Political Corruption of the IPCC Report?

Changes in the Final Text of the "Summary for Policy Makers" of the Fourth Assessment Report, WG1: The Physical Science Basis.

Introduction

Prior to publication, the final version of the Summary for Policy Makers was consensually agreed line by line by governmental agents. Applying the tools of "Redactionsgeschichte", the substantive editorial changes established in this process throw light on the directions in which political and economic interests have influenced the presented scientific material. Attention has been paid specifically to those alterations that change the emphasis or meaning of the text, while minor re-ordering, textual transposition and polish for meaning and clarity, have been ignored. Links are then made between the direction of governmental editorial bias and the lacunae or omissions in the content as a whole. The study concludes with an exploration of the "primary task" of the Inter Governmental Panel on Climate Change.

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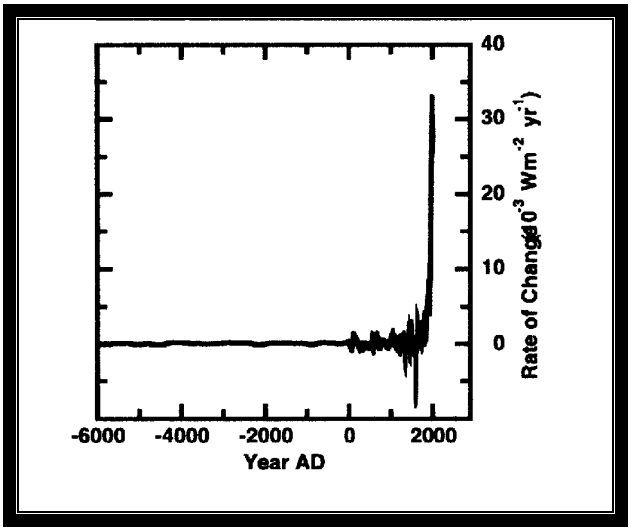
1. Rate of change in radiative forcing

The draft states in bold text that: "**The sustained rate of increase in radiative forcing over the past century…. is unprecedented in at least the last 20,000 years**". The Figure SPM-1 in the draft included this graph of the rate of change in radiative forcing.



The final version displaces reference to the rate of increase in radiative forcing, removes its emboldening, widens the time reference of the effect, halves the historic comparison, and inserts a qualification of "very likely" in place of the unqualified statement of the draft. The final version reads: "The combined radiative forcing… and its rate of increase during the industrial era is very likely to have been unprecedented in more than 10,000 years". The illustrative graph is also removed from figure SPM-1. The result is a damping of information

about acceleration of climate change. If retained, the material would have alerted systems analysts to the existence of second order change and the radical disturbance of system equilibrium, typical of the onset of a "chaos point" in complex system behaviour.

2. Water vapour feedback

In the draft section dealing with "Changes in Human and Natural Drivers of Climate" the accelerating effect of increasing concentration of atmospheric water vapour is noted:

> "Water vapour increases lead to a strong positive feedback that amplifies the global mean temperature response to increases in radiative forcing. New observational and modelling evidence confirms the importance of the expected feedbacks linked to water vapour, estimated to be approximately 1 W m^{-2} per ºC of global average temperature increase, or a 40-50% amplification of global mean warming."

The paragraph has been completely deleted from the final version. A brief and weakened acknowledgement of the issue has, however, been inserted in the final version towards the end of the section on Understanding and Attributing Climate Change: "Water vapour changes represent the largest feedback affecting climate sensitivity…"

The temperature-sensitive power of this amplifying (positive) feedback has a real-time effect on radiative forcing which is cumulative and proportional to rise in average global temperature. Note that the water-vapour feedback amplifies the effect of all other temperature-dependent feedbacks leading to second-order climate change. It is very likely to be the driver of currently observed phenomena summarised by the Chief Scientist at one of the NASA centres: **"Warming is accelerating GREATLY, especially 'Recently'."**

It is interesting to note (see www.esrl.noaa.gov/research/themes/forcing/) that water vapour is described in the NOAA paper "Radiative Forcing of Climate by non-CO_2 Atmospheric Gases" as "The most important greenhouse gas in the Earth's Atmosphere", which is "considered as a feedback in the climate system related to the human activities on other greenhouse gases…"

