

**Synthesis Report
Fifth Assessment Report**

COLLATED GOVERNMENT COMMENTS ON FINAL DRAFT

**– ALL COMMENTS BATCH A
incl. Annex with additional material received by 10 October 2014**

**– ALL COMMENTS BATCH B
received after 10 October 2014**

13 October 2014

Government comments Batch A

Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
Gen A-1	General					Whole Report	Please insert page numbers. [Government of United Republic of Tanzania]
Gen A-2	General	0				Whole Report	Overall, the text of the SPM still has quite a lot of technical detail. Prior to the 40th Session, we recommend that the authors carefully consider what content is essential to the SPM and what could be left in the underlying report. This may also help to limit direct repetition between the SPM and underlying report. Some specific suggestions are included in other comments. In particular, we found that the level of technical detail coming from the WGIII areas of the report was especially high and would benefit from further consideration. [Government of Canada]
Gen A-3	General	0				Whole Report	The addition of headline statements to the SPM, as with the WGI SPM, is a very welcome improvement. Further work could be done to sharpen these statements to increase their relevance to policymakers, as many are very general and may not have significant impact. We had also previously recommended being consistent in how bolded sentences are used in an IPCC SPM. We note that use of such formatting is still inconsistent in this final draft of the Synthesis Report and sometimes makes the text more difficult to understand. Although each of the WG reports used a different formatting and writing style, we encourage the SYR to adopt a consistent approach." [Government of Canada]
Gen A-4	General	0				Whole Report	A missed opportunity in this SYR is to draw together information on how the science has changed since the AR4. This is a key interest to policymakers and it is important that the IPCC demonstrate that it can pull together an effective story about how the science has evolved over the past seven years. Suggest the authors consider whether there are ways to further develop this kind of messaging in the final phases of the SYR development or in the communication and outreach on the report. [Government of Canada]
Gen A-5	General	0				Whole Report	The FD SyR is a great effort to integrate the information contained in the three volumes of the AR5, and therein lies its value. We appreciate the clearer and more developed structure and the additional headlines with respect to the FOD SyR. However, we think there is still room to give more added value, crosscutting and integrating the findings of climate projections and their impacts with responses from risk management adaptation and mitigation, adding some more graphics elements and some more details when addressing temporal or spatial information. [Government of Spain]
Gen A-6	General	0				Whole Report	It is suggested that the SPM include a table of contents with its complete structure [Government of Spain]
Gen A-7	General	0				Whole Report	Generally the report is well written and it is clear that much effort has been put into making the figures good and informative. It is however important to keep figures and table simple. Many figures contains a lot of information and some contains several panels, which makes it difficult to extract information from the figures. [Government of Denmark]
Gen A-8	General	0				Whole Report	<ul style="list-style-type: none"> • Lack of consistency with approved texts as appeared in adopted SPMs (WGI, WGII, WGIII). • The structure of SPM has changed as less bold lines are present instead each section/sub-section contains a bold statement compared to FOD. Hence, it is important that negotiated texts should be used from SPMs of WGs. • It is also noted that while there has been attempt to modify FOD, significant changes have been made in terms to sub-headings for example, FOD included 3.1 Mitigation Pathways, FD includes 3.1 Foundation of Decision Making for Climate Change. • In FD 4. Adaptation and Mitigation Measures has been reduced significantly with significant amount of new texts has been added. • Mitigation measures from Agriculture, Land use or AFOLU are missing from SPM of SYR FD. SPM of FD of SYR contains too many 'risks' in the title of section heading or sub-section heading. [Government of Saudi Arabia]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
Gen A-9	General					Whole Report	Mitigation should precede adaptation almost each time in the document where the two terms appear close to each other. [Government of France]
Gen A-10	General	0				Whole Report	We appreciate the efforts of the author team to improve the structure of the SYR since the last draft and the attempt to deliver a real synthesis and provide an integrated picture of all the information assessed in the three WG contributions and recent Special Reports to the AR5. We would also like to express our appreciation for the headline statements throughout the report. Our comments are meant to further improve the quality of the SYR and its SPM for policy makers. [Government of Germany]
Gen A-11	General	0				Whole Report	In the SYR and its SPM, climate policy is often presented in a rather negative way. The text very often highlights risks and challenges of mitigation. The finding that non-action would be even more challenging and would entail even more risks does not always become clear. We suggest to modify the text accordingly. [Government of Germany]
Gen A-12	General	0				Whole Report	When providing information about observed changes or about attribution of climate change starting at a certain point in time, please indicate if this timing is due to the quantity discussed or due to the availability of data. This concerns for example the sentence on P 6 L 2-3 "Ocean warming dominates the increase in energy stored in the climate system, accounting for more than 90% of the energy accumulated between 1971 and 2010 (high confidence)." [Government of Germany]
Gen A-13	General	0				Whole Report	Our comments on the SPM are also valid for the underlying report though we do not always reiterate our remarks. It is assumed that a coherent text will be provided by the authors and that the changes in the SPM will be transferred to the underlying report, in particular with regard to the headline statements. [Government of Germany]
Gen A-14	General	0				Whole Report	The integration of mitigation and adaptation aspects in the SYR, in particular the SPM and the headline statements, is highly appreciated. However, statements such as the headline statement of Section 3 "Adaptation and mitigation are complementary strategies for reducing and managing the risks of climate change." might suggest that adaptation is the preferred option, as it is mentioned first. However according to the AR5, the prior response strategy to meet climate change is mitigation. The AR5 clearly shows that without mitigation, risks will increase and the prospects for adaptation might become limited. See for example Section C2 of the WG2 SPM: "Prospects for climate-resilient pathways for sustainable development are related fundamentally to what the world accomplishes with climate-change mitigation. Since mitigation reduces the rate as well as the magnitude of warming, it also increases the time available for adaptation to a particular level of climate change, potentially by several decades. Delaying mitigation actions may reduce options for climate-resilient pathways in the future. Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits." Thus, we recommend to mention "mitigation" first. This concerns not only the expression "adaptation and mitigation" but also the sequence of subSections in Topics 3 and 4. This request applies to the entire SYR and its SPM. [Government of Germany]
Gen A-15	General	0				Whole Report	General comment concerning Impacts and Adaptation: compared to the First Order Draft, we have the impression that conclusions on tangible impacts and concrete adaptation options on a sectoral and regional level have been reduced in the present SPM. Especially, central conclusions from SYR Topic 4, 4.2 "Response Options for Adaptation" are missing that have initially been part of the SYR SPM First Order Draft (SPM Chapter 4.3). We encourage the authors to not fall back behind WG2 and SYR First Order Draft. [Government of Germany]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
Gen A-16	General	0				Whole Report	Please include numbers in the SPM for emission reductions required to reach the 2 °C limit (e.g. 40-70% reduction by 2050; 55 Gt / yr by 2030; 80 % RE in 2050 etc.). This is relevant information that should be presented in the SPM. We have made specific comments on the text in this regard. [Government of Germany]
Gen A-17	General	0				Whole Report	The reference levels for the projected changes do not always become clear throughout the text. Please make sure that the reader always knows exactly if the ranges given refer to the present or to the pre-industrial level, e.g. for temperature or sea level rise. [Government of Germany]
Gen A-18	General	0				Whole Report	This version of the SYR is much better compared to the previous one, in particular on the flow of the AR5 findings. Nevertheless, it seems that the description of attribution is still somehow weak in relation to attribution of climate change to causes vs. attribution of impacts to climate change, i.e., the link between WGI- and WGII-type attribution. [Government of Switzerland]
Gen A-19	General	0				Whole Report	The clarity of the headline statements has also improved. It was noticed that most but not all are brought up from the SYR into the SPM. It may be worth considering also bringing forward the very few that are currently only given in the full text (1.6, 1.7, part of 2.3, 4.4 ?). [Government of Switzerland]
Gen A-20	General	0				Whole Report	The SYR aims to make use of the totality of the information available in the individual WG's AR5 reports in an integrated manner [Government of Switzerland]
Gen A-21	General	0				Whole Report	It is important for the reader to understand there has been much progress and increased evidence since AR4. The increased knowledge base for the AR5 cycle, as highlighted in all three individual AR5 reports, is worth being noted in the SYR. [Government of Switzerland]
Gen A-22	General	0				Whole Report	In order to reduce popular misunderstanding/misinformation, it might be helpful to explain somewhere early in the document on that 2 degree C is not a target set by IPCC but why it is the basis of the assessment in AR5. [Government of Switzerland]
Gen A-23	General	0				Whole Report	In general, there is little mention of population scenarios in the SYR. [Government of Switzerland]
Gen A-24	General	0				Whole Report	In the Contents, write: "1.7 Human responses to climate change: mitigation and adaptation". [Government of Switzerland]
Gen A-25	General	0				Whole Report	The Government of Belgium would like to express its appreciation for the very large amount of work that went into the SYR contribution to the AR5 and for integrating most of our previous amendments. The comments made below are meant to further improve the text of the SPM, in order to make it more policy-relevant while fully respecting the scientific assessment made in the underlying reports. [Government of Belgium]
Gen A-26	General	0				Whole Report	The SYR (in particular its SPM), still appears more as juxtaposition of the WG contributions than as a real synthesis. However, progress was made with respect to the first draft and we would recommend further work in that direction. Many (bold) headline statements appear to come directly from the WG reports, and sometimes lack the clarity that needs to be provided by the context. We hope that the integration will be further improved in the next version. [Government of Belgium]
Gen A-27	General	0				Whole Report	There is a frequent confusion about the "century half-time" of CO2 in the atmosphere. Therefore it is important to explain that the stabilisation of concentrations or temperatures, at any level, requires that CO2 emissions decline to zero in a more or less close future depending on the level of emissions. It would be useful to mention that a fraction of the emitted CO2 remains in the atmosphere for longer than 1000 years. This should be explained in the SPM, and we think that it should also be briefly mentioned in the box on Article 2. [Government of Belgium]

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Gen A-28	General	0				Whole Report	The negative exponents, such as in GtCO ₂ eq yr ⁻¹ , may not be clear to all readers. Please replace them with the "divided by" notation, such as GtCO ₂ eq / yr. [Government of Belgium]
Gen A-29	General	0				Whole Report	General comment: In many statements about irreversibility it is not clear if the report is talking about the physical system, human, ecosystems. Examples provided below. [Government of Chile]
Gen A-30	General	0				Whole Report	Over the whole document there is no reference to "upwelling regions". This could be beneficial to better understand impacts and projections that are related to fisheries, ocena net Primary Production , marine ecosystems... [Government of Chile]
Gen A-31	General	0				Whole Report	Commend core writing team's untiring work in revising draft as it has become much more reader-friendly. Would like to see core elements of final draft retained upon approval. [Government of Japan]
Gen A-32	General	0				Whole Report	There are two kinds of expressions; "surface temperature (e.g. SYR-12 line.7)" and "surface air temperature (e.g. SYR-13 line.3)", and their meanings seem to be the same. These two kinds of expressions should be unified. As for expressions in the WG1 report, "global mean surface temperature" is utilized so that the former expression (without "air") will be preferable. [Government of Japan]
Gen A-33	General	0				Whole Report	<p>The Chinese government appreciates the author team and the Technical Support Unit of the Synthesis Report of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) for their contribution to the preparation of the present report, and wishes to take this opportunity to make the following comments in a hope that they can be adopted in subsequent modification processes. It believes that:</p> <p>I. The Synthesis Report and its Summary for Policy Makers(SPM) are of great usefulness to policy makers in their effort to develop climate change related policies. Any scientific conclusion quoted in the Report but stated in an incomplete manner or with preconditions or uncertainties omitted might be misread by policy makers. Therefore, it is suggested that a scientific conclusion taken from any of the three Working Groups' report should be quoted in its entirety in the longer report and SPM of the SYR.</p> <p>II. Mitigation and adaptation, which are of equal importance to climate change response, should be formulated in a balanced way in the Synthesis Report. However, the present draft SPM and its longer report give much less exposition on adaptation than on mitigation. The text on adaptation should be reinforced appropriately.</p> <p>III. About information related to Article 2 of the Convention, it is noted in the longer report of the Synthesis Report (lines 28-29, page 125), "Determining whether anthropogenic interference is 'dangerous' involves both risk assessment and value judgment and would be outside the IPCC mandate". Therefore, the mandate of the present report is to present policy makers with a full account of the scientific assessment of the current knowledge to inform their policy decisions related to the "dangerous level". However, information on "dangerous level" as stated in the current box singled out one scenario (the one associated with 66% of simulations meeting goal) and corresponding pathway to hold the warming below 2°C. It is suggested to add descriptions of other scenarios with possibility to achieve the 2°C to inform readers and policy makers from more than one dimensions.</p> <p>IV. The 12th session of IPCC WGIII modified or deleted some controversial text on the topic of international cooperation from the SPM of the WGIII contribution to AR5. It is suggested that both the SPM and the longer report of SYR, in particular section 4.4.1, should adopt the content and related formulations in the approved SPM of WGIII contribution to AR5. [Government of China]</p>

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Gen A-34	General	0				Whole Report	The text has improved much from the earlier draft. However, the SPM still falls short of an actual synthesis and it does not provide a very good integration of the assessments of the three IPCC Working Groups. Rather, it still gives the impression of largely a copy-paste composite. [Government of Sweden]
Gen A-35	General	0				Whole Report	A general comment, and in particular regarding SPM: The text should be written with the international readership in mind. Not all readers of the english version will have english as their native language. Thus, the authors should take extra care to avoid complex and long sentences. In particular run-on sentences should be avoided. Preferably, long sentences should be broken up into shorter ones. Attending to this kind of style details will make the text easier to understand and digest and for the intended readership. And furthermore, it will lend the text easier to translate without losing the precise meaning of the original text. Last but not the least, it will ease the approval session by avoiding unnecessary confusion and misunderstanding. [Government of Sweden]
Gen A-36	General					Whole Report	Perhaps it can be described somewhere that we as humans have not experienced these kind of CO2-levels before. We are thus in the middle of an experiment. It is therefore possible that surprises can occur. There can be risks that we have not yet identified. [Government of Sweden]
Gen A-37	General					Whole Report	It would be useful to, at an early stage in the SYR, insert a reference to the Glossaries of the three WGs. Many authors have invested a lot of time and energy here and the result is highly useful, for scientists as well as policy-makers. The glossaries can be linked to under the respective WGs on the IPCC web page. Footnote? [Government of Sweden]
Gen A-38	General					Whole Report	Overall layouting comment SPM: In the final print layout it is important that figure captions should be on the same page as the figure. It is hard to follow when the caption continues over onto the next page (e.g. Figures SPM.1 and SPM.2). [Government of Sweden]
Gen A-39	General	0				Whole Report	Consistency throughout the document concerning the use of "CO2 equivalent" or "CO2-equivalent" [Government of Sweden]
Gen A-40	General	0				Whole Report	The deadline for literature included in the reports should be noted somewhere. [Government of Sweden]
Gen A-41	General	0				Whole Report	In for example Fig SPM 8, risks with temperature increases of 2 and 4 degrees. It would be relevant if also risks associated with higher temperature increases were discussed in the figure our in text. Since there is a possibility for higher temperatures, this could be discussed. [Government of Sweden]
Gen A-42	General	0				Whole Report	It would be good if the risk levels in the report could be described a little bit more. For example in Fig SPM9, what probability levels are we discussing? [Government of Sweden]
Gen A-43	General	0				Whole Report	The Reasons for Concern should be included in the SPM [Government of Sweden]
Gen A-44	General	0				Whole Report	We think the draft has improved compared to the previous one and we thank the authors for their work. [Government of Netherlands]

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Gen A-45	General	0				Whole Report	Potentially, this Synthesis Report is the most policy relevant of the entire AR5, because it could draw conclusions concerning the entire cause-to-effect-chain, including options for dealing with climate change and the feedback of adaptation and mitigation on the climate system. Although some synthesis is present in the current draft, much more needs to be introduced. A Synthesis Report that would consist solely of cut-and-past from the already adopted reports of the AR5 cycle would not have an added value and would be a waste of a vast amount of effort put into the drafting by the authors and of large sums spent on the review and the intergovernmental process. [Government of Netherlands]
Gen A-46	General	0				Whole Report	GENERAL COMMENTS: There is a need to strenght the balance in this summary of adaptation with respect to mitigation. It appears like the summary is giving advantage to the promotion of the geoengineering as a mitigation solution. The fundamental rol of the summary is to provide a general view of the fifth assessment report, giving always the certainty that there are a need of ethical and precautionary principles in the consideration of the actions to limit the GEI. [Government of Venezuela]
Gen A-47	General	0				Whole Report	We believe that the current draft of the SYR is in much better shape than the previous version. The headline statements in shaded bold in the SPM text are in our view very important for policymakers and in general really well written. We also appreciate and support the structure you have choosen in the current draft both in the SPM and the Full report. [Government of Norway]
Gen A-48	General	0				Whole Report	The term "non-CO2 gases" is not consistently used and in most cases not sufficiently explained throughout the SYR. Figure 4.1 caption is a good example where we believe it is clear how the term is to be understood in that particular context. Please check for consistency and clarify the use of "non-CO2 gases" troughout the SYR. [Government of Norway]
Gen A-49	General	0				Whole Report	All throught the review process of AR5 we have been stressing how the term impact has been used, and we now feel that the use of this has improved throughout the document. [Government of Norway]
Gen A-50	General	0				Whole Report	The document jumps right in to summaries of the 3 sections, but could improved by starting with a summary of the overaching conclusion. [Government of United States of America]
Gen A-51	General	0				Whole Report	This document should be prepared so as to be effective for the people who will only read the gray boxes. This report is a story, of what happens if we don't act, and what can happen if we do... it should be an effective story. [Government of United States of America]
Gen A-52	General	0				Whole Report	For the whole document, use the letters to identify the exact panel when referring to only one in a multi-panel figure. These figures can be quite complex and hard to read (small). For a policymaker, it could be time consuming to try and figure out which one is the relevant panel. [Government of United States of America]
Gen A-53	General	0				Whole Report	Many of the figures and tables - as well as the captions - are remarkably dense. And while they convey a great deal of valuable information, they may be impenetrable to the policymaker or public. The authors should consider whether simpler figures and tables can be used in the SPM especially. For example, figures SPM.4 adn SPM.8 contain a lot of information - much of which is quite similar. Can they not be combined in some way to reduce the space and retain much of the same information (with both figures still being retained in the underlying report)? With regard to the captions, consider very short succinct 2-3 sentence descriptions of what the plots show, with a clear reference to the full caption in the underlying report. [Government of United States of America]
Gen A-54	General	0				Whole Report	Several figures and tables could benefit from including error bars. Providing such 'variability' is useful information to a policymaker. [Government of United States of America]

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Gen A-55	General	0				Whole Report	<p>General comments:</p> <p>We would like to thank the authors for their effort to improve this draft. The structure of the draft has been improved with reasonable sub-divisions, although some sections are still needed to be improved. This draft has stronger messages in bold and boxes at the beginning of each session and sub-sessions compared to the first draft. However, it is still difficult to draw out the key messages from the SPM. There are a few diagrams/tables which are not developed in the underlying report or do not provide proper explanation, such as session 4 in the SPM.</p> <p>We therefore would like to make a number of suggestions focused on the SPM.</p> <p>[Government of Republic of Korea]</p>
SPM A-1	SPM	0	0	0	0	SPM General	<p>The UK feels that the headline statements are a very important part of the SPM and that it is essential that they contain all the key messages from the report that we want policy makers to note and that they form a clear narrative in their own right. All our suggestions in relation to the headline statements are highlighted in bold</p> <p>To a greater or lesser extent the headline messages for Sections 1 and 2 do this but the messages in Section 3 omit a number of pieces of vital information for policy makers, some of which is missing from the SYR itself or hidden in graphs. The headline statements for Section 4 do not contain information of the same policy relevance of other Sections and should be rationalised to a smaller number of statements.</p> <p>These headline statements should be expanded to include clear statements on:</p> <ul style="list-style-type: none"> • what BAU looks like in terms of emissions, temperature increase and impacts • what is required to stay below 2C in terms of emissions, technology change, investment and risks • comparison between current emission trends (emissions, decarbonisation rates etc.) and those required for 2C including current pledges and where we need to be in 2025/30 • risks of delaying action • co-benefits of action <p>Where possible statements should be supported by key facts and examples to make them more robust. The wording in the headline statements should be simplified to provide clear text in a style that can be picked up and used a free standing key messages and quotes. In our proposed amendments we have gone some way to doing this but further will be required once the content of the statements have been agreed.</p> <p>It would be helpful to be able to put all the boxes together at the beginning of the document to make a coherent 1-2 side narrative - this could be an excellent communications tool</p> <p>[Government of United Kingdom of Great Britain & Northern Ireland]</p>
SPM A-2	SPM	0	0	0	0	SPM General	<p>In our comments below we have largely worked within the existing structure of the report, however we feel this could be improved to give a clearer narrative and flow of information and reduce the repetition of information. Specifically we would suggest:</p> <ul style="list-style-type: none"> • the information in 2.1 doesn't really form part of the narrative of the SPM so would be better in a Box • Section 3.1 should be moved to Section 4 to improve the narrative • the information on RFC and risks of 4C warming should be moved from Section 3.2 to Section 2.3 to keep all the text on climate risks together • Section 3.3 and 3.4 should be swapped around to make more of a logical flow • Section 3.4 contains a lot of important information and is quite long so would be better split into two parts i) where we need to be to reach 2C and ii) where we currently are • Section 4 should be shortened and rationalised into a smaller number of sections <p>[Government of United Kingdom of Great Britain & Northern Ireland]</p>
SPM A-3	SPM	0	0	0	0	SPM General	<p>In most cases throughout SYR adaptation is listed before mitigation. Unless there is a specific reason not to do so, mitigation should always come first. Although both are important mitigation should be the primary focus, followed by adaptation to the changes occurring.</p> <p>[Government of United Kingdom of Great Britain & Northern Ireland]</p>

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SPM A-4	SPM	0	0	0	0	SPM General	The meaning of confidence statements should be clearly explained in the text and they should be consistently applied throughout the body of the text for both the SPM and the main SYR. Confidence statements should not be used in the headline statements. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-5	SPM	0	1	127	40	SPM General	The report should be more concise, some ancillary information can be reduced, the narrative needs to be clear based on the structure of the report the the headline topics. Use of RCP term is quite obscure for Policy makers some simpler way of communication is needed here. [Government of Ireland]
SPM A-6	SPM	0				SPM General	The line numbers used refer to the high-resolution Draft of the SYR. [Government of Finland]
SPM A-7	SPM	0				SPM General	The headlines statements are a good way to bring up the most important messages. These messages should be clear and concrete, not abstract and they should not contain conceptual statements. [Government of Finland]
SPM A-8	SPM	0				SPM General	A general comment is that SYR should more clearly state the key assumptions involved in different modelling approaches, such as i/ regarding how costs for different techniques may develop in the future (costs for some renewable energy sources has been reduced - is that included in the scenarios?) and ii/ baseline development in emissions scenarios do not take into account impacts of a changing climate. This would help understanding and making use of the results presented in SYR. [Government of Sweden]
SPM A-9	SPM	0				SPM General	For all figures: Please be consistent with figure titles (on top of the figure) as some figures have a main title (Fig SPM2, 3, 8, 9, 13) while the others don't have one. We suggest for clarity that all figures should have a main descriptive title on top of the figure. [Government of Norway]
SPM A-10	SPM	0				SPM General	It is important to link in the case of the extremes the relationship between the past, present, and future. These are not linked. [Government of Bolivia]
SPM A-11	SPM	0				SPM General	We thank the authors for their efforts in producing this new draft of the SYR. We are pleased to see some synthesis/integration of the results from all three WG reports. The inclusion of headline messages (boxes) is very much appreciated. The SPM would, however, benefit from clearing phrasing of key findings and better highlighting of the new information since the AR4, and the key messages should contain more substance that can help guide policy makers rather than general overarching statements. In some cases, these statements don't contain new information and in many it would be useful to provide quantification. Efforts should be made to improve the overall readability of the SPM, making wherever possible the statements simpler and clearer to policy makers. However, the overall storyline of the SPM is sometimes not clear and still looks fragmented. [European Union]
SPM A-12	SPM	0				SPM General	While it makes sense that Topic 3 and 4 are distinct sections in the main body of the report, it is not obvious that the information found in Sections 3 and 4 of the SPM should be separated. Perhaps these could be merged to tell a clear story to policy makers. [European Union]
SPM A-13	SPM	0				SPM General	The use of acronyms could be reduced in the SPM. Especially those that are not very common to policy makers and not used many times throughout the SPM could be avoided, e.g. BECCS, CDR, SRM. [European Union]
SPM A-14	SPM	5	1	18	49	SPM General	The structure of sections 1 and 2 has greatly improved as well as the clarity and readability. Thanks to the writing team. [Government of Austria]
SPM A-15	SPM	5	1	31	34	SPM General	The text of the SPM lacks a threading narrative. The authors should seek out opportunities to weave a consistent story - making the text less dense and more comprehensible to the layperson, drawing in specific, compelling examples of observed changes, projected changes, uncertainties, etc. where necessary. [Government of United States of America]

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SPM A-16	SPM	5	1	31	34	SPM General	Generally speaking, much of the text in the SPM is qualitative in nature. The underlying reports are loaded with compelling quantitative information that would be valuable for a policymaker to have. The authors should consider including more quantitative information in the text of the SPM. These quantitative statements could serve as the illustrative examples (i.e., of observed changes, projected changes, etc.) that policymakers find compelling. [Government of United States of America]
SPM A-17	SPM	5	1	31	34	SPM General	Some of the figures have very long explanations that can be reduced substantially by removing sentences that explain additional details of the figure. The explanations are so long that they tend to defeat the purpose of an illustration. [Government of United States of America]
SPM A-18	SPM	5	1	31	34	SPM General	The boxed statement in p. 13 mentions that the oceans will warm and continue to lose oxygen, while in the preceding boxes highlighting observations, there is no mention of oxygen. So either take it out or mention something in p. 6 lines 14-15 (maybe the statement in p.37 lines 25-27). [Government of United States of America]
SPM A-19	SPM	5	1	31	34	SPM General	Figure SPM 8 and Figure SPM 4 are intended to present similar type of information for the present and future, hence they use the same symbols. It would be easier to appreciate the parallelism if the figures were made the same way. That is, why not make Figure SPM 4 more like SPM 8, skip the continents in the background, and the confusing mix of symbols and bars scattered all over the globe? [Government of United States of America]
SPM A-20	SPM	5	1	31	34	SPM General	The overall messages in the headline statements and the underlying text - especially in the adaptation sections (Sec 3.3-3.4, 4-4.5) are unclear. [Government of United States of America]
SPM A-21	SPM	5	1	31	34	SPM General	There are very few references to the vulnerability of wealthier countries to climate change, despite this being a theme of the WG2 report, esp post-Yokohama. The authors should strive to present a balanced perspective on vulnerabilities (developed and developing) and impacts (positive and negative), as appropriate. [Government of United States of America]
SPM A-22	SPM	5	5	5	7	SPM Introduction	Shorten by combining the two sentences e.g. "This report provides an integrated ..." [Government of Ireland]
SPM A-23	SPM	5	5	5	7	SPM Introduction	We would like to strengthen the first two sentences to better express that the SYR synthesizes and integrates (see Scope, Content and Process for the Preparation of the Synthesis Report (SYR) of the IPCC Fifth Assessment Report (AR5) (Scoping Document)). We suggest to rephrase these two sentences to: "This Synthesis Report (SYR) puts the main findings of the three Working Group contributions and both Special Reports of the AR5 cycle (include footnote) into perspective relative to each other. It draws conclusions beyond those that were possible in each of the other AR5 reports individually." FOOTNOTE: Climate Change 2013: The Physical Science Basis, Climate Change 2014: Impacts, Adaptation and Vulnerability, Climate Change 2014: Mitigation of Climate Change, Renewable Energy Sources and Climate Change Mitigation, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. [Government of Netherlands]
SPM A-24	SPM	5	5		7	SPM Introduction	<ul style="list-style-type: none"> The SPM of SYR should focus on 3 approved SPMs (WGI, WGII, WGIII) and should use approved texts as much as possible in order to assure successful outcome of AR5. This will avoid not re-negotiating texts in SPM of SYR and SYR as a whole. For example, SPM of FD of SYR (P5, L5-7) refers reports of the Working Group contributions. This shall be replaced with exact reference of SPMs (WGI, WGII, WGIII) which are long-hour negotiated and approved outcomes of AR5 reports. [Government of Saudi Arabia]
SPM A-25	SPM	5	6	5	6	SPM Introduction	Please consider to include a footnote which lists as a minimum the abbreviations for the two relevant Special Reports. We recognise and appreciate that they have been explicitly spelled out in the introduction of the full Synthesis report (page SYR-33), but believe that this is also relevant information for the readers that only reads the SPM. [Government of Norway]
SPM A-26	SPM	5	6	5	15	SPM Introduction	• SPM SYR [P5 L7] insert details of special reports. [Government of Saudi Arabia]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-27	SPM	5	9	5	9	SPM Introduction	We propose to delete "Follows the structure of this report, which contains" and replace with "Provide key conclusion on" [Government of United Republic of Tanzania]
SPM A-28	SPM	5	9	5	9	SPM Introduction	The reader should understand whether this SPM refers to the whole AR5 or to the SYR. Replace: "structure of this report" with "structure of the underlying report" [Government of Finland]
SPM A-29	SPM	5	9	5	9	SPM Introduction	Write:"... the structure of the underlying Synthesis Report, which ...". [Government of Switzerland]
SPM A-30	SPM	5	9	5	9	SPM Introduction	The following, simpler wording is suggested: "This summary addresses the following topics". The current text is unnecessarily convoluted. [Government of Austria]
SPM A-31	SPM	5	9	5	11	SPM Introduction	Shorten by combining the information e.g. "The report is structured ..." [Government of Ireland]
SPM A-32	SPM	5	9	5	12	SPM Introduction	Suggest replacing the word "contains" in these sentences with "addresses" and "includes". From an English language perspective, "contains" does not convey the right sense in these particular sentences. For example, on line 9, suggest stating "...which ADDRESSES the following topics..." and on line 11, suggest stating the "The report also INCLUDES..." [Government of Canada]
SPM A-33	SPM	5	11	5	11	SPM Introduction	Please, add '(page 19)' after the word "a Box" [Government of Finland]
SPM A-34	SPM	5	11	5	11	SPM Introduction	Write:"... measures. This report also ...". [Government of Switzerland]
SPM A-35	SPM	5	11	5	12	SPM Introduction	Please, replace: " relevant to the Article 2 of the United Nations..." with "relevant to the ultimate objective of the United Nations..." [Government of Finland]
SPM A-36	SPM	5	11	5	12	SPM Introduction	Explain what Art 2 is i.e. Objective of the UNFCCC to prevent dangerous climate change etc [Government of Ireland]
SPM A-37	SPM	5	12	5	12	SPM Introduction	Please consider to rewrite ": Objective in" so that the sentence reads "... relevant to Article 2: Objective in the United ...". Rationale: this is more in line with how it is formulated in the Convention. [Government of Norway]
SPM A-38	SPM	5	14	5	15	SPM Introduction	Please, change the sentence as follows: The uncertainty in key assessment findings in this report is expressed in the same way as in the the Working Group and Sepcial Reports. [Government of Finland]
SPM A-39	SPM	5	14	5	18	SPM Introduction	Remove unnecessary wording e.g. "it is based on the author team", "where appropiate" these are understood. [Government of Ireland]
SPM A-40	SPM	5	14	5	18	SPM Introduction	It would be of value to include cut off dates for publication of the underlying material. This could shorten following text [Government of Ireland]
SPM A-41	SPM	5	16	5	17	SPM Introduction	Confidence and likelihood terms given as examples in the text and in footnote 1 should be set in italics. [Government of Canada]
SPM A-42	SPM	5	16	5	17	SPM Introduction	Couldn't a more detailed explanation be given as to when it is possible to express the certainty probabilistically? [European Union]
SPM A-43	SPM	5	17	5	18	SPM Introduction	Does this sentence also apply to shaded / bolded statements as well as to the main body of text. At least four of the bolded statements include uncertainty qualifiers, suggesting that all the others are all considered statements of fact. It is unclear why a statement such as "there are many opportunities to link mitigation, adaptation and the pursuit of other societal objectives through integrated responses " (p.31, l.16-17) requires a confidence qualifier when other statements do not. Suggest reviewing. [Government of Canada]
SPM A-44	SPM	5	20	5	20	SPM Introduction	Insert a paragraph explaining the references in curly brackets at the end of the statements refer to the underlying Synthesis Report. [Government of Switzerland]
SPM A-45	SPM	5	21	5	21	SPM 1	Please, add to the title: Observed changes, impacts and their causes [Government of Finland]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-46	SPM	5	21	5	21	SPM 1	Section 1 - Observed Changes and their Causes needs to touch on all issues as included in Topic 1. While the discussion on observed changes, impacts, climate change drivers and extreme events includes sufficient detail, information on other major issues such as exposure, vulnerability, adaptation is either completely lacking or was summarily coupled with information related to other Topics. The SPM will often be read as a standalone document, without the benefit of the detail in the underlying chapters, therefore it is important to ensure a balanced discussion of the issues. [Government of Switzerland]
SPM A-47	SPM	5	21	6	26	SPM 1	This section is missing information regarding Arctic warming (other than sea ice extent). [European Union]
SPM A-48	SPM	5	23	5	23	Headline 1	Does "clear" mean "virtually certain"? If appropriate, defined uncertainty terminology should be used. [Government of United States of America]
SPM A-49	SPM	5	23	5	25	Headline 1	Put a full stop after the word "clear". After "... in history", add the following "and human influence is extremely likely to have been the dominant cause of the observed warming since the mid-20th century." (from page 8, lines 10-11). [Government of Finland]
SPM A-50	SPM	5	23	5	25	Headline 1	Write:"Human influence on the climate system is clear and has been detected in all components of its components. It is extremely likely that it has been the dominant cause of the observed warming since the mid-20th century. Increasing anthropogenic emissions of greenhouse gases in recent decades are the highest in history. The climate changes that have already occurred have had widespread and consequential impacts on human and natural systems." [Government of Switzerland]
SPM A-51	SPM	5	23	5	25	Headline 1	Clear messages but inclusion of a comment on observed atmospheric GHGs may be useful [Government of Ireland]
SPM A-52	SPM	5	23	5	25	Headline 1	Message in bold and box: current message, "Human influence on ... and natural systems", would have been given as a key message of the Session1 entitled as Observed changes and their causes, but is not well represented robust findings gained from observed changes through AR5, such as 'warming of the climate system is unequivocal ~'. Therefore we would like to suggest revising the current message to reflecting main messages of the observed climate changes from the underlying report and WGI AR5. [Government of Republic of Korea]
SPM A-53	SPM	5	24	5	24	Headline 1	This sentence is misleading. It is necessary to consider this affirmation in the context of i) the correlation between population and anthropogenic emissions since preindustrial times in developed and developing countries, and that ii) the impacts are accumulated since preindustrial times. We suggest the following wording: "HUMAN INFLUENCE ON THE CLIMATE SYSTEM IS CLEAR, AND RECENT ANTHROPOGENIC EMISSIONS OF GREENHOUSE GASES ARE THE HIGHEST IN HISTORY BECAUSE OF THE INCREASE OF THE POPULATION THAT HAS OCCURRED WORLDWIDE WITH HIGHER DIFFERENCES IN THE PERCAPITA EMISSIONS BETWEEN DEVELOPED AND DEVELOPING COUNTRIES. THE CLIMATE CHANGES THAT HAVE ALREADY ACCUMULATIVELY OCCURED SINCE PREINDUSTRIAL TIMES HAVE HAD WIDESPREAD AND CONSEQUENTIAL IMPACTS ON HUMAN AND NATURAL SYSTEMS". [Government of Bolivia]
SPM A-54	SPM	5	24	5	25	Headline 1	The word "consequential" carries different meanings in UK English from American English. The Concise Oxford Dictionary defines it as: (1) Following a consequence, or (2) Resulting indirectly. However in American usage it also appears to carry the meaning "having significant consequences, important" (Meriam-Webster.com) which we think is the intended meaning here. We made the same comment about similar wording in the draft WG2 SPM and the sentence was changed to: "In recent decades, changes in climate have caused impacts on natural and human systems in all continents and across the oceans". We suggest use of this WG2 SPM sentence here replacing ""The climate changes that ... natural systems". [Government of New Zealand]
SPM A-55	SPM	5	24	5	25	Headline 1	The expression "climate changes that have already occurred" is not straightforward enough for a headline statement, because it holds true for every period in Earth history. Please replace this expression by "recent climate changes". [Government of Germany]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-56	SPM	5	29	5	29	Headline 1.1	Does "unequivocal" mean "virtually certain"? If appropriate, defined uncertainty terminology should be used. [Government of United States of America]
SPM A-57	SPM	5	29	5	31	Headline 1.1	Clear messages but could be restructured e.g. put statements on atmosphere, ocean etc after unequivocal [Government of Ireland]
SPM A-58	SPM	5	31	5	31	Headline 1.1	Words 'concentrations of greenhouse gases' have increased may be added after the words 'sea level has risen' [Government of India]
SPM A-59	SPM	5	31	5	31	Headline 1.1	Write: "... sea level has risen and the concentrations of greenhouse gases have increased." [Government of Switzerland]
SPM A-60	SPM	5	33	5	38	Headline 1.1	The key messages could be more prominent for e.g. suggest to start with "The global temperature has increased by 0.85 C [0.65 to 1.06] over the period 1880 to 2012". Delete technical reference to data sets, as this is in the technical section. There is no need to specify that it is at the Earth's surface [Government of Ireland]
SPM A-61	SPM	5	34	5	34	SPM 1.1	Insert "... since RELIABLE RECORDS BEGAN IN 1850." Without this additional text, the reader could be under the false impression that decades just prior to 1850 were warmer than each of the last three decades. [Government of United States of America]
SPM A-62	SPM	5	34	5	34	SPM 1.1	"...where such assessment is possible": the addition of this phrase is a little confusing on first reading. Something like 'where reliable temperature data records exist' maybe more appropriate. [European Union]
SPM A-63	SPM	5	34	5	35	SPM 1.1	The phrase "where such assessment is possible", seems to refer the reader back to the previous sentence, which is not what is intended. Suggest rewriting this sentence as follows "The period from 1983 to 2012 was likely the warmest 30-year period of the last 1400 years in the Northern Hemisphere, where such assessment is possible (medium confidence)." [Government of Canada]
SPM A-64	SPM	5	34	5	35	SPM 1.1	The current sentence, 'In the Northern Hemisphere ~ the warmest 30-year period of the last 1400 years (medium confidence)', is referred to the message in line 22 ~ 25 on page 36 of the underlying report. The referred message is supported by two cases; 800 years (high confidence) and 1400 years (medium confidence) including the warm medieval period. If the current message is aiming to emphasize the recent changes of global warming, then it shall be taken the case with 'high confidence', otherwise it is recommended to put both cases as it is in the underlying report. [Government of Republic of Korea]
SPM A-65	SPM	5	35	5	38	SPM 1.1	This sentence could be simplified to read "The globally averaged combined land and ocean surface temperature data show a linear warming trend of 0.85...etc." [Government of Canada]
SPM A-66	SPM	5	36	5	38	SPM 1.1	The warming indicated of 0.85°C is over the period 1880-2012, and then there is a reference to figure SPM-1. There is some difficulty in interpretation, since the time period (X axis) in figure SPM.1 is wider, 1850-2012, and the anomalies are referred to the period 1986-2005. [Government of Spain]
SPM A-67	SPM	5	37	5	37	SPM 1.1	Please replace "several" by "multiple" to follow the wording from the SPM of WG1 (page 5), unless there is a justification for the change. [Government of Belgium]
SPM A-68	SPM	5	38	5	38	SPM 1.1	Specify the exact graph which is referred to - "Figure SPM.1.a" [Government of Sweden]
SPM A-69	SPM	5	38	5	38	SPM 1.1	Please consider inserting a sentence from WGI SPM Section B.1 that deals with regional temperature trends: "For the longest period when calculation of regional trends is sufficiently complete (1901 to 2012), almost the entire globe has experienced surface warming." Rationale: We believe it is important that also regional findings are presented in the SYR SPM. [Government of Norway]
SPM A-70	SPM	5	38			SPM 1.1	Provide full reference of Figure 1.1 (if it appears in SYR, please mention it clearly) [Government of Saudi Arabia]
SPM A-71	SPM	5	40	5	40	SPM 1.1	Why is the robust warming described as "multi-decadal" when the previous paragraph presented robust warming over longer time scales. Should this say "century-scale warming"? [Government of Canada]
SPM A-72	SPM	5	40	5	40	SPM 1.1	Word 'averaged' may be replaced by 'mean' [Government of India]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-73	SPM	5	40	5	40	SPM 1.1	Recommend a framing paragraph inserted here to introduce the next several topics. Consider: In addition to robust multi-decadal warming, climate change is evident in a number of other ways, including ocean warming, increased precipitation, oceanic uptake of CO ₂ /acidification, heightened loss of ice sheets and increasing global mean sea level. Enumerate the multiples lines of independent evidence illustrating anthropogenic climate change. Such succinct information would be quite valued by policymakers. [Government of United States of America]
SPM A-74	SPM	5	40	5	40	SPM 1.1	This paragraph may work better later. Consider moving to end of section and supplementing (after Pg6, line 26): At the same time, the globally averaged surface temperature exhibits substantial decadal and interannual variability (Figure SPM.1). Due to this natural variability, trends based on short records are very sensitive to the beginning and end dates and do not in general reflect long-term climate trends. As one example, the rate of warming over the past 15 years (1998-2012; 0.05 [-0.05 to 0.15]°C per decade), which begins with a strong El Nino, is smaller than the rate calculated since 1951 (1951-2012; 0.12...." [Government of United States of America]
SPM A-75	SPM	5	40	5	42	SPM 1.1	Suggest state "in addition to the clear warming trend " rather than "multi decadel etc" [Government of Ireland]
SPM A-76	SPM	5	40	6	1	SPM 1.1	This paragraph should be revised for clarity and to more accurately reflect the uncertainty associated with the cause of the observed reduction in surface warming over the past five years. Australia suggests adding the following language, from WGI SPM D.1 to the SPM p6, l2. "The observed reduction in surface warming trend over the period 1998 to 2012 as compared to the period 1951 to 2012, is due in roughly equal measure to a reduced trend in radiative forcing and a cooling contribution from natural internal variability, which includes a possible redistribution of heat within the ocean (medium confidence). The reduced trend in radiative forcing is primarily due to volcanic eruptions and the timing of the downward phase of the 11-year solar cycle. However, there is low confidence in quantifying the role of changes in radiative forcing in causing the reduced warming trend. There is medium confidence that natural internal decadal variability causes to a substantial degree the difference between observations and the simulations; the latter are not expected to reproduce the timing of natural internal variability. There may also be a contribution from forcing inadequacies and, in some models, an overestimate of the response to increasing greenhouse gas and other anthropogenic forcing (dominated by the effects of aerosols). {9.4, Box 9.2, 10.3, Box 10.2, 11.3}". Alternatively, the following condensed version could be used in the same place: "This observed reduction in surface warming trend over the period 1998 to 2012 is due in roughly equal measure to a reduced trend in radiative forcing and a cooling contribution from natural internal variability. However, there is low confidence in quantifying the role of changes in radiative forcing in causing the reduced warming trend. There is medium confidence that natural internal decadal variability causes to a substantial degree the difference between observations and the simulations; the latter are not expected to reproduce the timing of natural internal variability. There may also be a contribution from forcing inadequacies and, in some models, an overestimate of the response to increasing greenhouse gas and other anthropogenic forcing (dominated by the effects of aerosols). {9.4, Box 9.2, 10.3, Box 10.2, 11.3}" [Government of Australia]
SPM A-77	SPM	5	40	6	1	SPM 1.1	Good effort to begin connecting natural variability to climate change but needs greater clarity on line 43 about what is meant by 'rate of warming'. The authors should clarify if warming is referring to surface air temperatures or globally averaged surface temperatures as used in line 40. [Government of United States of America]
SPM A-78	SPM	5	40	6	5	SPM 1.1	As long as this paragraph is in the underlying Synthesis Report, it could be deleted from the SPM. If it is retained, it should be placed at the end of Section 1.1 as the current placement distracts from the flow of key findings highlighted in the Headline Text. [Government of United States of America]
SPM A-79	SPM	5	41	5	41	SPM 1.1	Specify the exact graph which is referred to - "Figure SPM.1.a" [Government of Sweden]
SPM A-80	SPM	5	42	5	42	SPM 1.1	The authors should insert "necessarily" between "in general" and "reflect" [Government of United States of America]
SPM A-81	SPM	5	43	5	44	SPM 1.1	sentence difficult to understand. Suggested new wording: "As one example,..., a time period which begins with a strong el Nino, has been smaller than the rate calculated for the time period since...." [Government of Sweden]
SPM A-82	SPM	5	43	5	45	SPM 1.1	Example could be dropped from the text or clarified with a conclusion linking it to the previous text. [Government of Ireland]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-83	SPM	5	43	6	1	SPM 1.1	Suggest that this sentence could better explain the point that 15-year trends are volatile. To the average reader, the numbers comparing trends for the short versus long period are simply different - the text doesn't show that trends for two 15-year periods can be very different. The key point, that the assessed uncertainty range is much narrower for the longer-term trend, is not drawn out here. Consider revising. [Government of Canada]
SPM A-84	SPM	5	43	6	1	SPM 1.1	A better formulation exists in WGI and maybe also used here. The authors may also consider to compare different 15-year periods rather than comparing only a 15-year period with the rate calculated since 1951, in order to better showcase the argument of the dependence of the warming rate to the chosen starting year. [European Union]
SPM A-85	SPM	5	43			SPM 1.1	change 'past 15 years' to 'past 17 years (1998-2014)' [Government of Saudi Arabia]
SPM A-86	SPM	5	44	5	44	SPM 1.1	The reference to the period 1998-2012 beginning with a strong El Nino will only make sense to those readers who know what the effect of a strong El Nino is on global average temperature. Suggest the phrase "which begins with a strong El Nino" be deleted from this sentence as it distracts from the main message that short term trends can be different than long term ones. The detail can be left to the full SYR. [Government of Canada]
SPM A-87	SPM	5	44	5	44	SPM 1.1	The text here should probably read "which began with a strong El Nino" rather than "which begins" [Government of United States of America]
SPM A-88	SPM	5		5		SPM	Confidence statements that should be in italics are not! [Government of Finland]
SPM A-89	SPM	5				Footnote 1	Footnote 1: It is suggested to include the information on levels of confidence and likelihoods in a table [Government of Spain]
SPM A-90	SPM	5				SPM 1	Mention about management and conservation of natural resources, lifestyle change, renewable energy and low-C technologies [Government of India]
SPM A-91	SPM	5				SPM 1	The AR5 for the first time delineates that increase in global temperature due to natural variability is +/- 0.1 oC and due to anthropogenic activity is 0.6 oC. This is not mentioned in SPM and needs to be highlighted in the beginning itself though there is figure SPM 3 in page SYR-9. [Government of India]
SPM A-92	SPM	5				Footnote 1	Footnote 1: the words referring to the level of confidence should be written in italics: "medium confidence", etc.. [Government of Switzerland]
SPM A-93	SPM	6	1	6	3	SPM 1.1	Important message but could be less complex; suggest "The global oceans have taken up over 90% of the additional energy accumulated between 1971 and 2010. The oceans are virtually certain to have warmed to a depth of 700 over this period. This warming is also likely to have occurred in the period from 1870s-1971. [Government of Ireland]
SPM A-94	SPM	6	1	6	4	SPM 1.1	We think the information presented here is extremely relevant when considering the development of the temperature of the atmosphere since 1998, but this is not made explicit. This is an example of synthesis that is still lacking in the draft. We suggest to rephrase to: "Between 1979 and 2010 the ocean absorbed roughly 93% of the energy stored in the climate system, while melting ice and the continents each took up 3%, leaving the atmosphere only 1% (Figure SPM.1bis). Small changes in the ocean uptake have large impacts on the atmosphere, but the deep ocean is too poorly monitored to provide an explanation for the atmospheric temperature pause with confidence." and insert WGI Box 3.1 Figure 1. Suggested caption text: "Figure 1bis: Energy accumulation in ZJ (1 ZJ = 1021 J) between 1971 and 2010. Upper ocean (light blue, above 700 m), deep ocean (dark blue, below 700 m, below 2000 m from 1992), ice melt (light grey; for glaciers and ice caps, Greenland and Antarctica from 1992, and Arctic sea ice from 1979), continental (land) warming (orange), and atmospheric warming (purple; from 1979). Dot-dashed lines indicate 90% confidence intervals for all components." [Government of Netherlands]
SPM A-95	SPM	6	1	6	11	SPM 1.1	Line 1 to 3 may be interchanged with lines 6 to 11 [Government of India]
SPM A-96	SPM	6	1	6	14	SPM 1.1	The sentence, in line 13 and 14, is an attribute of the ocean; therefore it will be more understandable for policymakers if this sentence is moved to the end of line 4 as part of the first paragraph in page 6. [Government of Republic of Korea]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-97	SPM	6	2	6	3	SPM 1.1	The authors should consider modifying the text to read: "Of the increased energy stored in the climate system over this period, ocean warming accounts for more than..." [Government of United States of America]
SPM A-98	SPM	6	2	6	4	SPM 1.1	Add from WGI SPM 'It is about as likely as not that ocean heat content from 0–700 m increased more slowly during 2003 to 2010 than during 1993 to 2002' [Government of Saudi Arabia]
SPM A-99	SPM	6	3	6	4	SPM 1.1	Is it possible to indicate by how much the ocean warmed? [Government of Sweden]
SPM A-100	SPM	6	4	6	4	SPM 1.1	Please consider adding text regarding ocean warming below 700 (From WGI SPM section B.2): "It is likely that the ocean warmed between 700 and 2000 m from 1957 to 2009, and from 3000 m to the bottom for the period 1992 to 2005." [Government of Norway]
SPM A-101	SPM	6	4	6	4	SPM 1.1	The authors should quantify by how much the upper ocean has warmed - both from 1971 to 2010 and from the 1870s to 1971. [Government of United States of America]
SPM A-102	SPM	6	7	6	7	SPM 1.1	The authors should quantify by how much precipitation has increased since 1901 over mid-latitude areas of the Northern Hemisphere. [Government of United States of America]
SPM A-103	SPM	6	7	6	8	SPM 1.1	It is confusing to report on changes over two different time periods, with different levels of confidence. Recommend focusing on changes since 1951. These are the changes about which there is high confidence. [Government of Canada]
SPM A-104	SPM	6	7			SPM 1.1	Add There is low confidence in the scientific understanding of the small observed increase in Antarctic sea ice extent due to the incomplete and competing scientific explanations for the causes of change and low confidence in estimates of natural internal variability in that region. From WG1 SPM page 19 [Government of Saudi Arabia]
SPM A-105	SPM	6	8	6	9	SPM 1.1	The statement regards other latitudes needs to be clarified. Is there low confidence in the detection of trends because of lack of data? Or is it because trends cannot be detected over large areas, but may be detectable in regional or local scale? [Government of Ireland]
SPM A-106	SPM	6	9	6	9	SPM 1.1	Please consider to include "in precipitation" after "... negative trends". [Government of Norway]
SPM A-107	SPM	6	10	6	10	SPM 1.1	Regarding the words "... in the global water cycle over the ocean ...", please check that the exact wording of WGI SPM, which refers specifically to evaporation and precipitation, is not better suited. [Government of Belgium]
SPM A-108	SPM	6	13	6	14	SPM 1.1	This number tells very little. Is 0.1 much or little? [Government of Finland]
SPM A-109	SPM	6	13	6	14	SPM 1.1	We think this sentence is too technical to be understood by policy makers and other users, and also unjustly suggest the change is minor. We would like to suggest an alternative representation of the same fact namely: "The acidity of ocean surface water has increased by 26% (expressed in hydrogen ion concentration) since the beginning of the industrial era (high confidence). {WGI SPM-11, Box 3.2}". [Government of Netherlands]
SPM A-110	SPM	6	14	6	14	SPM 1.1	Instead of a semicolon, use a full stop. [Government of Switzerland]
SPM A-111	SPM	6	14	6	14	SPM 1.1	Is 0.1 significant, does it need to be included? [Government of Ireland]
SPM A-112	SPM	6	14	6	14	SPM 1.1	The phrase "oceanic uptake of anthropogenic CO ₂ ..." is imprecise because it suggests the ocean selectively takes up anthropogenic gases (as opposed to both natural and anthropogenic CO ₂). The surface ocean takes up gases proportional to atmospheric composition (partial pressure, really), and acidification results because of the anthropogenically induced increase in CO ₂ . The authors should clarify the text accordingly. [Government of United States of America]
SPM A-113	SPM	6	14	6	15	SPM 1.1	Does it entail to all three Ocean (Indian, Atlantic and Pacific)? [Government of United Republic of Tanzania]
SPM A-114	SPM	6	14	6	15	SPM 1.1	We suggest to replace the sentence "Oceanic uptake of anthropogenic CO ₂ results in gradual acidification of the oceans" with a more precise wording based on the WGI SPM: The ocean has absorbed about 30% of the emitted anthropogenic CO ₂ , causing ocean acidification [Government of

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
							Belgium]
SPM A-115	SPM	6	14	6	15	SPM 1.1	Can this change in pH be put in context (as with sea-level rise on line 25-26) i.e. including the text drawn from the WG1 SPM 'corresponding to a 26% increase in acidity'. As it stands a 0.1 change in pH may not be seen as significant to policy makers/non-technical audience. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-116	SPM	6	14	6	15	SPM 1.1	The scale of ocean acidification impacts and the confidence with which we can predict them is a key change from AR4 and something that should be brought to the attention of policy makers more clearly than the current text does. We suggest adding the following text from WGII Chapter 6: 'The current rate of ocean acidification is unprecedented within the last 65 Ma (high confidence) if not the last 300 Ma (medium confidence).' [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-117	SPM	6	14	6	15	SPM 1.1	Please consider to add the following text from WGI SPM (p. 12): "corresponding to a 26% increase in hydrogen ion concentration". In addition no reference is made to deoxygenation in the SPM (except in the shaded text to section 2.2), we suggest to lift the text from page SYR-51: "Oxygen minimum zones are progressively expanding in the tropical Pacific, Atlantic, and Indian Oceans, due to reduced ventilation and O2 solubilities in more stratified oceans at higher temperatures (high confidence)". [Government of Norway]
SPM A-118	SPM	6	14	6	15	SPM 1.1	The authors should convert the 0.1 pH units into a percent change to provide some context. [Government of United States of America]
SPM A-119	SPM	6	14	6	15	SPM 1.1	If the reference to Fig. 1.2 refers to the underlying WG1 report and not the underlying SYR Topic 1 section, then this needs to be clarified. Fig 1.2 in the underlying SYR does not have anything to do with oceanic CO2 content or pH. [Government of United States of America]
SPM A-120	SPM	6	14	6	15	SPM 1.1	The reference to "gradual acidification" is inaccurate, as it does not convey the rate of ocean acidification correctly to policymakers. Consequently, this sentence needs to be rephrased to delete the reference to gradual, and replace it with a word or phrase that captures the rate of change and its significance correctly: REASONING: The present rate of ocean acidification is substantially larger than at other times in earth-system history. As noted in WG2 Chapter 6, present acidification rates are about 10 times higher than in the Paleo-Eocene thermal maximum era (55 million years ago). WG2 TS reported that the consequences at that time were associated with mass extinctions, combined with other drivers "However, mass extinctions in Earth history occurred during much slower rates of change in ocean acidification, combined with other drivers, suggesting that evolutionary rates may be too slow for sensitive and long-lived species to adapt to the projected rates of future change (medium confidence). [6.1]" [Government of Saint Lucia]
SPM A-121	SPM	6	14	6	15	SPM 1.1	Acidification of the ocean is an important topic throughout this report and SPM. It would be extremely useful to policy makers to explain (possibly as a footnote) what a decrease in 0.1 in pH means, so that they can better understand the implications. Without a reference of this kind, the 0.1 could be interpreted as insignificant. It would also be helpful to put this in context of past changes in ocean pH. [European Union]
SPM A-122	SPM	6	16	6	17	SPM 1.1	Important information. Could be presented in two shorter sentences [Government of Ireland]
SPM A-123	SPM	6	16	6	18	SPM 1.1	(i) Glaciological studies conducted by the Geological Survey of India for the past three decades on the Dakhshin Gangotri Glacier that forms a part of the East Antarctic Ice sheet confirm the recession of the polar ice sheet as shown by the IPCC-2013 report. Since 1996, nearly 4800 sq. m area has been vacated by this glacier. (ii) Similar studies in the past five years on the Vestre Brogerbreen Glacier located in the Svalbard area of the Arctic Region show recession of the glacier which support the IPCC's contention. (iii) Majority of the Himalayan glaciers are also receding which also support warming of the climate system. However, considering the vast ecosystem of the Himalayas, special emphasis of it should be given in the report. [Government of India]

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SPM A-124	SPM	6	16	6	18	SPM 1.1	The sentence does not make the important point that impacts of CC not just continue to increase, but that the pace of many is increasing. We suggest replace the phrase by the following sentence: "Antarctica and Greenland have lost mass at an accelerated pace (five and six times respectively faster on average in 2002-2011 than 1991-2001. (See WG1, SPM, page 9). [Government of Netherlands]
SPM A-125	SPM	6	16	6	18	SPM 1.1	Arctic sea-ice hasn't only continued to decline, but it has declined much faster than anticipated, and we suggest to replace the phrase by the following sentence: "Sea ice extent has been diminishing significantly faster than projected by most of the AR4 climate models. {WG1 1.3.4.3}." [Government of Netherlands]
SPM A-126	SPM	6	17	6	19	SPM 1.1	Please consider to insert "at an increasing rate" based on the formulation in WG1 SPM section B.3. The sentence would then read; "Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass at an increasing rate, glaciers have" [Government of Norway]
SPM A-127	SPM	6	17	6	22	SPM 1.1	Traceability issue: The reference to Figure 1.1 should appear at the end of first sentence in this paragraph. Its current placement is incorrect, as Figure 1.1 does not provide information on changes in permafrost conditions. [Government of Canada]
SPM A-128	SPM	6	17	6	22	SPM 1.1	Add from WG1 SPM). It is very likely that the annual mean Antarctic sea ice extent increased at a rate in the range of 1.2 to 1.8% per decade (range of 0.13 to 0.20 million km2 per decade) between 1979 and 2012 [Government of Saudi Arabia]
SPM A-129	SPM	6	17	6	26	SPM 1.1	It is suggested to add two graphs to support these two paragraphs, one on observed sea ice extent and the second on observed sea level change [Government of Spain]
SPM A-130	SPM	6	18	6	19	SPM 1.1	Sentence 'There is...total area' may be replaced with the fifth bullet of page 9 of SPM-B3 of WG-I [Government of India]
SPM A-131	SPM	6	19	6	20	SPM 1.1	The time period for this result about Antarctic sea ice area is missing. Please give the start date for the increase in area (1979). [Government of Canada]
SPM A-132	SPM	6	19	6	20	SPM 1.1	On the increase in Antarctic sea ice area: the information provided seems to be too brief. In the previous sentence, only decrease in ice and snow are mentioned, and then the Antarctic sea ice is mentioned as increasing. An explanation is necessary for this finding which holds despite the overall decrease in ice and snow. There may be ways to rephrase the text with a grouping of the loss of mass and the increase of total area. [Government of Switzerland]
SPM A-133	SPM	6	19	6	20	SPM 1.1	The existence of "strong regional differences" is not indicated in "Antarctic sea ice area" but "annual rate of Antarctic sea ice area". Corresponding description in the SPM of WG1 report is as follows: "There is high confidence that there are strong regional differences in this annual rate, with extent increasing in some regions and decreasing in others." (WG1 SPM. B.3) [Government of Japan]
SPM A-134	SPM	6	19	6	20	SPM 1.1	The difference between sea ice and land ice needs to be made more explicit otherwise the text is text is potentially confusing [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-135	SPM	6	20	6	20	SPM 1.1	Suggest replacing "a very likely increase" with "very likely an increase". [Government of Canada]
SPM A-136	SPM	6	20	6	20	SPM 1.1	After "differences in" please insert "the trend of the". [Government of Germany]
SPM A-137	SPM	6	20	6	20	SPM 1.1	Quantify what the very likely increase in Antarctic sea ice has been - and provide a reference year for this statement - since satellite record began in late 1970s? [Government of United States of America]
SPM A-138	SPM	6	20	6	20	SPM 1.1	"a very likely increase in total area" - is this correct? If there is a decrease in mass but increase in area, a quick explanation might be helpful, e.g. "due to spreading and thinning of the ice sheet". [Government of United States of America]
SPM A-139	SPM	6	20	6	22	SPM 1.1	Traceability issue: As neither of the section references (1.2.3 or 1.4.2) link permafrost temperatures to increased air temperature and changing snow cover, suggest that either those references should be replaced by the appropriate section chapter in the WG report, or mention of temperature and snow cover should be added to the sections cited.

