WMO

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

UNEP

IPCC Fourth Assessment Report

Expert/Government Review of the Second-Order Draft

Chapter 1

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-1	A	0	0	0	0	Most of this Introduction Chapter is a model of lucidity and pertinence, in sharp contrast to the SPM. Those responsible for the high quality of this chapter could well be asked to re-write the SPM. (Ian Cook, United Kingdom Atomic Energy Authority)	Noted - thank you but thank you - no
1-2	A	0	0	0	0	Generally this chapter is well written and relatively easy to understand (David Jackson, McMaster University)	Noted
1-3	A	0	0	0	0	Please see my Commentary titled "Addressing Potential Abrupt Climate Change" which does not fit into this Excel spreadsheet box. I have accordingly asked Dave Rutu to circulate it to lead authors. It draws attention to a body of peer reviewed and gray literature which appears to have been overlooked in the SOD, although it was brought to attention previously in my comments on the FOD. The main point is that the literature mostly treats atmospheric CO2 as a flow pollution problem, to be addressed through a reduction in emissions. However CO2 is not a noxious gas, and therefore atmospheric CO2 is an excess stock problem with several possible answers. It is technologically much easier to extract CO2 from the atmosphere by land use improvements that increase biotic absorption and yield biomass fuels (de-fossilization) than it is do without any fuel other than hydrogen (decarbonisation). In this Chapter the matter can be dealt with most simply by references to "emissions reductions" being replaced by references to "net emissions reductions" with a brief additional sentence to explain why. Although the best reference is Read and Parshotam (2006) this is still 'gray' and a sufficient basis for the suggested amendments to this Chapter is Read and Lermit (2005) and Read (2006). Additionally, the Executive summary refers to "previous and new cross cutting issues" (p3 line 18-19) but no new cross cutting issues are listed at p25 line 45. Unless the issues that are formally to be treated as cross cutting is determined by IPCC Bureau decisions (e.g. IPCC 2000, but surely that's a bit out of date by now?), or by other higher authority, I think that the increasing need to address Abrupt Climate Change should be treated as a new cross cutting issue and provide some wording for inclusion at line 46 on p25. If this wording is not adopted, I suggest the words "previous and new" should be deleted from p3, line 18 (Peter Read, Massey University)	**Rejected: Too complex to explain and also ambigous** Cross-cutting themes to be checked (**Holger**)
1-4	A	0	0	0	0	Please see my Commentary titled "Addressing Potential Abrupt Climate Change" which does not fit into this Excel spreadsheet box. I have accordingly asked Dave Rutu to circulate it to lead authors. It draws attention to a body of peer reviewed and gray literature which appears to have been overlooked in the SOD, although it was brought to attention previously in my comments on the FOD. The main point	Same as previous comment

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						is that the literature mostly treats atmospheric CO2 as a flow pollution problem, to be addressed through a reduction in emissions. However CO2 is not a noxious gas, and therefore atmospheric CO2 is an excess stock problem with several possible answers. It is technologically much easier to extract CO2 from the atmosphere by land use improvements that increase biotic absorption and yield biomass fuels (de-fossilization) than it is do without any fuel other than hydrogen (decarbonisation). In this Chapter the matter can be dealt with most simply by references to "emissions reductions" being replaced by references to "net emissions reductions" with a brief additional sentence to explain why. Although the best reference is Read and Parshotam (2006) this is still 'gray' and a sufficient basis for the suggested amendments to this Chapter is Read and Lermit (2005) and Read (2006). Additionally, the Executive summary refers to "previous and new cross cutting issues" (p3 line 18-19) but no new cross cutting issues are listed at p25 line 45. Unless the issues that are formally to be treated as cross cutting is determined by IPCC Bureau decisions (e.g. IPCC 2000, but surely that's a bit out of date by now?), or by other higher authority, I think that the increasing need to address Abrupt Climate Change should be treated as a new cross cutting issue and provide some wording for inclusion at line 46 on p25. If this wording is not adopted, I suggest the words "previous and new" should be deleted from p3, line 18 (Peter Read, Massey University)	
1-5	A	0	0	0	0	The chapter was improved. (Alexander Golub, Environmental Defense)	Noted
1-6	A	0	0	0	0	Uncertainty needs prominence. The recent surge in oil prices, climate change will find its solution itself. However, this will bring forward coal etc forward. Therefore there are many new challenges that need to be brought forward. A new sub-section on 1.3 could be included in this area. (Expert Review Meeting Paris, IPCC)	TIA – will have a new section on this
1-7	A	0	0	0	0	the high confidence argument should be put into footprint context and institutional architecture should include the markets. The institutional architecture is very descriptive and could be more specific including how this architecture is actually working. (Expert Review Meeting Paris, IPCC)	ACC: Will be rephrased and parts moved to Chapter 13
1-8	A	0	0	0	0	Policymakers are looking of cost of mitigation, which is not properly represented in the report. There must be literature available. What are the costs of adaptation versus mitigation. The costs currently seem to be underrated. (Expert Review Meeting Paris, IPCC)	Noted – General comment of no immediate relevance to Chapter 1`

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1-9	A	0	0	0	0	Approach to technology seems to be dominating.There seems to be an over-emphasis on R&D. The precision of definition needs to be improved. A systems approach needs to be adopted. (Expert Review Meeting Paris, IPCC)	Noted – General comment of no immediate relevance to Chapter 1`
1-10	A	0	0	0	0	Although SOD draft of Chapter 1 is greatly improved compared to the FOD, my overall reaction to the SOD is one of great disappointment. The human race is at a critical juncture with regard to the global warming issue, and there is not time to wait until AR5 in order to give policy makers a clear message. Avoidance of serious ecological and other consequences of global warming requires meaningful constraints on global CO2 emissions by 2020 (a meaningful constraint, for example, would be to return emissions by 2020 to the level they will have reached by 2010). I have read most of the SOD chapters of WG1 and of WG2, and it is critical that the introductory chapter of the WG3 report draw this information together in the discussion of Article 2 of the UNFCCC in order to present the case that very stringent and rapid reductions in CO2 emissions are likely required if policymakers wish to comply with Article 2. Having presented this case, Chapter 1 should then go on to state that the purpose of WG3 is to explain to policymakers the range of technical and planning options and policy tools available to achieve the deep reductions in GHG emissions that the science of Working Groups 1 and 2 indicates will very likely be needed. However, this is not even one of your stated purposes! The science of global warming, summarized by WG1, is stronger than ever, and clearly shows that the climate sensitivity is within the long-standing consensus range of 1.5-4.5 K and possibly much larger. It is also very clear from WG2 that the temperature limits of 1-2 K global mean warming, as originally proposed by the AGGG in the 1980s, represent reasonable upper limits to the allowable temperature change. From this it immediately follows that we have already exceeded, or will soon exceed, the CO2 concentration that violates Article 2 of the UNFCCC (the argument can be presented more formally, in risk terms, as I do in my more detailed comments below). This is a vitally important message that needs to be conveyed to policymakers with great urgency, but it is to be found nowhere in any of the three WG reports of AR4! If this and some of the deficiencies in other chapters are not corrected, AR4 (and especially WG3) will likely go down in history as a monumental failure, at a critical time in the history of the global warming problem, to tell policy makers, forthrightly, what they need to be told.	REJ: outcome too policy prescriptive – no consensus on DAI Needs to reflect accurately WG1 and WG2 Text will reflect the impact of delayed action

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						(Danny Harvey, University of Toronto)	
1-11	A	0	0	0	0	This chapter is greatly improved from FOD. The descriptions in SOD have been changed to be restrained and neutral ones. I would like to deeply appriciate all of the authors in this difficult chapter for their devoted and good jobs. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Noted
1-12	A	0	0	0	0	In the first eight pages exists reiterate references at the work developed by WG II in their different Chapters. Maybe preferable to support the work in elements obtained by different Chapters of WGIII, because this Introduction would collect the main findings obtained by WGIII Chapters. Take into account that if this way is repeated by others WG of AR4, will restrict Report credibility. (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted – more reference to other WGs and cut down of references
1-13	A	0	0	0	0	Overall a well-written chapter, however some issues concering capacity building, energy secuity can be added into the chapter (Rutu Dave, IPCC WGIII TSU)	Noted – energy security is included – capacity building not – space considerations
1-14	A	0	0	0	0	It does not reflect the discussion regarding the importance of technologies in each chapter. (Government of Japan)	REJ: – this is not a summary. Road map provides some of the requested information
1-24	B	0	0	0	0	Nowhere in this chapter is the standard IPCC methodology on likelihood and uncertainty used. Instead generalisations such as "it is clear", "impossible" and "will" are substituted. In addition the authors should review the chapter to ensure that their use of terms such as "likely" and "very likely" accord with the IPCC methodology. (Government of Australia)	ACC – needs to be made consistent - often unintentionally as the terms are used in a colloquial way (**Holger)**
1-25	B	0	0	0	0	It is identified that the WG3 report is of particular interest to policymakers seeking authorative information on mitigation measures. The introduction would benefit from greater emphasis on this aim/objective . An overarching section on the policy and technical context of mitigation and the rationale behind the report should be included up front, for example before discussion of Article 2 of the Convention. In addition the introduction would benefit from section 1.5.2 (i.e 'Road Map') being positioned closer to the front of the chapter. (Government of Australia)	Partially accepted – emphasis will be added (**Holger**) Road map will probably stay at the end
1-1	B	0	0	0	0	In several places in Chapter 1, WG3 duplicates the assessment functions that are properly the mandate of WGI and WG2. In doing so, different literature reference sets are used and the findings of WG3 do not always correspond with WGI and	Accepted –

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						WG2. WG3 should confine itself to summary statements using the findings of WG1 and WG2. (Government of Australia)	
1-2	B	0	0	0	0	Chapter 1 seems to over-reach in drawing conclusions/findings on various topics that really can only be based on assessments that come in later chapters. The authors should carefully review the content to ensure that Chapter 1 serves only as a chapter to provide scene setting for development throughout the report. Several comments are provided on specific points in Chapter 1 where this issue arises. (Government of Australia)	Accepted –
1-15	A	0	0	0	0	I suggest that the message from Chapter 1, p.4, l. 8-11 'Given WGI's findings of an upward change in climate sensitivity and increased risk of large scale, non-linear changes, larger emission reductions than those that emerged from the TAR (IPCC, 2001), will likely be required in order to meet the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC)' deserves to appear in the Executive Summary (Manfred Treber, Germanwatch)	Noted
1-16	A	0	0	0	0	Most of the emission levels in this report are give in terms of tCO2-eq. At many points in this chapter, emission levels are given in tC-eq. These should be converted to tCO2 or the values in tCO2 given as supplemental information, to allow comparison with other information. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accepted – will be made consistent with TSU ruling
1-17	A	1	1	1	1	please ignore (Steve Sawyer, Greenpeace International)	Noted
1-3	B	2	1	3	22	The Executive Summary of this chapter reads more like an introduction, and does not contain the critical findings that are outlined in the rest of the chapter. The authors should redraft this section to highlight the findings rather than the structure of the chapter. (Government of Australia)	Accepted – will be done (**Holger**)
1-4	B	2	17	2	28	The discussion of dangerous anthropogenic interference (DAI) in this paragraph does not include references to the discussion of impacts and key vulnerabilities in WG2. For consistency in the presentation of DAI across the AR4 the authors should include a brief discussion of WG2. (Government of Australia)	Partially accepted – reference will be made (**Bill**) Discussion of WG2 not task of Chapter 1
1-18	A	2	18	2	18	I suggest to add: ¨Defining what is dangerous anthropogenic interference.....¨, because is the man the main responsible of the negative situation.	Accepted - Done

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						(CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	
1-19	A	2	20	2	23	This is such a weak and self-evident statement that it is meaningless. (Danny Harvey, University of Toronto)	Rejected – not self-evident to many
1-20	A	2	23	2	25	Rewrite the sentence commencing on line 23 as follows: "EMISSION REDUCTION PATHWAYS WILL DEPEND ON decisions made in relation to Article 2 TO determine the level of climate change that MAY SERVE as the goal for policy AS WELL AS the scale AND TIMING of adaptation THAT MAY BE IMPLEMENTED TO COPE WITH CURRENT CLIMATE, CLIMATE VARIABILITY OR CLIMATE CHANGE ". [Note: Inserts are shown in UPPER CASE; deletions are not shown.] There should be explicit recognition that, depending on what aspects determine whether climate change is dangerous, adaptation may either increase the stabilization level or postpone its attainment. Either would decrease the costs of reducing emissions. See Goklany (2000a, 2003, 2005a). References: (1) Goklany, IM. 2000a. Potential Consequences of Increasing Atmospheric CO2 Concentration Compared to Other Environmental Problems. Technology 7S: 189-213. (2) Goklany, IM. 2003. Relative Contributions of Global Warming to Various Climate Sensitive Risks, and Their Implications for Adaptation and Mitigation. Energy & Environment 14: 797-822. (3) Goklany, IM. 2005a. A Climate Policy for the Short and Medium Term: Stabilization or Adaptation? Energy & Environment 16: 667-680. U.S. Government (Government of U.S. Department of State)	Rejected - 1. suggested text changes the meaning but accept the "timing of adaptation 2. point is biases as the issue can be both ways 3. No reference in exec summary
1-21	A	2	25	0	0	Replace "emission reduction" with "net emission reduction, i.e. emission reduction minus increase in biotic absorption" (Peter Read, Massey University)	Rejected – see 1-3
1-22	A	2	25	2	25	Replace "emission reduction" with "net emission reduction, i.e. emission reduction minus increase in biotic absorption" (Peter Read, Massey University)	Rejected – see 1-3
1-23	A	2	25	2	28	This statement is wrong. See my comment to page 6, lines 31-35. (Danny Harvey, University of Toronto)	Note – text will be cross-checked and made consistent with WGIII Chapter 3 As the feasibility, scale and timing of adaptation required - Done
1-24	A	2	25	2	28	This description is not sufficient. We recommend to replace "If warming of 2oC above ... below 2000 level by 2100" with TS P6, L32-35, "If warming of 2oC above pre-industrial were deemed to be a limit on global warming, global emissions would need to be reduced to at least 70% below 2000 levels by 2100. On the other	Accepted – second sentence will be added (Holger)

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						hand if a higher level of warming such as 4oC were deemed to be a limit, then emissions may not have to peak until well after mid century and could still be well above 2000 levels in 2100." (Government of Japan)	
1-5	B	2	25	2	28	Chapter 1 does not present an analysis of the range of emissions pathways to achieve specific temperature outcomes associated with stabilisation concentrations. Either delete sentence or express idea at this point in only a qualitative way. Topic is best summarised in the relevant Chapter. (Government of Australia)	Rejected – this is to set the backdrop for the report, introduced from Chapter 3
1-25	A	2	27	2	28	The text gives the wrong impression that the 2 degrees target can still be met by emission reduction. However, given the already existing high concentrations of GHG in the atmosphere and the most recent results with regard to the climate sensitivity it seems to be likely that such threshold has already been passed and that only so called overshooting scenarios would allow to meet such goal. (Government of Austria)	Rejected – this statement is not correct at present plus range 2-4o given (see A 1-24)
1-26	A	2	28	0	0	add "be", "be reduced" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-6	B	2	28	1	35	The Executive Summary should include a statement on what are the current total global emissions of CO2-e (i.e. all sources/ all gases). (Government of Australia)	Accepted – will be included (**Holger)**
1-27	A	2	30	2	35	It would help the reader to, in addition to pointing out 380 ppm, that ghg emissions have increased 75% since 1970 (from page 9). Even though this is pointed out in the summary for the policymaker, it's so significant that it's worth repeating to bring home the point that emissions have exploded in recent years. U.S. Government (Government of U.S. Department of State)	Accepted – will be included (**Holger)**
1-28	A	2	33	2	33	As a CONSEQUENCE, ATMOSPHERIC (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-29	A	2	33	2	33	CO2 rather than GHG (twice on the same line). (Government of France)	Accepted - Done
1-30	A	2	34	0	0	We know that the CO2 concentration variates of several ppm during the year due to the vegetation cycles. Is it more precise to write '... reaching 380 ppm CO2 as yearly average in 2004.' ? (Manfred Treber, Germanwatch)	Rejected – concentrations are usually given as annual averages
1-31	A	2	34	2	34	Erratum: to change "anually sine the late…" for "anually since the late…" (Félix Hernández, Economía y Geografía. Consejo Superior de Investigaciones	Accepted - Done

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						Científicas (IEG-CSIC))	
1-32	A	2	34	2	34	The word "Sine" may be replaced by "since". (Government of Pakistan)	Accepted - Done
1-33	A	2	35	0	0	Replace "emissions" with "net emissions" (Peter Read, Massey University)	See comment 1-21
1-34	A	2	35	2	35	Replace "emissions" with "net emissions" (Peter Read, Massey University)	See comment 1-21
1-35	A	2	35	2	37	In light of my overview comment and my comments to page 4, lines 46-48, this statement is far too weak. It needs to be strengthened, pointing out (among other things) that representation of the science of WG1 and WG2 in terms of probability distribution functions for climate sensitivity and for the global mean temperature change beyond which unacceptable harm occurs, respectively, indicates that we now already violate, or will soon violate, Article 2 of the UNFCCC. This follows from the formal analysis presented in Harvey (2006a) and discussed at length in my later comments. (Danny Harvey, University of Toronto)	Partially Accepted – text revised to reflect deep cuts DONE
1-7	B	2	35	2	35	This WGIII report (see for example, SPM, p8, lines 3-4) points out that major emissions reductions will require an effective global response. Mention here in Ch.1 of 'Kyoto targets' is somewhat misleading since that approach only applies to Annex 1 Parties. Rephrase to: '...beyond the current commitments in the Kyoto Protocol...' (Government of Australia)	Accepted – Done
1-36	A	2	38	2	38	I suggest to add: ¨.....important - economic development reached and needs,....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – Does not add any value
1-37	A	2	41	2	44	It is suggested that the following rewrite be used: “The numerous mitigation measures already underway . . .(all of which are steps towards implementation of Article 2) are inadequate for reversing . . .concentrations. U.S. Government (Government of U.S. Department of State)	Accepted – Done
1-38	A	2	45	2	45	I suggest to add: ¨economic development, and inadequates production and consumption patterns, continue to eclipse...¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – comment does not add any value
1-39	A	2	47	0	48	Suggest delete word "unhindered" in line 47. The relevant Art 2 condition to be complied with is "sustainable economic development", not "unhindered sustainable economic deveopment". If avoiding dangerous interference implies some (limited)	Accepted - use precise language of article 2 (**Bill)**