The modification, in the final version, of the strong positive feedback effects of water vapour is consistent with the governmental suppression of evidence of non-linear behaviour in the climate system. There is no reference to water vapour in the table of Radiative Forcing Components (SPM-2)

3. Confirmation of Global Warming

In the section dealing with "Direct Observations of Changes in Current Climate", the wording of the draft text: "Observations… provide stronger joint evidence of warming" has been tightened in the final version to read "Warming of the climate system is unequivocal". The statement is supported by reference to a series of current observations. Governmental consensus in the acceptance of this phrasing represents the ending of the debate about whether global warming is actually happening.

The final version has, however, omitted the draft comment that "In both hemispheres, air temperatures over land have risen at about double the rate of those over the ocean since 1979…"

4. Missing Implications

A. Both draft and final versions confirm that the average temperature of the global ocean has increased to depths of at least 3000 m., absorbing much of the heat being added to the climate system. One of the noted implications is that such warming causes sea-water to expand, contributing to sea-level rise. Neither version draws out the implication that mixing of warmer water to this depth would lead to the start of a cascade release of sea-bed clathrates, the early evidence of which is now confirmed by NASA. Methane release constitutes an amplifying feedback in climate change.

B. Increase in temperatures at the surface of the areas of permafrost, together with decrease in the area of seasonally frozen ground are noted in both versions. However, neither text draws out the implication for the feedback drivers occasioned by the consequential release of methane or out-gassing of carbon-dioxide from the thawing permafrost. Absence of attention to the feedback dynamics and their potential acceleration of climate change is consistent throughout the report.

C. Decrease in snow-cover, and in the areas of land-ice (and indeed sea-ice) are affirmed in both draft and final versions. The connection to the consequential decrease in albedo is not made, so eliding yet another factor in the amplifying feedback system.

D. Both final text and draft are consistent in their treatment of the meridional overturning circulation (MOC). They affirm little observational evidence for degrade in the energy transport dynamic and note that no models predict the close-down of the MOC during the 21st Century. They assert that if such an event were to happen in the future its effects would be minimal since the effects of global warming would roughly balance the cooling effects of the shutdown of the MOC. Several points are in order:

- Most recent observation (released since the IPCC process closed its uptake of published information) indicates a slow-down of some 30% in the northward warm current (Gulf Stream) in the North Atlantic.
- While this is still with limits of natural variation, it coincides with observed decrease in the power of the descending gyres (massive vortices) of cold saline water that drive the MOC.
- Increased precipitation in the high latitude North Atlantic is lowering salinity of surface water, as are also the increased flow of melt water from the Greenland ice-mass, and the decrease in the volume of sea ice formed on an annual basis.
- These accelerating feedbacks, added to the increase in high latitude air temperature (which is at least twice that of the global average) drive decreasing salinity and increasing temperature of the ocean surface water whose normal descent as cold, high-saline solution powers the MOC.
- The comment on the balancing of effects of degrade or shut down of the Gulf Stream is totally Eurocentric. The MOC is an energy re-distribution system. Less heat would be delivered to the north-western seaboard of Europe, so compensating for the effects of global warming which would otherwise be experienced. The heat energy, however, would be retained in the tropical and sub-tropical areas of the Atlantic Ocean. Increased temperature of ocean surface in these regions would enhance the already significant increase in tropical storm intensity.

5. Non-linearity of ice-sheet dynamics

The material on ice-sheet dynamics is scattered across three sections in both draft and final versions. In the section on Direct Observations of Changes in Current Climate, the draft text includes the comment "Recent observations show rapid changes in ice sheet flows". The observation is omitted from the final version.

In the section on Predictions of Future Changes in Climate, the final version notes: "Models used to date do not… include the full effects of changes in ice sheet flow, because a basis in published literature is lacking". There is a strange inversion here. The draft text appears to upgrade the modelled rates in the light of most recent field observations. The final version ignores field observation because it is not consistent with modelled results in published literature.

