

Climate Change: A Not a problem but a threat to the poor

3nd Draft

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“Everyone is entitled to his own opinion, but not to his own facts.”

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Introduction

When progressives (American liberals, leftists) trumpet a problem, I am wary. On all too many issues, their solution is always the same: more power for government. The climate change issue, whose implementation would involve a massive transfer of regulatory power to governments worldwide and to international agencies, is no exception. Regulations, not markets, would become the main driver of hundreds of billions of dollars of investments.

I have been studying "climate change" for years. It used to be called "global warming", but since there hasn't been any for almost 20 years, progressives had to come up with another term. What I have found after digging into the issue contradicts what I had read in the mainstream media: *The New York Times*, *The Washington Post*, NBC, CBS, ABC, etc.

My intention in this essay is to provide enough data and analysis for you to make up your mind on the validity of the two competing claims about what is actually happening to the Earth's climate. No one is paying me for this, but I do own stock in several oil and gas exploration companies.

Please do not take anything I say at face value. Look at the data and at competing hypotheses yourself, and follow a reliable practice: Ask, "What's the other side of the argument", and "Who says so, and how does he know?"

I shall tell you up front what I think. Then I shall present a series of questions and answers. This format will enable quick access to the discussion of a topic of particular interest to you. I shall present the views of the two schools of thought on the climate change issue with as much intellectual integrity as I can muster. This has been difficult because I consider the climate change 'alarmists' to be wrong. But I trust you will forget about my "bias" and focus on logic and evidence and on the science itself presented here, not on credentials or spurious justifications based on consensus.

The sources I reference are ones whose logic and evidence are persuasive to me because they are based on reliable and validated data, not models. I have tried to frame questions so as to present the arguments of the climate alarmists clearly and fairly. At the very least, I hope to persuade you that there is a coherent, logical, and fact-based other side to what you read in the mainstream media.

To avoid interpretative errors of my own, I rely heavily on quotations. Every assertion is referenced so you can find its source easily.²

What I think

² A footnote indicator at the end of a series of quotations refers to their common source.

I agree with a summary of the climate change issue has been developed by an all-volunteer group of primarily retired NASA scientists and engineers, mostly veterans of the Apollo program. They call themselves The Right Climate Stuff Research Team. <http://www.therightclimatestuff.com/> The group of more than 25 active members was formed in February 2012 as an independent research team with no funding in order to “determine the extent to which burning fossil fuels can cause harmful global warming.” Their key findings are:

1. “The science of the major cause of climate change is not settled.
2. Natural processes dominate climate change.
3. “Man-made CO2 impact appears to be muted.
4. “Real, empirical evidence does not support catastrophic warming.
5. “The government is over-reacting to concern about AGW.
6. “Catastrophic forecasts are coming from unvalidated climate models.
7. “The climate models contain assumptions of Earth’s sensitivity to CO2 that are far too high.
8. “That the EPA and the Administration are calling CO2 a pollutant is scientifically embarrassing.
9. “Using 165 years of real temperature and CO2 data, the maximum rise in temperature projects at only 1.2 degrees Celsius by 2100.”³

³ Tom Wismuller, The Right Climate Stuff, Panel 13, Tenth International conference on Climate Change, Heartland Institute, June 11, 2015.

10. “We are going to run out of fossil fuels before atmospheric CO₂ can rise to levels that could cause harmful warming of the planet.

11. “The minimum atmospheric CO₂ concentration required for plant growth, i.e. for plants to live, is 150 parts per million (ppm). In 1850 the concentration was 285 ppm. If the CO₂ concentration doubles, the CO₂ concentration will still be dangerously close to absolute minimum needed for plants to grow. To put this in context, the CO₂ concentration in the NASA space station was considered acceptable at 5000 ppm.”⁴

Questions and answers

1. What do the climate alarmists and climate skeptics agree on and where do they disagree?

“The common ground includes:

- The climate has always changed and always will.
- That CO₂ is a greenhouse gas, the accumulation of which results in warming of the lower atmosphere.
- That post-industrial human-related emissions comprise a new source of atmospheric CO₂.
- That a global warming of around 0.7°C may have occurred in the twentieth century.
- That global warming has ceased over the last eighteen years.”⁵

⁴ These final two points are from Hal Dorion, The Right Climate Stuff, Panel 13, Tenth International conference on Climate Change, Heartland Institute, June 11, 2015.

⁵ From Robert M. Carter, ‘The Scientific Context’, in Alan Moran (ed.) *Climate Change: The Facts*, (Woodsville, NH: Stockade Books, 2015), p.73.

2. What are the main claims of the International Panel on Climate Change [IPCC], the primary reference source for those who assert that climate change and anthropogenic carbon dioxide emissions should be of concern?

“Greenhouse gases absorb and redirect longer-wavelength radiation, but not shorter-wavelength radiation. When radiation from the sun hits the earth, some of it is absorbed by the land and the sea, which are consequently warmed by the energy. As a result, when the earth re-emits the sun's radiation in the form of heat, it is disproportionately of the lower-energy, longer-wavelength sort that the greenhouse gases, carbon dioxide (CO₂) foremost among them, trap or send back to earth. Thus, more carbon-dioxide emissions lead to a hotter planet.