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						hindrance to development, so be it. (Ralph Chapman, Victoria University of Wellington)	
1-40	A	3	1	3	2	I suggest to add: ¨.....the risks of abrupt or catastrophic change including the terrible results over the life and development in any countries, and potential.....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – Not IPCC language style
1-41	A	3	4	3	4	Change to "Properly designed climate change response can be part and parcel of sustainable development." As the Chapter 12, Pg 55, lines 4-5 points out: " Possible side effects of mitigation policies can either be positive or negative with respect to the promotion of sustainable development." Climate change mitigation can be the cause of other environmental problems, and development that is sustainable in many other respects may increase GHG emissions." The rest of the paragraph is correct in that it uses the verb "can" to describe the relationship. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accepted – Done
1-42	A	3	4	3	4	Change to "Properly designed climate change response can be part and parcel of sustainable development." As the Chapter 12, page 55, lines 4-5 points out: "Possible side effects of mitigation policies can either be positive or negative with respect to the promotion of sustainable development." Climate change mitigation can be the cause of other environmental problems, and development that is sustainable in many other respects may increase GHG emissions." The rest of the paragraph is correct in that it uses the verb "can" to describe the relationship. U.S. Government (Government of U.S. Department of State)	Identical comment as 1-41.
1-43	A	3	6	0	0	add "to", "contribute to" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted – Done
1-44	A	3	6	3	6	In TURN, SUSTAINABLE (Joe Asamoah, International Energy Foundation)	Accepted – Done
1-45	A	3	8	3	10	Rewrite the sentence starting with "Projected climate change" as follows: "IN THE SHORT-TO-MEDIUM TERM, SUSTAINABLE DEVELOPMENT CAN ENHANCE MITIGATIVE CAPACITY AND THE CAPACITY TO COPE WITH BOTH CURRENT CLIMATE AND CLIMATE CHANGE, WHILE IN THE LONG-TERM projected climate changes MIGHT exacerbate poverty and hence undermine sustainable development especially in least-developed countries, which are the most dependent on natural capital." [Note: Inserts are shown in UPPER CASE; deletions are not shown.] U.S. Government (Government of U.S. Department of State)	Rejected –Time scale can be both short and long term

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1-46	A	3	11	0	11	The statement that "Hence global mitigation efforts can enhance sustainable development prospects in part by reducing the risk of adverse impacts of climate change" needs augmenting. Suggest add: "Mitigation actions can also go beyond avoiding adverse impacts; effective mitigation measures can provide positive co-benefits such as improved health outcomes." (Ralph Chapman, Victoria University of Wellington)	Accepted - Done
1-47	A	3	12	0	0	Append to the end of this paragraph, the following: “so that social, economic and environmental well;-being is optimized.” U.S. Government (Government of U.S. Department of State)	Partially accepted – maximized instead of optimized - Done
1-48	A	3	18	0	0	IF suggested addition at page 25, line 46 is not accepted, THEN delete "previous and new" (Peter Read, Massey University)	Accepted - Done
1-49	A	3	18	3	18	IF suggested addition at page 25, line 46 is not accepted, THEN delete "previous and new" (Peter Read, Massey University)	Accepted - Done
1-8	B	3	18	3	21	Use of both semi-colons and commas in phrasing of element (c) would make text easier to understand. (Government of Australia)	Accepted – needs to be done plus Biomass and others added (**Holger)**
1-50	A	3	19	3	22	The clause “while the carbon intensity of energy did not change much” should be changed to read “while the rate of reduction in the carbon intensity of energy has fallen dramatically” Rationale: Review of figure TS4 shows that the rate of improvement in the carbon intensity of energy has diminished sharply, and that emission growth in the 1993-2003 period would be virtually identical to that in the 1973-1983 period had the rate of carbon intensity improvement remained unchanged. U.S. Government (Government of U.S. Department of State)	Cannot find this in text
1-51	A	4	4	4	4	I suggest to change: particular by main or principal in order to emphasize the importance (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted - Done
1-52	A	4	5	4	5	"cost-effective measures" is very limitted way of using phrase in this context. We have to take into consideration of , not only "cost", but much more broad and wide concept such as "social, economic, cultural and bio-physical aspects, etc." for policy makers. Following may be alternative expressions, for example: i.e. instead of "cost-effective measures", No.1, "the socio-economic optimum measures incuding cost-effeciveness", or more broadly,No.2, "the optimun measures for	Noted

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						socio-economic, cultural and bio-physicla and processes including cost-effectiveness". (Susumu Nakamaru, Sun Management Instutute)	
1-53	A	4	7	0	0	please add: '... mitigation potentials and associated costs as well as costs of impacts from climate change ...' (Manfred Treber, Germanwatch)	Partially accepted – mitigation potential included
1-9	B	4	8	4	8	Post-Kyoto' is too narrow a reference to context of the WGIII report. Rephrase as: '…important to support negotiations on future global emissions reductions.' (Government of Australia)	Accepted
1-10	B	4	8	4	11	Final sentence attempts a partial integration across WGI and WGIII findings that is more appropriate to a discussion to be developed in the AR4 Synthesis Report. As drafted, the sentence fails to begin with a focus on the core 'stabilisation of concentrations' focus of Article 2. Propose deleting the sentence. (Government of Australia)	To be checked (Bill)
1-54	A	4	9	0	0	after "emissions" insert "and/or increases in biotic absorption (hereafter referred to as "net emissions reductions")" (Peter Read, Massey University)	See 1-21
1-55	A	4	9	4	9	after "emissions" insert "and/or increases in biotic absorption (hereafter referred to as "net emissions reductions")" (Peter Read, Massey University)	See 1-21
1-11	B	4	9	4	11	Insert after “non-linear changes,” the following: “more effort is needed to develop response strategies, including more effective adaptation and vulnerability-reduction and/or…” U.S. Government (Government of U.S. Department of State)	Rejected – Too policy prescriptive
1-12	B	4	13	4	14	Rephrase to avoid policy prescription of 'has to be'. Suggest: '…and conditions for implementing the atmospheric concentration stabilisation objective'. (Government of Australia)	
1-56	A	4	15	4	15	I propose to chane greenhose gas (GHG) for GHG (Félix Hernández, Economía y Geografía. Consejo Superior de Investigaciones Científicas (IEG-CSIC))	Accepted - Done
1-57	A	4	17	0	0	It should be noted as well that Article 3 advises that Parties should be guided by the principles listed, notably principle 1 that highlights the basis of equity and common but differentiates responsibilities and respective capabilities of developing country Parties. (Valentin Bartra, Instituto Andino y Amazónico de Derecho Ambiental)	Accepted - **Philippe**

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1-58	A	4	17	4	17	It should be noted as well that Article 3 advises that Parties should be guided by the principles listed, notably principle 1 that highlights the basis of equity and common but differentiates responsibilities and respective capabilities of developing country Parties. (Valentin Bartra, Instituto Andino y Amazónico de Derecho Ambiental)	See I-57
1-13	B	4	21	4	21	Substitute "most" for "many" U.S. Government (Government of U.S. Department of State)	Not found in text
1-59	A	4	31	0	0	Some explanation of the link between DAI and the three subsidiary conditions should be given right after this paragraph. This is explained in Harvey (2006a) as follows, and I recommend incorporating the key points here: "By speaking of adaptation to climatic change, it is implied that the ultimate climatic change (related to the chosen GHG stabilization levels) is small enough and hence benign enough that adaptation is possible in the first place. The three subsidiary conditions (allowing ecosystems to adapt, maintaining food production, and enabling sustainable economic development) are restrictions on the rate at which non-dangerous greenhouse gas (GHG) concentrations are reached. They are related to that fact that climatic change that is not harmful (that is, sufficiently limited that adaptation is possible), were it to occur slowly, could be highly disruptive (harmful) if it were to occur too fast. These conditions thus set a constraint on rates of allowable GHG emissions, while the overall goal of capping GHG concentrations at non-dangerous levels largely represents a constraint on cumulative CO2 emissions." REFERENCE: Harvey, L.D.D. 2006a. Dangerous Anthropogenic Interference, Dangerous Climatic Change, and Harmful Climatic Change: Non-Trivial Distinctions with Significant Policy Implications. Climatic Change (accepted). (Danny Harvey, University of Toronto)	TIA -Will be dealt with as indicated 1-xxx (Bill) Legal interpretation unclear
1-60	A	4	33	4	38	What you have said is, strictly speaking, correct and does acknowledge that Article 2 may require that we accept slower economic development (and restraints on economic growth) in exchange for the benefits of reduced damages (which are both economic and non-economic) resulting from reduced climatic change. However, this is not how this part of Article 2 is usually interpreted – it has frequently been interpreted, perhaps self-servingly, as saying that there should be no restriction on economic growth. Thus, some elaboration of what Article 2 does and does not say	Noted REJ: This is just one interpretation of Art2 thus not acceptable as definitive

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						is required. Also – and this needs to be explained as I do below – the "tension" is more apparent than real. Thus, please point out that it may very well be that in order to have truly sustainable economic development, development will need to proceed more slowly than under a path that ultimately is not sustainable, and that Article 2 only requires the chosen GHG concentrations to enable sustainable development, NOT that they be such that there is no slowing down of economic growth. That being the case, there is no tension (in Article 2) between enabling economic growth on the one hand and protecting ecosystems and food-producing systems on the other hand. If anything, Article 2 requires that emission constraints begin sooner rather than later since, as shown by Kallbekken and Rive (2006), greater rates of emission reduction are required the later the emission reductions begin, if a given concentration ceiling is to be observed (the paper by Kallbekken and Rive (2006) absolutely must be cited and the key arguments highlighted here). Since, as explained in my comment to pg 4, line 31, the reference to adaptation of ecosystems represents a constraint on the rate of change of climate, which in turn requires early rather than later emission reductions consistent with a given concentration ceiling, which in turn allows more gradual rates of reduction in emissions, there is in fact little or no conflict between the first two and the third subsidiary conditions. REFERENCE: Kallbekken, S. and N. Rive. 2006. "Why delaying climate action is a gamble", in Schellnhuber, H.J., Cramer, W., Nakicenovic, N., Wigley, T., and Yohe, G. (editors), Avoiding Dangerous Climate Change, Cambridge University Press, Cambridge, pp. 311-315. (Danny Harvey, University of Toronto)	
1-61	A	4	36	4	36	On the other SIDE, VERY costly (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-62	A	4	36	4	36	I suggest to add: ¨.....very costly mitigation measures, or inactivity in decisions - making and taking of adequate measures, could have....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	REJ: this is not the point made here
1-63	A	4	37	0	38	Suggest add the following at the end of the paragraph: "However, the choice is not a simple trade-off between mitigation and economic growth. Too little mitigation for the sake of short-term growth may limit long-term economic development." (Ralph Chapman, Victoria University of Wellington)	Noted – we refer to the synergy between mitigation and SD later

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1-64	A	4	38	0	0	after "growth" insert "However, synergy between sustainable development and net emissions reductions can arise when the latter is achieved through increased biotic absorption." (Peter Read, Massey University)	See 1-21
1-65	A	4	38	4	38	after "growth" insert "However, synergy between sustainable development and net emissions reductions can arise when the latter is achieved through increased biotic absorption." (Peter Read, Massey University)	See 1-21
1-66	A	4	40	4	45	This paragraph is incorrect in suggesting that the reference to adaptation refers to the "level" of climate change rather that the rate of climate change. This paragraph can be deleted, in light of the explanation of the meaning of the reference to adaptation of ecosystems given in my comment to line 31. To repeat, in speaking about adaptation of ecosystems, it is implicitly assumed that climatic change is small enough that meaningful adaptation is even possible, and the requirement that ecosystems be allowed to adapt is an even more stringent restriction on allowable emissions because it requires that climatic change that, in equilibrium would be benign, must be slow enough that adaptation has time to occur. (Danny Harvey, University of Toronto)	Partially accepted – rate of change included - Done
1-67	A	4	42	4	42	Climate change will affect not only " economic development" ,but also, "social development". In this context, It is appropriate that "economic development" is to be replaced by "socio-economic development" for icluding much broder concept. (However, "economic development" may be cited from Articl 2 of the UNFCCC.) Taking appropriate balance between preserving ecosystem and economic development is very important, of cource, but sometimes we have learned from our historical experiences, some of the policy makers utilize this "balance" as an "excuse" not taking appropriate measures in timely manner, which may lead the unfavourable situation worse. (Susumu Nakamaru, Sun Management Instutute)	Rejected: Not language of Art 2
1-14	B	4	43	0	0	(1) Insert the following reference after "dangerous": Goklany (2000a). (2) Add the following new sentence after the period on line 43: "Complicating such assessment is that adaptive capacity is a function of a number of factors including economic development, technological change, and human and social capital – all of which should be enhanced over time, if the storylines embodied in the SRES scenarios are to be trusted (Goklany 2005c, 2006a)." References: (1) Goklany, IM. 2005c. Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds? 25th Annual North American Conference of the US Association for	REJ: reference inappropriate New sentence not fully correct – therefore too complicated

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						Energy Economics/International Association of Energy Economics, September 21-23, 2005. (2) Goklany, IM. 2006a. Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development. Mitigation and Adaptation Response Strategies for Global Change, forthcoming. U.S. Government (Government of U.S. Department of State)	
1-68	A	4	45	4	45	The ending bracket appearing after "2003" should be moved to the end of the line. (Government of Pakistan)	Accepted - Done
1-15	B	4	45	4	45	This sentence seeks to summarise a point brought out in the WGII report that is relevant in setting scene for the WGIII report. Hence, it seems inappropriate to seemingly introduce/rely upon additional literature (Barnett & Adger). Suggest text should simply present finding of WGII, and not attempt to add to WGIII task. (Government of Australia)	Accepted - done
1-69	A	4	46	4	48	This statement is not correct. Article 2 calls for stabilization of GHG concentrations at a level that prevents dangerous anthropogenic interference (DAI) in the climate system, period. Dangerous climatic change (DCC) is something altogether different, and the distinction between the two is quite important, as explained in Harvey (2006a). Sea level rise is again something else quite different, and one does not have the freedom (under Article 2) to choose the point within the cause-effect chain to focus attention. Rather, effort must be directed at GHG concentrations. As explained in Harvey (2006a), "Dangerous anthropogenic interference (DAI) in the climate system is a set of increases in GHGs concentrations that has a non-negligible possibility of provoking changes in climate that in turn have a non-negligible possibility of causing unacceptable harm to humans, human societies, or natural ecosystems. Dangerous climatic change is a change of climate that has a non-negligible possibility of causing harm to humans, human societies, or natural ecosystems." If DAI is defined at the level of temperature changes (contrary to what Article 2 clearly says), then one needs to know what the correct climatic sensitivity is in order to determine the allowable GHG emissions. However, if DAI is defined at the level of GHG concentrations (as in Article 2), then one need only determine a plausible upper limit to the climate sensitivity in order to determine the concentrations that constitute DAI, and hence to determine what the global emissions targets should be. Uncertainty in climate sensitivity causes the GHG concentration limits needed to prevent DAI to be more stringent than the concentration limits associated with, say, a best guess or middle estimate of climate	Partially accepted – reference to climate changed deleted Its one of several interpretations in the literature – no consensus so far

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						sensitivity. That is, uncertainty leads to lower allowable GHG concentrations. Another way in which the distinction between DAI and DCC is important is that changes in ocean chemistry (through the absorption of anthropogenic CO2) represent interference in the climate system (or, at least, in the broader Earth system) independently of the change in climate and hence independently of the climate sensitivity. By reading Article 2 as referring to DCC instead of DAI, a whole dimension of adverse impacts associated with CO2 emissions is bypassed (and the potential impacts associated with even a steady doubled CO2 concentration are indeed very severe!). The text should be revised to make the above points. Having done that, it is then necessary to introduce the inputs needed for a determination of what CO2 concentration constitutes DAI. This also provides an opportunity, so far missing from WG3, of synthesizing the information from WG1 and WG2 and incorporating this synthesis into the WG3 report. Two initial inputs are required in order to determine the allowable equivalent CO2 concentration, as explained in Harvey (2006a): (i) the climate sensitivity, which links concentrations to longterm global mean temperature change, and (ii) a threshold global mean temperature change, beyond which unacceptable impacts occur. In practice, the climate sensitivity is unknown but can be replaced with a probability distribution function (pdf) of climate sensitivity (the pdf gives the probability of the true climate sensitivity falling within various intervals). Similarly, the impacts associated with a given global mean temperature change are uncertain and, as well, there will be disagreement as to how large the impacts should be before they are unacceptable. Thus, a single temperature threshold for unacceptable warming can be replaced with a pdf for the temperature threshold. Having cast the climate sensitivity and temperature threshold in probabilistic terms, a third input is required in order to determine the maximum allowable GHG concentrations: the maximum acceptable probability of provoking impacts that had been previously deemed to be unacceptable. The greater the impacts chosen in step two to represent unacceptable damage, the lower this threshold probability should be. The most important output from WG1 is the pdf for climate sensitivity, and the various chapters (Chapter 8, Table 8.8.1; Chapter 9, Sections 9.6.2 and 9.6.3; Chapter 10, Sections 10.5.2 and 10.5.4) of WG1 support a pdf with 5-95% confidence limits of 2-5 K, with some evidence indicating even higher 95% limits. The WG2 report can be summarized by the pdf for the threshold of unacceptable warming; the evidence summarized in Chapter 4 supports a pdf with 5-95%	

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						confidence limits of 1-2 K (see Table 4.2). Given the magnitude of the impacts to be avoided, and that the risks in question are involuntary risks imposed on others, it is argued in Harvey (2006a,b) that the acceptable probability of incurring these impacts should be quite low – on the order of 1-10%. Given risk thresholds of 1-10%, and using a number of pdfs for climate sensitivity and the harm temperature threshold that are consistent with WG1 and WG2, respectively, Harvey (2006a,b) has shown that the maximum acceptable CO2 concentrations range from substantially less than the current concentration (380 ppmv) to no more than about 440 ppmv, depending on the chosen pdfs and risk threshold, and depending on future radiative forcing by non-CO2 GHGs. This is a significant new finding, not available at the time of the TAR, that should be emphasized here: the work of WG1 and WG2, combined with explicit consideration of morally defensible risk thresholds, implies that the current CO2 concentration may already violate Article 2 of the UNFCCC. REFERENCES: Harvey, L.D.D. 2006a. Dangerous Anthropogenic Interference, Dangerous Climatic Change, and Harmful Climatic Change: Non-Trivial Distinctions with Significant Policy Implications. Climatic Change (accepted). Harvey, L.D.D. 2006b. Allowable CO2 Concentrations Under the United Nations Framework Convention on Climate Change as a Function of the Climate Sensitivity PDF. Environmental Research Letters (submitted). (Danny Harvey, University of Toronto)	
1-70	A	5	1	5	1	criterion is CHOSEN, ITS (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-16	B	5	1	5	1	Singular 'criterion' (p5 line 2) seems too narrow - could be multiple 'criteria'. (Government of Australia)	Accepted - Done
1-71	A	5	6	5	7	add hyphen: "par-tially" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-72	A	5	8	5	8	recognized AS having (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-73	A	5	8	5	12	Please check the grammar of this sentence. (Government of Pakistan)	Accepted - Done
1-74	A	5	8	5	8	"as" may be replaced by "has". (Government of Pakistan)	Accepted - Done
1-17	B	5	8	0	0	Replace “has” with “as”. U.S. Government	Accepted - Done