The final version continues: "The projections include a contribution due to increased ice flow from Greenland and Antarctic at the rates observed for 1993-2003, but these flow rates could increase or decrease in the future. For example, if this contribution were to grow linearly with global average temperature change, the upper ranges of sea level rise for SRES scenarios shown in Table SPM-2 would increase by 0.1 m to 0.2 m. Larger values cannot be excluded, but understanding of these effects is too limited to assess their likelihood or provide a best estimate or an upper bound for sea level rise."

Observed data available to the IPCC included results from 1993-2006. Such data not only provides a figure for average rate of flow, but also indicates the second derivative, namely the rate of change in rate of flow. Elision of this layer from the data analysis impoverishes the presentation of policy-relevant information. Current observation indicates non-linearity in flow rate with a doubling time of approximately six years, even at the small increases in average global temperature already experienced. It is therefore highly unlikely that flow rates could possibly decrease in the future. Current understanding of ice flow dynamics is incomplete, but indicates that flow rate is unlikely to be limited to a linear relationship with rise in average global temperature. Non-linear flow rates are expected to increase leading to potential instabilities in ice discharge. Implications for sea-level rise and for the de-salination of ocean surface in the arctic North Atlantic (with consequent implications for the behaviour of the Meridional Overturning Current) have not been made at this point.

At the very end of the paper both draft and final versions make a further reference to ice flow dynamics, which tend to compensate for the earlier inadequacies. So the draft version reads: "The melting rate would increase if dynamical processes increase the rate of ice flow, as suggested by some recent observations".

The final version concludes: "Dynamical processes related to ice flow not included in current models but suggested by recent observations could increase the vulnerability of the ice sheets to warming, increasing future sea-level rise." Even here, the reference to second derivative behaviour (increase in the rate of ice flow) is omitted and reduced to "increase the vulnerability to warming".

It is perhaps significant that Lloyds of London have recently commissioned an independent group of specialists in ice-flow dynamics to advise them on the best current understanding of this critical area in the light of the conservative treatment offered by the IPCC.

6. Extent of summer Arctic sea-ice

In the section dealing with Direct Observation of Changes in Current Climate, both draft and final versions note that arctic sea ice has decreased in extent by some 2.7% per decade since 1978. However the draft text also includes the comment: "The smallest extent of summer sea ice was observed in 2005. Average temperatures have been rising since the 1960s, and 2005 was the warmest Arctic year." By providing only the flat decadal average, the final version removes all information about rate of change of extent of Artic sea ice which is embedded in the observational data. The acceleration of decrease in the extent of Arctic sea ice has implications for the acceleration of albedo-driven positive feedback, and also for the desalination of the surface water of the Arctic North Atlantic with consequences for the strength (and possible disruption) of the Meridional Overturning Current. The reduction of vectored information to absolute numbers is consistent throughout the final text, and removes all observation-based information about acceleration of climate change.

There is further reference to decrease in the extent of Arctic sea ice in the last section of both draft and final versions, which deals with Projections of Future Changes in Climate. Textual comparison is again revealing:

Draft version: "Sea ice shrinks both in the Arctic and Antarctic under all scenarios. This reduction is amplified by feedbacks in the Arctic where some models project sea ice to disappear for the A2 scenario by the latter part of the 21st century."

Final version: "Sea ice is projected to shrink in both the Arctic and Antarctic under all SRES scenarios. In some projections, Arctic late-summer sea ice disappears almost entirely by the latter part of the 21st. Century."

The phrase "This reduction is amplified by feedbacks in the Arctic" is deleted in the final version, consistently with the editorial tendency to elide all references to feedback dynamics and the acceleration of climate change, whether modelled or observed.

Since the closure of the IPCC process to new information, current models have taken into account the observed acceleration of decrease in summer Arctic ice. Predicted date for first occurrence of zero sea ice at the North Pole has now been brought forward from 2080 to 2040 with expected revision to 2030. Implications for albedo decrease, ocean heat uptake, desalination of the far North Atlantic, and increase in atmospheric water vapour, are all significant. All contribute to the interrelated and reinforcing effects of positive feedback that amplify radiative forcing and accelerate climate change.

