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To: UN IPCC Committee
From: Dr. Heinz Lycklama (PhD in Nuclear Physics, McMaster University)
Date: May 4, 2009 [Updated June 5, Sep. 14, Dec. 1, 2009 & Apr. 13, 2010]
Subject: Analysis of the Global Warming Issue [Latest at www.osta.com/gw]

Early in 2009 I started to look into the issue of Global Warming (GW) and attempt to understand why the issue had become such a controversial one. The general public has become attuned to the issue of GW and I (as an independent scientist) wanted to do my part in educating the public on the underlying science so that good public policy would be established. I assumed that science should be able to show the extent of GW and determine whether GW is due to man-made causes or to natural causes. Once we get the science right we would then know if we need to, should, or even could do anything about GW. It turns out that things are a lot more complicated and unsettled than I thought they were. So I dug into the science behind GW much more thoroughly.

Although I have addressed this memo to the UN IPCC (Intergovernmental Panel on Climate Change), my findings, conclusions and suggestions are meant for all scientists actively involved in the study of climate change. It is my sincere hope that all interested parties will take my comments seriously in order to resolve the confusion that exists in the science behind GW so that policy makers and politicians have the most recent and accurate information available about the extent and causes of GW. That way the policy makers might in turn recommend reasonable solutions to the perceived problem of GW. IPCC's continued involvement in fostering international public policy is important. Input from climate scientists not involved in the IPCC is also important.

I have read the **IPCC Fourth Assessment Report** (AR4) and related documents. The IPCC AR4 report makes these statements:

- Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.Continued greenhouse gas emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century.

The report makes the assumption that the recent GW trend observed over the last 25-30 years is likely based on increased greenhouse (GH) gases and that this GW trend is likely to continue during this century. However, the assumption and prediction do not agree with the Global Cooling (GC) cycle that some climate scientists have observed/predicted that we now appear to be entering.

My research led me to a report put together by a group of climate scientists who identify themselves as the Nongovernmental International Panel on Climate Change (**NIPCC**), as well as the **U.S. Senate Minority Report** in which more than 700 international scientists dissent over man-made GW claims. I have also discovered a large number of other technical papers in the field of climatology that show the extent and the causes of GW to be

different from what the IPCC report concludes. Many of my key reference documents are listed at the end of this report.

I have reviewed the **NIPCC report "Summary for Policymakers" document**, as well as some of the technical papers presented at the recent **International Climate Change Conference** held in NYC in March 2009. This in turn led me to many other dissenting opinions on the extent and possible causes of GW. Most of the non-IPCC technical papers conclude that GW is largely due to natural cyclical causes, and not due to anthropogenic causes. If we include the more than 31,000 scientists who have signed the **Global Warming Petition Project**, we have thousands of scientists who believe that the recent GW trend is due primarily to natural causes, with little impact by man-made causes, as the tens of scientists involved in IPCC believe. This is not consensus.

To me the key issues/questions to be resolved (as an independent scientist) are:

1. Has there been a GW trend in the recent past?
2. Is GW due to anthropogenic causes, e.g. carbon dioxide (CO2)?
3. Is GW due to natural causes?
4. Do we need to do something about GW immediately?
5. Is the recommended solution for GW based on good science?
6. Who is hurt by the recommended GW solution?
7. What conclusions can we draw from the analysis?
8. What should the GW community do next?

My findings and the basis of my conclusions are summarized below, with points in each section listed in no particular order. Section 8 of this report offers some suggestions on how the climate change community might reach a consensus on the remaining open issues. We need to diagnose the cause(s) of the perceived GW problem correctly before recommending a solution. Otherwise the "cure" may be worse than the "disease."

Updates, June 5/Sep. 14 '09 – The major reason for this update is the publication of the 868-page NIPCC document called "Climate Change Reconsidered" by the Heartland Institute (www.heartland.org) on June 2, 2009. The document was coauthored by Craig Idso, founder and chairman of the Center for the Study of CO2 and Global Change (www.co2science.org) and Fred Singer, founder and president of the Science and Environmental Policy Project (www.sepp.org.) Thirty-five scientists have made contributions and reviewed this very impressive document. The NIPCC report provides a very comprehensive critique of the errors and omissions in the IPCC report. Numerous references are provided to the scientific literature supporting the findings of the NIPCC report as summarized in the Executive Summary at the beginning of the report. New references are added below. I have reviewed the key findings of the new NIPCC report as summarized in the Executive Summary section and find that they are consistent with my findings as documented in the first 6 sections of my report. It is my hope that the IPCC will carefully consider the NIPCC findings and update the IPCC report accordingly. This will give policy makers and politicians the most recent information so that they can establish public policies based on good science.

Updates, Dec. 1 '09/Apr. 13 '10 – The ClimateGate and subsequent scandals confirm my worst suspicions as a scientist. It is time to revisit the science behind GW. Make special note of References 57, 63, 68, 72-74, 96, 98 & 101 starting on page 12.

1.0 Has there been a GW trend in the recent past?

Yes, a warming trend appears to have occurred over the last 130 years or so, from about 1880 AD on. The increase in average global temperature over this period appears to have been about 0.7 degrees Centigrade. Not all scientists agree on the magnitude of the increase in average global temperature, nor do they agree on the magnitude or direction of the change in average temperature predicted for the 21st century. Here are the highlights of my findings on why there are still differences of scientific opinion on this:

1. The temperature measurements used by the IPCC have been largely based on temperature gauges located on land.
2. Most temperature gauges were located in the northern hemisphere.
3. The predominance of temperature gauges in urban areas has biased average worldwide temperatures higher than they actually were.
4. Temperature measurements by satellite do not agree with those taken by temperature measurements taken by temperature gauges on land.
5. Global data from satellites does not show a GW trend since 2001, even though atmospheric CO2 concentration has been increasing.
6. Satellite temperature measurements were initially not considered by the IPCC.
7. The U.S average temperature has trended upward at about 0.5 degrees C per century over the last 130 years or so. This has included both GW and GC periods, each lasting approximately 30 years.
8. The earth has experienced GW and GC periods in the last few thousand years.
9. GW did occur in a medieval warm period from about 800 to 1200 AD, a period during which temperatures were higher than they are today.
10. A little ice age occurred from about 1300 to 1880 AD.
11. The amount of CO2 in the atmosphere has increased by about 30% since 1880.
12. The amount of methane in the atmosphere has also increased in this period.
13. Using CO2 "equivalency units" all GH gases have increased by about 60% in the period since 1880.
14. IPCC predicts a warming of 0.2 degrees centigrade per decade for the next two decades based on its climate models. However, this assumes that GW increases will continue near current rates and that global cooling (GC) will not occur.
15. There is no scientific consensus on the magnitude of temperature rise dependence on an increase in GH gases.
16. We are now (2008) apparently entering a GC cycle that is expected to last for 15 to 25 years, based on Dilley's gravitational models [*see below.*]
17. The Monckton report indicates that even though CO2 concentration is increasing, the average global temperature is not increasing proportionally.
18. IPCC's 4th assessment report published in 2007 has lowered the projections for the GW temperature increase and sea level rise of the earlier IPCC reports.

IPCC's projection for GW in the future is based on its climate models and assumes that the GW trend of the last 25 to 30 years will continue. The IPCC projection is at variance with projections made by the NIPCC, Easterbrook, Dilley [*see below*], and others.

2.0 Is GW due to anthropogenic causes, e.g. CO2?

One of the key questions in the GW discussion is that of the cause of GW. It is agreed that the existence of GH gases in the atmosphere has some impact on the average global temperature. But the overriding question is – is GW anthropogenic (caused by man) or is

GW controlled by natural causes? Is and will GW be harmful? Here are the highlights of my findings on this question:

1. The "general consensus" is that the production of CO2 by humans burning fossil fuel is the main cause for the earth's current (the last ~150 years) GW.
2. IPCC considers the following GH gases – carbon dioxide, methane, nitrous oxide, CFC, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
3. IPCC does not consider water vapor to be a GH gas, but the NIPCC report does.
4. There is a disagreement among climate scientists over whether water vapor should be a dependent variable or an independent variable in climate models.
5. NIPCC has shown that the distribution of water vapor in the atmosphere can produce strong negative feedback effects on global temperature.
6. Water vapor in the atmosphere holds 93 times more atmospheric heat than the CO2 does.
7. IPCC does admit that water vapor and cloud cover are sources of uncertainty in the impact on climate change.
8. There are so many sources and sinks of CO2 that it is difficult to determine with any accuracy how much of the atmospheric CO2 concentration is due to anthropogenic GH emissions.
9. Many climatologists consider that GH gases are comprised of a) 95% water vapor, b) 4.7% ocean biologic, volcanos, plant/animal activity, and c) 0.3% human additions such as CO2.
10. The IPCC climate model considers CO2 to be the major driver of climate change, but it does not consider solar irradiation as a significant cause of climate change.
11. Studies by Arthur Robinson, et. al. have shown that computer model uncertainties in ocean surface flux, north-south heat flux by motions, humidity and clouds are far greater than any CO2 effects [*see below.*]
12. Most of the CO2 in the atmosphere is produced by natural, not manmade, causes.
13. CO2 in the atmosphere has increased during most of the 20th century at a fairly constant rate. However, we had a period of GC from 1940 to 1975 (even while CO2 concentrations increased) as well as a GW period from 1975 to the early part of this century.
14. High concentrations of CO2 have been detected in the distant past without any apparent ill effects. This did not have an anthropogenic cause.
15. In the past CO2 cycles have always happened in response to natural temperature cycles, even when man was not a factor in producing CO2.
16. Global temperatures rose for a hundred years (~ 0.5 degrees C) before significant CO2 use by humans. There has been a steady increase in the use of CO2 by humans over the last 150 years, time that included warming periods (e.g. 1910-1940, 1972-2000) as well as a significant cooling period (e.g. 1940-1972).
17. World glaciers have been retreating at a fairly steady rate for the past 200 years, well before the significant increased use of hydrocarbons by man.
18. There has been a 7 inches per century sea level rise over the last 150 years, starting well before the significant increase in use of hydrocarbons by man.
19. Past IPCC climate models based on anthropogenic causes for GW have not done a good job of predicting global temperatures.

The case made by the IPCC that GW is largely due to anthropogenic causes does not have wide support outside of the IPCC committee. It does not appear that human hydrocarbon use is causing significant increasing global termperatures.

3.0 Is GW due to natural causes?

A number of independent studies by climate scientists have shown that GW is due to natural causes. Climatologists have identified at least the following natural causes – variations in solar output, variations in the earth's orbital characteristics and tilt, volcanic eruptions, atmosphere/ocean heat exchange, and the moon's gravitational cycles. Here are the highlights of some of these studies. The details of these studies can be found in the references listed at the end of this report.

