



**IPCC WGII  
Fourth Assessment Report  
Climate Change Impacts, Adaptation and Vulnerability  
*Government and Expert Review of Second Order Draft***

**Specific Comments**

**GOVERNMENT REVIEW COMMENTS**

**Chapter 18**

**August 2006**

**Inc late Mexican Govt comments at the end**

## Discussion of Government review comments and record keeping

IT IS RECOMMENDED THAT:

- AUTHORS BEGIN WORK ON THE COMMENTS IMMEDIATELY. SUBSTANTIVE COMMENTS NEED TO BE SEPARATED FROM NON-SUBSTANTIVE, AND THE TWO SHOULD BE TREATED DIFFERENTLY
- CONTACT IS MADE BETWEEN AUTHORS AND THEIR REVIEW EDITORS IN AUGUST

### Substantive comments

- The chapter writing team should discuss all substantive Govt review comments, by email and/or at Cape Town.
- Substantive comments require full and proper consideration. The *Principles Governing IPCC Work* state that:
  - genuine controversies should be reflected adequately in the text of the Report and
  - it is the role of the Review Editors to advise the lead authors on how to handle contentious/controversial issues
- You must record the outcome of these discussions in this document, under the column 'Notes of the Writing Team'.

### Non-substantive comments

- For non-substantive comments, a very brief entry should be made in the column 'Notes of the Writing Team'. The following terms are acceptable:
  - Addressed
  - Not applicable
  - Text removed
  - A tick to denote a comment has been addressed (somewhere on the document this should be stated)

### General

- The record should be kept in this document, ideally electronically.
- The document becomes part of the traceable account of the Working Group II Fourth Assessment. When completed to the satisfaction of the Review Editors, a copy should be returned to the TSU by the **8<sup>th</sup> December 2006**.

**IPCC WGII AR4 SOD \*GOVERNMENT\* Review Comments**

| Chapter-Comment | Batch | From Page | From Line | To Page | To line | Comments   | Notes of the writing team   |
|-----------------|-------|-----------|-----------|---------|---------|--|---|
| G-18-1          | A     | 0         |           |         |         | <i>What do we know and what don't we know that we need to know?</i> The chapter does not effectively summarize current understanding of the "appropriate" mix of mitigation and adaptation strategies in different contexts (e.g., scales). What is required is a conceptual framework at the beginning of the chapter that integrates impacts, adaptation, and mitigation, and enables the chapter to assess the literature/methods against the framework, articulate current understanding, and identify gaps in knowledge. For example, significant advances need to be made in modeling frameworks (dynamic, integrated) that incorporate the benefits of both adaptation and mitigation policies. Advances in the development of these frameworks by the research community would enable policy analysts to more effectively evaluate the appropriate mix of adaptation and mitigation policies.<br>(Government of USA) | The introductory section has been rewritten to take account of these concerns. In addition, the structure of the chapter has been altered to present the argument more clearly.   |
| G-18-2          | A     | 0         |           |         |         | This chapter is based on quite a narrow literature review. The key message, that both adaptation and mitigation are necessary to reduce the risks of climate change, is clearly presented. However, the section on the potential costs and damages avoided by adaptation and mitigation is confused and should be reviewed to ensure that key messages are not obscured. It is also unfortunate that the key questions concerning the cost/benefits of adaptation and mitigation are yet to be adequately addressed in the literature, and this finding should be highlighted.<br>(Government of Australia)  | The fact that the existing literature is small has been better explained. The section on costs and benefits has been improved and made consistent with WG-III.  |
| G-18-3          | A     | 0         |           |         |         | There is overlap with the adaptive capacity discussion in Ch. 17. Consistency in terminology, definitions, and content is desirable and it seems that Ch.18 should follow Ch.17's lead on this, as well as ceding the main discussion of adaptive capacity to Ch.17.<br>(Government of USA)  | Done.   |
| G-18-4          | A     | 0         |           |         |         | The term sustainable development and the different development paths that might contribute to it should be better defined.<br>(Government of Norway)   | We believe that trying to define sustainable development would open a can of worms and is better left to others outside the IPCC.   |
| G-18-3          | A     | 0         |           |         |         | There is overlap with the adaptive capacity discussion in Ch. 17. Consistency in terminology, definitions, and content is desirable and it seems that Ch.18 should follow Ch.17's lead on this, as well as ceding the main discussion of adaptive capacity to Ch.17.<br>(Government of USA)  | <b>JR: This comment came up in some of the expert review comments as well. (e.g. E-18-150 and 154). I think our discussion is consistent with chapter 17, but we could shorten the AC discussion here if that is felt to be desirable. Chapter team to decide in Capetown</b> |

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|-----------------|-------|-----------|-----------|---------|---------|--|--|
| G-18-4          | A     | 0         |           |         |         | The term sustainable development and the different development paths that might contribute to it should be better defined.<br>(Government of Norway)   | JR: not our responsibility. No change.   |
| G-18-5          | A     | 0         |           |         |         | The notion of governance is almost missing in the chapter. This observation is linked with the one on "national" or country-level bias in the chapter. The notion of governance (multi-level, multi-stakeholder) could be helpful in structuring the discussion on different actors and stakeholders.<br>(Government of Finland)   | There is hardly any literature on governance issues in relation to adaptation-mitigation linkages.   |
| G-18-6          | A     | 0         |           |         |         | The executive summary is very good. However, the chapter needs to be structured or written to support these points (e.g. second point in summary is important and not elaborated on in the body of the chapter). This is a key chapter overall because it provides an essential bridge to mitigation and WGIII. I agree that the main objective should be on assessing climate policy alternatives, in mitigation and adaptation, where capacity to respond, in terms of both mitigation and adaptation capacity, is defined by the various factors (those identified in the chapter). The executive summary is appropriately focused on climate change policy (i.e. approaches for assessing policy portfolios and insights with regard to the portfolio - adaptation, mitigation or both), the rest of the chapter is focused on adaptation experiences and examples alone. Policy makers are interested in evaluating policy alternatives, across both mitigation and adaptation options, and identifying effective policy portfolios. Analyses that integrate impacts, adaptation, and mitigation are required. Therefore, this chapter could provide very useful guidance regarding: (a) an appropriate framework for identifying mitigation-adaptation portfolios (including definitions, linkages, and conceptual issues as foundation), (b) an evaluation of existing approaches relative to the appropriate framework, and (c) identifying a research agenda given the current state of the art for analyses. At the moment, the chapter does not effectively provide this flow of information. Bits and pieces are there, but they are not effectively organized, connected, or focused. The various disconnected discussions of conceptual issues and development-adaptation-mitigation relationships and examples are necessary and useful foundation material for a more focused discussion on climate policy decision-making.<br>(Government of USA) | The chapter has been slightly restructured so as to improve the presentation of the argument. We have worked closely with lead authors for WG-III so as to ensure consistency. The discussion on conceptual frameworks has been shortened and clarified. |
| G-18-7          | A     | 0         |           |         |         | The chapter, as it discusses the interaction between adaptation and mitigation, is very welcome in the IPCC report. The chapter, however, presents a complex topic (due to, e.g. contrafactual future reasoning including issues such as "avoided damages") and should therefore be written with extra clarity and structure. At the moment, the TOC is not very balanced (E.g. 18.3. stands alone). Also, the chapter   | These concerns have all been addressed in the new structure.   |