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							[Government of Canada]
SPM A-140	SPM	6	20	6	22	SPM 1.1	"Antarctic sea ice area, with a very likely increase in total area" - There is a problem here due to the controversy that has been published in the peer-reviewed article on "Sudden increase in Antarctic sea ice: Fact or Artifact?" (Screen, JGR, doi:10.1029/2011GL047553, 2011) and another peer-review article on "A spurious jump in the satellite record: has Antarctic sea ice expansion been overestimated?" (Eisenman et al., The Cryosphere, 8, 1289-1296, doi:10.5194/tc-8-1289-2014, 2014), which questions whether or not and also the amount of increase in Antarctic sea ice area. The problem is that the IPCC AR5 WGI report on Arctarctica sea ice change is primarily based on results from one algorithm (the Bootstrap algorithm) while not including results from many other algorithms, as such is not robust and not representative of results from the community. This weakness in the robustness of Antarctica sea ice change using one algorithm is one of the key review comments of the IPCC AR5 WGI report, which was not adequately addressed. The authors should strongly consider omitting statements about Antarctic sea ice trends given this new research. Understandably, new research cannot be reflected in the SYR, but it would also reflect poorly on the IPCC if it stated conclusions that are still under significant debate. In light of this information, we suggest the authors consider if the text should be reformulated in any way. [Government of United States of America]
SPM A-141	SPM	6	22	6	22	SPM 1.1	If the reference to Fig.1.1 refers to the underlying WG1 report and not the underlying SYR Topic 1 section, then this needs to be clarified. Fig 1.1 in the underlying SYR does not have anything to do with snow cover. [Government of United States of America]
SPM A-142	SPM	6	23	6	23	SPM 1.1	Recent studies on the coastal erosion and shore line changes along selective stretches in East Coast of India viz., Kendrapada and Jagatsinghpur coast in Odisha revealed a land ward migration of the shoreline by about 200 to 500 m from the 1930 position in different sectors indicating marine transgression and coastal erosion which indirectly supports the present day global sea level rise. [Government of India]
SPM A-143	SPM	6	23	6	25	SPM 1.1	We suggest to add here: "Over 1993-2010 the annual rate of sea-level rise was almost double compared to the 1901-2010 average." [Government of Netherlands]
SPM A-144	SPM	6	24	6	24	SPM 1.1	Important information. Perhaps state the rate of increase has increased since ... rather than referring to millennia [Government of Ireland]
SPM A-145	SPM	6	24	6	26	SPM 1.1	"The rate of sea level...has been larger than the mean rate...": can't this be quantified or given as an order of magnitude? [European Union]
SPM A-146	SPM	6	25	6	25	SPM 1.1	Key message provided in page 11 of SPM-B-5 of WG-I may be included [Government of India]
SPM A-147	SPM	6	25			SPM 1.1	The last two millenia are not shown in Fig SPM.1. Suggest placing the reference to the figure after the word 'century' in this sentence. [Government of New Zealand]
SPM A-148	SPM	6	26	6	26	SPM 1.1	Specify the exact graph which is referred to - "Figure SPM.1.a" [Government of Sweden]
SPM A-149	SPM	7	1	7	1	Figure SPM.1	The authors should strongly consider having all elements of this Figure use the same IN-FIGURE color-coding as used in (d) to make it easier for the reader to understand. This will also make it possible to display the different data sources in (a), (b) and (c) [Government of United States of America]
SPM A-150	SPM	7	1	7	1	Figure SPM.1	The authors should include error bars in panel (a). [Government of United States of America]
SPM A-151	SPM	7	1	7	1	Figure SPM.1	Panel (c) is misleading in that rate of increase (i.e., the slopes) of CO2 and CH4, appear to be similar. But the fact is that the percentage change of CH4 is much larger than that of CO2. The authors should consider modifying the figure to accurately reflect this difference in the rate of change. [Government of United States of America]
SPM A-152	SPM	7	1	7	1	Figure SPM.1	For clarity, the x-axis should have years the plots in ALL panels (not just the bottom one. [Government of United States of America]

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SPM A-153	SPM	7	1	7	1	Figure SPM.1	Why are plots (a) and (b) normalized to 1993? This makes it very confusing to the lay reader, as it implies negative change. The authors should strongly consider starting plots (a) and (b) at 0 in 1850 and show the absolute change since then. [Government of United States of America]
SPM A-154	SPM	7	1	7	8	Figure SPM.1	Figure SPM.1 gives indicators on observed global climate change while the added Figure d deals with the changing carbon dioxide emission. Can the latter be regarded as an "indicator"? A sensible arrangement is to just delete it or move Figure d to 1.2 "Cause of climate change". [Government of China]
SPM A-155	SPM	7	1	7	8	Figure SPM.1	Figure legends for figure SPM.1 a, b, and c should be included to reference the different data sets used to generate these graphs. Alternatively, reference to the data sets could be included in the figure caption. [Government of United States of America]
SPM A-156	SPM	7	1	7	8	Figure SPM.1	Figure SPM 1 does not have the y-axis labelled. Specifically part a) of the figure is not consistent with the corresponding figure in WG1 documents. Please refer to WG1 SPM, page 6, figure SPM 1 (a) - where the y axis is temperature anomaly relative to 196-1990. The corresponding figure in the SPM of this synthesis report represents temperature anomaly with respect to 1986-2005 average, and therefore the figure's y axis looks different than that in the WG1 SPM page 6. Similarly, the y axis of part b) of the figure is different from the same diagram in WG1 SPM page 10, figure SPM 3 (d). These should be made consistent. Part (d) of the figure (showing distribution of emissions between fossil fuels and land use change) does not seem to add much value here, and can be removed if necessary. Some of the explanation of the figures, such as that on colors, could be given next to the graph [on the right] to avoid the long, dense text right at the bottom. [Government of United States of America]
SPM A-157	SPM	7	1	7	8	Figure SPM.1	In panel c of Fig. SPM.1, the orange and red are too close in color. The authors should consider using greater color difference to make figure clearer [Government of United States of America]
SPM A-158	SPM	7	1	7	8	Figure SPM.1	Figure SPM. 1 (1) This figure is composed of four diagrams. First three diagrams - (a), (b) and (c) – are observed indicators of climate changes occurred in the past, but (d) is more likely causes or drivers of global warming and driven from estimation rather than observed data. Therefore (d) would make policy makers or other readers get confused, thus it is strongly recommend that the diagram (d) is move to between line 18 and 19 in page 8 in the Session 1.2 or better place. (2) The reference period for the figures is same for a, b & c, 1986-2005. For the previous assessment reports used 1961-1990 as well as in WGI AR5. It is confusing if we change base period for every assessment - which means figures from different reports will be different. We strongly suggest to used same base period as in AR4 [Government of Republic of Korea]
SPM A-159	SPM	7	1			Figure SPM.1	Figure SPM.1: This figure is highly appreciated because it is very useful for communication purposes. Regarding Figure SPM.1 (a) and (b): We suggest to include an explanation of how zero is defined ("average over the period 1986 to 2005"). Regarding Figure SPM.1 (c): We suggest to change the title to "Globally averaged concentrations of three greenhouse gases" so that the reader immediately understands that the coloured dots refer to three specific (rather than all) GHGs. [Government of Germany]
SPM A-160	SPM	7	2	7	2	Figure SPM.1	The opening statement that all four panels display "indicators of a changing climate" seems inaccurate. Panels (c) and (d) are not indicators of climate, per se, although (c) is moderated by carbon cycle processes that are part and parcel of the climate system. Suggest replacing the first sentence with something like "Observed indicators of a changing global environment." Also, within the figure itself, can "globally averaged" be changed to "global average"? [Government of Canada]
SPM A-161	SPM	7	2	7	2	Figure SPM.1	Referring to "indicators": temperature and sea-level are indicators, while GHG and CO2 emissions are "drivers". [European Union]
SPM A-162	SPM	7	2	7	8	Figure SPM.1	Figure SPM.1 (d): replace the current figure with SYR, page 43, Figure 1.5: Annual anthropogenic CO2 emissions (GtCO2yr-1) from fossil fuel combustion, cement production and flaring, and forestry and other land use (FOLU),

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							1750–2011. Cumulative totals and uncertainties are shown on right hand side.{modified from WG I Figure TS.4 and WG 3 Figure TS.2} [Government of Switzerland]
SPM A-163	SPM	7	7	7	8	Figure SPM.1	Figure SPM.1, panel (c). It would be better to write colors of line and mark explicitly in the figure caption; i.e., CO2 for green, CH4 for orange, and N2O for red. [Government of Japan]
SPM A-164	SPM	7		7		Figure SPM.1	Figure SPM.1. "land use" in legend should be "FOLU" in order to be consistent with similar figures in shape and content, such as SYR Figure 1.5 (SYR-43), SYR Figure SPM.2 (SYR-8), and WGIII SPM Figure SPM.1 where "FOLU" is used and explained. [Government of Japan]
SPM A-165	SPM	7		7		Figure SPM.1	Figure SPM.1. Although Panel (d) seems to be based on the Figure TS.4 of WG1, the original figure contains not only "land use" but also "land/ocean sink". Because the original figure is good for understanding the CO2 balance, the original figure should be quoted without making any change. [Government of Japan]
SPM A-166	SPM	7		7		Figure SPM.1	For Figure SPM.1, it would it be useful to include the x-axis on all the graphs here, not just the bottom one [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-167	SPM	7				Figure SPM.1	Figure SPM.1 Suggest adding year labels at the top of panel (a), for clarity. [Government of New Zealand]
SPM A-168	SPM	7				Figure SPM.1	Figure SPM.1: We strongly support the introduction of panel (d) in this figure. It nicely shows correlation between the two parameters and atmospheric concentrations of GHGs and anthropogenic CO2 emissions. Please add "land use change" in panel d). Land use change is currently used in the figure caption, but not in the legend. [Government of Norway]
SPM A-169	SPM	8	4	8	4	SPM 1.2	Consider changing the title of the sub-section from 'Causes of climate change' to 'Drivers of climate change' (consistent with Topic 1 and WGI terminology). [Government of Switzerland]
SPM A-170	SPM	8	4	8	4	SPM 1.2	"result" instead of "results" [Government of Sweden]
SPM A-171	SPM	8	4	8	28	SPM 1.2	According to recent reports on Global Carbon Budget (see P. Friedlingstein et al., Persistent growth of CO2 emissions and implications for reaching climate targets, Nature Geoscience, (2014), and Le Quere et al., Global Carbon Budget 2014, Earth System Science Data Discussion 7, 521–610, 2014), the record of global carbon emissions will reach 40 GtCO2yr-1 in 2014 while it reached 36 40 GtCO2yr-1 in 2013 which is not consistent with this current Synthesis Report where it stated that the emissions reached 49 GtCO2yr-1 (+/- 4.5) in 2010. [Government of Algeria]
SPM A-172	SPM	8	4	9	28	SPM 1.2	The Session 1.2 (Causes of Climate change) mainly treated the drivers of climate change, but hasn't what the causes for, which is 'Radiative Forcing', at all. Therefore it shall be much better to add the main figures of the Radiative Forcing assessed through the AR 5. It can be referred to the session 1.3.1 in underlying report. We recommend to give the key findings on the natural and anthropogenic radiative forcings since the mid-18th century. [Government of Republic of Korea]
SPM A-173	SPM	8	6	8	6	Headline 1.2	AS IT IS THE WHOLE SECTION IS MISLEADING. It is important to give the key message by introducing after population growth: "(...) with higher differences in the percapita emissions between developed and developing countries". Two discussions need to be undertaken, the first one related to contributions of developed and developing countries to climate change and the second related to the differences on types of emissions, as follows: 1) There is the need to incorporate the relationship between percapita cumulative emissions by developed countries and developing countries between 1850 and 2014, their overuse or underuse of carbon (carbon debt) and their "fair emissions", according to the following information of IPCC (WGI and WGIII). Cumulative global emissions have been of about 1.200 GtCO2 in between the years 1850 to 2008. From about this, Annex I countries accounted for 864 GtCO2, which means the 72% of the total. Taking into account that their share of population was of nearly 25%, their fair CO2 emission share was 300 GtCO2 and their overuse or carbon debt was of about 564 GtCO2. Also, non-Annex I countries accounted for 336 GtCO2 meaning the 28% of the total of CO2 emissions, representing a fair emissions share of 900 GtCO2 or an underuse of 564 GtonCO2 emissions. 2) Also, in this section regarding to the

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							causes of climate change is important to introduce some discussion about international trade and climate change. Also it is important to include the discussion of territorial and consumption-based emissions. Since AR4 several data sets have quantified the difference between traditional "territorial" and "consumption-based" emission estimates that assign all emission released in the global production of goods and services to the country of final consumption. A growing share of CO2 emissions from fossil fuel combustion in developing countries is released in the production 1 of goods and services exported, notably from upper middle income countries to high income countries. Total annual industrial CO2 emissions from the non-Annex I group now exceed those of the Annex I group using territorial and consumption accounting methods, but per-capita emissions are still markedly higher in the Annex I group. [WGIII 1.3, 5.3] [Government of Bolivia]
SPM A-174	SPM	8	6	8	7	Headline 1.2	Suggest that opening sentence is replaced by text about the build up/increase of atmospheric GHG leading to an uptake in additional energy is the key cause of observed climate change [Government of Ireland]
SPM A-175	SPM	8	6	8	7	Headline 1.2	This sentence is problematic in the sense that it perpetuates the myth of an "iron law" between economic growth and emissions. Increases in emissions occur because we use the wrong technologies and fuels for meeting increased demand for energy services. The sentence implies that economic and population growth must stop in order to reduce emissions and that is not true. [Government of Sweden]
SPM A-176	SPM	8	6	8	11	Headline 1.2	Important message but to long it could be less complex, some elements missing and also could be clearer; [Government of Ireland]
SPM A-177	SPM	8	6	8	11	Headline 1.2	This text would benefit from more quantitative information and slight rewording. The additional text has been taken from the SPM main text. Replace existing text with: Anthropogenic greenhouse gas emissions have increased substantially since the preindustrial era driven largely by economic and population growth. About half of the anthropogenic CO2 emissions between 1750 and 2011 have occurred in the last 40 years with emissions from 2000 to 2010 the highest in human history. Human-induced emissions have driven atmospheric concentrations of greenhouse gases to levels that are unprecedented in at least the last 800,000 years, leading to a greater retention of the sun's energy by the climate system. Human influence has been detected in all parts of the climate system and is extremely likely to have been the dominant cause of the observed surface warming since the mid-20th century. {1.3, 1.4.1} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-178	SPM	8	6	8	11	Headline 1.2	Box could use improvement: (1) Headline would benefit from clear, upfront statement that emissions have increased and accelerated, 1975-2011 - i.e., highlight both magnitude (absolute) and rate (acceleration) effects. (2) As a quantitative measure of total (1750-2011) change, headline should elevate the WG1 finding (featured on I. 15) of 40% higher atmospheric CO2 in 2011, relative to pre-industrial, even after accounting for removals by ocean and terrestrial systems. (3) Further to (2), consider noting climate system's limited absorptive capacity and, for the ocean sink, linking to ocean acidification in text (absent from p. 9 paragraph on select impacts). (4) Does "uptake of energy by the climate system" refer to warming? If so, it might improve clarity to explicitly make that connection, or just substitute "warming"/"temperature rise". [Government of United States of America]
SPM A-179	SPM	8	7	8	7	Headline 1.2	Please add "human" before "history", as in WGIII SPM page 8 [Government of Belgium]
SPM A-180	SPM	8	7	8	7	Headline 1.2	"...emissions were the highest in history." Would it be more clear to say "...emissions were the highest of any decade in history."? [Government of United States of America]
SPM A-181	SPM	8	7	8	9	Headline 1.2	The word "Historical" is misleading and arguably inconsistent with the statement in P8 In 17-18 that about half of CO2 emissions have occurred in the last 40 years. Also what do historical emissions mean for current methane levels? A more nuanced statement is required. [Government of Ireland]
SPM A-182	SPM	8	7			Headline 1.2	Suggest there may be a need to reflect that 2000-2010 represents the last interval included in analysis. Otherwise this statement could be interpreted to indicate that emissions peaked in that interval and have since declined. [Government of Canada]

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SPM A-183	SPM	8	7			Headline 1.2	The sentence "From 2000 to 2010 emissions were the highest in history" might give the wrong impression that emissions are now peaking. Thus we suggest to write " ...emissions were higher than ever before in history." [Government of Germany]
SPM A-184	SPM	8	8	8	9	Headline 1.2	Suggest deleting "leading to an uptake of energy in the climate system" from the end of this sentence. This phrasing is confusing and is not explained elsewhere in the section. Assuming the authors are trying to make a link with the next sentence, suggest replacing "human influence" with text that makes the link between atmospheric concentrations and its influence on the climate system (there is wording on page 9, line 7 which could be used here). [Government of Canada]
SPM A-185	SPM	8	9	8	9	Headline 1.2	The phrase "leading to an uptake of energy by the climate system" seems to appear here out of nowhere (also in equivalent place in Topic 1, p. 40). It would be useful to adding a short, additional phrase to substantiate/explain. [Government of Switzerland]
SPM A-186	SPM	8	9	8	9	Headline 1.2	It is suggested to insert the qualifier "additional" before "uptake of energy", because there is a significant natural uptake of energy by the atmosphere. [Government of Austria]
SPM A-187	SPM	8	9	8	9	Headline 1.2	"unprecedented in at least 800,000 years": Really? How certain? [Government of United States of America]
SPM A-188	SPM	8	10	8	11	Headline 1.2	Saying 'all components' here is too general and will invite suggestions to list various components. Consider replacing "all components" with "throughout" or use the equivalent sentence in WGI, which mentions surface, atmosphere and ocean. [Government of Canada]
SPM A-189	SPM	8	10	8	11	Headline 1.2	Text seems out of place here. [Government of Ireland]
SPM A-190	SPM	8	10	8	11	Headline 1.2	The WGI SPM (headline statement on page 17) states that "This evidence for human influence has grown since AR4". We suggest including this important information here (or possibly in another part of the SYR SPM). [Government of Belgium]
SPM A-191	SPM	8	11	8	11	Headline 1.2	It is suggested to insert the qualifier "resulting" before "observed" and "global" before "warming" in order to clarify the linkage between enhancement of GHG concentrations in the atmosphere, energy uptake and global warming. The qualifier global is important in order to differentiate from small scale temperature changes that are also occurring. [Government of Austria]
SPM A-192	SPM	8	13	8	14	SPM 1.2	In line with comment 20: This sentence might start with "Increasing" [Government of Ireland]
SPM A-193	SPM	8	13	8	14	SPM 1.2	This is better wording than in the box above. Concentrations increase due to emissions. Emissions increase due to increased fossil fuel use etc, which is due to increased demand for energy services, which is driven by economic growth and population growth. [Government of Sweden]
SPM A-194	SPM	8	13	8	18	SPM 1.2	Specify the exact graph which is referred to - "Figure SPM.1.c" and "Figure SPM.1.d" [Government of Sweden]
SPM A-195	SPM	8	14	8	16	SPM 1.2	"Between 1750 and 2011, cumulative anthropogenic CO ₂ emissions to the atmosphere were 2040 ± 310 GtCO ₂ . About 40% of these emissions have remained in the atmosphere (880 ± 35 GtCO ₂). If this is exactly 40%, it should be (816 ± 124 GtCO ₂). [Government of Turkey]
SPM A-196	SPM	8	14	8	17	SPM 1.2	This statement has a very important idea that can be illustrate with the figure 1.8 panel b of the chapter 1 of WGIII report. Please complement the figure SPM.2 to include figure 1.8b WGIII. [Government of Venezuela]
SPM A-197	SPM	8	14	8	17	SPM 1.2	This statement has a very important idea that can be illustrate with the figure 1.8 panel b of the chapter 1 of WGIII report. Please complement the figure SPM.2 to include figure 1.8b WGIII. [Government of Bolivia]
SPM A-198	SPM	8	15	8	18	SPM 1.2	The sentence 'About 40%....last 40 years' has serious implications for interpreting historical responsibilities. Therefore this may be vetted by our scientific community observing this process. [Government of India]
SPM A-199	SPM	8	15	8	18	SPM 1.2	Correct: insert Of these anthropogenic CO ₂ emissions, 880 ± 35 GtCO ₂ have remained in the atmosphere, 568 ± 110 GtCO ₂ have been taken up by the ocean and 587 ± 90 GtCO ₂ have accumulated in natural terrestrial ecosystems [Government of Saudi Arabia]

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SPM A-200	SPM	8	16	8	17	SPM 1.2	"...the rest was removed from the atmosphere..." could be interpreted as meaning was removed by humans. Suggest saying "was removed from the atmosphere by natural processes..." [Government of United States of America]
SPM A-201	SPM	8	17	8	18	SPM 1.2	There was a very useful, compelling and policy-relevant statement in the WG3 report that should be brought forward here. It read something like, "Cumulative emissions for the most recent decade exceed total emissions from 1750 to 1970". The authors should strongly consider including that statement here. [Government of United States of America]
SPM A-202	SPM	8	18	8	18	SPM 1.2	In line with comment 20: It may be useful to provide information on CH4 and N2O also [Government of Ireland]
SPM A-203	SPM	8	20	8	20	SPM 1.2	At the beginning of the sentence, suggest specifying that this is "total" anthropogenic GHGs, in order to correspond with the wording used in the Figure SPM.2 caption. [Government of Canada]
SPM A-204	SPM	8	20	8	21	SPM 1.2	To much detail here. The key message is that recent emissions are the highest in human history. Suggest start para at "Emission in 2010.." The key message is that mitigation efforts aren't keeping pace. [Government of Ireland]
SPM A-205	SPM	8	20	8	21	SPM 1.2	Please add "(high confidence)" after 2010, following the SPM of WGIII (page 8). [Government of Belgium]
SPM A-206	SPM	8	21	8	21	SPM 1.2	Word 'decadal' may be added before the word 'increases' [Government of India]
SPM A-207	SPM	8	21	8	21	SPM 1.2	Words 'between 2000 and 2010' may be deleted [Government of India]
SPM A-208	SPM	8	21	8	21	SPM 1.2	Words 'towards end of the century (high confidence)' may be added after the word 'increases' [Government of India]
SPM A-209	SPM	8	21	8	21	SPM 1.2	The passage "despite a growing number of climate change mitigation policies." Is out of place here and only brings confusion unless qualified or explained. Suggest deleting it here and discuss policy in the appropriate section, or link more closely to lines 25-28 in the same paragraph. [Government of Sweden]
SPM A-210	SPM	8	22	8	22	SPM 1.2	Delete the word "have" between 2010 and reached 49 [Government of United Republic of Tanzania]
SPM A-211	SPM	8	22	8	22	SPM 1.2	Suggest units should be GtCO2-eq/yr as in the Figure caption. [Government of Canada]
SPM A-212	SPM	8	22	8	22	SPM 1.2	We assume that GtCO2yr-1 should be GtCO2eqyr-1? [Government of Finland]
SPM A-213	SPM	8	22	8	22	SPM 1.2	GtCO2 yr-1 should read GtCO2eq yr-1 here [Government of France]
SPM A-214	SPM	8	22	8	22	SPM 1.2	Replace "GtCO2 yr-1" with "GtCO2eq yr-1". [Government of Japan]
SPM A-215	SPM	8	22	8	23	SPM 1.2	Cross-check the validity and accuracy of the statement "Emission of CO2 from fossil fuel combustion and industrial processes contributed about 78% of the greenhouse gas emissions increase from 1979..." Since in SPM2 the highest percentage is 65% [Government of United Republic of Tanzania]
SPM A-216	SPM	8	22	8	24	SPM 1.2	This statement is a bit confusing. Please consider just referring to the period 1970-2010 or alternatively also reflect the exact numbers for the period 1970-2000 and the exact number for the period 2000-2010 as it is done in Figure SPM.2 for percentage growth in total annual GHG emissions over the two periods. [Government of Norway]
SPM A-217	SPM	8	22			SPM 1.2	Delete the word "have". [Government of Canada]
SPM A-218	SPM	8	22			SPM 1.2	2010 emissions were 49 Gt CO2 equivalent ('equivalent' is missing) [Government of New Zealand]
SPM A-219	SPM	8	23	8	23	SPM 1.2	Words 'high confidence' may be added in brackets after the words '1970 to 2010' [Government of India]
SPM A-220	SPM	8	23	8	23	SPM 1.2	"about 78%": Can the authors assign some range of uncertainty to this figure? [Government of United States of America]
SPM A-221	SPM	8	24	8	24	SPM 1.2	Words 'high confidence' may be added in brackets after the words '2000- 2010' [Government of India]

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SPM A-222	SPM	8	26	8	26	SPM 1.2	Words 'both drivers out paced emission reduction from improvement in emission intensity' may be added after the words ' between 2000 and 2010' [Government of India]
SPM A-223	SPM	8	26	8	27	SPM 1.2	Please clarify that the relative contribution of economic growth increase between 2000 and 2010, as done in the WGIII SPM (page 8): "The contribution of population growth between 2000 and 2010 remained roughly identical to the previous decades, while the contribution of economic growth has risen sharply (high confidence)." [Government of Belgium]
SPM A-224	SPM	8	26	8	27	SPM 1.2	How can the effect of economic growth on emissions growth be isolated from the effect of population growth? This seems to be a fairly tenuous assertion - especially since there is no confidence assigned to this statement. [Government of United States of America]
SPM A-225	SPM	8	27	8	28	SPM 1.2	Claim of a "long-standing trend of gradual decarbonization of the world's energy supply" is incorrect and, as a result, also inconsistent with Ch. 7 of WG3. To accurately reflect WG3 findings, the statement should convey that "increased use of coal"/carbonization - globally and specifically driven by Asian demand - more than offset "gradual decarbonization" in other economies (including but not limited to the U.S.). Please see p. 11 (text and Fig. 7.2), Ch. 7, WG3 (provided in email attachment: "ipcc_wg3_ar5_ch7 - YA excerpts for SYR_FGD rev.pdf"). [Government of United States of America]
SPM A-226	SPM	8	28	8	36	Figure SPM.2	Figure SPM.2: Is it possible to discriminate between Agricultural (biogenic) sources of methane emissions and Fossil sources (e.g fugitive emissions from natural gas systems)? [Government of Ireland]
SPM A-227	SPM	8	28	8	36	Figure SPM.2	It may be useful to have some of these numbers in a table also can the numbers be checked for rounding issues when converted to %values.g. 2010 emissions relative to 1990? [Government of Ireland]
SPM A-228	SPM	8	28			SPM 1.2	Can you please add a short paragraph on the regional aspect of GHG emissions; OECD and non-OECD or Developing and Developed countries. [Government of India]
SPM A-229	SPM	8	29	8	35	Figure SPM.2	Figure SPM.2, right hand side panel for GWP 100 AR5: GWPs are not referred to in the main text. In addition, such technical information might be confusing for policy makers. Rather than including the information in the SPM, it seems sufficient to introduce these numbers in Figure 1.6 of the underlying SYR. The sentence "See also Box 3.2 and Figure 1.6 for emissions based on metrics other than GWP 100." might be included in the caption of Fig. SPM.2. [Government of Germany]
SPM A-230	SPM	8	30	8	30	Figure SPM.2	In an effort to make the figure less cumbersome and more clear to the reader, the authors should consider only presenting the data with either SAR GWP values or AR5 GWP values. Whichever is not included, can be shown in the plot in the underlying report. Figures in the SPM need to be as uncluttered as possible. [Government of United States of America]
SPM A-231	SPM	8	30	9	2	Figure SPM.2	The righthand side of Figure SPM.2 is interesting but risks confusing the reader, especially due to the lengthy caption. Since the weighting factors are not discussed in the text, it might be better to consider removing this part of the graph and refer to the discussion on page 44. Alternatively, include a paragraph in the text about the use of SAR or AR5 weighting factors. [Government of Sweden]
SPM A-232	SPM	8	31	8	31	Figure SPM.2	It is not clear how the percentage increases quoted on the figure for 1970-2000 and 2000-2010 are calculated. If the rates of change are compounded (as one would typically expect when percentage rates of change are quoted), then one would see exponential increases, which are not really apparent in the figure. On the other hand, if rates of change are simply expressed as a percentage of 1970 emissions, then it would be preferable to express the rates of change in physical units (GtCO ₂ e/yr). Suggest reviewing/clarifying is possible. [Government of Canada]
SPM A-233	SPM	8	31	9	4	Figure SPM.2	It is our estimation that message concerning weighing the CO ₂ -eq emissions may remain unclear for a policy makers. Would it be useful to add the sentence from SYR page 44, lines 15-16 "Other metrics choices..." [Government of Finland]
SPM A-234	SPM	8	31	9	5	Figure SPM.2	The text is confusing when it comes to the explanation of the differences in GHG emissions by 2010 relating to the use of a different metrics. The example should only be provided if the calculations for CO ₂ e based on AR5 can be provided for all gases, including F-gases. The current language is rather confusing. [Government of Austria]

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SPM A-235	SPM	8	31	9	5	Figure SPM.2	Figure SPM.2 caption. The text refers to (52 GtCO ₂ eq.yr-1) but it also refers to figure 1.5 which shows GtCO ₂ yr-1 (i.e. not equivalents). [Government of Sweden]
SPM A-236	SPM	8	31			Figure SPM.2	Figure SPM 3 Suggest to use same language including quantified uncertainties as agreed upon the WGIII SPM page 6, Figure SPM 1 [Government of Saudi Arabia]
SPM A-237	SPM	8	32	8	32	Figure SPM.2	Footnote 3: Please consider to include information regarding why SAR values is used. Please look toward and adapt language used in Box 3.2 page 94. Suggestion: "The 100-year GWP from SAR was adopted by the UNFCCC and its Kyoto Protocol and is now used widely as the default metric." [Government of Norway]
SPM A-238	SPM	8	32			Figure SPM.2	Figure SPM.2 caption. For consistency, express emissions units as GtCO ₂ eqyr-1(not tCO ₂ eq/yr) [Government of New Zealand]
SPM A-239	SPM	8	33	8	33	Figure SPM.2	"Forestry and other land use". Please add "due to deforestation and forest degradation" to the sentence. [Government of Norway]
SPM A-240	SPM	8	34	8	35	Figure SPM.2	Delete "alternatively" and change "rather than" to "and on". Or, use similar formulation as in Caption of Figure 1.6 (page 44 of the draft SYR). [Government of Sweden]
SPM A-241	SPM	8	35	9	1	Figure SPM.2	Suggest replacing 'as well as' with 'and' [Government of New Zealand]
SPM A-242	SPM	8	35	9	2	Figure SPM.2	In the caption, "SAR" is not defined in line 35 when it is first mentioned. It is defined in next line. Also isn't it more self explanatory if it is named AR2 instead of SAR? [Government of United States of America]
SPM A-243	SPM	8	35	9	3	Figure SPM.2	We think the part of the sentence starting with "whereas, CO ₂ equivalent concentrations ..." are not needed here since the Figure only refers to emissions and not atmospheric concentrations. Please consider to delete this part of the sentence and the next short sentence starting with " CO ₂ -eq is used". We believe that this information is more relevant in Box 3.2 "Greenhouse gas metrics and mitigation pathways" [Government of Norway]
SPM A-244	SPM	8		8		Figure SPM.2	Figure SPM.2.Explain more clearly why there is a difference in GWP 100 CO ₂ FOLU values by SAR (11%) and AR5 (10%) at bar graphs (though the last sentence in the annotation of Figure SPM.2 explains the difference to some extent, the explanation is not adequate enough for readers to understand it.). Since the right bar graph by GWP 100 AR5 has never been found in WGIII SPM and is used in SYR SPM for the first time, explanation in details is necessary. [Government of Japan]
SPM A-245	SPM	8				Figure SPM.2	Figure SPM.2: Caption: please express the unit in a consistent manner : "GtCO ₂ eq/yr" should not become "GtCO ₂ eq.yr-1" at the end of the caption. [Government of Belgium]
SPM A-246	SPM	8				Figure SPM.2	Figure SPM.2: In the caption, line 34 : "SAR" should be spelled out the first time it is used, not the second one as currently done. [Government of Belgium]
SPM A-247	SPM	8				Figure SPM.2	Figure SPM2: please enlarge the title above this Figure. [Government of Norway]
SPM A-248	SPM	9	1	9	1	Figure SPM.2	change "form" to "from" [Government of Sweden]
SPM A-249	SPM	9	1	9	2	Figure SPM.2	It is not absolutely necessary to write here about the CO ₂ -eq concentrations because this is not what the figure is about. As this is repeated in footnotes and elsewhere, this sentence might be removed here. [Government of France]
SPM A-250	SPM	9	1			Figure SPM.2	Typo: Change "form" to "from" [Government of Canada]
SPM A-251	SPM	9	3	9	3	Figure SPM.2	Please change "results" to "result". [Government of Finland]

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SPM A-252	SPM	9	3	9	3	Figure SPM.2	We agree that it is good to define CO ₂ eq concentrations, but we think that it is confusing to define it in the caption of a figure which does not report concentrations. Please move this sentence to a more appropriate part of the SPM (possibly a footnote). [Government of Belgium]
SPM A-253	SPM	9	3	9	5	Figure SPM.2	This needs to be rephrased to avoid any misunderstanding. i.e. the magnitude of total CO ₂ emissions appears larger only because it uses a different "exchange rate", not because the actual amount of methane has increased. [European Union]
SPM A-254	SPM	9	4			Figure SPM.2	Editorial: Delete "would" before "results", or change to "would result" [Government of New Zealand]
SPM A-255	SPM	9	5	9	5	Figure SPM.2	The reference should be to figure 1.6. [Government of Austria]
SPM A-256	SPM	9	5			Figure SPM.2	Please change the reference into Figure SPM.1.6 [Government of Germany]
SPM A-257	SPM	9	6	9	8	Figure SPM.2	It is a bit weird to say that negative RF (aerosols, land use) have caused a fraction of the observed warming. One may want to phrase this differently to say that "anthropogenic increase in GHG concentrations, augmented or diminished by other anthropogenic forcings ..., have extremely likely caused ...". Or refer to exact WGI wording. [Government of France]
SPM A-258	SPM	9	6	9	14	Figure SPM.2	This is under the heading of causes of climate change. There may be sequencing or labeling issues [Government of Ireland]
SPM A-259	SPM	9	7	9	9	SPM 1.2	It would be helpful in trying to communicate with a broad audience if the assessment of global warming attribution to human influence could be conveyed more simply. The formal attribution statement is easy to misinterpret when the reader looks to Figure SPM.3 for context. In the Figure, it appears to a generalist's eye that the combined anthropogenic forcings can explain all of the observed warming given how closely the two bars and uncertainty ranges match. We realize that making an attribution statement at the highest likelihood possible (extremely likely) is desirable, and we support this, but remain concerned that readers will still be puzzled about why nothing more definitive than "more than half" can be said about how much of the observed warming humans are responsible for. This then begs the question of what is responsible for the "other half"? The SYR SPM should address this topic in a way to ensure policymakers fully understand the findings and can interpret them appropriately. We recommend at a minimum including the second attribution statement from the WGI SPM (D.3): "The best estimate of the human-induced contribution to warming is similar to the observed warming over this period" although ideally this finding could be expressed more directly (e.g. by saying that the best estimate indicates that all of the observed warming is attributable to humans). [Government of Canada]
SPM A-260	SPM	9	7	9	9	SPM 1.2	This statement would be easier to read, and would communicate more directly, if "extremely likely" were moved from line 8 to within the parentheses on line 9. Thus the text within the parentheses would become "extremely likely; Figure SPM.3". [Government of Canada]
SPM A-261	SPM	9	7	9	9	SPM 1.2	This sentence is a reformulated version of a sentence from WGI. When looking at the black vs. the orange bars in Figure SPM.3 and reading this sentence at the same time one can easily get somewhat confused. We believe that the following sentence from the same para, in WG I SPM where this sentence is originates from, is critically needed. "The best estimate of human-induced contribution to warming is similar to the observed warming over this period." [Government of Norway]
SPM A-262	SPM	9	7	9	9	SPM 1.2	Based on Figure SPM.3 it seems that the statement on causing "more than half" of the observed increase is too conservative. [European Union]
SPM A-263	SPM	9	7	9	9	SPM 1.2	This sentence could be phrased better to acknowledge that it's a combination of warming from GHGs and cooling from some anthropogenic forcings that constitute a net warming. We propose that the sentence should be splitted, as: " The anthropogenic increase in greenhouse gas concentrations have extremely likely caused the majority of the observed increase in global average surface temperature from 1951 to 2010. Other anthropogenic forcings, such as

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							aerosols and surface reflectance, provide altogether a cooling effect, which however does not balance the warming (Figure SPM .3)." [European Union]
SPM A-264	SPM	9	7	9	16	SPM 1.2	Please add the important information from WG1, that 'the best estimate of the human-induced contribution to warming is similar to the observed warming over this period' (WG1 SPM, page 17). On its own, the statement that the anthropogenic contribution is 'extremely likely to be more than half' is misleading, as people start to wonder about the other half. [Government of Germany]
SPM A-265	SPM	9	7	9	28	SPM 1.2 + Figure SPM.3	The term "other anthropogenic forcings" in the SPM.3 needs to be explained (what "other" incorporates). [European Union]
SPM A-266	SPM	9	8	9	8	SPM 1.2	'surface reflectance' needs to be defined [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-267	SPM	9	9	9	11	SPM 1.2	The phrasing of the statement suggests that CO2 can selectively contribute to surface warming in other continents but not Antarctica. Why not just say "globally" instead of "over every continent except Antarctica"? This draws undue attention to the strange behavior in Antarctica, where data may be questionable. [Government of United States of America]
SPM A-268	SPM	9	10	9	16	SPM 1.2	Insert: There may also be a contribution from forcing inadequacies and, in some models, an overestimate of the response to increasing greenhouse gas and other anthropogenic forcing (dominated by the effects of aerosols). From WGI SPM page 15, bullet 2 [Government of Saudi Arabia]
SPM A-269	SPM	9	11	9	15	SPM 1.2	Please consider to change the order of these two sentences that both deals with anthropogenic influences so that the "very likely" statements come first followed by the "likely" statements. In the "very likely" statement please consider to delete "and have very likely" after "... ice loss since 1979", since the likelihood qualifier has already been established in the beginning of this sentence. [Government of Norway]
SPM A-270	SPM	9	11			SPM 1.2	Please include the information of footnote 4 in the main text as this is important to know. [Government of Germany]
SPM A-271	SPM	9	12	9	13	SPM 1.2	Please consider to replace "the increases surface mass loss of the" with "a substantial decrease/reduction in mass from the". Rationale: The wording "substantial" is directly taken from WGI SPM page 9 and should be included here as well. We believe it is easier for the reader to understand "decrease in mass" or "reduction in mass" instead of "increased surface mass loss", and we believe it is superfluous to explicitly state "surface mass ice loss" since it is only the Greenland ice sheet that are discussed in this part of the sentence. [Government of Norway]
SPM A-272	SPM	9	13	9	16	SPM 1.2	Replace the last sentence of the paragraph with: "There is low confidence in the scientific understanding of the small observed increase in Antarctic sea ice extent due to the incomplete and competing scientific explanations for the causes of change and low confidence in estimates of natural internal variability in that region." Source: WG I, SPM p. 19. [Government of Saudi Arabia]
SPM A-273	SPM	9	14	9	15	SPM 1.2	re-write the sentence "...have likely made a substantial contribution to increases in global upper ocean heat content (0-700 m) to read " ... have likely made a substantial contribution to increases in global heat content of the upper ocean (0 - 700 m) " [Government of United Republic of Tanzania]
SPM A-274	SPM	9	15	9	15	SPM 1.2	"since 1979" implies no change before that? Should clarify why 1979? Because of satellite data record? If so, say so. [Government of United States of America]
SPM A-275	SPM	9	15	9	16	SPM 1.2	Please consider to explain in the caption what "other anthropogenic forcings" consists of. [Government of Norway]
SPM A-276	SPM	9	15	9	25	Figure SPM.3	Figure SPM.3: The scale is temperture so the caption should state observed temperture increase [Government of Ireland]
SPM A-277	SPM	9	15	9	25	Figure SPM.3	Figure SPM.3: While the intention is good the added value of this figure is not clear. [Government of Ireland]

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SPM A-278	SPM	9	15	9	25	Figure SPM.3	Figure SPM.3; A more detailed figure e.g top section of TS.6 WGI, may be better or just a written statement of the material provided. [Government of Ireland]
SPM A-279	SPM	9	15			SPM 1.2	Can a likelihood also be assigned to the statement on sea level rise in this sentence, as it is for ice loss and ocean heat content? [Government of New Zealand]
SPM A-280	SPM	9	16	9	16	SPM 1.2	This seems like an opportune time to make a statement about ocean acidification. The authors should consider amending the text accordingly. [Government of United States of America]
SPM A-281	SPM	9	16	9	18	Figure SPM.3	Figure SPM 3 is confusing. Though the point the authors are trying to make is important, the graphic does not do it clearly and could be misinterpreted. Suggest deleting. If not deleted at least clarify the uncertainty bands by labeling the axis. It looks like there is no influence of natural forcing and internal variability. [Government of United States of America]
SPM A-282	SPM	9	17	9	18	Figure SPM.3	Figure SPM 3. "Other Anthropogenic Forcings" shouldn't be in first capital letters to be consistent with the layout of the graph. [Government of Sweden]
SPM A-283	SPM	9	17	9	18	Figure SPM.3	Figure SPM.3: the title should be amended to be consistent with the text. Replace "observed warming" with "surface temperature increase". [European Union]
SPM A-284	SPM	9	17			Figure SPM.3	We very much appreciate Figure SPM.3 as this figure is very useful and clear. [Government of Germany]
SPM A-285	SPM	9	18	9	18	Figure SPM.3	Figure SPM.3 - The authors should include "(e.g., ...)" after "Other anthropogenic forcings", "Natural forcings", and "Internal variability" to give the policymaker a more concrete understanding what is driving climate change [Government of United States of America]
SPM A-286	SPM	9	19	9	19	Figure SPM.3	It is recommended to include the definition of mid-point as such term has not been used in the past by the IPCC. [Government of Austria]
SPM A-287	SPM	9	19	9	27	Figure SPM.3	Figure SPM 5 This figure is for the period 1951 to 2010. Warming was lower during the more recent period 1998 – 2010. This should be clearly indicated in this graph. [Government of Saudi Arabia]
SPM A-288	SPM	9	19	9	28	Figure SPM.3	Figure SPM. 3: Most diagrams and tables in AR5 reports show the considered or base period in bracket at the end of caption. In consistency, it is recommended to put the considered period [1951 ~ 2010] at the end of the title of the diagram. [Government of Republic of Korea]
SPM A-289	SPM	9	21	9	21	Figure SPM.3	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
SPM A-290	SPM	9	27	9	27	Figure SPM.3	Please consider including "each other" after "... partially compensate" [Government of Norway]
SPM A-291	SPM	9				Figure SPM.3	Figure SPM.3: We appreciate that the x-axis for this Figure is in temperature. However, could it be made more clear that the orange bar is the sum of green and yellow bars? Please consider to insert "Natural" in front of "internal variability" in the lowermost bar in accordance with the language used in WGI. And please consider to explicitly add a time reference in the uppermost bar "Observed warming 1951-2010" or include the time period in the Figure Title. [Government of Norway]
SPM A-292	SPM	10	1	10	20	Figure SPM.3	Some more reference to effects in human systems would better reflect the facts shown in Figure SPM.4. The reference to health "There has been increased heat-related mortality and decreased cold-related mortality in some regions as a result of warming (medium confidence). Local changes in temperature and rainfall have altered the distribution of some water-borne illnesses and disease vectors (medium confidence)." could probably be added, or replace the unclear statement on ocean acidification (which does not match exactly with the statement of page 51 "Various observations are consistent with expected impacts of ocean acidification"). [European Union]

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SPM A-293	SPM	10	1	15	7	SPM 1.3	The current and future risks and impacts of climate change on the enhancement of desertification have not been stated in the report. Desertification, enhanced by climate is thought to have many impacts on land use, agriculture,.....The Sahara dusts is a big natural source of aerosols in the atmosphere. This can impact climate and the human health and mortality alike. [Government of Algeria]
SPM A-294	SPM	10	3	10	5	Headline 1.3	The sentence "Impacts are due to observed climate change" may be replaced as "Impacts are due to climate change" [Government of India]
SPM A-295	SPM	10	3	10	5	Headline 1.3	The first part of the second sentence of the headline statement does not add valuable information to the headline statement, but repeats the first sentence in a confusing way. We suggest the following modification of the headline statement: "In recent decades, observed changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate." [Government of Germany]
SPM A-296	SPM	10	3	10	5	Headline 1.3	This headline statement would benefit from some re-ordering and the addition of some examples Replace existing text with: The impacts of climate change have been observed on natural and human systems on all continents and across the oceans in recent decades. Many species have shifted their geographical ranges, seasonal activities, migration patterns and abundance. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate. {1.4.2} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-297	SPM	10	3	10	5	Headline 1.3	Lines 4 and 5 are a little unclear and can be re-written as "Irrespective of its causes, climate impacts due to observed climate change indicate that natural and human systems are sensitive to a changing climate." [Government of United States of America]
SPM A-298	SPM	10	3	10	5	Headline 1.3	The text in bold is not very impactful. It can be replaced by a similar phrase in page 46. "Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, and in global mean sea level rise; and it is extremely likely to have been the dominant cause of the observed warming since the mid-20th century. In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate." [Government of United States of America]
SPM A-299	SPM	10	4	10	4	Headline 1.3	Recommend deleting the second sentence of this bolded headline. If not deleted, then recommend revising the second sentence of this header to say: 'Impacts due to observed climate change are assessed, irrespective of its cause.....etc.' OR "Assessed impacts are due to observed climate change, irrespective of its cause, etc." [Government of Canada]
SPM A-300	SPM	10	4	10	4	Headline 1.3	The attribution statement "Impacts are due to observed climate change" needs more substantiation, both here (briefly) and in Topic 1, p. 46. [Government of Switzerland]
SPM A-301	SPM	10	4	10	4	Headline 1.3	To delete "irrespective of its cause ": it complicates the reading and the concept has been already explained. [European Union]
SPM A-302	SPM	10	4	10	5	Headline 1.3	Suggest re-write of second sentence to read: "These impacts indicate the sensitivity of natural and human systems to a changing climate." Suggest new, short 3rd sentence that reads: "The extent to which these changes can be attributed to human influence varies." [Government of United States of America]
SPM A-303	SPM	10	7	10	16	SPM 1.3	There is an awkward string of facts, particularly at the end of this paragraph. The authors should work weave this text together more narratively. [Government of United States of America]
SPM A-304	SPM	10	7	10	16	SPM 1.3	Session 1.3: 'The impact of climate change' is important due to climate change may increase adverse risk and vulnerability at regional and global level. The impact of climate change should be considered the results (risk and vulnerability) together as in the related sessions 1.6 & 1.7 in the underlying report. The current section does not include risk and vulnerability caused by the impact of climate change. In this section, it is recommended to include

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							the key messages referred to the session 1.6 & 1.7 in the underlying report. [Government of Republic of Korea]
SPM A-305	SPM	10	8	10	8	SPM 1.3	Word 'which' may be deleted and the word 'affect' may be changed to 'affecting' [Government of India]
SPM A-306	SPM	10	9	10	11	SPM 1.3	The marine fish (some species like Oil sardine) availability extended to northern latitudes. The word 'extension of availability' may be included in the sentence [Government of India]
SPM A-307	SPM	10	9	10	11	SPM 1.3	The text in Section {1.4.2} does not support the statement that many terrestrial species have shifted their geographic range. In fact, the statement on page 51 lines 9 to 11 suggest that such changes are rare, and that such change occurs over very long time periods. On page 51, lines 15 to 17 a statement does support the migration of ocean species to cooler waters in response to ongoing climate change. The authors should revise the text in the SPM to more accurately reflect the findings in the underlying text. [Government of United States of America]
SPM A-308	SPM	10	11	10	12	SPM 1.3	Suggest moving the sentence on ocean acidification to the end of this paragraph (line 16, insert after "(high confidence)"). In this case, impacts are being attributed to ocean acidification, which is a process that is somewhat distinct from climate change per se, whereas all other impacts are being attributed to climate change. Ocean acidification refers to a change in the chemistry of the ocean rather than a change in average weather conditions or ocean temperature, salinity or circulation that are commonly understood as climate change. [Government of Canada]
SPM A-309	SPM	10	11	10	12	SPM 1.3	Reword this sentence to give a better synthesis for policy makers e.g "Anthropogenic ocean acidification represents an increasing risk for marine organisms and some observed impacts on marine organisms have been attributed to anthropogenic ocean acidification (medium confidence)". REASONS: Human influence is causing ocean acidification, marine organisms are sensitive to ocean acidification, and effects are very likely to increase: - Ocean acidification can be attributed to human influence (see WG1, SPM). - Ch6 WG2 states, "Impacts of ocean acidification range from changes in organismal physiology and behavior to population dynamics (medium to high confidence) and will affect marine ecosystems for centuries if emissions continue (high confidence)." And "Few field observations conducted in the last decade demonstrate biotic responses attributable to anthropogenic ocean acidification, as in many places these responses are not yet outside their natural variability and may be influenced by confounding local or regional factors." [Government of Saint Lucia]
SPM A-310	SPM	10	11	10	14	SPM 1.3	There are two consecutive sentences starting with "Some impacts". It would be better if you give examples for these examples in these sentences. [Government of Turkey]
SPM A-311	SPM	10	12	10	14	SPM 1.3	"Some impacts on human systems have also been attributed to climate change...": it will be good to provide in the same sentence 1-2 examples, so the reader gets an idea which are those impacts that are attributed to climate change and the sentence looks less generic. [European Union]
SPM A-312	SPM	10	12	14	12	SPM 1.3	This sentence is too generic and sounds obvious. Needs to be more explicit [Government of India]
SPM A-313	SPM	10	13	10	14	SPM 1.3	The phrase, "with a major or minor contribution of climate change distinguishable from other influences" does not appear to be necessary. Consider deleting. [Government of United States of America]
SPM A-314	SPM	10	14	10	14	SPM 1.3	Words 'Assessment of' may be replaced with the words 'Based on' [Government of India]
SPM A-315	SPM	10	14	10	16	SPM 1.3	Please consider to expand this sentence to also include neagative impacts on marine ecosystems and mention implications for food security. Rationale: Fisheries are important for many regions and marine ecosystems have been negatively affected as shown in Figure SPM.4, and mentioned in the text Topic 1 4.2, page 51 in lines 15-24. [Government of Norway]

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SPM A-316	SPM	10	14	10	16	SPM 1.3	This statement assumes that there has been no adaptation to climate or management practices by the agricultural community and that crops are only at risk from climate change. This should be clarified. [Government of United States of America]
SPM A-317	SPM	10	16	10	17	Figure SPM.4	Figure SPM 4. The resolution of the figure is not optimal. [Government of Sweden]
SPM A-318	SPM	10	16	10	18	Figure SPM.4	The authors clearly put a great deal of effort into developing this but it still is very general and has great potential to be misinterpreted-- that if there is no filled symbol over a region then there is no expected impact. Suggest removing the figure. If that is not possible, then the authors should correct it as follows: based on the underlying chapter there should be filled symbols in red for livelihoods, health and economics over west and east Africa. [Government of United States of America]
SPM A-319	SPM	10	16	10	20	Figure SPM.4	Figure SPM.4 It is difficult to comment on this figure as the unlying map was not visible even in the high resolution version of the document. Uncertain as to how to interpret the information in the regional boxes. Are this summaries of the regional impacts? With the symbols outside the boxes referring to more local impacts? Please clarify in caption. [Government of Ireland]
SPM A-320	SPM	10	16	10	20	Figure SPM.4	Figure SPM.4 is too small and cluttered. If the amount of information it contains is retained, it should be given an entire page in the landscape orientation. It is unclear why some of the symbols -- those with "minor contribution" and "very low confidence" are included in the Figure -- they (e.g., Rivers in the Caribbean) could be removed. [Government of United States of America]
SPM A-321	SPM	10	17	10	17	Figure SPM.4	Figure SPM.4 is too generic and does not highlight the intensity of the impact of climate change, on say, food production or water resources. Suggest adding a paragraph on the regional impacts, for e.g., the severity of the impact of climate change on food production in Africa or South Asia. Alternatively, can you include in Figure SPM.4, the intensity of the impact. [Government of India]
SPM A-322	SPM	10	17	10	17	Figure SPM.4	This is a major concern about Figure SPM.4: Why there is no impact on "livelihood, health, and economics" in Asia regionally or otherwise. This contradicts many places in the Topic 1-3 and in the WGI-III and the SREX that Asia may have more severe problems with flood, drought, fire, sea level rise on low land, etc. [Government of United States of America]
SPM A-323	SPM	10	18	10	18	Figure SPM.4	Figure SPM.2: Boxes with "regional-scale impacts" are misleading, probably due to bias in the literature and to the fact that smaller and more homogeneous regions are likely to have more different types of impacts encompassing the whole area than large heterogeneous ones. It is not appropriate to compare in this way regions so different in size and characteristics as Europe in one side and Central and South America or Africa on the other. From the figure it appears, for example, that Europe is more vulnerable (more regional scale-impacts) than Africa or Central-South America. These boxes, or the whole figure, should be deleted. [Government of Venezuela]
SPM A-324	SPM	10	18	10	20	Figure SPM.4	This figure is confusing and presents a lot of information. A way to aid the reader would be to provide 1-2 examples of how to decipher the graph (e.g. describing two impacts in 2 regions) [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-325	SPM	10	18	10	20	Figure SPM.4	'Attribution' is used first at p. SYR-10 in captions to the Figure SPM.4. Explanations on what attribution is are given at p. SYR-46. Explanations should go before the first use. [Government of Russian Federation]
SPM A-326	SPM	10		10		Figure SPM.4	Figure SPM 4. I have zoomed 150% in the pdf and have a huge monitor. The figure has a low resolution which makes it hard to read on paper. The sea level has risen so there is an erosion impact on western Europe soft coast which is not shown [Government of Denmark]
SPM A-327	SPM	10		10		Figure SPM.4	This description of impacts is very generic. The authors should consider modifying the text to tie in better with Fig. SPM 4 (which is really busy and could benefit from some explanation). For example: " The physical impacts (also described in section 1.1 and 1.2..) include... For the biological community, the impacts are.... The effect on the human system are more complex, but the most immediate is on agriculture..." [Government of United States of America]

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SPM A-328	SPM	10		10		Figure SPM.4	Figure SPM.4 should be given a full-page (landscape orientation) in order to make it more readable -- and understandable. It's currently too small. [Government of United States of America]
SPM A-329	SPM	10		10		Figure SPM.4	This figure appears to presume primarily negative impacts, or at the least, does not clarify whether any impacts will be positive. The authors should consider reflecting positive impacts, if there are any to be mentioned. [Government of United States of America]
SPM A-330	SPM	10		10		SPM 1.3	SUGGEST a new table similar to AR5 WG1 Table SPM.1, or extension of existing Figure SPM.4. The way information is provided in Table SPM.1 of WG1 is very helpful in assessing questions of attribution as well as for relating future projections to observed changes, which is crucial to make those future changes tangible. The findings on climate impacts from WG2 as presented in Fig. SPM.4 should be extended in a likewise manner. We understand that Fig. SPM.4 is helpful since it is highlighting impacts for different world regions, thus providing regional resolution. However, the combination of observed and projected climate impacts in a single table or figure would greatly help to assess climate impacts and to put future projections in relation to already experienced [Government of Saint Lucia]
SPM A-331	SPM	10		10		Figure SPM.4	Figure SPM.4 It's important to include impacts in marine ecosystems and freshwater ecosystems in South America [Government of Argentina]
SPM A-332	SPM	11	1	11	1	SPM 1.4	It would be better to say "Extreme events" rather than "Extremes" for clarification. [Government of Japan]
SPM A-333	SPM	11	1	11	3	SPM 1.4	Please consider if the literature assessed gives a basis for stating the last sentence more explicitly, for example by including relevant extreme weather events. [Government of Norway]
SPM A-334	SPM	11	1	11	22	SPM 1.4	We found that the placement of Section 1.4 made the SPM a little hard to follow, as the previous sections separated discussion of observation of climate change and attribution of climate change to human influence, whereas Section 1.4 jumps between the two concepts. Suggest the authors consider whether the content of Section 1.4 could be re-organized to help make these concepts more clear. [Government of Canada]
SPM A-335	SPM	11	1	11	22	SPM 1.4	The title of 1.4 need to be expanded to be clear what is meant by 'Extremes' [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-336	SPM	11	1			SPM 1.4	Section 1.4: we agree that it is important to highlight extremes, but the placement of this subsection seems odd. Please consider placing it earlier in the text and/or adapting the titles so that its content is clearer and better linked to other physical changes and impacts. [Government of Belgium]
SPM A-337	SPM	11	2	11	5	Headline 1.4	is the increase in extreme sea high sea levels part of extreme weather and climate events?, the concept of extreme sea levels is not clear [Government of United Republic of Tanzania]
SPM A-338	SPM	11	3	11	3	Headline 1.4	"changes in many extreme weather and climate events..." should be "changes in many categories of extreme weather events..." [Government of United States of America]
SPM A-339	SPM	11	3	11	5	Headline 1.4	The detailed text is largely focussed on a change in frequency rather than intensity. However, the summary statement reads as if the issue is a change in intensity i.e. less cold extremes. It would be helpful to clarify whether the change is in one or both attributes in the box summary. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-340	SPM	11	3	11	5	Headline 1.4	The headline should explicitly note "impacts" - not just "changes" - since underlying text touches on both. [Government of United States of America]
SPM A-341	SPM	11	3	11	5	Headline 1.4	By mixing different types of extreme events in this statement, an incorrect or over generalized message is conveyed ("Some of these changes have been linked to human influences.") SUGGEST reword to be more specific e.g. as "Changes in many extreme weather and climate phenomena have

