

October 23, 2003

On July 28th Senator McCain distributed a “dear colleague” letter to members of the US Senate in which he responded to a recent paper issued by the Republican Policy Committee, “The Shaky Science Behind the Climate Change Sense of the Congress Resolution.”

There is concern that the McCain analysis does not provide an objective portrayal of the current state of climate change science nor of the projected costs to the citizens of the United States of climate change policies such as the Kyoto Protocol and the Lieberman-McCain climate legislation S. 139.

Detailed responses to pertinent excerpts are provided below.

Sincerely,

Jim Inhofe

RESPONSE TO SENATOR McCAIN’S CLAIMS

Scientific Consensus on the Fundamentals of Climate Change

Senator McCain. Within the IPCC, "scientific consensus" means that the working group authors agree that a fair representation of the scientific debate has been achieved. Points of dispute in the science of climate change are usually resolved either by developing appropriate intervals of uncertainty around certain projections or by crafting language that reflects the different viewpoints of experts within the scientific community and the reasons that the differences exist. The very existence of the large range cited by the IPCC Working Group 1 Summary for Policy Makers (SPM) for warming projections to 2100 (2.5-10.4°F) attests to the insistence of such carefully peer reviewed documents to summarize uncertainties and disagreements. This stands in stark distinction to the easy and elliptical pronouncements of climate change skeptics to reporters or at Congressional hearings. They are non-representative of the scientific consensus. A small handful of contrarian counter examples do not constitute a diminution of broad scientific consensus that climate change is a potentially risky prospect.

Response: The problem with this argument is that the truth is not governed by “scientific consensus” but rather by actual observations. There is a growing rank of climate scientists who have begun to rely on actual observations, rather than climate models projections, in order to assess the climate’s response to collective human activities. Through such analysis, it is becoming increasingly obvious that the most likely path that global temperature will take during the next 100 years is one that lies at the lowest extreme of the IPCC’s temperature range (that is, a rise of about 1.4°C by the year 2100). The latest scientist to make this claim, apparently a ‘skeptic’ by Sen. McCain’s definition, is NASA’s James E. Hansen. Dr. Hansen is the scientist who first testified before Congress on this issue back more than 15 years ago that the human impact on the earth’s atmospheric composition was enhancing the natural greenhouse effect. Dr. Hansen has been an

active scientist in the field of climate change ever since and has appeared before Congress numerous times testifying on this topic. In his most recent writings, he attacks the IPCC for making exaggerated claims about the potential of future climate change and he suggests that the scenarios yielding dramatic climate change are indefensible. Quoting from a June 12, 2003 presentation he made to the President's Council on Environmental Quality (http://www.giss.nasa.gov/research/forcings/ceq_presentation.pdf):

“There are reasons to believe that the IPCC scenarios are duly pessimistic. First, they ignore changes in emissions, some already underway, due to concerns about global warming. Second, they assume that true air pollution will continue to get worse, with O₃, CH₄, and black carbon all greater in 2050 than in 2000. Third, they give a short shrift to technology advances that can reduce emissions in the next 50 years....This ‘current trends’ growth rate of climate forcings [based on observations], i.e. 2 W/m² in 50 years, is at the low end of the IPCC range of 2-4 W/m². The IPCC scenario of 4 W/m² requires a 4% per year exponential growth rate of CO₂ emissions for 50 years and a large growth of air pollution. The 4 W/m² scenario yields dramatic climate change for the media to fixate upon, but it is implausible.”

This is not, as Sen. McCain puts it, an “elliptical pronouncement” of a “climate change skeptic” but the well-reasoned conclusion based upon a careful examination of observed trends from a leading climate scientist who believes that the earth's climate is responding to human activities and will do so at a rate of about 0.15°C per decade for at least the next several decades—a rate of increase that is at the low end of the IPCC projections. Accompanying such a modest temperature rise is only a modest climate change—one which is easily adapted to, and one in which the potential for beneficial impacts (e.g. higher crop productivity, enhanced growing seasons) becomes large.