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|                 |       |           |           |         |         | introduces many theoretical concepts - perhaps too many in relation to the number of concrete examples provided.<br>(Government of Finland)  |   |
| G-18-8          | A     | 0         |           |         |         | The chapter mentions actors involved in adaptation, but it still seems to have a bias towards the national level. This view could be diversified with reference to regional, local or cross-border issues (e.g. globalisation as a development path)<br>(Government of Finland)  | More information has now been added in Section 18.4. However, most of the literature focuses on the national level.   |
| G-18-9          | A     | 0         |           |         |         | More emphasis on regional climate model<br>(Government of Spain)   | We do not discuss climate models on any scale, as this is the domain of other chapters in the IPCC.   |
| G-18-10         | A     | 0         |           |         |         | It is useful to distinguish adaptation that is organic (baseline) from adaptation policy, where organic adaptation is adaptation that occurs naturally via economic and institutional behavior, e.g., substituting inputs in production, installing new capital, development policies. This adaptation behavior is observed when comparing behavior with and without climate change. Adaptation policies therefore provide stimulus to the economic system with the goal of facilitating additional adaptation. At the moment, the chapter somewhat casually moves between these different meanings of “adaptation” and, as a result, clouds the discussion and reduces its effectiveness. The chapter needs to clearly distinguish and discuss these concepts.<br>(Government of USA) | This is conceptually true but the literature is not consistent in making this distinction. We have tried to improve the presentation in the introduction and in Section 18.3. |
| G-18-11         | A     | 0         |           |         |         | General comments on the whole chapter: this chapter needs a lot of editing, it has no clear structure and is full of spelling mistakes. A clear framework for the chapter is missing, although some efforts are tried for instance in section 18.4.1. Because of the missing structure and framework, the chapter is full of individual examples, repeating the same text over and over again and therefore it is very hard for a policy maker to get the messages out. It is advisable to make the chapter much more structured and focused (and consequently shorter).<br>(Government of Netherlands)  | We have addressed these concerns.   |
| G-18-12         | A     | 0         |           |         |         | Framework/conceptual discussions are sprinkled across the chapter and are redundant. A single discussion early in the chapter that consolidates these pieces would benefit the chapter.<br>(Government of USA)   | Agree, and this has been addressed in the final draft.  |
| G-18-13         | A     | 0         |           |         |         | Editing required – verb usage, grammar, incorrect wording, redundancies. The chapter is not very fluid and ideas are not well integrated.<br>(Government of USA)   | Done.   |
| G-18-           | A     | 0         |           |         |         | Differences in style and structure of chapter compared to ch 17; examples are not  | We hope this has now been improved.   |

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| 14              |       |           |           |         |         | used in this chapter (boxes)<br>(Government of Finland)   |  |
| G-18-15         | A     | 0         |           |         |         | Consider adding a discussion of the adaptation and mitigation benefits of reducing climate impacts variability and uncertainty. This is a novel perspective that is worthy of discussion. Gary Yohe is an excellent person to consult on this.<br>(Government of USA)   | We talked to Gary Yohe but he felt that this should be addressed in other chapters.  |
| G-18-16         | A     | 0         |           |         |         | Clarification of the relationship between mitigation and adaptation would be helpful and in particular where the mandate of WG2 ceases and WG3 begins.<br>(Government of Australia)   | The introduction has been changed to clarify the linkages. There is some overlap between WGs II and III, but close collaboration with WG-III lead authors has ensured consistency. |
| G-18-17         | A     | 0         |           |         |         | Assuming that a linear relation exists between adaptation or enhanced adaptive capacity, and sustainable development, and vice versa, is somewhat simplistic.<br>(Government of Norway)   | Not sure to which part of the chapter this comment refers. We believe we don't make this assumption.   |
| G-18-18         | A     | 1         |           | 34      |         | Consider the following references:<br>Goklany, IM. 1995. Strategies to Enhance Adaptability: Technological Change, Economic Growth and Free Trade. Climatic Change 30: 427-449.<br>Goklany, IM. 1998. Saving Habitat and Conserving Biodiversity on a Crowded Planet. BioScience 48 (1998): 941-953<br>Goklany, IM. 2000a. Potential Consequences of Increasing Atmospheric CO2 Concentration Compared to Other Environmental Problems. Technology 7S: 189-213.<br>Goklany, IM. 2000b. Applying the Precautionary Principle to Global Warming. Center for the Study of American Business, Washington University, St. Louis, Mo., USA. Policy Study 158. November 2000.<br>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.<br>Goklany, IM. 2005a. A Climate Policy for the Short and Medium Term: Stabilization or Adaptation? Energy & Environment 16: 667-680.<br>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.<br>Goklany, IM. 2006a. Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development. Mitigation and Adaptation Response Strategies for Global Change, forthcoming.<br>(Government of USA) | We have considered them and incorporated them if and where appropriate.  |

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| G-18-19         | A     | 2         | 3         | 2       | 23      | These paragraphs are largely contradictory to the executive summary in Chapter 17. Please check accuracy for consistency with Chapter 17.<br>(Government of Australia)   | Checked for consistency and changed where necessary.   |
| G-18-20         | A     | 2         | 3         | 2       | 3       | Replace "nature and society" with "natural and human systems".<br>(Government of Australia)  | Done.  |
| G-18-21         | A     | 2         | 4         |         | 6       | This statement is misleading and could be misconstrued. Because of climate change commitment, mitigation MUST begin far in advance of the expected climate effects. Also, there are other benefits in the form of air quality, energy efficiency, etc, some of which are immediate. Finally, I think WGIII Ch3 should also be cited here since long-term stabilization modeling is being presented in that chapter.<br>(Government of USA)   | Altered the statement and included reference to WG-III.  |
| G-18-22         | A     | 2         | 4         |         | 13      | These sentences seem to be appropriate support for the second bullet (Line 15 page 2). You might consider moving.<br>(Government of USA)   | Accepted. We have changed the key message accordingly.   |
| G-18-23         | A     | 2         | 5         | 2       | 5       | Insert "depending upon the mitigation actions adopted by states", after "hardly noticeable until 2040", because as it stands the statement is contradictory to the findings in some of the regional chapters, and presents a view that could be interpreted as "mitigation is ineffective". In addition it would be helpful to replace "hardly be noticeable" with a more exact phrase - presumably relating to a significant change in the trends of global temperature rise and other climate parameters.<br>(Government of Australia)   | We changed the wording to "Even the most stringent mitigation efforts cannot avoid further impacts of climate change in the next few decades [WG-I, WG-III], which makes adaptation unavoidable. |
| G-18-24         | A     | 2         | 6         |         | 7       | Replace "The benefits ... immediate, ..." with the following: " <b>Although</b> the benefits of adaptation are <b>frequently</b> local to regional in scale, <b>some adaptation measures (e.g., trade and coordinated roll back of subsidies for overuse of energy, land and other natural resource) can provide national benefits. Moreover, by contrast to mitigation, benefits of adaptation</b> can be immediate, ..." [New language is shown in bold; deletions not shown].<br>(Government of USA)  | We feel that this level of detail is not justified in the Executive Summary.   |
| G-18-25         | A     | 2         | 11        | 2       | 13      | There are a number of value judgements contained in this sentence. Delete "Mitigation is necessary because" to start sentence with "reliance on adaptation alone could eventually lead to a magnitude of climate change to which effective adaptation is possible only at very high social, environmental and economic costs" [18.4, 18.6]. Consider re-wording sentence to reflect that adaptation does not deal with the root problem of climate change and that in some sectors and systems (in particular natural systems) adaptive capacity is already being exceeded.<br>(Government of Australia) | Accepted and sentence has been reworded as suggested.  |