“The United Nations Intergovernmental Panel on Climate Change has the task of integrating the best available knowledge on technical questions relating to climate change. The IPCC produces an Assessment Report every five to seven years that seeks to forecast climate change given fairly reasonable assumptions for world population and economic growth. These projections are therefore premised on various potential global-development scenarios for the 21st century. The fifth and most recent Assessment Report (known as AR5), published last year, projects that, without significant interventions to reduce emissions, global temperatures will rise on the order of two degrees Celsius by the end of the century in moderate emissions scenarios, and closer to four degrees in the most aggressive emissions scenarios.”⁶

3. What is the basis of the IPCC's claims?

The IPCC's estimates are based entirely on computer simulations of future climate conditions, derived from extremely elaborate climate change models.

⁶ See Jim Manzi and Peter Wehner, 'Conservatives and Climate Change', in *National Affairs*, Number 24, summer 2015, pp. 117-18.

The claims are based on models, not data. The validity of the simulation results obviously depends on the validity of the models.

4. What is the hypothesis used to construct the computer simulations on which the climate alarmist view is based?

According to Richard S. Lindzen, “It should be recognized that the basis for a climate that is highly sensitive to added greenhouse gases is solely due to the behavior of the computer models. Within these models, the primary effect of increases in greenhouse gases is multiplied several fold by the interaction of the increases with water vapor, clouds, and other aspects of the system that are openly acknowledged by the ... IPCC to be highly uncertain.”⁷

And Garth W. Paltridge finds that, “...the representation of clouds in climate models)and of the water vapour which is intimately involved with cloud formation) is such as to amplify the forecast warming from increasing atmospheric CO₂ – on average over most of the models – by a factor of about three. Despite what the models are telling us – and perhaps *because* [italics in original] it is models that are telling us – no scientist close to the problem and in his right mind ... would say that he is 95 percent sure that the effect of clouds is to amplify rather than to reduce the global warming effect of increasing CO₂. If he is not sure that clouds amplify global warming, he cannot be sure that most of the global warming is a result of increasing CO₂.”⁸

⁷ See Richard S. Lindzen, ‘Global warming, models and language’, in Moran (ed.) *Climate Change*, p .39.

⁸ See Garth W. Paltridge, ‘Uncertainty, skepticism, and the climate issue’, in Moran (ed.) *Climate Change*, p. 148.

“The modelers assume that CO2 has caused most of the warming since the industrial revolution, and for the most part, they also assume relative humidity stays the same. The models then show that CO2 caused most of the warming and thus the assumption about humidity was ‘right’. If some other factor caused some of that warming, both points would be wrong.

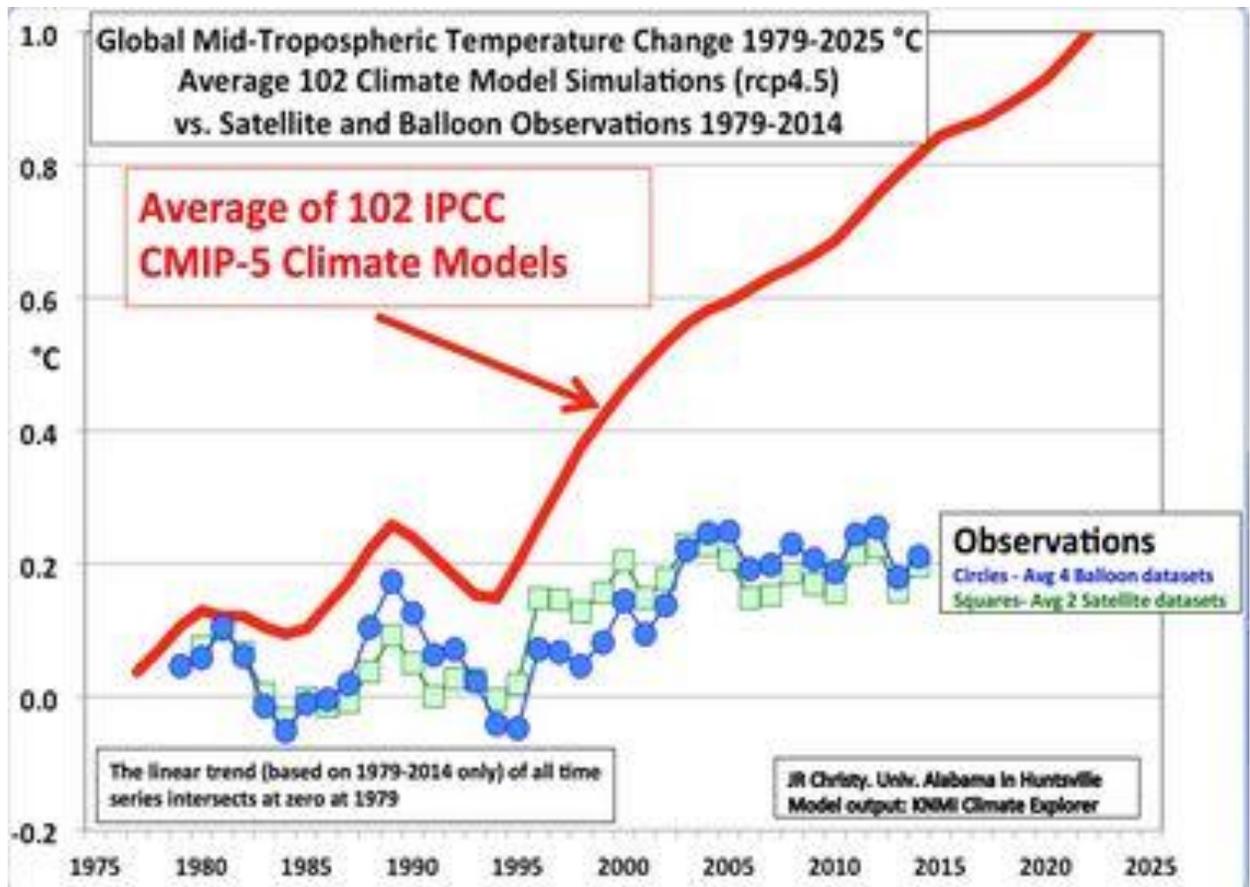
“The humidity that supposedly amplifies the warming is not just any old humid patch anywhere, but the thin layer near the top of the troposphere, about ten to twelve kilometres above the tropics. This is where the action is. Models predict faster warming there, and the trends [should] show up as a red ‘hot spot’ on the graphs.”⁹