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						(Government of U.S. Department of State)	
1-75	A	5	12	5	15	As noted in my comment to page 4, lines 46-48, the interpretation of Article 2 requires 3 distinctly different inputs: (i) a pdf or pdfs of climate sensitivity; (ii) a pdf of the threshold for global mean temperature change beyond which unacceptable impacts occur; and (iii) the maximum allowed probability of incurring impacts previously determined (in step (ii)) to be unacceptable. Step (i) is largely a scientifically determined input; step (ii) involves both scientific assessments subject to uncertainty and a subjective political/cultural/ethical judgment of what is "acceptable" damage or harm, and step (iii) is largely an ethical determination related to the imposition of involuntary risks on others, but is not independent of step (ii) (the greater the harm associated with the temperature threshold, the smaller the probability of incurring this harm that should be allowed). Some references to the ethical dimensions of step (iii) should be added, such as Brown (2003) and Toon (2003). Tonn (2003) suggests three different acceptable probabilities for three different categories of impacts: one in a million for substantial regional economic, political, and/or biological impacts, one in one hundred million for severe global economic, political, and/or biological impacts, and one in ten billion for extinction of humans. The impacts discussed in WG2 and used as the basis for the pdf for the upper limit on acceptable warming (step ii) would fall in Tonn's first or second category, and Tonn bases his one-in-a-million threshold for the first category on the rule of thumb used by the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) in the US, such that individuals should not be involuntarily subjected to a risk of death with a chance greater than one in a million. If the impacts to be avoided (step ii) involve the death of 1 million people during the lifetime of 10 billion (a conservative estimate – it could be much worse), then the allowable probability of incurring these impacts should not be more 1% if the average risk of death is not to exceed 1 in one million (in my own papers, referenced in other comments, I considered risks of 10-25% and still find that we already violate or are close to violating Article 2 – that is, the current or soon-to-be-reached GHG concentrations constitute DAI).. REFERENCES: Brown, D.A. 2003. 'The importance of expressly examining global warming policy issues through an ethical prism', Glob. Env. Change 13, 229-234. Tonn, B.: 2003, 'An equity first, risk-based framework for managing global climate change', Glob. Env. Change 13, 295-306.	Accepted : ethical Rejected: Science informs about Art 2 but does not decide on Art 2

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						(Danny Harvey, University of Toronto)	
1-76	A	5	12	5	32	It could be helpful to draw in this section some up-to-date scientific information from Schneider, Stephen H. and Janica Lane (2006), An Overview of 'Dangerous' Climate Change, in Schellnhuber, Hans Joachim, Wolfgang Cramer, Nebosja Nakicenovic, Tom Wigley and Gary Yohe (Eds), Avoiding Dangerous Climate Change, Cambridge University Press, and other papers in this volume. (Cédric PHILIBERT, International Energy Agency)	To be checked (Bill)
1-77	A	5	14	5	15	As pointed out in Harvey (2006a), the three subsidiary conditions listed in Article 2 (avoiding adverse impacts on ecosystems, food production, and on sustainable socio-economic systems) need not be regarded as the only three areas of harm to be avoided. Rather, these three areas are singled out in Article 2 because the impacts are sensitive to rates of climatic change as well as to the absolute or final climatic change (associated with stabilized GHG concentrations). There are many other harmful impacts through which higher GHG concentrations could be regarded as DAI, such as significant damage to existing physical infrastructure or to assets of cultural or historical significance, the loss of which might be inconsequential to ecosystems, food production, or economic sustainability. (Danny Harvey, University of Toronto)	Noted: Although valid point, space limitations do not allow a full analysis of all aspects of Art 2
1-78	A	5	21	5	33	The most important point that should be made, and is not made, is that research subsequent to the work of the AGGG has broadly confirmed the proposed 1 – 2 C warming limits. This is clearly seen from the summary table (Table 4.2) in Chapter 4 of WGII, which should be referenced here. (Danny Harvey, University of Toronto)	Rejected: Reference to WGII Chapter 4 already included
1-79	A	5	27	5	30	Is the description of "see Chapter 4" correct? If correct, please describe the section. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Accepted
1-80	A	5	31	5	32	"Large scale risks to ecosystems such as coral reefs also imply risks to hundreds of millions of people" seem to unnecessarily fear people. Is coral reefs an appropriate example here? (Koji Kadono, Global Industrial and Social Progress Research Institute(GISPRI))	Accepted – list of key vulnerabilities relevant to Art 2 will be included (Bill)
1-18	B	5	31	5	32	Final sentence introduces a selected, highly specific point in what is otherwise a paragraph discussing very general matters. Assessment of coral reef impacts is the task of WGII, not WGIII. And identifying one form of impact (coral reefs) but not a myriad of other possible impacts seems unbalanced. (Government of Australia)	Accepted – see 1-80
1-19	B	5	34	5	48	The paragraph should include some description of how adaptation should be	Accepted – see 1-80

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						considered in any discussion of what may be considered as DAI with the climate system. (Government of Australia)	
1-81	A	5	40	5	48	The bottom-line results of Harvey (2006a,b) should be summarized here, namely, that incorporation of climate sensitivity pdfs consistent with WG1 and of harm-threshold pdfs consistent with WG2, combined with an allowable probability of incurring harm previously determined to be unacceptable of 10% or even 25%, leads to the conclusion that we ALREADY violate, or are very close to already violating, Article 2 of the UNFCCC. One of the issues that has arisen during the last 5 years with regard to WG1 is the possibility (according to some analyses) of a climate sensitivity much greater than the upper limit of 4.5 C that had been accepted for so long. However, figure 4 of Harvey (2006b) shows that the allowable CO2 concentration is not significantly reduced as the 95th percentile of the pdf for climate sensitivity increases from 4.5 C to 8 C. Even for a 95th percentile at 2.5 C (i.e., a highly optimistic assumption concerning climate sensitivity), the allowable CO2 concentration is only 290-470 ppmv for allowable risks of noncompliance of 1-10%, and that assumes that non-CO2 GHG forcing can be reduced to half of its present value. This raises another point that needs to be emphasized in the discussion of Article 2, namely: that stringent reductions in non-CO2 GHG forcing are required ALONG WITH (not instead of) stringent reductions in CO2 emissions. REFERENCES: Harvey, L.D.D. 2006a. Dangerous Anthropogenic Interference, Dangerous Climatic Change, and Harmful Climatic Change: Non-Trivial Distinctions with Significant Policy Implications. Climatic Change (accepted). Harvey, L.D.D. 2006b. Allowable CO2 Concentrations Under the United Nations Framework Convention on Climate Change as a Function of the Climate Sensitivity PDF. Environmental Research Letters (submitted). (Danny Harvey, University of Toronto)	REJECTED – "already violated" is the reviewers opinion
1-82	A	5	45	5	45	I propose to add a note with examples of global consequences (el Niño….) (Félix Hernández, Economía y Geografía. Consejo Superior de Investigaciones Científicas (IEG-CSIC))	REJ – done earlier
1-20	B	5	47	5	48	Final sentence goes beyond scope of WGIII discussion - commentary along this line is the business of WGII. Note that the statement in this sentence does not align with WGII conclusions. Delete final sentence.	Check with WG 2

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Government of Australia)	
1-21	B	5	47	5	48	Eliminate the last sentence. First, this sentence assumes that the risk is not "low." That needs to be proven; see above comment. Second, it assumes that the consequences will be drastic. Third, it assumes that the likelihood and consequences of a shutdown would be what drives the timing of mitigation; but we don't know that either. U.S. Government (Government of U.S. Department of State)	See I-20
1-22	B	6	1	6	9	This paragraph sets out "several examples" of elected officials seeking to define acceptable levels of climate change. The only examples given are in the EU. The authors should review the literature for a wider regional/country range of examples - or results in line with the final sentence (line 8). (Government of Australia)	ACC
1-83	A	6	2	6	2	I suggest to eliminate: of elected officials remaining as ¨....several examples seeking to define....¨ because after stay clear that are elected officials (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	See I-22
1-23	B	6	3	6	8	Perhaps the EU Council of Ministers has a rational basis for its 2 degrees limit, but it is not evident in any of the citations provided (1.e., CEU 1996; CEU 2005a, 2005b). None of these documents provide a risk-benefit assessment of the consequences (both positive and negative) of actions designed to meet such a goal. It should be noted in the text here that the 2 degree goal is an expression of a political goal that has yet to be justified on the basis of a science-based risk assessment. Accordingly, add just ahead of the sentence commencing with "To date" on line 8, the following sentence: "However, the EU has not provided a comprehensive risk assessment of the social, economic and environmental consequences of adhering to such a goal either for its member countries or the rest of the world." U.S. Government (Government of U.S. Department of State)	REJ – Source of political decision is not IPCC afair
1-24	B	6	3	0	0	Insert "partly" between "based" and "on". U.S. Government (Government of U.S. Department of State)	REJ – EU use the language
1-25	B	6	8	6	13	Why is there no mention of various international partnerships (e.g., Methane to Markets, APP, etc) here? Also, a broader point should be made that this paragraph is too "Kyoto-centric" and does not reflect the many other actions being taken around the world, like APP and M2M. U.S. Government (Government of U.S. Department of State)	REJ – mentioned later in the chapter section 1.4.3 Also, not relevant here.
1-84	A	6	10	6	14	Though it indicates "each of these views has its strengthes and weaknesses", the	ACC to modify sentence

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						text does not mention weaknesses. Need to elaborate on it. (Koji Kadono, Global Industrial and Social Progress Research Institute(GISPRI))	
1-26	B	6	10	6	14	This para is difficult to comprehend when read in context of rest of 5.1.2.2. What does 'these views' refer to? Paras on pp5-6 cover a number of points and views - not simply the 3 referred to in final para. (Government of Australia)	TIA – rewrite sentence.
1-85	A	6	11	0	0	Harvey (2006a,b) should be referenced here, along with AGGG and O'Neill and Oppenheimer (2002). (Danny Harvey, University of Toronto)	TIA – rewrite sentence.
1-86	A	6	14	0	0	The implication is given that the answer to the question "What is dangerous interference.." is the EU's answer-if so, this should be explicitly stated. (David Jackson, McMaster University)	REJ – not strictly correct
1-87	A	6	18	0	0	substitute "is" for "are", "There is" (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC
1-88	A	6	18	6	21	Surely this sentence can be reworded in a way that is easier to read and more direct! (Danny Harvey, University of Toronto)	ACC
1-89	A	6	18	6	18	The sentence needs to be rephrased. (Government of Pakistan)	AZC
1-90	A	6	20	0	0	Replace "emission" with "net emission" (Peter Read, Massey University)	See 1.-21
1-91	A	6	20	6	20	Replace "emission" with "net emission" (Peter Read, Massey University)	See 1.-21
1-27	B	6	26	6	28	Rewrite the sentence commencing on line 26 as follows: "EMISSION REDUCTION PATHWAYS WILL DEPEND ON decisions made in relation to Article 2 TO determine the level of climate change that MAY SERVE as the goal for policy AS WELL AS the scale AND TIMING of adaptation THAT MAY BE IMPLEMENTED TO COPE WITH CURRENT CLIMATE, CLIMATE VARIABILITY OR CLIMATE CHANGE ". [Note: Inserts are shown in UPPER CASE; deletions are not shown.] Rationale: There should be explicit recognition that, depending on what aspects determine whether climate change is dangerous, adaptation may either increase the stabilization level or postpone its attainment. See Goklany (2000a, 2003, 2005a). References: (1) Goklany, IM. 2000a. Potential Consequences of Increasing Atmospheric CO2 Concentration Compared to Other Environmental Problems. Technology 7S: 189-213. (2) Goklany, IM. 2003. Relative Contributions of Global Warming to Various Climate Sensitive Risks, and Their Implications for	Partially ACC – See 1-20

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						Adaptation and Mitigation. Energy & Environment 14: 797-822. (3) Goklany, IM. 2005a. A Climate Policy for the Short and Medium Term: Stabilization or Adaptation? Energy & Environment 16: 667-680. U.S. Government (Government of U.S. Department of State)	
1-92	A	6	27	0	0	Replace "emission" with "net emission" (Peter Read, Massey University)	See I-21
1-93	A	6	27	6	27	Replace "emission" with "net emission" (Peter Read, Massey University)	See I-21
1-94	A	6	28	0	0	After “required”, add “and of the magnitude of losses for which meaningful adaptation is not possible”. The point is that there were be some changes to which species and ecosystems will NOT be able to adapt (they will become extinct instead), and these changes and the associated failures to adapt will be larger the greater the allowed GHG concentrations. (Danny Harvey, University of Toronto)	ACC
1-28	B	6	30	6	35	These examples of "hypothetical limits" should be deleted as they do not incorporate the range of values provided in Chapter 3 and do not add to the discussion of Article 2 in this chapter. (Government of Australia)	REJ – this section is discussing issues related to implemented and we need examples to show consequences therefore we chose these. Number to be checked.
1-95	A	6	31	6	35	The statements here are scientifically indefensible – they are simply wrong and must be changed. The equivalent CO2 concentration allowed for a given temperature limit (such as 2 C) depends on the climate sensitivity; there is no single allowed concentration. Climate sensitivity now is increasingly represented by a pdf, not by a single value. As discussed in WG1, and in my comments to pages 4 and 5, some work suggests 95th percentiles for climate sensitivity as high as 6 – 8 C. Even if the climate sensitivity is only 4 C, to limit warming to 2 C requires no more than the equivalent of a 50% CO2 increase (0.5 x 3.75 W/m2 forcing = 1.87 W/m2 forcing), a GHG forcing level that has ALREADY been exceeded. If 4 C warming is allowed and climate sensitivity is 4 C, then a CO2 doubling equivalent is allowed, which requires stabilizing CO2 at no more than 450 ppmv, which in turn requires near zero emissions by 2100. This is basic climate science, and is well established, so the statement that emission could be well above year 2000 emissions in 2100 is without any scientific foundation. The whole discussion needs to be reformulated in probabilistic terms, or at least has to consider a couple of different climate sensitivities, and has to be consistent with well established carbon cycle modeling results (which the current discussion is not).	REJ – the premise is wrong... This is only an example. It’s not a full blown analysis. We will add a sentence on climate sensitivity.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Danny Harvey, University of Toronto)	
1-29	B	6	46	6	47	Modify the sentence starting on line 46 as follows: "In turn sustainable development paths can reduce vulnerability to PROBLEMS CAUSED BY climate change and reduce GHG emissions, AND BROADLY INCREASE ADAPTIVE AND MITIGATIVE CAPACITIES (GOKLANY 2003a, 2005a, 2006a)." [Note: Inserts are shown in UPPER CASE; deletions are not shown.] References: (1) Goklany, IM. 2003a. Relative Contributions of Global Warming to Various Climate Sensitive Risks, and Their Implications for Adaptation and Mitigation. Energy & Environment 14: 797-822. (2) Goklany, IM. 2005a. A Climate Policy for the Short and Medium Term: Stabilization or Adaptation? Energy & Environment 16: 667-680. (3) Goklany, IM. 2006a. Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development. Mitigation and Adaptation Response Strategies for Global Change, forthcoming. U.S. Government (Government of U.S. Department of State)	REJ – changes the meaning of the sentence which we believe is the best formulation.
1-30	B	6	46	0	0	Change to "Properly designed climate change response can be part and parcel of sustainable development ." As the Chapter 12, page 55, lines 4-5 points out: "Possible side effects of mitigation policies can either be positive or negative with respect to the promotion of sustainable development." Climate change mitigation can be the cause of other environmental problems, and development that is sustainable in many other respects may increase GHG emissions." The rest of the paragraph is correct in that it uses the verb "can" to describe the relationship. U.S. Government (Government of U.S. Department of State)	ACC
1-96	A	6	49	6	49	I suggest to change least-developed countries by developing countries, because this is a category of United Nations that includes only a group of developing countries, and not taking into account other more vulnerables as small developing islands (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	ACC – change to developing co0puntries.
1-97	A	6	49	7	1	I suggest to add in the end: ¨.....which are the most dependent on natural capital and have smaller financial resources possibilities¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	ACC – See I-96
1-98	A	7	2	0	0	after "change" add ", as well as by reducing reliance on imported and increasingly expensive non-renewable energy sources". This point should be added because the import bill for oil at $70/barrel and likely more costly in the future could become a	REJ – Not necessary true. Prices go and prices down. So says history.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						significant break on economic development. (Danny Harvey, University of Toronto)	
1-31	B	7	4	7	19	Section 1.2.3.2 adds little that cannot be incorporated in the discussion of DAI at page 5 and should be deleted. (Government of Australia)	REJ – part of the agreed outline
1-99	A	7	6	7	19	Subsection 1.2.3.2 on Adaptation and Mitigation needs more detail brought in from WG 2 if the issues of substitutibility and/or complementarity are to be adequately addressed. Alternatively, begin the second sentence (in line 7) "If complementary, it is possible to argue under certain cost-benefit assumptions, that adaptation reduces...." In line 9, insert "on current pathways" between "since" and "mitigation" and remove the quotes around "dangerous". (Pat Finnegan, Grian)	REJ – But reference to other chapters already included.
1-100	A	7	7	7	8	I suggest to add: ¨.....and thus reduces the expected benefits of mitigation measures¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	REJ – would make the formulation to complex.
1-101	A	7	7	7	7	I suggest to add: ¨..... Reduces the cost effects of impacts...¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	REJ – would make the formulation to complex
1-102	A	7	8	0	0	after “substitutable” add “up to a certain point”, because adaptation and mitigation clearly are NOT substitutable at some point (for example, when the changes are large enough to drive species to extinction). (Danny Harvey, University of Toronto)	ACC
1-103	A	7	9	0	0	replace the word “dangerous” (which is in quotes) with “harmful”, because Article 2 nowhere refers to “dangerous climate change”, it refers to “dangerous anthropogenic interference in the climate system” and, as explained in Harvey (2006a) and in my comment to page 4, lines 46-48, the distinction between the two is important. (Danny Harvey, University of Toronto)	TIA – will use DIA
1-104	A	7	9	7	10	I propose to change "dangerous" climate change for "dangerous" irreversible climate changes (Félix Hernández, Economía y Geografía. Consejo Superior de Investigaciones Científicas (IEG-CSIC))	TIA – will use DIA
1-105	A	7	11	0	0	"see WGII, chapter 18" - this is unhelpful to the reader who won't necessarily have a copy of Chapt 18 at hand and even if it is, shouldn't be distracted by the need to look it up. Give a sentence or two illustrating the main point in addition to the	REJ - cannot find