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							<p>been observed since about 1950 at different levels of confidence. Changes for which a human contribution is assessed at least likely include a decrease in cold temperature extremes, increase in hot temperature extremes and heat waves and increases in extreme high sea levels."</p> <p>REASONS: WG1 Table SPM1 states "It is very likely that human influence has contributed to the observed global scale changes in the frequency and intensity of daily temperature extremes since the mid-20th century." It is clear from WG1 Table SPM1, the assessment that changes occurred as well as a human contribution to the observed changes is diverse across the different impacts. This is reflected in the paragraph text and should also be reflected in the summary statement. [Government of Saint Lucia]</p>
SPM A-342	SPM	11	3	11	22	SPM 1.4	<p>Session 1.4 (Extremes)</p> <p>(1) Message in bold and box is quite general and not clearly presented the main messages of changes on Extremes treated through the AR5.</p> <p>(2) Contents are lack of specific indicators of used examples or issues, such as cold days and night have decreased meanwhile warm days and nights have been increased then what these would cause in risk or how it would impact on vulnerability, etc.</p> <p>(3) The Sentence in line 9 and 10, "It is very likely that human influence has contributed to the observed global scale changes in the frequency and intensity of daily temperature extremes since the mid-20th century", seems re-assessed by authors, because the relevant part, session 1.5 (page 52 ~ 54) in the underlying report does not have any evidence of the sentence. Please check where this sentence comes from or revise it.(WG1?) [Government of Republic of Korea]</p>
SPM A-343	SPM	11	4	11	4	Headline 1.4	Consider also referring to extreme precipitation in the headline box. [Government of Canada]
SPM A-344	SPM	11	5	11	5	Headline 1.4	Suggest revising this last sentence to say "Changes in these extremes in some areas (regions) have been linked to human influences." In the current text, starting the sentence with "Some of these changes" could be interpreted to mean that of the preceding list of extremes, only some have been linked to human influences. [Government of Canada]
SPM A-345	SPM	11	5	11	5	Headline 1.4	"Some of...": this sentence seems weak and doesn't appear to reflect the findings of the report. Replace "some" with "most of". [European Union]
SPM A-346	SPM	11	7	11	13	SPM 1.4	This paragraphs begins with some findings in the frequency of heat waves observed in Europe, Asia and Australia and later it mentions some points also in relation with heat waves located "in some locations" (lines 11-12) and "in some regions" (line 13). Would it be possible to provide some specific geographical references for these findings? [Government of Spain]
SPM A-347	SPM	11	8	11	9	SPM 1.4	Is there any information on Africa? According to WG2 Ch2 such increase could also have occurred on other continents, but confidence is only medium due to insufficient data. (WG1 Ch 2: "There is only medium confidence that the length and frequency of warm spells, including heat waves, has increased since the middle of the 20th century mostly owing to lack of data or of studies in Africa and South America." This fact should be expressed in the SYR by adding the following sentence in L 9 (after "... and Australia"): "Due to lack of information there is only medium confidence about such increase in Africa and South America. [Government of Germany]
SPM A-348	SPM	11	11	11	13	SPM 1.4	"some locations" and "some regions" are quite vague terms. Is it possible to specify where? [Government of Finland]
SPM A-349	SPM	11	12	11	12	SPM 1.4	Editorial, suggest replace "on" with "in" [Government of Ireland]

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SPM A-350	SPM	11	12	11	13	SPM 1.4	This sentence is awkwardly worded, and the juxtaposition with the previous sentence may lead the reader to infer that there is medium confidence that human influence on the climate has caused these mortality impacts in some regions, which as we understand it, is an attribution that the authors do not make. Suggest rephrasing the sentence as "There is medium confidence that the observed warming has increased heat-related human mortality and decreased cold-related human mortality in some regions". This helps to make it clear that these mortality impacts are being attributed to observed climate change rather than human influence on the climate. [Government of Canada]
SPM A-351	SPM	11	12	11	13	SPM 1.4	The sentence on page SYR-53 lines 7-8 is clearer than this wording. [Government of New Zealand]
SPM A-352	SPM	11	15	11	15	SPM 1.4	the term 'heavy precipitation events' is unclear and the authors should provide a clear definition of what they mean by this term. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-353	SPM	11	16	11	16	SPM 1.4	"positive trends" can be misunderstood. Please reword stating the direction of the change the trend applies for. [Government of Sweden]
SPM A-354	SPM	11	17	11	17	SPM 1.4	"It is likely that extreme sea levels have increased..." Does the likelihood estimate apply to the observation of increases in extreme sea levels, or to the association between that and increases in mean sea level? If the former, why would the estimated likelihood not be higher? The authors should clarify. [Government of United States of America]
SPM A-355	SPM	11	17	11	18	SPM 1.4	The sentence may be modified as " Extreme sea levels have increased since 1970, it is likely that mean sea level rise is causing this increase" [Government of India]
SPM A-356	SPM	11	17	11	18	SPM 1.4	The authors should strongly consider inserting a brief definition of "extreme sea levels" in parentheses after this phrase, such as "(i.e., storm surge)". The concept of "extreme sea levels" is a ambiguous to a policymaker. [Government of United States of America]
SPM A-357	SPM	11	18			SPM 1.4	Suggest replacing 'being mainly a result' with 'mainly as a result' [Government of New Zealand]
SPM A-358	SPM	11	20	11	22	SPM 1.4	Paleoclimatic research conducted by the GSI in three major river valleys of the Himalaya (Indus, Satluj, Alaknanda) shows that there had been extreme climatic events in the geological past due to changes in the monsoon patterns and the events in Geologic past [Government of India]
SPM A-359	SPM	11	20	11	22	SPM 1.4	It is important to note in the discussion on exposure and vulnerability the link with sustainable development issues - cf. WGII as reflected in Topic 1 pg 54 - 'Differences in vulnerability and exposure arise from non-climatic factors and from multidimensional inequalities often produced by uneven development processes (very high confidence). These differences shape differential risks from climate change.' [Government of Switzerland]
SPM A-360	SPM	11	20	11	22	SPM 1.4	Policymakers care deeply about extreme events. After all, in many ways it is how extreme events will change that will determine many of the (near-term, at least) impacts from climate change. As such, the authors should strongly consider saying more about the observed changes in extreme events - as well as the attribution - to the degree that the science allows it. [Government of United States of America]
SPM A-361	SPM	11	21	11	22	SPM 1.4	Suggest "... human systems to climate variability and thus also to climate change". [Government of Sweden]
SPM A-362	SPM	11	25	11	25	SPM 2	The order is illogical here. Risk is a function of consequence and likelihood. So information on the consequence is required before being able to estimate risks. We suggest revising to read: "Future climate change, impacts and risks". The key message that follows this title appears to support this suggestion. [Government of Finland]
SPM A-363	SPM	11	27	11	30	Headline 2	Replace existing text with: Continued emission of greenhouse gases will cause further warming and long-lasting changes in all parts of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for human society and ecosystems. A combination of substantial, sustained reductions in greenhouse gas emissions and adaptation

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							measures can limit climate change risks. {2} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-364	SPM	11	27	11	30	Headline 2	The shaded box contains a very important statement, but please consider to add that emission reductions need to happen quickly, for example (on line 29) ".... substantial, immediate and sustained reductions" [Government of Norway]
SPM A-365	SPM	11	27	11	30	Headline 2	KEY CONCERN: The statement needs rewording to make clear the findings from WG2. SUGGEST rephrasing the paragraph to e.g.: "Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. Substantial and sustained reductions in greenhouse gas emissions in combination with adaptation to the remaining impacts can limit climate change risks. However, some risks from adverse impacts will remain for all levels of mitigation and adaptation (very high confidence)." REASONS: It is clear from the analysis of WG2 SPM that "Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits (high confidence)". While this is not disputed it should be made very explicit, which is why we suggest a rephrasing of the paragraph. In addition, it is very important to refer to a statement of adverse impacts from the WG2 SPM: "Under all assessed scenarios for adaptation and mitigation, some risk from adverse impacts remains (very high confidence)." [Government of Saint Lucia]
SPM A-366	SPM	11	27	11	30	Headline 2	A key finding is that all regions are affected, regardless of wealth. This should be added to the box. [European Union]
SPM A-367	SPM	11	28	11	28	Headline 2	Given the fact that the literal meaning of "irreversible" is different than the version used and defined in the Glossary, please either define it in a footnote or make reference to the definition in the Glossary. [Government of United States of America]
SPM A-368	SPM	11	29	11	29	Headline 2	After 'people and...' add '...specially natural ecosystems.' [Government of India]
SPM A-369	SPM	11	29	11	30	Headline 2	Please change the order of adaptation and mitigation according to the priority to address the climate change problem: "A combination of substantial, sustained reductions in greenhouse gas emissions and adaptation can limit climate change risks." Mitigation is the best option to reduce risks. Adaptation addresses remaining risks that cannot be avoided by mitigation. See also our general comment on the sequence of mitigation and adaption in the SYR. [Government of Germany]
SPM A-370	SPM	11	29	11	30	Headline 2	We suggest adding "and impacts" at the end of this sentence, as reducing risks would result in reduced impacts and would be more consistent with the previous sentence (which includes the word "impacts"). [Government of Belgium]
SPM A-371	SPM	11	29	11	30	Headline 2	We think this headline statement needs to be more specific, and we suggest the second sentence to read: "A combination of adaptation, and sustained mitigation that results in limiting average global temperature increase to maximally 2°C, needs net zero greenhouse gas emissions shortly after 2050, and would limit climate change risks." [Government of Netherlands]
SPM A-372	SPM	11	32	11	32	SPM 2.1	It could be useful to emphasize the adequate use of "projections" with some explanatory text (footnote?), as different from prognoses or forecast. [Government of Sweden]
SPM A-373	SPM	11	32	11	32	SPM 2.1	Is it a title of a chapter? The last paragraph which is about cumulative emissions and global mean T (very important issues/messages) seems to go beyond the current title. [European Union]
SPM A-374	SPM	11	32	11	36	SPM 2.1	The current text does not adequately reflect the content of the text in the SPM. It is important to that the headline statement not only mentions cumulative emissions but puts across what it tells us about past and future emissions. Replace existing text with: 2.1 Projection scenarios and future emissions Cumulative emissions of CO2 largely determine global mean surface warming by the late 21st century and beyond.

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							We have already emitted over half the CO2 budget that would give a likely chance of limiting warming to less than 2 °C. {2.1} It should be noted that the supporting text on cumulative emissions in the main report actually comes in Section 2.2 not Section 2.1 to which this headline statement is attached. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-375	SPM	11	32			SPM 2.1	Section 2.1 : We think that given its title, this section should provide a little more explanation on the drivers of emissions, or at least links to other sections of this SPM that deals with the driver of emissions and better links to the topics (the references to 2.1 and 4.2 in the first paragraph do not appear sufficient : we would expect references to SPM section 3 and topic 3, as "transformation" is linked to changes in the drivers introduced here). [Government of Belgium]
SPM A-376	SPM	11	32			SPM 2.1	Section 2.1: We do not understand why a section called "The basis on which projections are made" includes the important description of the link between the cumulative emissions and temperatures. This link is very important but we suggests to either change the title of this section to clarify or move its contents closer to where figure 5b appears a second time (possibly eliminating the need to duplicate it) or closer to table SPM1 (which would explain the scenario categories when they are first used). [Government of Belgium]
SPM A-377	SPM	11	34	11	34	Headline 2.1	Write:"The IPCC AR5 baseline and mitigation scenarios cover a wide range of future emissions, depending ...". [Government of Switzerland]
SPM A-378	SPM	11	34	11	35	Headline 2.1	Please, change: " ... depending on poplation size, economic activitylifestyle, energy use, land-use patterns, technology change and climate policy " Rationale: To make headline statements more concrete. [Government of Finland]
SPM A-379	SPM	11	34	11	36	Headline 2.1	This is misleading, as uncertainties and risks go far beyond uncertainty in emission scenarios. Please rephrase: "Scenarios of future climate change and associated risks and impacts ..." [Government of Saint Lucia]
SPM A-380	SPM	11	34	11	36	Headline 2.1	What is the logical connection between the two sentences? [European Union]
SPM A-381	SPM	11	35	11	35	Headline 2.1	As the expression "cumulative emissions of CO2" is mentioned for the first time, we suggest to provide information on its meaning. [Government of Germany]
SPM A-382	SPM	11	35	11	36	Headline 2.1	"...largely determine..." -> "...largely continue to determine..." [Government of Finland]
SPM A-383	SPM	11	38	11	39	SPM 2.1	Please, delete the lines. Text moved up to the box. [Government of Finland]
SPM A-384	SPM	11	38	11	39	SPM 2.1	This can be removed. Also sugest change the phrase "mainly determined by" to "mainly driven by". "Determined" gives the impression that emissions are an inevitable consequence of these factors. [Government of Ireland]
SPM A-385	SPM	11	39	11	39	SPM 2.1	Is there evidence of climate policy already impacting anthropogenic GHG emissions? [Government of India]
SPM A-386	SPM	11	39	11	39	SPM 2.1	Anthropogenic greenhouse gas gas emissions are mainly determined by... technology," not technology change. [Government of United States of America]
SPM A-387	SPM	11	41	11	41	SPM 2.1	In defining the RCPs can you add an explanation of the 4.5, 6.0, 8.5 etc after 'RCP', e.g. RCP6.0 [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-388	SPM	11	41	11	41	SPM 2.1	There needs to be a short definition of RCPs , and what RCP2.6 or 4.5 mean. A footnote at line 41, similar to footnote 12, page 9, WG3 SPM can be useful here. The footnote language in the WG3 SPM page 9 is reproduced here for convenience. "For the purpose of this assessment, roughly 300 baseline scenarios and 900 mitigation scenarios were collected

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							through an open call from integrated modelling teams around the world. These scenarios are complementary to the Representative Concentration Pathways (RCPs, see WGIII AR5 Glossary). The RCPs are identified by their approximate total radiative forcing in year 2100 relative to 1750: 2.6 Watts per square meter (W/m ²) for RCP2.6, 4.5 W/m ² for RCP4.5, 6.0 W/m ² for RCP6.0, and 8.5 W/m ² for RCP8.5." [Government of United States of America]
SPM A-389	SPM	11	41	11	41	SPM 2.1	Add commas and qualification ("based upon these factors"), as described: "The Representative Concentration Pathways (RCPs), which is used for making projections based upon these factors, describe the 21st century evolution of atmospheric greenhouse gas emissions and concentrations, air pollutant emissions and land-use change under four different futures." [Government of United States of America]
SPM A-390	SPM	11	41	11	44	SPM 2.1	The use of stabilization scenarios along with a mitigation scenario may be confusing in the policy arena where the objective is stabilization to be achieved by mitigation. [Government of Ireland]
SPM A-391	SPM	11	41	11	45	SPM 2.1	This para is too complex for this report and could be simplified e.g. state "Four different climate futures were explored using climate projections. These included a high, two medium and a low emissions future which each consisted of a range of GHG emissions scenarios, as well as other pollutants and features such as land use." Perhaps the original references to RCPs could be put into a clear table that can be presented to policy makers. [Government of Ireland]
SPM A-392	SPM	11	41	11	49	SPM 2.1	This paragraph about the scenarios is highly technical and difficult to read. We suggest it could be simplified by deleting the second and third sentences. The first sentence could be made a bit easier to read by replacing "the 21st century evolution" with "four different 21st century evolutions" (lines 41 and 42) and deleting "under four different futures" on line 43. The word "mitigation" should be deleted from the last sentence (i.e. "scenarios" not "mitigation scenarios"). The differences between the 4 RCPs is evident from the Figure, but no explanation is given to understand the naming convention for the RCPs; we aren't told what is stabilized in RCP4.5 and RCP6 etc., and the difference between mitigation and stabilization scenarios isn't explained. The most important information to convey is that the four RCPs represent 4 different futures and to refer readers to the graph to see how they differ. Also, suggest adding a reference here to Box 2.2 in the full SYR (on the RCPs). [Government of Canada]
SPM A-393	SPM	11	41	11	49	SPM 2.1	We have a concern that the description of the scenarios is very hard to understand. The names of the scenarios are very technical and we wonder whether it would be possible to develop descriptive names for the scenarios, at least for the high and low end scenarios that are most often used. [Government of Finland]
SPM A-394	SPM	11	43	11	44	SPM 2.1	Rephrase to "leading to a low forcing level". [Government of Sweden]
SPM A-395	SPM	11	43	11	45	SPM 2.1	It is important to introduce what are the assumptions of the models: i) perfect market competition; ii) increase of biofuels, etc. In order for policy makers to understand how scenarios has been shaped; and also to introduce that there are a lot of uncertainties in the models that do not fit the real world as stated in report of WGIII. We request to introduce the following wording about the models: "The models approximate cost-effective solutions that minimize the aggregate economic costs of achieving mitigation outcomes, unless they are specifically constrained to behave otherwise. They are simplified, stylized representations of highly-complex, real-world processes, and the scenarios they produce are based on uncertain projections about key events and drivers over often century-long timescales. Simplifications and differences in assumptions are the reason why output generated from different models, or versions of the same model, can differ, and projections from all models can differ considerably from the reality that unfolds. [Box TS.7, 6.2] WG III Footnote 14, page 10. [Government of Bolivia]"
SPM A-396	SPM	11	43	11	49	SPM 2.1	KEY CONCERN: The characterization of the RCPs here is inconsistent with the WGI and III reports. The language "very low" and "very high" greenhouse gas emissions contain implicit subjective judgments that should be avoided. SUGGEST rewording: "The RCPs include one representative mitigation scenario (RCP2.6) that keeps global warming below 2°C above pre-industrial temperatures by 2100 and beyond with a likely chance, as well as one high emission scenario (RCP8.5) and two intermediate scenarios (RCP4.5 and RCP6.0). Global surface temperature change for the end of

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							the 21st century is likely to exceed 1.5°C relative to 1850 to 1900 for all RCP scenarios except RCP2.6. It is likely to exceed 2°C for RCP6.0 and RCP8.5, and more likely than not to exceed 2°C for RCP4.5. Warming will continue beyond 2100 under all RCP scenarios except RCP2.6. Scenarios without additional efforts to constrain emissions ("baseline scenarios") lead to a range of forcing levels between RCP6.0 and RCP8.5. The RCPs are consistent with the wide range of scenarios assessed by WGIII." [Government of Saint Lucia]
SPM A-397	SPM	11	43	11	49	SPM 2.1	<p>REASONING FOR KEY CONCERN over the characterization of the RCPs, See other part of this comment for suggest rewording.</p> <p>REASONING: Adopt the summary statement from the WG1 SPM E.1 (see below for full text) and to bring the key distinguishing element of RCP2.6 forward, i.e. stabilizing warming by 2100. Moreover, the RCPs are not only consistent with the range of mitigation scenarios assessed in WGIII, but also consistent with the entire range. Finally, we suggest to avoid confusing the reader by mixing forcing, concentrations and greenhouse gas emissions in one descriptive sentence of the RCPs, as is currently the case, and to avoid including technicalities related to how WGIII categorized their scenarios.</p> <p>WG1 SPM E.1 Text "Global surface temperature change for the end of the 21st century is likely to exceed 1.5°C relative to 1850 to 1900 for all RCP scenarios except RCP2.6. It is likely to exceed 2°C for RCP6.0 and RCP8.5, and more likely than not to exceed 2°C for RCP4.5. Warming will continue beyond 2100 under all RCP scenarios except RCP2.6. Warming will continue to exhibit interannual-to-decadal variability and will not be regionally uniform (see Figures SPM.7 and SPM.8)." [Government of Saint Lucia]</p>
SPM A-398	SPM	11	44	11	44	SPM 2.1	The phrasing "two stabilization scenarios" is incorrect or misleading. RCP 6.0 does not stabilize concentrations or forcing by 2100, but still shows strong upwards trends. Furthermore, "stabilization scenarios" incorrectly suggests that both scenarios RCP 4.5 and RCP 6.0 imply mitigation action. RCP 4.5 is at the SRES B1 level and RCP 6.0 in the middle of the range of former SRES baseline scenarios. Thus, a more neutral wording like "medium-low and a medium-high scenario (RCP 4.5 and RCP 6.0)" seems more appropriate. Please rephrase. [Government of Germany]
SPM A-399	SPM	11	44	11	44	SPM 2.1	Suggest to delete "very". [Government of Sweden]
SPM A-400	SPM	11	44	11	44	SPM 2.1	What means "... with very high greenhouse gas emissions..."? We propose instead to say "...where GHG emissions follow current high trends, without additional mitigation efforts (RCP 8.5)." which is more clear to policy makers. [European Union]
SPM A-401	SPM	11	45	11	45	SPM 2.1	"...without additional efforts": could you explain what efforts are already included? [European Union]
SPM A-402	SPM	11	45	11	46	SPM 2.1	Please provide a more distinct explanation of "scenarios without additional efforts" ("baseline scenarios"). Does this mean without additional efforts compared to those already in place and/or announced? If there was a proper explanation, you could merely use the short term "baseline scenarios" in the remainder of the text. [Government of Germany]
SPM A-403	SPM	11	46	11	47	SPM 2.1	It may mislead policy makers to equate the scenario RCP2.6 with the 2°C temperature rise as formulated here. Based on the conclusion in the last paragraph on P27 of WG1 SPM, it is suggested that the text "RCP4.5 represents another scenario with possibility to hold global warming below 2°C" be inserted after the sentence "RCP2.6 is representative of a scenario that aims to keep global warming below 2°C above pre-industrial temperatures". An alternative solution is to add some words stating that for RCP2.6, 66% of simulations meet the goal of keeping temperature rise below 2°C. [Government of China]
SPM A-404	SPM	11	48	11	49	SPM 2.1	It is possible to misunderstand that value 2100 is concentration. It would be better to write "year 2100" or "categorized on the basis of CO2eq concentration in 2100." [Government of Japan]

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SPM A-405	SPM	11	49	11	49	SPM 2.1	Suggest changing to "categorized on the basis of CO ₂ -eq concentration in the year 2100" (clarifying that 2100 is the year) [Government of Canada]
SPM A-406	SPM	11	49	11	49	SPM 2.1	Is it possible to give a footnote on the relationship between SRES scenarios; A1, A2, B1 and B2; and RCPs. [Government of India]
SPM A-407	SPM	11	49	11	49	SPM 2.1	Revise to avoid confusion to: "the basis of the CO ₂ -eq concentration of the year 2100." [Government of Sweden]
SPM A-408	SPM	11		11		SPM 2.1, footnote 5	Footnote 5. Recommend revising to say: "The CO ₂ -equivalent concentration (CO ₂ -eq) is the CO ₂ concentration which would result in the same forcing as that of all greenhouse gases, including....etc." In line 2 of the footnote, use subscript "2" in "CO ₂ ". [Government of Canada]
SPM A-409	SPM	11				SPM 2.1	In 1.4 Extremes, the occurrence of intense cold waves, hailstorms need a mention [Government of India]
SPM A-410	SPM	11				SPM 2.1, footnote 5	In the endnote, "2" of "CO ₂ " should be written with subscript. [Government of Turkey]
SPM A-411	SPM	12	1	12	1	Figure SPM.5	Figure SPM.5: Please specify the end year for cumulative emissions presented in this figure in the figure heading and caption (1870 to when?). [Government of United States of America]
SPM A-412	SPM	12	1	12	11	Figure SPM.5	Figure SPM.5(b): the title needs amending to say "surface temperature rise" instead of "warming". Figure SPM.5(b) is a complicated one to explain to policy makers. Even the definition of ellipses in lines 9-12 is quite confusing and is not clear what is the actual message out of this particular figure. The meaning of the ellipses is obscure. Are them the levels at 2100? We are wondering why the WG1 figure on cumulative emissions (SPM.10 - WG1 SPM) is not used instead of SPM.5(b). [European Union]
SPM A-413	SPM	12	1	12	20	Figure SPM.5	Figure SPM5, part (a) should be titled as GHG emission pathways 2000-2100, instead of the current title of "Annual Anthropogenic CO ₂ emissions" which is misleading. Also, this figure is slightly different from the corresponding figure in WG3 SPM, page 11, Figure SPM 4 part (a). The two should be consistent as they are meant to depict the same information. Also, the figure in the WG3 SPM is better labelled than the one here in the synthesis report. Labelling it as per WG3 figure can negate the necessity for a long explanation of the figure in the key. [Government of United States of America]
SPM A-414	SPM	12	1			Figure SPM.5	Figure SPM.5 (b): The meaning of the dashed horizontal line is somewhat confusing. Please provide information on GtC/GtCO ₂ at the two horizontal axes as in WG1 Figure SPM.10. In addition, we propose to change the legend of the abscissa as follows: "... emissions since 1870" as this is easier to understand for lay people. [Government of Germany]
SPM A-415	SPM	12	1			Figure SPM.5	Figure SPM5.b: The improvement of this graph in comparison to the WG1 SPM is highly appreciated. [Government of Germany]
SPM A-416	SPM	12	3	12	3	Figure SPM.5	In Figure SPM.5b, suggest the authors consider whether it would be more appropriate to display the cumulative emissions estimate for 2011 (which is 515 GtC +/- 70 GtC, and is directly traceable to the WG1 SPM) rather than include a more vague marker representing the 2000s. [Government of Canada]
SPM A-417	SPM	12	3	12	3	Figure SPM.5	Is it possible to add the projections made for SRES scenarios during AR4, since this enables policy makers to get a comparative picture of the projections by the two successive IPCC reports. [Government of India]
SPM A-418	SPM	12	3	12	3	Figure SPM.5	Compliment IPCC for Figure SPM.5b which is a nice presentation of the warming ranges with cumulative CO ₂ emissions. [Government of India]
SPM A-419	SPM	12	3	12	11	Figure SPM.5	Figure SMP5(b) relates CO ₂ emissions to temperature for different concentrations, based on a simple climate model. This seems premature given that the CMIP5 projections of future climate using complex ESMs under different RCPs are only introduced in section 2.2. [Government of Finland]

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SPM A-420	SPM	12	3	12	11	Figure SPM.5	Figure SPM 5: in WG III SPM Fig SPM.4 the Vertical Axis represents annual GHG emissions, not CO2 emissions. In addition, FOD SPM Fig, 5 appeared different than FD SPM Fig. 5 need clarification. [Government of Saudi Arabia]
SPM A-421	SPM	12	3	12	11	Figure SPM.5	Please clarify in caption if the Temperature increase is the long term equilibrium temperature. Otherwise it is difficult to reconcile the estimate of CO2 eq 2011 of 430ppm and the observed warming in this figure [Government of Ireland]
SPM A-422	SPM	12	4	12	6	Figure SPM.5	This sentence indicates that WGIII scenarios are "total greenhouse gas concentration", while our understanding of the WGIII report is that this should be CO2-equivalent concentrations also including aerosols and land-use changes. Please check. It is important to clarify that the concentrations used to define the scenarios categories also includes aerosols and land-use changes, as this needs to be taken into account when comparing those numbers to other data. [Government of Belgium]
SPM A-423	SPM	12	6	12	7	Figure SPM.5	The wording "global mean surface temperature increase" in this caption is insufficiently precise, particularly given the strong policy relevance of Fig SPM.5(b). Please clarify whether this is the temperature increase at the time the indicated cumulative emission level is reached, or the eventual equilibrium temperature reached as a result of this cumulative emission, or the peak temperature reached, or the temperature reached at the end of the 21st Century, or We note that line 15 on the same page refers to the "projected 21st century temperature change" which might imply the fourth of these possibilities. This matter was already raised by a NZ scientist in the expert review, but has not been addressed. [Government of New Zealand]
SPM A-424	SPM	12	6	12	11	Figure SPM.5	The wording "the spread of projections" appears unclear. Does it mean the 90% range of scenarios, as we assume on the basis of WGI TS, and would it be correct to interpret it as the "likely range", following the WGI assessment ? If so, please replace "the spread" with "the likely range". We think that this is important to explain the climate uncertainty as clearly as possible, on the basis of the WGI assessment. [Government of Belgium]
SPM A-425	SPM	12	7	12	7	Figure SPM.5	Delete "total" and insert "anthropogenic", so the phrase reads: "...cumulative global anthropogenic CO2..." As it reads, the "total" is redundant with "cumulative" and the anthropogenic is needed since that is what the figure shows. [Government of United States of America]
SPM A-426	SPM	12	8			Figure SPM.5	It is not clear what 'hierarchy' is referred to. Perhaps 'suite' is a better word. [Government of New Zealand]
SPM A-427	SPM	12	9	12	11	Figure SPM.5	We suggest additional clarification is needed to properly understand the impact of non-CO2 drivers on the cumulative CO2 emissions. Suggest adding to the end of this sentence a phrase such as this: "(i.e. any single CO2-eq forcing level could be met by scenarios with different combinations of CO2 and non-CO2 drivers)." [Government of Canada]
SPM A-428	SPM	12	9	12	11	Figure SPM.5	Ellipses presumably represent atmospheric CO2 concentration levels but this is not explained in the caption, where only cumulative emissions are referred to. The authors should clarify. [Government of United States of America]
SPM A-429	SPM	12	9	12	11	Figure SPM.5	Clarify more clearly that the uncertainties associated with the ovals in the figure arise from the forcing from non-CO2 forcing agents (if, indeed, that is the case). [Government of United States of America]
SPM A-430	SPM	12	13	12	14	SPM 2.1	Please consider to include "and removals" after "Cumulative emissions". So that the sentence starts with "Cumulative emissions and removals of CO2...". Rationale: This is relevant to consideration of mitigation options in forestry. And therefore improves the conclusion for the most cost-effective mitigation options in forestry (page 29, line 16-19); "The most cost-effective mitigation options in forestry are afforestation, sustainable forest management and reducing deforestation, with large differences in their relative importance across regions"Ta inn page 29 line 16-19) [Government of Norway]
SPM A-431	SPM	12	13	12	20	SPM 2.1	This text has a strong message to convey, but it does not come across very clearly due to awkward wording. Suggest the second sentence could be rephrased as "Multiple lines of evidence show that there is a direct relationship between cumulative emissions and warming." This holds for both observed warming (WG1 Fig SPM.10) and projected warming, and thus it is not necessary to restrict this statement to projections. It is also not necessary to detail the lines of evidence since this is done in the figure caption. Suggest the third sentence be rephrased as "It

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							is likely that warming will remain below 2C if total CO2 emissions since 1870 are limited to no more than 2900 GtCO2 (2800-3200 GtCO2), of which two-thirds had already been emitted by 2011." Note that "about" in this sentence is redundant since an explicit uncertainty range is given. The authors could also consider deleting the first sentence of this paragraph, as it is a direct repetition of bolded headline. [Government of Canada]
SPM A-432	SPM	12	13	12	20	SPM 2.1	This paragraph illustrates that to stabilise temperatures at any level, CO2 emissions must stop - it is the only way to halt the growth of cumulative CO2 emissions. Please consider adding this important information, for more clarity. [Government of Belgium]
SPM A-433	SPM	12	13	12	20	SPM 2.1	Include a forward reference to Section 3.4 where the 2-degree pathways are explored in more detail [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-434	SPM	12	13	12	20	SPM 2.1	Figure SPM.5 (b) and last paragraph in page 12 is not about the basis on which projections are made, but more likely 'projected changes' gained through simulations using RCP scenarios. Therefore it will be better to put in the session 2.2. The end of the session 2.2 in page 15 would be better place for the figure (b) and the accompanied paragraph. [Government of Republic of Korea]
SPM A-435	SPM	12	14	12	14	SPM 2.1	It is suggested to insert "linear" in brackets after "straight-line" relationship in order to facilitate translation into other UN-languages that might not include the wording "straight-line" relationship. [Government of Austria]
SPM A-436	SPM	12	14	12	15	SPM 2.1	This sentence is an imprecise description. As reported by Working Group I, the cumulative CO2 emission correlates with the global surface temperature response in an approximately linear manner. Thus "straight line" used here is not accurate. It is suggested to adopt a nearly or quasi-linear relationship as formulated in WGI SPM (last but one paragraph on P27), that is, to reformulate "There is a strong consistent almost straight-line relationship between..." as "There is approximately linear relationship between...". [Government of China]
SPM A-437	SPM	12	15	12	15	SPM 2.1	See the New Zealand comment about Page 12 lines 6 and 7. It is important that the phrase "projected 21st century temperature change" or its replacement be consistent with how you decide to deal with the New Zealand Government comment on lines 6 and 7 [Government of New Zealand]
SPM A-438	SPM	12	16	12	16	SPM 2.1	"Figure" instead of "figure". [Government of Sweden]
SPM A-439	SPM	12	16	12	17	SPM 2.1	This estimate of likelihood of reaching 2 degC is based on a simple model, but isn't linked to the projections from CMIP5 models in the next section except by a plume that isn't properly explained until the next section. The discussion here is primarily about the requirements for mitigation - shouldn't this come later? [Government of Finland]
SPM A-440	SPM	12	16	12	18	SPM 2.1	Write:" Human-induced warming is likely to remain less than 2°C with total cumulative CO2 emissions since 1870 at about 2900 GtCO2 (2800-3200 GtCO2), two-thirds of which had already been emitted by 2011. " [Government of Switzerland]
SPM A-441	SPM	12	16	12	18	SPM 2.1	The sentence starting with "Providing" should be reworked for clarity [Government of Ireland]
SPM A-442	SPM	12	16	12	18	SPM 2.1	Assuming that this is based on WGI P.27, suggest that probability be written as percentages, thus saying "66%" instead of "two in three chance" for clear understanding by non-native speakers. [Government of Japan]
SPM A-443	SPM	12	16	12	18	SPM 2.1	Would like to request including the cases of >33% and >50% as in WG1 SPM for the information is very important for policy makers. Please replace this part with the corresponding part of WG1 SPM. (WG1 SPM p.27) "Limiting the warming caused by anthropogenic CO2 emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO2 emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO2), 0 and about 1210 GtC (4440 GtCO2), and 0 and about 1000 GtC (3670 GtCO2) since that period, respectively. These upper amounts are reduced to about 900 GtC (3300 GtCO2), 820 GtC (3010 GtCO2), and 790 GtC (2900 GtCO2), respectively, when accounting for non-CO2 forcings

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							as in RCP2.6. An amount of 515 [445 to 585] GtC (1890 [1630 to 2150] GtCO ₂), was already emitted by 2011." [Government of Japan]
SPM A-444	SPM	12	16	12	18	SPM 2.1	"requires" should be replaced with the wording such as "characterized by" (e.g., WG3 SPM Page.10 paragraph.2) as this part is explanation of assumptions which mitigation scenarios are based on. [Government of Japan]
SPM A-445	SPM	12	16	12	18	SPM 2.1	This paragraph provides a good illustration of the current challenge in keeping human-induced warming below 2°C. To further underline the mitigation challenge please consider including the following text taken from SYR-64 and SYR-127: "Leaving a budget of about 1000 GtCO ₂ (scenario range 750–1400 GtCO ₂ given different scenarios of non-CO ₂ climate drivers). At current rates, this remaining budget will be exhausted in the next 20 to 30 years." [Government of Norway]
SPM A-446	SPM	12	16	12	18	SPM 2.1	Lines 16 to 18 on this page are very confusing, and can be re-written as: "In order to provide at least a two-in-three chance that warming remains less than 2°C, requires total CO ₂ emissions (since 1870) to be restricted to 2900 GtCO ₂ (2800-3200 GtCO ₂). However, two thirds of this amount has been emitted by 2011." [Government of United States of America]
SPM A-447	SPM	12	16	12	18	SPM 2.1	Suggest rewording of "Providing a two-in-three chance or higher that total human induced warming remains less than 2 °C requires total CO ₂ emissions since 1870 to be limited to about 2900 GtCO ₂ (2800-3200 GtCO ₂), two-thirds of which had already been emitted by 2011" to read "Providing a two-in-three chance or higher likelihood etc..." [Government of Saint Lucia]
SPM A-448	SPM	12	16	12	20	SPM 2.1	insert as Scenarios consistent with the likely chance to keep temperature change below 2°C relative to pre-industrial levels includes GHG [Government of Saudi Arabia]
SPM A-449	SPM	12	16	12	20	SPM 2.1	Insert: "Limiting the warming caused by anthropogenic CO ₂ emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO ₂ emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO ₂), 0 and about 1210 GtC (4440 GtCO ₂), and 0 and about 1000 GtC (3670 GtCO ₂) since that period, respectively. These upper amounts are reduced to about 900 GtC (3300 GtCO ₂), 820 GtC (3010 GtCO ₂), and 790 GtC (2900 GtCO ₂), respectively, when accounting for non-CO ₂ forcings as in RCP2.6. An amount of 515 [445 to 585] GtC (1890 [1630 to 2150] GtCO ₂), was already emitted by 2011." Source: WG I, SPM p. 27. [Government of Saudi Arabia]
SPM A-450	SPM	12	16	12	20	SPM 2.1	This is a very important message and needs to be highlighted further. [European Union]
SPM A-451	SPM	12	17	12	18	SPM 2.1	Suggest that Line 17 should add 'cumulative' between 'total' and 'CO ₂ '. [Government of Canada]
SPM A-452	SPM	12	17	12	18	SPM 2.1	The space for cumulative carbon emission given here is taken from the longer report of the Synthesis Report (lines 40-41, page 64). However, the number 2800-3200 GtCO ₂ is not consistent with the data in Table 2.2 on page 65 of the longer report, which stands at 2550-3150 GtCO ₂ . It is suggested to give it a check and correction. [Government of China]
SPM A-453	SPM	12	18	12	20	SPM 2.1	Suggest it would be clearer if the phrase "early decades" were replaced by "in the next few decades" so readers understand this is a reference to the post 2011 time period. Also suggest adding to the end of the sentence the phrase "consistent with limits on total cumulative CO ₂ emissions". This limit on the "total carbon budget" for any particular temperature target is what makes the first part of the sentence true (using up more of the budget early leaves less for later). [Government of Canada]
SPM A-454	SPM	12	18	12	20	SPM 2.1	This is a very important sentence explaining the importance of near-term emission reductions and request that it be retained. [Government of Japan]
SPM A-455	SPM	12	18	12	20	SPM 2.1	I assume this is a forward look i.e. higher emissions over the next few decades will demand lower emissions later on. Rather than already requiring lower emissions because of higher emissions to date? Clarification would be helpful. [Government of United Kingdom of Great Britain & Northern Ireland]

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SPM A-456	SPM	12	18			SPM 2.1	Please add: "This means that it is required to limit total CO2 emissions after the year 2011 to 1000 Gt CO2." [Government of Germany]
SPM A-457	SPM	12	19	12	19	SPM 2.1	The term "negative emissions" is mentioned for the first time. Please explain the term in footnote or in the text. [Government of Germany]
SPM A-458	SPM	12	19	12	20	SPM 2.1	Could be revised to "High future CO2 emissions in early decades will require lower or..." to increase clarity. [Government of Sweden]
SPM A-459	SPM	12	19	12	20	SPM 2.1	Needs to elaborate/explain this further, as is a key message. [European Union]
SPM A-460	SPM	12	20			SPM 2.1	shall include references from SPMs and relevant % of agriculture, land-use and other sectors. [Government of Saudi Arabia]
SPM A-461	SPM	12	20			SPM 2.1	Please exchange the incorrect term "goal" with the term "limit". [Government of Germany]
SPM A-462	SPM	12		12		Figure SPM.5	Figure SPM5(b) has a label "baseline" next to the ellipse representing the greatest emissions (RCP8.5?). Baseline in this context refers to a reference scenario that assumes some kind of "business-as-usual" emissions. Confusingly, the term "baseline" is also used by climatologists to refer to the reference climate (either pre-industrial or some recent averaging period such as 1961-1990 or 1986-2005. I suggest altering this label to read "reference" or "business-as-usual" or "RCP8.5". [Government of Finland]
SPM A-463	SPM	12		12		Figure SPM.5	Figure SPM.5. For accurate understanding, to add the supplementary explanation below should be considered. While ellipses have been added in the figure (b) from the First Order Draft, additional explanation such as the description of the relevance of their areas and confidence of the temperature in its area should be written. Specifically, the description "The ellipses show the approximate position of samples, and the samples do not necessarily uniformly exist." [Government of Japan]
SPM A-464	SPM	12		12		Figure SPM.5	Figure SPM.5.b: It would be valuable to also include the RCPs as in Figure 2.3 since the RCPs are mentioned in the text. Further, to increase the readability and avoid cluttering the interesting part of the graph (the 'uncertainty cone') the coloured boxes telling the GHG concentrations could be moved sideways (right or left); the colouring will still provide a clear visual link between the box and the corresponding ellipsis. [Government of Sweden]
SPM A-465	SPM	12				Figure SPM.5	Fig SPM.5. This Figure is confusing because emissions are CO2-only, whereas the categories are described according to their concentrations in CO2-equivalent. In panel b, the text on the figure indicating "total human-induced warming" would suggest the CO2 equivalent emissions, but this is not the case. It is important to better clarify this figure and emphasize in the caption that the emissions pathways are for CO2-only emissions. Fig SPM.11 looks very similar to Figure SPM.5 but shows pathways for CO2eq emissions, so the pathways in the two Figures are different. Drawing the readers attention to this difference will help avoid misunderstandings. [Government of Canada]
SPM A-466	SPM	12				Figure SPM.5	Correct: Figure SPM.5 illustrates GHGs and not CO2 emissions. [Government of Saudi Arabia]
SPM A-467	SPM	12				Figure SPM.5	Figure SPM.5 (a): We suggest to add a vertical line at the year 2005 to indicate the end of the historical emissions line and the start of the RCPs or to add a sentence in the caption to specify that the RCPs start from 2005. [Government of Belgium]
SPM A-468	SPM	12				Figure SPM.5	Figure SPM.5: These two panels are much improved from the previous version and we strongly support the inclusion of the charts in their current format. However, in Panel b) please consider to be more specific regarding the "observed 2000s" black filled ellipse. If it is eg. the 2003-2012 period or 2000-2009 period it should be specified explicitly. This should also be explained in the caption. [Government of Norway]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-469	SPM	13	0			SPM 2.2	Please include Table 2.2 of the SYR in its SPM, Section 2.2. [Government of Germany]
SPM A-470	SPM	13	1	15	4	SPM 2.2	The whole chapter is very difficult to read, because of the reference to different reference periods. It needs to be re-worked and simplified. [European Union]
SPM A-471	SPM	13	1	18	20	SPM 2.2	There is little text focusing solely on impacts on water and this is all focused in relation to food security and urban areas. Given the extent and depth of change we think water warrants more focused text. Very little is also said in 2.4. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-472	SPM	13	3	13	3	Headline 2.2	Suggest stating "...under all assessed scenarios", rather than using the term "emission scenarios" as this expression is confusing for the reader when linking back to the description of the RCPs, where the term "mitigation scenarios" is used. It is important for the terminology relating to scenarios to be as consistent as possible, as this is confusing for non-specialists. [Government of Canada]
SPM A-473	SPM	13	3	13	3	Headline 2.2	Editorial, suggest replace "rise" with "increase" [Government of Ireland]
SPM A-474	SPM	13	3	13	4	Headline 2.2	It is not clear why this sentence refers to the fact that oceans will continue to "...lost oxygen". The loss of oxygen was not a finding that was identified in section 1 of the SPM (observed changes) and the continued loss of oxygen is also not explained in the supporting text for this bolded headline. Consider removing this reference here, as it was not identified as a key finding in the WGI SPM and the current level of explanation is not sufficient for readers. If this is an important result to highlight in the SPM, then some supporting text is required. [Government of Canada]
SPM A-475	SPM	13	3	13	5	Headline 2.2	This header does not seem sufficient to capture the range of projected changes of concern. Given that changes in climate extremes are among the most critical concerns related to future climate change it is surprising that nothing about extremes is included, including precipitation extremes. We recommend adding a statement about this and also about changes to the cryosphere given the wide ranging consequences that will result from loss of ice and snow. [Government of Canada]
SPM A-476	SPM	13	3	13	5	Headline 2.2	The point that impacts increase with rates and magnitude of warming is very relevant to the climate system too so this point should be made in Section 2.2. Extremes should be mentioned in this section otherwise it is unbalanced - there is a whole section on observed extremes. Replace existing text with: There will be further warming and changes in the climate system under all assessed emission scenarios but the greater the magnitude and rate of change, the greater the risk of harmful impacts. Surface air temperature is projected to rise over the 21st century. The ocean will continue to warm, acidify and be depleted of oxygen. Global mean sea level will continue to rise during the 21st century and beyond. Some extreme weather events will become more frequent and/or severe. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-477	SPM	13	3	13	5	Headline 2.2	This headline statement is too generic. It should contain some quantitative elements so to have real added value for policy makers. It is suggested to insert something about the likelihood to stay within 2°C. [European Union]
SPM A-478	SPM	13	4	13	4	Headline 2.2	A loss of ocean oxygen is not listed in the observed changes but is identified as a continuing impact here. It would be helpful to have this listed as an observed change. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-479	SPM	13	7	13	8	SPM 2.2	This first sentence is a hard to read. Suggest starting this paragraph with a sentence using plain language to say that there is a lag between when climate forcing occurs (e.g. when greenhouse gases are emitted) and the time period over which the climate system responds. Then suggest rewriting the first sentence to say "Estimates of near-term future climate have to take this slow response to past forcing into account, along with the response to future forcing and natural climate variability." [Government of Canada]
SPM A-480	SPM	13	7	13	8	SPM 2.2	What is meant by "the time evolution of future anthropogenic forcing"? Is it possible to use a term that is easier to understand? [Government of Germany]

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SPM A-481	SPM	13	7	13	8	SPM 2.2	The text could be revised for clarity here to read: "Estimates of the climate in the near term depend on the anthropogenic changes that have already occurred as well as future impacts and natural climate variability." [Government of United States of America]
SPM A-482	SPM	13	7	13	10	SPM 2.2	This is important but stated in a highly technical manner and somewhat convoluted and what is near term?. Is this saying e.g. "Climate projections to 2035 are already largely determined by current GHG warming due to past emissions"? If so it may be stated more clearly [Government of Ireland]
SPM A-483	SPM	13	8	13	8	SPM 2.2	the term "time-evolution" is unclear here [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-484	SPM	13	8	13	10	SPM 2.2	Missing from this text is the point that near term projections are similar across the RCPs. Suggest the sentence be revised to say "The global mean surface temperature change for the period 2016-2035 relative to 1986-2055 is similar for the four RCPs and will likely be in the range of 0.3 - 0.7degC (med conf)." This links better to the next sentence about results beginning to diverge mid-century across the scenarios. If the assumptions about volcanic eruptions and solar irradiance apply to both near-term and longer term projections, then this message could end the paragraph. On that point though, we would ask whether what is known about the possibility of changes in these two factors is fundamentally different. Volcanoes do erupt periodically. We expect this to occur in the future, and know the effect will be a short-lived global cooling; we just can't predict when they will occur. So it's important to include this caveat to near-term climate predictions. Unexpected changes in solar irradiance seems to be a different kind of uncertainty. [Government of Canada]
SPM A-485	SPM	13	9	13	11	SPM 2.2	Should the role of El Nino be included here within the phrase "assuming no major volcanic eruption or unexpected changes in total solar irradiance"? [Government of United States of America]
SPM A-486	SPM	13	10	13	10	SPM 2.2	The change of 0.3 to 0.7 °C does not have a sign. It should be stated that this is an increase in temperature of this range. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-487	SPM	13	10	13	11	SPM 2.2	The WGI SPM refers to "secular changes in total solar irradiance", rather than "unexpected changes in total solar irradiance". Please check and revert to the WGI language if appropriate. The readers may also wonder why solar and volcanic phenomena are explicitly mentioned: are there other unexpected issues not included in the RCP that may result in short-term changes being outside the provided range? [Government of Belgium]
SPM A-488	SPM	13	11	13	11	SPM 2.2	"...the rate of global warming begins to be strongly dependent upon..." Should the text more accurately say "rate AND MAGNITUDE" of global warming...? [Government of United States of America]
SPM A-489	SPM	13	11	13	12	SPM 2.2	This is also important but it could be stated that "it is highly dependent on current and near term policy choices and their effectiveness which determine future emissions pathways." [Government of Ireland]
SPM A-490	SPM	13	11	13	12	SPM 2.2	This sentence could say something more useful - and clear - to the policymaker if it were re-written to read, "There is not much divergence in warming among the various scenarios until mid-century." Or something to that effect. [Government of United States of America]
SPM A-491	SPM	13	11	13	12	SPM 2.2	This statement (By mid-21st century, the rate of global warming begins to be strongly dependent on the emissions scenario.) does not reflect the differences between emission paths that emerge earlier. SUGGESTION TO REWORD TO: "By mid-21st century, the projected change in global mean surface air temperature is strongly dependent on the emissions scenario ranging from 1.0 (0.4,1.6) °C for the RCP2.6 to 2.0 (1.4,2.6) °C for the RCP8.5 for the 2046-2065 period relative to 1986-2005." REASONING: As apparent from e.g. WG1 Fig. SPM7, the median projections of Global average surface temperature change of RCP8.5 and 2.6 deviate already as early as 2020. Given uncertainty and natural variability associated with projections, a clear deviation between warming levels in the two scenarios might be difficult before the mid-21st century. However, this is different for the rate of warming that will deviate already over the 2016-2035 period (and eventually lead to the difference in absolute warming levels apparent by mid-century). [Government of

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							Saint Lucia]
SPM A-492	SPM	13	14	13	17	SPM 2.2	In the SPM of WGI, the reference period is 1850-1900 while here it is 1851-1900. Please check and adapt (if it is changed here, changes will also be needed in the underlying SYR). [Government of Belgium]
SPM A-493	SPM	13	14	13	17	SPM 2.2	A start year of reference period is not correct. "1851" should be corrected to "1850." [Government of Japan]
SPM A-494	SPM	13	14	13	18	SPM 2.2	This section is hard to read. [Government of Finland]
SPM A-495	SPM	13	14	13	18	SPM 2.2	This is a very important statement but the use of the RCP TLA may be confusing some less technical term could be used. This is also a generic comment for the SPM. [Government of Ireland]
SPM A-496	SPM	13	14	13	18	SPM 2.2	This paragraph would need to be framed so that it is clear that it discusses the likelihood of two-degree warming under the various RCPs. The fuller ranges do follow, but it would become more clear for the reader if the framing were explicitly provided. [Government of Sweden]
SPM A-497	SPM	13	14	13	24	SPM 2.2	Discrete sentences. Need harmonization [Government of India]
SPM A-498	SPM	13	16	13	16	SPM 2.2	It is suggested to delete the sentence "more likely that not to exceed 2°C for RCP4.5" since the range of likelihood (50-100%) is too wide [Government of Spain]
SPM A-499	SPM	13	18			SPM 2.2	The reference to chapter 2.2.1 seems incorrect, it should be 12.4.1.1. Please verify. [Government of Germany]
SPM A-500	SPM	13	20	13	21	SPM 2.2	The justification for the selected baseline period (1986-2005) would be helpful information for the policy maker. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-501	SPM	13	20	13	21	SPM 2.2	These lines are not necessarily to be a paragraph in the context, please put this sentence as a footnote of the previous paragraph on the same page or delete it. [Government of Republic of Korea]
SPM A-502	SPM	13	23	13	24	SPM 2.2	Earlier in the text (SPM, page 11, lines 45-46) it is stated that baseline scenarios are those leading to forcing levels between RCP6.0 and RCP 8.5. Later in the text (SPM, page 21, line 47-49) it is stated that baseline scenarios lead to temperature increases from about 3.7 to 4.8 degrees C and when including climate uncertainty 2.5 to 7.8 degrees C. Against these facts, it is surprising that it is here (on page 13, line 23-24) stated that global mean temperature increase is likely to be 2.6 to 4.8 degrees C under RCP 8.5, as RCP 8.5 is the high end of the baseline scenario, but 2.6 to 4.8 degrees is the low end of the uncertainty range? [Government of Denmark]
SPM A-503	SPM	13	23	13	24	SPM 2.2	Not only RCP2.6 and RCP8.5, but also RCP4.5 and RCP6.0 should be described. These also are important knowledge. [Government of Japan]
SPM A-504	SPM	13	23	13	24	SPM 2.2	Please, specify the time period considered. [Government of Russian Federation]
SPM A-505	SPM	13	23	13	24	SPM 2.2	The content of this sentence is important, but the formulation is not of easy reading for policy makers. [European Union]
SPM A-506	SPM	13	24	13	24	SPM 2.2	Please consider to insert from SYR page 59 line 36; "The Arctic region will continue to warm more rapidly than the global mean.". Rationale: We believe it is important that also regional findings, and especially for the Arctic region where changes are more rapid, is presented in the SYR SPM. [Government of Norway]
SPM A-507	SPM	13	25	13	25	SPM 2.2	Describe Figure SPM 7- add a couple of sentences describing the regional variation in warming, since global mean warming does not mean much. For e.g., under RCP 8.5, warming could be anywhere between 2-3 C in southern latitude, to 8-10 C in the northern latitudes. [Government of India]

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SPM A-508	SPM	13	26	13	29	SPM 2.2	What about drought? Cyclones? Wildfires? Policymakers care deeply about extreme events. After all, in many ways it is how extreme events will change that will determine many of the (near-term, at least) impacts from climate change. As such, the authors should strongly consider saying more about the projected changes in extreme events - to the degree that the science allows it. [Government of United States of America]
SPM A-509	SPM	13	27	13	28	SPM 2.2	The following sentence is a key point in the chapter and should be included in bold in the box at the beginning of the section along with the point on ocean warming already there: "It is very likely that heat waves will occur with a higher frequency and duration" [Government of Denmark]
SPM A-510	SPM	13	28	13	29	SPM 2.2	Section 1.4 observes that it is also highly likely that there is a change in intensity of heat waves. For consistency can this section comment on future intensity of heatwaves? [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-511	SPM	13	30	13	30	Figure SPM.6	What do the numbers 39, 32, 21 and 21 refer to in Figure SPM.6? Clarify in caption. [Government of United States of America]
SPM A-512	SPM	13	30	13	36	Figure SPM.6	The right side bars do not add much additional information and serve to confuse for the RCP8.5 projections due to the alignment issues between the end of century value and the average which is for a different period. Suggest these are removed and this will reduce explanatory text also. [Government of Ireland]
SPM A-513	SPM	13	31	14	7	Figure SPM.6	For ease of reading, it is suggested to make a necessary clarification of the numbers of "39, 32" and "21, 21" appearing in Figures SPM.6 and 7 in terms of their meaning. [Government of China]
SPM A-514	SPM	13	32	13	33	Figure SPM.6	Editorial: Use of both '(a) and (b)' AND 'left and right' is unnecessary. [Government of New Zealand]
SPM A-515	SPM	13	32	13	36	Figure SPM.6	The caption is missing information indicating that the numbers above the lines represent the number of models contributing to the analysis. [Government of Canada]
SPM A-516	SPM	13	32	13	36	Figure SPM.6	Figure SPM.6: The numbers given inside the area of the graph are not explained in the caption. [Government of Sweden]
SPM A-517	SPM	13	33			Figure SPM.6	Suggest noting in the caption that sea level projections include ice sheet components as this is an advance from the AR4. [Government of Canada]
SPM A-518	SPM	13	37	13	37	Figure SPM.6	The text on line 14 above uses the period 1851-1900, whereas the footnote is 1850-1900. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-519	SPM	13		13		Figure SPM.6	Figure SPM.6 is so small that it is hard to read -> please consider enlargening it [Government of Finland]
SPM A-520	SPM	13				Figure SPM.6	Figure SPM.6: There is no information in the caption about the numbers on the plots (note: numbers indicate the number of the simulations). [Government of Turkey]
SPM A-521	SPM	13				Figure SPM.6	Figure SPM.6: The number of models is indicated in the figure but this is not explained in the caption. Please clarify the meaning of these numbers in the caption or remove them from the figure. [Government of Belgium]
SPM A-522	SPM	13				Figure SPM.6	Figure SPM 6. Please specify in the figure caption what the small red and blue numbers mean eg. numbers of models. [Government of Norway]
SPM A-523	SPM	14	1			Figure SPM.7	Adaptation is hardly discussed in this topic, thereby there is no context for the figure to show how adaptation can reduce risks. We suggest to remove from this graph only the risks without adaptation, and move the current figure including the reduced risks to Topic 3, after adaptation has been discussed. [Government of Netherlands]
SPM A-524	SPM	14	2	14	7	Figure SPM.7	In the caption to Figure SPM.7 it would be useful to clarify the meaning of terms "stippling" and "hatching" by reference to examples of specific regions where they occur in the figure. For example: "hatching" occurs in the Atlantic region south of Greenland in Figure (a) RCP 2.6, while "stippling" occurs in most other regions in this scenario [Government of Ireland]

