

Expert Reviewer: GRAY

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						<p>Comment</p> <p>** If you are cutting and pasting comments from another application into the review form, please DOUBLE-CLICK in the appropriate spreadsheet comment cell before pasting your comment. Only ONE comment per row, please.</p>
1	2	0	0	0	0	The chief defect of this Chapter is the total absnce of the main greenhouse gas, water vapour, By comparison, the others are insignificant.The usual excuse for this blatant omission is that computer models are so defective that the only way they can deal with the undoubted importance of water vapour is to relegate it to the status of a "feedback", and so remove its importance from public scrutiny. This Chapter is about greenhouse gases, not about the limitations of computer models. Water vapour is the most imporatnat greenhouse gas, and it should appear at the beginning, before all the others.You will, of course, have to admit that we know very little about its average or local concentration either recently or historically, and you may well conclude that this ignorance is an overwhelming liability to our current efforts to try and examine <u>the possible influences on the climate of changes in greenhouse gases.</u>
2	2	0	0	0	0	You similarly ignore the influence of clouds in your section on "Aerosols". Clouds are also a major influence on radiative forcing,.They also represent a defect in model treatment of the climate, where they are treated as a"feedback". Again, you cannot use this defect of the models as an excuse for ignoring their inflkence in a Chapter devoted to radiative forcing.
3	2	1	30	1	30	Insert a Heading "2.3.1. "Atmospheric water vapour (H2O)" and renumber the rest
4	2	1	39	2	39	There should be separate Headings fpr the different kinds of aerosols; ordinary clouds, sulphate-based enhancement, black carbon, dust, sea salt.
5	2	3	16	3	21	I have no confidence whatsoever in this statement. Many "natural" contributors to radiative forcing are almost unknown. These include water vapour, clouds, indirect effects of many aerosols, chnages in atmospheric circulation, changes in the sun, plus possible "feedbacks", changes in ocean circulation. Your figure of ~25% is a gross underestimate. This paragraph is super optimistic. In any case, this is supposed to be about atmospheric constituents, not about models
6	2	3	16	3	16	Replace "high" by "very low"
7	2	3	20	3	20	Replace "designed as" by "capable of acting"
8	2	3	23	3	23	Replace "an appropriate" by "a possible"
9	2	3	30	3	30	It is unacceptable to use one standard deviation as a measure of accuracy. You MUST dopuble the figure given to 2.59±0.52
10	2	3	31	3	32	Delete "Their RF has a high level of scientific understanding" This staement is contradicted by the quoted confidence limits which you have tried to minimise by using only one standard deviation.
11	2	3	28	3	28	There needs to be a paragraph here with your conclusions on the possible changes in radiative forcing of water vapour
12	2	3	30	3	30	Insert after "led" some date. Is it 1750?
13	2	3	32	3	32	Add at end "but is within the uncertainty limits"

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14	2	3	34	3	35	Replace "is" on line 34 to "1950s" on line 35 with "may have slightly increased, but so far it is not statistically significant"
15	2	3	37	3	37	Double the confidence figures to 1.63±0.32. You cannot get away with one standard deviation like this
16	2	3	38	3	38	Insert after "report" "except, possibly, water vapour"
17	2	3	38	3	38	Add at end "but is within the stated confidence limits"
18	2	3	39	3	41	Delete from "CO2" on line 39 to "century" on line 41. This statement makes no sense. "Emissions" do not have an RF value. It can only arise from CONCENTRATION changes. You do not indicate how the two may be related, so delete these sentences
19	2	3	42	3	42	Replace "1999" by "1980"
20	2	3	30	3	30	Add after "2.59±.52", "These figures are from measurements solely over the ocean. There is very little information on concentrations or radiative forcing over land surfaces"
21	2	3	31	2	31	Add at end "over the oceans"
22	2	3	42	3	42	Replace "more than 1.8" by "1.5". It is irresponsible to select only five years as representing a "trend", particularly as you do not mention the huge uncertainties. The alleged increase is not statistically significant
23	2	3	42	3	44	Delete the sentence from "Over the same period" to the end. It does not belong here as it refers to emissions which, I hope you know, is not the same as atmospheric concentrations. You need a separate section on "Emissions" with an explanation of the relationship between "emissions" and "atmospheric concentrations"
24	2	3	44	3	44	Add a section dealing with carbon dioxide emissions
25	2	3	47	3	47	Double the confidence figures to "0.48±0.10"
26	2	3	50	3	50	Insert after "negative" "and if current trends continue concentrations will fall at an increasing rate"
27	2	4	1	4	2	Replace with "The most likely reason is the continued draining of wetlands, which are the largest source of methane emissions". This is a better reason than the one you give
28	2	3	47	3	47	Insert after "LLGHG RF" "Methane concentrations are only measured over the oceans and little is known of their concentrations over land. It was only discovered recently that significant quantities of methane are emitted from forests."
29	2	3	50	3	50	Footnote: This is most unsatisfactory. Either you are able to provide 95% confidence figures (NOT only one standard deviation) from some acceptable statistical procedure, or you are guessing, and you should not pretend that these guesses have some sort of statistical significance when they do not. ALL the "Levels of scientific understanding" are suspect as they are made by the people who produce the figures. You should use honest guesswork terms like "thought to be", "possible", "may be" and so forth
30	2	4	6	4	6	Insert after "contributed" "about"
31	2	4	13	4	13	Double the confidence limits to 0.16± 0.04