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						citation. (David Jackson, McMaster University)	
1-106	A	7	16	7	16	In the first sentence in line 16, insert "degree of" between "the" and "mitigation". (Pat Finnegan, Grian)	ACC
1-107	A	7	17	0	0	Replace "emission" with "net emission" (Peter Read, Massey University)	See I-21
1-108	A	7	17	7	17	Replace "emission" with "net emission" (Peter Read, Massey University)	See I-21
1-32	B	7	21	7	48	Section 1.2.3.3 on Inertia should also include a paragraph discussing the inertia in the infrastructure of energy systems, and how this can impact upon emissions reductions. (Government of Australia)	REJ – already included.;
1-109	A	7	26	0	0	delete "changes"1 (Grassl Hartmut, Max Planck Institute for Meteorology)	REJ – the system responses to forcing changes
1-33	B	7	26	7	33	This series of sentences relates to topics which are within the scope and mandate of WGI. WGIII should state the key relevant findings of WGI needed to develop the WGIII storyline on mitigation. It is not appropriate for WGIII seemingly to extend the findings of WGI by selective addition of references pertaining to WGI topics. (Government of Australia)	ACC
1-110	A	7	43	7	43	socioeconomic SYSTEMS, BENEFITS… (Joe Asamoah, International Energy Foundation)	ACC
1-111	A	7	44	7	44	ULTIMATELY, MITIGATION (Joe Asamoah, International Energy Foundation)	ACC
1-112	A	7	46	7	46	The sentence defining "inertia" should come at the beginning of the Section 1.2.3.3. (Government of Pakistan)	REJ – we are not defining inertia here and we don't have the space to do sol
1-34	B	7	46	7	46	Reference here to 'the system' is unclear. Line 43 begins this para by reference to 'climate and socio-economic systems'. (Government of Australia)	ACC
1-35	B	7	46	7	48	Modify the sentence starting with "Inertia" as follows: "ON ONE HAND, inertia in the system SUGGESTS that mitigation actions SHOULD start in the short term in order to have longer term benefits and to avoid lock in of carbon intensive technologies (Unruh and Carrillo-Hermosilla, 2006; Chapter 11.6.2). ON THE OTHER HAND, SOME ANALYSIS BASED ON GLOBAL CLIMATE IMPACT ASSESSMENTS INDICATE THAT FOR THE NEXT SEVERAL DECADES, DAMAGES FROM CLIMATE-SENSITIVE PROBLEMS (WHICH WOULD	REJ – This changes the balance and is not clearly true.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						INCLUDE PROBLEMS CAUSED BY CURRENT CLIMATE AND CLIMATE VARIABILITY AND, THEREFORE, NECESSARILY EXCEED PROBLEMS CAUSED BY CLIMATE CHANGE ALONE) WOULD BE REDUCED MUCH MORE COST-EFFECTIVELY THROUGH EFFORTS TO REDUCE VULNERABILITIES TO THESE PROBLEMS THAN THROUGH DIFFERENT STABILIZATION SCHEMES. THIS SUGGESTS THAT THERE IS A WINDOW OF OPPORTUNITY OF AT LEAST THREE DECADES OR SO TO RESEARCH AND DEVELOP TECHNOLOGIES THAT WOULD MITIGATE EMISSIONS MUCH MORE COST-EFFECTIVELY THAN IS FEASIBLE TODAY (GOKLANY 2005a). THIS SUGGESTION IS REINFORCED BY OTHER ANALYSIS, BASED ON OTHER GLOBAL CLIMATE IMPACTS ANALYES USING SRES SCENARIOS, WHICH INDICATES THAT WELL-BEING IS NOT NECESSARILY LOWER UNDER THE WARMER SCENARIOS COMPARED TO THE COOLER SCENARIOS (GOKLANY 2005c)." [Note: Inserts are shown in UPPER CASE; deletions are not shown.] Reference: (1) Goklany, I.M. 2005a. A Climate Policy for the Short and Medium Term: Stabilization or Adaptation? Energy & Environment 16: 667-680. (2) Goklany, IM. 2005c. Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds? 25th Annual North American Conference of the US Association for Energy Economics/International Association of Energy Economics, September 21-23, 2005. U.S. Government (Government of U.S. Department of State)	
1-113	A	7	48	0	0	Add "While this is most evident in relation to precautionary action against the threat of abrupt climate change, it is fortunate that such action, involving increased use of biomass raw material as a substitute for fossil fuels - 'defossilizing' rather than 'decarbonising' - involves relative minor adaptation of existing infrastructure." (Peter Read, Massey University)	REJ – covered later in the chapter
1-114	A	7	48	7	48	Add "While this is most evident in relation to precautionary action against the threat of abrupt climate change, it is fortunate that such action, involving increased use of biomass raw material as a substitute for fossil fuels - 'defossilizing' rather than 'decarbonising' - involves relative minor adaptation of existing infrastructure." (Peter Read, Massey University)	REJ – covered later in the chapter
1-36	B	8	5	8	5	Insert "some" before "damages are likely to be irreversible". (Government of Australia)	TIA – will use many
1-37	B	8	5	0	0	Insert "some" before "damages" on line 5. U.S. Government (Government of U.S. Department of State)	TIA – will use many

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-115	A	8	8	0	0	correct "decisions": "decision" (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC
1-38	B	8	13	8	24	Section 1.2.3.5 should do more than merely list possible abrupt climate changes but should discuss how the risk of such change can be incorporated into policy responses to Article 2. (Government of Australia)	REJ – already there
1-39	B	8	14	8	24	This paragraph on abrupt/catastrophic changes is another example of WGIII duplicating assessment activity that is properly the mandate of WGII. The para should be rewritten to identify the relevant findings of WGII. (Government of Australia)	TIA – checking with WAG2 and remove references.
1-40	B	8	14	0	0	Replace “or” with “of.” U.S. Government (Government of U.S. Department of State)	ACC
1-116	A	8	16	0	0	"increases in extreme events" content? (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC – add to glossary.
1-117	A	8	21	0	0	change “of” to “that” (Danny Harvey, University of Toronto)	ACC
1-118	A	8	24	0	0	Add "Until the last few years, the threat of abrupt climate change has not been distinguished from the general issue of mitigation greenhouse levels. However it has recently been addressed in a two stage strategy that involves low cost precautionary measures that enable subsequent implementation of a high cost rapid response in the event that abrupt climate change is shown to be imminent (Read and Lermit, 2005)" (Peter Read, Massey University)	REJ – space limitation
1-119	A	8	24	2	24	Add "Until the last few years, the threat of abrupt climate change has not been distinguished from the general issue of mitigation greenhouse levels. However it has recently been addressed in a two stage strategy that involves low cost precautionary measures that enable subsequent implementation of a high cost rapid response in the event that abrupt climate change is shown to be imminent (Read and Lermit, 2005)" (Peter Read, Massey University)	REJ – space limitation
1-41	B	8	24	8	24	The statement that a catalogue of abrupt/catastrophic risks 'would add to the mitigation required' is loose. A scientific viewpoint around this point would best be developed in the AR4 Synthesis Report. The core thrust of the WGIII Chapters is upon the mitigation task needed to achieve indicative atmospheric concentration levels. In deciding upon what constitutes a 'safe' concentration level, Governments would presumably take into account levels that would lead to abrupt/catastrophic	TIA – checking with chapters 2 ande 3.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						risks - so in that sense there is no 'additional' mitigation task in reaching the selected concentration level. (Government of Australia)	
1-120	A	8	26	8	38	This section should be entirely deleted, or else it needs to be entirely rewritten. The first paragraph, with a lot of words, adds nothing of value except to state the obvious that, if we reduce emissions, there will be less climatic change! The second paragraph tries to justify the use of CBA in a precautionary, risk-averse framework. In reality, uncertainty and risk are already well incorporated in the pdfs for climate sensitivity and for the threshold in the change in global mean temperature deemed to cause impacts that are unacceptable, and in the maximum allowable probability for incurring impacts that had previously been deemed to be unacceptable (see comment to page 5, lines 12-15). That is, uncertainty is well represented in the framework set up by Harvey (2006a) and explained in my comments to page 4, lines 46-48. Article 2 is a fiduciary trust framework (certain assets are to be preserved for future generations, not based on supposed monetary costs or values, but because of their inherent value), not a CBA framework, so the reference to CBA analysis is without justification (Brown (1992) distinguishes these two frameworks). Also, what does CBA – the supposed economic valuation of species and ecosystems lost due to climatic change – have to do directly with uncertainty? If you want to say something about risk management, you should at least reference Harvey (1996a,b), who casts both the potential costs of both action and of non-action in terms of risk. REFERENCES: Brown, P.G. 1992. Climate change and the planetary trust. Energy Policy 20, 208-222. Harvey, L.D.D. 1996a. Development of a risk-hedging CO2 emission policy: Part I: Risks of unrestrained emissions, Climatic Change 34, 1-40. Harvey, L.D.D. 1996b. Development of a risk-hedging CO2 emission policy: Part II: Risks associated with measures to limit emissions, synthesis, and conclusions", Climatic Change 34, 41-71. (Danny Harvey, University of Toronto)	TIA will be rewritten
1-121	A	8	26	8	38	Discussion on uncertainty is patheticly short here. Basing on the costs and benefits a precautionary approach seems an oxymoron: a precautionary approach is warranted as costs and benefits are not known with certainty, thus a full-fledged cost benefit analysis is not achievable. Of course, however, costs incurred must be	TIA – will be more uncertain.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						proportionate to the risks incurred - that's slightly different. This discussion must be expanded by mentioning that an array of new literature has considered with policy instruments could better cope with the many uncertainties surrounding the climate change conversation. (chapter 13) (Cédric PHILIBERT, International Energy Agency)	
1-122	A	8	28	0	0	delete comma at the end of the line (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC
1-123	A	8	36	0	0	"incorporate" instead of "incorporates" (Government of Pakistan)	ACC
1-124	A	8	38	0	0	Suggest add to the end of this paragraph: "The combination of uncertainty, large-magnitude consequences and likely irreversibility argues for a particularly cautious approach." (Ralph Chapman, Victoria University of Wellington)	We are uncertain about this claim and to ACC would be irreversible at this point so we take precautionary approach and REJ – not always true
1-125	A	8	40	9	11	What is described in this paragraph is correct. However, the global public good nature of the climate system also implies that especially industrialized countries are using the intrinsic capacity of the earth to absorbe CO2, and are not paying for it. This is also free riding and can not be separated from the (absence of) willingness of (developing) countries to contribute to mitigation. This should also be acknowledged in this paragraph. (Gert de Gans, Kerkinactie / ICCO)	REJ – too much detail
1-126	A	8	42	9	12	Public Good At any case climate is a “impure public good” due to co- benefits. I remember only one literature reference on Public Goods Theory in CH 1 when earlier comments. If authors insist on PGT, also in Ch 1, then I suggest to look at a sound theoretical perspective, compare: 3) Dubin J.A., Navarro P. (1988) . How Markets for Impure Public Goods Organize. Journal of Law, Economics and Organization, 4, 217- 242. 4) Kotchen Mathew J. (2005). Impure Publics Goods and the Comparative Statics of Environmental Friendly Comsumption. Journal of Environmental economics and Management, 49, 281-300. (Juan F Llanes-Regueiro, Havana University)	Will check.
1-127	A	8	44	0	0	after "problems" insert " - e.g. treating CO2 as a flow pollution problem rather than as an excess stock of a natural non-noxious component of the atmosphere - " (Peter Read, Massey University)	REJ – not true.
1-128	A	8	44	8	44	after "problems" insert " - e.g. treating CO2 as a flow pollution problem rather than as an excess stock of a natural non-noxious component of the atmosphere - " (Peter Read, Massey University)	REJ – not true

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-129	A	8	47	0	0	"Climate is overused.." This sentence doesn't make sense - substitute "atmosphere" for "climate" (David Jackson, McMaster University)	TIA – use the expression climate system
1-42	B	8	47	8	47	The authors need to rephrase the phrase "Climate tends to be overused", as it makes little sense. (Government of Australia)	TIA – use the expression climate system
1-43	B	8	47	0	0	This sentence is incorrect and does not make sense. The problem is not that the climate is "overused" – there are many uses of the climate that will not have a detrimental impact – but that the implications of changing the chemistry of the atmosphere and oceans through emissions of CO2 and other GHGs are insufficiently accounted for in economic behavior. Unlike say an open-access fishery, which is non-excludible but which can be depleted and therefore entails a measure of rivalry, the climate is a full public good – both non-excludible and non-rival. The economic problem represented by climate change stems from the nature of GHG emissions as an externality in economic transactions; this should not be confused with the "tragedy of the commons" problem associated with open-access resources the use of which degrades the value of the resource. U.S. Government (Government of U.S. Department of State)	TIA – use the expression climate system
1-44	B	8	49	8	49	Meaning of 'underprovided' is unclear. (Government of Australia)	ACC - rewrite. To protection is under provided
1-45	B	8	49	9	5	The sentence "starting with "The benefits of avoided climate change" is overly simplistic and misleading. Because climate change is heterogeneous from location to location, the benefits of reducing it will vary from place to place. It will also, for any location, vary over time. In fact, unless climate change is excessive, there some will be winners while others will be losers. (See Goklany 2006a). In fact, according to the TAR, at low-to-moderate levels of climate change, global GDP may be boosted. This sentence needs to be substantially modified to address these issues. Reference: Goklany, IM. 2006a. Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development. Mitigation and Adaptation Response Strategies for Global Change, forthcoming. U.S. Government (Government of U.S. Department of State)	TIA – add expression "In general…;"
1-141	A	9	0	9	0	In the NOTE 1 in the end of the page to include: ¨.....insufficient incentives to cooperate or egoist national interests¨. (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	REJ – no added value and not IPCC language
1-46	B	9	1	0	0	Rewrite to include a few words: "irrespective OF whether one is contributing TO".	ACC

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						U.S. Government (Government of U.S. Department of State)	
1-47	B	9	3	9	3	Is the statement 'one is unable to enhance' too categorical? It will depend presumably on the nature of and what is meant by 'binding agreements'. It also assumes that enforcement is an 'all' or 'non' situation. (Government of Australia)	ACC to rewrite "therefore it is difficult to enforce binding commitments…" nOn line 5 add "others may succeed…"
1-48	B	9	7	9	8	It's not clear what point the first sentence is trying to make. U.S. Government (Government of U.S. Department of State)	TIA – will be clarified by Philippe
1-49	B	9	10	0	0	Rephrase, using the sentence on Chapter 1, p.7, line 6 in place. U.S. Government (Government of U.S. Department of State)	REJ – unable to find
1-130	A	9	15	9	24	The impact of climate change for some regions/nations may be a net improved climate. Therefore, in regions with cold climates global warming may be viewed by some sectors as a positive development. This perceived inequity in impacts may also effect the degree of urgency ascribed to mitigation measures. (David Jackson, McMaster University)	NOTED
1-131	A	9	15	9	28	The equity principle does not only apply to costs resulting from climate change. It should also be expressed in terms of using the intrinsic capacity of the earth to absorbe CO2, and sharing this volume among all world inhabitants on a per capita basis. (Gert de Gans, Kerkinactie / ICCO)	TIA – not enough space to cover all perspectives on equity.
1-50	B	9	15	9	15	The authors should explain upon what basis "equity is an important principle for the implementation of Article 2". (Government of Australia)	Bill will investigate and share the sentence.
1-1	C	9	15	9	28	Though this refers forward to Chapters 2 and 13, it should nevertheless here clarify the distinction between consequentialist, procedural, and rights-based ethical framings. It could usefully note that economic analysis pertains mainly to the first. (Government of UK)	Rejected – Reference is madxe to Chapter 2 & spacew considerations
1-51	B	9	16	9	16	Is 'demands' too strong a term when discussing factors around the concept of 'equity'? (Government of Australia)	REJ – ethical principles are strong statements.
1-52	B	9	19	9	20	In line 20, after "depend" add the following: "among numerous other things". The net costs also depend on the rate of technological change and the discount rate employed. These may be more important than the timing of "current mitigation efforts". U.S. Government (Government of U.S. Department of State)	TIA – will rewrite to accommodate the point although in better English

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-53	B	9	21	9	21	Should be a new sentence. (Government of Australia)	ACC
1-132	A	9	29	0	0	maintaining that every molecule of greenhouse gases emitted in any time or geographical space is equal. The causal relationship and its accumulation in the atmosphere continues regardless the strict adherence of the principles set forth in article 3 of the Convention (UN 1992). (Valentin Bartra, Instituto Andino y Amazónico de Derecho Ambiental)	REJ – cannot find
1-133	A	9	29	9	29	maintaining that every molecule of greenhouse gases emitted in any time or geographical space is equal. The causal relationship and its accumulation in the atmosphere continues regardless the strict adherence of the principles set forth in article 3 of the Convention (UN 1992). (Valentin Bartra, Instituto Andino y Amazónico de Derecho Ambiental)	REJ – cannot find
1-134	A	9	32	9	32	Energy Emissions and R&D trends. Before reviewing the last three decades I recommend a small paragraph on was happened before, specially after SWW. (Juan F Llanes-Regueiro, Havana University)	REJ – space constraint
1-135	A	9	33	9	33	Please replace the title of 1.3.1 section with "Last Three Decades Review" (Government of China Meteorological Administration)	ACC
1-54	B	9	35	9	39	The paragraph overly simplifies. CH4 and N2O are not primarily due to combustion of fossil fuels, and CH4 concentration is not increasing at the present time. It should be noted that the rate of increase in CH4 concentrations has apparently slowed substantially in recent decades. U.S. Government (Government of U.S. Department of State)	Check with WG 1 (Bill)
1-136	A	9	38	0	0	The increases in CO2 and CH4 are in fact unprecedented in at least the last 650,000 years, this being the age at the bottom of the latest ice core from Antarctica. A reference should be provided to Fig 6.3, Chapter 6, WG1, AR4. (Danny Harvey, University of Toronto)	Check sources (Bill)
1-137	A	9	38	9	38	I suggest to add: ¨.....sources of these gases are mainly from the combustion.....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	REJ – We have made this point already. See next sentence.
1-138	A	9	43	0	0	add: ".. global greenhouse gas emissions .." (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	ACC
1-139	A	9	44	0	0	correct to: "et al." (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC
1-140	A	9	44	0	0	delete "and methane" (Marland only reports CO2 emissions)	ACC

