operating at the current 90% of design capacity, would produce 560 GWe of electricity. Nuclear technology has advanced substantially since Palo Verde was built, so plants constructed today would be even more reliable and efficient.

Assuming a construction cost of $2.3 billion per 1,200 MW reactor (127) and 15% economies of scale, the total cost of this entire project would be $1 trillion, or 4 months of the current U.S. federal budget. This is 8% of the annual U.S. gross domestic product. Construction costs could be repaid in just a few years by the capital now spent by the people of the United States for foreign oil and by the change from U.S. import to export of energy.

The 50 nuclear installations might be sited on a population basis. If so, California would have six, while Oregon and Idaho together would have one. In view of the great economic value of these facilities, there would be vigorous competition for them.

In addition to these power plants, the U.S. should build fuel reprocessing capability, so that spent nuclear fuel can be reused. This would lower fuel cost and eliminate the storage of high-level nuclear waste. Fuel for the reactors can be assured for 1,000 years (128) by using both ordinary reactors with high breeding ratios and specific breeder reactors, so that more fuel is produced than consumed.

About 33% of the thermal energy in an ordinary nuclear reactor is converted to electricity. Some new designs are as high as 48%. The heat from a 1,243 MW reactor can produce 38,000 barrels of coal-derived oil per day (129). With one additional Palo Verde installation in each state for oil production, the yearly output would be at least 7 billion barrels per year with a value, at $60 per barrel, of more than $400 billion per year. This is twice the oil production of Saudi Arabia. Current proven coal reserves of the United States are sufficient to sustain this production for 200 years (128). This liquified coal exceeds the proven oil reserves of the entire world. The reactors could produce gaseous hydrocarbons from coal, too.

The remaining heat from nuclear power plants could warm air or water for use in indoor climate control and other purposes.

Nuclear reactors can also be used to produce hydrogen, instead of oil and gas (130,131). The current cost of production and infrastructure is, however, much higher for hydrogen than for oil and gas. Technological advance reduces cost, but usually not abruptly. A precedent in 1800 for the world to change from wood to methane would have been impractically ahead of its time, as may be a call today for an abrupt change from oil and gas to hydrogen. In distinguishing the practical from the futuristic, a free market in energy is absolutely essential.

Surely these are better outcomes than are available through international rationing and taxation of energy as has been recently proposed (82,83,97,123). This nuclear energy example demonstrates that current technology can produce abundant inexpensive energy if it is not politically suppressed.

There need be no vast government program to achieve this goal. It could be reached simply by legislatively removing all taxation, most regulation and litigation, and all subsidies from all forms of energy production in the U.S., thereby allowing the free market to build the most practical mixture of methods of energy generation.

With abundant and inexpensive energy, American industry could be revitalized, and the capital and energy required for further industrial and technological advance could be assured. Also assured would be the continued and increased prosperity of all Americans.

The people of the United States need more low-cost energy, not less. If this energy is produced in the United States, it can not only become a very valuable export, but it can also ensure that American industry remains competitive in world markets and that hoped-for American prosperity continues and grows.

In this hope, Americans are not alone. Across the globe, billions of people in poorer nations are struggling to improve their lives. These people need abundant low-cost energy, which is the currency of technological progress.

Only developing countries, that energy must come largely from the less technologically complicated hydrocarbon sources. It is a moral imperative that this energy be available. Otherwise, the efforts of these peoples will be in vain, and they will slip backwards into lives of poverty, suffering, and early death.

Energy is the foundation of wealth. Inexpensive energy allows people to do wonderful things. For example, there is concern that it may become difficult to grow sufficient food on the available land. Crops grow more abundantly in a warmer, higher CO2 environment.

In newly developing countries, that energy must come largely from the less technologically complicated hydrocarbon sources. It is a moral imperative that this energy be available. Otherwise, the efforts of these peoples will be in vain, and they will slip backwards into lives of poverty, suffering, and early death.

Energy is the foundation of wealth. Inexpensive energy allows people to do wonderful things. For example, there is concern that it may become difficult to grow sufficient food on the available land. Crops grow more abundantly in a warmer, higher CO2 environment.