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32	2	4	13	4	14	Transfer the last sentence to a section on "emissions" You don't seem to know that "concentrations" and "emissions" are different
33	2	4	17	4	17	Insert after "are: ", "about"
34	2	4	19	4	19	Insert after "was". "about"
35	2	4	31	4	31	Double the confidence limits, to two standard deviations "-0.03 ± 0.14"
36	2	4	41	4	41	Double confidence limits: to two standard deviations "0.35 (+0.3/-0.2)"
37	2	4	32	4	32	Surely "with a medium level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
38	2	4	41	4	42	Surely "with a medium level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
39	2	4	48	4	48	Replace "likely" with "possibly"
40	2	4	48	4	48	Double the confidence limits to two standard deviations. "0.07 ± 0.1"
41	2	4	48	4	48	Surely "with a low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
42	2	5	1	5	1	Double the confidence figures to two standard deviations: "-0.5 ± 0.8"
43	2	5	1	5	1	Surely "with a low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
44	2	5	12	5	12	Double the confidence limits to two standard deviations, to "-0.4 ± 0.4"
45	2	5	13	5	13	Double the confidence levels: to two standard deviations "-0.1 ± 0.2", and "+0.2 ± 0.2"
46	2	5	14	5	14	Double confidence limits to two standard deviations "0.0 ± 0.2", "-0.1 ± 0.2", "-0.1 ± 0.4"
47	2	5	23	5	23	Double the confidence limits to two standard deviations:Double the confidence limits to two standard deviations "-0.9 ± 1.0" Surely "with a very low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
48	2	5	47	5	47	Double confidence limits to two standard deviations "-0.1 ± 0.6" Surely "with a very low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
49	2	5	53	5	53	Double the confidence limits to two standard deviations. "-0.2 ± 0.6" Surely "with a low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
50	2	5	55	5	55	Double the confidence limits to two standard deviations. Replace "factor of three" with ":factor of six" Surely "with a low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete it
51	2	6	9	6	9	Double the confidence limits to two standard deviations. Replace "two" with ":four" Surely "with a low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete them
52	2	6	19	6	19	Replace "very likely" with "probably"

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53	2	6	19	6	19	Insert after "climate". This includes urban influences and energy emissions, and may not include effects of human greenhouse gas emissions"
54	2	6	20	6	20	Double confidence figures to give two standard deviations "2.9 ± 0.6"
55	2	6	23	6	23	Replace "very likely to be " with "possibly"
56	2	6	28	6	28	Replace "two" with "four" Surely "with a low level of scientific understanding".means that the confidence limits are too narrow. So what is the point of them? Delete it
57	2	6	54	6	54	Footnote. This is nonsense. Guesswork cannot represent any statistical level
58	2	7	17	7	17	Replace "very likely" with "possibly"
59	2	8	12	8	12	Replace "assess" with "assess"
60	2	8	13	8	13	Insert after "natural" insert "greenhouse gas changes (water vapour, methane)"
61	2	8	19	8	20	"Water vapour is the strongest greenhouse gas in the atmosphere and as most of its changes can be considered part of the climate response, rather than a forcing, its main effect is as a climate feedback", What is "considered" by others does not constitute a reason why the radiation forcing of the most important greenhouse gas in the atmosphere should be ignored in a Chapter dealing with this problem. There ought to be a special section which lists its properties and importance. Chapter 8 merely tries to fit it into a preconceived "feedback" category for which there is no observational evidence
62	2	10	13	10	13	Once again there should here be a paragraph on water vapour. What proportion of the greenhouse effect does it represent, are there any reliable measurements of its mean value, distribution spatially and over time and are these really related in some way only to "climate response?"
63	2	10	28	10	28	Replace "10" by "24"
64	2	10	28	10	28	Replace "1995" by "1980"
65	2	10	29	10	29	Insert after "increased "linearly"
66	2	10	29	10	29	Replace "19ppm" with 1.5ppmv per year."
67	2	10	29	10	30	Delete from "the highest" to the end on line 30. There is no statistical evidence that the rate of increase has changed over this period,if the uncertainties are considered. It is unfair to choose a small sequence without uncertainties as "evidence" of an increase
68	2	10	30	10	30	Add at end. "It should be pointed out that the figures refer to the average concentration over the oceans. We have little information on the concentrations over land, where radiative forcing is therefore uncertain"
69	2	10	46	10	46	Add at end. "It should be pointed out that the figures refer to the average concentration over the oceans".
70	2	10	52	10	52	Insert after "regions" "Unfortunately little progress has been made so far, so we have no reliable information on the greenhouse gas concentrations over land surfaces, or their possible contributions to radiative forcing."