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| G-18-26         | A     | 2         | 15        |         | 16      | This point is not supported in the chapter. Depending upon the scale of decision making, a portfolio of adaptation and mitigation strategies will be required for addressing climate change, I didn't find a discussion supporting this point in the chapter. Also, consider replacing this opening line with Lines 23-24 on page 4. (Government of USA)  | The new Section 18.5 now supports this statement.  |
| G-18-27         | A     | 2         | 20        | 2       | 23      | This sentence contains a policy judgement on the utility of mitigation and includes a eurocentric list of sectors and sectoral interests. These sectoral examples should be deleted. (Government of Australia)  | This sentence has been deleted.  |
| G-18-28         | A     | 2         | 20        |         | 20      | Useful to modify the sentence to read "Mitigation primarily involves <i>both the supply and demand sides</i> of the energy, ...". (Government of USA)   | This sentence has been deleted.  |
| G-18-29         | A     | 2         | 27        | 2       | 27      | Delete "bulk" as the most effective mitigation will require all major emitters. (Government of Australia)   | Done.  |
| G-18-30         | A     | 2         | 28        |         | 29      | The statement "The benefits of mitigation are global..." is too simplistic and not true under all circumstances. The statement is only valid if, because of global warming, everyone is a loser at all times. But we know this is true only if warming is excessive. At low-to-moderate global temperature increases, there will be winners and losers. (Government of USA)   | We have included the word "climate" before "benefits" to avoid confusion.  |
| G-18-31         | A     | 2         | 29        | 2       | 29      | Insert "and nationally" after "locally". (Government of Australia)  | Done.  |
| G-18-32         | A     | 2         | 29        |         | 30      | Modify "Both the costs and benefits to adaptation accrue locally" to read as follows: " <b>Although in most cases</b> , both the costs and benefits to adaptation accrue locally, <b>to the extent that adaptations can provide global benefits by reducing pressures on global biodiversity, reducing hunger or diseases such as malaria, and advancing sustainable development, they can provide global benefits.</b> " [New language is shown in bold; deletions not shown.] (Government of USA) | We feel that this level of detail is not justified in the Executive Summary.   |
| G-18-33         | A     | 2         | 31        | 2       | 32      | To the extent that sustainable development actions (which would increase adaptive capacity) are driven by international agreements and fora (e.g. the 2002 Summit), such actions would be advanced by such agreements. (Government of USA)  | True, but the statement refers to <i>most</i> adaptation. Such international agreements and fora are rather a unique case. |
| G-18-33         | A     | 2         | 31        | 2       | 32      | To the extent that sustainable development actions (which would increase adaptive capacity) are driven by international agreements and fora (e.g. the 2002 Summit), such actions would be advanced by such agreements. (Government of USA)  | JR: There are also several government comments which support my concerns about the executive summary text                  |



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|                 |       |           |           |         |         |   | making too sharp a distinction between A and M and downplaying the development path linkages  |
| G-18-34         | A     | 2         | 31        | 2       | 31      | Insert after "international agreements", "and unilateral national actions" as not all mitigation actions are driven because of international agreements.<br>(Government of Australia)   | Done.   |
| G-18-35         | A     | 2         | 38        | 2       | 40      | Clarify in the text that afforestation can be both a source and a sink of greenhouse gases.<br>(Government of Australia)  | This sentence has been deleted.   |
| G-18-36         | A     | 2         | 50        |         |         | This is an important caveat to the bold text opening statement of this paragraph. So much so, you might consider including it at the beginning of the paragraph in bold.<br>(Government of USA)   | We agree that it is an important caveat but decided not to put more emphasis on it, because there is no strong literature basis to support it yet.                |
| G-18-37         | A     | 3         | 3         |         | 5       | Replace the last sentence with: <b>“Some recent literature provides a conceptual framework and some empirical information that explicitly considers both adaptation and mitigation, but more work is needed in these areas to better assess potential synergies in climate policy.”</b> [New language is shown in bold; deletions not shown.] See Goklany (2006a) for one conceptual framework which would integrate adaptation, mitigation and sustainable development actions.<br>(Government of USA) | Disagree. The suggested paper would not have helped to assess the need for and potential of synergies in climate policy, as suggested in the sentence. No change. |
| G-18-38         | A     | 3         | 10        |         | 11      | Most global integrated assessment models don’t model feedbacks from impacts very well, so it is worth saying something about the state of modeling of feedbacks from impacts in IAMs within the context of this chapter and the implications for mitigation-adaptation tradeoffs.<br>(Government of USA)  | Accepted and added to the sentence.   |
| G-18-39         | A     | 3         | 15        |         | 15      | Consider adding “property rights” after “and value systems”<br>(Government of USA)  | Done.   |
| G-18-40         | A     | 3         | 16        |         | 20      | “Optimal” is a broader concept than zero-sum that depends on how mitigation and adaptation are defined. If mitigation and adaptation are represented as anything other than perfect substitutes, as suggested by the chapter, than the optimal mix will not be zero-sum. The authors should go a step further and provide a sentence on the future of analyses of this type. Currently, the text implies that it is and always will be hopelessly complex.<br>(Government of USA)                       | Agree. Wording has been changed.  |
| G-18-41         | A     | 3         | 17        |         | 20      | Replace “is problematic” on line 17 with “may be difficult to implement...” Add at the end of this sentence the following: “Although this is a difficulty inherent to the   | Done.   |

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|                 |       |           |           |         |         | analyses of all mitigation options as well.”<br>(Government of USA)  |  |
| G-18-42         | A     | 4         | 5         | 4       | 9       | Delete sentence beginning "Most industrialised countries...." This sentence is policy prescriptive.<br>(Government of Australia)   | Disagree. This sentence is a statement of fact.  |
| G-18-43         | A     | 4         | 9         |         | 9       | Consider adding “and potential long-term options” to the sentence about WGIII assessment of climate policy.<br>(Government of USA)   | This is correct but irrelevant in this context.  |
| G-18-44         | A     | 4         | 16        |         | 18      | We don’t believe that the sentence “Chapter 17 ... effective adaptation” is true at all times under all circumstances, and have provided comments to that effect on Chapter 17. We suggest substituting “constraints” for “limits”, and that adaptation options may be limited if temperature increases are high enough.<br>(Government of USA)  | We have checked this with Chapter 17 and ensured consistency between the two chapters.   |
| G-18-45         | A     | 4         | 30        | 4       | 30      | Delete "by", insert "with consideration of" as consideration of DAI under the UNFCCC takes other considerations into account.<br>(Government of Australia)   | The word “by” does not exclude other considerations. The proposed change would result in awkward English.                                  |
| G-18-46         | A     | 4         | 35        |         | 35      | It would be useful to distinguish the different definitions of “integrated assessment”—techniques used for impacts analysis as in much of WGII vs. long-term stabilization analysis in WGIII—and, throughout the chapter, and be clear which is being discussed.<br>(Government of USA)  | The reference to integrated assessment has been deleted here. More detail on integrated assessment has been provided two paragraphs later. |
| G-18-47         | A     | 5         | 13        |         | 15      | Replace this sentence with the following: “Some recent literature indicates there are significant synergies, particularly in terms of advancing both adaptive and mitigative capacities simultaneously (Goklany 2005a, 2006a), although other literature is more skeptical about the ability or desirability of exploiting these inter-relationships (Venema and Cisse 2004, Klein et al. 2005).”<br>(Government of USA) | Accepted.  |
| G-18-48         | A     | 5         | 13        |         |         | “Yet” should be removed from this sentence.<br>(Government of Japan)   | Done.  |
| G-18-49         | A     | 5         | 14        |         | 15      | As written, the text implies that it may not be desirable to explore inter-relationships between adaptation and mitigation. I suspect you meant that it may not be worth exploiting these inter-relationships.<br>(Government of USA)  | Accepted. The word “exploring” has been deleted.   |
| G-18-50         | A     | 5         | 15        |         |         | Insert a new sentence on line 15 that reads as follows: “Goklany (2005a, 2006a) suggests that it should also be possible to advance both adaptive and mitigative capacities through the pursuit of sustainable development goals.”<br>(Government of USA)  | This is addressed later in the chapter (Section 18.6).   |