1. The NIPCC report has concluded that climate change (GW and GC) may best be explained by natural causes due to the complex interactions between the atmosphere and oceans, and perhaps stimulated by variations of solar irradiation.
2. NIPCC has determined that internal oscillations such as North Atlantic Oscillation (NAO), Atlantic Multi-Decadal Oscillation (AMO), Pacific Decadal Oscillation (PDO), and the El Nino-Southern Oscillation (ENSO) play a major role in climate change. These oscillations are identified as internal oscillations of the atmosphere-ocean system by the IPCC.
3. The orbital influences on climate are well documented and widely accepted, but apparently not considered by the IPCC.
4. The sun has been shown to be a much more important climate driver than the concentration of atmospheric CO2.
5. Studies by Baliunas and Jastrow, and Friis-Christensen and Lassen, have shown that solar activity indicates a strong correlation with global temperatures. The solar activity includes sunspot cycle length, changes of solar ultraviolet or of the solar wind and its magnetic effect on cosmic rays and thus on cloud coverage.
6. Some solar physicists have suggested that the sun could have caused more than two thirds of observed GW in the past.
7. Solar activity is expected to decline for the next 50 years, resulting in GC.
8. A study by Easterbrook in 2008 has shown a strong correlation between the Glacial Decadal Oscillation (GDO) and the Pacific Decadal Oscillation (PDO), the warming and cooling of the Pacific Ocean, and global temperature records. In a similar manner the North Atlantic Oscillation (NAO) shows that we are entering a cooling period. These correlations are unrelated to atmospheric CO2 concentrations.
9. Studies have shown a connection between PDO and cloud variations.
10. Easterbrook's climate model matches the alternate 27-year warming/cooling cycles since about 1470, and predicted the cooling cycle that we are now entering. The IPCC climate model predicted increasing temperatures looking forward in time.
11. Easterbrook's climate model indicates that global climate changes correlate well with a) changes in solar irradiance, b) number of sunspots and sunspot cycle length, and c) production of BE10 and C14 in the atmosphere from radiation.
12. According to Easterbrook's studies, there appears to be "no correlation between CO2 and GW in the past. Half of the warming in the past century occurred before CO2 began to rise sharply. For 30 years after CO2 began to soar, GC occurred, rather than GW. Of the 25 past periods of GW, only the last one (the past 30 years) corresponds to rising CO2. 96% of GW periods in the past 500 years have no correlation with CO2."
13. Meteorologist Dilley has determined that there is a very significant link between GW and the moon's recurring gravitational cycles. They also apparently explain the cooling cycle that we are now entering.
14. Dilley has identified the gravitational cycles as the Primary Forcing Mechanism (PFM) for Climate.

15. Dilley has also determined that the moon's natural cycles explain the 50% increase in CO2 seen in the last 150 years, as well as over the past several thousands of years.
16. Dilley has determined that the magnitude of the current GW/CO2 cycle is due to the fact that the earth is presently at the peak of seven Primary Forcing Mechanism (PFM) cycles (caused by the moon's gravitational cycles), and not due to man-made CO2 emissions since the mid 19th century.
17. Dilley's model has about a 90% correlation with the average temperature data.
18. The "effect of sun irradiation on the ocean" model has about a 70% correlation with the average temperature data.
19. The assumption of GW caused by man-made CO2 has only about a 25% correlation with the average temperature data.

We must remember that warming does not tell us the cause of the warming, and that correlation does not necessarily indicate causation. However, we should pay attention to strong correlations that agree with postulated climate models. The natural causes of GW postulated by climate scientists need to be considered by the IPCC.

4.0 Do we need to do something about GW immediately?

The science behind GW and GC cycles is still in a state of flux. The debate is not settled. Thus it is too early to recommend a "solution" to address the driving functions behind climate changes. Here are some reasons why the science is not yet considered settled and why a solution to the perceived GW problem should not be implemented hastily:

1. There is nothing unusual about the recent warming period when compared with historical periods of warming. GW and GC periods have occurred throughout the last few thousands of years with more extreme temperature changes than we have measured today.
2. The last GC period ending in the 1970's resulted in a GC scare.
3. The IPCC study involved 52 scientists, not all of them climate scientists. The final IPCC reports were written by consensus among UN policy makers from many different countries, sometimes publishing results that were not approved by the IPCC scientists involved in the climate studies.
4. The NIPCC report expresses significant variances from the IPCC report.
5. More than 700 international scientists have expressed dissent in the U.S. Senate Minority Report over the man-made GW claims made in the IPCC report.
6. More than 31,000 scientists have signed a GW Petition that expresses strong disagreement with the conclusions drawn in the final IPCC report.
7. Meteorologist Dilley has put out a report based on 19 years of investigation that identifies the natural driving functions responsible for climate changes.
8. Dilley's models predict GC from 2008 to 2014, again from 2020 to 2025, with the coldest point being reached in 2050.
9. Grant money to fund climate studies has overwhelmingly been made available to groups that are sympathetic to anthropogenic causes (e.g. burning of fossil fuels) for GW.
10. A number of developed nations agreed to reduce CO2 emissions by a certain percentage according to the Kyoto Protocol adopted in 1997. None of these nations came anywhere close to meeting their goals. More aggressive goals are not likely to be met in the future.
11. If the Kyoto Protocol were implemented and successful, GW would only be reduced by 0.07 degrees C by 2050.

12. There is no scientific consensus that somewhat larger concentrations of CO2 in the atmosphere are harmful. Some researchers have shown that increased CO2 has been beneficial for agriculture and to have economic benefits.
13. Major discrepancies still exist between temperature measurements and computer climate change models. Existing climate change models do not explain many climate observations.
14. The IPCC's past predictions for future catastrophic consequences of GW have not come to pass since the IPCC climate models were inadequate.
15. The IPCC's prediction of a large temperature increase by the year 2100 is not based on credible climate models.
16. Al Gore has hijacked the good work of IPCC scientists and become an alarmist when it comes to GW. His movie "An Inconvenient Truth" has received wide publicity, but it has been shown to contain falsehoods. In October 2007 the High Court in London identified nine significant "errors" in his movie. Lord Christopher Monckton also wrote a paper pointing out "35 Inconvenient Truths" (errors and exaggerations) in Gore's movie. The movie has done a great disservice to getting the truth out about the extent and causes of GW and the likely impacts that we can expect in the future.
17. Al Gore has declared the GW debate over. This is a red flag when it comes to good science. If the debate were indeed over, Gore would be willing to debate protagonists, be able to articulate the causes for GW, and achieve general agreement from a majority of climate scientists – this has not happened.
18. We do not understand the costs of implementing the "consensus" GW solution. When asked to address this issue, Al Gore refuses. It is imperative that the economic costs of any solution be addressed and understood.
19. A recent poll indicates that GW ranks only 20th in a list of 20 major issues when prioritized by participants in the poll.