It is important to realize that the “consensus of scientists” cannot make scientific discoveries, nor quickly move to embrace them. Thus, results from the latest research efforts, such as those by Dr. Hansen, is not reflected by the “consensus.” This does not mean that Dr. Hansen's analysis is wrong, rather that the “consensus” is out of touch with the state-of-the science.

Senator McCain. New scientific findings since the IPCC 2001 assessment confirm climate crisis. Scientific findings since the release of the 2001 IPCC assessment are very much in line with this general tendency: refinement of our understanding and reducing some uncertainties while uncovering new potential problems and uncertainties. However, none was published in a respected, peer reviewed science journal that would fundamentally question the reality of global climate warming, and the causative role of greenhouse gases emitted from human activities in affecting the Earth's climate.

Response. Sen. McCain picks and chooses from the scientific literature. While there have been few papers to suggest that human activities play no role in the earth's greenhouse effect, there have been quite a number of papers published since IPCC 2001 which have *not* been in line with the IPCC's suggestion that extreme climate changes will result from human fossil fuel emissions. These include a series of important papers by such climate scientists as NASA's Dr. James E. Hansen, University of Virginia's Dr. Patrick J. Michaels, MIT's Dr. Richard Lindzen, and Harvard's Dr. Willie Soon and Dr. Sallie Baliunas.

Continued Unprecedented Warming of Surface Air Temperatures.

Senator McCain. The 1990's were the hottest decade of the 20th century. Temperature records dating back to 1880 indicate that six of the 10 hottest years occurred during the 1990's. This trend of ever increasing temperatures has continued into the 21st century, with 2001 and 2002 being the third and second, respectively, hottest years ever recorded. In addition, alarming warming is occurring in some regions of the globe. Despite the arguments of the RPC paper, a net warming in the Antarctic as a whole of 1.2°C per century (approximately twice the global average) has been reported. In addition, rapid warming has been well documented on the Antarctic Peninsula at a rate 10 times the global average. Similar rates of warming have been observed in Alaska. Meanwhile, a recent paper by several expert scientists has defended the "scientific consensus" that current temperatures are unprecedented not only for the past century, but for the past millennium. That paper directly contradicts recent skeptical arguments to the contrary.

Response: Sen. McCain is correct in that surface temperatures indicate that recent years are among the warmest in the surface record (which extends back about 150 years). However, there are more influences on the surface records than simply increased levels of greenhouse gases. For instance, Kalnay and Cai (2003) recently reported in *Nature* magazine that at least one-third of the temperature rise in the United States since 1950 is likely due to landscape changes (including urbanization). Since similar landscape changes are occurring across the world, similar effects are likely influencing the surface temperature record. If we look in the atmosphere above the earth's surface where the influence of landscape changes is reduced, there is a lot of evidence, both from satellites and weather-balloons (e.g. Christy et al., 2003; Lanzante et al., 2003), that the temperature changes, since 1979 have been several times less than those from the surface record. These observational records stand in sharp contrast to the modeling exercise of Santer et al. (2003) that indicates that temperatures have been rising substantially in the lower atmosphere. The difference between the observations and the model results indicate that the models are just getting it wrong.

As far as the Antarctic temperature records goes, Sen. McCain has his facts wrong. There have been many papers in the peer-reviewed scientific journals that have clearly shown that temperatures in Antarctica as a whole have been steady or even cooling since records have been kept there (the past 40 years or so). This includes a recent article published in *Nature* by Doran et al. in 2002. This fact has been widely reported by several articles in the *Washington Post* and *New York Times*. It is true that temperatures on the Antarctic Peninsula have warmed, but this is only a small arm of the Antarctic continent that makes up but a tiny fraction of the total area. Other large areas of the continent exhibit a cooling trend.