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| G-18-51         | A     | 5         | 43        | 6       | 47      | The authors should consider the value of box 18.1, it adds little to the discussion of the chapter and is completely unreferenced.<br>(Government of Australia)   | This box has now become Section 18.1.2. The need for this section has been indicated in the plenary-approved outline. The text has been shortened a bit, though.  |
| G-18-51         | A     | 5         | 43        | 6       | 47      | The authors should consider the value of box 18.1, it adds little to the discussion of the chapter and is completely unreferenced.<br>(Government of Australia)   | The box was explicitly requested – originally to provide a SHORT overview of BASIC features and linkages. Became long by popular demand (2 rounds of reviews). No change.   |
| G-18-52         | A     | 5         | 51        | 6       | 1       | This statement is too simplistic. There are ways of measuring and evaluating the effectiveness of adaptation policies and practices (e.g. dollars, lives lost, DALY's). Furthermore, mitigation is not necessarily straightforward in terms of measurement and evaluation. For example, carbon equivalents can only measure “physical” effectiveness, and they are rather imperfect at that given the different atmospheric lives of the gases.<br>(Government of USA)  | This is exactly the point: a given amount of mitigation leads to some reduction in C-equivalent. Adaptation efforts are diverse and their effectiveness cannot be measured by a common unit. No change or delete the sentence – inserted in response to an FOD comment. |
| G-18-53         | A     | 6         | 8         | 6       | 10      | Here the bias towards national level adaptation is unwarranted (and no references are presented). Adaptation expands over national borders often, in the case of international water bodies such as rivers. A specific example could also be the ACIA report on the arctic: indigenous peoples can not even be classified along national borders.<br>(Government of Finland)  | These examples do not negate the basic statement: MOST (not all) adaptation is local to national and only a few are multinational. No change.   |
| G-18-54         | A     | 6         | 9         |         | 12      | The benefits of mitigation are global only under certain circumstances, namely, if temperature change results in only losers. This is not necessarily true for low-to-moderate temperature increases.<br>(Government of USA)  | True but beyond the depth and level of detail required for a short overview of main similarities and differences. Plus: mitigation reducing POSITIVE impacts as well mentioned in p5 149. No change   |
| G-18-55         | A     | 6         | 12        |         | 14      | Positive spillovers associated with adaptation also include adaptations that would provide such global benefits as reducing biodiversity losses, malaria, other climate-sensitive diseases, and hunger (see Goklany 2006a).<br>(Government of USA)  | These are not really global benefits and not really benefits of adaptation – no change.   |
| G-18-56         | A     | 6         | 20        | 6       | 23      | This contradicts with ch 17 (p. 4 lines 36-42) by suggesting that adaptation is driven by individual and local self-interest only. The issues of risk perception and awareness are crucial here, along with institutional issues and incentive structures. A clearer conceptualisation of social systems with their level-structures could be useful here. Why is this section presented as a box, especially as it is the only box in the whole chapter? Boxes could be used for concrete examples instead of discussing the key terms of the chapter. | Note p6, line 21: the BULK of adaptation is driven by the self-interest ... which is totally different from the misrepresented statement “driven by ... self-interest ONLY”. No change.<br><br>Box can be converted to text ...   |

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|                 |       |           |           |         |         | (Government of Finland)  |   |
| G-18-57         | A     | 6         | 26        | 6       | 29      | Replace "information" with "knowledge"<br>(Government of Sweden)   | OK  |
| G-18-58         | A     | 6         | 47        |         |         | Add anew sentence that reads as follows:<br>“Finally, Goklany (2006a) notes that actions that would reduce societal vulnerability to climate-sensitive problems that might be exacerbated by climate change have very high benefit-cost ratios”. ACCEPT<br>(Government of USA)   | Not related to A-M similarities/differences.<br>No change   |
| G-18-59         | A     | 7         | 1         | 9       | 11      | This section, as a summary of the findings in the TAR, could be significantly reduced in size.<br>(Government of Australia)  | Section significantly reduced in size.  |
| G-18-60         | A     | 7         | 1         | 9       | 11      | Considering the premium on space, this recap of TAR is too long. It should be shortened.<br>(Government of USA)  | Section significantly shortened.  |
| G-18-61         | A     | 7         | 1         |         |         | Sec 18.2 – It would be useful to add discussion on updates to TAR thinking to this section. You might also consider using the format in the other WGII chapters for discussing support and revisions to TAR thinking.<br>(Government of USA)   | This is exactly the problem: there was no such chapter in TAR hence nothing to update. As the chapter shows, A-M linkages have received some but limited attention so far. The whole chapter is about updates. Some are added to this section as well.                  |
| G-18-51         | A     | 5         | 43        | 6       | 47      | The authors should consider the value of box 18.1, it adds little to the discussion of the chapter and is completely unreferenced.<br>(Government of Australia)  | The box was explicitly requested – originally to provide a SHORT overview of BASIC features and linkages. Became long by popular demand (2 rounds of reviews). No change.   |
| G-18-52         | A     | 5         | 51        | 6       | 1       | This statement is too simplistic. There are ways of measuring and evaluating the effectiveness of adaptation policies and practices (e.g. dollars, lives lost, DALY’s). Furthermore, mitigation is not necessarily straightforward in terms of measurement and evaluation. For example, carbon equivalents can only measure “physical” effectiveness, and they are rather imperfect at that given the different atmospheric lives of the gases.<br>(Government of USA) | This is exactly the point: a given amount of mitigation leads to some reduction in C-equivalent. Adaptation efforts are diverse and their effectiveness cannot be measured by a common unit. No change or delete the sentence – inserted in response to an FOD comment. |
| G-18-53         | A     | 6         | 8         | 6       | 10      | Here the bias towards national level adaptation is unwarranted (and no references are presented). Adaptation expands over national borders often, in the case of international water bodies such as rivers. A specific example could also be the ACIA report on the arctic: indigenous peoples can not even be classified along national borders.  | These examples do not negate the basic statement: MOST (not all) adaptation is local to national and only a few are multinational. No change.   |

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|-----------------|-------|-----------|-----------|---------|---------|--|---|
|                 |       |           |           |         |         | (Government of Finland)  |   |
| G-18-54         | A     | 6         | 9         |         | 12      | The benefits of mitigation are global only under certain circumstances, namely, if temperature change results in only losers. This is not necessarily true for low-to-moderate temperature increases.<br>(Government of USA)   | True but beyond the depth and level of detail required for a short overview of main similarities and differences. Plus: mitigation reducing POSITIVE impacts as well mentioned in p5 149. No change                             |
| G-18-55         | A     | 6         | 12        |         | 14      | Positive spillovers associated with adaptation also include adaptations that would provide such global benefits as reducing biodiversity losses, malaria, other climate-sensitive diseases, and hunger (see Goklany 2006a).<br>(Government of USA)   | These are not really global benefits and not really benefits of adaptation – no change.   |
| G-18-56         | A     | 6         | 20        | 6       | 23      | This contradicts with ch 17 (p. 4 lines 36-42) by suggesting that adaptation is driven by individual and local self-interest only. The issues of risk perception and awareness are crucial here, along with institutional issues and incentive structures. A clearer conceptualisation of social systems with their level-structures could be useful here. Why is this section presented as a box, especially as it is the only box in the whole chapter? Boxes could be used for concrete examples instead of discussing the key terms of the chapter.<br>(Government of Finland) | Note p6, line 21: the BULK of adaptation is driven by the self-interest ... which is totally different from the misrepresented statement “driven by ... self-interest ONLY”. No change.<br><br>Box can be converted to text ... |
| G-18-57         | A     | 6         | 26        | 6       | 29      | Replace "information" with "knowledge"<br>(Government of Sweden)   | OK  |
| G-18-58         | A     | 6         | 47        |         |         | Add anew sentence that reads as follows:<br>“Finally, Goklany (2006a) notes that actions that would reduce societal vulnerability to climate-sensitive problems that might be exacerbated by climate change have very high benefit-cost ratios<br>”. ACCEPT<br>(Government of USA)   | Not related to A-M similarities/differences.<br>No change   |
| G-18-59         | A     | 7         | 1         | 9       | 11      | This section, as a summary of the findings in the TAR, could be significantly reduced in size.<br>(Government of Australia)  | Disagree. It is about the allocated length. First of its kind and draws on TAR WGII and III. It was extended somewhat in response to FOD comments . No change.  |
| G-18-60         | A     | 7         | 1         | 9       | 11      | Considering the premium on space, this recap of TAR is too long. It should be shortened.<br>(Government of USA)  | No, this is an important summary of the situation in TAR, the root of Ch18 if AR4. No change.   |
| G-18-61         | A     | 7         | 1         |         |         | Sec 18.2 – It would be useful to add discussion on updates to TAR thinking to this section. You might also consider using the format in the other WGII chapters for discussing support and revisions to TAR thinking.<br>(Government of USA)   | This is exactly the problem: there was no such chapter in TAR hence nothing to update. As the chapter shows, A-M linkages have received some but limited attention so far. No   |