During the past 200 years, human ingenuity in the use of energy has produced many technological miracles. These advances have markedly increased the quality, quantity, and length of human life. Technologists of the 21st century need abundant, inexpensive energy with which to continue this advance.

Were this bright future to be prevented by world energy rationing, the result would be tragic indeed. In addition to human loss, the Earth’s environment would be a major victim of such a mistake. Inexpensive energy is essential to environmental health. Prosperous people have the wealth to spare for environmental preservation and enhancement. Poor, impoverished people do not.
CONCLUSIONS

There are no experimental data to support the hypothesis that increases in human hydrocarbon use or in atmospheric carbon, and other greenhouse gases are causing or can be expected to cause unfavorable changes in global temperatures, weather, or landscape. There is no reason to limit human production of CO₂, CH₄ and other minor greenhouse gases as has been proposed (82,83,97,123).

We also need not worry about environmental calamities even if the current natural warming trend continues. The Earth has been much warmer during the past 3,000 years without catastrophic effects. Whatever weather extremes we are seeing seasons and generally improves the habitability of colder regions.

As coal, oil, and natural gas are used to feed and lift from poverty vast numbers of people across the globe, more CO₂ will be released into the atmosphere. This will help to maintain and improve the health, longevity, prosperity, and productivity of all people.

The United States and other countries need to produce more energy, not less. The most practical, economical, and environmentally sound methods available are hydrocarbon and nuclear technologies.

Human use of coal, oil, and natural gas has not harmfully warmed the Earth, and the extrapolation of current trends shows that it will not do so in the foreseeable future. The CO₂ production does, however, accelerate the rate growths of plants and also permits plants to grow in drier regions. Animal life, which depends upon plants, also flourishes, and the diversity of plant and animal life is increased.

Human activities are producing part of the rise in CO₂ in the atmosphere. Mankind is moving the carbon in coal, oil, and natural gas from below ground to the atmosphere, where it is available for consumption by all forms of life. We are living in an increasingly lush environment of plants and animals as a result of this CO₂ increase. Our children will therefore enjoy an Earth with far more plant and animal life than that with which we now are blessed.

REFERENCES

The American Lung Association’s Fear Campaign

By Joel Schwartz

In the July and October issues of Environment & Climate News I showed how the American Lung Association misleads Americans about air pollution levels and trends in their communities and the nation, and how activists exaggerate the harm from any given level of air pollution. In this article I show how our air is in fact safe to breathe.

Ignoring Direct Evidence

Instead of acknowledging all the direct evidence that our air is safe to breathe, regulators and activists focus on indirect evidence from so-called “observational” epidemiology studies. These studies work with non-randomly selected subjects and non-randomly assigned pollution exposures and then use statistical methods to try to remove the biases inherent in non-random data.

Most epidemiological studies you read about in the newspaper—assessing the effects of diet or health habits on risk of cancer or heart disease, for example—are of this non-randomized, observational sort. In contrast to the direct evidence that current, low-level air pollution is not a health threat, these observational studies report small correlations between air pollution levels and risk of death.

A wealth of evidence has accumulated showing observational studies give spurious results, often “finding” effects that aren’t really there and producing results that reflect researchers’ expectations rather than reality.

Much conventional medical wisdom based on observational epidemiology studies has been tested and overturned by randomized controlled trials—a gold-standard methodology that eliminates the biases inherent in observational studies.

For example, hormone replacement therapy and Vitamin A turned out not to reduce the risk of cardiovascular disease (Vitamin A actually increases cardiovascular risks); following a low-fat diet turned out not to reduce the risk of heart disease or colorectal and breast cancers; and calcium supplements didn’t reduce the risk of osteoporosis. Observational air pollution studies should be considered just as unreliable.

Cleaner Air, Greater Fear

Perhaps not surprisingly, regulators, environmentalists, and most air pollution epidemiologists have ignored the problem of false results from observational studies.

Instead, their air pollution propaganda machine marches on. The American Lung Association (ALA) continues to claim children, the elderly, and those with respiratory diseases are especially “sensitive” to air pollution. They and other activists shamelessly exploit these ostensibly “at risk” groups, parading them at regulatory hearings and news conferences.