The IPCC report recommends a solution that assumes that GW is primarily due to anthropogenic causes, especially the emission of CO2. In contradiction, the NIPCC report concludes that there is no convincing evidence or observations of significant GW from other than natural causes. It appears the IPCC committee did not adequately consider the "second opinion" put forth by climate scientists outside of the IPCC "peer group" in drawing their conclusions and making their recommendations.

The recommended IPCC "consensus" GW solution involves:

1. Reducing CO2 emissions by 80% by the year 2050.
2. Establishing a cap-and-trade system to regulate conformance to the goals.

A number of analyses have been performed by different scientific groups to determine the probable causes of climate change, both anthropogenic and natural. We need to consider all of these analyses before drawing conclusions and determining what the best solution is for controlling the emission of GH gases, if indeed that is required. Implementing a solution for the perceived problem of GW before there is a strong consensus on the cause(s) of GW can do more harm than good.

5.0 Is the "consensus" GW solution based on good science?

It is my understanding the IPCC reports were put together by 52 or more scientists plus additional policy makers selected from UN member countries. The final versions of the IPCC reports were edited by UN policy makers who apparently did not seek approval for

technical changes from the scientists who provided the information for the reports. Some of these UN scientists have since disassociated themselves from the final reports and asked their names to be removed from these reports. The resulting IPCC reports have apparently not received wide support from the climate science community for the following reasons:

1. The climate model used by the IPCC assumes that man-made CO2 is the primary cause of GW.
2. The IPCC reports lack the approval of some of the IPCC scientists who provided input for them, nor did they include minority reports to outline the areas of disagreement.
3. NIPCC input was not adequately considered or rebutted. NIPCC concluded that GW is controlled by natural causes and that GH gases do not play a significant role in GW.
4. Satellite data was not adequately considered in measuring average global temperatures.
5. Solar irradiation was not considered as a cause of climate change.
6. Various well-known long-term and short-term gravitational cycles controlled by the orbits of the moon were not considered as a cause of climate change.
7. The "hockey-stick" graph included in early IPCC reports was based on an inaccurate climate model. The publication and subsequent withdrawal of this graph did not help the credibility of the IPCC.
8. The IPCC reports appear to be designed to show support for anthropogenic GW, and finding evidence of a human role in climate change, without scientific rebuttal to data that show otherwise.
9. The NIPCC report expresses significant variances from the IPCC report.
10. More than 700 international scientists have refuted the last IPCC report in the U.S. Senate Minority Report.
11. Dissent about the IPCC reports and the resulting Kyoto Protocol are expressed by more than 31,000 scientists who signed a GW Petition put out by the Oregon Institute for Science and Medicine.
12. The IPCC reports are apparently driven by a political agenda to find evidence for human causes for climate change.
13. Peer review has apparently been done by a select group of like-minded peers.
14. IPCC appears to be organized as "a government entity beholden to political agendas."
15. Research grants have apparently predominantly gone to scientists and policy makers who are willing to support IPCC's agenda.
16. Many IPCC reports have been controversial and their conclusions contradicted by subsequent research.
17. Most studies by climate scientists show that atmospheric man-made CO2 is not a significant cause of GW.
18. Reducing emissions of some GH gases to control pollution is important, but many climate scientists do not believe that this will not have a significant impact on the global climate.
19. Environmentalists have warned of a potential for a global catastrophe in the late 1970's based on the GC that was occurring in the previous 25-30 years. This did not occur.

Climate scientists need to reach a much higher degree of consensus on the cause(s) of GW before the science underlying GW can be considered settled. For example, further analysis is required to determine the impact of GH gases such as water vapor on the global climate.

6.0 Who is hurt by the "consensus" GW solution?

There is no such thing as a "free lunch." The current recommended solution is so expensive for so little gain that it will significantly increase the cost of all energy products. This will impact the following:

1. The poor – Poor people can barely afford the cost of fuel today. An added cap-and-trade tax will increase the cost of fuel beyond their ability to pay.
2. Energy consumers – All energy consumers would pay extra for the additional costs of uneconomical energy solutions whose use would be mandated by government regulation.
3. Third world countries – Many countries in Africa are currently not allowed to build electrical plants, especially those using coal as a fuel source, because of the impact on the environment. Extra taxes will make it impossible for them to better their economic situation.
4. Developed nations (and their citizens) who sign up for limiting CO2 emissions would likely experience slower economic growth and lose their competitive edge in the short term. This would likely result in certain industries and/or jobs moving off shore. The prosperity of these nations would suffer.
5. Oil exporting countries would pay higher taxes under any cap-and-trade program.
6. The world economic growth rate would likely be slower under any ill-conceived GW programs.
7. The political backlash from an ill-conceived GW program would be immense and result in undermining any public support that a sound GW program might have.

7.0 What conclusions can we draw from the analysis?

As the result of my reading and analysis, the major conclusions that I draw from my analysis of the issue are as follows:

1. The extent of the GW phenomena does not appear to be as great as has been presented to the public by the IPCC and the popular media.
2. The number of dissenting climate scientists is greater, by at least an order of magnitude, than the number of climate scientists who have contributed to the IPCC report. The number of dissenters is far too large to ignore.
3. The IPCC seems to have focused on the last 25 to 30 years during which a GW cycle has been observed. IPCC appears to have based its predictions of increased GW for the next century on the continuation of the recent GW trend, and ignoring prior trends in global temperatures, both warming and cooling.
4. Many climate scientists have determined that we are now entering a 25 to 30 year GC period, and not a period of GW.
5. The science behind GW is not well understood and is far from settled.
6. The economic and people costs of any proposed GW solution are not well researched or understood.
7. GW appears to be largely due to natural causes, with possibly minor contributions from man-made causes.
8. Technical contributions from hundreds of climate scientists outside of the IPCC have not been adequately considered by the IPCC in determining the extent or causes of GW.
9. Any extensive and costly action to control GW is premature because of significantly different opinions offered by different groups of climate scientists.