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71	2	11	7	11	7	It is not enough to refer to "emissions" in such a casual way, and you do not seem to understand that they are not the same as atmospheric concentrations. The Governments of the world are obsessed with "Emissions", yet you refrain from discussing them properly. There needs to be a separate section on "Emissions" It needs to discuss where they come from, how they are measured, with what level of accuracy, and how they are related to concentrations. There should be a Table with historic figures of the various emission sources and a graph which plots them. You should do it for methane and other greenhouse gases as well as carbon dioxide.
72	2	11	7	11	7	Delete "The driving forces for"
73	2	11	7	11	7	Delete "global"
74	2	11	7	11	7	Insert after "are", "considered to be"
75	2	11	7	11	7	Insert after "mainly", "from"
76	2	11	10	11	12	Delete sentence from "Also" in line 10 to ""2001)" in line twelve. This sentence makes no sense. It is surely obvious that absorption of CO2 is not an "emission". It is also highly dubious that it should be considered a "feedback"
77	2	11	14	11	14	Delete "After entering the atmosphere". CO2 exchanges ALL THE TIME, not only "after entering the atmosphere"
78	2	11	14	11	16	What is the difference between the "short-lived biosphere" and the "long-lived biosphere":. Surely it is a continuum, not readily divided into categories.
79	2	11	14	11	14	Insert after "short-lived", "components of the"
80	2	11	16	11	16	Insert after "long-lived", "components of"
81	2	11	16	11	16	Insert "the" before "deep ocean"
82	2	11	20	11	37	This paragraph might be better placed as part of a separate section on "emissions"
83	2	11	39	11	39	"Atmospheric oxygen". Give some actual figures.
84	2	11	39	11	52	This paragraph should form part of a separate section on "Emissions"
85	2	11	54	12	8	This paragraph should form part of a separate section on "Emissions"
86	2	11	54	12	8	The actual graph (Figure 2-3) shows how. This paragraph has selected figures from short-term fluctuations to give a false impression of excessive growth of emissions.
87	2	11	55	11	55	Insert after "increased", "irregularly, with a dip in 1992-3 and 1998",
88	2	11	57	11	57	Insert after "representing a", "short"
89	2	11	57	11	57	Delete "much"
90	2	12	2	12	2	Replace "emission rates" by "emissions"
91	2	12	3	12	3	Replace "50%" with "60%" It is not often that I catch you out with a figure that is too low!
92	2	12	10	12	20	This paragraph should be in a separate section on "Emissions"