7. Sea-level rise

Both draft and final texts report observed average rate of increase of average sea-level to be 1.8 [1.3 to 2.3] mm. per year over 1961 to 2003, and note that it stood at 3.1 [2.4 to 3.8] mm. per year between 1993 and 2003. Mode of presentation hides the fact that the rise was only 1.3 mm per year in the first period, and more than doubled in the final decade. The draft text comments: "It is unclear whether this recent increase is due to an accelerating trend or variability on decadal timescales." This is modified in the final version to read: "Whether the faster rate for 1993 to 2003 reflects decadal variability or an increase in the longer-term trend is unclear." The implication of possible non-linearity raised in the draft is replaced by the possibility of an implied linear change in the final text. Apparently any reference to possible acceleration of climate change is consistently removed.

8. Ocean Acidification

Both draft and final versions draw attention to the fact and quantification of acidification of ocean surface water due to increase in concentration of atmospheric CO_2. The draft text includes the phrase: "raising concerns for marine calcifying organisms". The phrase is omitted from the final version. Degrade in the population of calciferous marine plankton acts as a positive feedback, amplifying climate change by reducing the power of the natural carbon sink.

9. Storm intensity increase

It is noted in both versions that the number of tropical storms is not predicted to increase, though the intensity is expected to rise with larger peak wind speeds and more intense precipitation. The draft text notes that: "The reported increase in the proportion of very intense storms since 1970 is… much larger than simulated by current models". The final version modifies this to read: "The apparent increase in the proportion of very intense storms since 1970 is… much larger than simulated by current models…" It is hard to understand why, when scientists speak of "reported increase", government agents should change it to read "apparent increase". The modification introduces a significant element of doubt concerning the reporting, which lessens the weight to be given to the evidence.

In similar vein when referring to expectation that storms at higher latitudes will move poleward, the draft text speaks of "more intense mid-latitude storms with associated damaging winds and extreme wave heights". The final version keeps the reference to poleward movement but elides all reference to increased intensity, wind damage or wave height.

10. Treatment of carbon-cycle feedback

Leading climate simulation models are increasingly including the dynamics of the carbon-cycle feedbacks, though they are still experiencing difficulty in modelling the methane cycle, cloud dynamics and water-vapour feedbacks. The appropriate paragraph from the draft text is worth quoting in full:

"The long lifetime of atmospheric carbon dioxide implies climate change commitments that persist for centuries. Increases in global temperatures are expected to progressively reduce the efficiency of the ocean and biosphere to absorb anthropogenic carbon dioxide emissions. This positive feedback effect could lead to as much as 1.2°C of added warming by 2100 for higher SRES emission scenarios. Alternatively it reduces the total emissions consistent with a given carbon dioxide stabilization level, although there are still uncertainties due, for example, to limitations in the understanding of biophysical interactions and feedbacks."

The equivalent paragraph in the final version reads:

"Climate-carbon cycle coupling is expected to add carbon dioxide to the atmosphere as the climate system warms, but the magnitude of this feedback is uncertain. This increases the uncertainty in the trajectory of carbon dioxide emissions required to achieve a particular stabilization level of atmospheric carbon dioxide concentration…"

Note firstly that the final version omits all reference to the new research on the longevity of atmospheric carbon dioxide which confirms the long-lasting impact of climate change. Suppression of consequences reduces motivation for intervention.

The final version also omits all reference to the progressive degrade of the capacity of the ocean and biosphere to absorb anthropogenic carbon dioxide emissions. This "sink-degrade" feedback adds to the urgency of emissions reductions and is profoundly policy-relevant. Note, in addition, that the draft assertion that this amplifying feedback mechanism would add up to 1.2ºC to average global warming by the end of the 21st Century for higher SRES emission scenarios, is also omitted from the final version.

The draft text highlights the implication of the sink-degrade feedback for the reduction in carbon dioxide emission levels to achieve any specific concentration target. The final text focuses not on the need for sharper emissions reductions, but on the increased level of uncertainty introduced by including the carbon-cycle feedback. Illustrations of the implied emissions reductions required to achieve concentration targets under different scenarios are then offered in the succeeding paragraphs.