Medical doctors volunteer for ALA and other environmental groups to “educate” people about the ostensible harm from trace levels of air pollution. Local officials issue “code red” and “code orange” alerts when air pollution exceeds federal standards, creating the false appearance that going outside is hazardous. The number of alerts increases each time EPA tightens the standards, creating a false appearance of increasing risk even as air quality continues to improve.

EPA tightened the federal PM2.5 (fine particulate matter) standard in 2006 and recently proposed a much more stringent eight-hour ozone standard that it expects to finalize after press time for this publication. The new standards are so stringent most cities will soon have dozens of air pollution alerts each year, compared with somewhere between zero and a handful in most places today.

We’ll have cleaner air ... and yet greater fear.

Power to Regulators, Activists

What explains this relentless exaggeration of environmental risks? Regulators’ and environmentalists’ powers, funding, and prestige depend on the continued public perception that air pollution is still a serious problem. The regulatory system is fraught with conflicts of interest that allow these groups to pursue their interests and ideology at taxpayer expense.

The Environmental Protection Agency sets the nation’s air pollution health standards. That means regulators get to decide when their own jobs are finished. Not surprisingly, then, federal and state regulators provide millions of dollars a year in funding to environmental groups, which use the money to augment public fear of pollution and agitate for expansion of regulators’ powers.

Regulators are likewise major funders of the health research intended to demonstrate the alleged need for more regulation. Government officials decide what questions are asked, which scientists are funded to answer them, and how the research is portrayed in official reports. Scientists who choose a career in environmental health research are self-selected for environmentalist ideology. Many of those researchers have explicitly associated themselves with environmental groups such as ALA.

Much as activists would like us to think otherwise, environmentalism isn’t about health, and it isn’t about science. It’s about power, control, and ideology.

So the next time you see a scary report from an environmental group, breathe easier.

Joel Schwartz (joel@joelschartz.com) is a visiting fellow at the American Enterprise Institute.

“Instead of acknowledging all the direct evidence that our air is safe to breathe, regulators and activists focus on indirect evidence from so-called ‘observational’ epidemiology studies.”

INTERNET INFO

For more examples of exaggeration of harm from air pollution, see Joel Schwartz, Air Pollution and Health: Do Popular Portrayals Reflect the Scientific Evidence?: http://www.joelschartz.com/pdfs/AirPoll_Health_EPO_0506.pdf.
Environmental Scares Are Exposed One-By-One

Review by Jay Lehr, Ph.D.

Jack Dini, author of Challenging Environmental Mythology, is every bit the environmentalist. He loves animals and scenic parks. He thinks clean air and water are critically important. And within the pages of this book he offers an amazingly lucid, accurate, and common-sense criticism of the environmental movement in its current state.

Dini remembers the bright scientists that set the country on an appropriate path of environmental protection more than 35 years ago. He laments the hijacking of the movement by those who care less about the environment and more about expanding government power and reducing individual freedom.

Radical environmentalists increasingly assert that the mere ability to detect the trace presence of a chemical is enough to prove we need massive and unnecessary environmental regulation and remediation. They warn about chemicals measured in parts per trillion, which is the same ratio as one second in 32,000 years.

**Unjustified Radicalism**

While many people implicitly understand the unjustified radicalism of such environmental extremists, most of us do not have the ability to debate such extremists effectively or educate our friends who know no better. Dini gives us the tools to fight misinformation, whether spread maliciously or out of innocent ignorance.

Dini analyzes the foundation of every major environmental issue that is now clouded with political rhetoric. At a time when the public can be thoroughly confused between fact and fiction regarding our environment, Dini unravels our problems with the precision of a brilliant physicist and the unusual ability to communicate with simple, jargon-free language we can all understand.

The 32 brief essays that compose the book accurately describe the human risk, or lack thereof, from countless headlined environmental scares that have stricken fear into the hearts and minds of the great majority of the public, who do not have access to sound scientific data.

When you reach the end of this book, you will be enriched by the wonderful science you have learned from this modern day Mr. Wizard and elated by the lifting of the weight of pessimism from your shoulders.