10. Deception, the unbalanced use of scientific data, and exaggeration by certain policy makers and politicians have damaged the credibility of the good work done by IPCC scientists.
11. Climate scientists need to regroup and be more inclusive of research done by climate scientists with opposing viewpoints in order to develop a true scientific consensus on the extent and cause(s) of GW.

8.0 What should the GW community do next?

We need to recognize that the global climate is constantly changing; it always has and it always will. There are many open questions for which climate scientists do not yet have good answers. Here are my suggestions:

1. Recognize that the science of climate change is far from settled and that the scientific debate that can lead to better consensus is not over.
2. Separate the issue of pollution from that of GW. Most scientists agree on the major contributors to pollution and the need to control the emission of those pollutants.
3. Separate the green/renewable energy issue from that of GW. We need to promote green energy solutions (such as solar, wind, tidal, and geothermal) if and as they become economically viable anyway. That is just being a good steward of the earth's resources.
4. There is no agreement yet on what the key drivers behind GW are, and whether there is a need to control these drivers, i.e. are man-made causes significant enough contributors to warrant costly remedial programs at this time?
5. Develop a list of significant open issues in the field of climatology that need to be resolved in order to develop a true "consensus" GW solution, if indeed a solution is required. This will benefit the research funding agencies.
6. Include both IPCC and NIPCC scientists in the "peer group" of climate scientists so that all scientific analyses and results are adequately considered.
7. Provide grants/funds for climate researchers with opposing viewpoints.
8. Develop credible climate models that accurately reflect the temperature measurements over the last few hundred years so that predictions of future climate changes have much greater credibility.
9. Perform a cost benefit analysis of any proposed solution.
10. Use common sense and take politics out of the determination of optimum climate change programs, if any should be required.

It is my sincere hope that my suggestions will be helpful to the members of the IPCC committee (including all climate scientists) in drafting future IPCC reports that end up having much greater credibility and that result in the implementation of effective and economical public policies that benefit all mankind. Thanks for your consideration.

Footnote: Climate scientists should pay special attention to the last finding documented by the NIPCC on page 8 of the Executive Summary in their report "Climate Change Reconsidered":

> "There can be little doubt that ethanol mandates and subsidies have made both food and energy more, not less, expensive and therefore less available to a growing population. The extensive damage to natural ecosystems already caused by this poor policy decision, and the much greater destruction yet to come, are a high price to pay for refusing to understand and utilize the true science of climate change."

Let's make sure that we use good science in establishing public policies related to climate change! Reference #101 below is a good step in the right direction.

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NOTE: Updates to this report can be found on the Internet at www.osta.com/gw.

References [Updated May 24, 2011]

1. http://en.wikipedia.org/wiki/Climate_change - Wikipedia writeup on "Climate Change."
2. http://en.wikipedia.org/wiki/Global_warming - Wikipedia writeup on "Global Warming."
3. http://en.wikipedia.org/wiki/Intergovernmental_Panel_on_Climate_Change - Wikipedia writeup on IPCC.
4. http://www.eoearth.org/article/Causes_of_climate_change - The Encyclopedia of Earth article on "Causes of Climate Change."
5. http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf - Report of WG1 of IPCC, Summary for Policymakers – 2007.
6. http://www.ipcc.ch/pdf/presentations/wg1-report-2007-02.pdf - PowerPoint presentation on the Physical Science Basis for Climate Change.
7. http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-ts.pdf - Technical Summary Report of WG1 of IPCC.
8. http://www.epa.gov/climatechange/science/pastcc.html - U. S. EPA article on "Past Climate Change."
9. http://www.ff.org/centers/csspp/pdf/20070201_monckton.pdf - IPCC Fourth Assessment Report 2007 Analysis and Summary, February 2007, by Lord Christopher Monckton.
10. http://climatecongress.ku.dk/presentations - Presentations made at the Climate Change Conference held in Copenhagen, March 10-12, 2009.
11. http://www.heartland.org/events/NewYork08/proceedings.html - The 2008 International Conference on Climate Change held in NYC, March 2-4, 2008.
12. http://www.heartland.org/events/NewYork09/proceedings.html# - International Climate Change Conference held in NYC – March 8-10, 2009.
13. http://www.heartland.org/events/WashingtonDC09/index.html - Third International Conference on Climate Change held in Washington, DC, June 2, 2009.
14. http://www.heartland.org/custom/semod_policybot/pdf/22835.pdf - Heartland 2008 Report (50 pages) on "Nature, Not Human Activity, Rules the Climate" [Summary for Policymakers of the 2008 Report of the NIPCC.]
15. http://www.heartland.org/books/NIPCCFulltoc.html - Climate Change Reconsidered: Outline of NIPCC Report expected in May 2009.
16. http://www.nipccreport.org/ - Climate Change Reconsidered: The (868 page) Report of the NIPCC, published on June 2, 2009.
17. http://pathstoknowledge.wordpress.com/2009/06/03/nongovernmental-international-panel-on-climate-change-nipcc-2009-report - Summary of the NIPCC Report Findings and Conclusions, published on June 3, 2009.
18. http://www.sepp.org/ - Science & Environmental Policy Project.
19. http://www.sepp.org/publications/GWbooklet/withfigures.html - The Scientific Case Against The Global Climate Treaty by Fred Singer, July 1999.
20. http://www.sepp.org/publications/Kyoto%20not%20backed%20by%20Science-May%202002.doc - The Kyoto Protocol is not backed by Science, May 2002.
21. http://epw.senate.gov/public/index.cfm?FuseAction=Minority.Blogs&ContentRecord_id=2674E64F-802A-23AD-490B-BD9FAF4DCDB7 - U.S. Senate Minority Report: More Than 700 International Scientists Dissent Over Man-Made Global Warming Claims.