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SPM A-525	SPM	14	4	14	4	Figure SPM.7	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
SPM A-526	SPM	14	4	14	7	Figure SPM.7	The text of this citation is not written in user-friendly language. Can IT be revised to read: "Stippling shows regions where CONFIDENCE in the projected change is HIGH (i.e., is large compared to...)... Hatching shows regions where CONFIDENCE in the projected change is RELATIVELY LOW (i.e., is less than one...)". [Government of United States of America]
SPM A-527	SPM	14	5	14	7	Figure SPM.7	We appreciate the efforts made to simplify the description of stippling and hatching in this Figure caption in the SPM. We suggest some further simplification is possible, using similar phrasing for hatching as for stippling: "Hatching shows regions where the projected change is small compared to internal variability." [Government of Canada]
SPM A-528	SPM	14	5	14	7	Figure SPM.7	This would be good to write out in terms of what the information means, in less scientific language. [Government of Sweden]
SPM A-529	SPM	14	7	14	7	Figure SPM.7	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
SPM A-530	SPM	14	9	14	12	SPM 2.2	What about Tropical Region. This is important for Africa [Government of United Republic of Tanzania]
SPM A-531	SPM	14	9	14	12	SPM 2.2	This text could be shortened. "Under the RCP8.5 scenario, high latitudes, the equatorial Pacific and many mid-latitude wet regions are likely to experience an increase in annual mean precipitation, while in many mid-latitude and sub-tropical dry regions, mean precipitation will likely decrease" [Government of Finland]
SPM A-532	SPM	14	9	14	12	SPM 2.2	This section only mentions mean precipitation changes. Corresponding to the section 1.4 Extremes (on p.g SYR11, Line 1-22), which talks about observed change in extreme precipitation, one sentence on extreme precipitation changes in the future should also be added, such as (taken from Topic 2 on page SYR63, Line 1-2) "Extreme precipitation events over most mid-latitude land-masses and over wet tropical regions will very likely become more intense and more frequent." [Government of Japan]
SPM A-533	SPM	14	9	14	12	SPM 2.2	The information should be given for the lowest and the highest RCP. [Government of Sweden]
SPM A-534	SPM	14	14	14	14	SPM 2.2	Replace "increase" with "continue" unless the intent is to indicate acceleration in the decrease of ocean pH (acidification already indicates the direction of change, and thus increasing acidification implies acceleration of that change). [Government of Canada]
SPM A-535	SPM	14	14	14	15	SPM 2.2	Convert these pH changes to percentages against today's values to give the policymaker an idea of the magnitude of change this represents. [Government of United States of America]
SPM A-536	SPM	14	14	14	15	SPM 2.2	The text here is unclear. The authors should consider revising the text to read: "with a decrease in surface ocean pH below present-day values by a range of 0.06 to 0.07 for RCP2.6, and by 0.30 to 0.32 for RCP8.5". [Government of United States of America]
SPM A-537	SPM	14	14	14	15	SPM 2.2	This statement is not fully accurate ("Ocean acidification is projected to increase for all RCP scenarios, with a decrease in surface ocean pH below present-day values in the range of 0.06 to 0.07 for RCP2.6, to 0.30 to 0.32 for RCP8.5. {2.2.4, Figure 2.1}"), in the sense that the RCP 2.6 involves a projected slow decrease in ocean acidification from around midcentury. Suggest re-wording as follows: "Ocean acidification is projected to increase for all RCP scenarios, noting that in RCP 2.6 it slowly begins to decline from midcentury, however in all cases there is a decrease in surface ocean pH below present-day values in the range of 0.06 to 0.07 for RCP2.6, to 0.30 to 0.32 for RCP8.5. {2.2.4, Figure 2.1}" [Government of Saint Lucia]
SPM A-538	SPM	14	14	14	29	SPM 2.2	The warming of the oceans is only mentioned in the chapeau. Please consider introducing it here, with a reference to SYR section 2.2.3. It may also be useful to consider the AMOC here, on the basis of a sentence from section 2.2.3: "It is very likely that the Atlantic Meridional Overturning Circulation (AMOC) will weaken over the 21st

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							century". [Government of Belgium]
SPM A-539	SPM	14	14	15	4	SPM 2.2	Not only RCP2.6 and RCP8.5, but also RCP4.5 and RCP6.0 should be described. These also are important knowledge. [Government of Japan]
SPM A-540	SPM	14	15	14	15	SPM 2.2	Difficult for policy makers to evaluate what these surface ocean pH values really mean/imply without some explanation. [European Union]
SPM A-541	SPM	14	17	14	17	SPM 2.2	Add "RCP" between "all" and "scenarios" for clarification. [Government of Japan]
SPM A-542	SPM	14	17	14	17	SPM 2.2	There is a projection for Arctic sea ice reduction. Why not report anything for Antarctic sea ice projection? If the data do not exist or the projections not robust enough, it deserves being stated explicitly. [Government of United States of America]
SPM A-543	SPM	14	17	14	18	SPM 2.2	Arctic ocean becoming ice free in summers may be a overstatement [Government of India]
SPM A-544	SPM	14	17	14	18	SPM 2.2	Can anything more specific be said about any of the other scenarios? It seems odd to just highlight RCP8.5 in this case. For example, does RCP6.0 reveal an ice-free Arctic by, say, 2080? [Government of United States of America]
SPM A-545	SPM	14	17	14	19	SPM 2.2	This is a departure for the IPCC to selectively present results (on sea ice changes) only for a subset of models rather than for the full CMIP5 ensemble. We recommend being clearer about the basis of this assessment about the "likely" timing of a nearly ice-free arctic ocean (based on five out of 37 models that most closely reproduce observed trends). Suggest also considering whether the terms in this sentence could be simplified further for the average readers. [Government of Canada]
SPM A-546	SPM	14	17	14	19	SPM 2.2	The information should be given for the lowest and the highest RCP. [Government of Sweden]
SPM A-547	SPM	14	21	14	21	SPM 2.2	Please specify what is meant by "near surface" ie. upper 3.5m [Government of Denmark]
SPM A-548	SPM	14	21	14	23	SPM 2.2	Suggest that "Near-surface permafrost" needs to be defined to ensure this statement is not misinterpreted to indicate that permafrost will completely degrade over this area. [Government of Canada]
SPM A-549	SPM	14	21	14	23	SPM 2.2	Please, specify the time period considered. [Government of Russian Federation]
SPM A-550	SPM	14	22	14	23	SPM 2.2	Please quantify the uncertainty of these projections. The 37% increase that is projected under RCP2.6, for example, would be sensitive to factors such as the choice of climate model that is used as the basis for this projection, and thus that number itself is uncertain. That uncertainty is recognized in other WG1 projections (such as that for global mean temperature), and thus it should also be recognized for the projection of the reduction of area of near-surface permafrost (unless, of course, the projection is not sensitive to differences in temperature projections from different models). [Government of Canada]
SPM A-551	SPM	14	24	14	25	SPM 2.2	Is it for mid century? Looks overstatement [Government of India]
SPM A-552	SPM	14	25	14	25	SPM 2.2	What is meant by "glaciers in Antarctica"? [Government of Sweden]
SPM A-553	SPM	14	27	15	4	SPM 2.2	Consistent with the risk assessment approach of AR5, it is important to mention here that substantially higher levels of sea-level rise can't be ruled out, even though there's little consensus on the semi-empirical model that project them. (see WG1 SPM 2.6). We suggest to add: "It is unlikely that global mean sea level will rise by more than

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							one metre in this century, but the consequence of a greater rise could be so severe that this possibility becomes a significant part of risk assessment. {SyR page 33}" [Government of Netherlands]
SPM A-554	SPM	14	28	15	1	SPM 2.2	it would be useful to clarify the ranges stated. i.e. is this a range of sea-level rise rather than a range of rate of change, and assuming that it is an absolute rise in sea level - what is the baseline for this change? The words 'by 2100' also need to be added. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-555	SPM	14	28	15	4	SPM 2.2	Please consider moving this paragraph below the other paragraph which relates to ocean (acidification, page 14 line 14-15) to streamline the section (or move that other paragraph). [Government of Belgium]
SPM A-556	SPM	14	28	15	4	SPM 2.2	KEY CONCERN: It is important to include here a reference to the risk of a collapse of marine-based sectors of the Antarctic ice sheet, which inherently qualifies the 21st century, and post-21st-century assessments of sea level rise risk. PROPOSED TEXT: "Based on current understanding, only the collapse of marine-based sectors of the Antarctic ice sheet, if initiated, could cause global mean sea level to rise substantially above the likely range during the 21st century. This potential additional contribution cannot be precisely quantified but there is medium confidence that it would not exceed several tenths of a meter of sea level rise during the 21st century. (ES AR5 WG1 Ch13) About 3.3 m of equivalent global sea level of the West Antarctic ice sheet may be subject to potential ice loss via the marine ice-sheet instability. Consequently any significant ice loss from West Antarctic that occurs within the next century will be irreversible on a multi-centennial to millennial time scale. {13.4.4, 13.5.4}" REASONING: Given major scientific developments since the AR5 cut-off date for literature in WGI, which indicate the initiation of a marine ice sheet instability in a major sector of the West Antarctic, it is particularly important for the IPCC to include in this section of its 21st-century projections a substantial reference to this risk, based on the adopted WGI report. [Government of Saint Lucia]
SPM A-557	SPM	14	28	15	4	SPM 2.2	REASONING FOR KEY CONCERN on need for reference to the risk of a collapse of marine-based sectors of the Antarctic ice sheet. Given major scientific developments since the AR5 cut-off date for literature in WGI, which indicate the initiation of a marine ice sheet instability in a major sector of the West Antarctic, it is particularly important for the IPCC to include in this section of its 21st-century projections a substantial reference to this risk, based on the adopted WGI report. [Government of Saint Lucia]
SPM A-558	SPM	14	28	15	4	SPM 2.2	Considering the SPM is designed for policymakers, this paragraph can be regarded as ocean related attributions of global warming. Hence it would be better to put this paragraph together with line 14 - 15 in page 14. [Government of Republic of Korea]
SPM A-559	SPM	14	29	14	29	SPM 2.2	Space is needed between of and 0.45 [Government of United Republic of Tanzania]
SPM A-560	SPM	14	29	14	29	SPM 22	A space missing between "of" and "0.45". [Government of Belgium]
SPM A-561	SPM	14	29	14	29	SPM 2.2	A white space should be inserted between "of" and "0.45." [Government of Japan]
SPM A-562	SPM	14	29	14	29	SPM 2.2	"...and of0.45..." should be "...and of 0.45..." [Government of Sweden]
SPM A-563	SPM	14	29	14	29	SPM 2.2	Do we really have sufficient confidence in these numbers to list them to the hundredths of a meter? It seems like it may be more scientifically robust to state these to the tenth of a meter. [Government of United States of America]

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SPM A-564	SPM	14	29			SPM 2.2	Space should be put between "of" and "0.45". [Government of Turkey]
SPM A-565	SPM	14	29			SPM 2.2	Please provide information on the amount of sea level rise observed between preindustrial times and the period 1986-2005, as done for the temperature trend in footnote 6. This would also prevent misunderstanding about the reference period. [Government of Germany]
SPM A-566	SPM	14	30	15	1	SPM 2.2, footnote 8	Footnote 8 is an important qualifier to this statement of projected SLR. Suggest a brief statement on the Antarctic collapse in main text. [Government of Ireland]
SPM A-567	SPM	14	30	15	1	SPM 2.2	A projected reduction in the MOC was a key finding in the WGI report. Why is this not mentioned here? [Government of Ireland]
SPM A-568	SPM	15	1	15	4	SPM 2.2	This is a long and technical sentence. Suggest it be broken into two sentences. The first sentence could begin with the statement that "Sea level rise will not be uniform" adding to it to say "however it is very likely that sea level will rise in more than about 95% of the ocean area." This is the first main point: not a uniform rise, but rising in most places (vs falling). The second sentence can then address the magnitude of the projected change in coastal areas relative to the mean. If the stated result is true for RCP4.5 and RCP8.5, is it also true for RCP6? [Government of Canada]
SPM A-569	SPM	15	1	15	4	SPM 2.2	The sentence "By the end of the..." is quite difficult to follow -> could it e.g. be split into two? [Government of Finland]
SPM A-570	SPM	15	1	15	4	SPM 2.2	The sentence in L 1-4 is difficult to understand. Please use separate sentences or rephrase. [Government of Germany]
SPM A-571	SPM	15	1	15	4	SPM 2.2	Please consider to simplify the language in this sentence. At present it is difficult to grasp the main message from the last part of this sentence. Please consider to replace the $\pm 20\%$ of global mean sea level change for RCP4.5 and RCP 8.5 with a range in absolute values. [Government of Norway]
SPM A-572	SPM	15	1	15	4	SPM 2.2	Complicated paragraph for policy makers. We suggest to simplify and focus on the key policy-relevant message. It is suggested to delete the last part of the sentence, after "ocean area", which just complicates the reading. [European Union]
SPM A-573	SPM	15	4	15	4	SPM 2.2	Could the information be provided for the lowest and the highest RCP (2.6 and 8.5) rather than 4.5 and 8.5? [Government of Sweden]
SPM A-574	SPM	15	4	15	4	SPM 2.2	What about RCP6.0? Seems odd not to mention it at all in this paragraph and to highlight RCP4.5 and RCP8.5 only. [Government of United States of America]
SPM A-575	SPM	15	4	15	4	SPM 2.2	The emission path dependence of the sea level rise is important. Proposed text: "Global mean sea level rise depends on the pathway of CO2 emissions, not only on the cumulative total; reducing emissions earlier rather than later, for the same cumulative total, leads to a larger mitigation of sea level rise." [Government of Saint Lucia]
SPM A-576	SPM	15	4	15	4	SPM 2.2	The reduction projected in the rate of sea level rise under the lowest RCP 2.6 scenario is policy relevant: Proposed text: "In all scenarios except RCP 2.6 the rate of sea level rise increases through the 21st century, whereas in the latter it becomes roughly constant before the middle of the century and then declines slightly by 2100." [Government of Saint Lucia]
SPM A-577	SPM	15	4	15	4	SPM 2.2	The general reference to projected sea level rise being within +/-20% of the global mean does not provide full policy relevant information available for a risk assessment from this assessment. Suggest adding the following sentence: "Sea level rise is projected to be about 30% above the global mean value around North America and between 10% to 20% in equatorial regions", for example." [Government of Saint Lucia]

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SPM A-578	SPM	15	7	15	30	SPM 2.3	The current draft of the SPM does not mention the risks from climate change for coral reefs. In Fig. SPM.8 it is illustrated for two regions (Ocean and Australasia) that the risk for coral reefs associated with a warming of 4 degree C is very high without the potential for risk reduction through adaptation. We believe this could be explicitly mentioned, together with the risk for polar ecosystems in Sect. 2.3, and suggest to add the following sentences from WGII SPM (p. 17): "For medium to high-emission scenarios (RCP4.5, 6.0 and 8.5), ocean acidification poses substantial risks to marine ecosystems, especially polar ecosystems and coral reefs, associated with impacts on the physiology, behaviour, and population dynamics of individual species from phytoplankton to animals (medium to high confidence)." In this statement please consider to switch the order of "polar ecosystems" and "coral reefs" to avoid confusion regarding if this is only valid for cold-water corals in polar regions. [Government of Norway]
SPM A-579	SPM	15	7	18	20	SPM 2.3	Comment on topic 2.3 "Future risks and impacts caused by a changing climate": this topic could be enhanced by adding significant information on the level of risks at different levels of warming, and include reference to levels above preindustrial. Whilst it is understood that much of the AR5 has used a reference to the 1986-2005 period, the policy discussions around the below 2° warming limit, and the below 1.5° limit put forward by SIDS and LDCs, now under review in the climate convention means that the reference to the preindustrial period is extremely policy relevant. Specific systems could be added to this section as well as more detail on the risks at different levels of warming. [Government of Saint Lucia]
SPM A-580	SPM	15	7	18	20	SPM 2.3	The SPM needs to include a conclusion in the projected large scale damage and loss of coral reef ecosystems that clearly visible in the WG2 report. The proposed text is as follows: "One of the major marine ecosystems threatened by the combined effects of global warming and ocean acidification are coral reefs. Early warning signs have already emerged of substantial adverse impacts on coral reefs due to the combined effects of climate change, ocean acidification and other environmental pressures. A very high risk to these systems at a warming of about 2.5° above preindustrial (about 2° above AR5 reference period) is projected ((high confidence WG2 TS-16). Projected increases in mass coral bleaching and mortality due to ocean acidification and thermal stress will alter or eliminate ecosystems, increasing risks to coastal livelihoods and food security (medium to high confidence WG2 TS-27/8), diminishing their role in relation to shoreline protection, fishing and tourism. Under high to moderate rates of warming loss of coral reefs from most sites globally is projected by 2050 (WG2 TS-27/8). Coral reef ecosystem degradation associated with increasing sea surface temperature and ocean acidification will negatively impact island communities and livelihoods, given the dependence of island communities on coral reef ecosystems for coastal protection, subsistence fisheries, and tourism. (WG2 TS-28)" [Government of Saint Lucia]
SPM A-581	SPM	15	7	18	21	SPM 2.3	Section 2.3 from this SPM summarizes each topic from chapter B-2 of the SPM of the WGII except "key economic sectors and services". We suggest adding this information here to be more comprehensive. [Government of Belgium]
SPM A-582	SPM	15	7	27	12	SPM 2.3	Two radically different concepts of risk are used throughout these pages without making the distinction between the two. Risk of climate change impacts, and risk of mitigation and adaptation policies. We think this is very confusing and would suggest to use some other word for the second, and we suggest "uncertainty about the effectiveness". Although compared to the First Draft some improvements have been made, the word "risk" is still used where limitation or challenge would be better words. [Government of Netherlands]
SPM A-583	SPM	15	7			SPM 2.3	Section 2.3: More attention should be given in this section to the effects of uncertainty on risk estimates and benefits from mitigation. Statements from SYR Box 3.1, page 86, are helpful in this regard: "Accurately estimating climate change risks (and thus the benefits of mitigation) takes into account the full range of possible impacts of climate change, including those with high consequences but a low probability of occurrence. The benefits of mitigation may otherwise be underestimated (high confidence)". [Government of Belgium]
SPM A-584	SPM	15	9	15	9	Headline 2.3	Write: "Climate change will amplify existing risks for natural and human systems and create new ones in countries at all levels of development." [Government of Switzerland]

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SPM A-585	SPM	15	9	15	10	Headline 2.3	"Climate change will create new risks for natural and human systems and amplify existing risks in countries at all levels of development." In this statement is important to highlight that despite the fact that all countries will face risks, developing countries are more vulnerable and therefore will face higher risks are stronger negative impacts. [Government of Venezuela]
SPM A-586	SPM	15	9	15	10	Headline 2.3	"Climate change will create new risks for natural and human systems and amplify existing risks in countries at all levels of development." In this statement is important to highlight that despite the fact that all countries will face risks, developing countries and the poor are more vulnerable to climate change and therefore will face higher risks are stronger negative impacts. [Government of Bolivia]
SPM A-587	SPM	15	9	15	11	Headline 2.3	It would be helpful to include examples of future risks Replace existing text with: Climate change will create new and amplify existing risks for natural and human systems in countries at all levels of development. Climate change is projected to reduce food security, increase ill health, slow down economic growth, make poverty reduction more difficult and increase displacement of people. {2.3} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-588	SPM	15	10	15	11	Headline 2.3	Suggest deleting the sentence beginning with 'Greater rates of magnitude' unless two key points are included. First is a sentence describing the complexity of the term "adaptation limits," just as we agreed to at the WG2 approval session in Yokohama: Limits to adaptation occur when adaptive actions to avoid intolerable risk for an actor's objectives or for the needs of a system are not possible or are not currently available. Second is a sentence that recognizes the critical role that non-climate related factors (like weak governance and land use planning) play in limiting the effectiveness of adaptation efforts. The relevant underlying chapter 16 clearly states in the executive summary that: "A range of biophysical, institutional, financial, social, and cultural factors constrain the planning and implementation of adaptation options and potentially reduce their effectiveness (very high confidence). Adaptation of both human and natural systems is influenced by the rate of climate change as well as rates of economic development, demographic change, ecosystem alteration, and technological innovation." Not including these two points would result in an incredibly misleading statement. [Government of United States of America]
SPM A-589	SPM	15	11			Headline 2.3	The term "adaptation limits" is used in several places in the SPM and elsewhere in the SYR but not defined until page 87 (I.5-7). Given the importance of the concept, the definition should be provided in a footnote associated with this sentence. The footnote should present the definition as given on p. 87 - "Limits to adaptation occur when adaptive actions to avoid intolerable risks for an actor's objectives or for the needs of a system are not possible or are not currently available. Value-based judgments of what constitutes an intolerable risk may differ." Note that footnote 9 (p. 18) provides precedent for explaining key terms in the SPM. [Government of Canada]
SPM A-590	SPM	15	11			Headline 2.3	Please take the full quote from Box SYR P 66 L 24-30, adding: "Increasing magnitudes of warming increase the likelihood of severe, pervasive, and irreversible impacts for people, species and ecosystems. Continued high emissions would lead to mostly negative impacts for biodiversity, ecosystem services, and economic development and amplify risks for livelihoods and for food and human security." [Government of Germany]
SPM A-591	SPM	15	13	15	14	SPM 2.3	By definition, the ability of the affected system to adapt is an element of vulnerability. Therefore the sentence could be shortened to state that the "Risks caused by changing climate depend on the exposure and vulnerability of the affected system". [Government of Canada]
SPM A-592	SPM	15	13	15	14	SPM 2.3	This explanation of risks is not consistent with that described in WG II, Fig. SPM1: "Risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems". So, risk = f(exposure, vulnerability, hazard) but in the SYR: Risk = f(exposure, vulnerability, adaptive capacity). [Government of Finland]
SPM A-593	SPM	15	13	15	14	SPM 2.3	Should also include 'sensitivity' [Government of Ireland]
SPM A-594	SPM	15	13	15	14	SPM 2.3	This conceptualization is different from the conceptualization of "risks" used elsewhere in AR5, e.g., "Risks from climate change impacts arise from the interaction between hazard (...), vulnerability (susceptibility to harm), and exposure (people, assets or ecosystems at risk)" (Lines 31-33, p. 33). Please check and adapt this text to ensure

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							consistency. [Government of Belgium]
SPM A-595	SPM	15	13	15	14	SPM 2.3	Please consider to rewrite the first part of this sentence by, replacing " Risks caused by a changing climate" with (from page 66,line 36-37) "Key risks are potentially severe impacts relevant to understanding dangerous anthropogenic interference with the climate system, and depend on the exposure,". Please also consider to refer to Figure SPM.8 here instead of in the end of the para. Rationale: We believe that section 2.3 does not sufficiently refer and discuss the findings illustrated in Figure SPM.8, and feel that a closer connection between this proposed sentence and the Figure would improve the integration of this very important Figure. [Government of Norway]
SPM A-596	SPM	15	13	15	19	SPM 2.3	Insert: "International dimensions such as trade and relations among states are also important for understanding the risks of climate change at regional scales." Source: WG II, SPM p. 11. [Government of Saudi Arabia]
SPM A-597	SPM	15	14			SPM 2.3	The expression "paralleled by ocean acidification" does not seem to be correct. Acidification does not happen in parallel but has the same source as a large fraction of the warming, i.e. CO2. Please modify using "accompanied" or "going along". [Government of Germany]
SPM A-598	SPM	15	15	15	16	SPM 2.3	Please consider to expand this sentence with ", and there is also a potential for risk reduction through adaptation although there are certain limits to adaptation. Rationale: Our main point is that Figure SPM.8 illustrates the potential for risk reduction through both mitigation and adaptation, as well as limits to adaptation. [Government of Norway]
SPM A-599	SPM	15	15	15	16	SPM 2.3	The statement "The overall risks of climate change impacts can be reduced by limiting the rate and magnitude of climate change" is not complete, given that substantial risks emerge from ocean acidification, consequently they need to the limit and reduce carbon dioxide emissions and concentration need to be mentioned in this statement. this could be done along the following lines: "The overall risks of climate change and ocean acidification impacts can be reduced by limiting the rate and magnitude of climate change, and by limiting and reducing CO2 emissions and ultimately concentration." [Government of Saint Lucia]
SPM A-600	SPM	15	17	15	17	SPM 2.3	The precise levels of climate change sufficient to trigger abrupt and irreversible change remain uncertain'. You need to define what is meant by 'abrupt' in this context as previous sections have talked of slow change over a hundred years. We suggest moving the footnote on page 18 to page 15 [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-601	SPM	15	17	15	19	SPM 2.3	This text is misplaced - it should be moved to Section 2.4 [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-602	SPM	15	21	15	21	SPM 2.3	Words 'during 21st century and beyond' may be added after the words 'risk due to climate change' [Government of India]
SPM A-603	SPM	15	21	15	21	SPM 2.3	Written: "A large fraction of species faces...". This is about future, so replace by: " A large fraction of species is projected to face...". [Government of Russian Federation]
SPM A-604	SPM	15	21	15	24	SPM 2.3	This text about the ability of various species to keep pace with climate change would be strengthened by text noting that even if a single species can move sufficiently quickly, others on which it depends may be affected. This "mismatch" is presumably also important to extinction risk. [Government of Canada]
SPM A-605	SPM	15	22	15	22	SPM 2.3	Words 'such as habitat modification, over exploitation and invasive species' may be added after the words 'other stressors' [Government of India]
SPM A-606	SPM	15	22	15	24	SPM 2.3	"Plants cannot move": this may seem odd unless there is a qualifier such as "naturally" or "by themselves"? Please check whether such an addition would be appropriate. [Government of Belgium]

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SPM A-607	SPM	15	22	15	24	SPM 2.3	Change "Plants cannot move... in this century (high confidence)." to "Those that cannot adapt sufficiently fast will decrease in abundance or go extinct in part or all of their ranges." in WGII SPM B-2(P.15 L4). Though this sentence seems to provide commentary on Figure SPM.5 in WGII SPM B-2 differently, the description should be appropriately consistent with WGII SPM. [Government of Japan]
SPM A-608	SPM	15	23	15	24	SPM 2.3	As written, it could be interpreted as though most small mammals and freshwater mollusks will go extinct by 2100 under an RCP4.5 scenario. Surely, that's not the case. Please clarify carefully. [Government of United States of America]
SPM A-609	SPM	15	24	15	24	SPM 2.3	Use of RCP4.5 is obscure for most readers [Government of Ireland]
SPM A-610	SPM	15	25	15	27	SPM 2.3	This sentence should be written more clearly. For example, "The rate of current climate change is unprecedented in XXX years. Since historic ecosystem shifts in the past millions of years occurred under a much slower rate of climate change, future risks to species is high." [Government of United States of America]
SPM A-611	SPM	15	25	15	28	SPM 2.3	Please mention also the risks for marine organisms due to decreasing oxygen levels, see for example SYR P 69 L 26-30 and P 126 L 13. [Government of Germany]
SPM A-612	SPM	15	27	15	28	SPM 2.3	We suggest to add: ", and expanding oxygen minimum zones." [Government of Norway]
SPM A-613	SPM	15	28	15	28	SPM 2.3	Words 'and low-lying areas' may be added after 'Coastal systems' [Government of India]
SPM A-614	SPM	15	28	15	30	SPM 2.3	This sentence could be deleted because the changes after 2100 are dealt with in section 2.4. [Government of Finland]
SPM A-615	SPM	15				SPM 2.3	Footnote 8: it would be helpful to define "marine-based sectors". [Government of Switzerland]
SPM A-616	SPM	16	0			Figure SPM.8	Figure SPM.8: Some information from the WG2 report has not been taken into consideration, and sometimes the information provided does not seem logical: : - Why is there no icon for Livelihoods, health and economics in Central and South America for "reduced water availability, increased flooding and landslides"? - With regard to the oceans, what kind of health risks arise from increased mass coral bleaching and (coral) mortality? - Please add information that risks are not comparable. [Government of Germany]
SPM A-617	SPM	16	1	16	1	Figure SPM.8	There is a major concern about Figure SPM.8. Although there are some changes in the wording from the previous version, e.g., to say "potential for adaptation to reduce risk." However, the problem still remains in that it still says that there is no potential for additional adaptation to reduce risk for ecosystems in polar regions (in top left box of the figure), and no such potential in the present, or in the short term, or in the long term! The implication from this is serious: would IPCC intentionally declare that not any additional adaptation may reduce any risk at all in the polar regions where the risk level with current adaption is all that can be done since there is zero potential for additional adaptation to reduce risk with high adaptation. This means that IPCC establishes the status quo for ecosystem adaptation in the polar regions and thus encouraging inaction. [Government of United States of America]
SPM A-618	SPM	16	1	16	6	Figure SPM.8	The first figure on Polar Regions, "Risks on ecosystems": does the lack of shaded bar indicates that the potential for risk reduction is zero? [European Union]
SPM A-619	SPM	16	1			Figure SPM.8	Fig SPM.8: It is confusing to have some of the risk categories described in terms of increased impacts, whereas others just describe the impact. For example, should 'Heat-related human mortality' be 'Increased heat-related human mortality'? Suggest reviewing and revising where possible. [Government of Canada]

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SPM A-620	SPM	16	1			Figure SPM.8	Figure SPM.8. Having a single box for polar regions suggests that, for example, risks for health and well being of people are important in both the Arctic and Antarctic. The differences between these regions is lost; issues will clearly be different in the Arctic given that there are settlements, different natural ecosystems, resource development, etc. Suggest that note be added to indicate that most socioeconomic risks are more relevant to the Arctic. [Government of Canada]
SPM A-621	SPM	16	2	16	2	Figure SPM.8	Figure SPM.8: The figure is too complex and selective in the information that conveys. It is not clear how a risk is chosen as "representative" of a region or why almost all regions have the same number of risks (three, with the exception of the Small Islands that have only two). It fosters an unreliable image of the situation by not showing differences in vulnerability among regions. The utilization of this figure for policy making is therefore questionable. It should be deleted or profoundly changed and redesigned. [Government of Venezuela]
SPM A-622	SPM	16	2	16	6	Figure SPM.8	Could you please clarify in the caption or elsewhere whether or not cold-water coral ecosystems are included in the assessment for ecosystems in Polar regions? This is important due to the high susceptibility for the Arctic ocean with respect to ocean acidification. [Government of Norway]
SPM A-623	SPM	16	2	16	6	Figure SPM.8	KEY CONCERN Fig. 8 SPM: The term "highly adapted state" is very unclear and needs further clarification. SUGGEST Either revert back to WG2's expression "hypothetical adapted state", or clarify what is meant by a "highly adapted state" and why that is a better description of whatever methodology and assumptions underlay this assessment. From our perspective, both of these, but in particular the latter demands a box explaining the methodology underlying this key concept underlying the assessment presented in Figure SPM.8 and elsewhere in the report. SEE NEXT ROW FOR REASONING [Government of Saint Lucia]
SPM A-624	SPM	16	2	16	6	Figure SPM.8	REASONING FOR KEY CONCERN Fig. 8 SPM: The term "highly adapted state" is very unclear and needs further clarification. WG2 Assessment Box SPM.2 uses the expression "hypothetical highly adapted state", which is very different. However, it remains unclear what methodology is underlying this assessment. As we understand it, it purely considers biophysical limits to adaptation, but neglects social as well as economical limits. However, these limits may in particular affect the world's most vulnerable countries and determine their future "adaptive state" as it is e.g. highlighted in the ES of WG2 Chapter 22 on Africa: "Growing understanding of the multiple interlinked constraints on increasing adaptive capacity is beginning to indicate potential limits to adaptation in Africa (medium confidence). Climate change combined with other external changes (environmental, social, political, technological) may overwhelm the ability of people to cope and adapt, especially if the root causes of poverty and vulnerability are not addressed. Evidence is growing for the effectiveness of flexible and diverse development systems that are designed to reduce vulnerability, spread risk, and build adaptive capacity. These points indicate the benefits of new development trajectories that place climate resilience, ecosystem stability, equity and justice at the centre of development efforts." [Government of Saint Lucia]
SPM A-625	SPM	16	11	16	12	Figure SPM.8	Suggest deleting the sentence beginning with 'Greater rates of magnitude' unless a sentence providing context for the term "adaptation limits" is also included. Otherwise the term 'adaptation limits' could be interpreted in any number of ways making the term highly subjective and completely useless. The sentence 'Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits' was agreed to at the WG2 approval session in Yokohama ONLY IF the following sentence was added as a means of describing the complexity of the term 'adaptation limits': Limits to adaptation occur when adaptive actions to avoid intolerable risk for an actor's objectives or for the needs of a system are not possible or are not currently available. In addition, the over-simplistic statement 'Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits' fails to recognize the other factors that play a role in limiting the effectiveness of adaptation efforts. For example, the relevant underlying chapter 16 clearly states in the executive summary that: "A range of biophysical, institutional, financial, social, and cultural factors constrain the planning and implementation of adaptation options and potentially

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							reduce their effectiveness (very high confidence). Adaptation of both human and natural systems is influenced by the rate of climate change as well as rates of economic development, demographic change, ecosystem alteration, and technological innovation." Therefore, this additional text needs to be added to make the paragraph acceptable. By not providing context for the term 'adaptation limits' (which is new to this report) and failing to recognize non-climate stressors that contribute to the reduced effectiveness of adaptation actions, the result is an incredibly misleading statement. [Government of United States of America]
SPM A-626	SPM	16	19	16	19	Figure SPM.8	"Delaying mitigation shifts burdens from the present to the future" is a near-tautology. It would be more useful to say that delaying mitigation greatly increases the difficulty and expense associated with meeting climate stabilization targets. [Government of United States of America]
SPM A-627	SPM	16		16		Figure SPM.8	For Africa, why wildlife is not include as among the key risk?, there is a need to link drought to food security. [Government of United Republic of Tanzania]
SPM A-628	SPM	16		16		Figure SPM.8	Figure SPM 8 is hard to read. The small pictograms representing the key risks are difficult to read, the colours should be clearer. Also the regional texts are hard to read. An explanation for the two stages of adaptation needs to be described in more detail - either in the text or in the figure caption. [Government of Denmark]
SPM A-629	SPM	16				Figure SPM.8	Figure SPM 8. I have zoomed 150% in the pdf and have a huge monitor. The figure has a low resolution which makes it hard to read on paper. The sea level will rise and one of the key risks to Belgium, The Netherlands and Denmark is coastal erosion which is not shown in the figure. [Government of Denmark]
SPM A-630	SPM	16				Figure SPM.8	Figure SPM 8. This figure is a big improvement compared to the previous table presentation in WGII. However, we feel that the text in section 2.3 does not sufficiently relate to and discuss the findings visualized in the Figure. [Government of Norway]
SPM A-631	SPM	16				Figure SPM.8	Delete this figure, very general and confusing. [Government of Bolivia]
SPM A-632	SPM	17	1	17	1	SPM 2.3	Word 'reduce' may be replaced by 'affect' [Government of India]
SPM A-633	SPM	17	1	17	1	SPM 2.3	Word 'major crops such as' may be added before 'wheat, rice and maize' [Government of India]
SPM A-634	SPM	17	1	17	1	SPM 2.3	Please clarify that wheat, rice and maize are "major crops", using the wording from WGII SPM page 17: "for major crops (wheat, rice and maize)". [Government of Belgium]
SPM A-635	SPM	17	1	17	1	SPM 2.3	Suggest clarifying whether this statement refers to food security globally, regionally or both. Underlying chapters suggest that aggregate global impacts are negative, but that there may be positive impacts in some regions. [Government of United States of America]
SPM A-636	SPM	17	1	17	4	SPM 2.3	Suggest strengthening this statement such that it will more clearly convey the level of risk. Scenarios without adaptation are not as policy-relevant, particularly in agriculture where there will typically be reactive adaptation. The reader wants to know what the likely impacts are with adaptation, such as is depicted qualitatively in Figure SPM.8. The current formulation could be interpreted to suggest that adaptation is capable of minimizing negative impacts up to 4C. [Government of Canada]
SPM A-637	SPM	17	4	17	4	SPM 2.3	What is the 4C temperature increase relative to? [Government of Ireland]
SPM A-638	SPM	17	4	17	5	SPM 2.3	CRITICAL CONCERN: The temperature level (~4 °C) in the statement "Global temperature increases of ~4 °C or more, combined with increasing food demand, would pose large risks to food security globally and regionally" is inadequate and inconsistent with the underlying topic and WGII report. SUGGEST REWORD TO: "Global temperature increases of 1.5-3 °C or more, combined with increasing food demand, would pose large risks to food security globally and regionally".

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							<p>REASONING: We outline three reasons to support the changes proposed. NOTE: Due to the 1032 character limit for excel cell display these will be also placed in several rows.</p> <p>1) Possible confusion between local and global temperature increases 2) Convolution of global with regional 3) Inadequate overall assessment of combined risk from crop declines and "increasing food demand"</p> <p>CONTINUED ON NEXT ROW [Government of Saint Lucia]</p>
SPM A-639	SPM	17	4	17	5	SPM 2.3	<p>REASONING FOR CRITICAL CONCERN - Suggested reword to: "Global temperature increases of 1.5-3 °C or more, combined with increasing food demand, would pose large risks to food security globally and regionally"</p> <p>CONTINUED FROM ROW ABOVE</p> <p>1) Possible confusion between local and global temperature increases. The Executive Summary of WG2 Chapter 7 states "Under scenarios of high levels of warming, leading to local mean temperature increases of 3-4 °C or higher, models based on current agricultural systems suggest large negative impacts on agricultural productivity and substantial risks to global food production and security (medium confidence)."</p> <p>As far as we can see from e.g. AR5 WGI, in low latitudes (tropical regions) a local warming of 3-4°C above base periods commonly used in the assessments is equivalent with 2.5-3.5°C global warming above preindustrial. And in high latitudes locally 3-4°C above base periods is globally 2-3°C above preindustrial.</p> <p>"Risks globally and regionally" therefore would occur at 2-3°C above preindustrial. Instead, the SPM text inexplicably appears to link the level of risk identified in chapter 7 ("large negative impacts on agricultural productivity and substantial risks to food production and security") to over 4.6°C global warming above preindustrial approximately (assuming the 4°C relates to the same base period as the preceding sentence "above late-20th century levels", which would imply about 4.6 above pre-industrial - e.g. caption Figure SPM.10). [Government of Saint Lucia]</p>
SPM A-640	SPM	17	4	17	5	SPM 2.3	<p>REASONING FOR CRITICAL CONCERN - Suggested reword to: "Global temperature increases of 1.5-3 °C or more, combined with increasing food demand, would pose large risks to food security globally and regionally"</p> <p>CONTINUED FROM ROW ABOVE</p> <p>2) Convolution of global with regional The Executive Summary of WG2 Chapter 7 further states, "Such risks will be greatest for tropical countries, given the larger impacts in these regions, which are beyond projected adaptive capacity, and higher poverty rates compared to temperate regions. [7.4.1, Figures 7-4, 7-7]". This is again linked to local mean temperature increases of 3-4 °C or higher, which is equivalent with 2.5-3.5°C global warming above preindustrial in the tropics.</p> <p>In light of this, the SYR SPM statement is a highly inadequate reflection of that risk, by merging global and regional risks and relating the total risk to ~4°C or more. The part of the statement "large risks to food security ... regionally" is seriously at odds with the assessment of large risks at global warming of 2.5-3.5°C to large negative impacts on agricultural productivity to occur in low latitude regions. It is also clear from table 7-3 that the assessed ability of adaptation to reduce these "very high" risks at 4° warming is very small. [Government of Saint Lucia]</p>
SPM A-641	SPM	17	4	17	5	SPM 2.3	<p>REASONING FOR CRITICAL CONCERN - Suggested reword to: "Global temperature increases of 1.5-3 °C or more, combined with increasing food demand, would pose large risks to food security globally and regionally"</p> <p>CONTINUED FROM ROW ABOVE</p> <p>3) Inadequate overall assessment of combined risk from crop declines and "increasing food demand"</p>

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							<p>As large declines in crop productivity in tropical regions occur at 2.5-3.5°C above pre-industrial globally, risks are high at this level for those regions, even without taking into account increasing food demand. Inclusion of this statement part "combined with increasing food demand" puts the global temperature level at at yet more prohibitive odds with "~4 °C or more".</p> <p>Given limits and challenges to adaptation, and given relatively high population growth at low latitudes, we suggest that an overall risk assessment that includes increases in food demand implies that the global temperature level (at which high risks to food security regionally are assessed) be put at 1.5-3°C, instead of the 2-3°C or 2.5-3.5°C level implied by reduced crop productivity alone, and certainly instead of the ~4°C or more, which is completely inexplicable and not supported by evidence and WGII chapter 7. [Government of Saint Lucia]</p>
SPM A-642	SPM	17	6	17	7	SPM 2.3	We appreciate that this section on food security now includes both terrestrial and oceanic aspects. However (as Fig. SPM.9 shows), the largest reductions in fisheries are foreseen for the tropics. We therefore suggest to replace with the following text from WGII SPM (p. 18): "Redistribution of marine fisheries catch potential towards higher latitudes poses risk of reduced supplies, income and employment in tropical countries, with potential implications for food security (medium security)". [Government of Norway]
SPM A-643	SPM	17	7	17	7	SPM 2.3	Word 'water' may be added after the word 'surface' [Government of India]
SPM A-644	SPM	17	7	17	9	SPM 2.3	Suggest noting what sectors/uses this competition for water could affect - drinking water? Water for agriculture? Water for hydroelectricity? Could this have trickle-down effects on afforestation efforts or bioenergy crops? Same questions apply for subsequent mentions of water scarcity. [Government of Canada]
SPM A-645	SPM	17	7	17	9	SPM 2.3	We suggest to include here some map on the projected change in annual mean runoff, for example AR-WG2 Figure 3.4 or AR-WG1 figure 12.24, that will support the finding presented in this sentence. Otherwise, it is very difficult for the reader to understand where the "dry subtropical regions" are, and which are them [Government of Spain]
SPM A-646	SPM	17	7	17	9	SPM 2.3	Please make clear that not only dry subtropical regions are projected to face problems with renewable surface water and groundwater resources. [Government of Germany]
SPM A-647	SPM	17	7	17	9	SPM 2.3	This statement does not reflect the reduction or changes to surface runoff that will impact regions other than dry subtropical. Current depletion of groundwater occurs across many biogeographic and demographic systems. Does the underlying report include findings from other regions that could be added? [Government of United States of America]
SPM A-648	SPM	17	7	17	9	SPM 2.3	This reference to water resources in dry subtropical regions seems too specific, and without more background information does not fit in the SPM. A more general statement would be better: "The fractions of the global population that will experience water scarcity and be affected by major river floods are projected to increase with the level of warming in the 21st century (robust evidence, high agreement). (2.3.2)". [European Union]
SPM A-649	SPM	17	8	17	8	SPM 2.3	Word 'significantly' may be added after the words 'groundwater resources' [Government of India]
SPM A-650	SPM	17	8	17	8	SPM 2.3	renewable surface sounds odd. Is there a better word or explanation Change to surface water. [Government of Sweden]
SPM A-651	SPM	17	8	17	9	SPM 2.3	Why has there been a switch to evidence/agreement language at this point? Suggest readers would find confidence assessments more useful, and on the face of it, one would think that robust evidence/high agreement could indicate high (or very high) confidence, and that limited evidence/medium agreement could indicate low (or very low) confidence. If confidence assessments can be made, suggest this would be better than allowing readers to make their own, possibly less informed, assessments. [Government of Canada]
SPM A-652	SPM	17	9	17	9	SPM 2.3	Climate change poses risk for food production', this heading seems to be out of place. It should be placed at Line 1, Page 17. [Government of India]

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SPM A-653	SPM	17	9	17	9	SPM 2.3	Words 'among sectors' may be added after the word 'water' [Government of India]
SPM A-654	SPM	17	9			SPM 2.3	The paragraph is referred to both 2.3.2 and 2.3.1. Please indicate the session 2.3.1 at the end of the paragraph. [Government of Republic of Korea]
SPM A-655	SPM	17	10	17	10	Figure SPM.9	Panel (b) is confusing. Maybe some changes to the legend and caption might help. Or maybe laying out the graph differently. Or maybe you don't need this at all, really. Basically, it just says the impacts go from 50/50 positive to predominantly negative over the next 100 years. The graph isn't super insightful and can be removed from the SPM. [Government of United States of America]
SPM A-656	SPM	17	11	17	11	Figure SPM.9	We note that Figure SPM.9a is a figure from a single study (Cheung et al, 2010 - reference in WG2, Ch 6) based on climate change simulations with a single model (GFDL CM2.1) using an SRES forcing scenario (A1B) in one case and a constant year 2000 forcing scenario in the contrasting case. Suggest the authors consider whether it is appropriate to include this figure in the SYR SPM. In general, figures that synthesize across multiple studies and/or multiple models would provide more robust support for SYR conclusions. [Government of Canada]
SPM A-657	SPM	17	13	17	17	Figure SPM.9	The authors should clarify what types of crops this figure refers to - wheat, maize, soy, and/or rice? [Government of United States of America]
SPM A-658	SPM	17	17	17	17	Figure SPM.9	Figure caption: "relative to late-20th century levels". Do you mean "relative to 1986-2005"? If so, please clarify. [Government of Norway]
SPM A-659	SPM	17	19	17	19	SPM 2.3	Words 'Through out the 21st century' may be added before the starting of the paragraph [Government of India]
SPM A-660	SPM	17	19	17	19	SPM 2.3	Words 'injury, disease and' may be added after the words 'greater likelihood of' [Government of India]
SPM A-661	SPM	17	19	17	19	SPM 2.3	Write:"Throughout the 21st century, climate change is expected ...". [Government of Switzerland]
SPM A-662	SPM	17	19	17	20	SPM 2.3	Revise to clarify - "... including greater likelihood of death as a result of climate-related hazards/impacts...". (The probability of death without the qualifier is likely to remain 100%). [Government of Canada]
SPM A-663	SPM	17	19	17	20	SPM 2.3	We suggest the phrase "climate change is expected to lead to ... greater likelihood of death ..." needs to be reworded to more clearly explain what is meant. Everybody dies sometime, ie the unqualified likelihood of death is always 1.0. Perhaps what is meant is "climate change is expected to lead to ... greater likelihood of EARLY death ...? [Government of New Zealand]
SPM A-664	SPM	17	19	17	20	SPM 2.3	In the WGII SPM, this is two distinct sentences. The first refers to ill-health, while the second highlights examples such as death due to more intense heat waves and fires. It would be better to keep this consistent with the text in the WGII SPM to avoid misinterpretation. [European Union]
SPM A-665	SPM	17	19	18	2	SPM 2.3	It is suggested to provide in this paragraph some more specific information regarding the expression "in some areas for part of the year" (where and which parts/seasons of the year) [Government of Spain]
SPM A-666	SPM	17	19	18	2	SPM 2.3	The information should be given for the lowest and the highest RCP. [Government of Sweden]
SPM A-667	SPM	17	20	17	20	SPM 2.3	Words 'due to more intense heat waves and fire (very high confidence)' may be added after 'low income' [Government of India]
SPM A-668	SPM	17	20	17	20	SPM 2.3	"Developing countries with low income" Venezuela in conjunction with others countries expressed its reservation to the use of this type of classification of countries based on income. This was part of the last debate for the acceptance of the Working Group III, and was reserved. [Government of Venezuela]

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SPM A-669	SPM	17	21	18	2	SPM 2.3	"in some areas" is very unspecific. Is it possible to add examples by saying "such as ..."? [Government of Germany]
SPM A-670	SPM	17				Figure SPM.9	Figure SPM 9. The title of this figure is omitting to tell that there are also opportunities for food production, as all the blue on the map shows. Please consider modifying the title to "Climate change poses risks and presents opportunities for food production". [Government of Norway]
SPM A-671	SPM	17				Figure SPM.9	Figure SPM 9 (B). This figure is very useful, however it does not show clearly the message. We suggest that you present the increase in yield change above the x-axis while the decrease in yield could be presented below the x-axis. In our view the message from the figure will then communicate better. [Government of Norway]
SPM A-672	SPM	17				Figure SPM.9	Important to differentiate the impacts in developed and developing countries. As it is very much general and mostly shows the impacts in developed countries. [Government of Bolivia]
SPM A-673	SPM	18	1	18	1	SPM 2.3	Use of RCP8.5 is obscure for most readers [Government of Ireland]
SPM A-674	SPM	18	1	18	2	SPM 2.3	Clarity is needed on what is meant by "common human activities. Suggest adding phrase as it appears on p. 67 "including growing food or working outdoors". [Government of Canada]
SPM A-675	SPM	18	1	18	2	SPM 2.3	The authors should include a clear example here. Such general statements are not particularly helpful. For example, regarding human health impacts, can anything be said about malaria or the incidence of asthma attacks, etc.? [Government of United States of America]
SPM A-676	SPM	18	2	18	2	SPM 2.3	Please provide a better explanation of the term "common human activities". [Government of Germany]
SPM A-677	SPM	18	2	18	2	SPM 2.3	"... constrain human activities." Everywhere? In the tropics? [Government of United States of America]
SPM A-678	SPM	18	6	18	6	SPM 2.3	Word 'These' may be deleted [Government of India]
SPM A-679	SPM	18	7	18	7	SPM 2.3	We suggest the wording "Rural areas are expected to experience major impacts on water availability and supply, food supply, ..." should be changed. The present wording implies this statement is true for ALL rural areas, which from our understanding of the underpinning research is actually not the case. The wording should be modified to "Some rural areas ..." or "many rural areas ..." (depending on the assessment by the lead authors). [Government of New Zealand]
SPM A-680	SPM	18	7	18	9	SPM 2.3	Rural areas are expected to experience major impacts on water availability and supply, food security, infrastructure, and agricultural incomes, including shifts in 8 the production areas of food and non-food crops around the world. The Sahara region is not stated although it is one of the most vulnerable areas of the world to the impact of climate change. [Government of Algeria]
SPM A-681	SPM	18	9	18	9	SPM 2.3	Word 'around' may be replaced by 'across' [Government of India]
SPM A-682	SPM	18	11	18	11	SPM 2.3	From the viewpoint of accurately quoting from WG2 SPM P.12 BOX SPM 1_4), additional description should be added as follows. "(...) temperature, but few quantitative estimates have been completed for additional warming around 3°C or above." [Government of Japan]
SPM A-683	SPM	18	11	18	11	SPM 2.3	"Aggregate economic damages accelerate with increasing temperature." How much is the acceleration with which level of uncertainty? Please be consistent with WG findings in your clarification. [Government of United States of America]
SPM A-684	SPM	18	11	18	14	SPM 2.3	Very long sentence consider splitting [Government of Ireland]

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SPM A-685	SPM	18	11	18	14	SPM 2.3	In this paragraph, it states that: "From a poverty perspective, climate change impacts are projected to slow down economic growth, making poverty reduction more difficult, further erode food security...." However, we did not find justification in this section for the claim about slowing economic growth. Therefore we suggest that a citation or link to the justification be added, or rewrite these lines as "From a poverty perspective, climate change impacts are projected to make poverty reduction more difficult, further erode food security...." [Government of United States of America]
SPM A-686	SPM	18	13	18	13	SPM 2.3	Suggest deleting "further" (further relative to what state of food security ... that which would occur in the absence of climate change, but under other aspects of global change?). [Government of Canada]
SPM A-687	SPM	18	16	18	20	SPM 2.3	This discussion of migration is fine, but we are missing a more general and nuanced discussion of "indirect impacts of climate change", i.e. implications for a region of climate change impacts occurring outside that region. This is an emerging policy question in many countries that are developing adaptation strategies. There is discussion of these "cross-regional phenomena" in chapter 21, WG II: "Cross-regional phenomena can be crucial for understanding the ramifications of climate change at regional scales, and its impacts and policies of response (21.4) (high confidence)". The examples provided in that chapter are of global trade, financial transactions, and migration of humans and of ecosystems. This has not been picked up in the Synthesis Report. [Government of Finland]
SPM A-688	SPM	18	16	18	20	SPM 2.3	The authors should add after extreme weather events, 'reduced access to potable water, food and economic opportunity'. This is consistent with underlying chapter. [Government of United States of America]
SPM A-689	SPM	18	17	18	17	SPM 2.3	Please avoid describing a projected future in the present tense. In this case, suggest inserting "are projected to" prior to "experience higher exposure". [Government of Canada]
SPM A-690	SPM	18	18	18	18	SPM 2.3	Given that the statement is only made with medium confidence, "may indirectly" would be in better accord with the assessed level of uncertainty than "can indirectly". [Government of Canada]
SPM A-691	SPM	18	18	18	18	SPM 2.3	Add at the beginning of the sentence, 'In countries or regions without robust institutional arrangements to adapt,' climate change can indirectly increase risks of violent conflict.... This is one of the key discussions in underlying chapter. [Government of United States of America]
SPM A-692	SPM	18	20	18	20	SPM 2.3	Please delete the examples "such as poverty and economic shocks" or to enumerate completely the drivers of violence conflicts. These examples create the idea that the most important drivers of violence are poverty or economic issues while there are other well-documented drivers as territorial or religious conflicts. We can read at WGII 12.1 page 17 "Civil war has been studied extensively using quantitative and qualitative techniques, and there is high agreement about factors that increase the risk of civil war, namely: a recent history of civil violence, low levels of per capita income, low rates of economic growth, economic shocks, inconsistent political institutions, and the existence of conflict in neighboring countries (Miguel et al., 2004; Weede, 2004; Hegre and Sambanis, 2006; Dixon, 2009; Blattman and Miguel, 2010; Brückner and Ciccone, 2010). Nevertheless, almost all studies note the need for convincing theories that explain these associations." summary of chapter 12 WGII said: "Some of the factors that increase the risk of violent conflict within states are sensitive to climate change (medium agreement, medium evidence). The evidence on the effect of climate change and variability on violence is contested [12.5.1]. Although there is little agreement about direct causality, low per capita incomes, economic contraction, and inconsistent state institutions are associated with the incidence of violence [12.5.1]. These factors can be sensitive to climate change and variability. Poorly designed adaptation and mitigation strategies can increase the risk of violent conflict [12.5.2]. People living in places affected by violent conflict are particularly vulnerable to climate change (high agreement, medium evidence). Evidence shows that large-scale violent conflict harms infrastructure, institutions, natural capital, social capital and livelihood opportunities. Since these assets facilitate adaptation to climate change, there are strong grounds to infer that conflict strongly influences vulnerability to climate change impacts [12.5.3]." At 19.4.2.2

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							"Violent conflict between individuals or groups arises for a variety of reasons (Section 12.5). Factors such as poverty and economic shocks that are associated with a higher risk of violent conflict are themselves sensitive to climate change and variability (high confidence; Sections 12.5.1, 12.5.2; 13.2)" Therefore the main idea of the relationship between CC and violence conflict is summarized by " climate change or changes in climate variability increases the risk of armed conflict in certain circumstances", and this circumstances are not only poverty and economic shock. [Government of Venezuela]
SPM A-693	SPM	18	22	18	22	SPM 2.4	Irreversible and abrupt changes are not necessarily restricted to the period beyond 2100. We suggest to change this title to: "Irreversible and abrupt changes, and long term climate change" [Government of Netherlands]
SPM A-694	SPM	18	22	18	26	SPM 2.4	The second sentence in the box could be applicable even before 2100 so doesn't seem to be consistent with the title of this section. Perhaps the title would be better as "Long-term climate change, irreversibility and abrupt changes" and the order of the two sentences changed to start with the second sentence. [European Union]
SPM A-695	SPM	18	22	18	49	SPM 2.4	The Section on long-term climate change and irreversibility is highly relevant, and it is appreciated that this information is provided in the SYR (including footnote 9). [Government of Germany]
SPM A-696	SPM	18	22	18	49	SPM 2.4	The term "irreversibility" should be used carefully in this section. The section title seems to link irreversibility and abrupt changes but the footnote defining 'abrupt' leads one to believe that abrupt changes occur over longer time scales. Given the audience here is policy-makers, there needs to be clarity in both timescale and "irreversibility". Consider including the definition of "irreversibility" from the glossary in a footnote here. [Government of United States of America]
SPM A-697	SPM	18	24	18	25	Headline 2.4	Please consider to replace the word "cease" with "are terminated". We believe this is a formulation that better communicates the message and it also points towards the urgency needed for implementing mitigation measures. [Government of Norway]
SPM A-698	SPM	18	24	18	26	Headline 2.4	More explanation and examples of thresholds and tipping points should be given Replace existing text with: Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases cease. Some parts of the climate system may have thresholds which, if crossed, could lead to abrupt or irreversible change. Changes include permafrost methane release, tropical and boreal forest dieback, ice sheet melt, ocean currents and monsoonal circulation. The risk of abrupt and irreversible change increases as the magnitude of the warming increases. {2.4} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-699	SPM	18	24	18	26	Headline 2.4	This statement is imprecise. SUGGESTION: Please update with the statement from WG1 E.8: "Cumulative emissions of CO2 largely determine global mean surface warming by the late 21st century and beyond. Most aspects of climate change will persist for many centuries even if emissions of CO2 are stopped. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO2. The risk of abrupt and irreversible change increases as the magnitude of the warming increases." [Government of Saint Lucia]
SPM A-700	SPM	18	25	18	26	Headline 2.4	We suggest to adapt the second sentence of the headline statement to: "Abrupt and irreversible change may occur at any global mean temperature, but the risk increases with the magnitude of the warming. {2.4}" [Government of Netherlands]
SPM A-701	SPM	18	27	18	27	Headline 2.4	We recommend adding the following sentence added to the beginning of this paragraph (from lines 16-17 on page SYR-78): "Climate change represents a substantial multicentury commitment, effectively irreversible over a period of many generations." [Government of Canada]
SPM A-702	SPM	18	28	18	28	SPM 2.4	This result has been stated more simply elsewhere, by just beginning with the phrase "Surface temperatures will remain approximately constant...etc." Can the first words of the current sentence ("The anthropogenic contribution

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							to (surface temperatures)" be deleted? [Government of Canada]
SPM A-703	SPM	18	28	18	29	SPM 2.4	First sentence begs the question: "why?". It would be helpful to adding a short explanatory phrase. [Government of Switzerland]
SPM A-704	SPM	18	28	18	29	SPM 2.4	Suggested edits: "...temperatures WOULD remain approximately constant BECAUSE elevated levels for many centuries WOULD CONTINUE EVEN after a complete cessation..." [Government of United States of America]
SPM A-705	SPM	18	28	18	33	SPM 2.4	The paragraph is written in a way that a non-expert may conclude that mitigation action has no effect at all and as such why we discuss mitigation in the first place. To our view the text needs to be re-arranged to avoid such misinterpretation. [European Union]
SPM A-706	SPM	18	29	18	33	SPM 2.4	Request that this be maintained as it is a well-written summary of WGI SPM W E.8, and is important for the SYR. [Government of Japan]
SPM A-707	SPM	18	35	18	35	SPM 2.4	Replace "increase" with "continue" unless the intent is to indicate acceleration in the decrease of ocean pH (acidification already indicates the direction of change, and thus increasing acidification implies acceleration). [Government of Canada]
SPM A-708	SPM	18	35	18	35	SPM 2.4	"...ocean acidification will continue for centuries if CO2 emissions continue." This is puzzling. Would not OA continue FOREVER if CO2 emissions continue? Suggest revising. [Government of United States of America]
SPM A-709	SPM	18	35	18	36	SPM 2.4	The statement "There is high confidence that ocean acidification will increase for centuries if CO2 emissions continue, and will strongly affect marine ecosystems. {2.4}" is strictly correct only for scenarios above RCP 2.6, whereas in the latter ocean acidification is projected to be stabilising or slightly declining by 2100. In addition, as this section deals with post-2100 changes, it is also useful to observe that continuation of RCP 2.6 is likely to slowly reduce ocean acidification: CO2 concentrations in the post-2100 extension of RCP 2.6 indicate a continuing slow decline. As a consequence, suggest rewording this sentence along the following lines: "There is high confidence that ocean acidification will increase for centuries if CO2 emissions continue, and will strongly affect marine ecosystems. {2.4}, however it should be noted that in the lowest scenario examined (RCP 2.6) with extremely low or negative CO2 emissions, CO2 concentration slowly declines and likely along with it ocean acidification." [Government of Saint Lucia]
SPM A-710	SPM	18	38	18	44	SPM 2.4	While scientists have a good understanding of how the topography of the Greenland and Antarctic Ice sheets differ, affecting the likelihood of abrupt or irreversible change, this won't be common knowledge for many readers. Suggest one sentence be added to provide this context otherwise readers may well be perplexed as to why the contributions of the GIS and the AIS to SLR are addressed from different perspectives (existing text refers to temperature thresholds for millennial scale melt for the GIS, and to abrupt and irreversible loss for the AIS). Also, please clarify whether the loss of ice from the GIS is expected to be gradual or abrupt. [Government of Canada]
SPM A-711	SPM	18	41	18	41	SPM 2.4	Insert 'global mean warming' after 1degC. [Government of Canada]
SPM A-712	SPM	18	41	18	41	SPM 2.4	What does "low confidence" mean in this case? [Government of Sweden]
SPM A-713	SPM	18	41	18	41	SPM 2.4	"sea level rise of up to 7 m, is greater than 1 degree C (low confidence)". Here and elsewhere in the SYR, why including low confidence findings? In this particular case, why focus on the threshold for loss of the Greenland ice sheet when confidence in the findings is so limited? [Government of United States of America]
SPM A-714	SPM	18	41			SPM 2.4	Please clarify the meaning of this "low confidence" statement. Is there "low confidence" that under 1 degree will not result in the loss of Greenland ice sheet in the long term? This would be a cause for great concern. At what level of temperature increase does confidence become "medium"? [Government of Ireland]