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	
1-142	A	10	1	10	1	Please check the figure of 87% with the data from IEA. according to the IEA data, the growth rate of CO2 emissions was about 77% from 1971-2003. (Government of China Meteorological Administration)	Rick will check.
1-143	A	10	4	0	0	Replace 84% by 85% (to avoid a suggestion that the data is very precise). (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	ACC
1-144	A	10	10	10	19	This is confusingly written and the values used seem strange. These are addressed specifically below: (Archie McCulloch, Marbury Technical Consulting)	Accepted. All fluorinated gases include HFCs and the Montreal Protocol gases as well as PFCs and SF6, as in the figure 1-1. The Special Report does not consider PFCs and SF6 which are no replacements and this will be made clear when values are referenced. . **(Lambert to provide alternative text)**
1-145	A	10	12	10	12	The value of "about 1.2%" is spuriously accurate and should be quoted as "about 1%". (Archie McCulloch, Marbury Technical Consulting)	Accepted - Delete “about” and give a reference. **(Lambert to provide reference)**
1-146	A	10	13	10	0	Estimated annual emissions of all fluorinated gases (0.68GtCeq) and that of HFCs (0.11GtCeq) seem to be too small, compared to the figures in IPCC/TEAP Special Report on "Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons", where the annual emissions of CFCs, HCFCs, HFCs and PFCs in 2002 are estimated to be about 2.5GtCeq per year, and the annual emission of HFCs in 2002 are estimated to be about 0.4GtCeq per year. The figures should be further addressed. (Government of Japan)	Rejected There is no mistake made here. The commenter is confused by the use of GtCeq, whereas the Special Report consistently used GtCO2eq. It is proposed to convert the GtCeq back to GtCO2eq (with a reference to Special Report) and it is also proposed to put in the Figure 1-1 GtCO2eq rather than Pg CO2eq, because this is not used in the text.
1-147	A	10	14	10	15	The word Banks must be substituted for the word Stocks. These have specific meanings and the value quoted represents the bank in use. Furthermore, if it is to be quoted at all, the bank should be the 1.1 Gt CO2 eq of HFCs currently in systems. The materials last mentioned in the preceding sentence are HFCs and it is not clear that the current text refers to all fluorocarbons, not just HFCs. (Archie McCulloch, Marbury Technical Consulting)	Partially Accepted - Banks will be used, because the word stock has another meaning; The sentence should read “Banks of all fluorinated gases considered in the Special Report are much larger ….21.2 GtCO2eq, with HFCs at 1.1 Gt CO2eq.
1-148	A	10	14	10	14	The SROC reports current emissions of CFCs, HCFCs, HFCs and PFCs as 2.53 Gt CO2 eq and, while this equates roughly to the 0.68 Gt Ceq quoted here (actually 0.69), there is no reason to change the units - these should be Gt CO2 eq throughout (see the y-axis scale on Figure 1.1). In addition, the switch from discussing HFCs in	Accepted: as mentioned above, rewrite necessary as suggested above. **(Lambert)**

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						the first part of this paragraph, to discussing all fluorinated gases, needs either to be made much clearer or not discussed at all, particularly since Figure 1.1 does not include CFCs and HCFCs. (Archie McCulloch, Marbury Technical Consulting)	
1-149	A	10	14	10	0	Estimated stocks (5.7GtCeq) seem to be too small, compared to the figures in IPCC/TEAP Special Report on "Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons", where the banks of CFCs, HCFCs, HFCs and PFCs in 2002 are estimated to be about 21GtCeq per year. The figures should be further addressed. (Government of Japan)	Rejected - There is no mistake made here. The commenter is confused by the use of GtCeq, whereas the Special Report consistently used GtCO2eq. It is proposed to convert the GtCeq back to GtCO2eq (with a reference to Special Report) and it is also proposed to put in the Figure 1-1 GtCO2eq rather than Pg CO2eq, because this is not used in the text. (Lambert)
1-150	A	10	15	10	19	These sentences are prolix and unclear. What seems to be intended is: In some applications, the use of fluorinated gases increases energy efficiency, thereby reducing CO2 emissions. Provided that they confer comparable energy efficiency, non fluorocarbon replacements, which often have negligible GWPs, may have a lower climate impact. (Archie McCulloch, Marbury Technical Consulting)	Accepted It should at least be mentioned "Ïn some cases , the use of HFCs (replacing ODS) increases…….. Use of other replacement gases –with often……..
1-151	A	10	19	10	0	In terms of the overall trend of global greenhouse gas emissions, greenhouse gases which are not covered by the Kyoto Protocol, including CFCs, HCFCs and halons which are covered by the Montreal Protocol and have considerable contribution to global emissions should be addressed and added to Figure 1.1. This would aid in understanding the objective trend. (Government of Japan)	Partially Accepted – This can be resolved by either removing the last part (HFCs etc. from the graph) or by making it more clear in the text. The suggestion by the commenter is difficult to realise because there is no good reference for the emissions data 1970-2004 .(check for consistency with response in SPM)
1-152	A	10	20	10	24	To place more clear as a Note, indicating that belong to Figure 1.1 in small letther that text (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted
1-153	A	10	20	10	24	Notes appearing with Figure 1.1 should be in the same format as with other Figures appearing in the text. (Government of Pakistan)	Accepted
1-154	A	10	21	10	22	The definitions of 2) and 3) should be interchanged (Government of France)	ACC

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-155	A	10	27	0	0	The information contained in Figure 1.1 may be supplemented with a table showing the yearly values for all the emissions. (Government of Pakistan)	REJ – space constraint
1-156	A	10	29	10	30	Households emissions are not stable; see what is said in chapter 6; take care not sending a missleading message to policy makers. (Jacques Rilling, CSTB Building Research Center)	Partially accepted – sentence noting annual variability
1-55	B	10	30	10	30	It would be useful to make clear here that emissions from industry, households and services relates to direct emissions. A different picture emerges if analysed in terms of indirect emissions accounting for consumption of electricity by those sectors. (Government of Australia)	ACC will be accommodated with a sentence
1-157	A	11	0	11	0	Figure 1.2 - To place in the point 1), 2), a title as NOTES (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	\REJ – these help explain the graph
1-158	A	11	2	0	0	line 2 has to be placed above the inserted figure (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC
1-159	A	11	4	11	4	The caption of Figure 1.2 should appear before the part of the text in line above it. (Government of Pakistan)	ACC
1-160	A	11	6	11	11	We know from the Special Report on Aviation and the Global Atmosphere that contrails have a higher warming effect (in the RFI metrics) than the CO2 from aircraft. Therefore the contrails should be mentioned in a subchapter that reports on the greenhouse gas emissions although we have methodological problems to 'translate' the contrail effect to the GWP metric. Suggestion: insert in line 7: " ... 14% from transport (but without including the warming effects of contrails and cirrus clouds from aviation), and 12% ..." (Manfred Treber, Germanwatch)	Partially ACC – will add \sentence about indirect gases not covered (Bill)
1-161	A	11	6	11	9	Needs be more explicit on "energy supply": energy-related emissions account for 85 of CO2 emissions and probably more than 60% of overall emissions of GHG. What's meant here is probably the energy sector that includes heat and power and refineries. Please follwo figure 1.2 more closely in this text. (Cédric PHILIBERT, International Energy Agency)	TIA – drafting will be more careful.
1-162	A	11	6	11	8	The rationale for adding energy supply and energy demand as a basis for percentages estimates is unclear. Explicit the content of the energy supply sector, transport, buildings,... (Government of France)	Replace energy supply with energy industry
1-56	B	11	6	11	11	The authors should include the error ranges for the sectoral breakdown of GHG	REJ – Not available.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						emissions in 2004, as the presentation implies a certainty about emission sources that does not currently exist. (Government of Australia)	
1-163	A	11	8	0	0	it is said that 12% of the emissions come from buildings, when it is said in chapter 6 and others that bldgs emissions account for 33%; we need to make this self consistent. (Jacques Rilling, CSTB Building Research Center)	REJ – we are covering direct emissions.
1-164	A	11	13	11	13	Since 1970, EMISSIONS (Joe Asamoah, International Energy Foundation)	ACC
1-165	A	12	1	0	0	Fig. 1.3 same remark as for page 11, line 6-11: Please add to footnote 2) "Including international transport (bunkers), excluding fisheries, but neglecting the warming effects of aviation contrails and cirrus clouds" (Manfred Treber, Germanwatch)	REJ – not including indirect effects, but will clarify this in text or caption.
1-166	A	12	1	0	0	Fig 1.3.: I have the impression that the more common and popular unit for emissions from energy use is CO2 (and not C). Is it possible to choose 'Pg CO2 eq' as the unit of the y axis and multiply the numbers by 44/12? (Manfred Treber, Germanwatch)	ACC
1-167	A	12	1	12	12	This figure needs to be modified to include F-gas emissions from the transport and building sectors. Chapter 5, Pg. 11, lines 4-6, indicates that F-gases account for between 1.4 and 8.9% of total GHG emission from the transport sector. Chapter 6, Pg. 4, lines 8-9, indicates that halocarbons emissions from the building sector are estimated at 1.5 GtCO2-eq. These are non-trivial amounts. Also, since Figure 1.2 is given in Pg CO2-eq, it would help comparison to convert this figure to the same basis. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Needs to be checked
1-168	A	12	1	12	10	It is repeated in relation with Notes that are written in black letters after the Figure (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted -Done
1-169	A	12	1	12	12	Note text appears twice, within and bellow the figure (Government of Spain)	Accepted - Done
1-170	A	12	1	0	0	The information contained in Fig 1.3 may be supported with table. (Government of Pakistan)	Rejected – Space limitation
1-171	A	12	3	0	0	delete "N2O" double (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-172	A	12	3	12	3	To change the word graphics by figures, because figure is only one Figure 1.3	

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						(CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted - Done
1-173	A	12	4	0	0	"agriculture" and "forestry" not with capital letters (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-174	A	12	4	0	0	"about 100%" ? (Grassl Hartmut, Max Planck Institute for Meteorology)	To be checked
1-175	A	12	5	12	9	The Notes provided below in lines 5-9 are repetition of notes appearing earlier under the figure. (Government of Pakistan)	Accepted - Done
1-176	A	12	7	12	7	Figure 1.3 {same as Figure TS.2} The bars in this figure should be consistent with the sectoral chapters 4-10 and contain numbers consistent with the sectoral chapters. For example, waste is entirely missing from this figure (except as added to Note 3.) Also, Note 3 is shown with bar for "buildings" but pertains to agriculture and forestry...Misplaced?/Needs clarification. (Jean Bogner, Landfills +, Inc)	Consistent with Chapters 4-10 except for waste & landfill. Will be checked if further split is possible Strange allocation of emissions from fuel combustion in agriculture & forestry NEEDS TO BE CHECKED
1-177	A	12	12	0	0	Fig 1.3 Emissions of Fgases from buildings are not mentioned…while they are said being 60% of total in TS page 53.Needs to be modified. (Jacques Rilling, CSTB Building Research Center)	See 1-167 Needs to be checked
1-178	A	12	14	0	0	Pls. explain what group "Annex I parties" comprises. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	ACC put in glossary
1-179	A	12	14	0	0	Also more stringent energy standards for buldings and appliances may be required to guarantee that energy efficiency in this sector will be implemented instead of being more or less ignored by builders and users. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Noted (could not find where this comments relates to on line 14) Belongs in buildings chapter
1-180	A	12	15	12	17	I would add a remark that an importance difference between Annex I emissions and other regions is that not only CO2 from deforestation is more important, but also that CH4 and N2O are relatively more important than in Annex I. The EDGAR 3.2 FT2000 data provides the support for this statement. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	**ACC –delete Table 1.1 and associated text**
1-57	B	12	16	12	16	Phrase 'the UNFCCC system' is loose. Table 1.1 only describes Annex 1 countries emissions pattern. (Government of Australia)	See 1-180
1-181	A	13	0	13	0	Please check the source under the table1.1. (Government of China Meteorological Administration)	See 1-180
1-58	B	13	0	0	0	Table 1.1 only presents a limited picture of emissions sources as it is based only on	See 1-180

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						Annex 1 averages. The authors should also pair this Table with a similar table on global average sectoral emissions. (Government of Australia)	
1-182	A	13	1	13	0	Table 1.1. a) Confusing to have catagory for "fossil fuel combustion" since this would also be the major emissions source in the underlying "transport" and "buildings" catagories. Need to be specific about what is included in this category. b) How were the years "averaged" for this table? Please explain briefly or add notes to table... (,)	See 1-180
1-183	A	13	5	0	0	Table: pls. be more specific: is "fossil fuel combustion" only stationary? does "transport"include international transport? why are not the same categories used as in fig. 1.3? (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	See 1-180
1-184	A	13	11	0	0	Footnote: the authors' names are written "Liechtenstein" and "Luxemburg" (Grassl Hartmut, Max Planck Institute for Meteorology)	See 1-180
1-203	A	14	0	14	0	Fig 1.4 - to change ¨Distribution of regional per capita CO2 emissions....¨by ¨Distribution of regional GHG emissions, tCO2eq. per capita over different....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – For consistency – Units are not in caption text
1-185	A	14	1	14	7	It might be useful to add information how the share between Annex I and non-Annex I countries has changed between 1973 and 2005, especially since this whole section focuses on trend information. A static snapshot about the present is much less informative. The information could be readily derived from the underlying data sources. (Andy Reisinger, TSU IPCC Synthesis Report)	Will consider if space considers. (Holger)
1-186	A	14	1	14	1	It's difficult to understand that Middle East and not Europe or some other region have driven the rise in emissions since 1972. Would you please explain or provide some data? (Juan F Llanes-Regueiro, Havana University)	To be checked Rejected – space limitation
1-59	B	14	1	14	10	The discussion of regional per capita CO2 emissions needs to include a discussion on the importance of national circumstances on per capita emission rates. (Government of Australia)	Rejected – space limitations
1-60	B	14	1	14	7	There are some inconsistencies in dates and time periods in the SOD. Recommend focusing on 1970 as a baseline year as much as possible to ensure comparability. IPCC should provide a justification (such as availability of data) for using other baseline years (1972, 1973,…). This comment applies to SPM, TS, Chapter 1, and	Accepted – Justification: Data availability, decadal presentation determined by latest available data, etc. Will do our best to make

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						Chapter 7. U.S. Government (Government of U.S. Department of State)	base years consistent
1-187	A	14	2	14	4	Why referring to 1972m not to 1970 as is done in previous sections. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Accepted – let's try to use 1970
1-188	A	14	5	14	5	why "but". (Juan F Llanes-Regueiro, Havana University)	20% of population are responsible for 46% of emissions, small pop but large emissions
1-189	A	14	5	14	6	I suggest to change.....the 80% of people living...¨ for ¨..... the 80% of World population living.....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted - Done
1-61	B	14	7	14	8	Figure 1.4: the country groupings used in this figure should be explained (for example why were Australia and New Zealand paired with Japan). In addition a list of the countries included in each group (such as "Centrally Planned Asia") should be included. (Government of Australia)	Accepted See SPM
1-190	A	14	8	0	0	Figure 1.4. The meaning of "JANZ" and "IT Annex" is not clear in this figure. The acronyms are not reader-friendly and there are no references to this terminology elsewhere in the SPM. Additionally, the difference between "Centrally Planned Asia" and "Other Asia" is not explained. Including separate designations for major emissions emitting countries, particularly for Japan, is suggested. (Government of Japan)	Se 1-61
1-62	B	14	8	14	9	P14, lines 1 - 6 appropriately discuss aggregate regional emissions patterns but no explanation is provided as to why Fig 1.4 is inserted utilising a regional per capita emissions metric. And if it is relevant, why are not other regional metrics discussed, for example an economic intensity indicator (eg emissions/unit GDP), or emissions by land area (emissions/Mha)? (Government of Australia)	ACC – other metrics will be added to chapter
1-191	A	14	9	0	0	Pls. replace by:".. EDGAR 3.2 database" (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Accepted - Done
1-192	A	14	12	0	0	"which" should be "that" (Danny Harvey, University of Toronto)	Accepted - Done
1-193	A	14	12	14	13	Please replace "GHG" with "carbon dixide". (Government of China Meteorological Administration)	Rejected – text is correct
1-63	B	14	15	14	25	It is probably too simplistic to categorically and singularly use these developing	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						country initiatives as GHG mitigation activities: the reasons for a country taking any one of these measures are severalfold (and possibly not with an original, primary intention of climate change benefit). The paragraph would be more accurate if it made this point in the context of how economic and sustainability measures can combine and deliver a climate benefit. As an example box 12.1 (chapter 12, pages 13 and 14) makes the point that the policy of promoting fuel efficiency in the case of Brazil was not motivated by a desire to curb climate change, while Chapter 13 (page 5 lines 38-42) notes that most significant emissions reductions in both developed and developing countries occurs not because of climate drivers but because of actions to address energy security and other needs. The authors need to ensure that this is reflected in this discussion. (Government of Australia)	Accepted - to be redrafted to note that: • Both developing and developed countries have taken actions that reduce emissions although the motivation was not only climate • This can be significant even though not taken as part of a binding commitment • But, this will not be enough to stabilize the GHGs.
1-194	A	14	16	14	30	Please exchange the paragraph from line 16 to 25 with the paragraph form line 27 to 30 (Government of China Meteorological Administration)	ACC
1-195	A	14	16	14	16	Chandler et al is missing in reference list (Government of Finland)	Accepted – Done
1-196	A	14	17	0	0	correct to: "et al." (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-64	B	14	17	14	19	It would be helpful to make clear whether emissions saving quoted for Brazilian case study is based only on analysis of direct emissions (from cars and industry/electricity); or whether it encompasses the net atmospheric benefit from a life cycle perspective (eg emissions from production and use of fertiliser to grow sugar cane). (Government of Australia)	Needs checking with reference by our chair
1-197	A	14	26	0	0	Reference appears to be missing here. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	Rejected – Reference at the beginning of paragraph (Chandler at al., 2002)
1-65	B	14	26	14	26	The authors need to include a reference before "(2006)", for the sentence to make sense. (Government of Australia)	Accepted - Done
1-198	A	14	27	0	0	I do not understand the meaning of '... EU-25 countries, (2006) provides a rough estimate ...' (Manfred Treber, Germanwatch)	Accepted - Done
1-199	A	14	27	0	0	there seems to be a source citation missing before (2006)	Accepted - Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Grassl Hartmut, Max Planck Institute for Meteorology)	
1-200	A	14	27	0	0	Incomplete citation (Danny Harvey, University of Toronto)	Accepted - Done
1-201	A	14	27	14	27	Reference to (2006) should be clarified. (Government of Finland)	Accepted - Done
1-202	A	14	27	14	27	The reference is missing before "2006". (Government of Pakistan)	Accepted - Done
1-66	B	14	27	14	30	Although the qualifier 'rough estimate' is present, it is very doubtful that the EU example is illustrative of global possibilities due to climate change policies. The EU actions were not linked in 1990 to climate change policy, but were result of political/economic events of German reunification and UK switch to gas. Suggest deleting/reconstructing case example. (Government of Australia)	References for EU reductions will be supplied by Bill.
1-67	B	14	27	0	0	Not sure what is meant by (2006) in the following: "For the EU-25 countries, (2006) provides a rough estimate of . . . " Do they mean 2006 ghg emissions? U.S. Government (Government of U.S. Department of State)	Accepted – Done – reference EEA was missing
1-204	A	15	0	15	0	Figure 1.5 :The dashed blue coding is the same for two curves and does not allow to determine which is which. (Government of France)	Accepted – will be changed
1-205	A	15	2	15	2	Please integrate this section with the section 1.3.1.3. (Government of China Meteorological Administration)	Rejected - Will be rewritten accounting for the effects of high prices.
1-206	A	15	4	15	4	Please replace the "EJ" with "Mtoe". (Government of China Meteorological Administration)	**TSU to determine**
1-207	A	15	5	15	7	In this part, there is a description, " Fossil fuels accounted for 80%". However, how about other items ? It would be helpful to understand situation wholistically, if other items are inserted. i.e. (1) Nuclear energy, (2) Renewable Energy, a) Hydropower, b) Biomass, c) Window power, c) Soler power, e) Geothermal, f) Wave, g)Others such as fuel-battery. Ther is no obstacle to show these data in this paragraph. (Susumu Nakamaru, Sun Management Instutute)	Rejected – the main trends are only shown here for reasons of space limitations Fossil fuel use matters for climate change'; Details can be found in Chapter 4
1-208	A	15	5	15	5	Before "2.1%/yr" the word "annual" is already mentioned. Necessary correction may be made. (Government of Pakistan)	Accepted - Done
1-209	A	15	6	0	0	Fossil fuels now account for a higher % of total energy use than in 2000.	Rejected – data shown here are for 2003