And the results from Soon and Baliunas (2003), which are the "recent skeptical arguments" which run contrary to the ideas expressed by Mann et al. (2003) that the late-20th century is anomalously warm based by a proxy reconstruction of global temperatures, has actually been confirmed by a new analysis of global temperatures reconstructed from proxies since 200A.D. published by Mann and Jones (2003). In the recent Mann and Jones paper, the proxy reconstructions show evidence for the existence of a Medieval Warm Period and a subsequent Little Ice Age. The late-20th century global temperatures from the proxy record are not the warmest on record having been exceeded on at least three occasions in the past 1800 years, the earliest of which occurred in the 7th century. It is only when instrumental records are used to extend the proxy record past 1980 (the year the proxy record ends in the Mann and Jones study) that the late-20th century appears anomalously warm. Since the instrumental record does not portray the same characteristics as the reconstructed proxy record, and as the instrumental record has been shown to be biased by urbanization and other landscape changes (see above), the instrumental record cannot be fairly compared with the proxy record. Therefore,

there exists no reliable comparison of late-20th century temperatures with those of the recent millennia, despite claims to the contrary.

Reduced Disparity Between Satellite and Surface Temperature Trends

Senator McCain. Although the observed disparity in temperature trends generated by the so-called satellite record and the surface record has been quite controversial, this disparity has grown increasingly small in recent years. The latest analysis by the University of Alabama-Huntsville has identified a positive trend of 0.07 C/decade, almost twice the rate of warming reported just two years ago. In addition, another recent analysis of the satellite data has found a much greater rate of warming of 0.12C/decade -very similar to that generated for surface temperatures of 0.16C.

Response. This is a mischaracterization of the scientific record. Two recent studies have tried to assert that the satellite-measured temperature trends in the lower atmosphere are greater than the trends reported by University of Alabama-Huntsville researchers (Christy et al., 2003). However, neither of these two studies compares their trends with the trends of lower atmospheric temperatures independently measured by weather-balloons. The weather-balloon measurements, which are a completely separate measurement system from the satellite measurements, provide a strong indication (Lanzante et al., 2003) that the lower-atmospheric trends reported by the UAH researchers (Christy et al., 2003) are more likely correct than either the trends reported by scientists at the Remote Sensing Systems laboratory (which attempts to use climate model predictions to confirm observations—Santer et al., 2003) or from the University of Maryland (which fails to account for known and previously documented satellite drift effects—Vinnikov and Grody, 2003). Comparing one set of observations with another set of observations builds a much stronger case for the truth than comparing observations with either models (as in Santer et al., 2003), or by making no contemporaneous comparisons at all (as in Vinnikov and Grody, 2003). Therefore, there remains a large and unresolved discrepancy between the temperature trends in the lower atmosphere and the temperature trends at the surface during the past 24 years. This discrepancy *is not* modeled by global climate models which predict that the lower atmosphere should warm as fast, or even faster, than surface temperatures.

Improved Observations of Current Impacts of Recent Climate Change

Senator McCain. In addition to direct observations of temperature increases, the world's wildlife also is demonstrating that the climate is changing. Since the IPCC 2001 report, new studies have documented compelling evidence of global changes in the geographic distribution of biodiversity as species respond to warming.

Response. These observations serve as evidence that the ecosystems and individual species within them are adapting to climate changes. There remains little doubt to the fact that global temperatures have warmed over the past century. If we would have observed no changes in ecosystems, this would have indicated that something was terribly wrong as species which fail to adapt to a changing climate are ones which face extinction. The fact that ecosystems are changing in response to changing patterns of climate is evidence that a) ecosystems have the ability to adapt, and b) they do adapt as necessary. This inherent ability to adapt is evidence that the climate of the earth has been

changing for eons and that the earth's ecosystems have come to expect it and have developed ways to respond to changes. This is not to say that there will not be some losers, but there will always be something there eager to replace those lost in transition. There is recent evidence that, on the whole, there have been many more winners than losers, as Nemani et al., (2003) have reported that the global vegetation has become greener and lusher during the past two decades. Nemani et al. (2003) report that the combination of enhanced atmospheric carbon dioxide levels (which serves as a fertilizer for plants) and the changes in climate that have occurred during the past 20 years have provided for a better growing environment for global vegetation as a whole. This shows that global vegetation (including food crops) is benefiting from climate change, whatever the cause.