11. Conditions for climate stabilisation

The last section of the draft text is introduced by an emboldened assertion that: **"Current understanding of climate processes provides an important context for considering policy options that might lead to climate stabilization."**

The assertion is omitted from the final version.

The draft wording is based on the underlying assumption that policy options should lead toward the goal of climate stabilization and should take into account the current understanding of climate processes in deciding on the policy options required to achieve that goal. Omission of the statement removes the science-driven goal from the policy-making domain. It also weakens the expectation that decision-makers should take account of current scientific understanding in the formulation of policy. The editorial stance is totally consistent with the comments made by Dr. Susan Solomon, the co-chair of Work Group 1, in the Paris press conference at which the final text of the Summary for Policy Makers was introduced. She was asked whether the Report increased the urgency with which the climate change agenda must now be addressed. In her reply she affirmed that: "It is not my role to communicate what should be done…. The IPCC is not trying to make policy-prescriptive statements, but policy-relevant statements."

The generalised statement in the draft version: "Model results consistently show that if the concentration of all radiative forcing agents were to be stabilized, globally averaged temperatures would still increase", is modified and emboldened in the final text to read: **"Anthropogenic warming and sea level rise would continue for centuries due to the timescales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized"**.

In referring to "all radiative forcing agents" the draft text includes all factors that contribute to global warming, be they albedo, cloud dynamics, non-anthropogenic release of methane from organic store, water vapour feedbacks etc., in addition to the standard set of greenhouse gases. The final version introduces the word "anthropogenic" and then limits the radiative

forcing agents to "greenhouse gas concentrations". The result is the elision of non-anthropogenic and non-greenhouse gas agents involved in driving radiative forcing. It is this set of factors that is most involved in feedback dynamics and the acceleration of global warming.

This section also demonstrates the most disturbingly incompetent analysis of the whole report. The draft version includes the comment: "Stabilization of radiative forcing is a prerequisite for climate stabilization." This incomplete and misleading level of analysis represents a major lacuna in the IPCC presentation of policy-relevant information. Even this analysis went too far for the governmental agents, and the sentence is omitted from the final text. The following notes are added for clarification:

- Current national and international political negotiations are aimed at the stabilisation of greenhouse gas emissions. If achieved in full such a process would still lead to an accelerating increase in greenhouse gas concentrations.
- If anthropogenic greenhouse gas concentrations were to be stabilised there would still be an accelerating increase in radiative forcing.
- If radiative forcing (from all agents) were to be stabilised, there would still be constant increase in global heating. Climate change itself would not be stabilised.
- Climate stabilisation requires that radiative forcing (from all agents) be reduced to zero and then sustained in near-zero equilibrium.
- Stabilisation of climate within acceptable levels of dangerous climate change would require a period of negative radiative forcing before the final equilibrium was achieved.

Stabilisation of radiative forcing is a necessary but not sufficient prerequisite for climate stabilisation.

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The Politico-Economic Repression of Climate Science

Common understanding perceives the IPCC Report as "A study by the world's leading experts", "The work of several thousand climate experts". With so many scientists involved, each paragraph has been argued over and scrutinised intensely. Only points that were considered indisputable survived this process and made it to the final draft. The result is a document which is profoundly dependable albeit inevitably conservative. It is treated by policy-formulators and decision-makers alike as solid scientific ground on which strategy can confidently be based.

There are, however, two distinct and mutually incompatible functions, bundled together in an uneasy alliance, at the heart of the IPCC. It is the structural conflict between them that underlies the editorial dynamics that have been highlighted in this study.

Function 1: On the one hand, "The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation." It "scrupulously adheres to a high level of objectivity and credibility in all that it produces" and has established a globally recognised "ability to mobilize the best scientific talent that is available throughout the world". The sheer scale and competence of the scientific resources that have been brought together to address the most critical issue ever to face the human species, are utterly unprecedented in the history of scientific endeavour. The IPCC Report represents the culmination of this awesome process of assembly, analysis, scrutiny and integration.