“Jack Dini, author of Challenging Environmental Mythology, ... offers an amazingly lucid, accurate, and common-sense criticism of the environmental movement in its current state.”

Challenging Environmental Myths is deeply discounted on Amazon.com. You can afford to buy a dozen copies of this book and give them to friends who are willing to meet you halfway with an open mind on the key environmental issues of the day.

Jay Lehr, Ph.D. (lehr@heartland.org) is science director for The Heartland Institute.

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**Chemicals**

Continued from page 1

After lengthy and detailed study of environmental factors, scientists have found no link between environmental chemicals and the condition. The pocket of higher-than-normal PV cases in Schuylkill, Luzerne, and Carbon counties appears to be nothing more than a random statistical aberration.

PV is the overproduction of red blood cells, causing unusually thick blood. People with PV can live a normal life if they undergo blood removal and replacement when their blood gets too thick. The disease is not fatally invasive.

**Chemicals Blamed**

When it became apparent there were more than the usual number of PV cases in the three Pennsylvania counties, environmental activists were quick to assert industrial chemicals must be to blame.

Area residents suspected a chemical waste dump in Schuylkill County that was closed in 1979 and cleaned up through the Environmental Protection Agency’s Superfund program shortly thereafter. The Wilkes-Barre Times Leader suggested five coal-fired electric plants in the area might also be a factor.

The Wilkes-Barre and Philadelphia press sensationalized the ongoing investigation by state and federal officials. News reports included interviews with angry local citizens blaming their asthma and other illnesses on the suspect waste site.

“Scientists have cast doubt on high-profile accusations that industrial chemicals are causing an elevated number of cases of a rare disease ... in eastern Pennsylvania.”

The Pennsylvania State Health Director, Dr. Calvin Johnson, promised to keep an eye on things, and deputy state director Michael Huff said, “The department has committed to monitor the cases and see what might be causing this disease.”

**Scientists Find No Link**

Against this backdrop of fear, the federal Agency for Toxic Substances and Disease Registry (ATSDR) reported on October 24 investigators could find no pattern of exposure and disease that would implicate environmental chemicals. According to ATSDR, the individuals diagnosed with PV did not share common exposures that would raise concern about their cases being related.

Although fear had spread because PV appeared to be more prevalent than normal in a cluster of communities, scientists and statisticians know such random clusters happen.

“The risk of some factor in the environment causing this disease remains dubious at best,” said Dr. Gilbert Ross, medical director of the American Council on Science and Health.

“There is some expected variation in the rate of cancer across regions, just as with any other disease,” Ross added. “Some areas are hit harder, some less so—by chance. One-half of all counties will have a higher-than-average rate of whatever is being studied, while one-half will have a lower rate: [That’s] basic math.”

John Dale Dunn, M.D., J.D. (jdmdjd@web-access.net) teaches emergency medicine at Carl R. Darnall Army Medical Center, Fort Hood, Texas. He is a science and policy advisor to the American Council on Science and Health.
**GLOBAL SATELLITE TEMPERATURES**

**HOW MUCH GLOBAL WARMING?**

Each month, Environment & Climate News updates the global averaged satellite measurements of the Earth’s temperature. These numbers are important because they are real—not projections, forecasts, or guesses. Global satellite measurements are made from a series of orbiting platforms that sense the average temperature in various atmospheric layers. Here, we present the lowest level, which climate models say should be warming. The satellite measurements are considered accurate to within 0.01°C. The data used to create these graphs can be found on the Internet at [http://vortex.nsstc.uah.edu/public/msu/t2lt/tltglhmam_5.2](http://vortex.nsstc.uah.edu/public/msu/t2lt/tltglhmam_5.2).

**OCTOBER 2007**

**GLOBAL AVERAGE**

The global average temperature for October was 0.27°C above normal.

**NORTHERN HEMISPHERE**

The Northern Hemisphere’s temperature was 0.24°C above normal.

**SOUTHERN HEMISPHERE**

The Southern Hemisphere’s temperature was 0.3°C above normal.

**219,000 years of Temperature Variation**


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