Studies Attributing Recent Climate Change to Human Emissions of Greenhouse Gases

Senator McCain. In its 2001 report, the IPCC devoted an entire chapter to the evidence for human influence on the global climate. The IPCC is not the only institution that has arrived at this conclusion, however. Other scientists presented similar findings prior the last IPCC report, and additional studies have emerged over the past two years. In fact, no quantitative analysis of climate data has been able to account for the warming of the past several decades without accounting for the influence of greenhouse gases, and no other influence is as great.

Response. Human activities have the potential to effect climate on different scales from local, to regional, to perhaps even global. Climate-altering activities are not only related to emissions of greenhouse gases, but include agriculture, city building, and aerosol emissions among others. These activities may act to warm or cool or dry or wet, and their impacts may change in sign, type, or magnitude depending on where they are performed. And, these impacts occur on top of natural cycles of climate change, perhaps acting independently or perhaps in association with naturally occurring variability. Therefore, it becomes nearly impossible to determine the magnitude of the human influence on climate resulting from emissions of greenhouse gases. Furthermore, the question should not really be whether or not human activities are impacting the climate, but what is the net effect of any impacts. As demonstrated above, recent research (Nemani et al., 2003) indicates, that for the earth's terrestrial plant life, at least, the impacts have been positive, as the earth's environment has become a better place for growing plants.

SRES Scenarios Leading to Revised Temperature Projections

Senator McCain. IPCC 2001 temperature projections are higher than in 1995 because of more realistic treatment aerosols. One of the contributing authors to the IPCC Working Group I report stated that, "although climate modeling has advanced during the past five years, this is not the main reason for the revised range in temperature projections. The higher estimates of maximum warming by the year 2100 [compared to those made in 1995] stem from a more realistic view of sulphate aerosol emissions. The new emissions assume [aerosol] emissions will be reduced substantially in the coming decades, as this becomes technically and economically feasible, to avoid acid rain. Sulphate emissions have a cooling effect, so reducing them leads to higher estimates of warming."

Response. The introduction of sulfate aerosols into the climate change equation appears like a carefully constructed plan to produce carefully chosen results. In the IPCC's *First Assessment Report* in 1990, very little mention is made of sulfate aerosols and their impacts on climate. But by 1995, the year of the IPCC's *Second Assessment Report* (SAR), it was becoming clear that climate

models that included only the effects of increasing greenhouse gases were greater overestimating the amount of warming that was observed to have occurred during the 20th century. Realizing the problem, the IPCC stated:

“When increases in greenhouse gases only are taken into account...most [climate models] produce a greater mean warming than has been observed to date, unless a lower climate sensitivity [to the greenhouse effect] is used....There is growing evidence that increases in sulfate aerosols are partially counteracting the [warming] due to increases in greenhouse gases.”

Not wanting to admit that climate models were wrong (i.e. their sensitivity was too high), the latter possibility (sulfate cooling) was widely embraced for it implied that the climate models simply failed to include the effects of another anthropogenic emission. By carefully developing a sulfate emissions history and inputting it into the climate models, modelers were then able to closely reproduce the observed temperature variations—including the lack of warming from 1940 to 1976.

However, by including the impacts of sulfates, climate models predicted very low future warming rates. The range of future warming given by the IPCC in their SAR in 1996 was 1.0°C-3.5°C.

With the unveiling of the IPCC in 2001, it was revealed that the global temperature projections for the year 2100 had been changed from the SAR range of 1.0°C-3.5°C to the *Third Assessment Report* (TAR) range of 1.4°C-5.8°C. As Sen. McCain has pointed out, the primary reason for the increased warming projections was not carbon dioxide increases; in fact most of the TAR scenarios increase CO₂ at a rate very similar to that in the SAR. The projected warming was higher due to *the removal of sulfate aerosols*. That’s right, sulfate aerosols—which the IPCC had inserted just five years before so that the climate models would come closer to accurately modeling reality—they now have removed so that they can achieve a forecast of large temperature increases in the future. (This provides interesting commentary on how well the climate models will work in the future).