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93	2	12	30	12	30	Add at end "These figures are for averages over oceans./ We have no comparabe figures for carbon dioxide concentration, or of other greenhouse gases, over land surfaces"
94	2	12	43	12	43	Add at end "These figures are for a strictly limited number of sites. They may not be representative of the whole earth's surface as the greenhouse gases are not as "well-mixed" as is so frerquently stated"
95	2	13	1	13	1	Double the confidence limits to two standard deviations:"1.63 plus or minus 0.32"
96	2	13	2	13	2	Insert after "chapter" "but omits water vapour and clouds"
97	2	13	3	13	3	Insert after "2001)", "but remains within the 95% confidence limits"
98	2	13	3	13	3	Insert after "this" , "possible"
99	2	13	4	13	4	Delete "much"
100	2	13	5	13	5	Replace "observed" by "calculated"
101	2	13	23	13	23	Add at end "These measurements were, of course, for very few sites and they may not be representative of the whole earth's surface"
102	2	13	26	13	26	Double the confidence limits to two standard deviations: 1777.6 ± 1.2" leave out the second decimal point
103	2	13	28	13	28	Insert before "This network "This figure has been effectivelyunchanged since 1999 and, if trends since 1984 are considered, is expected to fall."
104	2	13	40	13	40	Add at end. As with carbon dioxide, the measurements take place only over oceans. We therefore have no reliable information on concnentratioins over land. This fact has been highlighted by the recent discovery that methane is emissted from forests (Keppler et al 2006)
105	2	13	57	13	57	Replace "are clearly" with "may be"
106	2	14	7	14	7	Delete "The"
107	2	14	7	14	7	Replace "source is" by "sources are"
108	2	14	7	14	7	Replace "it is" by "they are"
109	2	14	7	14	7	Insert after "animals" "with the recent addition of forests"
110	2	14	25	14	25	Reolace "variations" by "fall"
111	2	14	55	14	55	Replace "slow down" by "fall"
112	2	15	11	15	11	Add at end . This figure is, however, for just one site which may not be representative"
113	2	15	9	15	9	Double the confidence limits to two standard deviations:to " 715±8ppb", Twice
114	2	15	14	15	14	Double the confidence limits to two standard deviations:to " 715 ± 8ppb", and" 1776 plus or minus 88ppb"
115	2	15	16	15	16	Double the confidence limits to two standard deviations:to " 0.48 ± 0.10 Watts per sq meter""
116	2	15	36	15	36	Double the confidence limits to two standard deviations:to " 270 ± 14ppb"
117	2	15	51	15	51	Double the confidence limits to two standard deviations:to " 270 ±14ppb"
118	2	15	52	15	52	Double the confidence limits to two standard deviations:to "319 ± 0.8ppb" and "0.06 ± 0.4ppbv"
119	2	16	4	16	4	Double the confidence limits to two standard deviations:to "0.9 ±0.4"and "0.8 ± 0.6"

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120	2	20	26	20	26	Insert "about" after "of"
121	2	21	43	21	43	Double the confidence limits to two standard deviations:to "-0.03 ± 0.14"
122	2	21	55	21	55	Double the confidence limits to two standard deviations:to "-0.03 ± 0.14"
123	2	22	7	22	7	Double the confidence limits to two standard deviations:to "-0.35 ± 0.30"
124	2	23	7	23	7	Double the confidence limits to two standard deviations:to "-0.35 ± 0.30"
125	2	23	8	23	8	Double the confidence limits to two standard deviations:to "0.35± 0.30"
126	2	23	24	23	24	Double the confidence limits to two standard deviations:to "0.032 ± 0.008"
127	2	24	43	24	43	Double the confidence limits to two standard deviations:to "0.07 ± 0.02"
128	2	25	6	25	6	Delete "an"
129	2	25	16	25	16	This section fails to mention the most important aerosols, which are ordinary clouds. It is no excuse to say that they are "considered" to be a "feedback" to carbon dioxide concentrations since this is a mere defect of current models
130	2	25	20	25	20	Delete"anthropogenic" It is wrong to assume that humans are responsible for all changes in aerosols. Changes in natural aerosols have to be investigated
131	2	26	22	26	22	Insert after "properties "of the different kinds of aerosols"
132	2	28	37	28	37	Double the confidence limits to two standard deviations:to "-0.8 ± 0.4"
133	2	28	42	28	42	Double the confidence limits to two standard deviations; "factor of two" to "factor of four"
134	2	31	21	31	21	Double the confidence limits to two standard deviations:to "-0.5 ± 0.66"
135	2	31	25	31	25	Insert before "As in TAR" " (95% confidence limits of 0.3)
136	2	31	34	31	34	Add at end (95% confidence, 0.4)
137	2	31	39	31	39	Double the confidence limits to two standard deviations:to "-0.24 ± 0.16"
138	2	32	45	32	45	Double the confidence limits to two standard deviations:to "-0.40 ± 0.40"
139	2	32	46	32	46	Double the confidence limits to two standard deviations:to "-0.10 ± 0.20"
140	2	32	54	32	54	Double the confidence limits to two standard deviations:to "-0.18 ± 0.20"
141	2	32	54	32	54	Delete "relatively"
142	2	42	29	42	29	Insert "two" before "standard"
143	2	42	30	42	30	Replace "deviation" with "deviations"
144	2	42	30	42	30	Double the confidence limits to two standard deviations:to "-1.37 ± 0.28"
145	2	42	34	42	34	Double the confidence limits to two standard deviations:to "-0.64 ± 0.32"
146	2	43	18	43	18	Double the confidence limits to two standard deviations:to "--0.64 ± 0.32"
147	2	43	19	43	19	Double the confidence limits to two standard deviations:to "--0.37 ± 0.18"
148	2	45	46	45	46	Double the confidence limits to two standard deviations:to "--0.9 ± 0.86"
149	2	49	27	49	27	Double the confidence limits to two standard deviations:to "+-0.10 ± 0.60"