5. Does the empirical evidence [the data] support the alarmist hypothesis and the resulting simulations as to the long term effects of higher atmospheric concentrations of CO2? Put another way, how accurate have the models used as the basis for alarmism about climate change been?

The empirical evidence does not support the climate change hypothesis.

- Dr. John Cristy, Professor of Atmospheric Science and Director of the Earth System Science Center at the University of Alabama in Huntsville (UAH), has compared the results of past computer simulations to what has actually happened. As the chart below shows, all the models have always been wrong and are becoming increasingly inaccurate over time. All of them very substantially over-estimate the rate and amount of global temperature increase.

⁹ See Jo Nova, ‘the trillion dollar guess and the zombie theory’, in Moran (ed.) *Climate Change*, p .157.



Jo Nova points out that, “The best data [on the ‘hot spot’ comes from weather balloons, which rise up through the layer and radio the information back before they explode. We’ve released 28 million or so of these since the late 1950s, and the trend up there is unmistakably not what the models expected. Instead of getting more humid as the air warmed, it got less. Temperatures also didn’t warm as much as [the models indicated] they were supposed to. The result was stark in the colour maps of the atmosphere. Yellow is not red.”¹⁰

Also, according to Patrick J. Michaels, “The observed trend from 1951-2013 to 2004-2013 falls below the model average. The observed trend initially falls

¹⁰ Idem

below the fifth percentile trend 37 years ago, or in 1977, and remains there for every trend length through the end of the period.¹¹

In his view, “There is little doubt that the ensemble of climate models used in the 2013 IPCC report fails, when normatively tested as a hypothesis concerning observed global surface temperature trends.

“The normative test indicates that, when model output from the UN is examined retrospectively, the failure of hypothesis would have begun about 37 years ago.

“There is a growing body of refereed scientific literature that estimates, using largely independent techniques, that the sensitivity [of temperature to CO₂] is lower than the mean in the model ensemble used in 2013 IPCC report. Meta-analyses of these new results have yet to be performed to see whether they, as an ensemble, are also consistent with observed trends.¹²

6. Hasn't a definitive paper recently been published by Karl et al.¹³ showing that there has been no pause in the warming trend?

All of the data bases used to track climate change show that there has been no warming over the past eighteen years. But we learn that researchers at the National Oceanic and Atmospheric Administration [NOAA] recently released a paper presenting adjustments to the surface temperature data such that the reduction in global warming [the 18 year “pause”] disappeared.

¹¹ See Patrick J. Michaels, ‘why climate models are failing’, in Moran (ed.) *Climate Change*, p .30.

¹² See Michaels, “Why climate models are failing,” p.37.

¹³ See T.R. Karl, et al., ‘Possible artifacts of data biases in the recent global surface warming hiatus. *Scienceexpress*, June 4, 2015.

The responses questioning the claims made in the paper by Karl et al. strike me as much more persuasive than the paper itself. Patrick J. Michaels, Richard S. Lindzen, and Paul C. Knappenberger responded thus:

“The main claim by the authors that they have uncovered a significant recent warming trend is dubious. The significance level they report on their findings (.10) is hardly normative, and the use of it should prompt members of the scientific community to question the reasoning behind the use of such a lax standard.