The problem with the sulfate hypothesis is that there are not many observations which support it. Instead, the observations seem to indicate otherwise. An examination of the pattern of temperature change since 1975 is nearly opposite to the pattern that models project as resulting from sulfate aerosol emission. There is no evidence that industrial and populous regions (places where sulfate emissions occur or are transported) are warming relatively more slowly than surrounding locations (i.e., sulfates are counteracting the warming to a certain degree). Instead, the observations show that these regions are in fact warming at a greater rate than neighboring regions.

This fact is not lost on prominent scientists. NASA’s James Hansen, in his address to the President’s Council on the Environment had this to say about sulfate aerosols:

“Climate models should be puzzled by the large negative forcings [cooling] that aerosol scientists estimate as the direct and indirect effects of human-made fine particles in the air. If these forcings were included in full in global climate models, the models would tend to have cooling at middle latitudes in the Northern hemisphere where the aerosols are the most abundant...In reality, moderate warming has been observed there.”

Dr. Hansen thinks that the anthropogenic emissions of black carbon soot is possibly offsetting the cooling from sulfates. He, along with other scientists, concludes that the warming impact from soot has been underestimated by the IPCC (Sato, et al., 2003; Jacobson, 2001). Thus, soot aerosols have been offsetting a larger portion of the cooling effects from sulfates than the IPCC has accounted for. The implementation of air pollution proposals the IPCC envisions will be responsible for a drastic reduction of sulfate aerosols in the future (leading to enhanced warming) will surely be aimed at removing black carbon soot aerosols, a known air pollutant, as well (which should lead to cooling). Thus, had the IPCC correctly accounted for sulfates as well as black carbon soot, the impacts of future air pollution measures on the course of future temperatures would not nearly be as dramatic as the IPCC claims.

Senator McCain. In arguing that the IPCC's latest temperature projections are based on the allegedly flawed emissions scenarios and, hence, not to be taken seriously, the RPC document misinterprets scientific findings by T. Wigley and S. Raper (paper cited in RPC document). In that paper, Wigley and Raper did not "charge" the IPCC with anything. Their only critique, repeated by Schneider and MOSS26 was the lack of probabilistic evaluation of either climate sensitivities or SRES. An even more recent scientific paper⁷ argues, in fact, for a considerable increase of the upper limit of 2100 temperature projections presented in the IPCC report. Wigley and Raper did not have this latest study available, thus underestimating the range of temperature projections. What these latest scientific findings suggest, however, is that significant emissions reductions are required to avert even more catastrophic change at the upper end of the probability distribution.

Response. As stated previously, prominent climate researcher and NASA scientist Dr. James Hansen is in total disagreement with the idea that the rate of temperature change during the next 100 years will be near the high end of the IPCC projections. In fact, in his report to the President's Council on the Environment, he states that the time has finally come to tell the whole truth about the potential for future climate change and to stop pushing unrealistic extreme scenarios. He states:

“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 forcing scenarios consistent with what is realistic under current conditions. Scenarios that accurately fit recent and near-future observations have the best chance of bringing all of the important players into the discussion, and they are what is needed for the purpose of providing policy-makers the most effective options to stop global warming.”

Dr. Hansen thinks that prospects for future warming lie at the low end of the IPCC projections. He suggests that we are on a current course to raise temperatures by about 0.75°C by 2050. Other researchers have reached similar conclusions including Allen et al. (2000) and Michaels et al. (2003). A basic similarity runs through all of these papers—the projections are based upon and modified by actual observations of how the earth's climate has responded during the past several decades under the influence of all anthropogenic forcings (greenhouse gases, aerosols, landscape changes, etc.). All of these studies indicate that observed climate change is occurring at a pace that is at the very low end of the range of IPCC projections. The impacts resulting from climate change are much less than those associated with high warming rates, and indeed, may be a net positive (that such a possibility exists can be evidenced by the aforementioned results of Nemani et al., 2003, which show a steadily greening planet).

There is a Clear Human Fingerprint on the Earth's Atmosphere and Climate

Senator McCain. The RPC claim that humans do not exert a significant impact on the Earth's climate is a non-conclusion from the discussion about the adequacy of future emissions scenarios and climate projections. The IPCC has devoted substantial attention and effort to the question of attributing observed climatic changes to natural and human drivers of climate change.