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|                 |       |           |           |         |         |   | change.  |
| G-18-62         | A     | 9         | 23        |         | 35      | Consider using the Executive Summary text on the links between adaptation and mitigation capacity—it is clearer.<br>(Government of USA)   | JR: This provides some the background to the literature. No change.  |
| G-18-63         | A     | 9         | 24        |         | 29      | Something is missing here. The definition of mitigation capacity here does not suggest that capacity is a function of the severity of impacts. Severity would seem to define the necessity for mitigation capacity instead. Maybe expanded definitions of “intensity” or “capacity” could be given that support the current statement.<br>(Government of USA) | JR: No, if MC is the ability to diminish the intensity of the stresses, then clearly no small country could have any MC. Hence the proposed change in definition. No change. |
| G-18-64         | A     | 9         | 25        | 9       | 26      | Strange definition of mitigation, the definition mentioned later by Winkler et al is much more understandable.<br>(Government of Netherlands)   | JR: We agree. That’s why we propose it.  |
| G-18-65         | A     | 9         | 25        | 9       | 25      | refer to “AR4” instead of “4AR”<br>(Government of Germany)  | JR: will adopt whatever the agreed-upon use.   |
| G-18-66         | A     | 9         | 28        | 9       | 29      | Another example of a "national level" / country bias<br>(Government of Finland)   | JR: don’t understand.  |
| G-18-67         | A     | 9         | 37        |         | 41      | This is good initial text for this section. Consider moving this forward to become the 2nd paragraph of section 18.3.<br>(Government of USA)  | JR: We build to this new concept through a discussion of the established concepts of AC and MC in the previous paragraph. No change.   |
| G-18-68         | A     | 9         | 39        | 9       | 40      | In addition to "group or nation's level" a variety of different spatial scales and actors should be recognized.<br>(Government of Finland)  | JR: This is what we thought we were conveying by the existing text. No change.   |
| G-18-69         | A     | 9         | 43        |         | 43      | Shouldn’t natural capital be included in this list—both quantity and quality? As noted in Chapter 17, the environmental and natural resource condition will define capacity as well.<br>(Government of USA)   | JR: agree  |
| G-18-70         | A     | 10        | 2         | 10      | 2       | What does "their" refer to?<br>(Government of Netherlands)  | JR: will check and clarify   |
| G-18-71         | A     | 10        | 4         |         |         | Add at the end of this bullet the following: “public health services, and budgets and capabilities for research also contribute critically to the development of human capital (Goklany 2006a);”<br>(Government of USA)   | JR: can’t alter list being quoted.   |
| G-18-           | A     | 10        | 12        |         | 12      | Replace “other” with “additional” since many of the items in the list will pertain to   | JR: will do  |

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| 72              |       |           |           |         |         | developing countries as well.<br>(Government of USA)   |  |
| G-18-73         | A     | 10        | 20        |         | 20      | Add explanatory sentence on the availability and distribution of resources.<br>(Government of USA)   | JR: doesn't seem necessary. Text is clear on the face of it. No change.                          |
| G-18-74         | A     | 10        | 39        |         | 43      | Unnecessary redundant text that could be removed. Also, WG3 Ch3 is assessing new scenarios that have been produced since SRES.<br>(Government of USA)  | JR: We are trying to make a link here to the scenarios analysis in chapter 3. No change.         |
| G-18-75         | A     | 10        | 45        |         | 49      | All of this is covered in the text before this—can be removed. Also, Figure 18.1 is not useful. The text does a decent job describing these relationships, the figure doesn't add anything.<br>(Government of USA)   | JR: will remove this text if figure is removed. But cf. G-18-79.                                 |
| G-18-76         | A     | 11        | 5         |         | 5       | Suggest adding a reference to WG3 Ch3 to the list of references already here<br>(Government of USA)  | JR: will do.   |
| G-18-77         | A     | 11        | 29        | 11      | 51      | The authors should provide further explanation on Figure 18.1 and explain its purpose.<br>(Government of Australia)  | JR: Significance of Figure is explained on page 12, lines 7-25. No change if figure is retained. |
| G-18-78         | A     | 11        | 30        |         | 51      | Figure 18.1 is not useful. The text does a decent job describing these relationships, the figure doesn't add anything.<br>(Government of USA)  | JR: see response to G-18-75  |
| G-18-79         | A     | 11        | 49        |         |         | Figure 18.1. and the concept of development pathways is very interesting. It could include a "looping" arrow, since the alternative pathways affect the capacities and measures of adaptation and mitigation<br>(Government of Finland)  | JR: Thanks, but see G-18-75  |
| G-18-80         | A     | 12        | 27        | 12      | 34      | It should be absolutely clear that general adaptive capacity (e.g. rich country) does not lead directly to adaptive measures. The mediating links (e.g. awareness, risk perception, regulations, governance) should be highlighted.<br>(Government of Finland)   | JR: This is a crucial point but we have found no literature on it. No change                     |
| G-18-81         | A     | 12        | 38        |         | 41      | Add to this list of references, Goklany (1995) which was probably the first to make the connections between the ability to adapt (nowadays called adaptive capacity), the ability to mitigate (i.e., mitigative capacity), and sustainable development,<br>(Government of USA)                                       | JR: will check   |
| G-18-82         | A     | 13        | 1         | 13      | 2       | This is a good example of how an environmental-improvement project led to ancillary benefits, but it is not clear how urban food growing is linked to either climate change-related adaptation or mitigation. An example of a project with a more direct link to climate change/emissions reduction would be better. | JR: As noted in the text, link is to reduced transport emissions. No change.                     |

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|                 |       |           |           |         |         | (Government of Japan)   |  |
| G-18-83         | A     | 13        | 36        |         | 36      | Should the figure reference be 18.1?<br>(Government of USA)   | JR: Yes, thanks. Will change if figure is retained   |
| G-18-84         | A     | 14        | 24        |         | 24      | Section 18.4 – Good ideas, but poorly presented. Given the various framework/conceptual discussions, consider providing a more comprehensive decision framework in 18.4.1 (or preferably near the beginning of the chapter), where step 1 is evaluation of the existing situation (risks, relationships, response/mitigation/adaptation capacities, 18.3 text), and step 2 is evaluation of alternatives. Currently, 18.4.1 is all about step 2.<br>(Government of USA) | We tried a number of different organizations for the Chapter. Although none were ideal the current one seems to work best.<br>Rich, refer back to Tom's figure, now it will be in the introduction as a framework, and modify text without your figure.<br>Response: chapter reorganized, this section refers to the overall chapter framework (Fig 18.1). |
| G-18-85         | A     | 14        | 34        | 14      | 34      | Add "and climate change that is already occurring"<br>(Government of Netherlands)   | The statement is intended to be broad, covering present and future risks, and not make a policy judgement about whether or not climate change is occurring or if climate change policy should encompass all present and future climatic risks  |
| G-18-86         | A     | 14        | 37        | 14      | 44      | If in point number 3 (affect) and point 4 (change) implies both increase and decrease then examples for both (increase and decrease) are needed to explain the concept.<br>(Government of India)  | A simpler description is included; further references are in 18.5 and an on-line annex   |
| G-18-87         | A     | 14        | 38        | 14      | 39      | This point (1) seems to contradict previous discussion in this Chapter - which referred to adaptation/mitigation being complementary - both necessary: in contrast to 'substitutes'. Because of heterogeneity in adaptation effectiveness, it is difficult to see how adaptation/mitigation can be true substitutes.<br>(Government of Australia)   | Notion of complementarity included in revised definitions brought into the chapter early on  |
| G-18-88         | A     | 14        | 40        | 14      | 41      | Is second clause on less/more true? Response actions compete for resources in the whole economy, not just a binary way.<br>(Government of Australia)  | Changed text   |
| G-18-89         | A     | 14        | 43        | 14      | 43      | Point 4. should be rephrased in the following terms "Mitigation of emissions will reduce climate change impacts and will, therefore, change vulnerability to climate change".<br>(Government of Australia)  | Changed text   |
| G-18-90         | A     | 14        |           |         |         | Section 18.4: Ensure this section draws from and is consistent with Chapter 5, page 35, line 45.<br>(Government of USA)   | Okay   |