“... the authors’ treatment of buoy sea-surface temperature (SST) data was guaranteed to create a warming trend. The data were adjusted upward by 0.12°C to make them “homogenous” with the longer-running temperature records taken from engine intake channels in marine vessels.

“As has been acknowledged by numerous scientists, engine intake data are clearly contaminated by heat conduction from the structure, and as such, never intended for scientific use. On the other hand, environmental monitoring is the specific purpose of the buoys. Adjusting good data upward to match bad data seems questionable, and the fact that the buoy becomes increasingly dense in the last two decades means that this adjustment **must** [emphasis in original] put a warming trend in the data.

“...there exist multiple measures of bulk lower atmosphere temperature independent from surface measurements which indicate the existence of a “hiatus”. If the Karl et al., result were in fact robust, it could only mean that the disparity between surface and midtropospheric temperatures is even larger than previously noted.

“... even presuming all the adjustments applied by the authors ultimately prove to be accurate, the temperature trend reported during the “hiatus” period (1998-2014) remains significantly below (using Karl et al.’s measure of

significance) the mean trend projected by the collection of climate models used in the most recent report from the ... IPCC.”¹⁴

Judith Curry, a climatologist at Georgia Tech also is skeptical. She notes that

“The greatest changes in the new NOAA surface temperature analysis is (sic) to the ocean temperatures since 1998. This seems rather ironic, since this is the period where there is the greatest coverage of data with the highest quality of measurements – ARGO buoys and satellites don’t show a warming trend. Nevertheless, the NOAA team finds a substantial increase in the ocean surface temperature anomaly trend since 1998.

“... the gold standard dataset for global ocean surface temperatures is the UK dataset, HadSST3... The UK group has dealt with the same issues raise d by the NOAA team.... The NOAA group has [not] done anywhere near as careful a job as the UK group on processing the ocean temperatures.”¹⁵

In sum, the adjustments made by the NOAA researchers yield a result that is at odds with every other surface temperature dataset as well as satellite data.

7. What do the data show?

“While the range of temperature has varied from year to year – as it has since the beginning of time – there has been no net global warming for over eighteen years.

“According to the temperature records kept by the UK Met Office (and other series are much the same), [e.g., the University of Alabama Huntsville satellite temperature dataset], over the past 150 years ... mean global temperature has increased by a little under a degree

¹⁴ Blog post in <http://wsattsupwiththat.com>, June 4,2015.

¹⁵ ¹⁵ Blog post in <http://wsattsupwiththat.com>, June 9,2015

centigrade – according to the MET office, 0.8°C.... The great bulk of it [0.5°C] ... occurred during the last quarter of the late twentieth century.... But since then, ... there has been no further warming at all. The latest report of the Intergovernmental Panel on Climate Change (IPCC) ... reckons that global warming has latterly been occurring at the rate of ... 0.05°C a decade, plus or minus 0.1°C.... In other words, the observed rate of warming is less than the margin of error.”¹⁶

“To understand what the data are telling us as to the sensitivity of temperature to CO₂ emissions, it first is necessary to understand how scientists define climate sensitivity.

“The technical definition of climate sensitivity is the equilibrated response of global mean temperature anomaly to a doubling of CO₂. Because of a logarithmic dependence of the relative impact of CO₂, it doesn’t matter what the starting value for a doubling is. Doubling from 1000 to 2000 ppmbv [parts per million by volume] has the same effect as doubling from 280-560 ppmbv.

“... only sensitivities [of temperature to CO₂] under about 1°C are consistent with observations.

“However, the IPCC suggests that aerosols constitute a highly uncertain potential source of cooling. Modelers have been able to invoke this uncertainty in order to adjust the net anthropogenic forcing [effect] (i.e. the sum of greenhouse forcing and aerosol forcing) to match the observations.... For the [climate] sensitivities in excess of 1.5°C, this [adjustment [for aerosols] is about half of the [three watts per square meter] [that the IPCC says is the [total] radiative forcing due to

¹⁶ See Nigel Lawson, ‘Cool it on climate change’, in Moran (ed.) *Climate Change*, p .98.

anthropogenic greenhouse gases (CO₂, methane, nitrous oxide, etc.), and already in excess of what the IPCC considers the likely aerosol contribution, but recent work suggests that even this estimate for aerosols is much too great.

“[Furthermore], ... global mean temperature anomaly would vary even without external forcing. [Translation: the temperature would vary even without any effect from man-made CO₂].

“... natural (non-greenhouse related) internal [temperature variability... is likely to have accounted for about half of the warming since the late 1970s. Under the circumstances, getting models to replicate the much reduced directly forced warming will require even more implausible cancellation [cooling effect] by aerosols. This is clearly not the case ... Even if the attribution claim were correct, it would still be completely consistent with low sensitivity [of temperature to CO₂].

“It seems to me that the most reasonable conclusion to reach under the circumstances is that climate sensitivity [to CO₂] is small. Moreover, mild warming is likely to be net benefit.”¹⁷

8. How confident can we be that the data from the measurements are correct and a warming trend really has been taking place?

