



**IPCC Synthesis Report
Fourth Assessment Report**

Comments on the Final Government Draft

GOVERNMENT and ORGANIZATION COMMENTS

– TOPIC 2 (all batches to 7 November 2007) –

November 7, 2007



WMO

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



UNEP

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Topic - Batch - Comment	Page	Line	To Page	To Line	Comment
2-A-1	0	0			Well-written in general. (Government of Argentina)
2-A-2	0	0			By and large a clear and succinct summary of this topic. This topic could be improved by strengthening the text to highlight where significant advances in science have been made since the TAR. See specific examples in comments on Topic 2. (Government of Canada)
2-A-3	1	1	1	1	Changing the title to: "Topic 2 - Causes of observed climate change" would make it easier for the chapter to stand alone and would also be more consistent with the preceding and following topic titles ('Observed changes in climate and their effects' and 'Projected climate change and its impacts' respectively). (Government of New Zealand)
2-A-4	1	1	1	1	Change the title to "Causes of Climate Change". (World Meteorological Organization)
2-A-5	1	5	1	7	Replace "chain from x to y to z" with "linkage between x, y, and z". (Government of United States of America)
2-A-6	1	7	1	7	Footnote 3 last line. For clarity could change to ".....defined for the year 1750 and"..... "metre of the earth's surface area (W/m2)." (International Energy Agency)
2-A-7	1	11	1	12	Put in footnote following "GHG emissions" on line 14. It's unnecessary to specify the UNFCCC gases in the text. (Government of United States of America)
2-A-8	1	14	1	22	Please indicate via a footnote whether the global emissions figures cited in these two paragraphs include or exclude land-use change/sinks. (Government of United States of America)
2-A-9	1	14			Please add "long lived" before "greenhouse gas (GHG)". Reason: the main context is only about long-lived GHG, therefore, the title should be corresponding with the main context. (Government of China)
2-A-10	1	15	1	15	Add "per year" after "equivalent" (Government of United States of America)
2-A-11	1	19	1	19	add: while other GHG increased less markedly. (Government of Germany)
2-A-12	1	22	1	22	At end of sentence, insert the following: "... , largely because of rapid economic growth in developing countries." (Government of United States of America)

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2-A-13	1	27	1	27	Delete “different” (Government of United States of America)
2-A-14	1	33	1	33	In footnote (4) please insert 'reporting under' after 'with', thus: "GHG emissions have been weighted by their 100-year Global Warming Potentials, using values consistent with reporting under the UNFCCC" (the UNFCCC itself does not contain GWPs). (Government of New Zealand)
2-A-15	1	36	1	36	I suggest to add here at least the GWP of methane. (Government of Switzerland)
2-A-16	2	1	2	2	Figure 2.1 "Energy supply" as for first comment above on SPM-3 [TSU Note: "Energy Supply" comment above is: "Figure SPM.3: Energy supply of 25.9% in Fig SPM-3 is really "Electricity supply" I assume if transport is separate and heat is included in other sectors - eg buildings."] (International Energy Agency)
2-A-17	2	1	2	6	Fig 2.1. (a): In principle, such a figure can be misleading. The dark grey boxes (CO2 fossil..) is growing steadily but the others are piled up and hence need a closer look. Much better would be time series plot of each GHG, which would amplify what happened when. See for instance the white boxes (CO2 deforestation ..). (Government of Switzerland)
2-A-18	2	4	2	5	(Same comment as on the SPM.) The caption here says that for Figure 2.1 b and c, the data are shown in CO2-eq whereas they are actually given in percentages. (Government of Canada)
2-A-19	2	14	2	18	In order to clarify the text, please consider adding Figure SPM2 from the WGIII SPM. (Government of Denmark)
2-A-20	2	16	2	16	Remove semicolon and replace with an em-dash. (Government of United States of America)
2-A-21	2	16	2	16	Insert “In addition” in front of “The long-term trend” (Government of United States of America)
2-A-22	2	17	2	18	Very important information. Please add: "Investments today are again more carbon intensive than before 2000." (Government of Germany)
2-A-23	2	17	2	18	Insert between “term” and “trend” the word “global”. Suggest adding a clause or sentence at the end of the paragraph that provides context and an indication that Annex I countries continue to improve emissions intensity—for example “... , largely because of increased use of fossil fuels in developing countries.” (Government of United States of America)