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|-----------------|-------|-----------|-----------|---------|---------|---|---|
| G-18-91         | A     | 15        | 6         | 15      | 8       | Robustness is here reduced to knowledge and not linked to institutions (legitimacy, credibility, feasibility) See eg. Nowotny, Helga, Scott, Peter & Gibbons, Michael (2002) Rethinking Science (Cambridge: Polity). (Government of Sweden)   | Okay  |
| G-18-92         | A     | 15        | 10        |         | 10      | Replace “language” with “notation” (Government of USA)  | Done  |
| G-18-93         | A     | 15        | 21        | 15      | 51      | Figure 18.2 is hard to understand (Government of Sweden)  | Dropped   |
| G-18-94         | A     | 15        | 22        | 15      | 50      | This figure seems to be superfluous, is a figure needed for such a simple message that is already explained in the text? (Government of Netherlands)  | Dropped   |
| G-18-95         | A     | 15        | 22        |         | 22      | Figure 18.2 – I believe you should add “overall state of environment and natural resources” to the “then Learn” list of items, possibly with Climate Change. (Government of USA)  | Dropped   |
| G-18-96         | A     | 15        | 48        |         |         | Figure 18.2. is unclear. All the graphics are exactly the same in the three sections and the idea of a decision tree does not come out. (Government of Finland)   | Dropped   |
| G-18-97         | A     | 16        | 1         | 16      | 1       | The authors should include a sentence outlining that while initial studies focussed on damages avoided through mitigation, our understanding of this subject is still limited and more research needs to be undertaken. (Government of Australia)   | Initial studies tended to focus on the relationship between mitigation and damages avoided. > Initial studies tended to focus on the relationship between mitigation and damages avoided, but our knowledge of this subject is still limited and more research needs to be undertaken.  |
| G-18-98         | A     | 16        | 2         |         |         | The authors should consider making it clear that large-scale modeling of adaptation-mitigation feedbacks is needed and lacking. A necessary first step will be improved modeling of feedbacks from impacts, which is currently immature in most long-term global integrated assessment modeling. Adaptation modeling can follow with modeling structures that permit the reallocation of production factors and budgets in response to the changing climate. The adaptation responses therefore redefine the circumstances for mitigation. However, current impacts modeling capability is rudimentary, and modeling of adaptation responses to climate change impacts has only just begun (see the last paragraph of this section). (This comment applies to sections 18.4.2 and 18.4.3) (Government of USA) | Added<br>Large-scale modeling of adaptation-mitigation feedbacks is needed and lacking. A necessary first step will be improved modeling of feedbacks from impacts, which is currently immature in most long-term global integrated assessment modeling. Adaptation modeling can follow with modeling structures that permit the reallocation of production factors and budgets in response to the changing climate. The adaptation responses therefore redefine the circumstances for mitigation. However, current impacts modeling capability |

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|                 |       |           |           |         |         |   | is rudimentary, and modeling of adaptation responses to climate change impacts has only just begun.<br>Further action: emphasize more and pick up in closing section TD   |
| G-18-99         | A     | 16        | 2         |         |         | Section 18.4.2 – section is hard to follow because it is lacking a clear focus.<br>(Government of USA)  | Focus is now explained in the introduction.   |
| G-18-100        | A     | 16        | 2         |         |         | Currently, the text discusses adaptation that occurs naturally, but should also include discussion of adaptation policy and policy induced changes to adaptation capacity. The section provides a useful overview of a variety of frameworks, but needs to note that none explicitly consider mitigation-adaptation policy trade-offs. Also, the discussion would be more useful if it provided guidance on the framework needed to analyze mitigation-adaptation policy trade-offs.<br>(Government of USA) | Added:<br>Note that we do not distinguish adaptation by actor (e.g., individuals, government departments) as the comments below generally hold for all types of adaptation.   |
| G-18-101        | A     | 16        | 4         |         | 8       | Add references for first two sentences. This paragraph overstates the level of understanding in the literature with regard to the relationship between mitigation of greenhouse gases and resulting damages avoided, and adaptation and damages avoided. I believe we have a rudimentary understanding of these, as well as interactions between mitigation-adaptation-damages avoided.<br>(Government of USA)  | Added:<br>(see below)   |
| G-18-102        | A     | 16        | 20        |         | 20      | Missing word “marginal” before costs and benefits. Total benefits and costs are not being equated.<br>(Government of USA)   | Balances > equates<br>Added marginal  |
| G-18-103        | A     | 16        | 21        | 16      | 21      | What is "higher than efficient abatement"?<br>(Government of Netherlands)   | Reformulated: abatement that is more stringent than would be suggest by cost-benefit analysis.  |
| G-18-104        | A     | 16        | 21        | 16      | 21      | the text is not very clear<br>(Government of Netherlands)   | Vague complaint.  |
| G-18-105        | A     | 16        | 27        | 16      | 27      | Replace "adapts" with "adopts"<br>(Government of Netherlands)   | Done  |
| G-18-106        | A     | 16        | 44        |         | 46      | This is an inappropriate characterization of long-term global climate CEA analyses. They do assume a range of global climate change targets, but the rationale is simply scientific—to explore alternative targets and evaluate relative responses. It is misleading (and unfair) to assert grand assumptions of global cooperation, precise impacts management, and calculated acceptable losses.<br>(Government of USA)   | Added Or, cost-effectiveness analyses consider a range of hypothetical targets, but remain silent on the appropriateness of these targets.<br>Added emphasis: Adaptation is only indirectly considered by CEAs together with definition of CEA. |

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| G-18-107        | A     | 16        | 48        |         | 50      | This is an incorrect characterization of deterministic scenarios modeling. They do not claim to “know the true state of the world.” They simply present a few feasible alternatives and no assertion that one is the true state or even the more likely state. (Government of USA)  | Assume > implicitly assume  |
| G-18-108        | A     | 17        | 1         |         | 1       | Missing “with non-climate policies” after “measures” (Government of USA)  | adaptation and mitigation measures > adaptation measures, mitigation measures and non-climate policies  |
| G-18-109        | A     | 17        | 30        | 17      | 36      | This needs a note of caution, that this is the result of just one model (FUND), which is rather a high-mitigation-cost model. Other studies assume only small GDP-effects of mitigation (e.g. IMCP-study) or, in relation to baseline growth rates, only a small delay in economic growth due to climate policy (Azar, C., Schneider, S., 2002. Are the economic costs of stabilizing the atmosphere prohibitive? Ecological Economics 42, pp. 73–80.) (Government of Germany)  | Added<br>Note that FUND has somewhat high costs of emission reduction (cf. SAR), and also assumes a large impact of slowed growth in the OECD on the rest of the world.<br>The impact of mitigation on adaptive capacity has not been studied with any other model.<br>Also note: models with lower mitigation costs might give somewhat different results but did not perform this kind of analysis (see EXP comment on IMCP citations. AND: move last 2 sentences before the malaria example. |
| G-18-110        | A     | 17        | 34        | 17      | 36      | Here "development" is used in a generic sense; could be qualified (but may also be a more philosophical question) (Government of Finland)   | Added<br>The earlier studies used “adaptive capacity” and “development” in a generic sense. Tol and Yohe (forthcoming, GEC) use more specific indicators on adaptive capacity and development, without changing the general conclusion.   |
| G-18-111        | A     | 17        | 36        |         |         | Append the following to the end of this para: “In fact, based on this contingency, Goklany (2000b) argues that aggressive mitigation that goes beyond “no-regrets” would run afoul of the precautionary principle (see also Goklany 2003, 2005a).” (Government of USA)  | Added<br>Based on this contingency, Goklany (2000b) argues that aggressive mitigation would run afoul of the precautionary principle.   |
| G-18-112        | A     | 17        | 39        | 18      | 44      | On this section in general: Here a discussion is needed of abrupt changes and the necessities of avoiding those, even if this information is not quantifiable to a large extent. It is awkward to criticise Warren (2006) and Hare (2006) for delivering qualitative evidence, but at the same time not criticising Tol et al. for ignoring important types of impacts. Further, some important literature is not assessed, e.g. Watkiss et al. 2005 “The impacts and costs of climate Change” or Kempfert and Schumacher 2005 “Cost of Inaction and Costs of Action in Climate Protection” | Added at the very end of the section a paragraph noting that abatement may reduce the probability of extreme climate scenarios, but noting that there are few studies on the effects of drastic climatic events.<br><br>Revised section, referring to FUND as an  |