Anyone studying the data used to support a claim about climate change must always keep in mind a mantra of Walter H.G. Lewin, former professor of physics at MIT: “Any measurement that you make without knowledge of its uncertainty is completely meaningless.” This warning applies in spades to analysis of climate change. Since the climate system is extremely complex, it is difficult to separate normal variations in climate from the variation allegedly incurred by man-made CO₂ emissions. It is also difficult to adjust the data so that the circumstances of

¹⁷ See Lindzen, ‘Global warming, models and language’, in Moran (ed.) *Climate Change* pp. 40, 43,46.

measurement are constant over time. If these adjustments are not made, a false conclusion is likely to be drawn because of changed circumstances that have nothing to do with climate change. For example, if the same weather station is used over a long time and the area around it changes from a cow pasture to an urban parking lot, the temperature will rise for reasons having nothing to do with climate.

There are many other difficulties too: those in distinguishing between a purely local change and a global change and those involved in developing data that is properly calibrated (consistent over time), and validated (confirmed by multiple sources and accepted methods of good scientific practice). Getting the measurements right is a daunting task.

Here are some highlights from the massive literature on the question of how confident we can be about inferring that unusual global warming is even occurring, much less whether or not it is driven mainly by man-made CO₂ emissions.

“Neither the rate nor the magnitude of the reported late twentieth century surface warming (1979-2000) lay outside normal natural variability, nor was it in any way unusual compared to earlier episodes in Earth’s climatic history.

“Though global average temperature may have warmed during the twentieth century, no direct instrumental records exist that demonstrate any such warming within an acceptable degree of probability.

“The main record used by the IPCC for analyzing contemporary ‘climate change’ is compiled by averaging individual temperature records of varying quality and length from around the globe. This, the HADCRUT record -- the name being a combination of data sets of two organisations namely the Hadley Centre of the UK Met Office and the Climatic Research Unit (CRU) at the University of East Anglia – has a number of known deficiencies. These include that it is far too short to be treated as a serious climate record ..., is

probably inadequately corrected for the urban heat island effect, and is subject to other large errors....”¹⁸

William Soon points out that, “To determine whether a warming trend has been occurring, the raw data on temperature have to be adjusted because of lack of uniformity of what is being measured over time. For example, non-climatic effects such as urbanization and differences in the time of day of measurement need to be accounted for in order for the data to present a correct “apples to apples” comparison. When the necessary corrections are made, there is no warming trend. Does this finding have independent support? The answer seems to be “yes”. The analysis that makes the necessary and appropriate adjustments – William Soon’s Northern Hemisphere Composite (NHC) --compares pretty well with the northern hemisphere sea surface temperature data as well as the best record of the irradiance from the sun, total solar irradiance (TSI).¹⁹

9. What does the long term geologic and atmospheric record tell us about whether current global climatic conditions and CO2 concentrations are abnormal and a legitimate cause for worry?

“In the past, when atmospheric CO2 was up to one thousand times higher than at present, there were no tipping points, no carbon dioxide-driven climate change, and no runaway global warming.

“In times of high atmospheric CO2, oceans were not acid, ... and the rate of change of temperature, sea level and ice waxing and waning was no different

¹⁸ See Carter, ‘The scientific context’, in Moran (ed.) *Climate Change*, pp. 68, 79.

¹⁹ See William Soon, Sun-climate connection, Panel 13, Tenth International conference on Climate Change, Heartland Institute, June 11, 2015.

from the present. ... Seawater does not become acidified: it changes slightly in alkalinity.”²⁰

“Because the short thermometer temperature records such as HADCRUT manifestly do not comprise an adequate climate record, it is to these geological data sets that we must turn to provide the proper climatic context against which to assess modern temperature changes.

“A case in point is the high-quality inferred air temperature above the Greenland ice cap for the last 10,000 years.... This record shows)i) that temperatures were up to a full two degrees warmer than today during the Holocene Climatic Optimum, c. 8,000 years before present (BP); (ii) the presence of a persistent millennial cycle of warmings and coolings, with all pre-modern peaks of this cycle, including the Mediaeval Warm Period, being warmer than the late twentieth century peak; and (iii) an overall cooling of temperature since 8,000 years BP which took place against the background of an increase of atmospheric carbon dioxide (CO₂) of 20 ppm (of natural origin, and as recorded in Antarctic ice cores).

“It is widely misrepresented ... that the Earth’s current levels of atmospheric CO₂ are dangerously and atypically high. Modern CO₂ levels lie near to an all-time low as assessed against the geological record.”²¹

10. What are the competing hypotheses as to how the Earth’s climate will evolve, and which seems best supported by the evidence?

There are two hypotheses on offer: a) catastrophic global warming, mainly induced by an increase in man-made CO₂ emissions, and b) not much change

²⁰ See Ian Plimer, ‘The science and politics of climate change’, in Moran (ed.) *Climate Change* ,pp .13, 17.

²¹ See Carter, ‘The scientific context’, in Moran (ed.) *Climate Change*, pp. 69-71.

or global cooling, depending almost entirely on natural forces, especially variations in the activity of the sun and Earth's relationship to it over time.