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SPM A-715	SPM	18	46	18	48	SPM 2.4	The sentence is somewhat hard to read. Consider to re-write. Suggestion: "Terrestrial and freshwater ecosystems will have an increased risk of abrupt and irreversible regional-scale change in the composition, structure, and function with climate change associated with medium- to high-emission scenarios." [Government of Norway]
SPM A-716	SPM	18	46	18	49	SPM 2.4	Other examples could be cited in addition to permafrost to make this statement more compelling (see how the issue is handled in WGII SPM and TS). Also need to note the positive climate feedback, 'leading to substantial additional climate change (medium confidence)' (WGII TS). [Government of Switzerland]
SPM A-717	SPM	18	48	18	48	SPM 2.4	Since there is no clear reason to exclude marine ecosystem, "terrestrial and freshwater ecosystem" should be "terrestrial, freshwater and marine ecosystem" to keep it consistent with SYR p.81, L23. [Government of Japan]
SPM A-718	SPM	18	48	18	49	SPM 2.4	It would be very relevant for policymakers if you could include text that describes the CO2 and CH4 emissions from permafrost thawing. This is described under Topic 2 page 72 line 12-14 and page 81 line 29-31. [Government of Norway]
SPM A-719	SPM	18	48	18	49	SPM 2.4	The authors should complete the thought for the policymaker: Why would he/she care about a reduction in permafrost extent? Consider including a statement about the potential for triggering C release from thawing permafrost or the impacts it could have on ecosystems and infrastructure. [Government of United States of America]
SPM A-720	SPM	19	1	19	1	SPM 3	The title of this section won't really mean much to people. Replace existing text with: 4. Managing Climate Change Risks [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-721	SPM	19	1	19	1	SPM 3	The title of this section only partially covers the actual contents and is not very clear from a policy makers' point of view. The section is about strategic and long term planning and decision making. It does not only cover transformation. Suggest modifying the title, at least in the SPM. [European Union]
SPM A-722	SPM	19	3	19	4	Headline 3	Adaptation and mitigation, the order should be reversed. In coherence with the rest of the document (see for instance in line 14, same page - 19) mitigation should precede adaptation almost each time in the document where the two terms appears close to each other. [Government of France]
SPM A-723	SPM	19	3	19	6	Headline 3	<p>The integration of mitigation and adaptation aspects in the headline statement is appreciated. However, the current text saying "mitigation and adaptation are complementary strategies for reducing and managing the risks of climate change" is misleading and not consistent with the underlying report and many statements in the SYR. The AR5 clearly shows that without mitigation, risks increase and the prospects for adaptation might become limited. We suggest to replace the current headline statement with text as follows (taken from Section C2 of the WG2 SPM): "Prospects for climate-resilient pathways for sustainable development are related fundamentally to what the world accomplishes with climate-change mitigation. Since mitigation reduces the rate as well as the magnitude of warming, it also increases the time available for adaptation to a particular level of climate change, potentially by several decades. Delaying mitigation actions may reduce options for climate-resilient pathways in the future. Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits."</p> <p>It is suggested to use further information from Section WG2 SPM Section C2 in Section 3 of the SYR, especially in regard to information on transformation that is currently missing.</p> <p>If the present text is maintained, in the first sentence we propose to mention "adaptation and mitigation" in a reverse order: "mitigation and adaptation". According to the AR5 the first option to meet climate change is mitigation. See also our general comment on the sequence of mitigation and adaption in the SYR. [Government of Germany]</p>
SPM A-724	SPM	19	3	19	6	Headline 3	System transformation involves adaptation and mitigation, which are unbalanced in description. It is suggested to add "Benefits from adaptation can be realized in addressing risks." after "Adaptation and ...climate change." [Government of China]
SPM A-725	SPM	19	3	19	6	Headline 3	Replace existing text with: Mitigation and adaptation are complementary strategies for reducing and managing the risks of climate change. Substantial emissions reductions in the coming decades will reduce risks in the 21st century and beyond, increase prospects for effective adaptation, reduce the costs and challenges of mitigation, and contribute to climate-resilient

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							pathways for sustainable development. {3.2, 3.3, 3.4} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-726	SPM	19	3	19	7	Headline 3	There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The effect of mitigation on natural gas export revenues is more uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of CCS would reduce the adverse effect of mitigation on the value of fossil fuel assets (medium confidence). (From WGIII page 20: these are concrete illustrations of how mitigation could make adaptation even more challenging. [Government of Saudi Arabia]
SPM A-727	SPM	19	4	19	6	Headline 3	Please add the notion of urgency as on P 20 L 16-8: "Substantial cuts in greenhouse gas emissions over the next few decades can significantly reduce risks of climate change in the second half of the 21st century and beyond..." replacing "Substantial near-term emissions reductions can reduce risks in the 21st-century and beyond..." [Government of Germany]
SPM A-728	SPM	19	4	19	6	Headline 3	The sentence "Substantial near-term emissions reductions can reduce risks in the 21st century and beyond" should be replaced with the corresponding part in WG2 SPM: "Adaptation and mitigation choices in the near term will affect the risks of climate change throughout the 21st century (high confidence)". If this sentence is about cost increase issues limited to mitigation, this should be replaced with "Delaying additional mitigation further increases mitigation costs in the medium- to long-term" as written in WG3 SPM. Or, if this is about energy demand, this should be replaced with "Near-term reductions in energy demand are an important element of cost-effective mitigation strategies" as written in WG3 SPM. [Government of Japan]
SPM A-729	SPM	19	5	19	6	Headline 3	Suggest inserting IN THE LONGER TERM after "challenges of mitigation" [Government of United States of America]
SPM A-730	SPM	19	7	19	7	Headline 3	Insert: "Mitigation and adaptation can positively or negatively influence the achievement of other societal goals, such as those related to human health, food security, biodiversity, local environmental quality, energy access, livelihoods, and equitable sustainable development; and vice versa, policies toward other societal goals can influence the achievement of mitigation and adaptation objectives." Source: WG III, SPM p. 5. [Government of Saudi Arabia]
SPM A-731	SPM	19	7	19	27	Headline 3.1	The headline statement of Section 3.1. is not consistent with the title of Section 3. The potential and need for mitigation and adaptation measures to transform/change systems should be presented as a result in the very beginning. Currently, transformation is only mentioned in Section 3.3. with reference to adaptation but not with reference to mitigation in Section 3.4. Please add the following text from SYR P 82 L 16-21. "Mitigation, adaptation, and climate impacts can all result in transformations to and changes in systems. Depending on the rate and magnitude of change and the vulnerability and exposure of human and natural systems, climate change will alter ecosystems, food systems, infrastructure, coastal, urban and rural areas, human health and livelihoods. Mitigation involves fundamental changes in the way that human societies produce and use energy services and land. Adaptive responses to a changing climate require actions that range from incremental changes to more fundamental, transformational changes." Please note that we changed the order of the last two sentences in line with our general comment on the sequence of mitigation and adaption in the SYR. [Government of Germany]
SPM A-732	SPM	19	8	19	8	Headline 3.1	It would be more appropriate to write: "Decision making to limit effects of climate change". [Government of Switzerland]

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SPM A-733	SPM	19	8	19	8	Headline 3.1	Current title does not reflect content. Suggest to change it. [European Union]
SPM A-734	SPM	19	8	19	27	SPM 3.1	The text in Section 3.1 would sit better in Section 4. This would improve the narrative and keep relevant information together. The text in Section 4 should be shortened and rationalised under fewer headings. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-735	SPM	19	8	19	27	SPM 3.1	The section 3.1 "Foundations of decision making" does not currently include narratives on "co-benefits" of climate change action which can be critical for decision makers. It is suggested that after line 24, one line of co-benefits is added. An example of this line could be: "These methods could also help identify co-benefits and synergies between climate change action and larger sustainable development goals." This line has been adapted from wordings on co-benefits in WG2 Technical Summary document page 33. [Government of United States of America]
SPM A-736	SPM	19	8			SPM 3.1	Need to broaden the discussion of this section taking more elements of SPM.2 of WGIII related to approaches to climate change mitigation, such as the complete first paragraph: Mitigation, together with adaptation to climate change, contributes to the objective expressed in Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC): The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. The following paragraph is only important to be considered extensively: Sustainable development and equity provide a basis for assessing climate policies and highlight the need for addressing the risks of climate change.3 Limiting the effects of climate change is necessary to achieve sustainable development and equity, including poverty eradication. At the same time, some mitigation efforts could undermine action on the right to promote sustainable development, and on the achievement of poverty eradication and equity. Consequently, a comprehensive assessment of climate policies involves going beyond a focus on mitigation and adaptation policies alone to examine development pathways more broadly, along with their determinants. It is also important to consider inputs from the WGII section regarding decision making context about risk management and resilience, and the role of indigenous peoples and community-based adaptation. [Government of Bolivia]
SPM A-737	SPM	19	10	19	12	Headline 3.1	Write:"Effective decision making to limit the effects of climate change benefits from a wide range of analytical approaches for evaluating expected risks and benefits, recognizing the importance of information, governance, ethical dimensions, value judgments, economic assessments and diverse perceptions and responses to risk and uncertainty." [Government of Switzerland]
SPM A-738	SPM	19	10	19	12	Headline 3.1	Perhaps state more clearly or use a more policy relevant statement - needs to specify link to "future generations" rather than the future if that is the intention. [Government of Ireland]
SPM A-739	SPM	19	14	19	14	SPM 3.1	Write:"Mitigation and adaptation may raise issues of equity, justice and fairness and may have implications ...". [Government of Switzerland]
SPM A-740	SPM	19	14	19	16	SPM 3.1	Insert: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." Source: WG III, SPM p. 5. [Government of Saudi Arabia]
SPM A-741	SPM	19	15	19	16	SPM 3.1	Please exchange the expression "are among the least responsible for" with "are among those causing the least contribution to GHG emissions". Justification: The current statement contains a value judgement is and not appropriate for IPCC. [Government of Germany]

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SPM A-742	SPM	19	15	19	16	SPM 3.1	The expression "Many of these (...)" should be replaced with the expression which has been adopted in WG3 SPM as follows: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." [Government of Japan]
SPM A-743	SPM	19	15	19	27	SPM 3.1	"Many of those most vulnerable to climate change are among the least responsible for GHG emissions" (l. 15-16): Statement appears to prescriptively allocate adaptation/mitigation burden on the basis solely of emissions history. Recommend deleting this sentence or balancing to equally recognize shifting emissions patterns (present-day and future responsibility). As-is, statement (i) raises policy sensitivities and (ii) de-emphasizes that "effective mitigation will...be achieved...only through collective response" (l. 25-27). [Government of United States of America]
SPM A-744	SPM	19	16	19	16	SPM 3.1	"Delaying mitigation shifts burdens from present to future." This is an important fact, therefore we propose to put it at the end of the headline statement of Section 3, P 19 L 6. See also our comment on this headline statement above. [Government of Germany]
SPM A-745	SPM	19	16	19	16	SPM 3.1	We suggest to expand this sentence: "Delaying action shifts burdens from the present to the future, reduces the options to deal with CC and increases both costs and residual damages. {3.1}" [Government of Netherlands]
SPM A-746	SPM	19	16	19	16	SPM 3.1	"Delaying mitigation shifts burdens from the present to the future." I should say "Delaying mitigation and adaptation shifts burdens from the present to the future." [Government of Venezuela]
SPM A-747	SPM	19	16	19	16	SPM 3.1	The sentence "Delaying mitigation..." looks not logically linked to the previous one. It may be changed as: "Delaying mitigation raises issues of intergenerational justice, because it shifts burdens from the present to the future." [European Union]
SPM A-748	SPM	19	18	19	19	SPM 3.1	The information provided in the SYR main section of 3.1 does not seem to substantiate this. [Government of Sweden]
SPM A-749	SPM	19	18	19	21	SPM 3.1	Suggest the first sentence of this paragraph be deleted as it appears editorial. The factual content of the paragraph is better captured by starting with "Analytic methods from economics and decision analysis are available to undertakes balanced decision making that reflects ethical dimensions." [Government of Canada]
SPM A-750	SPM	19	18	19	23	SPM 3.1	Please delete this paragraph, since the message is confusing and needs a lot of explanation. Also, it conveys more of the policy prescription. [Government of India]
SPM A-751	SPM	19	18	19	23	SPM 3.1	Minimum and maximum threshold levels of adaptation may be indicated [Government of India]
SPM A-752	SPM	19	18	19	23	SPM 3.1	Not clear on the added value of this statement [Government of Ireland]
SPM A-753	SPM	19	18	19	23	SPM 3.1	Suggest revision so that the message is clearer. In particular, "Decision makers are sometimes influenced by social, cultural and emotional factors that cause them to misestimate risks, engage in short-term thinking and be biased toward the status quo." cannot be found in any of the three WG SPMs, and therefore request revision for consistency with approved text. For example, suggest revision to the following text from WGII SPM p6, para2: "The design of climate policy is influenced by how individuals and organizations perceive risks and uncertainties and take them into account." [Government of Japan]
SPM A-754	SPM	19	18	19	23	SPM 3.1	Very generic paragraph. It looks like a compilation of very general statements and provide no real information to decision makers. Is this an output of recent research assessed by AR5 ? Also the last sentence needs to be revisited. [European Union]
SPM A-755	SPM	19	19	19	19	SPM 3.1	Misestimate is not a real word. Underestimate or mistake would be more accurate in this context. [Government of Ireland]

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SPM A-756	SPM	19	19	19	21	SPM 3.1	Analytical approaches can not completely reflect ethical dimensions without value judgements as inputs. E.g. assumptions on parameter values or else parameter values based on survey response. Therefore it is more appropriate to say that analytical methods can assist in balanced decision making that reflects ethical dimensions. At end of sentence line 21, after 'available' insert 'that can help'. [Government of Ireland]
SPM A-757	SPM	19	19	19	21	SPM 3.1	The value of this sentence would be much improved by stating which analytical methods that are available. Please consider to include some examples. If this makes the sentence to long and specific you should consider to rephrase or delete this sentence. [Government of Norway]
SPM A-758	SPM	19	21	19	22	SPM 3.1	Suggest deleting "cannot identify a single best balance between mitigation, adaptation and residual climate impacts" so that the sentence reads "these methods can take account of a wide range of possible impacts, including low-probability outcomes with large consequences". In its current formulation the sentence suggests a best balance exists, but that the methods discussed cannot identify it. The AR4 discussion of adaptation and mitigation very effectively showed that the concept of a balance between the two is inappropriate. [Government of Canada]
SPM A-759	SPM	19	21	19	23	SPM 3.1	Again, this para incorrectly implies that mitigation and adaptation are equal options to respond to climate change. The AR5 shows, however, that mitigation action to reduce GHG emissions is key to reducing the impacts and risks of climate change. Without significant mitigation the risks of climate change including tipping points become very high and the effects of adaption action might become limited. Therefore, the statement should be modified in order to correctly reflect the science presented in AR5. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
SPM A-760	SPM	19	21	19	23	SPM 3.1	There is a repetition: please delete "of take account" [Government of Belgium]
SPM A-761	SPM	19	21	19	23	SPM 3.1	The sentence "These methods cannot identify a single best balance between mitigation, adaptation, and residual climate impacts..." is unclear, and should be written in a way that is more understandable, such as: "Given the social, cultural and emotional factors that influence decision making, these methods in and of themselves cannot identify for decision-makers a single best balance in between how much and what actions to take to mitigate, how much and what actions to take to adapt, and how much residual risk to accept." [Government of United States of America]
SPM A-762	SPM	19	22	19	22	SPM 3.1	Editorial correction: The phrase "take account of" should occur only once in this sentence. [Government of New Zealand]
SPM A-763	SPM	19	22	19	22	SPM 3.1	"take account of" is twice [Government of Finland]
SPM A-764	SPM	19	22	19	22	SPM 3.1	"take account of" is repeated [Government of Italy]
SPM A-765	SPM	19	22	19	22	SPM 3.1	Eliminate one of the two "take account of". [Government of Switzerland]
SPM A-766	SPM	19	22	19	22	SPM 3.1	typo: delete "take account of" as it is written twice. [Government of Ireland]
SPM A-767	SPM	19	22	19	22	SPM 3.1	Delete duplicated "take account of". [Government of Japan]
SPM A-768	SPM	19	22	19	22	SPM 3.1	Editorial: delete "take account of" because these words have been repeated. [Government of Austria]
SPM A-769	SPM	19	22	19	22	SPM 3.1	Repetition of "take account of". [Government of Sweden]

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SPM A-770	SPM	19	22	19	22	SPM 3.1	Delete repetition "take account of". [Government of Russian Federation]
SPM A-771	SPM	19	22	19	22	SPM 3.1	Referring to "of take account": to delete. [European Union]
SPM A-772	SPM	19	22	19	23	SPM 3.1	Is it residual climate impacts? It should be residual climate change impacts..... May add 'change' [Government of India]
SPM A-773	SPM	19	22			SPM 3.1	"take account of" is duplicated, one of them should be removed. [Government of Turkey]
SPM A-774	SPM	19	22			SPM 3.1	Delete take into account (double typing). [Government of Algeria]
SPM A-775	SPM	19	25	19	25	SPM 3.1	'collective response' may be replaced with 'collective and differentiated responses'. [Government of India]
SPM A-776	SPM	19	25	19	27	SPM 3.1	Suggest the text of the SPM should try to avoid academic jargon such as "collective action problem". A possible suggestion would be "Effective mitigation of climate change can only be achieved through a collective response at the global scale." [Government of Canada]
SPM A-777	SPM	19	25	19	27	SPM 3.1	This is important, in a shortened version could be the headline statement, the other points about socio-economic etc follow and could be expressed more concisely [Government of Ireland]
SPM A-778	SPM	19	25	19	27	SPM 3.1	Questionable statement "Effective mitigation will not be achieved..." Is there robust evidence for this? For collective goals, yes. However, even collective goals will require many diverse individual actions to sum up to significant action; universal monolithic action (which this sentence implies) is not the goal. Suggested re-write: "Effective mitigation requires a large number of individual mitigation efforts that together sum up to a significant collective action." [Government of United States of America]
SPM A-779	SPM	19	25			SPM 3.1	Please cite not only partly but the full sentence from SYR P 82 L 48-49: "Climate change has the characteristics of a collective action problem at the global scale, because most greenhouse gases (GHGs) accumulate over time and mix globally, and emissions by any agent (e.g., individual, community, company, country) affect other agents." This pinpoints the problem of a common good more precisely. [Government of Germany]
SPM A-780	SPM	19	26	19	27	SPM 3.1	The phrase "collective response" cannot be found in the WG3 text and could have a different meaning than the agreed upon text on p. 5, para 2 of the WG3 SPM. Therefore, we suggest the sentence be re-worded to read: "... but only through INTERNATIONAL COOPERATION. The WG3 SPM then goes on to cite Sections 1.2.4, 2.6.4, 3.2, 4.2, 13.2, and 13.3 [Government of United States of America]
SPM A-781	SPM	19	29			SPM 3.2	Section 3.2: This section does not provide information on economic losses associated with climate change, while some information is available in WGII SPM (page 19). The WGII SPM also provides useful caveats to include such information, explaining that the data depends on hypotheses and is incomplete. If such information is not provided here, it may give the impression that either the losses due to climate change are completely unknown, or that they are negligible as compared to costs from mitigation, which are mentioned several times in the SYR. Please ensure a good balance between the treatment of the costs from climate change impacts and those from mitigation, with appropriate caveats. [Government of Belgium]
SPM A-782	SPM	19	29			SPM 3.2	This section 3.2 is about Climate change risks reduced by mitigation and adaptation, but the emphasis is only in mitigation. It is important to rephrase this title as follows: CLIMATE CHANGE RISKS REDUCED BY MITIGATION AND ADAPTATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT. In this section is important to introduce the discussion about "decoupling economic growth from emission of green house gases". As it stands, mitigation is an end by itself and is not related to sustainable development and poverty eradication which are the overriding priorities of developing countries parties, including the consideration of human rights of peoples and those of indigenous peoples' rights. [Government of Bolivia]

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SPM A-783	SPM	19	31	19	31	Headline 3.2	SPM readers may not understand what constitutes "additional mitigation" (i.e., this is mitigation in addition to what?). Consider clarifying if possible. [Government of Canada]
SPM A-784	SPM	19	31	19	32	Headline 3.2	Important statement but could be clearer e.g. "Projections show that adaptation alone will not be sufficient to..." [Government of Ireland]
SPM A-785	SPM	19	31	19	33	Headline 3.2	This sentence suggest that without additional mitigation, there would be "risks of impacts" by the end of the century. Wouldn't it be more appropriate to write "risks and impacts", or just "impacts", as the level of climate change that would be reached would result into actual impacts by the end of the century or before, not just "risks" ? [Government of Belgium]
SPM A-786	SPM	19	31	19	35	Headline 3.2	Please address risks of mitigation systematically in Section 3.4 and refrain from fragmented references throughout the different Sections such as the present Section 3.2. To this end, the second sentence of the present headline statement should be moved to Section 3.4. Please join this sentence with the para on P 30 L 21-25 (see our comment on these lines) and move it to Section 3.4. [Government of Germany]
SPM A-787	SPM	19	31	19	35	Headline 3.2	"It is important to highlight in the headlines what BAU looks like in terms of emissions and impacts. Text on the risks from mitigation needs to be carefully balanced to reflect the context for these risks, the fact that there are benefits too and that they are of a different scale to the risks from climate change. Replace existing text with: Without additional mitigation, and even with adaptation, warming by the end of the 21st century is more likely than not to exceed 4C leading to a high to very high risk of severe, widespread, and irreversible impacts globally. The risks of warming of 4C and above include substantial species extinction, global and regional food insecurity and consequential constraints on common human activities. Mitigation and adaptation can significantly reduce these risks, but do so over different timescales. Stringent mitigation can reduce costs for achieving air quality and energy security objectives, with significant co-benefits for human health but also involves its own set of challenges associated with large scale changes in energy systems and land use. These co-benefits and challenges are not on the same scale as the risks from climate change itself.{3.2, 3.4} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-788	SPM	19	31	19	35	Headline 3.2	The text in the box is not complete. It is suggested to add at the end: "Moreover, mitigation brings substantial co-benefits. [European Union]
SPM A-789	SPM	19	32	19	32	Headline 3.2	It is awkward to give a range of levels of risk, particularly since the levels result from expert judgment (i.e., they are not quantified). Suggest simply replacing "high to very high" with "high". [Government of Canada]
SPM A-790	SPM	19	33	19	33	Headline 3.2	Write:"Well designed measures reduce the risks of mitigation, and their impact involve less severe, widespread, and irreversible impacts as risks from climate change, increasing the benefits from near-term mitigation action." [Government of Switzerland]
SPM A-791	SPM	19	33	19	33	Headline 3.2	After "Risks from" insert "some" and after "mitigation", insert "options" [Government of Ireland]
SPM A-792	SPM	19	33	19	33	Headline 3.2	The current wording conveys the message that mitigation includes risks what is somehow misleading. A clearer wording might be: Despite strong efforts in mitigation risks of climate change can still be substantial, but they do not [Government of Austria]
SPM A-793	SPM	19	33	19	33	Headline 3.2	The passage "despite a growing number of climate change mitigation policies." Is out of place here and only brings confusion unless qualified or explained. Suggest deleting it here and discuss policy in the appropriate section, or linke more closely to lines 25-28 in the same paragraph. [Government of Sweden]
SPM A-794	SPM	19	33	19	33	Headline 3.2	How "substantial" is defined here? Wouldn't the size of the risk from mitigation be dependent on the type of action taken? It's difficult to say "can" in this case. "may" is more accurate. [European Union]
SPM A-795	SPM	19	33	19	34	Headline 3.2	The key message is that the risks of not carrying out sufficient mitigation are much higher than those that arise from doing so. There is a also a clearer statement in the underlying text which would improve communication.

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							[Government of Ireland]
SPM A-796	SPM	19	33	19	35	Headline 3.2	The second sentence in this headline box is awkwardly worded and would benefit from rephrasing. Clarity is needed to differentiate between the risks associated with policy changes implemented to reduce GHG emissions and the risks associated with the impacts of climate changes. [Government of Canada]
SPM A-797	SPM	19	33	19	35	Headline 3.2	Firstly, please, delete "Risks from mitigation can be substantial" and replace it with "Stringent mitigation involves its own set of risks," Secondly, add a full stop after "climate change". Then the last sentence could start "This increases the benefits..." [Government of Finland]
SPM A-798	SPM	19	33	19	35	Headline 3.2	This box presents risks from mitigation at the same level as risks from climate change impacts. This does not appear consistent with the WGIII report, which presents risks from mitigation in a different way, see for example WGIII SPM page 18: "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy". This is a very different message. Please delete the current sentence on risks from mitigation and if needed, replace it with something fully consistent with the WGIII report. [Government of Belgium]
SPM A-799	SPM	19	33	19	35	Headline 3.2	While the draft goes "Risks from mitigation can be substantial (...)", the "Risks" should be defined in SPM. Furthermore, the body of this SYR refers to the risk of adaptation in addition to the risk of mitigation. Also, descriptions in SPM are not really summarizing the body part of SYR so that such description should be quoted from SYR, and we would like to propose a change as follows: "Risks from adaptation and mitigation can be substantial, but they can be deployed much more quickly in response to observed consequences and costs than climate change risks which may persist for millennia and can create lower irreversibility risks" [Government of Japan]
SPM A-800	SPM	19	33	19	35	Headline 3.2	"Risks from mitigation can be substantial, but they do not involve the same possibility of severe, widespread, and irreversible impacts as risks from climate change ..." This depends on the mitigation actions considered, some of them imply risks of extremely severe impacts and must be evaluated with precaution and responsibility. "Risks from mitigation can be substantial, but they do not involve the same possibility of severe, widespread, and irreversible impacts as risks from climate change ..." This depends on the mitigation actions considered, some of them imply risks of extremely severe impacts and must be evaluated with precaution and responsibility. [Government of Venezuela]
SPM A-801	SPM	19	33	19	35	Headline 3.2	3.2_ bold point. The last part of this sentence is not so clear, but it is a very important and policyrelevant message. Please consider to rephrase, or write the subsentence "increasing the benefit..." as a separate sentence. [Government of Norway]
SPM A-802	SPM	19	33	19	36	Headline 3.2	The bold text in lines 33 to 36 is misleading, especially the sentence that states that "Risks from mitigation can be substantial, but..." This can be rephrased as " Though there may be some risks involved with undertaking large-scale mitigation, these risks are do not involve the same severe, widespread, and irreversible impacts as risks from climate change, increasing the benefits from near-term mitigation action." [Government of United States of America]
SPM A-803	SPM	19	33			Headline 3.2	The focus on risks of mitigation seems to be unbalanced. Please change into "Risks from mitigation increase with delayed action and could become substantial, ..." [Government of Germany]
SPM A-804	SPM	19	34	19	35	Headline 3.2	The last part of sentence is not characteristic for the text below, but rather for text presented in paragraph 3.3 (p21). Suggest to remove ", increasing the benefits from near-term mitigation action" [Government of Sweden]
SPM A-805	SPM	19	34	19	35	Headline 3.2	Ending phrase "increasing the benefits from near-term mitigation action" is not clear in the context of this sentence. Requires editing for clarification. [Government of United States of America]
SPM A-806	SPM	19	35			Headline 3.2	Please add a sentence on adaptation consistent with the title of this Section (can reduce risks but prospects decrease with increasing climate change). [Government of Germany]
SPM A-807	SPM	19	37	19	37	SPM 3.2	It is suggested to insert "climate change" before "risks" because mitigation (and adaptation) both include also risks, e.g. economic risks for companies trading in fossil fuels. [Government of Austria]

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SPM A-808	SPM	19	37	19	38	SPM 3.2	Again, this sentence incorrectly implies that mitigation and adaptation are equal options to respond to climate change. Please modify. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
SPM A-809	SPM	19	37	19	38	SPM 3.2	The limits to adaptation need to be acknowledged here. It is proposed to add at the end of the paragraph: "However there are limits to adaptation". [European Union]
SPM A-810	SPM	19	37	19	41	SPM 3.2	This is an almost exact repeat of the bold boxed language in lines 3-6. Consider deletion or revision. [Government of United States of America]
SPM A-811	SPM	19	39	19	41	SPM 3.2	Reword sentence starting with "Benefits from adaptation...". The current wording is too difficult. [Government of Sweden]
SPM A-812	SPM	19	43	19	43	SPM 3.2	Write:"Reasons For Concern". [Government of Switzerland]
SPM A-813	SPM	19	43	19	44	SPM 3.2	Need for clarity on the implications of aggregation of five RFCs, language requires improvement. [Government of India]
SPM A-814	SPM	19	43	19	47	SPM 3.2	Recommend avoiding acronyms where they are not really common. Suggest not using RFC for Reasons for Concern. [Government of Canada]
SPM A-815	SPM	19	43	19	47	SPM 3.2	The short-hand descriptors for the five reasons for concern are problematic as they do not constitute a coherent list. Some are systems/sectors, some climate variables/events. In particular 'distribution of impacts' is not clear. If there is not sufficient space to describe these categories in more detail, we strongly recommend that at a minimum, the "Risks to" and "Risks associated with" language be used as in WGII Figure 19-4 (i.e. Risks to unique and threatened species, and risks associated with the other four categories). [Government of Canada]
SPM A-816	SPM	19	43	19	47	SPM 3.2	Please include information on how key risks have been identified by WG2 as such information is essential for SYR's readers: "Identification of key risks was based on expert judgement using the following specific criteria: large magnitude, high probability, or irreversibility of impacts; timing of impacts; persistent vulnerability or exposure contributing to risks; or limited potential to reduce risks through adaptation or mitigation." (Information taken from WG2 SPM.) [Government of Germany]
SPM A-817	SPM	19	43	19	47	SPM 3.2	It's not clear that mentioning the Reasons For Concern in the SPM is useful to policy makers. If they are going to be included, there needs to be more background information on what they are and represent, as is provided in the main body of the SYR. It is also not clear why mentioned in 3.2 given the title of this section. [European Union]
SPM A-818	SPM	19	43	20	8	SPM 3.2 + Box SPM.1	It is not appropriate to use an acronym for "reasons for concern". This should be spelled out in all places where it is used. [Government of Ireland]
SPM A-819	SPM	19	43			SPM 3.2	Please make clear the RFCs are defined by the IPCC: "The five 'Reasons for Concern' (RFCs), as identified by the IPCC, aggregate..." [Government of Germany]
SPM A-820	SPM	19	44	19	45	SPM 3.2	Write:"d regions: (1) Unique and...". [Government of Switzerland]
SPM A-821	SPM	19	45	19	45	SPM 3.2	No need for "." before "(4)". [Government of Japan]
SPM A-822	SPM	19	46	19	47	SPM 3.2	Suggest changing "the RFCs play a role in..." to "the RFCs are DESCRIBED in...". The wording "play a role in" does not make sense here. [Government of Canada]
SPM A-823	SPM	19	47	19	47	SPM 3.2	Words 'which refers to dangerous vanthropogenic interference with the climate system' may added added in the end of the paragraph i.e. after ' Article 2 of UNFCCC' [Government of India]

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SPM A-824	SPM	19	49	20	4	Box SPM.1	The Convention itself has operationalised article to by adopting an aspirational goal of limiting average global temperature increase to 2°C. We think it would be useful to add this to the box and elaborate on what the implications are in terms of GHG-concentrations, cummulative emissions, consistent emission pathways, residual impacts and associated adaptation needs. [Government of Netherlands]
SPM A-825	SPM	19	49	20	4	Box SPM.1	We would like to add information on the comparison of mitigation and adaptation costs in the 2 degree box. We suggest: "An important concern is determining the balance between spending on adaptation versus that on other investments – mitigation and non-climate endeavors. However, these numbers cannot be directly compared. The most recent global adaptation cost estimates suggest a range from \$70 billion to \$100 billion per year globally by 2050, (but there is little confidence in these numbers). The estimated costs of mitigation in an idealized scenario are loss of consumption of 2%-6% in 2050 relative to consumption in the baseline. Adaptation cannot reasonably overcome all climate change effects and there will always be residual damages (Parry et al 2009), and many of the cost of climate change and adaptation poses challenges for measurement and certainly for monetization, leaving the variables unsuited for direct comparison. {WGII 17.2, WGIII 3.5, WGIII 6.3.6}" [Government of Netherlands]
SPM A-826	SPM	19	51	20	4	Box SPM.1	The authors should make this text consistent with the approved text from Assessment Box SPM.1 of the approved WG2 SPM. Specifically, delete lines 53-56 and replace with: "Human influence on the climate system is clear. Yet determining whether such influence constitutes "dangerous anthropogenic interference" in the words of Article 2 of the UNFCCC involves both risk assessment and value judgments. This report assesses risks across contexts and through time, providing a basis for judgments about the level of climate change at which risks become dangerous." [Government of United States of America]
SPM A-827	SPM	19	54	19	55	Box SPM.1	Recommend deleting "a basis for" from this sentence and replacing it with "scientific information to consider in". The revised sentence would read "The AR5 provides scientific information to consider in such a judgement by..." [Government of Canada]
SPM A-828	SPM	19	54			Box SPM.1	Change "would involve" to "involves". [Government of Canada]
SPM A-829	SPM	19	55	19	55	Box SPM.1	Write:"...basis for such judgements by ...". [Government of Switzerland]
SPM A-830	SPM	19	56	20	4	Box SPM.1	This message needs to be carefully formulated to ensure that it is not interpreted as a value judgment being made by the IPCC. Recommend deleting the first part of the sentence on line 56 that says "Because climate change is expected to disproportionately affect poor populations", and revising the remaining sentence as follows: "Conditions which might be considered dangerous anthropogenic interference are not affecting and will not affect all communities and locations at the same time or in the same way." Recommend deleting the last sentence of this box (lines 3-4) to limit this short background box to factual statements. [Government of Canada]
SPM A-831	SPM	19	56	20	4	Box SPM.1	This statement presents a subjective view and does not seem to be rooted in the underlying report. The reason for poor populations to be disproportionately high affected is primary their larger vulnerability as shown by WG2. However, due to the fact that these populations are often strongly concerned for their basic needs (they "face other pressing development goals", see WG3 Ch2, ES), the awareness and judgement of the danger due to climate change might be of secondary importance. Please use information on the perception of risk levels from Chapter 2 of WG3. [Government of Germany]
SPM A-832	SPM	19		19		SPM 3	We propose to rename the title in Topic 3 to read " Mitigation and Adaptation strategy" to be consistent and harmonized with the contents [Government of United Republic of Tanzania]
SPM A-833	SPM	19		21		SPM 3.2	This section needs to contain text on the co-benefits of mitigation action on climate change such as improvements in air quality and energy security - this is important information for policy makers [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-834	SPM	19				SPM 3	Section 3 - Transformations and Changes in Systems is not mentioning at all the linkage with the sustainable development agenda, the issue of eventual co-benefits, tradeoffs, and more generally opportunities within wider development plans (cf. section 3.5 in Topic 3). Sustainable development is important in the long term because it is a

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							key factor influencing not only emissions but also vulnerability. It is a key cross-cutting issue that needs to be properly spelled out in the SPM (see also comment on section 1 on the need for more balanced approach in the introduction and development of the various issues within each Topic). [Government of Switzerland]
SPM A-835	SPM	20	2	20	2	Box SPM.1	Add "as such" or "as dangerous" to sentence to read "before these are experienced as such [OR as dangerous] in other parts of the globe." both here and in the same sentence in the Art. 2 Box on p. 125. [Government of Switzerland]
SPM A-836	SPM	20	2	20	4	Box SPM.1	This text suggests that vulnerability and poverty is geographically distributed alone? This may need to be revisited [Government of Ireland]
SPM A-837	SPM	20	3	20	4	Box SPM.1	BOX SPM.1. The part "Depending on value judgments (...)" is not included in WG1,2 and 3 reports, thus this should be deleted. [Government of Japan]
SPM A-838	SPM	20	4	20	4	Box SPM.1	Box SPM.1 - As the text itself states, determining a level of climate change as dangerous involves value judgements which are outside the mandate of the IPCC. It is therefore not appropriate to link current impacts to the term dangerous and an alternative word such as significant should be used [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-839	SPM	20	6	20	6	SPM 3.2	"... century will lead to high to very high risk of severe impacts ..." - This wording confusing can easily be misunderstood. Is it a "high" or a "very high" risk or should it be "from high to very high"? The same is stated in 3.2 and should be clarified. Suggest rephrasing to "... century will result in risks ranging from high to very high..." [Government of Sweden]
SPM A-840	SPM	20	6	20	8	SPM 3.2	This first sentence is phrased exactly as in the header. Suggest it could be deleted since it is repetitious. Some of the information could be worked in to the next sentence. Suggest rewriting sentence 2 (starting on line 7) to say "For three of the five Reasons for Concern high to very high risks will occur even at the low end of projected warming in baseline scenarios." [Government of Canada]
SPM A-841	SPM	20	6	20	13	SPM 3.2	The reasons for concern diagram (burning embers) assumes some average level of future global socioeconomic development. WG II chapter 19 pointed out that the risks could be greater or less for the same level of temperature change under alternative plausible socioeconomic scenarios. Moreover, the rates of future climate change will also affect the risk of impact, and these are not shown in this figure either. These represent large uncertainties that are not represented here. This is in contrast to the great efforts made to represent uncertainties in climate projections. I think some explanation is required to clarify these important caveats. [Government of Finland]
SPM A-842	SPM	20	6	20	13	SPM 3.2	Regarding the risk of the climate change, only the extinction risks of "Unique and threatened system" etc has been described and the coverage of the "risks" seems to be narrow. Economic risks also should be argued as written in WG2 SPM, e.g. "Global economic impacts from climate change are difficult to estimate" [Government of Japan]
SPM A-843	SPM	20	6	20	13	SPM 3.2	KEY CONCERN: This paragraph highlights the crucial SYR figure SPM.10 however the paragraph's text mischaracterizes the substantial risks below 4°C, suggesting by omission that impacts only become severe at 4°C, and only baseline scenarios lead to high risks the RFCs. REWORD: "Without additional mitigation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread, and irreversible impacts globally (high confidence). High risks for three of the five RFCs will occur for all classes of mitigation scenarios except the lowest classes; those with warming by 2100 projected below 2°C (Figure SPM.10.A and B). Risks for unique and threatened systems as well as climate-change-related risks from extreme events become high already at temperature levels above 1.5°C. Projected warming in baseline scenarios is more likely than not to exceed 4°C by 2100, surpassing the temperature at which risk becomes high or very high for every RFC. Risks associated with temperatures at or above 4°C above pre-industrial levels include substantial species extinction, global and regional food insecurity, consequential constraints on common human activities, and limited potential for adaptation in some cases (high confidence). {2.3, Figure 2.5, 3.2, 3.4, Box 2.4, Box Art.2}"

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							REASONING: This is an essential and rich figure that maximizes the benefit of a SYR, as opposed to just the three WGs, however the paragraph's text mischaracterizes the substantial risks below 4°C, suggesting by omission that impacts only become severe at 4°C, and only baseline scenarios lead to high risks the RFCs. Instead, it is clear from fig SPM.10 that (1) weak mitigation scenarios (panel B) are characterized by >2.5°C warming and lead to high risks for 3 out of 5 RFCs. In addition, it is clear from the WG2 TS that risks for unique and threatened systems as well as climate-change related extreme events become high already at a warming above 1.5°C relativ to pre-industrial. This is extremely policy relevant. [Government of Saint Lucia]
SPM A-844	SPM	20	6	20	13	SPM 3.2	REWORD: "Without additional mitigation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread, and irreversible impacts globally (high confidence). High risks for three of the five RFCs will occur for all classes of mitigation scenarios except the lowest classes; those with warming by 2100 projected below 2°C (Figure SPM.10.A and B). Risks for unique and threatened systems as well as climate-change-related risks from extreme events become high already at temperature levels above 1.5°C. Projected warming in baseline scenarios is more likely than not to exceed 4°C by 2100, surpassing the temperature at which risk becomes high or very high for every RFC. Risks associated with temperatures at or above 4°C above pre-industrial levels include substantial species extinction, global and regional food insecurity, consequential constraints on common human activities, and limited potential for adaptation in some cases (high confidence). {2.3, Figure 2.5, 3.2, 3.4, Box 2.4, Box Art.2}" [Government of Saint Lucia]
SPM A-845	SPM	20	6	20	13	SPM 3.2	REASONING FOR PROPOSED REWORDING: SPM.10 is an essential and rich figure that maximizes the benefit of a SYR, as opposed to just the three WGs, however the paragraph's text mischaracterizes the substantial risks below 4°C, suggesting by omission that impacts only become severe at 4°C, and only baseline scenarios lead to high risks the RFCs. Instead, it is clear from fig SPM.10 that (1) weak mitigation scenarios (panel B) are characterized by >2.5°C warming and lead to high risks for 3 out of 5 RFCs. In addition, it is clear from the WG2 TS that risks for unique and threatened systems as well as climate-change related extreme events become high already at a warming above 1.5°C relativ to pre-industrial. This is extremely policy relevant. \ [Government of Saint Lucia]
SPM A-846	SPM	20	7	20	7	SPM 3.2	Is the confidence assessment for lines 7-8 the same as that for the previous sentence? If not, suggest clarifying. [Government of Canada]
SPM A-847	SPM	20	7	20	8	SPM 3.2	Sentence starting "these risks" should be made clearer e.g. what is the low end of projected warming? [Government of Ireland]
SPM A-848	SPM	20	9	20	9	SPM 3.2	Suggest explaining 'baseline' as not all readers may know what this is. Add in brackets what is meant by a baseline scenario (i.e. 'business as usual', 'current legislation' or "without additional mitigation"). [Government of Canada]
SPM A-849	SPM	20	9	20	9	SPM 3.2	The "baseline scenarios" should be clearly defined, preferably early on in this section of the SPM (the informaiton seems to be in footnote 2 of the Table SPM.1, which seems to be too "hidden". [Government of Sweden]
SPM A-850	SPM	20	9	20	10	SPM 3.2	It is suggested to move the words "above pre-industrial levels" from line 11 to line 10 so that the 4 degrees C are qualified the first time this value is mentioned because this helps the reader's understanding. [Government of Austria]
SPM A-851	SPM	20	10	20	10	SPM 3.2	Write: "...or very high for every RFC.". [Government of Switzerland]
SPM A-852	SPM	20	10	20	13	SPM 3.2	We appreciate and support that information regarding risks if global temperature increases above 4 degrees. [Government of Norway]
SPM A-853	SPM	20	12			SPM 3.2	Suggest replacing "consequential constraints on common human activities" - a phrase already used on p.18 that is not well-understood - with a more simple reference to health risks. [Government of Canada]

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SPM A-854	SPM	20	15	20	16	SPM 3.2	While the first part of this first sentence is fine, the second part is very awkward/confusing and the same point is made (about the importance of emission reductions in the coming decades) in the next sentence anyway. Suggest deleting the second part (i.e. ending the sentence after CO2). [Government of Canada]
SPM A-855	SPM	20	15	20	19	SPM 3.2	Please use for Figure SPM.10 the explanation that is later used in the SYR's main part: "Maintaining climate change risks below a threshold (Panel A) requires keeping cumulative emissions below a certain level (Panel B), which means that global net emissions eventually must decrease to zero (Panel C)." See P 84, L 21-23. [Government of Germany]
SPM A-856	SPM	20	15	20	19	SPM 3.2	The explanation related to figure SPM.10 needs improvement and clarification. In this paragraph, the reference to panel B and C does not appear consistent with the text : the reduction of emission in the next decades is mainly explained in panel C (not B as written), while the fact that all studied scenarios imply some residual damages appears more linked to panel A and B (while C is referred to). [Government of Belgium]
SPM A-857	SPM	20	15	20	19	SPM 3.2	This paragraph starts with a statement regarding cumulative emissions of CO2 and then talks about all greenhouse gases. Perhaps it would be better to separate these statements or provide more information earlier on the emissions reductions of other GHGs. There is also some repetition especially lines 16 and 17. [European Union]
SPM A-858	SPM	20	16	20	16	SPM 3.2	Suggest "emissions and emission reductions", rather than "emissions reductions". [Government of Sweden]
SPM A-859	SPM	20	16	20	18	SPM 3.2	The sentence about residual impacts only takes into account mitigation. It does not include adaptation or non-climate related actions, like good governance, good land use planning and resource management, etc., which can reduce the risk of unavoidable residual damage. [Government of United States of America]
SPM A-860	SPM	20	16	20	18	SPM 3.2	KEY CONCERN "Substantial cuts in greenhouse gas emissions over the next few decades can significantly reduce risks of climate change in the second half of the 21st century" This is highly inconsistent with WG1 and SYR figure SPM.6 that shows climate projections for RCP2.6 are clearly diverging from RCP8.5 already by the 2020s, including the RATE of change that is crucial for adaptation and risks. Even a slow component like sea-level rise is clearly diverging before 2050. CHANGE TO: "Substantial cuts in greenhouse gas emissions over the next few decades can significantly reduce risks of climate change" [Government of Saint Lucia]
SPM A-861	SPM	20	16	20	19	SPM 3.2	Request replacement of "SPM.10.C" to "SPM.10.A-C" as "SPM.10.C" alone does not represent assessment of risks to derive conclusions on risk reduction and residual climate damages. [Government of Japan]
SPM A-862	SPM	20	16	20	19	SPM 3.2	The sentence "Substantial near-term emissions reductions can reduce risks in the 21st century and beyond" should be replaced with the corresponding part in WG2 SPM: "Adaptation and mitigation choices in the near term will affect the risks of climate change throughout the 21st century (high confidence)". If this sentence is about cost increase issues limited to mitigation, this should be replaced with "Delaying additional mitigation further increases mitigation costs in the medium- to long-term" as written in WG3 SPM. Or, if this is about energy demand, this should be replaced with "Near-term reductions in energy demand are an important element of cost-effective mitigation strategies" as written in WG3 SPM. [Government of Japan]
SPM A-863	SPM	20	17	20	18	SPM 3.2	This can be shorter e.g. "some residual risks are unavoidable" [Government of Ireland]
SPM A-864	SPM	20	18	20	18	SPM 3.2	The sentence: "... but some risks from residual climate damages ..." is not clear. [Government of Switzerland]
SPM A-865	SPM	20	18	20	19	SPM 3.2	Suggest the figure reference be placed elsewhere in the paragraph, as Figure SPM.10.C does not indicate anything about residual damages. It would also be useful to define "residual climate damages", as this may not be understood by readers. [Government of Canada]

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SPM A-866	SPM	20	21	20	21	SPM 3.2	Write:"In the absence of complementary and well designed policies, stringent mitigation may involve its own set of risks.". [Government of Switzerland]
SPM A-867	SPM	20	21	20	21	SPM 3.2	"Stringent mitigation...risks." This statement is not elaborated. What is stringent mitigation,in what context and what are the risks? Perhaps delete first sentence of paragraph and keep rest which is a statement of the reality rather than highlight as a singular statement. [Government of Ireland]
SPM A-868	SPM	20	21	20	21	SPM 3.2	The first sentence of this paragraph appears inconsistent with the following ones, and inconsistent with the treatment of side-effects and co-benefits from mitigation in the WGIII SPM (page 18: "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy"). Please ensure full consistency with the SPM of WGIII, with a treatment of risks that takes the various effects of mitigation into account. [Government of Belgium]
SPM A-869	SPM	20	21	20	21	SPM 3.2	For better understanding of policy makers, the following sentence from the line 28-30 in page 84 of the body text should be added: " Stringent mitigation involves its own set of risks. Scenarios that are likely to limit warming to below 2 °C or even 3 °C involve large-scale changes in energy systems and potentially land-use over the coming decades (3.4)." [Government of Japan]
SPM A-870	SPM	20	21	20	21	SPM 3.2	Much more context and balance needs to be provided for the phrase ' Stringent mitigation involves its own set of risk', this includes recognition of the co-benefits from mitigation. To distinguish between these and the much larger risks from climate change itself, it would be better to use the word 'challenge'. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-871	SPM	20	21	20	21	SPM 3.2	Delete this reference to mitigation risks or explain what they are (and how they can be avoided). [Government of Sweden]
SPM A-872	SPM	20	21	20	21	SPM 3.2	1st sentence: need to elaborate further on those risks, so to give some meaning; currently the sentence is somewhat isolated. [European Union]
SPM A-873	SPM	20	21	20	22	SPM 3.2	It is not clear how inertia in the economic system increases the benefits from near-term mitigation efforts. Indeed, inertia in the economic system may be a barrier to near-term mitigation efforts. Consider deleting reference to the economic system or clarifying. [Government of Canada]
SPM A-874	SPM	20	21	20	25	SPM 3.2	It is hard to know how to read the 2nd and 3rd sentences in the context of the first, since they do not seem to amplify the risks associated with "stringent" mitigation. The risks being referred to in this paragraph are not clear. Also, the SPM should not assume that readers would understand what constitutes "stringent mitigation" - suggest explaining further. [Government of Canada]
SPM A-875	SPM	20	21	20	25	SPM 3.2	"Stringent mitigation involves its own set of risks" needs to be expanded upon. This paragraph is confusing - is the focus on mitigation costs? [Government of United States of America]
SPM A-876	SPM	20	21	20	26	SPM 3.2	Please address risks of mitigation systematically in Section 3.4 that addresses mitigation pathways and refrain from fragmented references throughout the different Sections such as the present Section 3.2 . Please move this para to Section 3.4. In addition, the sentence "Stringent mitigation involves its own risks." is not a balanced statement as it stands, because such risks depend mainly on timing of mitigation. (Risks of mitigation are relatively low if such stringent action started immediately.) Furthermore, the risks of climate change are very different in nature from those of mitigation., see SYR P 83 L 44-51. These aspects should be added in order to put the statement in context. [Government of Germany]
SPM A-877	SPM	20	22	20	24	SPM 3.2	Suggest replacing "increase" with "are projected to increase" in these sentences. [Government of Canada]

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SPM A-878	SPM	20	23	20	24	SPM 3.2	Delete 'or constraints on technological options', since technology is only one of the constraints. [Government of India]
SPM A-879	SPM	20	23	20	25	SPM 3.2	Repetition of the word risks makes it loose its meaning. The sentence can be ended after "costs and risks" [Government of Ireland]
SPM A-880	SPM	20	23	20	25	SPM 3.2	The description regarding cost should be written as written in WG3 SPM. "Delaying additional mitigation further increases mitigation costs in the medium- to long-term" [Government of Japan]
SPM A-881	SPM	20	23	20	25	SPM 3.2	"Delays in..." This sentence isn't very clear. [European Union]
SPM A-882	SPM	20	24	20	24	SPM 3.2	The wording on the latter half of this sentence is not clear (the use of "risks" twice is what is confusing). Please rephrase [Government of United States of America]
SPM A-883	SPM	20	24	20	25	SPM 3.2	The following part of the sentence is difficult to understand and we would suggest to rephrase it: "...risks to hold climate change risks at a given level" [Government of Denmark]
SPM A-884	SPM	20	24	20	25	SPM 3.2	"...risks to hold climate change risks at a given level" sounds awkward, clunky and unclear. Consider splitting into two sentences in order to increase clarity. [Government of Sweden]
SPM A-885	SPM	20	25	20	25	SPM 3.2	Table SPM.2 is referred to before Table SPM.1; maybe it would be worth re-numbering/re-ordering. Include in the references Box 3.4. [Government of Switzerland]
SPM A-886	SPM	20	26	20	26	Figure SPM.10	Figure SPM.10: Panel B is presented in a larger and more readable form on page 12 (SPM 5). It can be omitted here and, thereby, save space. [Government of United States of America]
SPM A-887	SPM	20	26	20	27	Figure SPM.10	Figure SPM.10: The synthesis of information about the risks of climate change resulting from temperature increase, which result from cumulative emissions, which in turn are associated with certain emission reduction targets is highly appreciated. We have some suggestions for further improvements for panel B and C: - Please increase the figures and fonts as they are too small to read. - It is a good idea to shift the x-axis by 1900 Gt CO2 between panels B and C, but please explain in the caption. - The title of panel C is misleading as emission changes are important at any time, not only "by 2050 and 2100", please modify. Add e.g. the information "by 2050 and 2100" to the y-axis label instead. [Government of Germany]
SPM A-888	SPM	20	26	20	28	Figure SPM.10	This sequence of graphics is still very confusing and not easy to understand even after reading the descriptive text. Suggest deleting or seriously reworking how to communicate the open circles in a different graphical way. [Government of United States of America]
SPM A-889	SPM	20	26	20	33	Figure SPM.10	Comment on Fig SPM.10: We suggest the label on the y-axis of panel C be changed to "Change in ANNUAL CO2-equivalent emissions..." (This is explained deep within the caption, but it would also be useful to see it on the figure itself). [Government of New Zealand]
SPM A-890	SPM	20	27	20	27	Figure SPM.10	The logical transition from panel (a) to (b) is very weak. As a result, the authors should separate the "burning embers" panel of Fig. SPM.10 into its own distinct figure. The transition from panel (b) to (c) is useful and logical and should, therefore be retained. For space considerations, it could be sufficient to just retain panel (c) in Figure SPM.10 and make reference back to Fig SPM.5 panel (b). [Government of United States of America]
SPM A-891	SPM	20	27	20	27	Figure SPM.10	Fig SPM.10: There is a lot of detail in this figure - specifically panels (b) and (c). The authors should, therefore, take care to explain clearly in the caption. It's not clear why the 530-580ppm bubble to 2100 in panel (c) requires a higher emissions reduction than either the 430-480ppm or 480-530ppm scenarios. This should be explained in the caption or the results should be re-analyzed to ensure they are, indeed, correct. Also, why does the size of the bubble increase so much from the 480-530ppm to the 530-580ppm scenario? [Government of United States of America]
SPM A-892	SPM	20	27			Figure SPM.10	Fig SPM.10: This figure is quite confusing. Suggest the authors consider whether it may be too ambitious to try to show so much information in a single multi-paneled Figure. Panels b and c are natural companions based on the same set of scenarios. Suggest these be kept together and the Reasons for Concern Figure be considered alone.