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|                 |       |           |           |         |         | (Government of Germany)   | integrated assessment model (see response to E-18-270<br>We considered adding the following, but decided against it.<br>Kemfert (2004) claims that the dynamic economic impacts of climate change are far larger than the static impacts estimated by other studies. Fankhauser and Tol (2005) reach the opposite conclusion. Roson and Tol (2006) highlight a series of methodological problems with the Kemfert (2004) paper, none of which is refuted by Kemfert (2006).<br><br>Note that Kemfert and Schumacher (2005) was not peer-reviewed. |
| G-18-113        | A     | 17        | 39        | 20      | 44      | This subsection should be more documented and made consistent with information found in chapter 20 regarding the estimation of damage costs. In particular, referring only to a discount rate of 5% is not satisfying in the context of long-term impacts - see 20.6.2.<br>(Government of Belgium)  | See Chapter 20 for further discussion.<br><br>Added.<br>for a 3% discount rate, this is \$33/tC<br>for a 3% discount rate, this is €7.10 per person.<br>Noted the update of the Tol meta-analysis by Downing et al. 2006  |
| G-18-114        | A     | 17        | 39        |         |         | Sec 18.4.3 – Need to add a few sentences on the modeling of adaptation effects on mitigation.<br>(Government of USA)  | Added (in 18.4.2)<br>(making mitigation harder)<br>(making mitigation easier)   |
| G-18-115        | A     | 17        | 44        |         | 44      | Please qualify “most” for the readers. Note the number of studies reviewed by Tol (2005b), and how representative they are in the context of the literature on this topic, including those that did not report/provide marginal damage costs, and how they differ qualitatively.<br>(Government of USA)                                   | Added:<br>including 103 estimates from 28 papers published from 1991 to 2003.<br><br>(72% when quality-weighted)  |
| G-18-116        | A     | 17        | 48        | 17      | 51      | This example is flawed and should be deleted. The very same para above says, that the 7\$ are estimates of marginal cost and not average cost, so using marginals here implies estimating an “upper limit” to the damage cost. This is misleading however, since CBA has severe limitations with a view to taking into account, e.g. High | Dropped the reference to the EU<br>Added<br>See Chapter 20 for further discussion.  |

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|                 |       |           |           |         |         | impact- Medium probability events and dealing with various other uncertainties with regard to future climate changes. These limitations should be discussed here, just as limitations of other approaches in the next para are discussed. Even Tol 2003 (see references) acknowledges, that uncertainties might be too large to apply CBA. Same limitations are pointed to in chapter 19.<br>(Government of Germany)   | High impact / low probability impacts are in fact included by the likes of Ayres, Ceronsky, Hohmeyer, Hope, and Nordhaus, so we noted that some of the reviewed estimates include only a few impacts; other estimates include a wide range of impacts, including low probability/high impact scenarios.<br><br>Added:<br>Note that these estimates are highly uncertain. |
| G-18-117        | A     | 18        | 10        |         | 10      | I believe you want to reword this to make the grander statement that “adaptation and the impact of mitigation on impacts are ignored.”<br>(Government of USA)  | Disagree, as Parry does include some adaptation. Changed to “adaptation (except in some parts of the Parry study) and the impacts of mitigation on impacts are ignored.”   |
| G-18-118        | A     | 18        | 11        |         |         | Authors should note: “Goklany (2005a), based on the results of Arnell et al (2002) and the papers underlying Parry et al (2001) and taking explicit consideration of the co-benefits resulting from efforts to reduce the vulnerability to climate-sensitive problems that might worsen with climate change, shows that such an approach is at least through the 2080s, superior to either the Kyoto Protocol or any other stabilization scheme.”<br>(Government of USA) | Disagree.<br><br>This belongs in 18.4.1. Something very similar was included there in response to the US comments on that section.   |
| G-18-119        | A     | 18        | 13        |         | 14      | It would be useful to discuss the implications of omitting mitigation.<br>(Government of USA)  | Added reference to 18.4.1.   |
| G-18-120        | A     | 18        | 14        |         | 24      | This belongs in WGII chap 4 or 5 since the point here is the interplay between mitigation and adaptation, not these details.<br>(Government of USA)  | Shortened to focus on the avoided damage, added a box on stabilisation from WGI/III  |
| G-18-121        | A     | 18        | 31        | 18      | 36      | Saying that "most serious impacts can be avoided with lenient stabilisation targets such as 850 ppm equivalent" is not compatible with other studies, such as reported in Shellnhuber 2006 (Avoiding Dangerous Climate Change)<br>(Government of Belgium)  | Tol and Yohe is in Schellnhuber (2006), are the only chapter to estimate avoided impacts.<br><br>Added a box on stabilisation and noted that other integrated assessment models have yet to produce comparable analyses..  |
| G-18-122        | A     | 18        | 31        |         | 36      | This description of the Tol and Yohe (2006) work attributes a bit too much significance to this study. It is novel, provocative, and important initial work, but as Tol and Yohe note in the paper, there are a number of significant caveats. In  | Noted that FUND represents impacts in reduced form, does not capture discontinuities   |

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|                 |       |           |           |         |         | particular, with respect to the result mentioned in your p18 paragraph regarding avoiding most damages with relatively lenient targets, Tol and Yohe suggest that that the result should be interpreted qualitatively as declining marginal avoided damages with tightening stabilization targets, and the quantitative results should be viewed with skepticism. Even then, while this qualitative interpretation is intuitive, the authors also note that the impacts results should be interpreted as illustrative. FUND impacts modeling is comprehensive in a way; but, it impacts are represented in reduced form and they do not capture discontinuities or interactions between impacts. In addition, climate change is modeled as being smooth.<br>(Government of USA) | or interactions between impacts, and models climate change as being smooth.  |
| G-18-123        | A     | 18        | 33        | 18      | 35      | The characterisation of specific ppm values (i.e.. 850 and 450) as "lenient" or "stringent" is not helpful. The authors should revise these sentences.<br>(Government of Australia)   | Replaced the qualitative description with the numbers.   |
| G-18-124        | A     | 18        | 38        |         | 44      | It should be mentioned that there are no large-scale modeling studies of adaptation-mitigation feedbacks, in large part due to the rudimentary modeling of feedbacks from impacts. This should be an important research agenda. In my opinion, this is an important conclusion of this chapter that would be worth adding to the executive summary and technical summary.<br>(Government of USA)  | This comment is repetitive, except for the bit on the summaries.   |
| G-18-125        | A     | 18        | 41        | 18      | 43      | The conclusion "estimated avoided damages ... do not warrant very stringent emission reduction" is flawed, since this, inter alia, does not reflect the possible avoidance of abrupt changes when applying stringent emission reductions.<br>(Government of Germany)  | Added a reference to 18.4.1 where cost-benefit analysis is discussed.  |
| G-18-126        | A     | 18        | 50        | 19      | 2       | Four types of linkages are announced, but the subsequent lines only seem to mention two. Unless each is seen as two different types of linkages (providing/foreclosing, fostering/hindering)?<br>(Government of Netherlands)  | Yes, it is meant 2*2: M+A, M-A, A+M, A-M<br>Change to 2 types AtoM and MtoA and note that each can be + or -?                              |
| G-18-127        | A     | 19        | 37        |         | 40      | The text should note whether McDonald et al. (2006) investigate the consequences on global hunger and biodiversity, and report their results. As an aside, we note that any increase in world cereal prices would inevitably price people at the lower rungs of society worldwide out of the market and, therefore, add to hunger – unless of course these shortfalls are made up somehow (e.g., through safety nets, aid, economic improvements leading to greater purchasing power.<br>(Government of USA)  | Not the issues here. No change.  |
| G-18-128        | A     | 19        | 48        | 19      | 48      | Replace "reconfirms" with "reaffirms"<br>(Government of Netherlands)  | Reaffirm= repeat, reiterate. Here the wording, provided by a reviewer in the previous round, emphasizes reconfirm=strengthen, reinforce No |