To accept the validity of the hypothesis that man-made CO₂ emissions are triggering potentially catastrophic global warming, one has to believe that an increase of a bit more than 3.7 hundredths of 1%, in the atmospheric concentration of a substance only part of which -- perhaps a very small part -- is caused by human activity, can drive cataclysmic global change. One must believe further that this effect will overwhelm any changes in the activity of the sun, which is the origin of 99.98 percent of the total energy contribution to Earth's climate. I am not a scientist, but this set of beliefs does not pass my "smell test". On the contrary, I find the much more plausible hypothesis to be that small changes in solar output may have major climatic consequences on Earth. I grant that neither hypothesis is proven or disproven. But at the very least the public should be told that there is a plausible alternative hypothesis, and that it fits the data at least as well] as -- and in my layman's opinion better than --the IPCC view. Instead of aggressive advocacy, in support of trillion dollar remedial measures for a problem that may not exist, governments should be funding studies that focus on disconfirmation of the prevailing view as long as there remains -- as is most definitely the case now -- great uncertainty as to what causes what and why.

Here are some gleanings to give you a sense of the empirical and analytical support for the hypothesis that the behavior of the sun may be by far the main driver of climate change on Earth.

"Besides temperature and CO₂ ... solar activity has increased over the past 150 years.

"The solar magnetic field has more than doubled.

"The solar activity of the past decades was one of the highest over the past 10,000 years.

“Since the birth of Christ, total temperature development has closely matched solar irradiance (TSI) – measured in watts per square meter.”²²

Physicist Henrik Svensmark has developed a hypothesis, backed up by much empirical evidence, showing a strong connection between climate and “cosmic rays” – high energy radiation, consisting primarily of high energy protons and atomic nuclei.

Svensmark’s work describes the basic process by which cosmic rays influence temperature as follows: lower magnetic field strength → fewer sunspots → less solar wind [a stream of plasma released from the upper atmosphere of the sun, consisting mainly of electrons, protons, and alpha particles] → more galactic cosmic rays hitting earth → more low level cloud formation → more sunlight reflected into space → earth becomes colder.²³

“... the Serbian astronomer Milutin Milankovitch argued that orbital changes associated with obliquity [tilt of the earth’s axis], precession of the equinoxes, and variations in orbital eccentricity [around the sun], should have a profound effect on glaciation.... The major factor in long term glacial growth and retreat is summer insolation (the amount of incoming solar radiation). This determines whether snow that accumulates in winter will survive the summer. If it does, then snow will accumulate forming glaciers.

²² See Sebastian Luning, ‘The neglected sun: how the IPCC managed to forget natural variability in their climate models’, Ninth International conference on Climate Change, Heartland Institute, July 8, 2014. This paper is notable for the large number of scientific studies it references as concerning effect of the sun on climate. Almost none of them are reported in the mainstream media.

²³ This summary of Svensmark’s hypothesis is from a presentation by Don J. Easterbrook, ‘Cause of the pause in global warming: its implications for future climates -- the past is key to the future’, Ninth International conference on Climate Change, Heartland Institute, July 8, 2014. For a detailed description of Svensmark’s hypothesis please see Henrik Svensmark’s lecture of March 15, 2015 <https://www.youtube.com/watch?v=EgA8zSSC0zI>

“Milankovitch argued that the relevant quantity for forcing glacial cycles is the insolation in summer over the Arctic. The orbital variation of this quantity is about [100 watts per square meter], which is huge compared to the contribution due to CO₂. Moreover, as the 2002 paper by Sverker Edvardsson et al. and the 2006 paper by Roe have shown, the correlation of the Milankovitch parameter with the time rate of change of ice volume is about as good as any correlation in geophysics...”²⁴

A Russian scientist, Habibullo Abdussamatov of the Pulkovo Observatory, draws on his analysis of the effects of the sun [total solar irradiance (TSI)] on the Earth’s energy balance, and proposes that the maximum phase of the solar cycle – and therefore maximum global warming -- was reached in the second half of 2014, and thus that we can expect to experience the beginning of a new Little Ice Age.

There follow his key contentions, evidence, and analysis:

“The sun is the main factor controlling the climatic system and it is more powerful than abilities of human beings. The climate changes are beyond human control and are practically not connected with its activities.

“In the 20th century TSI reached its record for at least the past 700 years.

There is no global warming for more than 17 years [as of July 2014] [as] the result of the TSI fall since 1990.

“The Earth will continue to have a negative energy balance in the future ... because the Sun is moving to the Grand Minimum [TSI].

“The gradual consumption of the solar energy accumulated by the ocean during the whole XX century will result in decrease of global temperature after 20 +/- 8 years due to the long-term negative average

²⁴ See Lindzen, ‘Global warming, models and language’, in Moran (ed.) *Climate Change*, p.55.

annual balance of the energy incoming and emitted by the Earth into space.