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
							[Government of Canada]
SPM A-893	SPM	20	28	20	33	Figure SPM.10	Figure SPM.10 (c): Use the same scale for the Cumulative CO2 emissions after 2010 (GtCO2) as in Figure SPM.10 (b), i.e. till 8000 GtCO2. [Government of Switzerland]
SPM A-894	SPM	20	28	21	9	Figure SPM.10	Figure caption SPM.10: Please consider to include text that describes the observed temperature increase from the 1850-1900 period to 2003-2012 period since this level is explicitly marked on the white thermometer in Panel (A). [Government of Norway]
SPM A-895	SPM	20	28	21	9	Figure SPM.10	Figure SPM.10 (b) and (c) are, above all, ineffective in presentation and blur. (b) is a replica of Figure SPM.5 (b).. These two figures are not treated in SPM of WGII and WGIII; therefore, it is doubtful whether these figures are worth to be in the SPM of SYR. [Government of Republic of Korea]
SPM A-896	SPM	20	32	20	32	Figure SPM.10	Nowhere in the SPM are the criteria for "key risks" discussed here enumerated. The authors should make reference to them here in the SPM as a footnote, or at least point the reader to where more can be read about "key risks". [Government of United States of America]
SPM A-897	SPM	20		20		Figure SPM.10	Figure SPM.10.It is suggested to improve the links among the elements of the figure, and to assure the consistency among them (are the temperature scale of panel A and B equal?; one is referred to 1850-1900 and the other to 1861-1880). It is suggested to illustrate how to "read" this figure with a storyline. [Government of Spain]
SPM A-898	SPM	20		20		Figure SPM.10	Figure SPM.10, present version has too much information. Please, consider deleting panel C which needs a lot of interpretation to be understood. Concerning Panel B, it seems to fit well here, maybe even better than in Figure SPM.5. There is no need to duplicate the figure. [Government of Finland]
SPM A-899	SPM	20		20		Figure SPM.10	Figure SPM.10 is hard to read especially panels B and C. Panel A i very important in understanding the reasons for concern, the figure ought to be kept in backgroundbox SPM.1, Panels B and C relate to mitigation and could be put in a separte figure. [Government of Denmark]
SPM A-900	SPM	20		20		Figure SPM.10	Graph "C" in Figure SPM.10 is quite small and confusing - the other two graphs in the figure seem more intuitive. Can "C" be explained more clearly? [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-901	SPM	20		20		Figure SPM.10	Fig. SPM.10: Excellent combination of panels across WG reports. Synthetic! Consider to increase the size in order to make it easier to read. [Government of Sweden]
SPM A-902	SPM	20		20		Figure SPM.10	Combining these three figures into one makes it difficult to read and understand for someone not steeped in IPCC. In particular, component B and now C are not easily understood. For a Summary for Policy Makers, Figure (A) might be sufficient. Also, some of the reasons for concern are not entirely dependent on anthropogenic climate change (eg. extreme weather events) so it is untrue that these all depend on cumulative GHG emissions. [Government of United States of America]
SPM A-903	SPM	20				Figure SPM.10	Figure SPM.10: This is an important figure. However, its size should be increased to a full page and graphical improvements to make it easier to read would be welcome. The grid lines that shows the links between the panels should be made more visible (in addition, double arrows between each panel and the next may perhaps help showing the links in a visual way). Panel (C) is an interesting presentation of the WGIII numbers, we appreciate the effort and the integrative nature of the whole figure SPM.10. [Government of Belgium]
SPM A-904	SPM	20				Figure SPM.10	Figure SPM.10. Replace "zero net carbon emissions", a horizontal label in Figure SPM.10 panel (C), with "zero net GHG emissions", because Y-axis shows associated change in annual GHG emissions as written in pg SYR21, line 3-4.. [Government of Japan]
SPM A-905	SPM	20				Figure SPM.10	Figure SPM.10. It would be better to align x-axis between panel (B) and panel (C) to show their relation clearly. [Government of Japan]
SPM A-906	SPM	20				Figure SPM.10	Figure SPM.10. For better understanding of Figure SPM 10, we would like to propose additional explanation as follows. - Regarding (c), the difference between the emissions in 2050 and 2100 are hard to be recognized, so these colors

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							should be changed so as to be comprehensible. Also, if possible, the figure should be made bigger. - Regarding figures (b) and (c), ellipses have been added in the figure (b) from the First Order Draft. Would like to request that the description of the validity of its area and if confidence of the temperature in its area is uniform or not, etc. should be added. Specifically, the description "The ellipses indicate the approximate distribution of samples, and the distribution of samples is not uniform inside the area." [Government of Japan]
SPM A-907	SPM	20				Figure SPM.10	Figure SPM.10: There is a lot of information included in these three panels and quite difficult to read panel B and C. Consider making panel A the main focus of the figure by putting this on top of panels B and C and also making panels B and C larger by putting them next to each other directly underneath panel A. Panel B is also a repetition of Figure SPM.5. Also, Panel A and B should be linkable with a common temperature reference. Now you use "relative to 1850-1900" in figure A and "relative to 1861-1880" in figure B. [Government of Norway]
SPM A-908	SPM	20				Figure SPM.10	Figure SPM.10(C): This figure contains important information but is far too complicated for an SPM. Please find an alternative way of presenting this information. [European Union]
SPM A-909	SPM	21	1	21	1	Figure SPM.10	The "mitigation scenarios" should be clearly defined, preferably early on in this section of the SPM. [Government of Sweden]
SPM A-910	SPM	21	1	21	2	Figure SPM.10	Mitigation efforts have to be taken by developed countries may also be included [Government of India]
SPM A-911	SPM	21	2	21	2	Figure SPM.10	Please check the number of the cited figure. It should be "Figure 2.3". [Government of Germany]
SPM A-912	SPM	21	2			Figure SPM.10	The figure being referred to here is Figure 2.3 in the current draft of the SYR (not Figure 2.2) - please make this correction. [Government of Canada]
SPM A-913	SPM	21	10	21	35	SPM 3.3	The discussion of adaptation pathways does not do justice to the WGII report findings. It is way too vague and incoherent; the most important issues are probably the limits to adaptation (see fig SPM7), the costs of adaptation and the problem how to design robust adaptation strategies if you do not know the local climate changes in the future. We think the statement should express that for larger temperature rises an ever larger share of impacts cannot be adapted to. A statement on the costs of adaptation is merited here. We suggest to add the unchanged Figure SPM-7 here. See also WGII SPM p.19 where it reads: "Global economic impacts from climate change are difficult to estimate. Economic impact estimates completed over the past 20 years vary in their coverage of subsets of economic sectors and depend on a large number of assumptions, many of which are disputable, and many estimates do not account for catastrophic changes, tipping points, and many other factors. With these recognized limitations, the incomplete estimates of global annual economic losses for additional temperature increases of ~2°C are between 0.2 and 2.0% of income (±1 standard deviation around the mean) (medium evidence, medium agreement). Losses are more likely than not to be greater, rather than smaller, than this range (limited evidence, high agreement). Additionally, there are large differences between and within countries. Losses accelerate with greater warming (limited evidence, high agreement), but few quantitative estimates have been completed for additional warming around 3°C or above. Estimates of the incremental economic impact of emitting carbon dioxide lie between a few dollars and several hundreds of dollars per tonne of carbon (robust evidence, medium agreement). Estimates vary strongly with the assumed damage function and discount rate." [Government of Netherlands]
SPM A-914	SPM	21	11	21	11	SPM 3.3	This section would better placed after the section on mitigation pathways. This would improve the narrative. The title of this section could be shortened to: Adaptation pathways [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-915	SPM	21	11	21	11	SPM 3.3	It seems appropriate to re-title this section, "Characteristics, risks and BENEFITS of adaptation pathways" as the section goes on to note how enhancing adaptation can advance other goals (e.g., sustainable development). [Government of United States of America]

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SPM A-916	SPM	21	11	21	36	SPM 3.3	When compared to the April 2014 version of the Synthesis Report and its Summary for Policy Makers, the August 2014 version significantly downplays the important connection between climate response (adaptation and mitigation) and sustainable development. Given that sustainable development is a critical, and often higher priority, commitment for many countries, it seems inappropriate to lose that essential linkage in the Synthesis Report and especially in its Summary for Policy Makers. [Government of United States of America]
SPM A-917	SPM	21	11	21	36	SPM 3.3	Chapter 3.3 is highly abstract and demanding for policy makers. It does not really show "pathways". We miss some reference to different adaptation pathways and options linked to different levels of warming. Reference to transformation and transformational changes, incremental changes etc. are hard to digest without further background. What do they mean? Some clarification text could be added (e.g. transformational adaptation can include introduction of new technologies or practices, formation of new financial structures or systems of governance, adaptation at greater scales or magnitudes, and shifts in the location of activities). Same for maladaptation, a term not usually known by policy makers. [European Union]
SPM A-918	SPM	21	11	21	36	SPM 3.3	The text in the main report is better: Overemphasising short-term outcomes, or failing to sufficiently anticipate consequences, can increase the vulnerability or exposure of the target group or the vulnerability of other people, places or sectors (medium evidence, high agreement). [European Union]
SPM A-919	SPM	21	11	21	36	SPM 3.3	Very important (and understandable) statements from the SYR could be added on decision-making processes and capacity building: - Integration of adaptation into planning and decision making can promote synergies with development and disaster risk reduction. - Adaptation planning and implementation at all levels of governance are contingent on societal values, objectives, and risk perceptions (high confidence). Recognition of diverse interests, circumstances, social- cultural contexts, and expectations can benefit decision-making processes. - Building adaptive capacity is crucial for effective selection and implementation of adaptation options (high agreement, robust evidence). Successful adaptation requires identifying adaptation options and assessing their costs and benefits, but also increasing the adaptive capacity of human and natural systems (high agreement, medium evidence). This can involve complex governance challenges and new institutions and institutional arrangements. [European Union]
SPM A-920	SPM	21	11	26	27	SPM 3.3	Please reverse the order of Section 3.3 and 3.4: According to the AR5 the first option to meet climate change is mitigation. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
SPM A-921	SPM	21	11			SPM 3.3	Please limit the title of Section 3.3 to "Characteristics of adaptation pathways" as the term "characteristics" already includes risks. If risks are mentioned, co-benefits need to be mentioned as well for reasons of balance. [Government of Germany]
SPM A-922	SPM	21	11			SPM 3.3	Section 3.3 of characteristics and risks of adaptation pathways is very poor and does not reflect the content of the summary of WGII on adaptation. There is the need for a more balanced summary of WG III on mitigation and WG II on adaptation, and particularly the section referred to B) FUTURE RISKS AND OPPORTUNITIES FOR ADAPTATION. [Government of Bolivia]
SPM A-923	SPM	21	12	21	15	Headline 3.3	We would like to propose to quote from page 28 of WG2 SPM as follows: Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits. [Government of Japan]
SPM A-924	SPM	21	13	21	16	Headline 3.3	Replace existing text with: Adaptation measures can help manage the risks of climate change impacts at a local level, but there are limits to its effectiveness, particularly if greenhouse gas emissions are not reduced. A longer-term perspective allows more immediate adaptation actions to be building blocks for future adaptations, increasing future options and preparedness. {3.3} [Government of United Kingdom of Great Britain & Northern Ireland]

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SPM A-925	SPM	21	13	21	16	Headline 3.3	As this Headline Text and supporting paragraphs read now, they minimize the importance of adaptation. Recommend re-visiting. This section could be stronger even without being policy prescriptive, consider taking additional information from Topic 3.3. [Government of United States of America]
SPM A-926	SPM	21	14	21	14	Headline 3.3	Write:"A long-term persepective in the framework of sustainable development allows more ...": [Government of Switzerland]
SPM A-927	SPM	21	14	21	16	Headline 3.3	Suggest deleting the phrase "A longer term perspective allows more" as it adds confusion and no significant value. The remaining sentence could state "Immediate adaptation actions can be building blocks for future adaptation, increasing future options and preparedness." [Government of Canada]
SPM A-928	SPM	21	14	21	16	Headline 3.3	It is noted that the sentence "A longer-term perspective allows more immediate adaptation actions to be building blocks for future adaptations, increasing future options and preparedness" does not convey very well the rich information included in the three paragraphs below. An alternative wording might be: A longer-term perspective in decision making results in near-term adaptation actions that would be coherent with transformative adaptation later on. [Government of Austria]
SPM A-929	SPM	21	18	21	18	SPM 3.3	Words 'with no single approach for reducing risks appropraite across all setting' may be added after the words 'context-specific' [Government of India]
SPM A-930	SPM	21	18	21	21	SPM 3.3	It is suggested to increase the description on adaptation, that is, to add "Integration of adaptation into planning and decision-making can promote synergies with development and reduce the possibility of maladaptive actions (robust evidence, high agreement)" (taken from the last paragraph in bold, page 31, C-1, Technical Summery, WGII) before the last sentence (A first...) of this paragraph. [Government of China]
SPM A-931	SPM	21	19	21	21	SPM 3.3	Consider changing final word of the sentence from "variability" to "risks" (consistent with risk management theme). [Government of Canada]
SPM A-932	SPM	21	19	21	21	SPM 3.3	"A first step..." This sentence, as written, appears to be at odds with the rest of the discussion in section 3.3. The sentence should include the additional text about taking a longer term perspective as outline in the Boxed text. First steps should seek to avoid maladaptation or lock-in to measures which are not sustainable in the longer term, as elaborated in the following paragraph. [Government of Ireland]
SPM A-933	SPM	21	19	21	21	SPM 3.3	Consider pulling out these 2 high confidence statements for the bold box. They are more useful to policy-makers. [Government of United States of America]
SPM A-934	SPM	21	23	21	23	SPM 3.3	Suggest deleting the phrase 'there are limits to adaptation;' The subsequent sentences in this paragraph do not provide context for such a statement. The affirmative, present tense phrase leads the reader to conclude that there is a large body of evidence supporting the claim that there are limits to adaptation. This is simply not the case, which is why there is no underlying text to support such a standalone statement. [Government of United States of America]
SPM A-935	SPM	21	23	21	24	SPM 3.3	Suggest adding a sentence to provide context after the sentence beginning with 'greater rates and magnitude.' The sentence 'Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits' was agreed to at the WG2 approval session in Yokohama ONLY IF the following sentence was added as a means of describing the complexity of the term 'adaptation limits': Limits to adaptation occur when adaptive actions to avoid intolerable risk for an actor's objectives or for the needs of a system are not possible or are not currently available. This additional text needs to be added to make the paragraph acceptable. [Government of United States of America]
SPM A-936	SPM	21	24	21	24	SPM 3.3	Words 'medium confidence' may be added in bracket after the word 'maladaptation' [Government of India]
SPM A-937	SPM	21	24	21	24	SPM 3.3	Word 'increasing' may be replaced by 'increase which can' [Government of India]

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SPM A-938	SPM	21	24	21	24	SPM 3.3	The statement 'exceeding adaptation limits' is open for interpretation - adaptation limits are probably highly contextual. It would be useful if the report gave an IPCC definition for this notion. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-939	SPM	21	26	21	26	SPM 3.3	"...increasing the vulnerability or exposure..." Compared to what? Today? Perfect adaptation? [Government of United States of America]
SPM A-940	SPM	21	30	21	30	SPM 3.3	Words 'in climate resilient pathways' may added after the word 'sustainable development' [Government of India]
SPM A-941	SPM	21	30	21	30	SPM 3.3	Write:"Economic, social, technological, and political transformations can enhance adaptation and promote sustainable development (high confidence)". [Government of Switzerland]
SPM A-942	SPM	21	30	21	30	SPM 3.3	Write:"Considering transformational change, beyond incremental changes to existing systems and structures, may decrease costs and losses, and avoid missing opportunities.". [Government of Switzerland]
SPM A-943	SPM	21	30	21	36	SPM 3.3	This paragraph is very vague and confusing. It seems to say that current arrangements don't (or won't) do the job, but offers no insight into what the world should transform to, which therefore leaves the nature of the transformation open to the imagination of the reader. Suggest the authors review for policy-relevance and consider breaking up the paragraph further to make it more readable. [Government of Canada]
SPM A-944	SPM	21	30	21	36	SPM 3.3	The paragraph sound too complicated for policy makers. One sentence mentioning transformation may be sufficient [Government of Italy]
SPM A-945	SPM	21	30	21	36	SPM 3.3	There is nothing mentioned here about the value of mainstreaming adaptation/resilience into broader development planning in order to minimize risk. This was a fairly central theme of the WG2 report. [Government of United States of America]
SPM A-946	SPM	21	30			SPM 3.3	his might be adversely used in the UNFCCC negotiations by introducing conditionality in adaptation support, including with regard to governance systems. Delete on the basis that adaptation is context specific as underlined above. [Government of Saudi Arabia]
SPM A-947	SPM	21	31	21	33	SPM 3.3	This statement needs a confidence level as written. [Government of United States of America]
SPM A-948	SPM	21	36			SPM 3.3	Please add from SYR P 87 L 32-34: "Building adaptive capacity is crucial for effective selection and implementation of adaptation options (high agreement, robust evidence)." [Government of Germany]
SPM A-949	SPM	21	38	21	38	SPM 3.4	It would be better to write:" ... challenges of mitigation pathways". [Government of Switzerland]
SPM A-950	SPM	21	38	21	38	SPM 3.4	This section would better placed before the section on adaptation pathways. This would improve the narrative. The title of this section could be shortened to: Mitigation pathways [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-951	SPM	21	38	21	38	SPM 3.4	It seems appropriate to re-title this section, "Characteristics, risks and BENEFITS of mitigation pathways" as the section goes on to note how enhancing mitigation can advance other goals (e.g., sustainable development). [Government of United States of America]
SPM A-952	SPM	21	38	21	38	SPM 3.4	KEY CONCERN: The word "risk" is undefined here and does not appear in mitigation context in the rest of this section, therefore seems irrelevant. While "risk" in a WGII context is defined in the underlying WGII report, this is not the case for WGIII. The word "risk" can therefore not be used in the title of this section and must be deleted. Only if well-defined, supported by evidence, substantiated in the text of the subsequent text, and used in balance (e.g. risks of both near-term and long-term mitigation; risks of both relatively high and low mitigation efforts, risks of particular technologies - CDR, nuclear etc.) can this be introduced SUGGESTION delete "and risks": "3.4 Characteristics of mitigation pathways" [Government of Saint Lucia]

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SPM A-953	SPM	21	38	21	40	SPM 3.4	Greater clarification in this section about the technological readiness of existing measures would be helpful. Does saying 'measures exist' mean that the technologies are available and ready to be deployed on a large scale? [Government of Canada]
SPM A-954	SPM	21	38	26	27	SPM 3.4	This is a key section with information very relevant to policy makers. Clear information on: <ul style="list-style-type: none"> • The expected global temperature in 2100 without additional mitigation • What emissions need to do to have a likely chance of reaching 2C and how this compared to current • The scale of the challenge • The risks of delay and the likely co-benefits Should be provided and not hidden in supporting text and diagrams The section is currently quite long and would better be split into two sections; the first on where we need to be to reach 2C and the second on where we currently are. The headline statements below could then reflect this new split [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-955	SPM	21	38			SPM 3.4	Section 3.4: There is a lot of information in this section, supporting only a single headline box. This seems somewhat unbalanced across the SPM. Suggest this authors consider whether all of this information is essential to the key message. [Government of Canada]
SPM A-956	SPM	21	38			SPM 3.4	Please limit the title of Section 3.4. to "Characteristics of mitigation pathways" as the term "characteristics" already implies risks. If risks are mentioned, co-benefits need to be mentioned as well for reasons of balance. In the text, please expand on the co-benefits. In terms of risks, you might add risks of stranded assets for investments in fossil fuel infrastructure. [Government of Germany]
SPM A-957	SPM	21	39	21	41	Headline 3.4	This is a very important finding, however, its stement could be shorter in various forms e.g. Limiting the likey temperture increase (perferred wording to warming) to less than 2C is achievable but entails substantial GHG emissions reductions during the next two decades". Also "limiting the likely temperature increase to below 3C (not clear why 2.5 is introduced) involves similar challanges but over the next 2-3 decades" (if the number of decades is correct?) [Government of Ireland]
SPM A-958	SPM	21	39	21	42	Headline 3.4	As for the sentence "Measures exist to achieve the substantial emissions reductions over the next few decades necessary to limit likely warming to 2°C", WG3 SPM states otherwise, which is to say, "The availability and scale of these and other Carbon Dioxide Removal (CDR) technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks". In addition, what are meant by "similar challenges" in the 2nd sentence in the box is unclear. Therefore, we would like to propose to combine the sentences in the box as written below: Measures to achieve the substantial emissions reductions over the next few decades necessary to limit likely warming to 2 °C exist with substantial technological, economic, social, and institutional challenges, which increase with delays in additional mitigation and technology constraints. Limiting warming to 2.5°C or 3°C involves similar challenges, but less quickly. [Government of Japan]
SPM A-959	SPM	21	39	21	43	Headline 3.4	The highlighted paragraph mentions the goals of limiting temperature increase by climate change to 2C or to 2,8-3C. It should refer to 2 or 1,5 as considered in the UNFCCC negotiations. Why include the additional 2,8-3 goal? [Government of Venezuela]
SPM A-960	SPM	21	39	21	43	Headline 3.4	The highlighted paragraph mentions the goals of limiting temperature increase by climate change to 2C or to 2,8-3C. It should refer to 2 or 1,5 as considered in the UNFCCC negotiations. Why include the additional 2,8-3 goal?. [Government of Bolivia]
SPM A-961	SPM	21	40	21	40	Headline 3.4	Referring to "Measures exist to achieve": replace with "Cost-effective pathways exist for achieving". [European Union]
SPM A-962	SPM	21	40	21	41	Headline 3.4	Please alter "to limit likely warming to 2 °C" into "to limit warming to below 2 °C with a likely chance" in order to avoid confusion. What would "likely (66% to 100%) warming" exactly look like? Does the original wording mean that the 66%-100% range is below 2°C? [Government of Germany]

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SPM A-963	SPM	21	40	21	41	Headline 3.4	Recommend that opening line elevate a few key summary statistics - signature (oft-cited) climate and energy system characteristics of stringent scenarios; in particular, consider linking "2 degrees C" to a 450 ppm CO2e limit (per I. 52, p. 21) and at least 80% supply decarbonization below 2010 levels (Fig. SPM.11, p. 22), within this century. [Government of United States of America]
SPM A-964	SPM	21	40	21	41	Headline 3.4	UNCLEAR/INACCURATE: "Measures exist to achieve the substantial emissions reductions over the next few decades necessary to limit likely warming to 2 °C". Should read "Measures exist to achieve the substantial emissions reductions over the next few decades necessary to limit likely warming below 2 °C above pre-industrial." [Government of Saint Lucia]
SPM A-965	SPM	21	40	21	44	Headline 3.4	The references to "measures" and "challenges" in this paragraph is a little confusing and difficult to reconcile. Suggest clarifying and also explaining what will happen "less quickly" (e.g., overcoming challenges? implementing measures?). [Government of Canada]
SPM A-966	SPM	21	40	21	44	Headline 3.4	The text in the box would need some changes to make it clear: the word "exist" is not clear because it does not indicate if these measures are already implemented or are potential measures only know from a theoretical point of view. The use of the word "likely" in this context is not appropriate. The words "such reductions" in the last sentence are unclear because there is no indication if they refer to limits of 2, 2.5 or 3 degrees. And should the order of the second and third sentences be reversed? [Government of Switzerland]
SPM A-967	SPM	21	40	21	44	Headline 3.4	Replace existing text with: To have a likely chance of keeping temperature change below 2 °C global GHG emissions in 2050 need to be 40 % to 70 % lower than in 2010, and emissions levels near zero or below in 2100. Measures exist to achieve the substantial emissions reductions over the next few decades necessary to limit likely warming to 2 °C, however many such scenarios necessitate the widespread deployment of Carbon Dioxide Removal (CDR) technologies and methods, the availability and scale of which are uncertain. Implementing the emission reductions necessary to limit likely warming to 2C will require a reversal of current emission trends and poses substantial technological, economic, social, and institutional challenges of a scale not seen globally before. Delaying mitigation efforts or constraining the use of certain technologies increases these challenges and the costs of mitigation. Existing emission pledges for 2020 (Cancún Pledges) are not consistent with cost effective long-term mitigation trajectories that are at least as likely as not to limit temperature change to 2 °C. They do not preclude the option to meet that goal but would require substantial increases in mitigation ambition beyond 2020. {3.4} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-968	SPM	21	41	21	42	Headline 3.4	Please consider to delete the following sentence: "Limiting warming to 2.5 or 3 involves similar challenges, but less quickly.". We do not see the rationale for including this sentence. In our understanding the global community is committed to limit global warming to 2 degrees Celsius or less. [Government of Norway]
SPM A-969	SPM	21	41	21	42	Headline 3.4	The authors should be more quantitative here. Rather than saying that limiting warming to 2.5-3C involves similar changes, but less quickly - be specific: "Limiting warming to 2.5-3C involves similar changes, but delayed by XX to YY years." [Government of United States of America]
SPM A-970	SPM	21	41	21	42	Headline 3.4	Referring to "Limiting warming to 2.5 °C or 3 °C involves similar challenges, but less quickly": the term "less quickly" does not make much sense. We propose to re-phrase using a simpler message: "The earlier the action, the most cost-effective it will be. Delayed actions lead to lower probability to meet the 2 °C target." [European Union]
SPM A-971	SPM	21	41	21	43	Headline 3.4	For clarity, end sentence after challenges. Then "These increase with etc.." [Government of Ireland]
SPM A-972	SPM	21	42	21	43	Headline 3.4	Social and institutional challenges are not discussed in the text in this paragraph. Suggestion: remove these the words "social" and "institutional" in the sentence. Alternatively, add a paragraph in the text that explains the link also to these challenges. [Government of Sweden]
SPM A-973	SPM	21	43	21	43	Headline 3.4	To enhance the clarity for not-native readers it is suggested to insert "with" before "technology constraints". [Government of Austria]

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SPM A-974	SPM	21	45	21	46	SPM 3.4	This statement could be misconstrued i.e. economic growth is not intrinsically bound to emissions growth. A shorter statement such as "In the absence of effective additional mitigation measures global GHG emissions are expected to continue to grow." [Government of Ireland]
SPM A-975	SPM	21	46	21	46	SPM 3.4	Change 'is expected to' to 'will' - this is something that is not in doubt [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-976	SPM	21	46	21	49	SPM 3.4	It is confusing statement. Needs clarity. Too many values for temperature rise in future. Confusing with earlier values [Government of India]
SPM A-977	SPM	21	46	21	49	SPM 3.4	Again an important statement but could be shortened e.g. "In the baseline/business as usual scenarios where effective additional mitigation does not take place the global median temperature is projected to increase by 3.7 to 4.8C above pre-industrial temperatures. The full range of temperature projections for this scenario is from 2.5-7.8C. [Government of Ireland]
SPM A-978	SPM	21	46	21	49	SPM 3.4	Please, specify the time period considered. [Government of Russian Federation]
SPM A-979	SPM	21	46	21	49	SPM 3.4	Are these changes for 2100 ? There is also some repetition. It may be better to have all the surface temperature increase estimations in one place in the report. [European Union]
SPM A-980	SPM	21	46	21	50	SPM 3.4	The statement does not reveal the year for which the projections are made. Shouldn't it say "in 2100"? [Government of Germany]
SPM A-981	SPM	21	46	21	50	SPM 3.4	In order to avoid confusion regarding the temperature increase under business as usual scenarios, it would be extremely helpful to explain the difference between the values indicated here and the values indicated on P 13, L 23, 24. It is essential for the AR5 to clearly communicate the projected temperature increase for baseline scenarios by the end of this century related to the pre-industrial level - and to give only one range. Currently, it is unclear which one is the relevant range. [Government of Germany]
SPM A-982	SPM	21	47	21	47	SPM 3.4	We suggest a date should be given (e.g. end of the 21st Century?) for these temperature increases under baseline scenarios - since we don't think the baseline scenarios stabilize greenhouse gas concentrations - at least within the next few centuries. [Government of New Zealand]
SPM A-983	SPM	21	47	21	47	SPM 3.4	The phrase 'economic growth' is suggested to be reworded as 'economic activities' to be consistent with the description on page 8 of WGIII SPM. [Government of China]
SPM A-984	SPM	21	47	21	48	SPM 3.4	The definition of "baseline scenarios" should be moved to the first mentioning of this expression, i.e. P 11 L 45. [Government of Germany]
SPM A-985	SPM	21	47	21	48	SPM 3.4	The Report, including the rest of the SYR, consistently identifies business-as-usual scenarios as "baseline scenarios" - not "baseline anthropogenic scenarios". For clarity and consistency in designating non-mitigation scenarios, suggest deleting "anthropogenic". [Government of United States of America]
SPM A-986	SPM	21	47	21	49	SPM 3.4	Overall, this sentence is too technical for the SYR SPM. What does "including climate uncertainty" mean? Is this a reference to results from different climate models? Suggest rewriting in simpler words along the lines of "Projected global mean surface temperature increases in baseline scenarios - those without additional efforts to mitigate climate change - are from about 3.7 to 4.8degC above the average temperature for 1850-1900 when estimated using a single best estimate of the transient climate system response to changes in emissions. This range widens to 2.5 to 7.8degC when accounting for uncertainty in the transient climate response to changing emissions. [Government of Canada]
SPM A-987	SPM	21	47	21	49	SPM 3.4	The following is a key point and should be included in the box in bold - as it was in the SPM of the April version of the SYR: "Global mean surface temperature increases in baseline anthropogenic scenarios - those without additional mitigation - are from about 3.7 to 4.8 degrees C ..." (but probably using the shorter formulation that was used in the April version. i.e.: "Baseline scenarios, those without additional mitigation, result in global mean surface temperature increases in 2100 from 3.7 to 4.8 degrees C compared to...") [Government of Denmark]

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SPM A-988	SPM	21	47	21	50	SPM 3.4	it is not stated by when these increases in temperature will occur i.e by 2100? [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-989	SPM	21	48	21	48	SPM 3.4	Editorial: delete the second of the two "C"s [Government of Switzerland]
SPM A-990	SPM	21	48	21	48	SPM 3.4	Delete unnecessary "C" just after "°C". [Government of Japan]
SPM A-991	SPM	21	48	21	49	SPM 3.4	Repetition of " C" on line 48 and double mentioning of "oC" on line 49. [Government of Sweden]
SPM A-992	SPM	21	48			SPM 3.4	"4.8°C" should be replaced with "4.8 °C". [Government of Turkey]
SPM A-993	SPM	21	49	21	49	SPM 3.4	The "climate uncertainty" should be explained, or reworded for easier understanding. [Government of Sweden]
SPM A-994	SPM	21	49			SPM 3.4	Please explain "climate uncertainty" and "median transient climate response" by footnote. [Government of Germany]
SPM A-995	SPM	21	51	21	51	SPM 3.4	Temperature increase would be clearer than temperature change [Government of Ireland]
SPM A-996	SPM	21	52	21	52	SPM 3.4	Editorial: the text has CO2 eq, whereas the rest of occurrences in the body of the text spell out equivalent; check for consistency throughout. [Government of Switzerland]
SPM A-997	SPM	21	52	21	53	SPM 3.4	In order to provide better information to policy makers, other knowledge should also be described in addition to the Table 3.1 (WG3 Table SPM.1) as a reference. Specifically, the description from SYR-88 Line 13-16 should be added as follows; "(...) over the century. Scenarios reaching concentration levels of about 500 ppm CO2eq by 2100 are more likely than not to limit temperature change to less than 2 °C, unless concentration levels temporarily exceed roughly 530 ppm CO2eq before 2100. In this case, temperature is about as likely as not to remain below 2 °C." [Government of Japan]
SPM A-998	SPM	21	52	21	53	SPM 3.4	The authors should insert a footnote at the end of this sentence clarifying what current atmospheric concentrations of CO2-eq are (with appropriate uncertainty). [Government of United States of America]
SPM A-999	SPM	21	52	21	56	SPM 3.4	We would like to see the following key point from the WGIII and the SYR page 88 included in the text again as it was in the April version of the SPM and that it be highlighted in bold: "Scenarios reaching 450 ppm by 2100 (these scenarios are likely to maintain temperature change at below 2 degrees C) involve a 40% to 70% reduction in GHG emissions by 2050. [Government of Denmark]
SPM A-1000	SPM	21	53	21	53	SPM 3.4	Be precise as to which century is being discussed. Therefore, insert "21st" before "century" (twice). [Government of Canada]
SPM A-1001	SPM	21	53	21	54	SPM 3.4	Regarding 'large scale changes in energy systems', suggest elaborating here to indicate what kind of changes, e.g., the scale up of non- and low-emitting forms of energy. [Government of Canada]
SPM A-1002	SPM	21	53	21	54	SPM 3.4	Limiting temperature increase to higher levels? Such as [Government of Ireland]
SPM A-1003	SPM	21	53	21	54	SPM 3.4	The paragraph contains very useful information about mitigation options for policy makers. Thus we would like to propose to include all the options which characterize the 450ppm scenarios in the WG3 SPM. Specifically, the wording "(...) by mid-century through more rapid improvements of energy efficiency, a tripling to nearly a quadrupling of the share of zero- and low-carbon energy supply from renewables, nuclear energy and fossil energy with carbon dioxide capture and storage (CCS), or bioenergy with CCS (BECCS), and possibly land use." should be included in

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							the SYR as well. [Government of Japan]
SPM A-1004	SPM	21	53	21	54	SPM 3.4	"requires" should be replaced with the wording such as "characterized by" (e.g., WG3 SPM Page.10 paragraph.2) as this part is explanation of assumptions which mitigation scenarios are based on. [Government of Japan]
SPM A-1005	SPM	21	53	21	54	SPM 3.4	This text does not properly convey the scales of the challenge of meeting 2C and the unprecedented global changes in energy systems required [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1006	SPM	21	53	21	54	SPM 3.4	It seems unnecessary - and possibly even incorrect - to include the word "possibly" in front of "land use" here. Consider deleting. [Government of United States of America]
SPM A-1007	SPM	21	54	21	55	SPM 3.4	The sentence "Limiting temperature ..." is misleading. It is proposed to change it along the lines : "Delaying mitigation will make the 2°C target difficult to achieve and may lead to higher warming". [European Union]
SPM A-1008	SPM	21	54			SPM 3.4	In order to be of greatest use for policy makers, this section should include the highly statements by WG III characterizing mitigation pathways below 2 °C. Please include the following statements (from SPM WG III, Section 4.2.1, slightly modified): "Global CO2 emissions from the energy supply sector are projected to decline over the next decades and are characterized by reductions of 90% or more below 2010 levels between 2040 and 2070." "These scenarios involve a 40% to 70% reduction in GHG emissions by 2050, relative to 2010 levels, and emissions near zero GtCO2eq or below in 2100. These scenarios include more rapid improvements in energy efficiency and a tripling to nearly a quadrupling of the share of zero- and low-carbon energy supply from renewable energy, nuclear energy and fossil energy with carbon dioxide capture and storage (CCS), or bioenergy with CCS (BECCS) by the year 2050." [Government of Germany]
SPM A-1009	SPM	21	55	21	56	SPM 3.4	Regarding the reference to 1.5°C in the description of "Limiting temperature (...)", to show particular example of less than 2.0°C to be 1.5°C is not valid, because WG3 SPM paragraph 1 of page 17 (bold section) says " Only a limited number of studies have explored scenarios that are more likely than not to bring temperature change back to below 1.5 °C by 2100 relative to pre-industrial levels." From the viewpoint of consistency with WG3 SPM, the description "such as 1.5°C" should be deleted. Or, the description above "Only a limited..." should be added if 1.5°C is to be mentioned. [Government of Japan]
SPM A-1010	SPM	21	55	21	56	SPM 3.4	KEY CONCERN: The characterization of 1.5°C scenarios is of very limited use and needs to be improved as does the description of what is needed for the 2°C scenarios. The draft SYR SPM lacks specificity about what is required for 2°C scenarios: SUGGEST: Add details from WGIII on what is needed eg - WGIII SPM notes very policy relevant information that 2°C scenarios are "characterized by lower global GHG emissions in 2050 than in 2010, 40 % to 70 % lower globally, and emissions levels near zero GtCO2eq or below in 2100." - WGIII SPM notes on 1.5°C scenarios: "In these scenarios, the cumulative CO2 emissions range between 655 and 815 GtCO2 for the period 2011 – 2050 and between 90 and 350 GtCO2 for the period 2011 – 2100. Global CO2eq emissions in 2050 are between 70 and 95 % below 2010 emissions, and they are between 110 and 120 % below 2010 emissions in 2100."

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							- WGIII work shows that both 2°C and 1.5°C seem characterized by distinctive phase-out of emissions. [Government of Saint Lucia]
SPM A-1011	SPM	21	55	21	56	SPM 3.4	KEY CONCERN: Co-benefits of low-emission scenarios have very high policy relevance a, as support for and implementation of low-carbon development plans would be helped by these. This is omitted in the SYR, and section 4.5 lacks quantitative indications. SUGGESTION include additional headline text from WGIII SPM: "Mitigation scenarios reaching about 450 or 500 ppm CO ₂ eq by 2100 show reduced costs for achieving air quality and energy security objectives, with significant co-benefits for human health, ecosystem impacts, and sufficiency of resources and resilience of the energy system; these scenarios did not quantify other co-benefits or adverse side-effects (medium confidence)" [Government of Saint Lucia]
SPM A-1012	SPM	21	55			SPM 3.4	Suggest changing 'include' to 'requires' (i.e. "...higher levels requires similar changes, but less quickly". [Government of Canada]
SPM A-1013	SPM	21		26		SPM 3.3	The key points on co-benefits from mitigation should be included in this section again as they were in the April version of the SYR. They are essential in understanding the incentives for climate action. The following formulation from the April version should be included again and put in bold as this is a key conclusion in the WGIII AR5: "Mitigation scenarios reaching about 450 or 500ppm CO ₂ eq by 2100 show reduced costs for achieving air quality and energy security objectives, with significant co-benefits for human health, eco-system impacts, and sufficiency of resources and resilience of the energy system;" [Government of Denmark]
SPM A-1014	SPM	21				SPM 3.3	No mention about mitigation as adaptation co-benefit in the beginning of the section [Government of India]
SPM A-1015	SPM	22	0	22	4	Figure SPM.11	Figure SPM.11: This figure is very important but quite difficult for communication to a non-expert audience. Please consider further simplification. [Government of Germany]
SPM A-1016	SPM	22	1	22	4	Figure SPM.11	Figure 11 a) is repeated and is the same as SPM 5 a), and hence can be deleted. part b) of the figure 11 as well as Table SPM 1 are mentioning similar things, therefore it might be useful to retain only one of the two. [Government of United States of America]
SPM A-1017	SPM	22	2	22	2	Figure SPM.11	The "baseline and mitigation scenarios" should be identified and explained up front in the section. [Government of Sweden]
SPM A-1018	SPM	22		23		Figure SPM.11	It is suggested to enhance the coherence between figure SPM.11 and Table SPM.1 by using the same concentration ranges (e.g. 430 to 480 ppm; 480-530; 530-580 and 580 - 720. [Government of Austria]
SPM A-1019	SPM	22		23		Figure SPM.11	Table SPM.1: There is the question whether or not to include scenarios where emissions for 2010 do not match with the actual emissions to some extent. It might be helpful to include a footnote showing that authors considered that issue. [Government of Austria]
SPM A-1020	SPM	22		23		Figure SPM.11	Table SPM.1: It is suggested to explain that it has not been possible to estimate probabilities for the various scenarios considered. This means: all have the same probability to become reality. The reason being: it depends on decisions of decision makers, from the individuals to CEOs of companies to governments and parliaments which will be the actual emission pathway. There are no technical or economical barriers that would exclude the scenarios included in the assessment. [Government of Austria]
SPM A-1021	SPM	22				Figure SPM.11	Figure SPM.11 I would add also the upscaling requirement for 2030 (the percentage). Also, it is not very clear to me why the min for 430-480 of 2030 is lower than 2010. Does it mean that, possibly, we do not need to up-scale low-carbon energy supply before 2030? My opinion is that the figure's message is misleading, I would suggest to revise accordingly. [Government of Italy]

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SPM A-1022	SPM	22				Figure SPM.11	Figure SPM.11: We suggest the following editorial improvement, to improve the readability of the lower panel: move the legend associated with each CO ₂ eq category to the corresponding sub-panel (split the existing left legend) [Government of Belgium]
SPM A-1023	SPM	23	3	23	3	Table SPM.1	Check footnotes to the table, some seems to be misplaced. Cf. WGIII Table SPM.1. [Government of Sweden]
SPM A-1024	SPM	23	3	23	4	Table SPM.1	Table SPM1 contains useful information but is too complex for a SPM. I requires a lot of prior knowledge to understand and you have to questions the appropriateness of including a table that requires over half a page of footnotes. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1025	SPM	23	4	23	4	Table SPM.1	Table SPM.1: There are several issues with the footnotes associated with this table: (a) Footnote (6) should be associated with the first column (CO ₂ eq Concentrations in 2100) and fourth column (Change in CO ₂ eq emissions compared to 2010); (b) Footnote (7) is misplaced at the top of the right-most heading; and (c) Footnote (9) appears in the table for concentrations ranging from 530-650ppm, but the footnote text relates only to 580-650ppm, so the footnote in the table should be moved to a more appropriate box. [Government of United States of America]
SPM A-1026	SPM	23	5	23	41	Table SPM.1	This is a huge amount of space devoted to footnotes that also appear on p. 89. Perhaps the caption could instruct the reader to go to Table 3.1 for the footnotes in order to save space in the SPM. [Government of Canada]
SPM A-1027	SPM	23	5	23	41	Table SPM.1	Footnotes are too lengthy. We suggest making them more concise. [Government of Japan]
SPM A-1028	SPM	23	7	23	7	Table SPM.1	750–1000 ppm may be wrong, supposed to be 720–1000 ppm, as indicted in the second from the bottom cell of the left end column for “CO ₂ eq Concentrations in 2100” in Table SPM.1. [Government of Japan]
SPM A-1029	SPM	23	7	23	7	Table SPM.1	According to the table it should state “... 720-1000 ppm...”. [Government of Sweden]
SPM A-1030	SPM	23	12	23	13	Table SPM.1	Please insure that the 30% value is consistent with the calculation based on numbers in figure SPM2 [Government of Ireland]
SPM A-1031	SPM	23	17	23	17	Table SPM.1	Editorial: “for” instead of “For”. [Government of Austria]
SPM A-1032	SPM	23	38	23	41	Table SPM.1	It seems strange that the overshoot scenario for 580-650 (logically the one referred to as “the former” in line 40) is “unlikely” to exceed 2 degrees, while the 580-650 scenario with no overshoot (logically the one referred to as “the latter” in line 39) is only “more unlikely than likely” to exceed 2 degrees. [Government of Denmark]
SPM A-1033	SPM	23				Table SPM.1	Table SPM.1: We suggest placing this table before figure SPM11, and further simplifying it. Specifically, we suggest: - replacing the temperature columns on the right side with a single column that explains the key aspects of each scenario category in terms of temperature, in a synthetic way as usually done in the text. - reducing the number and length of the footnotes to a minimum, with a reference to the topics for further details. Suggestions are provided in an attached file. [Government of Belgium]
SPM A-1034	SPM	23				Table SPM.1	Table SPM.1. Request explanation of why the columns for Cumulative CO ₂ emissions in 2011-2050 and 2011-2100 and 2100 temperature change which were included in WG3 SPM, Table SPM.1 have been omitted from current table. If explanations are difficult to provide, request use of original WG3 SPM Table SPM.1 in the SYR as well. [Government of Japan]
SPM A-1035	SPM	23				Table SPM.1	Table SPM.1: Please check the value in this table. “-52 to -42” in row “500 CO ₂ eq concentration in 2100, No overshoot of 530 ppmCO ₂ eq”, column “Change in CO ₂ eq emission compared to 2100, for 2050” is different from that in WGIII SPM Table SPM.1, where “-57 to -42. [Government of Japan]
SPM A-1036	SPM	23				Table SPM.1	Table SPM.1: This table is very clear and hence central to the understanding of SYR. However, the WGIII SPM includes an explanatory footnote on the reasons for the differences between the AR5 range and the AR4 range. We believe the WGIII SPM footnote 16, page 15, contains very important information that helps policy makers

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							understand why the range in AR5 is different from the range in AR4. Please consider including this information in an additional footnote to this Table. [Government of Norway]
SPM A-1037	SPM	23				Table SPM.1	Table SPM1: In the version of this Table from WGIII SPM it was a reference to the time horizon. Please include "over the 21st century" in the upper-row, right column after "Likelihood of staying below specific temperature levels " [Government of Norway]
SPM A-1038	SPM	24	1	24	1	SPM 3.4	The word concentration should be in the text and not footnoted e.g. "overshoot of the atmospheric concentration etc" [Government of Ireland]
SPM A-1039	SPM	24	1	24	8	SPM 3.4	Insert: "CDR technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks (high confidence). CDR is also prevalent in many scenarios without overshoot to compensate for residual emissions from sectors where mitigation is more expensive. There is only limited evidence on the potential for large-scale deployment of BECCS, large-scale afforestation, and other CDR technologies and methods." Source: WGIII, SPM p. 13. [Government of Saudi Arabia]
SPM A-1040	SPM	24	1	24	8	SPM 3.4	The current text does not provide sufficient information on CDR. Please replace the current paragraph and take the carefully drafted text from the WG3 SPM P 15 including footnote 18: "Mitigation scenarios reaching about 450 ppm CO2eq in 2100 typically involve temporary overshoot of atmospheric concentrations, as do many scenarios reaching about 500 ppm to 550 ppm CO2eq in 2100. Depending on the level of the overshoot, overshoot scenarios typically rely on the availability and widespread deployment of BECCS and afforestation in the second half of the century. The availability and scale of these and other Carbon Dioxide Removal (CDR) technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks (high confidence) (see Section SPM.4.2). (footnote 18). CDR is also prevalent in many scenarios without overshoot to compensate for residual emissions from sectors where mitigation is more expensive. There is only limited evidence on the potential for large-scale deployment of BECCS, large-scale afforestation, and other CDR technologies and methods. [2.6, 6.3, 6.9.1, Figure 6.7, 7.11, 11.13]" Footnote 18: "According to WGI, CDR methods have biogeochemical and technological limitations to their potential on the global scale. There is insufficient knowledge to quantify how much CO2 emissions could be partially offset by CDR on a century timescale. CDR methods carry side-effects and long-term consequences on a global scale. [WGI SPM.E.8]". See also our comment on SRM in the SYR on P 24 L 25ff, suggesting to join the two potential options to remove CO2 from the atmosphere. [Government of Germany]
SPM A-1041	SPM	24	1	24	8	SPM 3.4	It is important to summarize the uncertainties regarding CDR in a very clear way. We suggest adding information from the SPM of WGIII, page 13: "The availability and scale of CDR technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenge and risks (high confidence)." As also noted on page 13 of the WGIII SPM and relevant here, there is limited evidence regarding the potential for large-scale deployment of BECCS in particular. [Government of Belgium]
SPM A-1042	SPM	24	1	24	8	SPM 3.4	Perhaps this paragraph could be moved before Table SPM.1. The table is quite complicated to read and the explanation of overshooting in this paragraph is valuable for understanding the table. Maybe the paragraph could be placed below Figure SPM.11. [Government of Sweden]
SPM A-1043	SPM	24	1	24	8	SPM 3.4	These ideas show which are the most relevant pathway to reduce GHG emissions. However do not explain what the role of lifestyles and behavioral changes are. Please include some explanation about the role of lifestyles and behavioral changes to present the information of the outcome of the scenarios in a more equilibrate manner. Additionally some acronyms need to be spelled such as CDR, CCS, BECCS. [Government of Venezuela]
SPM A-1044	SPM	24	1	24	31	SPM 3.4	Use "carbon dioxide removal" instead of the acronym CDR to improve clarity of the text. [Government of Sweden]
SPM A-1045	SPM	24	3	24	3	SPM 3.4	Please clarify this sentence by following the wording from the SPM of WGIII, page 13: "Depending on the level of the overshoot, overshoot scenarios ...". [Government of Belgium]

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SPM A-1046	SPM	24	3	24	5	SPM 3.4	It would help the reader if the reason why BECCS and afforestation are included in overshoot scenarios were explained. It might help to add to the end of this sentence the following text:to remove CO2 from the air and thereby lower atmospheric CO2 concentrations more rapidly than would otherwise occur." [Government of Canada]
SPM A-1047	SPM	24	3	24	5	SPM 3.4	The sentence "Overshoot scenarios typically rely on the widespread availability and deployment of bioenergy with carbon dioxide capture and storage (BECCS) and afforestation in the second half of the century (Table SPM.1)." is not fully coherent with Figure SPM.11, upper panel, that shows negative emissions for RCP 3.6 (10-90 percentile) only after 2080. This incoherence already occurs in the WG3 SPM. Please clarify. [Government of Germany]
SPM A-1048	SPM	24	4	24	4	SPM 3.4	Is it BECCS with afforestation or if not is afforestation the correct term to use here? Should it not be to increase the carbon stored in terrestrial ecosystems including in biomass such as forests and in soils or "in land-based sectors" as used in box 4.3. [Government of Ireland]
SPM A-1049	SPM	24	4	24	5	SPM 3.4	QUOTATION: "...and afforestation in the second half of the century". COMMENT: "Afforestation" is happening from the time forest trees are established on the land. In boreal forests it can take many years before these seedlings contribute significantly to pull down any overshoot. Please consider to add "effects of afforestation" to the sentence [Government of Norway]
SPM A-1050	SPM	24	5	24	8	SPM 3.4	Here the use of the term "carbon dioxide removal technologies" seems to be used in two ways: first to refer specifically to BECCS and afforestation (lines 5-6) and then to capture broader concerns about a range of CDR methods (line 7-8). We recommend clarifying that BECCS and afforestation are the only CDR approaches included in mitigation scenarios. Then the last part of this paragraph can extend consideration to the broader range of potential CDR approaches. If the last sentence is meant to imply that the inclusion of BECCS and large scale afforestation in overshoot scenarios is somehow questionable (i.e. overly optimistic assumptions in the overshoot scenarios about implementation), then this needs clarifying. There were different interpretations from reading this last sentence. [Government of Canada]
SPM A-1051	SPM	24	5	24	8	SPM 3.4	We think the sentences on CDR are too speculative and we suggest to change replace the current sentences to: "Such carbon dioxide removal (CDR) technologies could potentially reduce atmospheric GHG levels, but there are biogeochemical, technical and societal limitations, risks and challenges that make it difficult to provide quantitative estimates of their potentials." [Government of Netherlands]
SPM A-1052	SPM	24	6	24	8	SPM 3.4	This sentence reads as if the difficulty is only with providing quantitative estimates. Is it not more the case that the issues raised provide practical constraints on the potential to deploy CDR technologies at an effective level, rather than just on our ability to quantify its impact? [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1053	SPM	24	6	24	8	SPM 3.4	Please consider whether this statement is relevant to CDR technologies in general. We believe that there is easier to quantify the potential related to some CDR technologies such as afforestation and probably BECCS as well, than for other CDR technologies. Please consider inserting ",to varying degrees," before "make it difficult...". [Government of Norway]
SPM A-1054	SPM	24	7	24	7	SPM 3.4	The meaning of "biogeochemical... limitations" is unclear. Perhaps "limitations associated with the knowledge or relevant biogeochemical aspects"? [Government of Sweden]
SPM A-1055	SPM	24	8	24	8	SPM 3.4	Emissions should peak by 2020 and decline to zero shortly after 2050 if the global average temperature rise is likely to be limited to 2°C. This implies that unabated fossil fuel technologies should be phased out in the power sector. We suggest to add: "The stabilization of greenhouse gas concentrations at low levels requires a fundamental transformation of the energy supply system, including the long-term phase-out of unabated fossil fuel conversion technologies and their substitution by low-GHG alternatives (robust evidence, high agreement). Concentrations of CO2 in the atmosphere can only be stabilized if global (net) CO2 emissions peak and decline toward zero in the long term. (WGIII TS-46)" [Government of Netherlands]
SPM A-1056	SPM	24	8			SPM 3.4	It is necessary to include the precautionary approach stated in WGI and WGIII about geoengineering. According to WGI and WGIII, CDR methods have biogeochemical and technological limitations to their potential on the global scale. There is insufficient knowledge to quantify how much CO2 emissions could be partially offset by CDR on a century timescale. CDR methods carry side-effects and longterm consequences on a global scale. [WGI SPM.E.8]

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							[Government of Bolivia]
SPM A-1057	SPM	24	10	24	12	SPM 3.4	This is a very important findings with respect to mitigation of SLCFs and long term warming. Suggest these findings are reflected in the high level message in Box 3.4. [Government of Ireland]
SPM A-1058	SPM	24	10	24	12	SPM 3.4	Please check the confidence statement : the same statement is provided in topic 3 (page 93) without confidence statement. Why is the confidence limited to "medium", and if so, what has medium confidence : the reduction of the rate, the fact that long-term effects are limited, or both ? [Government of Belgium]
SPM A-1059	SPM	24	10	24	12	SPM 3.4	The authors should provide quantitative findings here: "... can reduce the rate of warming in the short-term, UP TO X% REDUCTION IN WARMING BY MIDCENTURY ..." [Government of United States of America]
SPM A-1060	SPM	24	10	24	12	SPM 3.4	UNCLEAR/MISLEADING: These lines are only valid for warming non-CO2 agents and lump together a wide range of very different forcing agents. As shown in Figure WGI SPM.5 there are many agents which are categorized under "short lived gases and aerosols" that have a cooling effect. Reducing the latter agents would result in a warming. This paragraph is therefore not balanced, is misleading, and should thus be modified in correctly reflecting the possible trade-offs. SUGGESTION: "Reducing emissions of non-CO2 greenhouse gases is an important element of mitigation strategies. While mitigation of certain warming short-lived climate gases and aerosols can reduce the rate of temperature increase in the short term, mitigating cooling forcings would result in a temperature increase." [Government of Saint Lucia]
SPM A-1061	SPM	24	10	24	15	SPM 3.4	It would be helpful for the narrative on this page, about mitigation scenarios reaching 450ppm CO2-eq (those likely to maintain global temperature below 2degC), if the explanation of SLFCs could be expanded. This is an area of key interest to policymakers. This paragraph should elaborate on the role of SLFCs in mitigation scenarios, give examples of the SLFCs that are being alluded to, and explain the timing of SLCF emission reductions. [Government of Canada]
SPM A-1062	SPM	24	10			SPM 3.4	Recommend changing the second 'Mitigation' on line 10 to 'Reducing emissions'. This will ensure readers aren't left wondering whether mitigation means something other than reducing emissions here. [Government of Canada]
SPM A-1063	SPM	24	10			SPM 3.4	The first sentence includes a value judgement, please replace by "Reducing CO2 emissions of non-CO2 agents can be an element of mitigation strategies." [Government of Germany]
SPM A-1064	SPM	24	12	24	15	SPM 3.4	The information on metrics is not linked to the efficiency of mitigation action related to SLCF. It is valid for any statement on GHG-emission reductions throughout the AR5, and Box 3.2 of the SAR on metrics provides this information. However, it does not add valuable information to this paragraph in the SPM, but rather obscures its message. Please remove. [Government of Germany]
SPM A-1065	SPM	24	15	24	15	SPM 3.4	Misspelling of word "judgements". [Government of Sweden]
SPM A-1066	SPM	24	17	24	18	SPM 3.4	The sentence beginning "Delaying additional mitigation" is an important message and should be highlighted. [Government of Ireland]
SPM A-1067	SPM	24	17	24	18	SPM 3.4	This is a very important message, which should appear in a bold statement or headline. However, we would like to ask the authors to check that the wording "delaying (...) to 2030 or beyond": the words "and beyond" may need to be deleted because we could not find support for the possibility to keep the warming below 2°C with only 50% of chances if no additional mitigation is taking place after 2030. Achieving less than 50% of chances would not be useful as an objective. Achieving about 50% of chances with emission continuing unabated after 2030 may be impossible given the amount of cumulative emissions that would already be reached by that time, which would be very close to the maximum consistent with 2°C. [Government of Belgium]

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SPM A-1068	SPM	24	17	24	20	SPM 3.4	This is a key message for policy makers and needs to be further highlighted (e.g. as part of the higher message box). [European Union]
SPM A-1069	SPM	24	17	24	23	SPM 3.4	This is very important but it is not clear why 2030 is addressed first and then 2020. A chronological statement of these findings may be better. [Government of Ireland]
SPM A-1070	SPM	24	17			SPM 3.4	In regard to "delaying additional mitigation to 2030 or beyond", the main text of the SYR P 92 L 30 states "Cost-effective scenarios that are likely to about as likely as not to limit temperature change to less than 2 °C this century (2100 concentration levels of about 450 ppmv CO ₂ eq to about 500 ppmv CO ₂ eq) involve emissions between about 30 GtCO ₂ eq/yr and 50 GtCO ₂ eq/yr by 2030. Scenarios with emission levels of above 55 GtCO ₂ eq/yr will require substantially higher rates ... ". On the basis of this information, we suggest adding "associated with emission levels of above 55 GtCO ₂ eq/yr" so that the sentence reads "Delaying additional mitigation to 2030 or beyond, associated with emission levels of above 55 GtCO ₂ eq/yr, will substantially" [Government of Germany]
SPM A-1071	SPM	24	18	24	18	SPM 3.4	Can "substantially" be quantified here. It would be useful to include some numbers. [European Union]
SPM A-1072	SPM	24	18	24	20	SPM 3.4	"requires" should be replaced with the wording such as "characterized by" (e.g., WG3 SPM Page.10 paragraph.2) as this part is explanation of assumptions which mitigation scenarios are based on. [Government of Japan]
SPM A-1073	SPM	24	18	24	24	SPM 3.4	It is important to explicitly note in this section that these costs do not include benefits of reduced climate change. [Government of Sweden]
SPM A-1074	SPM	24	19	24	19	SPM 3.4	Clarify what "over this period" refers to - through 2100? [Government of United States of America]
SPM A-1075	SPM	24	20	24	23	SPM 3.4	Please introduce a line break right before the information on the Cancun pledges as this information should not be mixed with that on CDR. [Government of Germany]
SPM A-1076	SPM	24	20	24	23	SPM 3.4	The sentence is very confusing as currently written. Revise [Government of United States of America]
SPM A-1077	SPM	24	20	24	23	SPM 3.4	THIS IS UNCLEAR/MISLEADING AND SUGGEST CHANGE TO: "Estimated global emissions levels in 2020 based on the Cancún Pledges are not consistent with cost-effective trajectories that are at least about as likely as not to limit temperature change to 2 °C. They do not preclude the option to meet this goal, albeit with the substantial increase in challenges of delayed scenarios in general, as mentioned above (Figure SPM.12). {3.4}" REASONING: This statement needs to be linked directly to the first sentences of this paragraph. Writing "not consistent with cost-effective trajectories" without further explanation is much too convoluted and technical. It must be made clear that Cancun pledges scenarios are what are called "delayed" scenarios in WG3, as opposed to "cost-effective" (note the latter is only mentioned in this single paragraph of text, apart from being mentioned in captions of figures and tables). Calling Cancun pledges scenarios as what they are is also important [Government of Saint Lucia]
SPM A-1078	SPM	24	20	24	23	SPM 3.4	The text describing Cancun pledges should be removed, since it is a political matter. Anyway, by the end of 2015 they will be out of date. [Government of Russian Federation]
SPM A-1079	SPM	24	21	24	21	SPM 3.4	The words "at least" in front of "about as likely as not" are confusing. Suggest using only the appropriate term here, or explaining what is meant by "at least" in another way. [Government of Canada]
SPM A-1080	SPM	24	21	24	21	SPM 3.4	Editorial: correct the font for "u" of Cancún. [Government of Switzerland]

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SPM A-1081	SPM	24	21	24	21	SPM 3.4	Wrong font for "ú" [Government of Sweden]
SPM A-1082	SPM	24	22	24	22	SPM 3.4	..but they do not preclude the option to meet this goal...' change 'option to meet ' to 'possibility of meeting' [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1083	SPM	24	23	24	23	SPM 3.4	We like to add the following sentences: "Cost estimates do not consider the benefits of reduced climate change nor the co-benefits and adverse side-effects of mitigation. Economic assessment of climate change risks has fundamental limitations, which can lead to biased decision-making if ignored. {Box 3.1} [Government of Netherlands]
SPM A-1084	SPM	24	25	24	25	SPM 3.4	Some minimal introduction, to what SRM is, is needed here. Suggest the description of SRM beginning on line 31 of page 95 be used here and on page 95 (the box on geoengineering) a more formal definition be used for both CDR and SRM. [Government of Canada]
SPM A-1085	SPM	24	25	24	25	SPM 3.4	Aerosol cooling is SRM but not planned. Perhaps a clearer statement is needed such as "deliberate SRM" [Government of Ireland]
SPM A-1086	SPM	24	25	24	25	SPM 3.4	This statement on SRM is misleading in its assertion. We have proxies that give us a decent understanding of several types of SRM techniques. The authors should revise the text to read something to the effect of: "REAL-WORLD DEPLOYMENT OF SRM TECHNIQUES AT A LARGE SCALE TO ADDRESS ANTHROPOGENIC CLIMATE CHANGE is not included...". Note, "is untested" should be deleted as this raises a series of questions about why SRM was not included. [Government of United States of America]
SPM A-1087	SPM	24	25	24	27	SPM 3.4	In these sentences, suggest referring to the limited amount of literature available on which to base assessment of SRM, consistent with Box 3.3. For example, the sentence on lines 25 to 26 could begin with "Although insufficient evidence precludes a comprehensive assessment, SRM is..." [Government of Canada]
SPM A-1088	SPM	24	25	24	27	SPM 3.4	This statement is overly definitive in its assertion and needs to be revised to read: "SRM entails numerous uncertainties AND MAY HAVE side effects, risks..." For example, painting a roof white (or a city's roofs white for that matter) is an SRM technique, but does not have the issues enumerated here. Also, the word "has" should be deleted before "particular governance". [Government of United States of America]
SPM A-1089	SPM	24	25	24	29	SPM 3.4	The para on SRM is disconnected from that on CDR and not linked to negative emissions. We suggest joining the information on SRM in one para on top of P 24 by introducing that SRM is the second potential option to remove CO2 from the atmosphere. [Government of Germany]
SPM A-1090	SPM	24	25	24	29	SPM 3.4	This paragraph on SRM is largely built on the presumption that SRM is solely atmospheric injection of reflective particles. This presumption should be made explicit. If not, it raises questions about consistencies within the paragraph about other SRM techniques. [Government of United States of America]
SPM A-1091	SPM	24	25	24	29	SPM 3.4	The paragraph on SRM seems a bit in isolation; it would have made more sense to have a paragraph dealing with the broader climate engineering issue so to provide some context and then add those messages on SRM which are indeed crucial. [European Union]
SPM A-1092	SPM	24	27	24	29	SPM 3.4	Confusing statement [Government of India]
SPM A-1093	SPM	24	30	24	30	Figure SPM.12	Figure SPM.12: This figure is very difficult to understand--all three panels. However, it is also a critically important figure. The authors should seek ways to simplify it. One thing to consider would be eliminating the individual model runs ("spaghetti lines") in panel (a). [Government of United States of America]
SPM A-1094	SPM	24	30	24	30	Figure SPM.12	See comments #7 above – information about Cancun pledges should be removed from picture SPM.12 and from the text in line 6 on the page 25. [Government of Russian Federation]
SPM A-1095	SPM	24	30	25	16	Figure SPM.12	Figure SPM.12 - there is no mention of what the black dot represents in the left panel (perhaps it is the Cancun reference point?) [Government of United States of America]
SPM A-1096	SPM	24		24		Figure SPM.12	As in several other cases in the SPM, this Figure tries to capture too many ideas in a single space making it difficult for a non-expert to understand. Recommend dropping the "share of zero and low carbon energy" component