22. http://www.petitionproject.org/ - GlobalWarming Petition Project, signed by more than 31,000 scientists.
23. www.co2science.org - Craig Idso's website on CO2 Science.
24. http://www.appinsys.com/GlobalWarming - Global Warming Science.
25. http://www.appinsys.com/globalwarming/GW_SimplifiedNutshell.htm - Global Warming - the Short Version of Why the Anthropogenic CO2 Theory is Wrong.
26. http://www.climatescienceinternational.org/index.php?option=com_content&task=view&id=37&Itemid=54 - International Climate Science Coalition, The Manhattan Declaration on Climate Change.
27. http://www.climatescienceinternational.org - Website for International Climate Science Coalition.
28. http://globalwarmingclearinghouse.blogspot.com - Global Warming Clearinghouse with references to key reports, articles, papers and blogs with the latest information available on Global Warming.
29. http://www.globalresearch.ca/index.php?context=va&aid=10783 - Don Easterbrook article on "Global Cooling is Here," 11/2/08.
30. http://news.yahoo.com/s/prweb/20090416/bs_prweb/prweb2329394_2 - Web Article on Natural GW/GC (global cooling) cycles, 4/16/09.
31. http://www.globalweathercycles.com/ - Global Weather Cycles eBook by Meteorologist David Dilley.
32. http://www.ourcivilisation.com/aginatur/moregw.htm - The Myth of Global Warming.
33. http://www.ourcivilisation.com/aginatur/cycles/fig8.htm - Global Temperature Anomalies (1979-2002).
34. http://www.youtube.com/watch?v=xzSzItt6h-s - The Great Global Warming Swindle – Produced by WAGTV.
35. http://www.youtube.com/watch?v=Io-Tb7vTamY - Global Warming Hoax.
36. http://whatreallyhappened.com/WRHARTICLES/globalwarming.html - The Global Warming Scam.
37. http://www.kusi.com/weather/colemanscorner/38574742.html - The Amazing Story Behind the Global Warming Scam.
38. http://www.youtube.com/watch?v=XDI2NVTYRXU&feature=related - Al Gore Debates Global Warming.
39. http://www.youtube.com/watch?v=FOLkze-9GcI&feature=related - Climate Change – Is CO2 the Cause?
40. http://www.youtube.com/watch?v=9fCP_nHRjP8&feature=channel - Evidence CO2 does not cause dangerous Global warming.
41. http://www.theregister.co.uk/2008/05/02/a_tale_of_two_thermometers/ - Is the earth getting warmer, or cooler? A tale of two thermometers, Steven Goddard, posted in Science, 5/2/08.
42. http://www.petitionproject.org/gw_article/GWReview_OISM300.pdf - Environmental Effects of Increased Atmospheric Carbon Dioxide, Arthur Robinson, et. al., 2007.
43. http://www.discovery.org/v/30 - The Global Warming Myth – Dr. Noah Robinson, Telecosm 2007.
44. http://www.geocraft.com/WVFossils/greenhouse_data.html - Water Vapor Rules the Greenhouse System.
45. http://www.geocraft.com/WVFossils/ice_ages.html#anchor2108263 - Global Warming: A Chilling Perspective.

46. http://archive.newsmax.com/archives/ic/2007/6/21/123227.shtml?s=al&promo_code=35F1-1 - Canadian Professor: Prepare for Global Cooling.
47. The Politically Incorrect Guide to Global Warming, Christopher C. Horner, 2007.
48. http://www.staff.livjm.ac.uk/spsbpeis/PAS.htm - Position of the Geological Science Committee of the Polish Academy of Sciences on the Threat of Global Warming.
49. http://www.climatecooling.org - Global Climate Cooling Facts.
50. http://wattsupwiththat.com/2008/02/19/january-2008-4-sources-say-globally-cooler-in-the-past-12-months - January 2008, 4 sources say "globally cooler" in the past 12 months.
51. http://www.metro.us/us/comic.xml?path=%2fus%2farticle%2f2009%2f04%2f27%2f04%2f4243-82%2findex.xml&__toolbar=0&id=comp:000049c059d0:000000508d:16fe - Global cooling (shown in four data sets).
52. http://www.geocraft.com/WVFossils/greenhouse_data.html - Water Vapor Rules the Greenhouse System.
53. http://video.newsmax.com/?bcpid=20972460001&bclid=22770166001&bctid=23619354001?s=al&promo_code=8009-1 - Interview with Dr. William Gray, Emeritus Professor of Atmospheric Science at Colorado State University on "Global Warming Not Our Biggest Problem."
54. http://www.uoguelph.ca/~rmckitri/research/jgr07/M&M.JGR07-background.pdf - Quantifying the influence of anthropogenic surface processes and inhomogeneities on gridded global climate data, Ross McKitrick and Patrick Michaels.
55. http://www.drroyspencer.com/2009/05/global-warming-causing-carbon-dioxide-increases-a-simple-model/ - Global Warming Causing CO2 Increases: A Simple Model, Roy Spencer.
56. http://nzclimatescience.net/index.php?option=com_content&task=view&id=471&Itemid=1 - Mankind has an insignificant impact on the climate of planet earth, Jay Lehr, Ph.D., Science Director of the Heartland Institute, USA.
57. http://www.sydneyminingclub.org/presentations/2008/november/plimer/player.html - Human-Induced Climate Change: A Load of Hot Air - Professor Ian Plimer.
58. http://joannenova.com.au - The Skepitcs Handbook on Global Warming, written by Joanne Nova, former believer in GHG, 2009.
59. http://www.fraserinstitute.org/Commerce.Web/product_files/CriticalTopicsInGlobalWarming.pdf - Critical Topics in Global Warming: Supplementary Analysis of the Independent Summary for Policymakers, Fraser Institute, March 2009.
60. http://en.wikipedia.org/wiki/Scientific_opinion_on_climate_change - Wikipedia article on Scientific Opinion on Climate Change.
61. http://www.skepticalscience.com - Skeptical Science, Examining the science of Global Warming skepticism.
62. http://www.cornwallalliance.org/docs/suppressed-epa-memo-on-global-warming.pdf -Proposed NCEE Comments on Draft Technical Support Document for Endangerment Analysis for GHG Emissions under the Clean Air Act, Mar. 09.
63. http://carbon-sense.com/2009/09/13/climate-skeptics-090911 - PowerPoint slide show explaining the Climate Skeptics' scientific arguments against the threats of human-caused Global Warming and major problems associated with proposed Cap-n-Trade legislation.
64. http://carbon-sense.com/wp-content/uploads/2009/10/no-man-made-global-warming.pdf - Man-made Global Warming does not Exist, October 2009.
65. http://carbon-sense.com/2009/10/11/ipcc-science-scrutinised - Scrutiny of UN IPCC Climate Science.