Response. Despite all the talk of an identification of a global warming “fingerprint” based upon the prediction from climate models, these same models are unable to replicate the observed trends in lower atmospheric temperatures. Since the interplay between temperatures at the surface and in the lower atmosphere is the key ingredient to determining patterns of weather, this would suggest that climate models are unable to accurately model pattern of weather (i.e. patterns that in summary define climate).

Mitigating Climate Change and the U.S. Economy

Senator McCain. No reasonable scientist, economist, or policy-maker today believes that the initial reduction commitments of the Kyoto Protocol are the complete solution to the global climate crisis. Far greater emissions reductions will be required to stabilize the climate -using and building on flexible, multi-lateral approaches with significant leadership from the United States.

Several studies have demonstrated that climate mitigation is affordable and beneficial in the U.S.

Another study found that the perception that emissions reduction targets such as those of the Kyoto Protocol are unavoidably costly or unfair is the result of outdated modeling assessments.

The IPCC Working Group III – studying mitigation options globally – came to similar conclusions reviewing many more studies and for many other countries and regions. It stated, *“Estimates of costs and benefits of mitigation actions differ because of (i) how welfare is measured, (ii) the scope and methodology of the analysis, and (iii) the underlying assumption built into the analysis.”* Thus, many economic cost and benefit analyses produce widely ranging conclusions about the economic impacts of dealing with climate change. The IPCC also concluded, however, that, *“Some sources of greenhouse gas emissions can be limited at no or negative social cost [i.e., a benefit] to the extent that the policies can exploit no regrets options.”*

Response. The belief that government can do anything to “stabilize the climate,” and that punishing energy taxes for regulating CO2 would be beneficial for the United States is simply not believable. What is a “stable climate?” The very idea is so incredible as to beg the question of motives.

In rejecting the “science” underlying Kyoto, Russian officials and scientists at the September 29 to October 3, Moscow-hosted the World Conference on Climate Change (WCCC) have observed that the U.N. is engaged in yet another of its wealth redistribution schemes (The carbon trading scheme envisioned in Kyoto and S. 139 would result in huge income transfers, as rich nations paid poor nations for emissions quotas that the latter would probably not have used anyway.) and the European Union is seeking a competitive economic advantage over the U.S. Here’s how some Russian commentators reported it: (emphasis added)

If the ecological aspect of the Kyoto Accords seems suspect to many neutral observers and specialists, where did **the worldwide hysteria** surrounding the Protocol come from?

From the economic point of view, the answer to this naive question is absolutely banal. In the Protocol's arcane construction, there are unusually attractive ways to make money out of thin air. Sergei Roginko, Director of the Ecology and Development Group at the Russian Academy of Science's Institute of European Studies and a member of the Interagency Commission for Climate Change Issues, the new carbon dioxide market based on the Protocol fits perfectly into the current quasi-virtual world economy thanks to the ethereal quality of its product. "The new market offers not the gasses themselves, but the right to emit them. People are trading legal documents based on gasses that have not been and never will be emitted into the atmosphere."

The EU is playing the central role in this new virtual market. The EU understood at the right time that a major world market with a turnover of hundreds of billions of dollars had emerged from nothing. It is acting enviably in advance of all official timetables set by the Kyoto Accords. As early as 1998, the EU announced that it would establish its regime of internal quota trading by 2005, meaning three years before the beginning of international trading according to the Protocol. Without waiting for the agreement's legitimization, the bureaucrats in Brussels with surprising self-confidence have sketched out the complex outlines of the future CO2 market. They are pushing not only to become the **big players** in world quota trading, but **also to make up the rules of the game** for the rest of the world.

Under pressure from greens in the legislatures of practically all European countries, bills were introduced to levy huge taxes on industrial polluters, which is why an entire range of new ecologically clean technologies were first developed and implemented in the EU. **Europe is trying to make its manufacturing competitive compared to the US**, and in order to do this, it has to lower costs. The second most important factor contributing to costs after electricity is costs related to "clean manufacturing."