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							altogether for the SPM. The Before and After comparison seems to be more important for an SPM. [Government of United States of America]
SPM A-1097	SPM	25	3	25	3	Figure SPM.12	The values in brackets (430-530) are confusing without any further explanation. [Government of Austria]
SPM A-1098	SPM	25	5	25	5	Figure SPM.12	How many policy makers will be concerned about the "interquartile range across scenarios" suggest that technical terminology is reduced and the caption significantly shortened [Government of Ireland]
SPM A-1099	SPM	25	10	25	10	Figure SPM.12	Words 'high efficient technologies' may be added after the word 'with' [Government of India]
SPM A-1100	SPM	25	11	25	13	Figure SPM.12	Figure SPM.12 caption: List of "Zero- and low-carbon" (l. 11) supply technologies correctly includes "BECCS" (l. 13), which is potentially net-negative/subzero-carbon. Consider referring upfront to "Zero-carbon, low-carbon, and net carbon negative" supply options. [Government of United States of America]
SPM A-1101	SPM	25	16	25	22	Figure SPM.12	There is a missed synthesis opportunity here. The costs of mitigation in isolation are misleading and should be considered against avoided damages, co-benefits and adaptation costs to get a good picture of what the net costs (or benefits) are. Notions like that often co-benefits are higher than the cost of mitigation should be mentioned here. We suggest to use text from WGII 16.3.2.5. [Government of Netherlands]
SPM A-1102	SPM	25	18	25	18	SPM 3.4	Suggest adding that estimates of aggregate economic costs "are uncertain" and vary widely [Government of Sweden]
SPM A-1103	SPM	25	18	25	24	SPM 3.4	It would seem highly relevant to include in the text itself the points on reduction in annualized consumption growth implied by the numbers in the bottom table of Figure SPM.13, thus adding at the end of line 24 a sentence along these lines: "This entails that in a 450 ppm scenario annualized consumption growth reductions is estimated to be 0.04-014 (median 0.06) percentage points per year.". [Government of Denmark]
SPM A-1104	SPM	25	18	25	24	SPM 3.4	Insert: "Estimates of the aggregate economic costs of mitigation vary widely and are highly sensitive to model design and assumptions as well as the specification of scenarios, including the characterization of technologies and the timing of mitigation (high confidence). Scenarios in which all countries of the world begin mitigation immediately, there is a single global carbon price, and all key technologies are available, have been used as a cost-effective benchmark for estimating macroeconomic mitigation costs. Under these assumptions, mitigation scenarios that reach atmospheric concentrations of about 450 ppm CO ₂ eq by 2100 entail losses in global consumption—not including benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation—of 1 % to 4 % (median: 1.7 %) in 2030, 2 % to 6 % (median: 3.4 %) in 2050, and 3 % to 11 % (median: 4.8 %) in 2100 relative to consumption in baseline scenarios that grows anywhere from 300 % to more than 900 % over the century." Source: WG III, SPM p. 15. [Government of Saudi Arabia]
SPM A-1105	SPM	25	18	25	24	SPM 3.4	Appreciate inclusion of preconditions for mitigation costs (immediate mitigation in all countries, single global carbon price, and all the key technologies available included)., however current placement in SPM not so good. Request they be moved up from the caption for Figure SPM.13 to the main text, as in WG3 SPM, to ensure better understanding by policymakers. [Government of Japan]
SPM A-1106	SPM	25	18	25	33	SPM 3.4	The following point from the text explaining the figure (lines 31-33) should not only be part of the figure text, but should be included in the text itself (i.e. added to the section in lines 18-24) as this is key information in a cost perspective: "Cost estimates ... do not consider the benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation". [Government of Denmark]
SPM A-1107	SPM	25	18	25	33	SPM 3.4	This paragraph and figure (Figure SPM.13) discuss consumption, but it is not clear what consumption is referring to. The previous paragraph discuss the energy system and low-carbon energy technologies. Therefore, there is a risk that the reader assumes that energy consumption is what is referred to. A clarification is needed here as well as in section 3.4. [Government of Sweden]

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SPM A-1108	SPM	25	19	25	19	SPM 3.4	What is a "stylized assumption"? This term will not be understood by readers. [Government of Canada]
SPM A-1109	SPM	25	19	25	19	SPM 3.4	Global consumption of 'what'..... [Government of India]
SPM A-1110	SPM	25	19	25	19	SPM 3.4	"Stylized assumptions" may not be comprehensible to a policymaker. Use text that can be understood by a layperson. [Government of United States of America]
SPM A-1111	SPM	25	19	25	24	SPM 3.4	We would prefer using the WGIII SPM language here because it avoids separating the information about losses from its context (baseline growth) and includes a caveat about benefits and side-effects. (see WGIII SPM section 4.1, page 15) [Government of Belgium]
SPM A-1112	SPM	25	19	25	24	SPM 3.4	The authors should make this one sentence and take this sentence verbatim from the WG3 SPM (p. 15) as it was a very carefully crafted after long negotiations. The version in the final WG3 SPM does not allow for cherry-picking of pieces of the sentence, whereas parts of this multi-sentence formulation could be taken out of context very easily. [Government of United States of America]
SPM A-1113	SPM	25	19	25	24	SPM 3.4	Consider adding statement: "Cost estimates do not consider the benefits of reduced climate change, nor the co-benefits or adverse side-effects of mitigation." [Government of United States of America]
SPM A-1114	SPM	25	19			SPM 3.4	Please insert a footnote explaining the meaning of "stylized assumptions" (from WG3 SPM): "Scenarios in which all countries of the world begin mitigation immediately, there is a single global carbon price, and all key technologies are available, have been used as a cost-effective benchmark for estimating macroeconomic mitigation costs" [Government of Germany]
SPM A-1115	SPM	25	20	25	20	SPM 3.4	The authors need to insert the word "likely" in this sentence: "...most studies have estimated that limiting LIKELY warming to 2C..." [Government of United States of America]
SPM A-1116	SPM	25	20	25	22	SPM 3.4	Suggest that context should be provided at the start of the Para as is normal so that the % reduction numbers have meaning from the outset. [Government of Ireland]
SPM A-1117	SPM	25	21	25	21	SPM 3.4	This line introduces the term "loss in global consumption" without giving a proper definition. A short footnote of definition on what losses in global consumption means would be helpful for clarity. [Government of United States of America]
SPM A-1118	SPM	25	21	25	24	SPM 3.4	The paragraph is complex to read and needs a simple conclusion. We propose rephrasing and an addition at the end: "...losses in global consumption of 1.7% in 2030 (median; range 1%-4%), 3.4% in 2050 (2%-6%) and 4.8% in 2100 (3%-11%) relative to consumption in baseline scenarios. For context, aggregate consumption in baseline scenarios grows anywhere from 300% to more than 900% over the century (Figure SPM.13), and therefore the overall impact on consumption of mitigation policies looks relatively modest. {3,4}" [European Union]
SPM A-1119	SPM	25	22	25	23	SPM 3.4	It should be highlighted in comparative statements that the baseline scenario is a fictitious scenario where climate change does not exist and ergo where the costs of inaction are not experienced as they would normally be. Therefore, after "in 2100 relative to consumption in baseline scenarios" insert "without the costs of climate change" [Government of Ireland]
SPM A-1120	SPM	25	23	25	24	SPM 3.4	The sentence on the growth of GDP in baseline scenarios needs further qualification. It should be explained that those baselines have been calculated without any assumptions about the impacts of climate change that are expected to be negative under high GHG emissions scenarios. [Government of Austria]
SPM A-1121	SPM	25	24	25	33	Figure SPM.13	The last sentence in the caption of figure SPM.13 "Cost estimates shown in this table do not consider the benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation." is essential for interpretation, and it does not only apply to the figure or its table, but to all cost estimates of mitigation. We would therefore like to request the following modifications: - In the figure caption, please move the sentence between the second and the third sentence in L 29, and remove the reference to the table, as the statement applies to the entire figure. It would then read: "... default technology

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							assumptions. In addition, cost estimates do not consider the benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation. Consumption losses are shown... - Please copy the sentence in question (L 31-33) to the main text, L 24, so that it reads: "In general, mitigation cost estimates do not consider the benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation." [Government of Germany]
SPM A-1122	SPM	25	24			SPM 3.4	Please add the information from WG3 SPM.4: "These numbers correspond to an annualized reduction of consumption growth by 0.04 to 0.14 (median: 0.06) percentage points over the century relative to annualized consumption growth in the baseline that is between 1.6 % and 3 % per year." [Government of Germany]
SPM A-1123	SPM	25	25	25	25	Figure SPM.13	Figure SPM.13: Is it possible to convert this figure into GDP loss, since it is much easier for policymakers to assess the implications of different CO2 stabilization scenarios? [Government of India]
SPM A-1124	SPM	25	26	25	26	Figure SPM.13	Fig SPM.13: Enormous efforts were made in the WG3 Approval Session to illustrate that the costs are almost insignificant relative to projected growth. That fact is completely lost in this figure. The authors need to find a way to illustrate this fact graphically, perhaps by including some sort of inset that puts these reductions in consumption truly in the context of the BAU growth of 300-900% to put the scale in appropriate context. [Government of United States of America]
SPM A-1125	SPM	25	27	25	33	Figure SPM.13	Please consider including the following sentence from the WGIII SPM (page 17) as part of the explanatory text for Figure SPM.13: "Estimates at the high end of these cost ranges are from models that are relatively inflexible to achieve the deep emissions reductions required in the long run to meet these goals and / or include assumptions about market imperfections that would raise costs.". We believe this provides important context helping explain the ranges provided in the Figure. [Government of Norway]
SPM A-1126	SPM	25	27			Figure SPM.13	The information in Figure SPM.13 might be better displayed in tabular form in order to give equal weight to the percentage point reductions and the reduction in consumption numbers. [Government of Germany]
SPM A-1127	SPM	25	30	25	30	Figure SPM.13	Please consider changing "as well as" to "nor". [Government of Finland]
SPM A-1128	SPM	25	30	25	31	Figure SPM.13	The meaning of this sentence is difficult to grasp as it seems that a few words have been left out. We would suggest to add a few words so that it reads: "The table at the bottom shows annualized consumption growth reductions relative to consumption growth in a baseline scenario where growth is projected to be 1.6% to 3% per year" [Government of Denmark]
SPM A-1129	SPM	25	35	25	35	SPM 3.4	Write:"Under the absence or limited availability of technologies and knowledge, ...". [Government of Switzerland]
SPM A-1130	SPM	25	37	25	39	SPM 3.4	This should be rephrased to be clearer. Suggest replacing sentence beginning "Many models" by the following sentence; "For many models, limiting temperature increase to below 2C is more unlikely than likely if additional mitigation is considerably delayed, or if availability of key technologies such as bioenergy, CCS, and their combination (BECCS) is limited." [Government of Ireland]
SPM A-1131	SPM	25	37	25	39	SPM 3.4	QUOTATION: " Many models could not reproduce temperature increase below 2 ° C with a likely chance,if availability of key technologies, such as bioenergy, CCS and BECCS would be limited. COMMENT: By "limited bioenergy" is it meant to be understood as a maximum of 100 EJ/yr modern bioenergy supply globally (see footnote 5 to Table SPM.2, page 26). Here it is also stated that modern bioenergy was only 18 EJ/yr in 2008 , this means more than a 5 times upscaling! This is also further explained in Figure 11.20 in WG III where it is shown that global bioenergy use in 2010 were approx. 50 EJ/yr. This means that about 32 EJ/yr was more primitive (ordinary) bioenergy. Please consider both the text in line 37-37 together with the text in Footnote 5 in Table SPM.2 page 26 in light of this. [Government of Norway]
SPM A-1132	SPM	25	38	25	38	SPM 3.4	The authors should clarify what is meant by "considerably delayed" - is this 5 years or 50 years? [Government of United States of America]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-1133	SPM	26	1	26	10	Table SPM.2	Mitigation action can obviously be delayed more or less until 2030 - what level of delay is implied here? Is it the situation with no additional mitigation measures until 2030 (baseline) compared with the cost-effective scenario? If that is the case, it should be spelled out that delaying means no additional mitigation measures/baseline until 2030. [Government of Denmark]
SPM A-1134	SPM	26	1	26	25	Table SPM.2	Table SPM.2. This table classifies energy technologies according to the scenarios, but the description of line 33-37 in page 25 of body text is too biased; it only mentions CCS and BECCS while there is no description about the situations of nuclear and/or renewable energy, both of which are on the table. Added to that, the number of samples in the table is too small. The situations of nuclear energy and renewables should be clearly described as written in page 21 of WG3 SPM, such as follows: Under the absence or limited availability of technologies, mitigation costs can increase substantially depending on the technology considered. Among those technologies, a growing number of RE technologies have achieved a level of maturity to enable deployment at significant scale since AR4 (robust evidence, high agreement) and nuclear energy is a mature low-GHG emission source of baseload power, but its share of global electricity generation has been declining (since 1993). Nuclear energy could make an increasing contribution to lowcarbon energy supply, but a variety of barriers and risks exist (robust evidence, high agreement). Delaying additional mitigation further increases mitigation costs in the medium- to long-term. Many models could not reproduce temperature increase below 2 °C with a likely chance, if additional mitigation would be considerably delayed, or if availability of key technologies, such as bioenergy, CCS, and their combination (BECCS) would be limited (high confidence). [Government of Japan]
SPM A-1135	SPM	26	1	26	27	Table SPM.2	It is very questionable whether it is motivated to have this complicated table (Table SPM.2) in the SPM. The message is pretty simple and also make sense thus making a complicated table rather superfluous (also given the uncertainties and limitations of IAM:s). [Government of Sweden]
SPM A-1136	SPM	26	1	26	27	Table SPM.2	Table SPM.2 is not visualizing the message and the last two columns in Table SPM.2 are difficult to interpret. Are the numbers in column 6-7 mean values that should be compared with the mean of column 2-5 in the same row? At least explain the two last columns better. Ideally, change strategy for visualizing the data, perhaps graphs are possible? [Government of Sweden]
SPM A-1137	SPM	26	3	26	3	Table SPM.2	The wording "the 16th and 84th percentile" is rather technical. Reword? See also footnote 3. [Government of Sweden]
SPM A-1138	SPM	26	5	26	5	Table SPM.2	Table SPM.2: This table is quite technical and difficult to understand. Strongly suggest that the authors consider further efforts to simplify it. The numbers in the boxes are difficult to understand, especially without any form of unit. It might also help to at least put directly into the Table caption the information about how to interpret the colours, rather than having to go to footnote 4 to get this info. Rather than giving detailed % info, something simple could be added to indicate that green indicates 100% of models, with the colours yellow-orange-red representing declining percentages thereafter, in that order. [Government of Canada]
SPM A-1139	SPM	26	30	26	30	SPM 4	This is an important statement but its logic could be clearer e.g. use effective rather than many. Suggest to end sentence after challenges. The "No single option" text is implied so can be deleted. Replace "with other" with "and support other sustainable societal objectives" [Government of Ireland]
SPM A-1140	SPM	26	30	26	30	SPM 4	Replace existing text with: 4. Mitigation and Adaptation Measures [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1141	SPM	26	30	26	30	SPM 4	Co-benefits, synergies and tradeoffs with mitigation and other objectives, highlighted in the WGII report, could also have been mentioned here. [European Union]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-1142	SPM	26	30	26	30	SPM 4	Instead of "Adaptation and Mitigation": "Mitigation and Adaptation". [European Union]
SPM A-1143	SPM	26	30	27	29	SPM 4	If this summary is for policy makers, this section should be more robust. There could be additional supporting text added below the first box on measures, and include additional supporting text from Topic 4.1-2. [Government of United States of America]
SPM A-1144	SPM	26	30	31	34	SPM 4	In Section 4 of the SPM, many statements including those in highlighted in boxes, seem to be intended for an audience of researchers, and convey no clear actionable pathways for governments. [Government of United States of America]
SPM A-1145	SPM	26	30	31	34	SPM 4	Session 4 - Adaptation and Mitigation Measures- is needing more revisions than other parts of the SPM as this session is poorly considered the key messages and relevant contents from the underlying report. Please enhance the whole subsections including clear key messages with more supportive information from the underlying report or WG report. [Government of Republic of Korea]
SPM A-1146	SPM	26	32	26	32	Headline 4	Instead of "adaptation and mitigation": "mitigation and adaptation". [European Union]
SPM A-1147	SPM	26	32	26	33	Headline 4	Delete "but no single option is sufficient by itself" [Government of United States of America]
SPM A-1148	SPM	26	32	26	34	Headline 4	Replace existing text with: Many mitigation and adaptation options can help address the climate challenge, but no single option is sufficient by itself. Effective implementation depends on supporting policies, and can be enhanced through integrated responses that link adaptation and mitigation with other societal objectives. {4} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1149	SPM	26	32	26	34	Headline 4	This statement provides little information to policy makers or society. A stronger and more relevant statement could be used here on the links between adaptation and mitigation, the limits of adaptation and risk management. [European Union]
SPM A-1150	SPM	26	32			Headline 4	Suggest simply stating "climate change" rather than the "climate challenge". [Government of Canada]
SPM A-1151	SPM	26	32			Headline 4	Please reverse the order of "mitigation" and "adaptation": Mitigation is the first option to address climate change. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
SPM A-1152	SPM	26	36	26	36	SPM 4.1	Replace existing text with: 4.1 Common enabling factors and constraints for mitigation and adaptation responses [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1153	SPM	26	36	26	36	SPM 4.1	Instead of "adaptation and mitigation": "mitigation and adaptation". [European Union]
SPM A-1154	SPM	26	36	27	14	SPM 4.1	Session 4.1 is better to treat the 'Common enabling factors and constraints' as described in the Table 4.1 in underlying report (page 100), and current text should be revised in the relevance of the table. [Government of Republic of Korea]
SPM A-1155	SPM	26	37	26	37	SPM 4.1	Words 'enhanced capacity' may be added before the word 'institutions' [Government of India]
SPM A-1156	SPM	26	38	26	38	Headline 4.1	Replace existing text with: Mitigation and adaptation responses are underpinned by common enabling factors. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1157	SPM	26	38	26	38	Headline 4.1	Instead of "Adaptation and mitigation": "Mitigation and adaptation". [European Union]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-1158	SPM	26	38			Headline 4.1	Please reverse the order of "mitigation" and "adaptation": Mitigation is the first option to address climate change. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
SPM A-1159	SPM	26	39	26	40	Headline 4.1	Do readers know what "environmentally sound infrastructure, livelihoods, and behavioural and lifestyle choices" are? Have these things been assessed by the IPCC? Rather than using jargon, perhaps it would be better to say something like "investments in infrastructure, livelihoods and behavioural and lifestyle choices that limit emissions" (or some other words that indicate the objectives of the investments). [Government of Canada]
SPM A-1160	SPM	26	40	26	40	Headline 4.1	Please add "price signals" following "institutions and governance". Please apply this modification also to the respective headline statement in the underlying report on P 99 L 19. Justification: Price signals are a key factor for investments in mitigation and adaptation. The importance of appropriate carbon prices for investments are mentioned throughout the IPCC reports and should hence be mentioned here as well. [Government of Germany]
SPM A-1161	SPM	26	40	27	12	SPM 4.1	There is a missed opportunity for synthesis here, as most important issues around the interaction of mitigation and adaptation are not discussed. Issues like interchangeability of mitigation and adaptation, the role of mitigation and adaptation in an overall strategy to limit climate change to 2 degrees (fig SPM7), and synergies between mitigation and adaptation (particularly in agriculture, forestry, urban infrastructure, energy and water sectors {WGII 2.5.1}) and where is there a possible conflict. Ideally we would like to see a RCP driven approach that addresses the impact of an RCP on our world, what does this mean for both mitigation and adaptation, and what kind of costs are involved with that. For now we suggest: "Prospects for climate resilient pathways for sustainable development are related to what the world accomplishes with climate change mitigation. (fig SPM7). Both the costs and benefits of adaptation are expected to increase with the magnitude and rate of climate change and associated impacts, but implementation may also become more challenging. Opportunities to take advantage of synergies between adaptation and mitigation may decrease with time, particularly if the limits for adaptation are exceeded." We suggest to insert Figure WGII 2.4 here. [Government of Netherlands]
SPM A-1162	SPM	26	66	26	66	SPM 4.1	Reference is made in several places to "exceeding adaptation limits." What, exactly does this mean? [Government of United States of America]
SPM A-1163	SPM	26		26		Table SPM.2	Table SPM.2: We would find it highly relevant and strongly suggest to also include information/figures on the costs of delaying action through 2020. In the April version of the SPM, the text explaining this table indicated that there would also be information for delaying through 2020 (but the table itself did not display this information). We would therefore assume that such information is available in the underlying report. [Government of Denmark]
SPM A-1164	SPM	26		26		Table SPM.2	Table SPM.2. The median of cost for Nuclear Phase-out and Limited Solar/Wind are reversal in 450ppm scenario and 550ppm scenario, which is not comprehensible in common sense. For the better understanding of policy makers, the reasons should be described clearly at a footnote. [Government of Japan]
SPM A-1165	SPM	26		26		Table SPM.2	Table SPM.2: Reducing the font size of column headers would increase readability. [Government of Sweden]
SPM A-1166	SPM	26				Table SPM.2	Table SPM.2: This table is difficult to understand. Please either remove it from the SPM or simplify it. In particular, we do not think that indicating the number of studies [n= ...] is useful in this SPM. [Government of Belgium]
SPM A-1167	SPM	26				Table SPM.2	Table SPM.2: We wonder how the costs are measured: is it a comparison of NPVs, which would imply that the conclusions are highly dependent on the discount rate? A lower discount rate (which is used in many climate cost-benefit analysis) would lead to a higher cost of delaying. If so, it may need to be explained to ensure the policy relevance of the table. [Government of Belgium]
SPM A-1168	SPM	26				Table SPM.2	Table SPM.2. Request elaboration, along with lines 4-5, as indication of the fraction of models that could successfully reach the targeted concentration levels was not included in WG3 SPM and the current explanation is vague. [Government of Japan]
SPM A-1169	SPM	26				Table SPM.2	Table SPM.2: Please reconsider the use of colours in this table. [Government of Norway]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-1170	SPM	27	1	27	1	SPM 4.1	Instead of "adaptation and mitigation": "mitigation and adaptation". [European Union]
SPM A-1171	SPM	27	1	27	4	SPM 4.1	The wording of this sentence seems odd: the first part does not seem to be in opposition with the second, so the reasons for using the word "whereas" is unclear. Please rephrase. Relevant information is available on page 99 of the SYR, section 4.2: "Technological innovation and investments in green infrastructure and environmentally sound technologies and infrastructure can reduce GHG emissions and enhance societal resilience to climate change (very high confidence). Adaptation and mitigation are constrained by the inertia of global and regional trends in economic development, GHG emissions, resource consumptions, infrastructure and settlements patterns, institutional behaviours, and technology (high agreement, medium evidence)" [Government of Belgium]
SPM A-1172	SPM	27	1	27	4	SPM 4.1	This summary doesn't accurately capture the underlying text from 4.1, which references green infrastructure specifically. [Government of United States of America]
SPM A-1173	SPM	27	1	27	4	SPM 4.1	Suggest that the original statement from the SYR is used here (p.98, 22-24 of SYR): "Technological innovation and investments in green infrastructure and environmentally sound technologies can reduce greenhouse gas emissions and enhance societal resilience to climate change (very high confidence)". It remarks environmentally sound technologies and green infrastructure. Much of the sense of this statement is lost in SPM. [European Union]
SPM A-1174	SPM	27	3	27	5	SPM 4.1	Please give the mitigation options in the order of their potential contribution to mitigation. See also our comment on P 39 L 1. [Government of Germany]
SPM A-1175	SPM	27	7	27	11	SPM 4.1	The message is not very clear, please rephrase [Government of Belgium]
SPM A-1176	SPM	27	11	27	11	SPM 4.1	It is suggested to delete "part of the foundation" because it only makes the sentence more difficult to comprehend. [Government of Austria]
SPM A-1177	SPM	27	11	27	11	SPM 4.1	"For many regions and sectors..." Isn't this true universally? [Government of United States of America]
SPM A-1178	SPM	27	11			SPM 4.1	Suggest deleting "for many regions and sectors". Would this not be common across all regions and sectors? [Government of Canada]
SPM A-1179	SPM	27	13			SPM 4.1	This is the first reference to disaster risk reduction, and it could strike readers as coming out of the blue. The WGII report (and the SREX) does an excellent job at highlighting the linkages between DRR and adaptation - this information could be considered for the SYR. [Government of Canada]
SPM A-1180	SPM	27	16	27	16	SPM 4.2	Sub-section 4.2 Response options for adaptation should offer higher visibility to issues such as adaptation opportunities, synergies and tradeoffs. The text on past/current adaptation experience should be moved to Section 1. [Government of Switzerland]
SPM A-1181	SPM	27	16	27	18	SPM 4.2	Can be shortened by removing text from 1st sectors to 2nd sectors. [Government of Ireland]
SPM A-1182	SPM	27	16	27	29	SPM 4.2	Section 4.2 : This paragraph appears to provide only limited practical information about adaptation responses. Please try to add a short summary of key elements from the SREX. [Government of Belgium]
SPM A-1183	SPM	27	16	27	29	SPM 4.2	Consider including the text from Topic 4.2 (pg 104) about "Significant co-benefits, synergies, and trade-offs..." in this section. [Government of United States of America]
SPM A-1184	SPM	27	16	27	29	SPM 4.2	Consider including a reference to the importance of cross-sectoral/integrated approaches to adaptation. This would match what's under the next section on mitigation (4.3), and is consistent with the underlying chapters. [Government of United States of America]
SPM A-1185	SPM	27	16	27	29	SPM 4.2	Important missing statement from SYR, p.101, l.19-20: Appropriate strategies and actions depend on co-benefits and opportunities within wider development plans and strategic goals. [European Union]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM A-1186	SPM	27	17	29	33	SPM 4.2 to SPM 4.3	Please reverse the order of Sections 4.2 and 4.3: According to the AR5 the first option to meet climate change is mitigation. [Government of Germany]
SPM A-1187	SPM	27	19			Headline 4.2	Please add the information that increasing climate change can be avoided: "Increasing climate change due to delayed or insufficient mitigation will erode ..." [Government of Germany]
SPM A-1188	SPM	27	20	27	20	Headline 4.2	Referring to "some": change with "most". [European Union]
SPM A-1189	SPM	27	22	27	24	SPM 4.2	Oddly, there is nothing mentioned here about the value of mainstreaming adaptation/resilience into broader development planning in order to minimize risk. This was a fairly central theme of the WG2 report, no? [Government of United States of America]
SPM A-1190	SPM	27	22	27	24	SPM 4.2	The authors should make this finding more relevant by prefacing the statement with, "Since AR4..." or some other caveat that illustrates the fact that this is a novel finding in the past few years. [Government of United States of America]
SPM A-1191	SPM	27	22	28	6	Table SPM.3	Session 4.2 has only a table, Table SPM .3, but there is no proper messages driven from the table. Please revise this session with what the messages are intend to deliver. [Government of Republic of Korea]
SPM A-1192	SPM	27	23	27	24	SPM 4.2	we suggest "... with more limited implementation of responses ..." be changed to " ... with limited implementation of responses ..." (ie drop the "more") - since more is a relational term but it is not clear what the extent of implementation of response is being compared to. [Government of New Zealand]
SPM A-1193	SPM	27	23	27	33	SPM 4.2	It is suggested to insert "still" before "more limited". [Government of Austria]
SPM A-1194	SPM	27	24	27	24	SPM 4.2	A sentence 'Adaptation is especially important in developing countries as they are most vulnerable to climate change' may be added at the starting of the paragraph. [Government of India]
SPM A-1195	SPM	27	24	27	24	SPM 4.2	is implementation the right word here? Impacts??? Are the embedment of of adaptation not leading to efficient implementation (whatever is implemented does not lead to efficient responses). Or, more likely should "responses" be changed to "adaptation actions", thus telling that embedment of adaptation at the policy level is not enough to get the job done. [Government of Sweden]
SPM A-1196	SPM	27	24			SPM 4.2	Please add: "Governments at various levels have begun to develop adaptation plans and policies and integrate climate-change considerations into broader development plans." This sentence from SYR P 55 L 2-3 will give a more specific idea of ongoing actions and opens the ground for further need mentioned in L 26ff [Government of Germany]
SPM A-1197	SPM	27	25	27	25	SPM 4.2	A word 'further' may be added before 'expected' [Government of India]
SPM A-1198	SPM	27	27			SPM 4.2	Adaptation options exist in all sectors and regions: The developing countries are still suffering from the lack of infrastructures and tools to adapt to the risks of climate. So, not all regions are at the same level with respect to adaptation options. [Government of Algeria]
SPM A-1199	SPM	27	29	27	29	SPM 4.2	Insert: "Large-scale public-private risk reduction initiatives and economic diversification are examples of adaptation actions." Source: WG II, SPM p. 19. [Government of Saudi Arabia]
SPM A-1200	SPM	27	30			SPM 4.2	It is important to include and additional paragraph: "Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation" (page 23, WGII). [Government of Bolivia]

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SPM A-1201	SPM	28	1	28	4	Table SPM.3	A more useful statement on mitigation can be made e.g. On links and synergies between mitigation and adaptation. [Government of Ireland]
SPM A-1202	SPM	28	2	28	3	Table SPM.3	Suggest deleting sentence, "Mitigation is considered essential..." because it doesn't help explain the table. [Government of United States of America]
SPM A-1203	SPM	28	2	28	4	Table SPM.3	The role of mitigation in addressing climate change has been emphasized in 4.3. There is no need to note mitigation here anymore since Table 4.2 addresses adaptation. It is suggested to delete words concerning mitigation in the caption ("Mitigation is considered essential for managing the risks of climate change. It is not addressed in this table as mitigation is addressed elsewhere in this SPM."). [Government of China]
SPM A-1204	SPM	28	3	28	3	Table SPM.3	Grammar: replace "as" by "because". [Government of Switzerland]
SPM A-1205	SPM	28	5	28	5	Table SPM.3	Table SPM 3. The categorisation of examples within the categories described should be uniform. In the literature these are generally categorised according to hard, soft and grey options. Also, why have some categories been included in this table not others; e.g agriculture, flood risk etc are missing. [Government of Ireland]
SPM A-1206	SPM	28	5	28	5	Table SPM.3	Table SPM.3 top box: why call out gender inequality only? [Government of United States of America]
SPM A-1207	SPM	28	5	28	5	Table SPM.3	Table SPM.3 "Building codes and practices" is mentioned twice. [Government of United States of America]
SPM A-1208	SPM	28	5	28	5	Table SPM.3	Table SPM.3: Why are social safety nets listed under Structural/physical? [Government of United States of America]
SPM A-1209	SPM	28	5	28	5	Table SPM.3	Table SPM.3, about 75% of the way down... Again, why is only gender inequality mentioned? [Government of United States of America]
SPM A-1210	SPM	28	5	28	6	Table SPM.3	The information contained in Table SPM3 is too detailed for the summary for policy makers and should be in the main report only [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1211	SPM	28				Table SPM.3	Table SPM.3: Social: Educational options: Research, observation and knowledge gaps especially in some regions are not stated in the table. [Government of Algeria]
SPM A-1212	SPM	28				Table SPM.3	Table SPM.3. links better with the original paragraph to which it was linked: "Adaptation is place- and context-specific, with no single approach for reducing risks appropriate across all settings (high confidence). Effective risk reduction and adaptation strategies consider the dynamics of vulnerability and exposure and their linkages with socioeconomic processes, sustainable development, and climate change. Specific examples of responses to climate change are presented in Table SPM.3". Table SPM.3. actually does not link to sectoral options. A list of sectors for which adaptation options/potential have been identified in the IPCC report could provide additional information. [European Union]
SPM A-1213	SPM	29	1	29	1	SPM 4.3	This section seems to be weak with only CCS being really concrete. The rest lies on generalities that might little substance to the readers. [Government of Switzerland]
SPM A-1214	SPM	29	1	29	32	SPM 4.3	The WG3 report and Fig. SYR SPM.14 show the high priority to decarbonize the energy sector in low emission scenarios. Please present the mitigation options in the order of their contribution to reducing emissions, both in the headline statement in L 2-5 as well as in Fig. SYR SPM.14 and throughout the SYR. This is important because policy-makers will most probably associate the order of technologies with their relevance regarding mitigation potentials. [Government of Germany]
SPM A-1215	SPM	29	1	29	32	SPM 4.3	The SPM mentions Renewable Energies (RE) only once - in a figure caption. This is not adequately reflecting the underlying report, given the significant importance of RE demonstrated in the SRREN and in the WG3-report. RE accounted for nearly half of the estimated 208GW of new electric capacity installed in 2011. Please add information

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							on the role of RE in Section 4.3. of the SPM. [Government of Germany]
SPM A-1216	SPM	29	2	29	3	Headline 4.3	Replace "Cost-effective mitigation is based on an" with "Mitigation can be cost effective using" [Government of United States of America]
SPM A-1217	SPM	29	3	29	3	Headline 4.3	The word "exist" is not clear because it does not indicate if these measures are already implemented or are potential measures only know from a theoretical point of view. [Government of Switzerland]
SPM A-1218	SPM	29	3	29	3	Headline 4.3	Important statement but consider breaking up the key parts for clarity. [Government of Ireland]
SPM A-1219	SPM	29	3	29	5	Headline 4.3	This is a very important statement, and it is well written. However, please consider to replace "is based on" with "include". Rationale: It is other cost-effective mitigation options available that is not mentioned eg. Connected to industrial processes. [Government of Norway]
SPM A-1220	SPM	29	7	29	7	SPM 4.3	Is it 'cross sectoral' or 'multi sectoral'? There will be very few examples for cross sectoral mitigation strategies. Presume that multi sectoral strategies are required to address the mitigation challenge. [Government of India]
SPM A-1221	SPM	29	7	29	7	SPM 4.3	Insert: "Climate policy intersects with other societal goals creating the possibility of co-benefits or adverse sideeffects. These intersections, if well-managed, can strengthen the basis for undertaking climate action." Source: WG III, SPM p. 5. [Government of Saudi Arabia]
SPM A-1222	SPM	29	7	29	9	SPM 4.3	Concerned that there is an oversight in this statement. Clear sectoral mitigation strategies are the first step before doing cross and intersectoral analysis. This should be clearly stated. Also the real world pit falls of addressing cross-sectoral issues should at least be acknowledged. [Government of Ireland]
SPM A-1223	SPM	29	7	29	9	SPM 4.3	It could also be noted, as it is later in the text, that sector-specific policies could be more easily implemented and thus effective. [Government of Sweden]
SPM A-1224	SPM	29	7	29	9	SPM 4.3	SYR should emphasise the breakthrough of renewable energy that has occurred since the A4 in deployment, distribution and cost levels. We suggest to insert the following language from WGIII SPM, page 21: "Since AR4, many RE technologies have demonstrated substantial performance improvements and cost reductions, and a growing number of RE technologies have achieved a level of maturity to enable deployment at significant scale (robust evidence, high agreement). Regarding electricity generation alone, RE accounted for just over half of the new electricity-generating capacity added globally in 2012, led by growth in wind, hydro and solar power. {WGIII SPM-21}" [Government of Netherlands]
SPM A-1225	SPM	29	8	29	8	SPM 4.3	Replace "determining" with "affecting" [Government of United States of America]
SPM A-1226	SPM	29	11	29	11	SPM 4.3	Suggest deleting the words "baseline and mitigation" before the word "scenario". Is stabilizing at 450ppm CO2eq really considered a baseline scenario? [Government of Canada]
SPM A-1227	SPM	29	11	29	11	SPM 4.3	Please write "baseline scenarios and mitigation scenarios". If you only refer to "baseline and mitigation scenarios" it sounds as if there was a separate category of combined scenarios for baseline and mitigation. [Government of Germany]
SPM A-1228	SPM	29	11	29	11	SPM 4.3	Suggest revision of "stabilize" to "reach," in accordance with WG3 SPM (caption for Figure SPM.7) based on assumption that concentration levels do not stabilize at 450ppm beyond 2100 in all scenarios. [Government of Japan]
SPM A-1229	SPM	29	11	29	19	SPM 4.3	The Figure SPM.14 includes a lot of information so please consider including also some text highlighting the most important messages from the Figure. For example that the 450 ppm scenarios in the energy supply sector require a large departure from the baseline and reductions far below the 2010 level by 2050. Similar for the industry sector. [Government of Norway]

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SPM A-1230	SPM	29	11	29	19	SPM 4.3	<p>We do not understand why Land-Use (forestry and agriculture) is singled out in detail here. SPM.14 shows there is minor mitigation potential here compared to other sectors. WGIII SPM provides a rich overview of key aspects of mitigation scenarios that all seem much more relevant, indeed necessary, and with much higher mitigation potential. SUGGESTION: Remove reference to Land-Use in detail and include four important elements from WGIII SPM on decarbonization, renewable energy, reductions in energy demand and Reduced energy intensity in industry</p> <p>1) Decarbonization of the energy supply sector: Large-scale global changes in the energy supply sector "In these [450ppm] selected scenarios, global CO2 emissions from the energy supply sector are projected to decline over the next decades and are characterized by reductions of 90 % or more below 2010 levels between 2040 and 2070. Emissions in many of these scenarios are projected to decline to below zero thereafter." (SPM 4.2.1 Cross-sectoral mitigation pathways and measures)</p> <p>2) Rapid increase of renewable "In the majority of low-stabilization scenarios, the share of low-carbon electricity supply (comprising renewable energy (RE), nuclear and CCS) increases from the current share of approximately 30 % to more than 80 % by 2050, and fossil fuel power generation without CCS is phased out almost entirely by 2100" (SPM 4.2.2 Energy Supply) [Government of Saint Lucia]</p>
SPM A-1231	SPM	29	11	29	19	SPM 4.3	<p>SUGGESTION: Remove reference to Land-Use in detail and include four important elements from WGIII SPM on decarbonization, renewable energy, reductions in energy demand and Reduced energy intensity in industry</p> <p>3) Reductions energy demand "Near-term reductions in energy demand are an important element of cost-effective mitigation strategies, provide more flexibility for reducing carbon intensity in the energy supply sector, hedge against related supply-side risks, avoid lock-in to carbonintensive infrastructures, and are associated with important co-benefits." (SPM 4.2.1 Cross-sectoral mitigation pathways and measures)</p> <p>4) Reduced energy intensity industry "The energy intensity of the industry sector could be directly reduced by about 25 % compared to the current level through the wide-scale upgrading, replacement and deployment of best available technologies, particularly in countries where these are not in use and in non-energy intensive industries" (SPM 4.2.3 Energy end-use sectors - Industry) [Government of Saint Lucia]</p>
SPM A-1232	SPM	29	11	29	26	SPM 4.3 + Figure SPM.14	<p>This is very important analysis but detail in Figure SPM14 is difficult to interpret. Perhaps use a table instead and include Figure 6.11 from WGIII. It would also be useful to state what emissions levels of key gases (CO2, CH4,N2O) are envisaged in 2050 and 2100. [Government of Ireland]</p>
SPM A-1233	SPM	29	12	29	14	SPM 4.3	<p>Insert: "Decarbonization happens more rapidly in electricity generation than in the industry, buildings, and transport sectors (medium evidence, high agreement). In the majority of low-stabilization scenarios, the share of low-carbon electricity supply (comprising renewable energy (RE), nuclear and CCS) increases from the current share of approximately 30 % to more than 80 % by 2050, and fossil fuel power generation without CCS is phased out almost entirely by 2100." Source: WG III, SPM p. 21 and</p> <p>"GHG emissions from energy supply can be reduced significantly by replacing current world average coal-fired power plants with modern, highly efficient natural gas combined-cycle power plants or combined heat and power plants, provided that natural gas is available and the fugitive emissions associated with extraction and supply are low or mitigated (robust evidence, high agreement).Carbon dioxide capture and storage (CCS) technologies could reduce the lifecycle GHG emissions of fossil fuel power plants (medium evidence, medium agreement)." Source: WG III, SPM p. 22. [Government of Saudi Arabia]</p>
SPM A-1234	SPM	29	12	29	16	SPM 4.3	<p>Insert: "Efficiency enhancements and behavioural changes, in order to reduce energy demand compared to baseline scenarios without compromising development, are a key mitigation strategy in scenarios reaching atmospheric CO2eq concentrations of about 450 or 500 ppm by 2100 (robust evidence, high agreement)." Source: WG III, SPM</p>

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							p. 21. [Government of Saudi Arabia]
SPM A-1235	SPM	29	13	29	13	SPM 4.3	Insert: "mitigation goals include decarbonizing THE ENERGY SUPPLY (i.e., reducing" [Government of United States of America]
SPM A-1236	SPM	29	13	29	14	SPM 4.3	Section 1.2 of the SPM highlights coal as a cause of the reversal of the long-standing global trend of decarbonization, but solutions are not mentioned explicitly in the SPM. Suggest that this sentence could be improved by adding points about the importance of phasing out coal-fired electricity and scaling up low-carbon electricity supply. Both of these subjects are covered on SYR page 110, lines 1-9. Specifically, we suggest that from this section, the benefits of scale up to 80% low-carbon electricity by 2050 could be highlighted in the SPM. Also, Table 4.5 on page SYR-111 highlights replacing coal in three of its four mitigation measures described for energy supply. The proposed edit for page 29, lines 13-14 is: "Key measures to achieve such mitigation goals include phasing out traditional coal-fired electricity generation and increasing the share of low-carbon electricity supply to as much as 80% by 2050, as well as efficiency enhancements..." [Government of Canada]
SPM A-1237	SPM	29	13	29	14	SPM 4.3	The explanation of decarbonization should be moved to the first mentioning of this expression in the SPM on P 8 L 27. [Government of Germany]
SPM A-1238	SPM	29	13	29	14	SPM 4.3	Does "decarbonizing" really only relate to electricity generation? WGIII SPM uses "Decarbonising (i.e. reducing the carbon intensity of) electricity generation...". [European Union]
SPM A-1239	SPM	29	16	29	16	SPM 4.3	Insert: "Bioenergy can play a critical role for mitigation, but there are issues to consider, such as the sustainability of practices and the efficiency of bioenergy systems (robust evidence, medium agreement)." Source: WG III, SPM p. 26. [Government of Saudi Arabia]
SPM A-1240	SPM	29	16	29	17	SPM 4.3	This first part of the sentence could be more clearly developed and emphasized, with a reference to the UN mechanism REDD+. [Government of Sweden]
SPM A-1241	SPM	29	16	29	19	SPM 4.3	In this case cost effective a generic economic idea that exclude social costs of afforestation. A large quantity of literature (e.g. Smith K., 2007, the carbon neutral myth, offset indulgencies for your climate sins) that show the high social cost of afforestation. Please include a observation to clarify the exclusion of social costs. [Government of Venezuela]
SPM A-1242	SPM	29	18	29	19	SPM 4.3	It might worth mentioning these land management practices will be providing limited potential for mitigation once the soil sink approaches an equilibrium level and adoption reaches the capacity. [Government of Canada]
SPM A-1243	SPM	29	19	29	19	SPM 4.3	Insert: "The economic mitigation potential of supply-side measures is estimated to be 7.2 to 11 GtCO ₂ eq/year in 2030 for mitigation efforts consistent with carbon prices up to 100 USD/tCO ₂ eq, about a third of which can be achieved at a < 20 USD/tCO ₂ eq (medium evidence, medium agreement)." Source: WG III, SPM p. 25. [Government of Saudi Arabia]
SPM A-1244	SPM	29	20	29	20	SPM 4.3	Insert: "Some mitigation policies raise the prices for some energy services and could hamper the ability of societies to expand access to modern energy services to underserved populations (low confidence). These potential adverse side-effects can be avoided with the adoption of complementary policies (medium confidence). Most notably, about 1.3 billion people worldwide do not have access to electricity and about 3 billion are dependent on traditional solid fuels for cooking and heating with severe adverse effects on health, ecosystems and development. Providing access to modern energy services is an important sustainable development objective. The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 and 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement). A transition away from the use of traditional biomass and the more efficient combustion of solid fuels reduce air pollutant emissions, such as sulfur dioxide (SO ₂), nitrogen oxides (NO _x), carbon monoxide (CO), and black carbon (BC), and thus yield large health benefits (high confidence)." Source: WG III, SPM p. 30. [Government of Saudi Arabia]

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							Arabia]
SPM A-1245	SPM	29	20	29	26	Figure SPM.14	The figure SPM.14 integrates the first two parts of the respective figure 4.1 (SYR P 107). However, the information on the scenarios "without CCS" is missing. We suggest to add the missing part to the figure SPM.14. In addition, what does "80 GtCO ₂ /yr" in the third panel mean? [Government of Germany]
SPM A-1246	SPM	29	20	29	26	Figure SPM.14	Figure SPM 1.4 Suggest additional discussion of the non-CO ₂ emissions is required given the diverse range of gases and source activities included. Overall it would seems that emissions relative to the baseline are reduced by 50%, but is this due to reduction in HFCs, fossil methane, biogenic methane, N ₂ O? Some insight into the contribution from each sector to this divergence from baseline is required. For example, reduction in fossil methane may be achieved through the same measures which reduce CO ₂ emissions from Fossil Fuels. [Government of Ireland]
SPM A-1247	SPM	29	20	29	26	Figure SPM.14	Figure SPM 14 Additional information on non-CO ₂ emissions may be required given the diverse range of gases and source activities included. Overall it would seems that emissions relative to the baseline are reduced by 50%, but is this due to reduction in HFCs, fossil methane, biogenic methane, N ₂ O? Some insight into the contribution from each sector to this divergence from baseline is required. [Government of Ireland]
SPM A-1248	SPM	29	20			Figure SPM.14	Please change title to "Direct and non-CO ₂ emissions by major sectors" and delete duplicated information in the inset (Max, 75%, Median, etc.) as it is the same for both the baseline and the mitigation scenarios. [Government of Germany]
SPM A-1249	SPM	29	21	29	21	Figure SPM.14	This graph only represents direct emissions. This gives the incorrect impression that almost all mitigation needs to take place in electricity generation while the potential for industry and buildings is minor. We therefore suggest to assign emissions to the sector where the energy is used, or, as a minimum SPM-14 is put in perspective with the following text: "Direct emissions as assigned to sectors in figure SPM-14 do not represent the emission reduction potential that arises from energy saving and energy efficiency improvements, which predominantly occur in the industry and particularly in buildings. [Government of Netherlands]
SPM A-1250	SPM	29	21			Figure SPM.14	Figure SPM.14. Are negative emissions for Electricity in 2100 due to BECCS? Suggest identifying this. [Government of Canada]
SPM A-1251	SPM	29	22	29	26	Figure SPM.14	In the first leftmost panel undertext "land use (net)", please explain in the caption what is meant by "net": emissions and removals. [Government of Norway]
SPM A-1252	SPM	29	25	29	26	Figure SPM.14	That many models cannot reach 450 ppm in the absence of CCS should be explained (e.g., adding a qualifier "...due to model limitations in technology assumptions" [Government of Sweden]
SPM A-1253	SPM	29	28	29	30	SPM 4.3	Behavior, lifestyle... : delete this sentence, since, behavioral, cultural and lifestyle practices can be changed with appropriate financial incentives or disincentives. [Government of India]
SPM A-1254	SPM	29	28	29	31	SPM 4.3	This is an important para with clear and policy relevant findings. [Government of Norway]
SPM A-1255	SPM	29	28	29	32	SPM 4.3	The paragraph beginning "Behavior, lifestyle and culture..." is largely redundant with a similar statement found p. 27 line 6-9. [Government of United States of America]
SPM A-1256	SPM	29	31	29	31	SPM 4.3	The authors should insert "behaviors and lifestyles, such as changes in" prior to "consumption" [Government of United States of America]
SPM A-1257	SPM	29	34	29	34	SPM 4.4	Technology development and transfer/diffusion is a goal not a policy approach as implied by the original heading. Replace existing text with: 4.4 Policy options to spur effective mitigation and adaptation responses from a local to global level [Government of United Kingdom of Great Britain & Northern Ireland]

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SPM A-1258	SPM	29	34	31	34	SPM 4.4, SPM 4.5	Session 4.4 and 4.5: These two sections are worth to be being separate section considering the contents in the underlying report. However, these two parts in the SPM are not giving clear messages at all. In a sense, as SPM is set for policymakers, it would be better to merge into a section with messages focused on integrated policies on mitigation, unless revise each subsection with more supportive information referred to the related sections in the underlying report. [Government of Republic of Korea]
SPM A-1259	SPM	29	36	29	38	Headline 4.4	Please include the sentence from P 30 L 1-2 in the headline statement: "Substantial reductions in emissions would require large changes in investment patterns (high agreement, robust evidence)." Furthermore, the current first sentence of the headline statement might be dropped - it doesn't convey any clear message ("Effective adaptation and mitigation responses will depend on policies and measures across a range of scales" - how shall the reader understand "a range of scales"?). [Government of Germany]
SPM A-1260	SPM	29	36	29	38	Headline 4.4	Mixes up adaptation and mitigation. Additionally the term technology diffusion is used more widely in the text and underlying chapters than technology transfer. Technology transfer has taken a more narrow and specific meaning in the negotiations around IPRs – the use of a broader term is more appropriate. The fact that international cooperation is critical for mitigation is a key point of interest to policy makers so should be in the headline statements. Replace existing text with: Effective adaptation and mitigation responses will depend on policies and measures across a range of scales. International cooperation is critical for effective mitigation. Support for technology development and diffusion, and finance for climate responses, can complement policies that directly promote adaptation and mitigation. {4.4} [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1261	SPM	29	37	29	38	Headline 4.4	Words 'can complement' may be replaced by 'is critical to support' [Government of India]
SPM A-1262	SPM	29	37	29	38	Headline 4.4	The description of support for finance and technology transfer was deleted through the approval process of WG3 SPM, thus this description should be deleted. Otherwise, we would like to propose to quote from page 113 line25-26 of SYR as follows: "Existing and proposed international climate change cooperation arrangements vary in their focus and degree of centralization and coordination". [Government of Japan]
SPM A-1263	SPM	29	38	29	38	Headline 4.4	Mitigation, adaptation, technology and financing are crucial to deal with climate change, a challenge that would be almost impossible to meet without the latter two. It is necessary to emphasize the role of technology and funding not just as a complement to mitigation and adaptation. It is suggested to replace 'complement' with a more appropriate word. [Government of China]
SPM A-1264	SPM	29		29		Figure SPM.14	Figure SPM.14, there should be a stronger contrast between faded and solid colours. Now they are so close to another that is difficult to separate them. [Government of Finland]
SPM A-1265	SPM	29		29		Figure SPM.14	In Figure SPM.14 the smaller scale of changes for land-use and buildings makes it hard to read them. [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1266	SPM	29				SPM 4.3	delete 'energy use and associated' [Government of Saudi Arabia]
SPM A-1267	SPM	29				Figure SPM.14	Figure SPM.14. Request explanation of why this figure, in comparison with Figure 4.1 in the longer report, uses different sector names (e.g. land use / AFOLU) and places sectors in a different order. Also request that additional information be provided in the notes that the estimates include CCS. Further request that a figure exhibiting emission ranges that are not inclusive of CCS also be included to ensure that readers understand that mitigation options, which "exist in every major sector" (p29, line3), are not limited to those with CCS, as this is the only figure presenting sector-specific details. [Government of Japan]
SPM A-1268	SPM	29				Figure SPM.14	Figure SPM.14: We appreciate this Figure, it communicates well but could benefit from more space. The bars, especially in the buildings sector are too small. Could you show this in two panels. One with the larger contributors:

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							electricity, non-co2 and industry, and one with the others, changing the scale og the y-axis? Also, the legend in the Figure would benefit from enhancing the difference between baseline (faded) and mitigation (solid) scenarios. Please also consider moving the indication of the 2010 level first (before 2030). And also explain this in the figure caption. [Government of Norway]
SPM A-1269	SPM	30	1	30	2	SPM 4.4	The statement contained in the main text (P 113 L 9-11) conveys a much clearer message: "Because climate change has the characteristics of a collective action problem at the global scale, effective mitigation will not be achieved if individual agents advance their own interests independently, even though mitigation can also have local co-benefits." [Government of Germany]
SPM A-1270	SPM	30	1	30	2	SPM 4.4	The message that mitigation actions take place at various levels is also needed here. [Government of Ireland]
SPM A-1271	SPM	30	1	30	2	SPM 4.4	The existing sentence is policy-prescriptive: "International cooperation is critical for effective mitigation..." As agreed to in Berlin at the WG3 Approval Session, a more appropriate phrasing can be found inth WG3 SPM, p. 5: "Effective mitigation will not be achieved in individual agents advance their own interests independently." The text should be changed to reflect this policy-relevant, but not policy-prescriptive language. [Government of United States of America]
SPM A-1272	SPM	30	2	30	3	SPM 4.4	Reference may be obtained with section 2.2 of SPM of WG-II [Government of India]
SPM A-1273	SPM	30	5	30	5	SPM 4.4	Word 'main' may be replaced by 'legitimate' [Government of India]
SPM A-1274	SPM	30	5	30	6	SPM 4.4	"...is the main multilateral forum focussed on addressing climate change." Does this apply to adaptation as well as mitigation? Should the statement specify climate change mitigation? [Government of United States of America]
SPM A-1275	SPM	30	5	30	44	SPM 4.4	Why are findings presented as bullet points? Please follow the structure and style of the rest of the SPM [Government of Germany]
SPM A-1276	SPM	30	6	30	8	SPM 4.4	Suggest that this text could be more explicit in recognizing non-UNFCCC multilateral fora that enhance international cooperation to address specific emissions (e.g., methane, HFCs, SLCFs) or to address emissions in specific sectors (e.g. aviation, marine, agriculture). Also, the term "different levels of governance" does not seem to be correct with respect to the type of bodies being referred to here. [Government of Canada]
SPM A-1277	SPM	30	7	30	7	SPM 4.4	Words 'resulted in diversifying' may be replaced by 'complemented' [Government of India]
SPM A-1278	SPM	30	9	30	11	SPM 4.4	While this statement is directly from the WGIII SPM, it quite vague and there is only medium evidence and low agreement to support it (whereas most findings highlighted in the SPM are more robust). Recommend revising, and focusing on providing more meaning for readers in terms of lessons offered for the future. [Government of Canada]
SPM A-1279	SPM	30	10	30	10	SPM 4.4	Words 'success and failures in' may be added before 'implementation' [Government of India]
SPM A-1280	SPM	30	13	30	14	SPM 4.4	Linkage can be established with 3rd para of page 31 of SPM WG-III. [Government of India]
SPM A-1281	SPM	30	13	30	14	SPM 4.4	Line 'Potential adantages...liquidity' may be deleted. [Government of India]
SPM A-1282	SPM	30	13	30	14	SPM 4.4	Linkage can be established with 3rd para of page 31 of SPM WG-III. [Government of India]
SPM A-1283	SPM	30	15	30	15	SPM 4.4	Words 'and finances' may be added before 'for supporting..' [Government of India]

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SPM A-1284	SPM	30	19	30	19	SPM 4.4	Write:"... sub-national legislation, plans and strategies ...". [Government of Switzerland]
SPM A-1285	SPM	30	19	30	45	SPM 4.4	The list on P 30 on policy instruments at the national and subnational scale should mention all those given in Table 4.7 (P 118) rather than only presenting some of them. E.g., the current list does not address fossil fuel subsidy removal and subsidies for renewable energy (FITs). Please add at least these two very important instruments. [Government of Germany]
SPM A-1286	SPM	30	20	30	20	SPM 4.4	Is it the first mention of AR4? If yes, spell out. [Government of Switzerland]
SPM A-1287	SPM	30	21	30	21	SPM 4.4	Words 'and reduce adverse side effects' may be added after the words 'increase co-benefits'. [Government of India]
SPM A-1288	SPM	30	23	30	29	SPM 4.4	Oddly, there is nothing mentioned here about the value of mainstreaming adaptation/resilience into broader development planning in order to minimize risk. This was a fairly central theme of the WG2 report, no? [Government of United States of America]
SPM A-1289	SPM	30	25	30	25	SPM 4.4	Word 'Subnational' may be replaced by 'local' [Government of India]
SPM A-1290	SPM	30	25	30	25	SPM 4.4	Words 'and the private sector' may be deleted [Government of India]
SPM A-1291	SPM	30	25	30	25	SPM 4.4	"Subnational governments and the private sector are increasingly recognized as critical to progress in adaptation," Subnational governments, being elected by the people and having the responsibility of furthering and protecting people's interests, cannot be at the same level of the private sector. While subnational governments are critical for adaptation, the involvement of the private sector is desirable in articulation with governmental policies. [Government of Venezuela]
SPM A-1292	SPM	30	25	30	25	SPM 4.4	"Subnational governments and the private sector are increasingly recognized as critical to progress in adaptation," Subnational governments, being elected by the people and having the responsibility of furthering and protecting people's interests, cannot be at the same level of the private sector. While subnational governments are critical for adaptation, the involvement of the private sector is desirable in articulation with governmental policies. [Government of Bolivia]
SPM A-1293	SPM	30	30	30	31	SPM 4.4	"there is low confidence in observed global-scale trends in drought ...due to dependencies of observed trends on the choice of definition of drought." It sounds as though the problem here is that different studies in different regions used different definitions, hence one cannot make a global-scale assessment. A more clear way to state this might be to say "inconsistent definitions of drought used in studies considering different regions." [Government of United States of America]
SPM A-1294	SPM	30	30	30	32	SPM 4.4	Please add the information that cap/trade can lead to cost efficient mitigation along the lines of the WG3 SPM: "In principle, a cap and trade system can achieve mitigation in a cost-effective way; its implementation depends on national circumstances." [Government of Germany]
SPM A-1295	SPM	30	31	30	32	SPM 4.4	"loose caps or caps that have not proved [should be proven] to be constraining." What's the difference? [Government of United States of America]
SPM A-1296	SPM	30	32	30	34	SPM 4.4	The meaning of the following part of the sentence is not obvious: "... have helped weaken the link between GHG emissions and GDP" We would suggest to rephrase to "have helped to decouple GHG emissions and GDP". [Government of Denmark]
SPM A-1297	SPM	30	33	30	34	SPM 4.4	This sentence is almost verbatim from the WGIII SPM, but in the WGIII SPM it starts with the words "In some countries", which seems to be justified. In addition, there were two separate sentences, which tends to make the text more readable. Please check this and revert to the WGIII sentences if there is no reason to change. [Government of Belgium]