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150	2	50	28	50	28	Insert after "cities" "where surface temperature is often measured, thus introducing an upwards bias in the global average"
151	2	137	5	137	5	The top graph shows plainly that carbon dioxide concentrations are increasing in a linear fashion, and that there is no evidence of a recent increase in rate.
152	2	137	5	137	5	The second diagram shows that emissions show considerable variability in their rate of increase, but no indication that there is a current change in rate.
153	2	138	5	138	5	This diagram needs the addition of uncertainty ranges (to two standard deviations)
154	2	139	4	139	4	This diagram shows clearly that atmospheric methane concentrations have been constant since 1999, and are likely to fall if the trends from 1980 continue
155	2	139	10	139	10	Double all these figures to show two standard deviations (95% confidence limits)
156	2	158	5	158	5	This diagram omits water vapour and ordinary clouds. It is no excuse to say they are "feedbacks". They are important components of the radiative forcing budget and it is dishonest to leave them out.
157	2	158	5	158	5	All the "error bars" must be doubled, to show two standard deviations and 95% confidence levels
158	2	158	5	158	5	The total net radiative forcing could obviously be zero or negative, particularly if the correct confidence levels were inserted
159	2	160	5	160	5	Again, you have left out water vapour and clouds. It is no excuse that the models are not able to handle them except as "feedbacks"
160	2	162	5	162	6	Delete from "The figure gives an indication" on line 5 to "current emissions" on line 6. This statement is untrue. There has to be some indication of how emissions influence atmospheric concentrations before you can claim that variations in emissions influence climate.
161	2	163	5	153	5	The diagram for methane should show that it has stabilised since 1999
162	2	164	5	164	5	Again water vapour and clouds are omitted. It is no excuse to cite the inadequacies of model treatment
163	2	164	5	164	5	Again all the uncertainty bars should be doubled to represent two standard deviations and 95% accuracy
164	2	91	17	91	17	An error. "Kernthaler" should move to the next line
165	2	111	4	111	4	Replace "climate change" by "change of climate". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing
166	2	111	7	111	7	Delete "change" The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing, so avoid it
167	2	111	10	111	10	Replace "climate change" by "change of climate". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing
168	2	111	1	111	1	Replace "climate change" by "change of climate". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing
169	2	111	5	111	5	Insert after "atmosphere" , "and changes to the climate of cities and other human occupation from buildings and energy production"
170	2	111	5	111	5	Insert after "known", "greenhouse gas"

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171	2	111	10	111	10	Insert before "is" "within urban arfeas"
172	2	111	11	111	11	Insert aftwr "contrttribution", ", largely confined to urban areas,""
173	2	111	12	111	12	Insert after "discuss" "some of"
174	2	111	12	111	12	Delete "change". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing
175	2	111	45	111	45	Insert after "activities" "are often assumed to have (but withoit much evidence)"
176	2	111	57	111	57	Add at end "Ordinary clouds are a particularly important form of aerosol"
177	2	112	4	112	4	Delete "change". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing. So avoid it
178	2	112	6	112	6	Delete "change". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing. So avoid it
179	2	112	9	112	9	Delete "change". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing. So avoid it
180	2	112	21	112	21	Delete "change". The term "climate change" is defined differently by the FCCC and IPCC and its use is confusing. So avoid it
181	2	112	37	112	37	Add at end "Human activities also alter the temperature in and near cities from building and energy production, causing an upwards bias to global surface temperature"
182	2	112	47	112	47	Insert after "changes" "ocean circulation changes (El Niño and La Niña),"
183	2	113	3	113	3	ALL the confidence figures in Table 2.1 MUST BE DOUBLED to reflect 95% confidence levels
184	2	113	7	113	7	Replace "standard deviation" by "two standard deviations (to show 95% confidence levels)"
185	2	113	7	113	7	Insert "two" after "including" and put "s" on "standard deviation"
186	2	113	8	113	8	Plural of "uncertainties"
187	2	128	1	128	1	All uncertainties in Table 2-12 MUST BE doubled to reflect 95% confidence limits