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Michael Jefferson, World Renewable Energy Network & Congresses)	possibly updated to 2004 (Rick)
1-210	A	15	8	15	8	I suggest to add: ¨.....in the primary energy mix almost has not changed...¨ because had their changes. (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – shares of renewables have not changed (to be checked) (Rick)
1-211	A	15	11	15	11	Please change the title of the section 1.3.1.2 "Energy Intensities" with "Carbon Dixide Emission". (Government of China Meteorological Administration)	Partially accepted – Changed to just "Intensities"
1-212	A	15	13	15	16	The Kaya identity is simply the product of the four factors list here - why not just say that? (David Jackson, McMaster University)	TIA – Otmar will redraft
1-213	A	15	13	15	13	Focus only on technology. There are at least 4 other issues where research is needed: 1) ancillary and co benefits from mitigation, specially in developing countries, 2) an approach to understand and measures of sustainability, specially related to CC, 3) actual factors influencing population growth and transition and 4) the theory and practice of international agreements and cooperation. (Juan F Llanes-Regueiro, Havana University)	Rejected – this does not belong to the discussion of the Kaya identity
1-214	A	15	13	15	18	The Kaya-identity of four factors is one form of decomposition analysis. It would provide more information if the division into five factors were used: CO2/TPES, TPES/FEC, FEC/GDP, GDP/POP, POP (see Luukkanen, J., Vehmas, J., Kinnunen, V., Kuntsi-Reunanen, E. & Kaivo-oja, J. (2005) Converging CO2 Emission to Equal per Capita Levels. Mission Possible? FFRC-Publications 2/2005. Finland Futures Research Centre, Turku School of Economics and Business Administration. Turku. 139 p.) (Government of Finland)	**Reject – too complicated for climate people**
1-68	B	15	13	15	13	The authors should provide a description of why the Kaya identity is a useful tool in terms of energy intensities. (Government of Australia)	Rejected – text shows how various important intensities explain CO2 emissions
1-215	A	15	21	0	0	text of figure 1.5: in the beginning of the text has to be added "Relative change of Kaya factors since 1973:" (Grassl Hartmut, Max Planck Institute for Meteorology)	Rejected – GDP is not a Kaya factor
1-216	A	15	21	0	0	In Fig1.5, y-axis legend change "Index 1973 = 100" for "Index 1973 = 1.0" (Government of Spain)	Accepted – Will be changed
1-217	A	15	21	0	0	Figure 1.5. The graphic representation for Energy/GDP and GDP/POP are indistinguishable. The use of more distinctive colours is necessary for	Accepted – Will be changed

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						differentiation of data sets. (Government of Japan)	
1-218	A	15	25	0	0	correct to: "et al." in the last line of the text of figure 1.5 (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-219	A	16	4	0	0	This paragraph is confusing because the causes of changes in energy intensity and carbon intensity are not explained. The sentence that "The structural changes of the global energy system were mainly due to reduced energy intensity" is illogical. I think what is meant here is that reduced energy intensity was caused by structural changes to the global economy, including a shift towards lighter industry in many industrialized and some developing countries. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	Accepted - Done
1-220	A	16	4	0	0	Cause and effect have been reversed here. Also, it is structural changes in the world economy (not in the energy system) that have caused a decrease in energy intensity. (Danny Harvey, University of Toronto)	Accepted – Will be changed
1-221	A	16	5	0	0	It seems to me important to know how the carbon intensity reduced like this between 1973 and 1983. There must be data for this. The root of this should be reported in the text, so that lessons can be learned on how to repeat it. (Stanley Gordelier, Nuclear Energy Agency of the OECD)	Rejected – Space limitations and subject matter of Chapter 4
1-222	A	16	5	16	10	Figure 1.6 needs to be better explained in the text. Upon some study, it appears that the size of the block is the indicator of the relative weight of the influence of that indicator, but this should be explained in the text. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	Accepted – will be done (**Ottmar**) Text will be better explained but no change in the graph.
1-223	A	16	7	0	0	it should be "oil price shocks" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-224	A	16	7	0	0	Carbon intensity has been increasing since 2000 - so it approached zero between 1993 and 2000 only (not in the decade 1993-2003). (Michael Jefferson, World Renewable Energy Network & Congresses)	Noted / Rejected – Figure shown decades
1-225	A	16	8	0	0	Please make the same order of the main drivers corresponding to their importance as already written in lines 2 and 3: ' ... could not offset income effects and population growth, and ...' (Manfred Treber, Germanwatch)	Accepted - Done
1-226	A	16	9	16	0	Figure 1.6 (same as Figure TS.4). This figure requires further explanation or simplication or deletion. The y-axis label does not apply to all bars (e.g., population; ratios of indicators). Not clear what the "X" for change is referring to...	Accepted – will be explained (**Ottmar**) **See SPM for consistency.**

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(,)	
1-227	A	16	9	16	0	Figure 1.6: Is the unit of Y-axis correct? Should you change "GtCO2" to "% per year"? (also the same comment to Figure TS 4 and Figure 1.6) (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	ACC - Y-Axis is corrected labelled
1-228	A	16	11	0	0	year 2005 in text of figure 1.6 correct? (Grassl Hartmut, Max Planck Institute for Meteorology)	Yes – year related to the data source
1-229	A	16	11	0	0	text of figure 1.6: what with Poland, Czech Republic, Slovakia, Balkan countries? (Grassl Hartmut, Max Planck Institute for Meteorology)	Good question - **Ottmar**?
1-230	A	16	11	0	0	text of figure 1.6: add "Sub-Saharan", "Sub-Saharan Africa" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-231	A	16	11	0	0	text of figure 1.6: add ";net change" after "transition countries" (Grassl Hartmut, Max Planck Institute for Meteorology)	Reviewer means Fig 1.7 – **Ottm**ar is this correct?
1-232	A	16	13	16	0	Figure 1.7: The decompositon can be done only by growth rate, i.e. % per year. If the decomposition is shown by the absolute CO2 emissions, you must assume some conditions (e.g., the static CO2 emission per capita using the value in 1971 for the contribution by population growth). Depending on the assumptions, the contribution by each decomposed factor is different. You should describe the assumption briefly, or change the absorute emissions to the emission growth rate due to large differences of the contributions in the absorute emissions by the assumptions. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	**Ottmar – how should we respond**
1-233	A	17	1	17	3	It should be specified that you are talking about the period 1971-2001. However, I don't think that the failure to reduce emissions over this time period is relevant, as no-one was trying or was required to reduce emissions over this time period. What does matter is whether nations are on track to be successful in reducing emissions as required by the Kyoto Protocol. (Danny Harvey, University of Toronto)	Noted - Period is correct except where indicated – no blame of failure – just a statement of facts On track is dealt with elsewhere in the Chapter
1-69	B	17	1	17	3	Drafting in this para (eg 'the club') is not appropriate to an IPCC report. Suggest redrafting along lines: "the main emitting countries…have experienced growth in emissions over the past 30 years". (Government of Australia)	Accepted - Done
1-234	A	17	2	0	0	"club of the main emitters" should be just "main emitters" There is no "club" (David Jackson, McMaster University)	Accepted - Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-235	A	17	2	17	2	I suggest to add: India after China, and place Japan before Brazil. (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted - Done
1-70	B	17	2	17	2	Authors need to explain what they mean by "at a regional scale" as they then go on to list regions (North America and Western Europe) and countries (China, Brazil and Japan). (Government of Australia)	Accepted – Test changed (DONE)
1-236	A	17	3	17	3	Please add "carbon dioxide" before "emission". (Government of China Meteorological Administration)	Accepted - Done
1-237	A	17	5	17	10	No references are provided here for the assertions about the causes of the declines in energy and/or carbon intensity. The sentence that "together with Western Europe, US/Canada and Japan were the only countries that reduced carbon intensity substantially" needs to be clarified. The meaning here is that all of these industrialized countries reduced carbon intensity, but that is not a clear distinction. If these are the "only" economies, which ones are being left out? (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	**Ottmar** – how best do we respond. Refernece may be too narrow. Seems to apply to China as well and maybe others. FIX IT! Probably this applies to AI countries.
1-238	A	17	5	0	0	add "strong", "strong reduction" (Grassl Hartmut, Max Planck Institute for Meteorology)	**Ottmar** – can we say “strong”
1-239	A	17	5	0	0	Given the wide disparity in Western Europe between countries, what value is there in lumping them together (eg Spain +67% CO2 since 1990; Germany -15%)? (Michael Jefferson, World Renewable Energy Network & Congresses)	Noted – space limitations demand that we restrict the discussion to major emitting countries or regions
1-71	B	17	5	17	14	This paragraph uses terms that are not defined either in the chapter of the glossary ('decarbonisation'; 'carbon intensity'). Nor is there any table/figure/references to support various findings referring to top ratings of Western Europe, US/Canada, Japan. In line 11, the phrase 'only economies' suggests finding is based upon an analysis of every country in the world, when in fact Figure 1.7 seems to indicate only some countries were included in the analysis. (For example, CO2 intensity in Australia has declined but this is not presented in the same analysis). Para needs to be explicit on whether the commentary refers only to energy sector or to all sources of emissions. (Government of Australia)	Check glossary and add if not included **Ottmar** – we got to rephrase this (see comment 1-237 above)
1-240	A	17	8	17	9	The reduction of carbon intensity . . . It should be made clear that this is the question of carbon intensity of primary energy use (CO2/TPES) not carbon intensity of economy (CO2/GDP)	Accepted - Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Government of Finland)	
1-241	A	17	11	0	0	write preferably "USA" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-72	B	17	12	17	12	The authors should define what "substantially" means in relation to reduced carbon-intensities. (Government of Australia)	ACC – be consistent with SPM and Ottmar.
1-242	A	17	16	17	25	There is considerable debate about the causes of the improvements in energy intensity in China, so it is not appropriate to state that the improvements are only due to closure of small factories (many of which reportedly have reopened anyway) and FDI which apparently brought more efficient technologies (a point which is refuted in my recent book about the auto industry in China entitled "China Shifts Gears: Automakers, Oil, Pollution and Development" (MIT Press 2006). There is considerable evidence that the improvements in energy intensity have been brought about by specific efficiency policies and standards. It is simply incorrect that carbon intensity has risen in China during the past two decades. From 1980-2002, carbon intensity declined dramatically in China largely due to improvements in energy efficiency. There has, however, been a recent worsening of carbon and energy intensity (more intensive) in the past few years, which most analysts have been attributing to weak enforcement of efficiency standards. Correct data are presented on page 16 of Chapter 4. Still, the larger point is correct that carbon intensity in China (and Russia for that matter) is still higher than in most industrialized countries and there is a long way to go. The situation in India is quite different from that of China, so I would not group them together here. India has not had the dramatic improvements in energy or carbon intensity that China has had, largely because India started from a more efficient and lower-carbon base. I'm less familiar with the trends in India but these should be double checked. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	Accepted – text will be revised to reflect review comment (**Ottmar**)
1-73	B	17	16	17	16	Use of 'massive…use' is imprecise. What matters for a carbon intensity index is the increase in usage share of high carbon fuels. (Government of Australia)	TIA – redraft (Holgar)
1-74	B	17	17	17	17	The authors should confirm that they mean "carbon intensities" and not "carbon emissions". (Government of Australia)	Reflected in text = carbon intensities Done
1-243	A	17	18	17	20	The decline in energy intensity (TPES/GDP) in China is also to a large extent due to the structural change of economy - shift towards less energy intensive sectors	

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						(see Luukkanen, J., Vehmas, J., Kinnunen, V., Kuntsi-Reunanen, E. & Kaivo-oja, J. (2005) Converging CO2 Emission to Equal per Capita Levels. Mission Possible? FFRC-Publications 2/2005. Finland Futures Research Centre, Turku School of Economics and Business Administration. Turku. 139 p.) (Government of Finland)	Accepted – see 1-242 (**Ottmar**)
1-244	A	17	27	17	27	Please replace "GHG" with "carbon dioxide". (Government of China Meteorological Administration)	Rejected – GHG emissions is correct
1-245	A	17	28	0	0	substitute "decline" for "collapse" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted – changed to downfall
1-246	A	17	28	17	28	As a RESULT, TOTAL (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-247	A	17	29	17	31	Significant reduction in carbon intensity in former socialist countries started after they overcome economic crisis when recovery growth began. (Alexander Golub, Environmental Defense)	Rejected – started with collapse of economies then continued with recovery and new capital stock (**Ottmar** check please)
1-248	A	17	30	0	0	delete “of” (Danny Harvey, University of Toronto)	Accepted - Done
1-75	B	17	30	17	30	'Despite ….decline' is meaningless. Delete this phrase. (Government of Australia)	Rejected – not meaningless But deletion may be considered due to space limitation
1-76	B	17	33	17	33	First sentence 'formidable' presents a tone of defeatism on Article 2 of UNFCCC that is not found in the draft SPM. In addition, the 'therefore' drafting construct links back to preceding paras of Section 1.3.1.2. which address past 30 year patterns (i.e. going back even well before UNFCCC existed) - rest of WGIII report deals with possibilities of climate change responses of the future which are not simply a mirror of the past. (Government of Australia)	Noted – it is a formidable task for the future based on past experience – Any suggestions for rewording (**TEAM**)
1-249	A	17	37	0	0	Should read “within a time frame SUCH that ecosystems can adapt naturally, THAT food production is not threatened, and that enables ….”. However, you should go further and say: “Article 2 requires the prevention of dangerous interference in the climate system by limiting GHG concentrations, and achieving these limits within a timeframe such that ecosystems can adapt naturally, that food production is not threatened, and that enables … ”. (Danny Harvey, University of Toronto)	Partially rejected – the article 2 principles were dealt with earlier in the Chapter. Suggested text to wordy given space limitations
1-250	A	17	38	17	39	Limiting human population should not be dismissed as a means of limiting GHG concentrations, and neither should limiting economic growth once some minimal standard (already reached in developed countries) has been achieved. It is NOT an	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						issue of "controlling" population, but rather, one of creating the conditions such that couples desire smaller families, and then giving them the means to control for themselves the number and spacing of their children. There is at present a larger unmet demand for contraceptive services, and this demand will grow if the conditions leading to the desire for smaller families are created. Thus, it is really about a matter of increasing personal choice, not one of government control. Secondly, you (and policy makers and politicians) should face up to the fact that we may very well need to accept smaller economic growth in exchange for avoiding (for example), global ecological catastrophe (which is where we are currently heading, as is clear from WG2). So … say what needs to be said. The simple fact is, all four factors in the Kaya identity are important and will probably need to be considered if we are to minimize noncompliance with Article 2. (Danny Harvey, University of Toronto)	**Rejected as too prescriptive**
1-77	B	17	39	17	41	The following sentence and its explanation should be considered for inclusion in the executive summary: "Therefore, the remaining two, technology-oriented factors energy and carbon intensities have to bear the main burden." U.S. Government (Government of U.S. Department of State)	Noted
1-251	A	17	45	0	0	This could be a little misleading in terms of the impact of uranium price fluctuations. Firstly, the price of uranium has been at a historic low until the recent rises and more importantly, the cost of uranium is only a few percent (<5%) of the cost of nuclear electricity (note the distinction here between the cost of uranium and the cost of nuclear fuel, which can include ore conversion, enrichment, fuel fabrication, spent fuel treatment and disposal etc; in total these come to more like 15%). Hence the cost of nuclear generated electricity is largely insulated from the cost of the uranium, whereas the cost of gas fired electricity generation is dominated by the cost of gas (about 75%). This is recognized elsewhere in the document, chapter 4, p14, line 20, "Conversely, surplus uranium supplies may possibly lower fuel prices, but this represents a relatively low fraction of generation costs compared to fossil fuel power stations." (Stanley Gordelier, Nuclear Energy Agency of the OECD)	Noted – correct, but comments does not relate to the text here on resource price increases and the impact on supply security
1-252	A	17	45	18	19	A more general comment, linked to comment above, is the need for consistency through other chapters in WGIII with how both how high [current] oil price, and 'energy security', are dealt with. The areas for consistency should include: definition of the term energy security; common approach to the matter of [current] high oil prices - including reference to the impact of high oil prices on developing	Accepted – add definition of security in glossary