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2-A-24	2	20	2	20	Delete “terms of”. “Difference in” is sufficient. (Government of United States of America)
2-A-25	3	3	3	5	Suggest bringing into the Figure caption here text from the Figure Caption in the WGIII SPM version of this Figure explaining the percentages in the bars of the chart. (Government of Canada)
2-A-26	3	4	3	4	Figure 2.2. The text below the graphs notes "see appendix for definitions of the country groupings". These need to be included either in the Glossary or as a separate attachment. (Government of Australia)
2-A-27	3	13	3	14	Caused me some confusion because Fig 2.4 is referred to here in the text before Fig 2.3 is - and both refer to radiative forcing. So I would suggest deleting "(Figure 2.4)" from this sentence. (International Energy Agency)
2-A-28	3	16	3	16	Change to: “Human activities mainly result...”, as there are also other influences on GHG, e.g. via NOx emissions (Government of Belgium)
2-A-29	3	18	3	18	Please remove the word 'natural'. Concentrations will increase when emissions are larger than removals, whether the removals are natural or not. (Government of New Zealand)
2-A-30	3	25	3	26	The sentence in these lines does not correspond to the text provided in the SPM-WG1. The current text changes the meaning of the assessment of both the SPM-WG1 and the full report of WG1. The text should be changed to the text in the SPM-WG1: "The primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use, with land use change providing another significant but smaller contribution" (Government of Brazil)
2-A-31	3	29	3	40	Can we assume all readers will know what ppm and ppb are? Or is a footnote needed? (International Energy Agency)
2-A-32	3	35	3	39	Explanations of the CO2 equivalent forcings for each gas should be included, or as a footnote. This would start to build the picture for discussion in Topic 5 which is expressed in terms of CO2 equivalent concentrations. (Government of Australia)
2-A-33	4	2	4	4	Please rewrite as: Many halocarbons since the middle of the XXth century (including hydrofluorocarbons since the late 1990s) have increased from a near zero background concentration, primarily due to human activities. {WGI 2.3, SPM;4 SROC SPM (Government of Argentina)
2-A-34	4	2	4	2	Add: “Many halocarbons (including hydrofluorocarbons), which also induce climate warming, have...”, as shown in WG I Figure SPM.2 (Government of Belgium)

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2-A-35	5	14	5	16	Delete sentence beginning "Aerosols...". It dilutes message and confuses even the informed reader. (Government of United States of America)
2-A-36	5	22	5	28	LOSU is yet another a new term relating to "Treatment of uncertainty". Maybe not possible to relate "level of scientific understanding" to high/low agreement etc so maybe an extra sentence in the Box "Treatment of uncertainty" could also briefly discuss LOSU (International Energy Agency)
2-A-37	5	28	5	28	Add the following sentence to the end of the caption: "The range for linear contrails does not include other possible effects of aviation on cloudiness." This point has been consistently stated in WG1 SPM, TS, and Chapter 2 (sections 2.6 and 2.9). (Government of United States of America)
2-A-38	6	1	6	26	Reference to Climate sensitivity and its feedbacks is important. It is suggested that Topic2, 2.3 Climate sensitivity and feedbacks is succinctly included in the SPM. (Government of Japan)
2-A-39	6	5	6	10	The results in the AR4 about climate sensitivity represent a significant advance since the TAR. The Synthesis Report should be making every effort to highlight such significant advances where possible. Suggest adding to this paragraph, perhaps after the end of the first sentence, the following lines from the WGI Technical Summary TS-37: Specification of a likely range and most likely value for equilibrium climate sensitivity in the AR4 represents significant progress in quantifying the climate system response to radiative forcing since the TAR." Alternatively, the bolded header from the WGI SPM page 12 column 1 could be used. (Government of Canada)
2-A-40	6	17	6	17	Could add: than "reported" in the TAR (International Energy Agency)
2-A-41	6	22	6	26	This paragraph does not adequately describe the findings of Ch. 7 of WGI about carbon cycle feedbacks, nor does it provide any information to readers about a subject of wide interest to many - the potential for large feedbacks from warming and thawing of permafrost. We suggest, at a minimum, adding the following sentence to the end of this paragraph (taken from the Executive Summary of Ch. 7, with some additional text added to the end of the suggested sentence for completion): "The largest contribution to the uncertainty in the climate-carbon cycle feedback concerns the response of vegetation and soils to climate change, responses which are not yet fully incorporated into current models." (Government of Canada)
2-A-42	6	23			after "...last 650.000 years". insert "(180 - 300 ppm) as determined from ice cores. The annual carbon dioxide concentration growth rate was larger during the last 10 years (1995 - 2005 average: 1.9 ppm per year) than it has been since the beginning of the continuous direct atmospheric measurements (1960 - 2005 average: 1.4 ppm per year) although there is year to year variability in growth rates" (text from SPM WG 1, page 2) "Current atmospheric CO2 concentrations were at 379 ppm in 2005" (WWF International)