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|                 |       |           |           |         |         |  | change.  |
| G-18-129        | A     | 22        | 3         |         | 11      | Good opening text for the chapter.<br>(Government of USA)  | Maybe, but the preceeding assessment was needed to support it. No change.                      |
| G-18-130        | A     | 22        | 17        |         | 24      | Key point of chapter. The authors might consider increasing its visibility.<br>(Government of USA)   | Yes, in ES and TS.   |
| G-18-131        | A     | 22        | 24        |         | 27      | The statement about there being few studies because the effects are marginal is unjustifiably conclusive. Suggest that the former reason is the more likely justification for there being few studies.<br>(Government of USA)  | OK Changed main to another reason ,  |
| G-18-132        | A     | 22        | 24        |         | 30      | The phrasing here misleadingly dismisses the impacts on land and water, and suggests that the adaptation implications of mitigation are in general small. This is misleading because the largest share of impacts are expected on land and water.<br>(Government of USA) | OK changed text to emphasize that in water and land A-M and M-A linkages might be significant. |
| G-18-133        | A     | 22        | 33        |         | 33      | Sections 18.5 and 18.4.4 are filled with examples and could be merged to improve readability.<br>(Government of USA)   | Accepted; merged into new 18.3   |
| G-18-134        | A     | 22        | 43        | 22      | 45      | Where is the example from? At least in Finland, the lead in adaptation has been taken by the ministry of agriculture and forestry, while the ministry of environment is also very involved in mitigation.<br>(Government of Finland)                                     | This is an example only (we say might), but it is true in the UK                               |
| G-18-135        | A     | 23        | 51        | 23      | 51      | Add "On the other hand" before "Resources devoted"<br>(Government of Netherlands)  | Declined; this is a stylistic issue  |
| G-18-136        | A     | 24        | 27        |         | 27      | This is useful material for an early framework discussion.<br>(Government of USA)  | Accepted   |
| G-18-137        | A     | 24        | 29        | 24      | 29      | The act-then-learn perspective should have one fixed name used consistently<br>(Government of Finland)   | Accepted   |
| G-18-138        | A     | 24        | 31        | 24      | 32      | The example of air conditioning has already been mentioned many times before in this chapter.<br>(Government of Netherlands)   | Accepted; it is one of the easiest to portray  |
| G-18-139        | A     | 25        | 18        | 25      | 44      | Figure 18.3 is useful, however, in the first row on "Global Policy" tends towards implicit value judgements. For example, suggest deletion of "policy lobbying by ENGOs".<br>(Government of Australia)   | Accepted   |
| G-18-140        | A     | 25        | 19        |         | 43      | Figure 18.3 is not very useful and could easily be removed.<br>(Government of USA)   | Re-done  |
| G-18-141        | A     | 25        | 46        | 28      | 27      | This would be useful text to have at the beginning of the chapter.<br>(Government of USA)  | This is a matter of choice. We do summarise the policy context in Section 18.1, but discuss    |

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|                 |       |           |           |         |         |  | it in more detail here. We think it fits better here.                                 |
| G-18-142        | A     | 26        | 8         | 26      | 8       | Insert "international" before "institutional frameworks".<br>(Government of Australia)   | Done.   |
| G-18-143        | A     | 26        | 28        | 26      | 33      | These two sentences should be deleted as they are unnecessarily critical of the capacity of the UNFCCC and add little to the discussion in the Chapter.<br>(Government of Australia) | Disagree. It is a statement of fact; no criticism.                                    |
| G-18-144        | A     | 26        | 30        |         | 30      | Replace "be unable" with "may find it difficult".<br>(Government of USA)   | Done.   |
| G-18-145        | A     | 28        | 4         | 28      | 8       | This paragraph provides little relevant information and notes that most post-2012 proposals are yet to be reviewed. Suggest deletion.<br>(Government of Australia)                   | Text has been updated and references have been added.                                 |
| G-18-146        | A     | 28        | 18        |         | 24      | This is a main point of the chapter, but is buried here.<br>(Government of USA)  | We repeat it in Section 18.8.   |
| G-18-147        | A     | 29        | 14        | 29      | 14      | This sentence needs editing: "more and more" is confusing.<br>(Government of Netherlands)  | This sentence has been deleted.   |
| G-18-148        | A     | 29        | 21        | 29      | 30      | This paragraph is explicitly policy prescriptive and exceeds the mandate of the IPCC. It should be deleted.<br>(Government of Australia)   | This paragraph has been deleted.  |
| G-18-149        | A     | 29        | 33        | 29      | 35      | This sentence needs editing, there is a verb missing.<br>(Government of Netherlands)   | This sentence has been deleted.   |
| G-18-150        | A     | 29        | 50        | 29      | 50      | There is no special working group on Forest Sinks in the ECCP, maybe the working group on impacts and adaptation is meant here?<br>(Government of Netherlands)                       | This sentence has been deleted.   |
| G-18-151        | A     | 29        | 51        | 29      | 51      | The abbreviation should be ECCP. The next phase (ECCP II) could also be mentioned, since it also includes adaptation as a policy goal<br>(Government of Finland)                     | This sentence has been deleted.   |
| G-18-152        | A     | 29        | 51        | 29      | 51      | Replace "ECPP" with "ECCP"<br>(Government of Netherlands)  | This sentence has been deleted.   |
| G-18-153        | A     | 30        | 39        | 30      | 42      | Delete sentence beginning "Equally, linkages...." this sentence is policy prescriptive.<br>(Government of Australia)   | This sentence has been deleted.   |
| G-18-154        | A     | 31        | 35        | 31      | 38      | Who are "they"?<br>(Government of Netherlands)   | This has been corrected.  |
| G-18-155        | A     | 32        | 36        | 32      | 38      | The sole inclusion of the example of the CBD is unnecessary. Suggest deleting.<br>(Government of Australia)  | This sentence has been connected to the next paragraph. The paragraph has been moved. |
| G-18-           | A     | 33        | 6         |         | 13      | Section 18.6.3 could be easily merged with 18.6.2  | Done.   |



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| 156                    |              |                  |                  |                |                | (Government of USA)   |                                  |
| G-18-157               | A            | 33               | 35               |                |                | One example of actors who combine the two is land use planners; planning is an important way of integrating goals of social development to environmental goals and climate change adaptation and mitigation.<br>(Government of Finland) | Accepted                         |
| G-18-158               | A            | 34               | 6                | 34             | 7              | "A clear, comprehensive, analytical framework..." Is this possible?<br>(Government of Sweden)   | Rewritten                        |
| G-18-159               | A            | 34               | 21               |                | 22             | Global effects may be small, but what about regional and local effects? As noted elsewhere in the chapter, these are clearly important for impacts and adaptation responses.<br>(Government of USA)                                     | Accepted                         |
| G-18-160               | A            | 34               | 42               |                | 44             | This is a very important point that should be made with the earlier discussion of long-term modeling—exogenous GDP projections are going to be an obstacle for modeling adaptation-mitigation linkages.<br>(Government of USA)          | Rewritten                        |
| G-18-161               | A            | 34               | 44               |                | 46             | A lot if work has been done with respect food security in conjunction with the Millennium Development Goals. We would recommend looking at them.<br>(Government of USA)   | Accepted                         |

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**Chapter 18**

**Late comments from Govt of Mexico:**

|    |    |    |    |    |   |   |
|----|----|----|----|----|---|---|
| 18 | 2  | 29 | 2  | 30 | Suggestion to add the word "predominantly", in accordance with the text of the chapter, to read: "both the costs and benefits of adaptation accrue predominantly locally" | We have added "and nationally"  |
| 18 | 2  | 49 | 2  | 49 | Could the word "effective" be more appropriate than the word "efficient" in this sentence?  | No, it is about the efficient use of financial resources.                                     |
| 18 | 8  | 24 | 8  | 26 | What does "it" refer to in this phrase? Maybe you could add: "In a parallel way, (a system's) mitigative capacity ..."  | There is no "it" in these lines.  |
| 18 | 30 | 2  | 30 | 3  | Too policy-prescriptive, even for this section of the chapter, which as a whole sounds policy-prescriptive.   | The section as a whole has been rewritten with the aim of making it less policy prescriptive. |
| 18 | 30 | 15 | 30 | 18 | Again, too policy-prescriptive.   | See above.  |
| 18 | 30 | 33 | 30 | 37 | Sentence is not clear.  | Rephrased.  |
| 18 | 33 | 10 | 33 | 10 | Suggestion to substitute "has begun" by "has been recognised".  | Relevant paragraph has been deleted.  |