“All eighteen periods of significant climate changes found during the last 7,500 years were entirely caused by corresponding quasi-bicentennial variations of TSI together with the subsequent feedback effects, which always control and totally determine cyclic mechanism of climatic changes from global warmings to Little Ice Ages.

“Every time the TSI experienced its quasi-bicentennial peak up to ~ 0.5%, a global warming began with a time delay of 20+/-8 years defined by the thermal inertia of the ocean, and each quasi-bicentennial descent in the TSI caused a Little Ice Age (together with the subsequent nonlinear feedback effects).

“... significant climate variations during at least the past 800,000 years indicate that quasi-bicentennial and 100,000 years cyclic variations of the TSI entering the Earth’s upper atmosphere (taking into account their direct and subsequent nonlinear secondary feedback influences) are the main fundamental cause of corresponding alternations of climate variations from global warmings to the Little Ice Ages and Big Glacial Periods.

“After the maximum phase of solar cycle 24 (approximately at the second half of 2014), after the whole season of “solar summer” in our solar system as a whole, we expect a season of “solar autumn”, and then approximately in 2060+/- 11, the season of “solar winter” of the quasi-bicentennial solar cycle.

“In 1998-2005 the Earth reached the maximum of global warming.”

Dr. Abdussamatov predicted the stabilization of both temperature and the ocean level for the past [now 18] years in 2003-2007.

On the relative impact of CO2 concentration in the atmosphere he contends that

“Antarctic ice cores provide clear evidence of a close coupling between variations of the temperature and atmosphere concentration of the CO2 during the past 800,000 years induced by the astronomical Mikankovitch cycles. According to the ice core data drilled near Vostok site, Antarctica: The peaks of the carbon dioxide concentration have *never preceded* the warmings, but on the contrary always took place 800 +/- 400 years *after* them.

“There is no evidence that carbon dioxide is a major factor in the warming.

“... the climate sensitivity to increasing content of carbon dioxide decreases with significant growth of water vapor concentration in the surface layer. Negligible effect of the human-induced carbon dioxide emission on the atmosphere has insignificant consequences.”²⁵

11. What is the effect of more CO2 in the atmosphere?

The EPA to its shame has labelled CO2 a pollutant. This is nonsense.

“[CO2] is a non-toxic, non-irritating, and natural component of the atmosphere. Long –term CO2 enrichment studies confirm the findings of shorter term experiments, demonstrating numerous growth-enhancing, water-conserving, and stress-alleviating effects of elevated atmospheric CO2 on plants growing in both terrestrial and aquatic ecosystems.

“The ongoing rise in the air’s CO2 is causing a great greening of the Earth.

“Terrestrial ecosystems have thrived throughout the world as a result of warming temperatures and rising levels of atmospheric CO2. Empirical data

²⁵ All quotations by Dr. Abdussamatov are from Habibullo Abdussamatov, ‘2014 – The beginning of the new Little Ice Age’, Ninth International conference on Climate Change, Heartland Institute, July 8, 2014.

pertaining to numerous animal species, including amphibians, birds, butterflies, other insects, reptiles, and mammals, indicate global warming and its myriad ecological effects tend to foster the expansion and proliferation of animal habitats, ranges, and populations, or otherwise have no observable impacts one way or another. Multiple lines of evidence indicate animal species are adapting, and in some cases evolving, to cope with climate change of the modern era.

“Rising temperatures and atmospheric CO2 levels do not pose a significant threat to aquatic life. Many aquatic species have shown tolerance to temperatures and CO2 values predicted for the next few centuries, and many have demonstrated a likelihood of positive responses in empirical studies. Any projected adverse impacts of rising temperatures or declining seawater and freshwater pH levels (‘acidification’) will be largely mitigated through phenotypic adaptation or evolution....”²⁶

12. Isn't it true that sea levels have been rising and isn't that evidence of the effect of rising CO2 concentrations?

Ian Plimer offers the following observations,

“The most common reason for water covering the land is ice melting.

“Ice retreats and expands for many reasons and temperature is only one of the reasons.

“Water can rise over the land because the oceans fill with sediment, large submarine igneous provinces displace water, the ocean floor rises, and continental and glacial ice sheets melt.

“Within the current interglacial [“a geological interval of warmer global average temperature lasting thousands of years that separates consecutive

²⁶ See Carter, ‘The scientific context’, in Moran (ed.) *Climate Change*, pp. 79-80.

glacial periods within an ice age”), [the] sea level has risen about 130 metres over the past 12,000 years, [but] the rate of sea level rise has decreased (as would be expected toward the end of an interglacial).

“Sea level changes are natural.

“What is important is that the post-glacial rise is declining [emphasis added], exactly what would be expected at the end of an interglacial period.

“It seems illogical that the current sea level rise is due to human activities whereas the previous hundreds of sea level rises were not.

“In what can only be regarded as religious narcissism, climate catastrophists now claim that sea level rise, ice sheet melting, torrential rains, drought, hurricanes, and any other severe weather event is due to the activity of affluent Westerners.

“There can be no understanding of sea level rise and fall without an understanding of local land level rises and falls.