66. http://www.cornwallalliance.org/docs/a-call-to-truth-prudence-and-protection-of-the-poor.pdf - A Call to Truth, Prudence, and Protection of the Poor: An Evangelical Response to Global Warming, The Cornwall Alliance, 2006.
67. http://www.cornwallalliance.org/blog/item/movie-debunks-global-warming-hype - Cornwall Alliance introduces movie "Not Evil Just Wrong" that showcases the human cost of global warming hype, October 2009.
68. http://www.friendsofscience.org/assets/documents/monckton_2009.pdf - Christopher Monckton presentation on the Global Warming alarmism using statistics and charts – October 2009.
69. http://scienceandpublicpolicy.org/images/stories/press_releases/Press-Release_No-Climate-Crisis.pdf - Proved: There is no Climate Crisis, Paper by Christopher Monckton, July 2008.
70. http://www.telegraph.co.uk/comment/columnists/christopherbooker/6679082/Climate-change-this-is-the-worst-scientific-scandal-of-our-generation.html - Climate Change: This is the worst scientific scandal of our generation, Christopher Booker, November 28, 2009.
71. http://www.timesonline.co.uk/tol/news/environment/article6936328.ece - Climate Change Data Dumped, Nov. 29, 2009.
72. http://www.ncpa.org/sub/dpd/index.php?Article_Category=32 - National Center for Policy Analysis list of documents exposing Climate Change political agenda, December 2009.
73. http://scienceandpublicpolicy.org/images/stories/papers/originals/Monckton-Caught%20Green-Handed%20Climategate%20Scandal.pdf - ClimateGate: Caught Green-Handed, An SPPI Paper by Christopher Monckton, November 30, 2009.
74. http://scienceandpublicpolicy.org/images/stories/papers/reprint/450_peer_reviewed_papers.pdf - 450 Peer-Reviewed Papers Supporting Skepticism of AGW-Caused Global Warming, November 16, 2009.
75. http://noconsensus.wordpress.com/2009/05/21/disproving-the-anthropogenic-global-warming-agw-problem - Disproving the Anthropogenic Global Warming (AGW) Problem – by Leonard Weinstein on April 25, 2009.
76. http://www.heartland.org/bin/media/newyork08/PowerPoint/Tuesday/miskolczi.pdf - Physics of the Planetary Greenhouse Effect, Dr. Ferenc Miskolczi, March 2008.
77. http://www.heartland.org/bin/media/newyork08/PowerPoint/Tuesday/zagoni.pdf - Some Paleoclimatic Consequences of Dr. Miskolczi's New Greenhouse Theory, Dr. Miklos Zagoni, March 2008.
78. http://landshape.org/dokuwiki/doku.php?id=introduction - The New Climate Theory of Dr. Ferenc Miskolczi.
79. http://met.hu/doc/idojaras/vol111001_01.pdf - Greenhouse Effect in Semi-transparent Planetary Atmospheres, Dr Ferenc Miskolczi, January 2007.
80. http://wattsupwiththat.com/2009/12/08/the-smoking-gun-at-darwin-zero/ - The Smoking Gun at Darwin Zero, Willis Eschenbach, Dec. 12, 2009.
81. http://seoblackhat.com/2007/03/04/global-warming-on-mars-pluto-triton-and-jupiter/ - Global Warming on Mars, Pluto, Triton and Jupiter.
82. http://wattsupwiththat.files.wordpress.com/2009/12/billbell.pdf - The Scam of Our Lifetime, Global Warming Caused by Human-made CO2?, Advertisement published in Calgary paper in 2009.
83. http://www.marshall.org/pdf/materials/188.pdf - The IPCC, the "Hockey Stick" Curve, and the Illusion of Experience, by Stephen McIntyre & Ross McKitrick, November 18, 2003.