The Most advantageous solution for Europe is to expand its environmental regulations to the rest of the world, first and foremost, to the US. Preliminary estimates published in the Economist show that full compliance with the Kyoto Protocol would cost 1% of the world GDP. **The lion's share of this cost would be borne by the American economy.**

(http://www.gateway2russia.com/st/art_153584.php)

The Lieberman-McCain cap and trade legislation (S.139) **assists the EU and U.N. bureaucrats** in putting the U.S. at an economic disadvantage and imposing higher rates of poverty and suffering on the American people, especially minorities and the poor. Study upon study finds that Kyoto would

incur substantial costs, bring little progress toward its objective, and, because of the huge fund transfers that would result from the practice of emissions trading, stir political disputes.

According to the U.S. Department of Energy's Energy Information Administration (EIA), the Climate Stewardship Act of 2003 (S. 139), sponsored by Senators John McCain (R-Arizona) and Joseph Lieberman (D-Connecticut) to curtail greenhouse gas emissions would have far-reaching negative effects on the American economy.

By 2025, the average American family can expect to pay \$444 more per year for energy as a result of Lieberman-McCain (S. 139), according to the EIA analysis. The average American will have paid nearly \$2,500 to comply with the law, and the nation as a whole will have lost more than \$500 billion in gross domestic product, measured in 1996 dollars.

Compliance with the proposed legislation, modeled closely after the Kyoto Protocol, will stir up a new round of environmental debates, warned the EIA, as nuclear power's share of the country's electricity supply would have to rise 50 percent to meet consumer energy demands without an increase in carbon dioxide emissions. Conservation and renewable energy sources will fall far short of meeting America's energy needs, the report noted.

According to Wharton Econometric Forecasting Associates (WEFA), implementation of the Kyoto Protocol would cost 2.4 million U.S. jobs and reduce GDP by 3.2 percent--about \$300 billion annually.

Moreover, according to WEFA, American consumers would face higher food, medical, and housing costs, and the average household of four would see its real income fall by nearly \$3,000 in 2010 and every year thereafter. Energy and electricity prices would nearly double, and gasoline prices would increase by 65 cents per gallon.

The WEFA findings were largely confirmed in a 1998 analysis by the Clinton Energy Information Administration.

A study by economist William Nordhaus in *Science* magazine (Nov. 9, 2001) concludes that participation in the treaty would have cost the United States some \$2.3 trillion over the coming decades—more than twice the combined cost to all other participants. Senate bill S. 139 likewise forces the U.S. into being so unequal a partner in the science-deficient Kyoto enterprise.

A study by Dr. Stephen Fuller finds that Implementation of the Kyoto Protocol will have a substantial annual economic impact on the nation's 25.5 million senior households by 2010 and continuing thereafter. The most visible economic impacts will be on the direct cost of the energy that **senior households** consume. This impact will be seen in gasoline prices that are at least \$0.60 higher per gallon than at present (and in addition to projected inflationary increases) and could rise to almost \$0.80 higher per gallon by 2020. Electricity for air conditioning, heating and cooking, and lighting houses will increase by more than 50 percent on average, over and above the projected inflation for this period. (<http://www.ceednet.org/resources/seniors5.asp>)

Senator McCain admits that more than Kyoto will be required in the future. Tighter controls on CO2 emissions will likely end the use of coal for electricity generation. According to a recent report by Daniel E. Klein and Ralph L. Keeney, removing coal from America's energy mix would directly result in massive job loss and 14,000 to **25,000 premature adult deaths** per year. **Child deaths** due to reduced income, as well as deaths resulting from increased unemployment, were not

quantified in this study. However, the authors' extrapolations from other studies suggest that these increased incidences of mortality could be substantial. These negative effects would likely be borne disproportionately by Hispanics and African Americans.
(<http://www.ceednet.org/kkhealth/index.asp>)

Iain Murray of the Competitive Enterprise Institute summed it this way: "The America that Senators McCain and Lieberman want us to live in is a poorer country in every sense of the word. People will lose thousands of dollars of income they could use to help their households. [They will] travel less, and may even lose their jobs."