Function 2: Coupled with this scientific task is the intergovernmental control function of the Panel. The implications of anthropogenic climate change have been seen to pose a potentially massive threat to those powerful political and economic vested interests at national and international levels whose security and bottom line depend on the maintenance of the addiction to fossil energy. Strong denial of collateral damage to the environment is an inherent element of the addiction. Climate science confronts this addicted culture with the harsh realities, consequences and implications of its habit. In the name of the survival of humanity and of the planetary context on which our species depends, climate science raises the urgent imperative of a global detox programme.

It is hardly surprising, therefore, that those elements of the international community whose profitability, lifestyle, economics and security are most at risk, have mobilised the most powerful defence against the diagnosis and treatment of the addiction. The damage limitation process has been one of containment, discreditation, raising of doubt, highlighting of conflict and uncertainty, selective suppression of information, and blocking access to power without regard to the consequences. The denial of anthropogenic climate change has been the most damaging deception ever perpetrated in the history of human civilisation. The decade and a half of resultant impotence and inactivity has lost us the window of opportunity to avoid dangerous climate change, made it virtually impossible to avoid catastrophic climate change, and brought us face to face with the looming possibility of a major global extinction event of cataclysmic proportions. During this period, the international record of political compromise and appeasement has precipitated an humanitarian disaster.

From its inception the IPCC has been subject to the tension between these two incompatible drives. Its conflicted primary task involves both the mobilisation of best possible scientific engagement with the global "problematique", and also the containment and control of the scientific endeavour on behalf of those vested interests most threatened by its findings. After the publication of the Third Assessment Report in 2001 the fossil-fuel industry recognised that the scientific information presented by the IPCC posed a massive threat to its future profitability and steps were taken to gain control of its process and agenda. The leader of the Senate in the Washington administration went on record at this time to castigate climate change as "The greatest hoax ever perpetrated on the American people", a sentiment later echoed by the President himself.

Political Controll of the IPCC Process

Dr. Rajendra Pachauri replaced the unacceptable Dr Robert Watson as Chairman of the IPCC. Dr. Susan Solomon, a senior scientist of the Earth System Research Laboratory at NOAA (National Oceanic and Atmospheric Administration) was appointed as co-chair of Work Group 1 dealing with the physical science basis. Several other leading authors and

review editors were also replaced by staff acceptable to the Washington Administration. Constitutionally the developed country from which the Workgroup co-chair is drawn is responsible for hosting and support of the section. WG1 was therefore placed under the jurisdiction of NOAA. Vice Admiral Conrad C. Lautenbacher was appointed Under-secretary of Commerce for Oceans and Atmosphere, a post which also carries the role of Administer of NOAA where he oversees the day to day functions and lays out its strategic and operational future.

NOAA is not an independent academic institution, but is part of the U.S. Department of Commerce, and is "dedicated to enhancing economic security and national safety" of the USA. NOAA personnel not only supported the scientific task of WG1, but a cadre of NOAA staff including Arun Kumar, deputy director of the NOAA Climate Prediction Center, also served as government reviewers of the final report. In a recently published survey NOAA scientists recorded a higher level of complaints of Government interference with their academic independence, right to publish, research agenda and funding, than any other institution in the USA.

The constitution of the IPCC WG1 carries within its structure a conflict of interests which lays it open to the charge of collusion in the management of scientific analysis of climate change. It is hardly surprising that the resultant Summary for Policy Makers was immediately welcomed and affirmed as acceptable to the Washington Administration. Denial has now yielded on the issues of the reality of the occurrence of climate change and its attribution to anthropogenic causes. It has moved ground to the denial of amplifying feedback, acceleration of climate change, non-linearity in system behaviour and potential feedback-driven instability.

The outcome is a document which lays a necessary but far from sufficient basis for the formulation of strategic policy. Despite the best efforts of the global scientific community, pursuit of goals based upon this Report may contribute to the sustained profitability of the hydro-carbon-based industries, but they do not get to first base in the task of preventing catastrophic climate change.

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16th February 2007

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