84. http://www.dailyexpress.co.uk/posts/view/146138 - Climate Change is Natural: 100 Reasons Why, UK Daily Express, December 15, 2009.
85. http://www-eaps.mit.edu/faculty/lindzen/180_Eugenics.pdf - Science and Politics: Global Warming and Eugenics, Richard Lindzen (MIT), August 1995.
86. http://icecap.us/index.php/go/new-and-cool/fact_based_climate_debate/ - Fact-based Climate Debate, Lee Gerhard, IPCC Expert Reviewer, Dec. 17, 2009.
87. http://www.uoguelph.ca/~rmckitri/research/nvst.html - The Graph of Temperature vs. Number of Stations.
88. http://www.uoguelph.ca/~rmckitri/cc.html - Global Warming: Competing Views – a webpage maintained by Ross McKitrick.
89. http://www.uoguelph.ca/~rmckitri/research/APEC-hockey.pdf - What is the 'Hockey Stick' Debate About?" Ross McKitrick, April 4, 2005.
90. http://www.cfact.org/a/1594/All-pain-no-gain - All Pain, No Gain, Oct. 8, 2009.
91. http://carbon-sense.com/wp-content/uploads/2010/03/grass-trees-climate-food.pdf - Grasses, Trees, Climate and Food, by the Carbon Sense Coalition, March 2010.
92. http://www.spiegel.de/international/world/0,1518,686697,00.html - A Superstorm for Global Warming Research, April 2010.
93. http://www.cfact.org/a/1717/Lord-Monckton-at-Bonn-climate-talks - Lord Monckton at Bonn UN Climate Talks, April 9, 2010.
94. http://www.cfact.org/a/1718/Global-warmings-weak-links - Global Warming's Weak Links, April 9, 2010.
95. http://www.washingtontimes.com/news/2010/apr/07/global-warmings-unscientific-method/ - Global Warming's Unscientific Method, April 7, 2010.
96. http://wattsupwiththat.com/climategate - Everything about Climategate.
97. http://www.climate-skeptic.com - Climate Skeptic website.
98. http://www.coyoteblog.com/Skeptics_Guide_to_Anthropogenic_Global_Warming_v1.0.pdf - A Skeptical Layman's Guide to Anthropogenic Global Warming v1.01, Warren Meyer, July 3, 2007.
99. http://www.climate-skeptic.com/Climate%20Presentation%20Annotated%201-1-2010.pdf - Catastrophe Denied: A Critique of Catastrophic Man-Made Global Warming Theory, Warren Meyer, November 10, 2009.
100. http://www.climate-skeptic.com/2010/01/catastrophe-denied-the-science-of-the-skeptics-position.html - Catastrophe Denied: The Science of the Skeptic's Position, Warren Meyer, January 24, 2010.
101. http://www.scoop.co.nz/stories/SC1004/S00006.htm - Science, Climate Change and Integrity, Royal Society of New Zealand, April 7, 2010.
102. http://www.geocraft.com/WVFossils/GlobWarmTest/start.html - Global Warming Test, a simple ten question test.
103. http://scienceandpublicpolicy.org/images/stories/papers/reprint/two_dead_elephants.pdf - Two Dead Elephants in Parliament, Malcolm Roberts, Feb. 7, 2010.
104. http://www.minemanagers.com.au/client_images/895936.pdf - Testimony of Roy W. Spencer Before the Senate Environment and Public Works Committee on July 22, 2008.
105. http://www.noconsensus.org/ipcc-audit/findings-main-page.php - There is No "Scientific Consensus" on Global Warming – Citizen Audit Main Findings [on 2007 UN IPCC report] released on April 14, 2010.
106. http://scienceandpublicpolicy.org/images/stories/papers/originals/climate_science_corrupted.pdf - Climate Science Corrupted, John McLean, Nov. 20, 2009.
107. http://mclean.ch/climate/global_warming.htm - Global Warming Issues, posted by John McLean.

108. http://www.co2science.org/education/truthalerts/v13/cowpea.php - CO2 Truth-Alert Archive, April 2010.
109. http://international-environmental-affairs.suite101.com/article.cfm/new-scientist-does-about-turn-on-global-warming#ixzz0lKJjIRwG - 'New Scientist' Does About Turn on Global Warming, April 16, 2010.
110. http://www.cfact.org/a/1732/Questions-posed-for-Kerry-Lieberman-on-new-climateenergy-bill - Questions posed for Kerry, Lieberman on new climate-energy bill, May 12, 2010.
111. http://www.marshall.org/pdf/materials/884.pdf - Understand Climate Science Before Making Policy, William Happer, May 14, 2010.
112. http://www.marshall.org/pdf/materials/885.pdf - Understand Climate Science Before Making Climate Policy, Roger Cohen, May 14, 2010.
113. http://www.marshall.org/pdf/materials/886.pdf - Links to a Sampling of Scientific Literature, Reports, Presentations, and Other Material, May 14, 2010.
114. http://cei.org/news-release/2010/05/11/kerry-graham-lieberman-bill-huge-payoff-big-business - Kerry-(Graham)-Lieberman Bill a Hugh Payoff to Big Business, May 11, 2010.
115. http://www.answersingenesis.org/articles/arj/v3/n1/bible-science-perspective-on-global-warming - A Proposed Bible-Science Perspective on Global Warming, - Rod Martin, 5/26/10.
116. http://opinion.financialpost.com/2010/06/06/legal-verdict-manmade-global-warming-science-doesn%E2%80%99t-withstand-scrutiny/ - Legal Verdict: Manmade Global Warming Science Doesn't Withstand Scrutiny.
117. http://www.probeinternational.org/UPennCross.pdf - Global Warming Advocacy Science: A Cross Examination.
118. http://opinion.financialpost.com/2010/06/13/the-ipcc-consensus-on-climate-change-was-phoney-says-ipcc-insider - The IPCC consensus on climate change was phoney, says IPCC insider.
119. http://www.firstthings.com/article/2011/05/the-truth-about-greenhouse-gases - William Happer article on the dubious science of the climate crusaders.
120. http://blogs.forbes.com/patrickmichaels/2011/05/19/sound-fury-and-the-policy-of-climate-change - OpEd piece by Patrick Michaels on Climate of Fear in the May 2011 of the Forbes magazine.
121. http://gisandscience.com/2010/05/17/national-academy-of-sciences-to-release-three-reports-in-the-americas-climate-choices-study-on-may-19 - National Academy of Sciences (NAS) release of three reports in the "America's Climate Choices" Study on May 19, 2011.
122. http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=05192010 – Press release accompanying the NAS "America's Climate Choices" Study.
123. http://www.sepp.org/twtwfiles/2011/TWTW%202011-5-21.pdf – The (5/21/11) Report by The Science and Environmental Policy Project (SEPP), www.sepp.org.
124. http://www.galileomovement.com.au/galileo_movement.php - Announcement of the Galileo Movement in Australia in May 2011.
125. http://climatecommission.govspace.gov.au/files/2011/05/Climate-Commission-Science-Report-Key-Messages1.pdf - Australian Government Climate Commission Report – The Critical Decade: Key messages.
126. http://www.galileomovement.com.au/docs/MediaRelease20110523.pdf - The Galileo Movement response to the Australian Climate Commission Report
127. http://www.galileomovement.com.au/docs/Report20110523.pdf - Exposing the Climate Commission's unscientific 'Key Messages' in its report.