The U.S. National Assessment of the Potential Consequences Climate Variability and Change

Senator McCain. The RPC document claims that the first U.S. National Assessment of the Potential Consequences of Climate Variability and Change – a "Clinton era report" -has been scientifically discredited and disavowed by the U.S. government. These claims are false.

Response. The USNA was anything but scientifically sound. The two models that base the entire USNA were shown to be unable to reproduce the known temperature history of the United States any better than random numbers. This represents an abject failure of the models. This critical flaw was described before the Oversight and Investigations Subcommittee of the U. S. House of Representatives Committee on Energy and Commerce on July 25, 2002. It is also the focus of a lawsuit brought against the federal government alleging that because of this shortcoming, the USNA fails to meet the standards of the Federal Data Quality Act. There is no scientifically reliable (and thus useable) information can result from climate models which fail to reproduce known climate.

References

Allen, M., et al., 2000. Quantifying the uncertainty in forecasts of anthropogenic climate change. *Nature*, **407**, 617-620.

Christy, J.R., R.W. Spencer, W.B. Norris, W.D. Braswell and D.E. Parker, 2003: Error estimates of Version 5.0 of MSU/AMSU bulk atmospheric temperatures. *J. Atmos. Oceanic Tech.*, **20**, 613-629.

Doran, P., et al., 2002. Antarctic climate cooling and terrestrial ecosystem response. *Nature*, **415**, 517-520.

Hansen, J.E., Sato, M., 2001. Trends of measured climate forcing agents. *Proc. Nat. Acad. Sci.*, **98**, 14778-14783.

IPCC, 2001. Houghton, J.T., et al., (Eds). *Climate Change 2001, The Scientific Basis*. Cambridge University Press, Cambridge, UK, 881pp.

IPCC, 1996. Houghton, J.T., et al., (Eds). *Climate Change 1995, The Science of Climate Change*. Cambridge University Press, Cambridge, UK, 572pp.

IPCC, 1990. Houghton, J.T., et al., (Eds). *Climate Change, The IPCC Scientific Assessment*. Cambridge University Press, Cambridge, UK, 365pp.

Jacobson, M.Z., 2001. Strong radiative heating due to the mixing state of black carbon in atmospheric aerosols. *Nature*, **409**, 695–697.

Kalnay, E., and Cai, M., 2003. Impact of urbanization and land-use change on climate. *Nature*, **423**, 528-531.

Lanzante, J.R., S.A. Klein and D.J. Seidel, 2003: Temporal homogenization of radiosonde temperature data. Part II: Trends, sensitivities and MSU comparison. *J. Climate*, **16**, 241-262.

Lindzen, R.S., Chou, M.D., Hou, A.Y., 2001. Does the earth have an adaptive infrared iris? *Bull. Amer. Meteorol. Soc.*, **82**, 417-432.

Mann, M.E., et al., 2003. On past temperatures and anomalous late-20th century warmth. *EOS, Trans. Amer. Geophys. Union*, **84**, 256-258.

Mann, M.E., Jones, P.D., 2003. Global surface temperatures over the past two millennia. *Geophys. Res. Lett.*, doi:10.1029/2003GI017814.

Michaels, P.J., et al., 2002. revised 21st century temperature projections. *Cli. Res.*, **23**, 1-9.

Nemani, R.R., et al., 2003. Climate-driven increases in global terrestrial net primary production from 1982 to 1999. *Science*, **300**, 1560-1563.

Santer, B.D., et al., 2003. Influence of Satellite Data Uncertainties on the Detection of Externally Forced Climate Change, *Science*, **300**, 1280-1284.

Sato, M., et al., 2003. Global atmospheric black carbon inferred from AERONET. *Proceedings of the National Academy of Sciences*, **100**, 6319–6324.

Semenov, V.A., Bengtsson, L., 2003. Modes of the wintertime Arctic temperature variability. *Geophysical Research Letters*, doi:10.1029/2003GL017112.

Soon, W., Baliunas, S., 2003. Proxy climate and environmental changes of the past 1000 years. *Cli. Res.*, **23**, 89-110.

Vinnikov, K. Y., Grody, N.C., 2003. Global warming trend of mean tropospheric temperature observed by satellites. *Science*, **302**, 269-272.