“Without a detailed knowledge of local land rises and falls, subsidence, erosion and sedimentation, global sea level predictions for coastal planning are only unfounded speculation.”²⁷

13. What are the effects of the shift away from fossil fuels to renewable energy?

The greatest health risk in the world, especially in poor nations where most of the global population lives, is poverty.

Low cost energy is essential to enable people to pull themselves out of poverty.

Renewable energy, besides being unreliable, is vastly more expensive than fossil fuels.

²⁷ See Plimer, ‘The science and politics of climate change’, in Moran (ed.) *Climate Change*. pp .13-15.

The trillions of dollars that may be spent on futile, unnecessary climate change mitigation are trillions not spent on producing goods and services people actually want or better spent on solving global problems that are very real, very large, very immediate, and quite addressable with great benefit for the funds spent.

The push for substituting renewable energy for energy from fossil fuels is a rich person's conceit, designed to make one feel good about oneself, but its main impact is to impose a huge tax on the poor. It is immoral.

14. How can you deny the authority of the IPCC when 97% of scientists support the hypothesis of anthropogenic global warming?

William Soon thinks that "The many, many thousands of pages of the Assessment Report of the UN's climate panel, the Intergovernmental Panel on Climate Change (IPCC), are the expression of the beliefs of a small circle of scientists and interested lobbyists who, against all evidence, have convinced themselves that humans are having a dramatic effect on the Earth's climate.

"In my field, the physics of the sun, the IPCC asserts against all evidence that the sun has little influence on climate change. This represents neither a consensus nor an authoritative view of the subject. My own summary of the latest science and evidence on the sun's influence on the climate comes to quite opposite conclusions.

"Of the 38 co-authors and three review editors of the IPCC's solar sub-chapter (chapter 8 by Myhre et al. 2013), only one is an expert on solar physics. Perhaps not surprisingly, then, the subchapter is shot through with critical errors and serious misrepresentations.

"Contrary to reports of a '97 per cent consensus', the 2014 paper by Legates et al. demonstrated that only 0.5 per cent of the abstracts of 11,944 scientific papers on climate-related topics published over the 21 years from 1991-2011 had explicitly stated an opinion that more than half of the global warming

since 1950 had been caused by human emissions of CO₂ and other greenhouse gases. . The overwhelming majority of scientists in climate and related fields, therefore, remain commendably open to the possibility that some other influence – such as the sun – may be the true *primum mobile* of the Earth’s climate.”²⁸

The truth of a hypothesis is established by how well it fits [explains] the evidence, not by consensus and/or qualifications.

15. Don’t the data show a “hockey stick” pattern of global warming that coincides with an increase in man-made [anthropogenic CO₂ emissions and isn’t this *prima facie* evidence of anthropogenic global warming?

“...the finding in 1998 that temperature trends were much higher in the present day than in the past by American climatologist Michael Mann was a key part of the political move toward climate change policy. Rather than the climate oscillating between hotter periods (for instance, the medieval warm period) and cooler periods (for instance, the little ice age between the fourteenth and nineteenth centuries), Mann’s findings suggested that global warming was out of control. The graph of temperatures in the northern hemisphere looked ... like a ‘hockey stick’. Mann’s redrawn temperature graph was in part based on a study of ... tree rings. Ross McKittrick and Steve McIntyre studied the data behind the evidence and the statistical techniques used to extrapolate it, and found [[that] key errors in the statistical techniques used to combine Mann et al.’s blended data would almost invariably produce a ‘hockey stick’.”²⁹

²⁸ See William Soon, Sun shunned, in Moran (ed.) *Climate Change*, pp. 58, 65.

²⁹ See Alan Moran, ‘The hockey stick in retrospective’, in Moran (ed.) *Climate Change*, p. 201.

“Mann’s algorithm, applied to a large proxy data set, extracted the shape associated with one small and controversial subset of the tree rings records, namely the bristlecone pines from high and arid mountains in the US southwest.

“Bristlecone records are sensitive to a variety of environmental conditions other than temperature and should be avoided for climate reconstructions;

“Mann’s results strongly depend on the bristlecone records; and

“His results are therefore not robust, an important point over and above the lack of statistical significance.”³⁰

16. What about the narrative that the global temperature has not risen in the last 18 years because the excess heat is being trapped in the oceans and eventually will burst forth?

“The trapping of heat is inferred from models, not from observations. The NASA data seems to suggest that it is not excess energy trapped in the ocean, but rather that the change in the IPO/PDO [Inter-decadal Pacific Oscillation / Pacific Decadal Oscillation] has led to increased cloudiness, hence a reduction in the incoming shortwave radiation around the year 2000.... This would mean that there is no excess to be trapped whether in the ocean or anywhere else.”³¹

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³⁰ See Ross McKittrick, ‘the hockey stick: a retrospective’, in Moran (ed.) *Climate Change*, pp. 203, 208.

• ³¹ See Stewart W. Franks, ‘The scientific method (and other heresies)’, in Moran (ed.) *Climate Change*, p.60.

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