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						countries (see references below)- and the description of the linkage of the response to high oil prices and response to climate change. On the latter point, for example in Chapter 1, line 9, the linkage is described as 'non-negligible', whereas in Chapter 3, page 97, line 49, it states 'National policies driven by energy security concerns can, however, have strong alignment with climate goals." For policy makers, it is more relevant to emphasise the strong potential for alignment (renewable/alternative energy, reduced energy intensity, energy efficiency); which is backed up by the previous Ch1 comment noting IMF commentary. On the matter of analytic work around the impacts of high oil prices on developing countries, the IEA, May 2004 'Analysis of the Impact of High Oil Prices on the Global Economy'; and ESMAP (World Bank) "The Impact of Higher Oil Prices on Low Income Countries and on the Poor.", March 2005, ESM299, are useful references. The IEA report states: “The adverse economic impact of higher oil prices on oil-importing developing countries is generally even more severe than for OECD countries. This is because their economies are more dependent on imported oil and more energy-intensive, and because energy is used less efficiently. On average, oil-importing developing countries use more than twice as much oil to produce a unit of economic output as do OECD countries. Developing countries are also less able to weather the financial turmoil wrought by higher oil-import costs.” (p2, Summary). The ESMAP study includes an analysis of 131 countries' vulnerability to oil shocks, looking at oil self-sufficiency (using a ratio of consumption less production to consumption); and find that "Of the group of 47 countries whose per capita income is less than US$2 a day, 9 were self sufficient….and 25 were entirely import dependent." (ESMAP, p 19-20). (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	Rejected - No contradiction between Chapters 1 and 3. No further text revisions
1-253	A	17	45	17	45	Please integrate this section into the section 1.3.1.1. (Government of China Meteorological Administration)	Rejected – see comment 1-205
1-254	A	17	45	18	19	You should discuss also the energy security in developing countries, especially in rural areas where majority of population still relies on traditional fuels. E.g. references to IEA Energy Outlook could be added. (Government of Finland)	Partially accepted via definition of energy security and revised text (see 1-255) **Holger**
1-255	A	17	47	18	7	This paragraph is not so much about "energy security" than about "influence of current high oil prices on CO2 emissions" - and that how it should be titled, characterised and slightly expanded to… (Cédric PHILIBERT, International Energy Agency)	Accepted – will be revised (**Holger**)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-256	A	18	2	18	2	footnote 4: the REN21 (Renewable Energy Policy Network) should also be mentioned here. (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	Accepted - Done
1-257	A	18	2	18	2	I suggest to add: ¨.....biofuel for transport sector. (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	REJ – too specific, belongs to renewables.
1-78	B	18	4	18	7	Final sentence comes at the end of a paragraph on energy security. Is it really the case that in regions quoted in final sentence, intensified coal use has been driven by energy security factor in all/any of case examples? (Government of Australia)	Chair to rephrase
1-258	A	18	6	0	0	Substitute "US" for "North America" There hasn't been significantly more coal use in Canada. (David Jackson, McMaster University)	Accepted - Done
1-259	A	18	7	18	19	Add a sentence recognising that the IMF, since 2004, has advocated the implementation of alternative energy and energy efficiency as a response to high oil prices, as well as enhanced oil production. The reference for this is the Communiqué of the International Monetary and Financial Committee of the Board of Governors of the International Monetary Fund, in its October 2004 Communique, and for example Press Release No. 05/87 April 16, 2005: “4. The Committee notes that conditions in the oil market will remain tight in the medium term, reflecting strong global demand, low excess capacity, and supply concerns even after investments in some countries. It underscores the importance of stability in oil markets for global prosperity, and recognizes the impact of higher oil prices especially on poorer communities. In this context, the Committee calls for efforts to remove disincentives to investment in oil production and refining capacity, and to promote energy sustainability and efficiency, including through new technologies and removing barriers to the development of alternative fuels.” In its April 22, 2006 statement (same Committee title) it states even more specifically: "The Committee emphasizes the importance of further [oil] upstream and downstream investment, policies to promote energy efficiency, conservation, and alternative sources of energy." This could be inserted after the sentence ending "…unconventional oil resources." in line 15, or at the end of the first paragraph, ending line 7. It is also relevant for section 1.4.2 which includes international institutional references to MDGs. (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	Rejected – why single out IMF others have done this too, e.g., 2006 EU Green paper
1-79	B	18	11	18	11	What defines 'rational energy use'? Do the authors mean 'energy efficiency' (or	Put in glossary

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						similar)? (Government of Australia)	
1-260	A	18	15	0	0	Inset after " ..unconventional oil resources' the sentence "For example, the combustion of natural gas for oil sands extraction is the fastest growing source of GHG in Canada." (David Jackson, McMaster University)	Rejected specifc to a country, but not helpful
1-80	B	18	15	18	19	The authors should delete the last sentence as CCS has little to do with energy security. (Government of Australia)	REJ citation from Australian White paper on energy security to be added.
1-261	A	18	16	18	18	It is more correct to say that alternatives to fossil fuels cannot yet FULLY meet the demand for secure and affordable energy supplies, because of course there are technological options that can do this (e.g. wind, solar, nuclear, efficiency). The point is that there is not one single option that saves the day, and none that can be expanded at a fast enough rate to compensate for increased demand as well as replacement of existing fossil. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	TIA – to be taken up in projections section.
1-262	A	18	25	0	0	substitute "is" for "are", "There is" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-81	B	18	25	18	34	Logic of first para hard to follow. Some text missing around 'set scenarios' (lines 28-29); 'and yet' (line 29) doesn't connect to anything; penultimate sentence is meaningless. (Government of Australia)	Accepted – Changed (see 1-265)
1-263	A	18	28	0	0	the text should read "the International Energy Outlook of the Energy Information Agency in the USA (EIA 2005) (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-264	A	18	28	0	0	"have a set" content? (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted – Changed - DONE
1-265	A	18	29	0	0	Replace “and yet” with “, but all scenarios” (Danny Harvey, University of Toronto)	Accepted - Done
1-266	A	18	30	18	34	There are sentences, "Should there be no change in energy policies, ……..". Is it possible to show a result of siumulation, i.e. the energy mix data, such as Fossile fuel xx%, Renewable endergy, a)Hydro power y%,b) Biomass z%, ..., Nuclear energy p%, etc. These data will be helpful to examine to chage energy policies. (Susumu Nakamaru, Sun Management Instutute)	Rejected – growth rates are given in next paragraph

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1-267	A	18	31	18	42	In this part, data is shown only the growth rate of each resource in each year, and as no basic data (absolute volume or figure) is shown for understanding the size of total volume of each item, it is hard to understand each figure. Please indicate the basic data in figure for each, i.e. coal xxtons, oil yytons, etc. (Susumu Nakamaru, Sun Management Instutute)	Rejected – space limitation (data in Chapter 4) To be checked (**Holger**)
1-82	B	18	31	0	0	Please remove “and most certainly there will be” adds unnecessary editorial content. U.S. Government (Government of U.S. Department of State)	Accepted - Done
1-268	A	18	32	0	0	correct to: "in the … timeframe" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-269	A	18	36	0	0	Unless there is full confidence that ultimately recoverable conventional oil resources are well in excess of 2 trillion barrels, the assumption that oil use will continue to grow at 1% to 2% per annum up to 2030 is very dubious. (Michael Jefferson, World Renewable Energy Network & Congresses)	Noted – data are from referenced sources
1-270	A	18	47	19	3	In Line No. 2 while referring to Figure 1.8, emission units used are GtC while in the actual Figure the units used are GtCO2. Necessary adjustment may be made. (,)	Accepted – will be revised (**Holger**)
1-271	A	18	47	0	0	substitute "above" for "better than" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted – changed to “more than” - Done
1-83	B	18	47	18	47	Substitute 'more than' for 'better'. (Government of Australia)	Accepted - Done
1-84	B	18	48	18	48	Footnote 4: delete "Asian-Pacific Partnership" replace with Asia-Pacific Partnership on Clean Development and Climate. (Government of Australia)	Accepted - Done
1-272	A	19	0	19	0	I suggest to revise the descriptions down of Figure 1.8 related with IEA and EIA because they are not clears, maybe had mistakes when they were written (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – Reference are correct
1-273	A	19	2	19	3	"According to IEA projection, emission will reach 10.4 GtC in 2030, an increase of 4.1 GtC over the 2002 level". "In such case, showing data of "in what extent the Global average temperature will increase. " will be helpful to understand the magnitude of the GHG's impact. (Susumu Nakamaru, Sun Management Instutute)	REJ – Would involve new analysis.
1-274	A	19	5	19	7	I suggest this alternative redaction: ¨ The bulk of energy demand growth occurs mainly in any developing countries, and accordingly the emissions growth is	Rejected – suggested text adds no value and increases the word count

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						dominated by these countries. The total of developing countries represents more than two thirds of IEA projected increase in global energy related emissions, and while they accounted for 36% of total emissions in 2002, will notably....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	
1-275	A	19	5	19	5	Please add one paragraph on the more information of energy related emissions in OECD. (Government of China Meteorological Administration)	REJ – space consideration)
1-276	A	19	8	19	0	The following is a key point and ought to be included in the SPM, along with Figure 1.8: "Developing countries, which accounted for 36% of total emissions in 2002, will notably overtake OECD as the leading contributor to global emissions in the early 2020s". (Government of Japan)	Noted
1-85	B	19	8	19	8	The finding that developing countries will overtake OECD countries in 2020 as the leading contributor to global emissions fails to take into account the recent research on the 'Brazil Proposal", which illustrates that "contributions" to global emissions between developed and developing countries is much closer than that which is implied here. In addition the authors should recognise that projections are not predictions: replace 'will' by 'projected to'. See the presentation provided at the 24th meeting of the Subsidiary Bodies to the UNFCCC on 17 May 2006, by Modelling and Assessment of Contributions to Climate Change (MATCH) and www.match-info.net (Government of Australia)	REJECTED on space considerations Accepted to change to “projected” - Done
1-86	B	19	9	19	10	Figure 1.8: The legend is confusing. The sources include “IEIA” Should this be “EIA”? If so it would be clearer if the “IEA” sources were listed on the left and the EIA sources were listed on the right. U.S. Government (Government of U.S. Department of State)	Accepted – legend will be changed (**Holger)**
1-277	A	19	10	0	0	Figure 1.8 legend what is mean by IEIA? Missing comparison of two bar in diferent time interval. (NOIM UDDIN, Macquarie University, Sydney)	Accepted – legend will be changed (**Holger)**
1-278	A	19	10	0	0	Fig. 1.8: Please choose the correct description for the y-axis: 'CO2 emission from energy use in GtCO2' (Manfred Treber, Germanwatch)	Accepted – axis will be corrected (**Holger)**
1-279	A	19	10	0	0	In Figure 1.8, the legend showing "Economies in Tranistion (IEIA)" should be changed to "Economies in Transition (EIA)". (,)	Accepted – legend will be changed (**Holger)**

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-280	A	19	10	0	0	text of figure 1.8: add "emission" after CO2 (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-281	A	19	10	0	0	Fig 1.8, Explain the meaning of doble bars at 2010-2030 in the figure legend (Government of Spain)	Accepted – legend will be clarified (**Holger)**
1-282	A	19	12	19	18	As Item No.5 above, only growth rate figure is indicated, and it is not easey to understand whole picture, therefore, it would be helpful to show absolute volume of each item for quick understanding to readers, or alternatively, please indicate the page such data is exhibited . (Susumu Nakamaru, Sun Management Instutute)	Rejected – data shown in Fig 1.8 plus space limitations
1-283	A	19	13	19	15	It would be useful to show this information graphically as well. (Government of Pakistan)	Rejected – data in Figure 1.8
1-284	A	19	20	0	0	This section on non-CO2 gases is very short in view of the significant fraction in total GHG emissions (about 25%) and the various reduction options available for these sources, e.g. CH4 recovery from coal mining, landfills and wastewater treatment, CH4 reduction by utilisation or flaring instead of venting of associated gas in oil production, N2Oabatement in adipic acid and nitric acid production, HFC-23 abatement from HCFC-22 production, PFC reduction from aluminium production, SF6 from magfnesium production, etc. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Check with CH 3 whether there is anything more to say – Lambert/Holgar) Message isn't coming through. Rewrite to highlight the message. Add role and dynamics of MP gases.
1-285	A	19	21	0	0	The order of starting with F-gases is somewhat strange. Suggest to move to the end of section 1.2.2.3. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Accepted – Will be done (**Holger**)
1-286	A	19	25	0	0	Change "which" to "that" (Danny Harvey, University of Toronto)	Accepted - Done
1-287	A	20	2	0	0	I assume the reference (IPCC 2005) means the Special Report 'Safeguarding the Ozone Layer and the Global Climate System'. Therefore write ' ... earlier IPCC Special Report (IPCC, 2005).' (Manfred Treber, Germanwatch)	Accepted - Done
1-87	B	20	3	20	6	The authors should describe whether the finding that the increase in F-gases between 2004-2050 takes into account that these gases will be replacing CFCs, which have a much greater GWP than their replacements. Discussion similar to that in the TS at page 2 line 20 could be replicated. (Government of Australia)	See I-84
1-288	A	20	4	20	5	The values should be quoted in Gt CO2 eq for consistency. (Archie McCulloch, Marbury Technical Consulting)	Accepted – Will be done (**Holger**)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-289	A	20	9	20	13	The rate of increase of atmospheric CH4 fluctuated a lot during the 1990's for reasons not clearly understood (changes in wetland sources? changes in hydroxyl radical sink?). Thus this statement is an oversimplification since the trends are not as simple as suggested and methane has both a large natural source (wetlands) and many anthropogenic sources (rice production, ruminant animals, landfills, coalbed leakages, natural gas leakages, etc.). Suggest adding appropriate references to WGI and to critical literature esp papers by Dlugokencky including Fiore, Horowitz, Dlugokencky, and West: GEOPHYSICAL RESEARCH LETTERS, VOL. 33, L12809, 2006. Impact of meteorology and emissions on methane trends, 1990–2004. (Jean Bogner, Landfills +, Inc)	Checking by Bill)
1-290	A	20	10	20	11	I do not agree with this statement. Reduction of livestock numbers in the former USSR and increased CH4 recovery in coal mining and from landfills also contributed significantly to this stabilisation. See chapter x in Olivier (2002) ….. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	See I-289
1-291	A	20	10	20	11	I suggest to add: ..... This stabilization is mainly the result of land - use changes. (taking into account that exists other causes) (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	See I-289**)**
1-292	A	20	20	0	0	delete "at" after "with" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted – “at” deleted - Done
1-293	A	20	20	20	20	with A SMALL annual (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-294	A	20	20	20	20	The word "at" appearing after the word "with" may be deleted. (Government of Pakistan)	Accepted - Done
1-295	A	20	21	0	0	".. waste and forestry dev. .." (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Accepted - Done
1-88	B	20	29	20	32	This paragraph presenting a primary conclusion is poorly framed. In line 29, expression 'it appears' is weak - the analytical foundation is clear that BAU produces increasing global emissions. In the second sentence 'policies under discussion' has not been covered in the Chapter - that is a field that unfolds in later Chapters. It follows that the conclusion in the third sentence is not based on any robust analysis in the Chapter. (Government of Australia)	Rejected – it is a summary of previous paragraphs
1-296	A	20	30	0	0	correct to: "alternative"	Accepted - Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Grassl Hartmut, Max Planck Institute for Meteorology)	
1-297	A	20	31	0	0	delete "it appears" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-298	A	20	34	21	15	This appears to be the only reference to 'technology' in the introductory chapter, I would recommend changing the title of the subheading 1.3.3 to 'Technology Development and Deployment', and the subheading below, 1.3.3.1, to 'Inducing Technology Change'. A very important policy-relevant distinction needs explicitly made in Chapter 1, and reflected in the technology sections in other chapters, between technology 'development' implying new technology (R&D, 'innovation'), and 'deployment and diffusion' of existing or near-commercial technology. A critical factor in this area which also needs explicitly recognised is the importance of investment (across all parts of the technology spectrum from R&D to scaling up deployment), for which policy, and policy design, play a key role - hence the need for precision in definitions. In relation to the latter it would be helpful for policymakers to clarify the connection between assessment of 'technology', and the broader energy or infrastructure policies, referred to in other sections. (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	Change title to Technology Research , Development and Deployment:: Needs and Trends. Add section on deployment
1-299	A	20	34	20	34	The key for altering emissions trends. Emissions increase is due mainly to population growth, it's doubtful if only technology will do the job. When you mention GDP per capita, population is involved. (Juan F Llanes-Regueiro, Havana University)	Noted – text says "technology is key" but other factors plays also a role including population growth
1-300	A	20	35	21	15	It would be useful to better define the different stages of technological innovation here: research, development, demonstration, early deployment, and diffusion. The distinction between the latter two might be thought of as niche deployment (where government often has a role to play to pull or enable technologies to enter the marketplace), and widespread diffusion. Otherwise, what's the difference between deployment and diffusion? The 1997 President's Council of Advisors for Science & Technology (PCAST) study on Federal R&D, coined the acronym: RD3 (research, development, demonstration, and deployment), and this is now frequently used in the literature. The second sentence in this section is a fragment. A more sophisticated discussion of the drivers of energy-technology innovation might be warranted here (see Grubler, Sagar, Holdren, Dooley, Kammen, Margolis to name a few in the field who have written on the subject). In fact, Chapter 2 contains this discussion, so much could be drawn from the end of Chapter 2. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	Needs to be checked (**TEAM/Mits)** Rejected – Sentence is complete

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-301	A	20	41	20	44	This sentence makes a very important point, but it is quite long and difficult to read. A clearer form would be to state "Because of the longevity of energy infrastructures (including the lock-in effect), it is near-term investment decisions in the development, deployment and diffusion of technology that will determine the long term development of the energy system, and its emissions (G and N, 2002)." Reinforcing this point, is an additional reference from a briefing to policymakers, by the Tyndall Centre research collaboration: "To have the requisite impact in 2050 [on emissions], it is necessary to start directing investment towards low carbon technologies in the immediate and short term from now to 2010, and to persist with such low carbon investments thereafter." Reference: Executive Summary from Kohler, J. et. al., 2005. New Lessons for Technology Policy and Climate Change, Investment for Innovation: a briefing document for policymakers, Tyndall Briefing Note No. 13, Tyndall Centre for Climate Change Research, UK. Available from, URL: www.tyndall.ac.uk. (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	Noted – adding reference may be considered (**Holger**) - but space limitations
1-89	B	20	41	20	44	Final sentence is too simplistic. Near term technology investments are part of the affect on structure of the future energy system - but so too are medium and long-term investment decisions. (Government of Australia)	REJ – misses the point again.
1-302	A	20	46	20	49	As elsewhere in WG3, you have regarded the solution to the global warming problem as being purely one of technological development. It is amply demonstrated that enlightened (appropriate) urban planning is a critical factor (as I have been trying to get Chapter 5 to acknowledge), as is the need to fully employ existing knowledge when it comes to construction of buildings (as is amply demonstrated in Chapter 6). Thus, with this single-minded focus on technological development as the solution, you are bypassing two critical and potentially important strategies that can contribute to reducing emissions. I have raised these points in my comments to the ZOD and FOD. Why do you persist in deliberately omitting these important areas? (Danny Harvey, University of Toronto)	Accepted to be accommodated in initial statement.
1-90	B	20	46	20	49	The following section should be considered for inclusion in the Executive Summary: "Generally speaking, it would be economically impossible, without technology research, development, demonstration, deployment and diffusion (RDDD&D) and Induced Technology Change (ITC), to stabilize GHG concentrations at a level that would prevent DAI with the climate system." U.S. Government	Noted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Government of U.S. Department of State)	
1-303	A	20	48	20	48	It might be useful to put a brief explanation for ITC here as it may be the first time readers have come across the phrase, and it plays an important role later on. (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	glossary (**Mits/Ottmar**)
1-304	A	21	3	21	4	Suggest sentence is clarified a bit, perhaps: "However, RDDD&D can only occur at sufficient scale if climate policies are adopted to stimulate this process beyond business as usual." (Kirsty Hamilton, Chatham House; UK Business Council for Sustainable Energy)	Rejected – done it See NIKE
1-305	A	21	6	21	10	Since energy efficiency improvement is the most important mitigation option, I suggest to start with it, not mention it as the last item here. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Accepted - Done
1-306	A	21	7	0	0	Replace “solar” with “active solar energy transformation, passive solar design of buildings” and then add Harvey (2006) to the list of references. REFERENCE: Harvey, L.D.D. 2006. A Handbook on Low-Energy Buildings and District Energy Systems: Fundamentals, Techniques, and Examples (2006), James & James, London. 701 pages. (Danny Harvey, University of Toronto)	Rejected – too specific for introduction & space limitations
1-307	A	21	7	21	7	I suggest to add:.....¨ There are various types of technologies associated to different sources of energy, including but not limited to....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – efficiency improvements are not a source of energy
1-308	A	21	7	21	12	Are mixed sources of energy and technologies (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Noted
1-309	A	21	8	21	8	suggest adding "energy from waste" to this list. This is also a sector with mature technologies for renewable energy production (landfill methane recovery; incineration). (Jean Bogner, Landfills +, Inc)	Accepted - Done
1-310	A	21	12	0	0	You should also add IEA (2006) Energy Technology Perspectives to the list of references. (Jos Olivier, Netherlands Environmental Assessment Agency (MNP))	Accepted – will be done (**Holger**)
1-311	A	21	19	21	24	It could be mentioned here that the Figure 1.9 gives only public financing of R&D. An estimate of companies R&D financing could be given also. (Government of Finland)	ACC)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
1-312	A	21	21	21	25	Here, ETI is being equated with SPENDING on ETI, and it is not the same thing. Spending on ETI is merely an input to the innovation process, but it does not mean that the output is necessarily correlated with the input. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	Noted – text does not imply that spending is automatically increasing output
1-313	A	21	24	21	24	After 'development.', insert: 'It is salutary to note that the total annual energy-related R&D expenditure shown in Figure 1.9 is equal to only one day of consumer spending on the international energy markets!' (Ian Cook, United Kingdom Atomic Energy Authority)	Get a life.
1-91	B	21	26	21	28	The authors should rephrase their finding that lack of R&D funding equates to lack of technological development. A lack of R&D funding is only one of many factors that influence technological development (as discussed in later chapters of the WG3 report). (Government of Australia)	ACC (Rick) Rephrase to note no change in R&D expenditures in response the growing recognition of the climate change.;
1-92	B	21	26	21	26	Language 'we are not on track' is overstated - need to adopt a more measured, scientific form of language, for example: '…suggests that strengthened R & D policies will be needed to …'. (Government of Australia)	ACC (Rick) Rephrase to note no change in R&D expenditures in response the growing recognition of the climate change.;
1-314	A	21	28	0	0	As a fraction of sales, R&D expenditures in energy technology lags other industries. Given the long lead times for R&D and deployment of energy technologies, and the need for very large quantities of new, non-CO2-emitting energy supplies by 2050 (150 EJ/year) and 2100 (500 EJ/year) it is clear that this investment is subcritical. An effort on the scale of the late 1970's, or perhaps even on the scale of the space programs of the 1960's would be more appropriate. Long term, large scale, high risk, high benefit energy research is not rewarded in the private market, and must be supported by governments. The international ITER project, in which China, the European Union, India, Japan, Russia, South Korea and the United States are joining to demonstrate the scientific and technological feasibility of fusion energy, is a good example of such investment. (Robert Goldston, Princeton Plasma Physics Laboratory)	Noted – Space considerations make it difficult.
1-93	B	21	28	21	30	Figure 1.9: The authors should confirm that the y-axis represents "Billions" rather than "Millions". (Government of Australia)	Accepted - Indeed, should be Million – right RICK?
1-94	B	21	28	0	0	Recommended addition at the end of the paragraph, before the figure: As a fraction of sales, R&D expenditures in energy technology lags other industries. Given the long lead times for R&D and deployment of energy technologies, and the need for	Noted – Space considerations make it