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2-A-43	6	30	6	32	This is another example of where a stronger case should be made for significant advances since the TAR since a strong anthropogenic signal is now evident from a number of studies of different aspects of the climate system. Suggest including here, with this introductory paragraph, the following sentence from the WGI Technical Summary page TS-33: "An anthropogenic signal has now more clearly emerged in formal attribution studies of aspects of the climate system beyond global-scale atmospheric temperature, including changes in global ocean heat content, continental scale temperature trends, temperature extremes, circulation and Arctic sea ice extent (among other things)." (Text altered to a minor extent from TechSum.) (Government of Canada)
2-A-44	6	43	6	43	To clarify could amend to: "During this period, the sum of natural solar and volcanic forcings....." (International Energy Agency)
2-A-45	7	6	7	18	Fig 2.5 'Antartica' is missing from the figure. The point (lines 17-18) would have been made moe convincingly if Antartica ('only natural forcing') was included. But given footnote (6) (same page), could one notshow the trend function for southern hemispheric temperature data? See for instance the following paper where global temperature data analysis was ncluded as illustration: 1998 Beran, J., Ghosh, S. Root-n-consistent estimation in partial linear models with long-memory errors. Scandinavian Journal of Statistics, 25, 345-357. (includes data example: global warming). (Government of Switzerland)
2-A-46	7	11	7	11	Change "where" to "when". It's a time plot, not a spatial one. (Government of United States of America)
2-A-47	7	17	7	18	The reference to Antarctica is easily misunderstood. We would like the authors to clarify it by including the footnote in the main text: "It is likely that there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica, for which there is insufficient observational coverage to make a continent scale assessment) (Figure 2.5). {WGI 3.2, 9.4, SPM}". If this is not acceptable to the authors we would like them to at least put the reference to Antarctica in brackets: "It is likely that there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica6) (Figure 2.5). {WGI 3.2, 9.4, SPM}". (Government of New Zealand)
2-A-48	7	20	7	21	Sentence is misleading. "The observed patterns ... are only simulated by models .." should be edited. The dark lines in Fig 2.5 are not simulated but are observations. (Government of Switzerland)
2-A-49	8	8	8	8	I would add "events" after "drought". (Government of Switzerland)
2-A-50	8	12	8	13	This sentence does not stand for itself. Suggest to change to "Discernible human influence on climate extends to other aspects than mean temperature, including temperature extremes and wind patterns." (Government of European Community)

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2-A-51	8	15	8	21	For clarity, split paragraph as done in WG1 SPM—that is, before “Anthropogenic...” on line 17. (Government of United States of America)
2-A-52	8	19	8	20	We believe the sentence "However the observed changes in the Northern Hemisphere circulation are larger than simulated in response to 20th century forcing change", while clear to those who have been exposed to climate modelling previously, is not clearly understood by the lay reader. We would like to repeat our earlier suggestion to insert the words 'by models' after 'simulated' for clarity, thus: "However the observed changes in the Northern Hemisphere circulation are larger than simulated by models in response to 20th century forcing change". (Government of New Zealand)
2-A-53	8	24	8	24	Re: There is also "some" evidence of the impact of human climatic influence... what does "some" mean? And what does "have climate influence" mean? (Government of Australia)
2-A-54	8	27	8	27	...and throughout the text: wouldn't be more scientifically sound avoid "much evidence"? "strong"? (Government of Switzerland)
2-A-55	8	30	8	32	Revise to the language accepted for the WG2 SPM (page 2 of final layout), and cite the WG2 SPM: “A global synthesis of studies since 1970 has shown it is likely that anthropogenic warming has had a discernible influence on many physical and biological systems.” “At the global scale” implies that observations are available with reasonable coverage across the globe. This is not the case. Observations are scarce or nonexistent over most of the Earth’s land surface, particularly the Southern Hemisphere, Eurasia, and the boreal zones. (Government of United States of America)
2-A-56	8	34	8	34	Revise to the corresponding statement in the WG2 SPM (page 2, last paragraph, of the final layout version). (Government of United States of America)
2-A-57	8	34	8	42	Re: use of adjectives "strongly", "significant" (x2) and "many" (natural systems) - these need to be defined. Also, should the authors be using such strong language if they are only saying that it is "likely" that anthropogenic warming has had a discernible influence on "many" (again, what does this mean?) natural systems, and that only a few studies on specific responses to warming have been performed?? (Government of Australia)
2-A-58	8	44	8	49	The statement "Natural temperature variability is larger at the regional than the global scale.." can be misleading. If global temperature data that is being referred to here is an average of several series, then this is clear since by definition, an average has smaller variance than the individuals that make up the average. But in the given context, this is more an artifact than a law for a global phenomenon. On the other hand if 'global scale' refers to large (spatial) scale space-time observations, then perhaps large scale space-time modeling would be needed to identify the influential factors. If such work has been done, then it should be referred to here. Methodologically, it should be possible to adapt the idea of local-regression in an appropriate method of data analysis. (Government of Switzerland)

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2-B-1	2	1			There is not much additional information in Fig. 2.1 (b) compared to (a). Fig. (b) could be omitted. On the other hand would it be interested to see the development shown in Fig.c and not only the situation 2004. (Government of Switzerland)
2-B-2	2	21			The reference where the definiton of Annex I countries is found should be in the text, not only in the underline of Fig. 2.2 (Government of Switzerland)
2-B-3	3	1			The two illustrations in Fig.2.2 are to small. If they are important, they should be readable, if not, they can be omitted. (Government of Switzerland)
2-B-4	3	18			"when emissions are larger than natural removal processes": the term "natural" should be omitted (Government of Switzerland)