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						very large quantities of new, non-CO2-emitting energy supplies by 2050 (150 EJ/year) and 2100 (500 EJ/year) it is clear that this investment is subcritical. An effort on the scale of the late 1970's, or perhaps even on the scale of the space programs of the 1960's would be more appropriate. Long-term, large scale, high-risk, high benefit energy research is not rewarded in the private market, and must be supported by governments. The international ITER project, in which China, the European Union, India, Japan, Russia, South Korea and the United States are joining to demonstrate the scientific and technological feasibility of fusion energy, is a good example of such investment. U.S. Government (Government of U.S. Department of State)	difficult. NOTE: Long term, large scale, high risk energy research is not taken up by private markets and must be supported by governments.
1-315	A	21	30	0	0	It should be clarified that these data are for IEA member countries only, not for the whole world. (Kelly Sims Gallagher, John F. Kennedy School of Government, Harvard University)	**Rick** – its IEA member countries?
1-316	A	21	30	0	0	figure 1.9: currency unit? USD/barrel? (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted –will be added on right Y-axis (**Rick/Holger**)
1-317	A	21	30	0	0	Update the data on the price of oil at the last possible moment so as to extend the data as far forward in time as possible. (Danny Harvey, University of Toronto)	Accepted – data to be updated but not projefted (**Holger/Rick**)
1-318	A	21	30	0	0	Fig. 1.9, Include units in the y-axis 2 (US$?) (Government of Spain)	Accepted –will be added on right Y-axis (**Rick/Holger**)
1-319	A	22	2	0	0	add hyphen "sub-critical" (Grassl Hartmut, Max Planck Institute for Meteorology)	ACC
1-95	B	22	5	25	11	The purpose of section 1.4 is not explained. As currently drafted the section reads as a list of institutional architectures with little or no analysis. In addition sub-section 1.4.2 as a discussion of the MEAs that influence sustainable development decision making, falls outside the mandate of the IPCC. Sub-section 1.4.3 on technology seems to be merely an incomplete list of some global and regional technology agreements, which provides no analysis and little guidance for readers. Suggest deletion of entirety of section 1.4. (Government of Australia)	Accepted – Under 1.2 mention UNFCCC and its nearly unanimous endorsement. Then the guidling principles are listed. Then in 1.4 Bill, MIts, and Phillipe will rewrite. Phillipe 1.2 sentence, and 1.4.1 1.4.2. MIts does 1.4.3.
1-320	A	22	6	22	6	1.4 Institutional Architecture: this part is very long, is important to reduce eliminating so much history that is well known, only the explanation of aspects that are related with WG III: Mitigation (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE,	Refer to 1.95)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						TECHNOLOGY AND THE ENVIRONMENT)	
1-321	A	22	6	22	6	1.4 Institutional Architecture. This point would be titled International Framework because all points talk about this matter. Institutional Architectureis referred to Institutions dedicated to climate change matters, if they are enough, overlaps, necessities, and others (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Refer to 1.95**)**
1-322	A	22	8	23	32	Please add more information on the demonstrable progress in achieving its commitments under the UNFCCC, the Kyoto Protocol and the 2005 Montreal in the section of 1.4.1. (Government of China Meteorological Administration)	REJ – beyond the chapter and IPCC mandate
1-323	A	22	10	0	0	UNFCCC was adopted at an INC meeting on ninth of May 1992 in New York (as written in Article 26 of UN FCCC) and then signed in Rio. Therefore change in line 10 ' ... was adopted in 1992 in May in New York and signed at the Rio Earth Summit ... (Manfred Treber, Germanwatch)	Accepted – will be corrected (**Philippe**)
1-324	A	22	27	0	0	correct to: "Annex I" (Grassl Hartmut, Max Planck Institute for Meteorology)	REJ I it is Annex II
1-325	A	22	28	0	0	see: above (Grassl Hartmut, Max Planck Institute for Meteorology)	Noted
1-326	A	22	32	0	0	see. above (Grassl Hartmut, Max Planck Institute for Meteorology)	Noted
1-327	A	23	3	0	0	correct to: "choose" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-328	A	23	5	0	0	Replace "emissions" with "net emissions" (it may be noted that RMU's mentioned at line 14 provide an example of the net emissions approach, albeit very limited and tightly constrained by accountability provisions). (Peter Read, Massey University)	REJ – too simplistic
1-329	A	23	5	23	5	Replace "emissions" with "net emissions" (it may be noted that RMU's mentioned at line 14 provide an example of the net emissions approach, albeit very limited and tightly constrained by accountability provisions). (Peter Read, Massey University)	REJ – too simplistic)
1-330	A	23	29	23	31	the last sentence of the paragraph can be deleted, it is a repetition (Grassl Hartmut, Max Planck Institute for Meteorology)	To be checked – **Philippe??**
1-331	A	23	31	0	0	A major shortcoming of the COP series was the great difficulty in obtaining even	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						token recognition of nuclear fission and fusion as important mitigation technologies, primarily because of the vociferous anti-nuclear interventions by certain NGOs. This should be noted because the present eport correctly highlights the important role of of nuclear technologies in mitigation. (David Jackson, McMaster University)	Noted and rejected – no space for criticizing COP decision here
1-96	B	23	40	0	0	Modify the start of the sentence starting with "MDG#7" as follows: "MEETING MDG#7 WOULD IN GENERAL require the integration…" U.S. Government (Government of U.S. Department of State)	Accepted - Done
1-332	A	23	45	23	45	I suggest to add: ¨-----, the World Summit of Sustainable Development(2002)developed....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Rejected – text is clear as is
1-333	A	24	14	24	26	I suggest to add: the International Meeting to Review the Implementation of the Action Programme for the Sustainable Development of Small Islands Developing States(2005) ¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	**REJ – too detalied**
1-334	A	24	19	24	26	I suggest breaking this long sentence into two sentences, in order to make it easier to read and to put the main point up front. For example: "Other international fora are important to further the agenda for sustainable development and climate change (see Chapter 13). These include …." (Danny Harvey, University of Toronto)	Accepted - Done
1-335	A	24	30	25	15	It might be useful to include some information on the roles of the UNFCCC and the Kyoto protocol mechanisms, such as CDM, JI and emissions trading, in transferring and diffusing new technologies. (Ellina Levina, OECD)	Rejected – space limitation
1-336	A	24	34	0	42	Fairly detailed for this place in the report. Delete or move to chapter 13(?) (Peter Bosch, IPCC TSU)	ACC but will not move
1-337	A	24	37	24	37	After '(GIF),', insert: 'the ITER fusion energy project,'. (Ian Cook, United Kingdom Atomic Energy Authority)	Accepted - Done
1-338	A	24	38	0	0	"… (REEEP) and the ITER fusion energy project." (Robert Goldston, Princeton Plasma Physics Laboratory)	Accepted - Done
1-339	A	24	38	0	0	After " ..(REEEP)" insert" and the ITER fusion project" (David Jackson, McMaster University)	Accepted - Done
1-340	A	24	38	0	0	After (REEEP) insert "and the Gleneagles G8 Plan of Action (2005) including the	Partially accepted - Global Bioenergy

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						Global Bioenergy Partnership" and replace " and" in previous line with ", " (Peter Read, Massey University)	Partnership added - Done
1-341	A	24	38	24	38	After (REEEP) insert "and the Gleneagles G8 Plan of Action (2005) including the Global Bioenergy Partnership" and replace " and" in previous line with ", " (Peter Read, Massey University)	Partially accepted - Global Bioenergy Partnership added - Done
1-97	B	24	38	0	0	"… (REEEP) and the ITER fusion energy project." U.S. Government (Government of U.S. Department of State)	Accepted - Done
1-342	A	24	42	0	0	Inset as a last line in the paragraph "The International Atomic Energy Agency (IAEA) of the United Nation coordinates and promotes international collaboration in the peaceful uses of atomic energy including nuclear power both fission and fusion. The NEA (Nuclear Energy Agency), sister organization of the IEA, performs a similar role for fission in the OECD." (David Jackson, McMaster University)	Rejected – space limitation
1-343	A	25	4	0	0	EU cooperation with India and China, missing references (NOIM UDDIN, Macquarie University, Sydney)	**Cite webseite**
1-344	A	25	13	0	0	1.4.5 Role of the Market Commencement of operations of the European Emissions Trading System in January 2005 with its important results to date, confirm the value of market instruments to advance the ultimate objective of the Convention. (various European references, current) (Valentin Bartra, Instituto Andino y Amazónico de Derecho Ambiental)	Accepted – should be mentioned in **1.4.1.**
1-345	A	25	13	25	13	1.4.5 Role of the Market Commencement of operations of the European Emissions Trading System in January 2005 with its important results to date, confirm the value of market instruments to advance the ultimate objective of the Convention. (various European references, current) (Valentin Bartra, Instituto Andino y Amazónico de Derecho Ambiental)	Same as previous comment 1-344
1-98	B	25	15	25	27	The two paragraphs describing the history of the IPCC are misplaced and should be deleted. (Government of Australia)	Accepted – 1. para will be deleted
1-346	A	25	17	25	27	Please delete these two paragraphs, because it is not necessary to introduce the Mandate of the IPCC in this section. (Government of China Meteorological Administration)	Accepted – 1. para will be deleted
1-347	A	25	35	25	35	The reference "IPPC, 1996" may be corrected to read "IPCC, 1996".	Accepted - Done

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						(Government of Pakistan)	
1-348	A	25	39	0	0	substitute "assessment" for "transparent consensus" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted – Sentence deleted
1-349	A	25	40	25	40	Please check the sources of "(IPCC, 2001, WGIII, Chapter 1)". (Government of China Meteorological Administration)	To be checked – **Philippe/Holger**
1-350	A	25	43	0	0	add comma before "respectively" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-351	A	25	46	0	0	Add "Additionally, potential abrupt climate change has become sufficiently pressing for it to be treated in the future as a cross cutting issue, although the socio-economic literature on a precautionary response is still very limited (Obersteiner et al 2001a and 2001b), Read and Lermit (2005) Read (2006a and [2006b - gray as of sept 2006])". (Peter Read, Massey University)	Rejected – not the place to recommend future cross-cutting issues
1-352	A	25	46	25	46	Add "Additionally, potential abrupt climate change has become sufficiently pressing for it to be treated in the future as a cross cutting issue, although the socio-economic literature on a precautionary response is still very limited (Obersteiner et al 2001a and 2001b), Read and Lermit (2005) Read (2006a and [2006b - gray as of sept 2006])". (Peter Read, Massey University)	Same comment as 1-351 - Rejected
1-353	A	25	46	25	46	Please check the sources of "(IPCC, 2000)". (Government of China Meteorological Administration)	Noted – Reference is correct
1-354	A	25	48	25	48	"AR IV" may be replaced by "AR4". (Government of Pakistan)	Accepted - Done
1-99	B	25	48	25	48	Insert "and" between "Carbon Capture and Storage" and "on Safeguarding" (Government of Australia)	Rejected – it is a list and “and” follows later
1-355	A	25	49	0	0	the correct name of the Special Report of IPCC on CCS is 'Carbon Dioxide Capture and Storage'. Please write this in line 49: ' IPCC special reports on CO2 Capture and Storage, on ...' (Manfred Treber, Germanwatch)	Accepted - Done
1-356	A	26	3	26	3	Although, the structure OF AR IV (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-357	A	26	13	26	48	This description of the Working Group III report is exactly how the SPM is structured. An abridged version of this report summary should be included in the SPM as an introductory statement to guide the reader. As it stands, the structure of the SPM is difficult to follow the inclusion of a summary such as this one would	Noted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						improve the readability of the SPM a great deal. (Government of Japan)	
1-358	A	26	15	0	0	correct to: "report's" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-359	A	26	35	26	35	I suggest to add:¨....., technology transfer, relationship with three dimensions of sustainable development, system changes and.....¨ (CRISTOBAL FELIX DIAZ MOREJON, MINISTRY OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT)	Accepted - Done
1-360	A	26	40	0	0	add hyphen "medium-term" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-361	A	26	40	26	40	short/MEDIUM (Joe Asamoah, International Energy Foundation)	Accepted - Done
1-362	A	27	7	27	8	reference of Archer (2005) is incomplete (Grassl Hartmut, Max Planck Institute for Meteorology)	To be checked and completed
1-363	A	27	10	28	5	The graph shows GDP losses with different stabilisation targets. This figure as it is constructed now is as if you would compare apples and oranges. The graph is misleading and gives wrong impressions. model results cannot be compared because of the following reasons: 1. different baseline assumptions: IMCP focuses on technological changes which is relevant also for the baseline (TC in baseline), IPCC not. 2. different model parameter assumptions: not only for the baseline, but also for substitution elasticities etc.; 3. different model types: top down models and bottom up models usually show very different results, especially because they differ in type, assumptions and TC; 4.different regional scale of models: in IMCP there are some one region -models (Demeter, Mind) which can hardly compared with the other multi regional models;. as this slide with be used as policy recommendation, it is dangerous to present such kind of overview. As the IMCP study focuses primarily on TC, "benefits" of emissions mitigation as presented by the E3ME model, can only be explained by TCs. It is however, difficult to explain decision maker, why emissions mitigation improves GDP. This is not in line with any IPCC study before; furthermore, it is very confusing to have two AIM studies-AIM A1 PS and AIM-IMCP show very different results: this can be explained, as before, through the treatment of TC in IMCP. It is however very difficult to explain outsiders why this is the case. I would strongly recommend either use only IPCC scenarios or run IMCP models in the IPCC mode. (Claudia Kemfert, German Institute for Economic Research)	Chapter 3 Comment Repeat of comment 1-100 Rejected – graph does not belong to Chapter 1
1-100	B	27	10	28	5	The graph shows GDP losses with different stabilisation targets. This figure as it is	Chapter 3 Comment

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team
						constructed now is as if you would compare apples and oranges. The graph is misleading and gives wrong impressions. model results cannot be compared because of the following reasons: 1. different baseline assumptions: IMCP focuses on technological changes which is relevant also for the baseline (TC in baseline), IPCC not. 2. different model parameter assumptions: not only for the baseline, but also for substitution elasticities etc.; 3. different model types: top down models and bottom up models usually show very different results, especially because they differ in type, assumptions and TC; 4.different regional scale of models: in IMCP there are some one region -models (Demeter, Mind) which can hardly compared with the other multi regional models;. as this slide with be used as policy recommendation, it is dangerous to present such kind of overview. As the IMCP study focuses primarily on TC, "benefits" of emissions mitigation as presented by the E3ME model, can only be explained by TCs. It is however, difficult to explain decision maker, why emissions mitigation improves GDP. This is not in line with any IPCC study before; furthermore, it is very confusing to have two AIM studies-AIM A1 PS and AIM-IMCP show very different results: this can be explained, as before, through the treatment of TC in IMCP. It is however very difficult to explain outsiders why this is the case. I would strongly recommend either use only IPCC scenarios or run IMCP models in the IPCC mode. (Government of Germany)	Repeat of comment 1-363 Rejected – graph does not belong to Chapter 1
1-364	A	28	7	0	0	delete text after "30" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-365	A	29	46	0	0	correct to "Climate-change Policy" (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-366	A	29	47	0	0	delete the double full stop (Grassl Hartmut, Max Planck Institute for Meteorology)	Accepted - Done
1-367	A	30	3	30	5	P30 l. 3-5. References to reports that do not exist should be avoided. The authors of the report IR-01-051 “Managing Climate Risk” are: Obersteiner M, Azar C, Kossmeier S, Mechler R, Möllersten K, Nilsson S, Read P, Yamgata Y, Yan J (2001). See www.iiasa.ac.at/publications (Kenneth Möllersten, Swedish Energy Agency)	To be checked – **Holger take the IIASA ref**
1-368	A	30	44	30	47	from which journal is the reference paper of Thomas? (Grassl Hartmut, Max Planck Institute for Meteorology)	To be checked – **Bill**
1-369	A	31	4	31	6	if the reference of Tokushige is still forthcoming, it will not have to be cited (Grassl Hartmut, Max Planck Institute for Meteorology)	Ref ok