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SPM A-1298	SPM	30	33	30	34	SPM 4.4	The wording "helped weaken the link" is problematic in two ways. First, it implies that there is such a strong link (sure, one could say that there was historically when looked at through economic models that in themselves link GDP and emissions). Second, in reality it has more than weakened the link. There are many countries where the link has been broken. You could simply state that tax based policies have resulted in reduced emissions even as economies continue to grow. When you say "fuel taxes" you mean "primarily fiscal fuel taxes"? [Government of Sweden]
SPM A-1299	SPM	30	40	30	40	SPM 4.4	Word 'instruments' may be deleted [Government of India]
SPM A-1300	SPM	30	40	30	44	SPM 4.4	Insert: "Although most economic theory suggests that economy-wide policies for the singular objective of mitigation would be more cost-effective than sector-specific policies, since AR4 a growing number of studies has demonstrated that administrative and political barriers may make economy-wide policies harder to design and implement than sectorspecific policies." Source: WG III, SPM p. 29. [Government of Saudi Arabia]
SPM A-1301	SPM	30	41	30	41	SPM 4.4	Word 'former' may be replaced by 'later' [Government of India]
SPM A-1302	SPM	30	46	30	47	SPM 4.4	Should a 'low confidence' statement be included in the SPM of the SYR? Suggest considering removing this. [Government of Canada]
SPM A-1303	SPM	30	46	30	47	SPM 4.4	Timescales are extremely important for such blanket statements as this one. Some distinction might also be made between societal dynamics and individual community dynamics. If such distinctions are made, there is considerable data to support these conclusions and they are, therefore, not "low confidence" statements. The authors should re-examine the text with this in mind. [Government of United States of America]
SPM A-1304	SPM	30	46	30	51	SPM 4.4	In order to have a balanced presentation of the impacts of mitigation policies, the co-benefits of mitigation action should be mentioned in this section, where the potential for adverse side-effects is described. [Government of Denmark]
SPM A-1305	SPM	30	46	30	51	SPM 4.4	Mitigation policy is rather negatively framed here. Why is the negative statement in the first sentence with only low confidence lifted into the SYR-SPM? WG3 provides plenty of information about the co-benefits of mitigation, and clearly shows that they outweigh the adverse side effects. The para should start with information on the co-benefits of mitigation using for example the messages of the SPM of WG3 on P 19: "Mitigation scenarios reaching about 450 or 500 ppm CO2eq by 2100 show reduced costs for achieving air quality and energy security objectives, with significant co-benefits for human health, ecosystem impacts, and sufficiency of resources and resilience of the energy system; these scenarios did not quantify other co-benefits or adverse side-effects (medium confidence)." (see also the rest of this paragraph). Please see also our comment on the information provided on fossil fuel subsidies. [Government of Germany]
SPM A-1306	SPM	30	46	30	51	SPM 4.4	The opposite is also true. To give one side of the story therefore gives the wrong impression. Suggest after "medium confidence)." in line 49, insert "On the other hand some mitigation technologies will lower the cost of expanding access to energy e.g. distributed renewable energy where energy distribution infrastructure is limited". [Government of Ireland]
SPM A-1307	SPM	30	47	30	49	SPM 4.4	Request revision of text on avoidance of side-effects by adopting benefit transfer mechanisms to be in line with WG3 SPM; so as to facilitate sound discussions at the plenary. [Government of Japan]
SPM A-1308	SPM	30	48	30	48	SPM 4.4	Word 'avoided' may be replaced by the word 'reduced' [Government of India]
SPM A-1309	SPM	30	49	30	50	SPM 4.4	Regarding the statement "At the same time, reducing subsidies for GHG-related activities in various sectors...", the term 'GHG-related activities' is vague and could refer to any activity that has GHG emissions or even benefits. Suggest being more precise here as it appears to be referencing fossil-fuel related activities or high-emitting GHG activities. [Government of Canada]

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SPM A-1310	SPM	30	49	30	51	SPM 4.4	Please add information from the WG3 TS that reduction of subsidies to fossil energy can achieve significant emission reductions at negative social cost (very high confidence). The modified sentence would read: "At the same time, reducing subsidies for GHG-related activities in various sectors can achieve emission reductions at negative social costs, depending on the social and economic context (high confidence)." [Government of Germany]
SPM A-1311	SPM	30	49	30	51	SPM 4.4	The sentence beginning "At the same time" could be further elaborated. Suggest in line 50 after "related activities", insert "e.g. fossil fuel extraction and use". In line 51, after "context", insert "while increasing the availability of government revenue for other purposes including climate response". [Government of Ireland]
SPM A-1312	SPM	30	51	30	51	SPM 4.4	The sentence 'The overall net effect of these regulatory and economic tools on an economy, will be different for different countries, depending on the stage of development and natural circumstances of a country' may be added after the end of the paragraph. [Government of India]
SPM A-1313	SPM	30	52			SPM 4.4	Insert: "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The effect of mitigation on natural gas export revenues is more uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of CCS would reduce the adverse effect of mitigation on the value of fossil fuel assets (medium confidence)." Source: WG III, SPM p. 18. [Government of Saudi Arabia]
SPM A-1314	SPM	30	53	30	53	SPM 4.4	Sentence may be ended after the words 'policies' and words 'In addition' may be added before the words 'many adaptation efforts' [Government of India]
SPM A-1315	SPM	30	53	30	54	SPM 4.4	Consider deleting the word "development" - at least with respect to technologies. Unlike mitigation, the vast majority of adaptation issues can be addressed through existing technologies - thereby placing the focus on diffusion and management. [Government of Canada]
SPM A-1316	SPM	30	53	30	54	SPM 4.4	This sentence implies that only adaptation "relies on development and diffusion of technologies and management practices", but mitigation does not. This is not consistent with the remaining text, please modify. [Government of Germany]
SPM A-1317	SPM	30	53	30	54	SPM 4.4	This description, which argues the importance of technology policy along with mitigation measures, is quite important, therefore, should be maintained. [Government of Japan]
SPM A-1318	SPM	30	53	30	57	SPM 4.4	On adaptation technologies, the key might be on effective dissemination. This statement is extracted from SYR, page 121: 2-4: "Adaptation technologies are often familiar and already applied elsewhere, but their effective use depends on an appropriate institutional, regulatory, social and cultural context (high confidence)." [European Union]
SPM A-1319	SPM	30	55	30	55	SPM 4.4	Please, explain abbreviation "R&D" at first appear. [Government of Russian Federation]
SPM A-1320	SPM	30	56	30	56	SPM 4.4	The sentence 'and supportive policies for smooth transfer of technologies linked to condition in both developed and developing countries. [Government of India]
SPM A-1321	SPM	31	1	31	1	SPM 4.4	Words 'over the next two decades upto 2029' may be added after the words 'investment patterns'. [Government of India]
SPM A-1322	SPM	31	1	31	2	SPM 4.4	Please translate the confidence statement "high agreement, robust evidence" into "high confidence" according to the uncertainty guidelines. [Government of Germany]
SPM A-1323	SPM	31	2	31	4	SPM 4.4	With regard to this statement, recommend elaborating a bit on the types of low-carbon electricity supply that might contribute, particularly hydro which is technologically mature and can provide consistent base-load power. [Government of Canada]

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SPM A-1324	SPM	31	2	31	4	SPM 4.4	Insert: "Current climate action plans focus largely on energy efficiency." "Annual incremental energy efficiency investments in transport, buildings and industry is projected to increase by about USD 336 (1 – 641) billion (limited evidence, medium agreement), frequently involving modernization of existing equipment." Source: WG III, SPM p. 27. [Government of Saudi Arabia]
SPM A-1325	SPM	31	2	31	6	SPM 4.4	Please consider to include the quantifications of the changes in the investment flows given in WGIII SPM Section 5.1 page 27. [Government of Norway]
SPM A-1326	SPM	31	4	31	4	SPM 4.4	Words 'before 2030' may be deleted [Government of India]
SPM A-1327	SPM	31	5	31	5	SPM 4.4	Words 'private sector, along with the public' may be replaced by the words 'public sector supported by private' [Government of India]
SPM A-1328	SPM	31	8	31	8	SPM 4.4	Word 'Limited' may be deleted [Government of India]
SPM A-1329	SPM	31	8	31	9	SPM 4.4	The picture presented here seems too be unbalanced. There is a financing gap for both adaptation and mitigation. However, the financial gap for mitigation is not mentioned here. If the paragraph is considered necessary, it should incorporate the respective findings for mitigation as well. Furthermore, if there is limited evidence, how can the confidence level attributed to this statement be "medium confidence"? [Government of Germany]
SPM A-1330	SPM	31	8	31	9	SPM 4.4	The sentence "limited evidence indicates a gap between global adaptation needs and the funds available for adaptation (medium confidence) " is very likely to be misread. As we understand, the above statement is meant to reflect that there is a funding gap and growing adaptation deficit while the relevant research is limited. It is suggested to use the original words in bold in the last paragraph on page 3, Chapter 17, WGII instead: "Global adaptation cost estimates are substantially greater than current adaptation funding and investment, particularly in developing countries, suggesting a funding gap and a growing adaptation deficit." [Government of China]
SPM A-1331	SPM	31	8	31	9	SPM 4.4	Does this sentence mean there is not much evidence of a gap or that there is a gap but the evidence is poor? [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1332	SPM	31	8	31	19	SPM 4.4, SPM 4.5	It is not appropriate to have confidence statements in the headline statements - these should be deleted [Government of United Kingdom of Great Britain & Northern Ireland]
SPM A-1333	SPM	31	9	31	12	SPM 4.4	Considering the debate on financing for adaptation at WG2 plenary and the agreement on the need for a better assessment of adaptation costs and funds, request replacement with following text from WG2 SPM, p28: There is a need for a better assessment of global adaptation costs, funding, and investment. Studies estimating the global cost of adaptation are characterized by shortcomings in data, methods, and coverage (high confidence). [Government of Japan]
SPM A-1334	SPM	31	10	31	11	SPM 4.4	There is not only a need for better assessment of adaptation funding and investment, but the same is true for mitigation, although the knowledge gaps might be more substantial on the adaptation side. However, presenting only the knowledge gap regarding adaptation presents a rather unbalanced picture. The sentence should be either removed or amended by adding respective findings with regard to mitigation. Assessment results could be borrowed inter alia from the executive summary of chapter 16, WG3, second paragraph, that reads "Scientific literature on investment and finance to address climate change is still very limited and knowledge gaps are substantial; there are no agreed definitions for climate investment and climate finance. Quantitative data are limited, relate to different concepts, and are incomplete. Accounting systems are highly imperfect." [Government of Germany]
SPM A-1335	SPM	31	11	31	12	SPM 4.4	IPCC report on SREX may be referred [Government of India]
SPM A-1336	SPM	31	14	31	34	SPM 4.5	It is suggested to include the full content of Section C2 of the WG2 SPM in this Section, in particular regarding the notion that prospects for climate-resilient pathways for sustainable development are related fundamentally to what the world accomplishes with climate-change mitigation, and the notion of transformation that is dropped from the last

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							paragraph in the SYR. [Government of Germany]
SPM A-1337	SPM	31	14			SPM 4.5	Interaction between mitigation and adaptation shall include 'economic diversification' [Government of Saudi Arabia]
SPM A-1338	SPM	31	14			Headline 4.5	A very clear statement from SYR could be inserted here (page 123: 23-24): "Integration of adaptation and mitigation into planning and decision making can create synergies with sustainable development (high confidence). A multi-objective approach to policy-making can help manage synergies and trade-offs". [European Union]
SPM A-1339	SPM	31	15	31	19	Headline 4.5	This box should more clearly call out co-benefits of mitigation measures (per overall report comment). "pursuit of other societal objectives" doesn't really convey the advantages of mitigative actions. Suggested wording: "...many opportunities to use integrated responses to link mitigation, adaptation and the pursuit of other societal objectives such as those related to human health, food security, environmental quality, energy access, livelihoods, and sustainable development..." [Government of United States of America]
SPM A-1340	SPM	31	21	31	21	SPM 4.5	Words 'as threat multiplier' may be added before the word 'exacerbates' [Government of India]
SPM A-1341	SPM	31	21	31	25	SPM 4.5	We think it would be very policy relevant to compare early to postponed action. The longer document has some good language that we suggest to include in the SPM: "In an iterative risk management framework, inertia in the economic and climate systems and the possibility of irreversible impacts from climate change increase the benefits of near-term mitigation efforts (high confidence). The actions taken today affect the options available in the future to reduce emissions, limit temperature change, and adapt to climate change. Near-term choices can create, amplify or limit significant elements of lock-in that are important for decision-making." (page 84, lines 39-43) and: "Near-term reductions in energy demand are an important element of cost-effective mitigation strategies, provide more flexibility for reducing carbon intensity in the energy supply sector, hedge against related supply-side risks, avoid lock-in to carbon-intensive infrastructures, and are associated with important co-benefits." (page 106, lines 26-29) [Government of Netherlands]
SPM A-1342	SPM	31	22	31	22	SPM 4.5	Words 'and constraining possible development, that further eroding the basis for sustainable development' may be added after the word 'poor' [Government of India]
SPM A-1343	SPM	31	22			SPM 4.5	Please reverse the order of "mitigation" and "adaptation": Mitigation is the first option to address climate change. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
SPM A-1344	SPM	31	23	31	23	SPM 4.5	Words 'high confidence' may added in brackets after the word 'mitigation' [Government of India]
SPM A-1345	SPM	31	23	31	25	SPM 4.5	The SYR text, section 4.5.(page 123: 15-17) , gives a very high confidence to the statement on interactions, not a medium confidece as stated in SPM. [European Union]
SPM A-1346	SPM	31	29	31	29	SPM 4.5	Words 'high confidence' may added in brackets after the word 'management' [Government of India]
SPM A-1347	SPM	31	29	31	29	SPM 4.5	Consider adding: e.g. job creation and better air quality. [Government of United States of America]
SPM A-1348	SPM	31	29	31	30	SPM 4.5	The wording is a bit vague. Explain that the tools and structures are needed for greater policy coherence and integration through multi-objective policy strategies? [Government of Sweden]
SPM A-1349	SPM	31	30	31	30	SPM 4.5	Word 'adequate' may be deleted [Government of India]

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SPM A-1350	SPM	31	30	31	30	SPM 4.5	Words 'institutional and human capacity' may be replaced by 'upgrading human and institutional capacity for institutional supporting effective decisions for climate resilient pathway' [Government of India]
SPM A-1351	SPM	31	31	31	31	SPM 4.5	Word 'use' may be added after the word 'water' [Government of India]
SPM A-1352	SPM	31	31	31	31	SPM 4.5	Suggest writing that "Integrated responses (or multi-objective strategies) are especially relevant to urban, transport and energy planning..." [Government of Sweden]
SPM A-1353	SPM	31	31	31	33	SPM 4.5	Urbanization deserves its own paragraph and not mixing up with interactions among water... carbon sequestration, as it is in SYR section 4.5 page 123: 55-56: "An integrated response to urbanization provides substantial opportunities for enhanced resilience, reduced emissions, and more sustainable development (medium confidence)". [European Union]
SPM A-1354	SPM	31	32	31	32	SPM 4.5	Word 'generation' may be added after the word 'energy' [Government of India]
SPM A-1355	SPM	31	32	31	32	SPM 4.5	Words 'fiber production' may be added after the word 'food' [Government of India]
SPM A-1356	SPM	31	32	31	32	SPM 4.5	To reflect WG3 and given this paragraph's sustainable development theme, should include "carbon capture" alongside (but distinct from) "sequestration"; "sequestration" alone suggests power plant CCS and reads as CO2-centric, neglecting, e.g., capture of fugitive methane for further energy system use (with or without downstream sequestration). For example, Chapter 7, WG3 flags that fugitive methane, if captured by the Nigerian natural gas industry, could substantially meet regional energy needs (p. 47, part of Box 7.1, "Energy systems of LDCs", Ch. 7, WG3 - see email attachment: "ipcc_wg3_ar5_ch7 - YA excerpts for SYR_FGD rev.pdf"). [Government of United States of America]
SPM A-1357	SPM	31	33	31	33	SPM 4.5	Words 'medium confidence' may added in brackets after the word 'development' [Government of India]
Intro A-1	Introduction	33	3	33	3	Box 1	It is not clear what is meant by "high level". [Government of Switzerland]
Intro A-2	Introduction	33	5	33	5	Box 1	Write:"The SYR integrates the main findings ...". [Government of Switzerland]
Intro A-3	Introduction	33	24	33	24	Box 1	Insert a paragraph explaining the references in curly brackets at the end of the statements. [Government of Switzerland]
Intro A-4	Introduction	33	27	33	28	Box 1	"Risk is the potential for consequences" may be replaced with "Risk is the potential of losing something of value." [Government of Turkey]
Intro A-5	Introduction	33	27	33	29	Box 1	For consistency, suggest that the definition of risk used here should be the same as that in the approved WG II SPM (Background box SPM.2). Note that the definition in this paragraph is the same that was in the FGD of the WGII SPM, and also differs slightly from the definition that appears in the WGII Glossary. [Government of Canada]
Intro A-6	Introduction	33	38	33	41	Box 1	It is suggested to delete these four lines in the introductory box. This topic should only be addressed under topic 4 in order not to confuse the reader. [Government of Austria]
Intro A-7	Introduction	33	39			Box 1	What is meant with "investments"? Do you refer to financial investments? Please clarify. [Government of Germany]
Intro A-8	Introduction	33	40	33	41	Box 1	One of the important co-benefits of climate change mitigation action, e.g. on emissions from the transport sector, is improved air quality. I would suggest making this explicit: "Co-benefits arise when investments in adaptation or mitigation can be managed to yield increased welfare from improved economic growth, public health, air quality or

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							infrastructure." [Government of United Kingdom of Great Britain & Northern Ireland]
Intro A-9	Introduction	33	46	33	46	Box 1	Editorial: < 'tail' > should be replaced by < 'tail' > (ie quotation mark after the word tail as well as before it). [Government of New Zealand]
Intro A-10	Introduction	33	50	33	50	Box 1	"amplify climate change atmosphere" appears to be an error, or its meaning is unclear. [Government of United Kingdom of Great Britain & Northern Ireland]
Intro A-11	Introduction	33	50			Box 1	Editorial: Delete "atmosphere" at the end of the line. [Government of New Zealand]
Intro A-12	Introduction	33		34		Box 1	Misspelling of IPCC in the header. [Government of Sweden]
Intro A-13	Introduction	34	17	34	32	Box 2	Please consider to include Figure 1 and Table 1 from the IPCC Guidance note on uncertainty (2010) in this para of the Box Introduction.2. Rationale: We believe that a structured visualisation is of great support for these language technicalities. We believe that the fact that lead authors once needed visual guidance to implement this language in their assessments is a really good argument to also give this visual guidance explicitly, not only as a reference, to the readers of the SYR. [Government of Norway]
Intro A-14	Introduction	34	31			Box 2	The understanding of the uncertainty language of the AR5 is key to the SYR. It is therefore suggested to at least include the Figure from the AR5 Uncertainty Guidance Note that is reproduced, e.g. in the TS of WG1 in Box TS.1. It would also be helpful to improve the format of the information, using table-like style for the difference qualifiers like in WG1 Box TS.1 or WG2 Box TS.3. Please stress the uncertainty language in AR5 is different from that of AR4. [Government of Germany]
T1 A-1	Topic 1	35	1	55	11	general	The relation between 1.4 to other Topic 1 sections, especially 1.3, is not well described. In 1.4, a distinction is made between detection (sections 1.2 and 1.3?) and attribution. Both 1.3 and 1.4 seem to look into attribution so it would be good to state more clearly how 1.4 is complementary to 1.3, and what is being statistically analyzed: observations or simulations (and refer to appropriate sections). [Government of United States of America]
T1 A-2	Topic 1	35	3	35	3	Headline 1	The first sentence has 2 ideas and it is not conveyed that they are linked, i.e., that the human influence is via increase in GHG. [Government of United States of America]
T1 A-3	Topic 1	35	3	35	3	Headline 1	Does "clear" mean "virtually certain"? [Government of United States of America]
T1 A-4	Topic 1	35	4	35	4	Headline 1	How long is "ever"? [Government of United States of America]
T1 A-5	Topic 1	35	5	35	5	Headline 1	See the New Zealand Government comments regarding page SPM5 lines 24-25, where we suggest the word "consequential" should not be used because of its different meaning in UK English and American English. Please deal with this line in Topic 1 in the same way as you deal with it in the SPM. [Government of New Zealand]
T1 A-6	Topic 1	35	5	35	5	Headline 1	What is meant by "consequential impacts"? [Government of United States of America]
T1 A-7	Topic 1	35	20	35	20	Headline 1.1	How is "unequivocal" defined? Is it "virtually certain"? [Government of United States of America]
T1 A-8	Topic 1	35	23	36	20	Figure 1.1	The caption is very detailed, perhaps overly. It seems other figures do not have referrals to other sections that are as excessive. In panel e, not clear if white means no data or no significant change. [Government of United States of America]
T1 A-9	Topic 1	35	24	35	24	Figure 1.1	Provide error bars for: (a) annual average temperature, and (c) Antarctic sea ice extent [Government of United States of America]

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T1 A-10	Topic 1	35		55		general	Misspelling of IPCC in the header. [Government of Sweden]
T1 A-11	Topic 1	36	16	36	16	Caption 1.1	Replace "WGI Figure 3.2" to "WGI Figure 3.13; WGI Figure TS.1" for correction. [Government of Japan]
T1 A-12	Topic 1	36	24	36	25	1.1.1	The order of words is a little awkward. Better: Over each of the last three decades, the Earth's surface has been successively warmer ... [Government of United States of America]
T1 A-13	Topic 1	36	34	36	34	1.1.1	Please consider inserting a separate para that deals with regional temperature trends: "For the longest period when calculation of regional trends is sufficiently complete (1901 to 2012), almost the entire globe has experienced surface warming. There are relatively large regional differences in observed temperature increase (see Figure 1.1 (b)). Multiple lines of evidence support very substantial Arctic warming since the mid-20th century.". Rationale: We believe it is important that also regional findings are reflected in the SYR, and think a reference to Figure 1.1 b is appropriate. Especially because of the rapid rate of change observed in the Arctic region this region merits a separate statement. [Government of Norway]
T1 A-14	Topic 1	36	39	36	39	1.1.1	"El Niño" replace for "El Niño Southern Oscillation " [Government of Argentina]
T1 A-15	Topic 1	36	42	36	43	1.1.1	If the actual numerical rate of change is not given, then is there a need to state what level of confidence there is? Or is the intent to state that there is medium confidence that the troposphere is warming at a steady rate? Also not clear if we have better knowledge about vertical structure or if the rate is changing with altitude. [Government of United States of America]
T1 A-16	Topic 1	37	3	37	7	1.1.2	Statement is confusing because nothing is said about the 700-300m depth. In Chapter 3 (WG1) the statement is somewhat more complete (but also a bit confusing). Maybe just indicate lack of data for the deeper layers of the oceans? [Government of Chile]
T1 A-17	Topic 1	37	8	37	8	Figure 1.2	The small wedges in this figure are so much smaller than the big ones that relative sizes are difficult to estimate by eye, even approximately. Could some numbers (e.g. for the year 2100) be added? [Government of United States of America]
T1 A-18	Topic 1	37	8			Figure 1.2	Figure 1.2: Please add an axis right to the graph indicating the percentages of energy accumulated in each component of the Earth system. [Government of Germany]
T1 A-19	Topic 1	37	24	37	25	1.1.2	Please consider to add the following text from WGI SPM (p. 12): "corresponding to a 26% increase in hydrogen ion concentration" [Government of Norway]
T1 A-20	Topic 1	37	24	37	28	1.1.2	As comment above, there needs to be more explanation here of what 0.1 means in the historical context. It's hard for a reader to tell whether 0.1 is a small or large change in pH. [European Union]
T1 A-21	Topic 1	37	24			1.1.2	The meaning of "pH" might not be known to lay readers. Please explain using a footnote. [Government of Germany]
T1 A-22	Topic 1	37	25	37	28	1.1.2	Please mention the existence of low-oxygen zones in coastal regions in this para, see SYR P 69 L 26-27 "The progressive expansion of Oxygen Minimum Zones and anoxic 'dead zones' in the oceans...". [Government of Germany]
T1 A-23	Topic 1	37	26	37	26	1.1.2	To keep consistency with the description in WG1 TS.2.8.5, "the open ocean" should be corrected to "the open ocean thermocline." Oxygen decline is observed mainly in the thermocline, not whole depths. [Government of Japan]
T1 A-24	Topic 1	37	26	37	26	1.1.2	"oxygen concentrations have decreased..." Would be nice here to say why. [Government of United States of America]
T1 A-25	Topic 1	37	27			1.1.2	WGI SPM B.2 is here an incorrect citation; the correct citation regarding oceanic CO2 uptake is WGI SPM B.5. [Government of Germany]

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T1 A-26	Topic 1	38	6	38	6	1.1.3	Written: "permafrost temperatures have increased in most regions since the early 1980s". Deep permafrost temperature has not changed. Clarification is needed. [Government of Russian Federation]
T1 A-27	Topic 1	38	6	38	8	1.1.3	The existence of "strong regional differences" is not indicated in "Antarctic sea ice area" but "annual rate of Antarctic sea ice area". Corresponding description in the SPM of WG1 report is as follows: "There is high confidence that there are strong regional differences in this annual rate, with extent increasing in some regions and decreasing in others." (WG1 SPM. B.3) [Government of Japan]
T1 A-28	Topic 1	38	7	38	8	1.1.3	"Antarctic sea ice area, with a very likely increase in total area" - There is a problem here due to the controversy that has been published in the peer-reviewed article on "Sudden increase in Antarctic sea ice: Fact or Artifact?" (Screen, JGR, doi:10.1029/2011GL047553, 2011) and another peer-review article on "A spurious jump in the satellite record: has Antarctic sea ice expansion been overestimated?" (Eisenman et al., The Cryosphere, 8, 1289D1296, doi:10.5194/tc-8-1289-2014, 2014), which questions whether or not and also the amount of increase in Antarctic sea ice area. The problem is that the IPCC AR5 WGI report on Arctarctica sea ice change is primarily based on results from one algorithm (the Bootstrap algorithm) while not including results from many other algorithms, as such is not robust and not representative of results from the community. This weakness in the robustness of Antarctica sea ice change using one algorithm is one of the key review comments of the IPCC AR5 WGI report, which was not adequately addressed. The authors should strongly consider omitting statements about Antarctic sea ice trends given this new research. Understandably, new research cannot be reflected in the SYR, but it would also reflect poorly on the IPCC if it stated conclusions that are still under significant debate. In light of this information, we suggest the authors consider if the text should be reformulated in any way. [Government of United States of America]
T1 A-29	Topic 1	38	8	38	8	1.1.3	Include timespan for Antarctica se-ice increase. [Government of Chile]
T1 A-30	Topic 1	38	11	38	13	1.1.3	"the rate of ice loss from A, B, and C has likely decreased..." The use of "has" instead of "have" suggests that the statement applies to A+b+C considered together. Is this what is meant? Or does the statement apply also to A an B and C in isolation? If the latter, then "has" should be "have." [Government of United States of America]
T1 A-31	Topic 1	38	12	38	13	1.1.3	In WG1 SPM, three regions mentioned here is not in juxtaposition. To keep consistency with WG1 SPM, the description here should be corrected to "the Antarctic ice sheet, mainly from the northern Antarctic Peninsula and the Amundsen Sea sector of West Antarctica, ..." [Government of Japan]
T1 A-32	Topic 1	38	15	38	20	1.1.3	While much less pronounced, (approx 2.6% per decade), the decline in Arctic winter sea ice extent could also be mentioned (see Arctic Report Card: http://www.arctic.noaa.gov/reportcard/sea_ice.html). [Government of Norway]
T1 A-33	Topic 1	38	17	38	17	1.1.3	"Perennial sea ice" is not necessarily equivalent to "summer sea ice minimum", since at the time of that minimum newly grown seasonal sea ice may be present in some areas. Suggest deleting "(perennial sea ice)." [Government of United States of America]
T1 A-34	Topic 1	38	38	38	42	1.1.4	The purpose of statement seems unclear to me. I guess it is about the lea-level rise budget that is closed now (1993), but wasn't closed before? [Government of Chile]
T1 A-35	Topic 1	38	39	38	39	1.1.4	What is the estimated uncertainty in the 75% figure? [Government of United States of America]
T1 A-36	Topic 1	38	49	38	54	1.1.4	In order to shorten the text, I would delete this paragraph. [Government of Finland]
T1 A-37	Topic 1	39	1	39	35	Box 1.1	We support the inclusion of the Box 1.1 [Government of New Zealand]

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T1 A-38	Topic 1	39	1	40	10	Box 1.1	This box is highly appreciated. [Government of Germany]
T1 A-39	Topic 1	39	3	39	34	Box 1.1	Box 1.1: Between 1984 and 1998, there has been a big volcanic eruption in Pinatubo (1991). The decrease of the trend of temperature between 1998 and 2011 is difficult to link it to the volcanic eruptions notably the one of Island in 2010. [Government of Algeria]
T1 A-40	Topic 1	39	6	39	16	Box 1.1	How is one supposed to reconcile medium confidence (line 6) associated with the statement that the hiatus is caused half by forcing and half by internal variability with the low confidence (line 16) in quantifying the role of forcing in the hiatus? If we have low confidence in quantifying the role of forcing, then how can we have medium (i.e. greater) confidence that contribution of forcing is about half? [Government of United States of America]
T1 A-41	Topic 1	39	8	39	14	Box 1.1	The text mentions 2011 and 2012: Which year is correct? [Government of Germany]
T1 A-42	Topic 1	39	12	39	17	Box 1.1	Discussing lower rates for shorter periods of time creates confusion. One could simply give the long term rate of change and then state something like "if shorter periods are used, then rates will reflect short term fluctuations. Rates are lower when the selected period includes years with significant volcanic eruptions (Pinatubo, El Chicon, etc.) or the cooling phase of the solar cycle (200x-)." [Government of United States of America]
T1 A-43	Topic 1	39	13	39	15	Box 1.1	In 2001/2002 there was a maximum of the solar cycle. Therefore, we would suppose the start of the cooling phase of the solar cycle in 2002 at the earliest, not in 2000 as mentioned in the text. [Government of Germany]
T1 A-44	Topic 1	39	20	39	20	Box 1.1	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T1 A-45	Topic 1	39	23	39	23	Box 1.1	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T1 A-46	Topic 1	39		39		Box 1.1	Consider moving this box to after section 1.3 on Radiative Forcings begins. [Government of United States of America]
T1 A-47	Topic 1	39				Box 1.1	footnote 12: It is suggested to provide some examples of the feedback processes mentioned in this footnote that also determine equilibrium climate sensitivity. [Government of Austria]
T1 A-48	Topic 1	39				Box 1.1	Box 1.1: This box is very useful, explaining the so called hiatus. But the language is technical and complicated, and it is not clear whether the hiatus is actually explained, or if it gives cause to reconsider basis Climate science conclusions. Please consider shortening and clarifying text, to highlight key messages. [Government of Norway]
T1 A-49	Topic 1	40	1			Box 1.1	Figure Box 1.1, Figure 1: The relative frequency of the observed trends cannot be seen in its entirety because the y-axis is cut off at 8. Please provide the maximum value as text in the graphs. [Government of Germany]
T1 A-50	Topic 1	40	8	40	8	Box 1.1	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T1 A-51	Topic 1	40	9	40	9	Box 1.1	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T1 A-52	Topic 1	40	16	40	16	1.2	Add "basically", "generally" or "tend to" before "lead to" (in 2 places) because the positive (negative) RFs do not always lead to the near-surface warming (cooling). [Government of Japan]
T1 A-53	Topic 1	40	18	40	18	1.2	Change "Figure 1.3" to "Figure 1.4". [Government of Japan]
T1 A-54	Topic 1	40	18	40	18	1.2	The reference should probably be to figure 1.4 but not to figure 1.3 that describes observed changes in atmospheric GHG concentrations. [Government of Austria]

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T1 A-55	Topic 1	40	19	40	21	1.2	Please add information on "Other Anthropogenic" to the caption of Figure 1.3. [Government of Germany]
T1 A-56	Topic 1	40	26	40	26	Headline 1.2	The phrase "leading to an uptake of energy by the climate system" seems to appear here out of nowhere (also in equivalent place in SPM, p. 8). The suggestion is to adding a short, additional phrase to substantiate/explain. [Government of Switzerland]
T1 A-57	Topic 1	40	28			1.2.1	1.3.1 Natural and anthropogenic radiative forcings The percentage of anthropogenic methane emissions compared to biogenic is not clearly stated. [Government of Algeria]
T1 A-58	Topic 1	40	33	40	33	1.2.1	The uncertainty range of decadal rate of change in CO2 concentration is not valid. "2.0 ± 10 ppm yr-1" should be corrected to "2.0 ± 0.1 ppm yr-1." [Government of Japan]
T1 A-59	Topic 1	40	33	40	33	1.2.1	It is suggested to double-check the uncertainty range of plus/minus 10ppm per year. [Government of Austria]
T1 A-60	Topic 1	40	33	40	33	1.2.1	It may confuse readers to refer to a "decadal rate of change" and then measure that rate in ppm PER YEAR. And what exactly is a "decadal rate of change?" The rate of change over a given decade? if so say which one. Or the rate of change between one decade and the next? (which ones?) [Government of United States of America]
T1 A-61	Topic 1	40	33			1.2.1	Is the uncertainty part of "2.0 ± 10 ppm yr-1" correct? [Government of Turkey]
T1 A-62	Topic 1	41	1	41	1	Figure 1.3	Figure 1.3: Provide error bars if possible. [Government of United States of America]
T1 A-63	Topic 1	41	8	41	8	1.2.1	Suggest quantifying the proportion of RF contributed by CO2. [Government of United States of America]
T1 A-64	Topic 1	41	21	41	24	1.2.1	Uncertainty regarding changes in solar irradiance is not presented. [Government of Algeria]
T1 A-65	Topic 1	41				Figure 1.3	Figure 1.3. For clarification, it would be better to write "Direct Atmospheric Measurements" or "Direct Measurements" rather than "Measurements" in the legend. [Government of Japan]
T1 A-66	Topic 1	42	6	42	6	Figure 1.4	It is suggested to specify the type of ozone. This could be done by inserting "stratospheric" before "ozone". [Government of Austria]
T1 A-67	Topic 1	42	10			1.2.2	1.3.2 Human activities affecting emission drivers The impact of economic recession in the world during the last few years and its effect on the reduction of carbon emission is not presented in this report. [Government of Algeria]
T1 A-68	Topic 1	42	12	42	16	1.2.2	Can an estimated uncertainty in the 40% figure be provided? [Government of United States of America]
T1 A-69	Topic 1	42	16	42	16	1.2.2	Please consider adding "mainly due to deforestation and forest degradation" after "(FOLU)". [Government of Norway]
T1 A-70	Topic 1	42				Figure 1.4	Figure 1.4: the top x-axis (CO2-eq) could be misunderstood as, unlike for RF, one cannot sum up the GHG and other anthropogenic terms to get the total. Maybe the (upper) scale could be limited to the 2 to 3 Wm-2 range (400 to 500 ppm). [Government of France]
T1 A-71	Topic 1	42				Footnote	footnote 15, last sentence: The following wording is suggested: Estimates match nicely given their uncertainties. [Government of Austria]
T1 A-72	Topic 1	43	1	43	1	Figure 1.5	In Figure 1.5's legend, it is confusing that "forestry and other land use" is written as an abbreviation FOLU, while "Fossil fuel, cement and flaring" is written in full text. Suggest spelling out both in this figure. [Government of Canada]

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T1 A-73	Topic 1	43	2	43	4	Figure 1.5	Figure 1.5. Please consider adding that emissions in the FOLU sector are mainly due to deforestation and forest degradation. [Government of Norway]
T1 A-74	Topic 1	43	11	44	28	1.2.2	These three paragraphs could be combined and shortened. [Government of Finland]
T1 A-75	Topic 1	43	23	43	24	1.2.2	Provide error bars for "76%" and "6.2%", if possible. [Government of United States of America]
T1 A-76	Topic 1	43	23	44	1	1.2.2	P 43 states that 76 % of total anthropogenic GHG emissions in 2010 stems from CO2 and P 44 says that about 25% of annual emissions come from non-CO2-gases. This is a duplication which might confuse readers. Please consider revising the text concerned. [Government of Germany]
T1 A-77	Topic 1	43				Figure 1.5	Figure 1.5. It seems to be coarse label interval for x-axis. It would be add labels 1750, 1850, 1950 and ticks for x-axis. [Government of Japan]
T1 A-78	Topic 1	44	1	44	1	1.2.2	Footnote 17: this information has already been given in the caption of figure 1.6 -> footnote 17 could be deleted. [Government of Finland]
T1 A-79	Topic 1	44	4			Figure 1.6	Figure SPM. 1.6.: Please include GW100 from AR4 as these are more relevant for the UNFCCC. [Government of Germany]
T1 A-80	Topic 1	44	5	44	17	Figure 1.6	It is strongly suggested to use the same figure caption as for figure SPM.2. The latter is much clearer!! [Government of Austria]
T1 A-81	Topic 1	44	15			Caption 1.6	The panels seem to be incorrectly referenced in the caption to Fig 1.6. The first bracket should read "(left and middle panel)" and the second bracket "(right panel)" and not (right and middle panel) and (left panel c) [Government of New Zealand]
T1 A-82	Topic 1	44	20	44	20	1.2.2	It is suggested to delete the qualifier "directly" as it would only confuse. [Government of Austria]
T1 A-83	Topic 1	44	21	44	21	1.2.2	It is suggested to explain the term "indirect emissions" in a footnote or include it in a glossary. [Government of Austria]
T1 A-84	Topic 1	45	1	45	1	Figure 1.7	Provide error bars if possible. [Government of United States of America]
T1 A-85	Topic 1	45	7	45	10	Caption 1.7	Given that the title of the figure refers to "anthropogenic" emissions, is it correct to interpret that the emissions from forest fires, peat fires, and peat decay referred to in lines 7-10 are also attributed to anthropogenic causes? If yes, then the wording is ok, but if not, suggest clarifying. [Government of Canada]
T1 A-86	Topic 1	45	7	45	10	Caption 1.7	Please consider adding that emissions in the FOLU sector are mainly due to deforestation and forest degradation. [Government of Norway]
T1 A-87	Topic 1	45	11	45	11	Caption 1.7	Reference should refer to footnote 16, not footnote 6. [Government of Finland]
T1 A-88	Topic 1	45	13	45	19	1.2.2	Would like to propose to insert "Regional patterns of GHG emissions are shifting along with changes in the world economy." at the end of the paragraph. (WG3 TS) [Government of Japan]
T1 A-89	Topic 1	46	6			Figure 1.8	Please explain "purchasing power parities", using a footnote. [Government of Germany]
T1 A-90	Topic 1	46	14			1.3	What is meant by "support"? Please explain or modify the text so that it can be understood by non-experts. [Government of Germany]

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T1 A-91	Topic 1	46	19	46	19	1.3	Suggest either deleting the word 'other' in this sentence or put a comma after it. Human activity is not a natural forcing, so saying "human activity, as well as other natural climate drivers" doesn't make sense. [Government of Canada]
T1 A-92	Topic 1	46	22	46	23	Headline 1.3	The first part of the sentence is ok "human influence has been detected in warming of the atmosphere and the ocean" but the second part could be changed in order to specify that this warming has consequences like "changes in the global water cycle, in reductions in snow and ice, and in global sea level rise". [Government of Italy]
T1 A-93	Topic 1	46	22	46	27	Headline 1.3	Since WG1 and WG2 have dealt with "attribution" in different ways, we strongly urge the authors to insert a box (or modify existing box) explaining this distinction explicitly. For example: "There are two distinct treatments of attribution: one treats the links between climate change and its drivers; the second treats the links between climate change and its observed impacts. The first distinguishes natural and anthropogenic drivers; the second does not distinguish natural vs. anthropogenic climate change. WG1 applies the first; WG2 applies the second." [Government of United States of America]
T1 A-94	Topic 1	46	26	46	26	Headline 1.3	The attribution statement "Impacts are due to observed climate change" needs more substantiation, both here and in the SPM, p. 10. [Government of Switzerland]
T1 A-95	Topic 1	46	33	46	33	1.3.1	Suggest trying to simplify the sentence stating "The best estimate of the human induced contribution to warming is similar to the observed warming over this period" if possible, given that this is the Synthesis Report. [Government of Canada]
T1 A-96	Topic 1	47	5	47	7	1.3.1	This part would deserve more explanation in the Synthesis Report. [Government of Switzerland]
T1 A-97	Topic 1	47	8	47	19	Figure 1.9	Figure 1.9 is almost the same as Figure 1.4, with one showing contributions to radiative forcing and CO2 equivalent concentration, and the other contributions to observed warming. Suggest the authors look at the possibility of combining into a single figure. [Government of New Zealand]
T1 A-98	Topic 1	47	12	47	12	Caption 1.9	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T1 A-99	Topic 1	47	12	47	15	Caption 1.9	Figure 1.4 on page 40 and Figure 1.9 on page 47 give information on the roles of climate forcings. This information looks somewhat contradictory. The uncertainty of anthropogenic combined forcings in Fig 1.9 is much less than in Fig 1.4. The only explanation given in the caption of Fig 1.9 is that the two contributions (GHGs and other anthropogenic forcings) are partially compensational. Please, explain with one or two sentences on natural processes which are (or might be) the main causes to this compensational effect. [Government of Finland]
T1 A-100	Topic 1	47	21	47	27	1.3.1	To clarify the text here, two distinct messages need to come through: one on detection. And one on attribution. The authors should make clear that detection of change has been made on all continents (including Antarctica), but that attribution has been made on all continents except Antarctica (due to the observational uncertainties). [Government of United States of America]
T1 A-101	Topic 1	48	1	48	1	Figure 1.10	Top plot: Is it for Arctic sea ice extent or sea ice area? [Government of United States of America]
T1 A-102	Topic 1	48	1	48	12	Figure 1.10	Hard to read figure. No mention that temperature panels have red outlines, OHC have blue outlines and ice panels have black outlines. Maybe the background map could be a different projection so that the small panels can be larger. Or turn the figure and put on a full page. [Government of United States of America]
T1 A-103	Topic 1	48	3	48	5	Figure 1.10	Something is wrong with this caption title. It seems nonsensical...maybe remove "for change" in line 3? [Government of United States of America]
T1 A-104	Topic 1	48	18	48	18	1.3.1	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T1 A-105	Topic 1	48	20	48	21	1.3.1	It should be revised to "the observed increase in surface mass loss of the Greenland ice sheet since 1993" because this phenomenon did not have the specific onset in the year 1993. [Government of Japan]

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T1 A-106	Topic 1	48		48		Figure 1.10	Fig. 1.10: This figure is perhaps the most important contribution from WG I (updated from AR4), providing the visual evidence for the anthropogenic contribution to climate change. Though it may be tough to accomodate for many policy-makers, it ought to be in the SYR. [Government of Sweden]
T1 A-107	Topic 1	49	11	49	12	1.3.1	Please consider to also include relevant information for ocean depths below 700 m. This is assessed in WGI SPM page 6, section B.2. "It is likely that the ocean warmed between 700 and 2000 m from 1957 to 2009, and from 3000 m to the bottom for the period 1992 to 2005." [Government of Norway]
T1 A-108	Topic 1	49	16	49	18	1.3.1	The WGII CC-OA section should also be cited after the statement regarding ocean acidification. [Government of United States of America]
T1 A-109	Topic 1	49	20	52	6	1.3.2	1.4.2 Observed impacts attributed to climate change Desertification or dramatic advancing of the desert as consequence of climate change (e.g., dryness, drought, heat waves, degradation of lands) is not stated throughout the document. [Government of Algeria]
T1 A-110	Topic 1	49	20			1.3.2	Section 1.4.2. Effects on enclosed coastal waters such as estuaries are not clearly articulated in the text at all. The word "estuary" or any word meaning these systems (e.g. shallow, inlet) is absent. [Government of New Zealand]
T1 A-111	Topic 1	49	22	49	24	1.3.2	Recommend that the second bolded sentence could be deleted. It simply repeats the content of the first, the only additional concept being "irrespective of its cause" which is likely to add confusion. [Government of Canada]
T1 A-112	Topic 1	50	1	50	10	Figure 1.11	Panel A is already quite complex. It would be better to separate it from the other two panels unless a better explanation how they are linked can be provided. For example, the caption for panel B could have a phrase such as.."(B) Example of biological system impact (referred to in panel A)". Similarly, the link between Panel C and the food-component aspect in panel A could be stated in a phrase as in "c) Example of the Food production impact in terms of Crop yields." [Government of United States of America]
T1 A-113	Topic 1	50	2	50	10	Figure 1.11	A term "Attribution" is used in the Figure 1.11 (A) caption with no explanation. Confidence in attribution to climate change is also not explained. Recommended: at the end of the caption replace "attribution" by "attribution based on literature and expert judgments". [Government of Russian Federation]
T1 A-114	Topic 1	50		50		Figure 1.11	I have zoomed 150% in the pdf and have a huge monitor. The figure has a low resolution which makes it hard to read on paper. The sea level has rised so there is an erosion impact on western Europe soft coast which is not shown [Government of Denmark]
T1 A-115	Topic 1	50		50		Figure 1.11	At Fig. 1.11 (A), symbols given in a frame not always consistent with those presented at the corresponding region. For example: (1) Food production symbol appears in the Europe frame, but not on the Europe map. (2) Food production symbol appears on the Asia map, but not in the Asia frame.(3) River, lakes, floods & drought symbol appears in the Arctic frame, but not on the Arctic map. It is expedient to make all things consistent. [Government of Russian Federation]
T1 A-116	Topic 1	51	1	51	1	Figure 1.12	Figure 1.12: in the bottom panel, should there not be a line connecting atmospseric warming to increased soil moisture drought (below and to the right)? [Government of United States of America]
T1 A-117	Topic 1	51	2	51	3	1.3.2	In this paragraph there is a confidence level is given to the "glacier retreat" (high confidence), but earlier (page 48, line 20) there is a likelihood statement (likely). [Government of Chile]
T1 A-118	Topic 1	51	9	51	12	1.3.2	This long sentence is somewhat cumbersome to read and grasp. Please consider to rephrase. [Government of Norway]
T1 A-119	Topic 1	51	10	51	10	1.3.2	Does "high confidence" here apply to the our confidence in the attribution of those few extinctions to climate change, or to the fact that only a few such attributions have been made? [Government of United States of America]
T1 A-120	Topic 1	51	19	51	21	1.3.2	With respect to the statement regarding impacts of ocean acidification, the confidence statement for the impact to coral growth rates is inconsistent with the cited chapter statements. WGII Box CC-CR, page 55 states that reduced coral calcification rates due to OA has high confidence (not low confidence). Correct the confidence statement and add reference to WGII Box CC-CR [Government of United States of America]

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T1 A-121	Topic 1	51	23	51	23	1.3.2	"more stratified oceans at higher temperatures." Believe that the main factor contributing to increased stratification is greater warming of the surface ocean vs lower depths. Suggest saying "higher surface ocean temperatures." [Government of United States of America]
T1 A-122	Topic 1	51	26			1.3.2	Consider deleting phrase "Based on many studies covering a wide range of regions and crops" as it distracts from the main point of the bolded sentence (about impacts on crop yields). The remaining text of this paragraph effectively conveys this additional detail. [Government of Canada]
T1 A-123	Topic 1	51	34	51	34	1.3.2	It seems that the reference should rather be to Figure 1.11A, or to the whole Fig. 1.11, than to Fig. 1.11C. [Government of Finland]
T1 A-124	Topic 1	51	38	51	42	1.3.2	1.4.2 - both heat- and cold- related deaths are mentioned in the same sentence without clarifying that they should be looked at in separation as the exact causes, incidences and consequences of heat and cold are quite different from one another [Government of United Kingdom of Great Britain & Northern Ireland]
T1 A-125	Topic 1	51		51		1.3.2	Aside from cereal prices, there is not much economic assessment here. Is it possible to make a statement on the cost of food storage and transport in a warmer world? [Government of United States of America]
T1 A-126	Topic 1	52	1	52	1	Figure 1.12	Fig.1.12: the impact on the cryosphere: "western Andes". In chapter 27 I see a number of tables summarising the evidence on "glaciers in the tropical Andes" and runoff/snowpack, ELA, in the "extratropical Andes". Maybe change "Western Andes" to "extratropical andes" ? [Government of Chile]
T1 A-127	Topic 1	52	1	52	1	Figure 1.12	The text in the boxes is very hard to read. [Government of United States of America]
T1 A-128	Topic 1	52	1	52	6	Figure 1.12	Figure 1.12. We support the inclusion of this figure - the depiction of "cascading effects" is particularly useful when talking about the effects of climate change on biodiversity and natural systems. [Government of New Zealand]
T1 A-129	Topic 1	52	1			Figure 1.12	Figure 1.12: It is assumed that the information on forests is limited to WN-America and the Western Sahel because major effects have been observed in these regions. However, Ch18 provides information on other regions too. This should be clarified in the caption of the figure. [Government of Germany]
T1 A-130	Topic 1	52		52		Figure 1.12	Figure 1.12 - text boxes are blurry [Government of Denmark]
T1 A-131	Topic 1	52				Figure 1.12	Fig. 1.12, Cryosphere section, top box on right hand side - Suggest that "Alterations in drainage" or "alterations in surface hydrology and surface water distribution" would be better wording than "changes in locations of thermokarst lakes". This would be more inclusive and focuses more on the distribution of surface water and changes that may accompany permafrost thaw. [Government of Canada]
T1 A-132	Topic 1	52				Figure 1.12	Fig. 1.12 - Cryosphere section, lowest box on right hand side - Suggest revising final outcome statement (Arctic) to read "Impacts on livelihoods, particularly those of indigenous peoples". This change is important to convey that climate change impacts all residents of the Arctic. [Government of Canada]
T1 A-133	Topic 1	52				Figure 1.12	Figure 1.12. This Figure is very useful in illustrating the complex interactions between different changes in the climate systems. In the middle panel for oceans the interacting effect from ocean acidification is not included. We suggest to add a separate color for chemical effects, and show the potential impacts on biology from ocean acidification [Government of Norway]
T1 A-134	Topic 1	53	4	53	4	1.4	It is suggested to simplify the wording and simply state: It is very likely that humidity has increased since the 1970s. [Government of Austria]
T1 A-135	Topic 1	53	16	53	16	1.4	It seems to be unnecessary '-' between "air" and "specific" as the expression in WG1 AR5 TS.2.5.1 and the executive summary of Chapter 2. [Government of Japan]
T1 A-136	Topic 1	53	21	53	35	1.4	In the statements about floods and droughts there is no mention to the TFE9 (TS-WR1) "extremes": Floods and Droughts There continues to be a lack of evidence and thus low confidence regarding the sign of trend in the magnitude and/or frequency of floods on a global scale over the instrumental record. There is high confidence that past floods

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							larger than those recorded since 1900 have occurred during the past five centuries in northern and central Europe, western Mediterranean region, and eastern Asia. There is medium confidence that modern large floods are comparable to or surpass historical floods in magnitude and/or frequency in the Near East, India and central North America. {2.6.2, 5.5.5} Compelling arguments both for and against significant increases in the land area affected by drought and/or dryness since the mid-20th century have resulted in a low confidence assessment of observed and attributable large-scale trends. This is due primarily to a lack and quality of direct observations, dependencies of inferred trends on the index choice, geographical inconsistencies in the trends and difficulties in distinguishing decadal scale variability from long term trends. On millennial time scales, there is high confidence that proxy information provides evidence of droughts of greater magnitude and longer duration than observed during the 20th century in many regions. There is medium confidence that more megadroughts occurred in monsoon Asia and wetter conditions prevailed in arid Central Asia and the South American monsoon region during the Little Ice Age (1450 to 1850) compared to the Medieval Climate Anomaly (950 to 1250). {2.6.2, 5.5.4, 5.5.5, 10.6.1} [Government of Chile]
T1 A-137	Topic 1	53	35			1.4	Please explain the abbreviation "ES". [Government of Germany]
T1 A-138	Topic 1	53	37	53	37	1.4	The term "There" must be in bold face. [Government of Japan]
T1 A-139	Topic 1	53	52	53	53	1.4	This sentence "lack of preparedness for current climate variability in some sectors" could strengthen the message in the SPM. [Government of Chile]
T1 A-140	Topic 1	54	6	55	11	1.5	These sections (1.7 in particular) do not appear to directly relate to the topic 'observed Changes and their Causes.' They may be better situated elsewhere in the SYR or could be removed. Australia suggests moving Section 1.6 to create an additional subsection under Section 2.3.3 Water, food and urban systems, human health, security and livelihoods as the material covered by section 1.6 is more directly related to section 2.3 Future Risks and impacts caused by a changing climate. Section 1.7 p54 lines 48-57 and p55 lines 1-6 should be moved to Section 4.2 Response options for Adaptation. Section 1.7 p55 lines 8-11 should be moved to section 4.3 Response Options for Mitigation. Section 1.7 p54 lines 41-47 should be deleted. [Government of Australia]
T1 A-141	Topic 1	54	19	54	19	1.5	Delete: "Differences in vulnerability and exposure arise from non-climatic factors ..." [Government of Saudi Arabia]
T1 A-142	Topic 1	54	19	54	20	1.5	"multidimensional inequalities" is jargon. We suggest removing the word "multidimensional" - the sentence would still convey the same meaning. [Government of New Zealand]
T1 A-143	Topic 1	54	23	54	23	1.5	It is suggested to substitute "heightened" by "increased" as this might be the clearer language. [Government of Austria]
T1 A-144	Topic 1	54	30	54	39	1.5	There is an issue here with consistency in referencing. These two paragraphs are verbatim text from WGII SPM A-1, but are not referenced as such. Yet the previous two paragraphs do reference the WGII SPM. Suggest reviewing. [Government of Canada]
T1 A-145	Topic 1	54	41	54	41	1.6	Write:"Human responses to climate change: mitigation and adaptation". A general comment on Sub-section 1.7 Human responses to climate change: adaptation and mitigation offers too little detail on both adaptation and mitigation as compared with the previous SYR drafts (see also follow-up comments).No real finding / conclusion can be drawn based on the very limited discussion of 'mitigation' under observed changes. As noted by WGIII, there has not been a substantial deviation in global emissions from the past trend triggered by ongoing mitigation actions - this is extensively covered in section 1.3. - Past and recent drivers of climate change. According to WGIII report, mitigation plans and strategies are in their early stages of development and implementation, making it difficult to assess their aggregate impact even on future global emissions. Currently there can be no conclusion on concrete

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							observed impacts of mitigation measures, as actually stated in the short text in Topic 1 'a full assessment of their impact may be premature'. This is also in relation to the time lag for mitigation measures to show impact on the global scale (not fully explained in the text though). So, the alternative is: either to include more information on mitigation or to keep this section focused on adaptation, as in the earlier drafts of the SYR. [Government of Switzerland]
T1 A-146	Topic 1	54	41	55	11	1.6	This Section 1.7 is entitled "Human responses to climate change: adaptation and mitigation", however, it does not contain information on mitigation. Please add. (And please reverse the order of "mitigation" and "adaptation"; see our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
T1 A-147	Topic 1	54	43	55	11	1.6	This part seems to be a bit poor. Maybe some explanations more could improve the quality of this paragraph (i.e. some definitions, synergies and conflicts between adaptation and mitigation, etc.) [Government of Italy]
T1 A-148	Topic 1	54	45	54	45	1.6	It is suggested to elaborate more on adaptation and mitigation in this first paragraph of subchapter 1.7. The following wording is suggested: In today's changing climate, accumulating experience with adaptation to the impacts of climate change and efforts to mitigate greenhouse gas emissions can provide [Government of Austria]
T1 A-149	Topic 1	54	48	54	49	1.6	It is not clear why it is written "Adaptation and mitigation...., even while global anthropogenic GHG emissions have continued to increase". I would say that adaptation is accumulating across regions and scale moreover because global anthropogenic GHG emissions have continued to increase. [Government of Italy]
T1 A-150	Topic 1	54	48	55	8	1.6	Decide which phrase is substantive and which is subordinate because "even while" is used in opposite senses between the headline statement on p. 54 and the bold text on p. 55. The suggestion would be to rewriting first occurrence on p.54, line 48 to read "whilst at the same time global anthropogenic GHG emissions...". By the way, 'Global increases in anthropogenic emissions and climate impacts have occurred,' when talking about climate impacts - what kind of increases is this referring to: increase in range? increase in magnitude? which kind of impacts? as compared to which reference period? Please reconsider, this phrasing is too vague. [Government of Switzerland]
T1 A-151	Topic 1	54	51	54	51	1.6	See the New Zealand Government comments regarding SPM page SYR-27 lines 23 - 24. We suggest replacing "more limited" with "limited" for the reasons we have described there. [Government of New Zealand]
T1 A-152	Topic 1	55	7	55	10	1.6	In order to shorten the text, this paragraph could be deleted because almost the same thing has already been said on pp. 43, lines 12-14. [Government of Finland]
T1 A-153	Topic 1	55	8	55	8	1.6	It is suggested to enhance clarity of the sentence by substituting "even while" by "despite". The sentence would read: Global increase in anthropogenic emissions and climate impacts have occurred despite mitigation activities have taken place in many parts of the world. [Government of Austria]
T1 A-154	Topic 1	55	8	55	9	1.6	Global increases in anthropogenic emissions and climate impacts have occurred, even while mitigation activities have taken place in many parts of the world.' Coupling GHG emissions and climate impacts when discussing mitigation as a driver of change is potentially misleading, when not noting the indirect effect of mitigation on climate impacts per se and the complexity behind the driving forces of such impacts. [Government of Switzerland]
T1 A-155	Topic 1	55	8	55	11	1.6	The para at hand is unbalanced, framing mitigation very negatively. The impression is given that mitigation activities have no effect, because they do not stop emission growth. Please put the information into context and stress the main drivers of emission growth according to the WG3 report (economic and population growth). Evidence presented in the WG3 report demonstrates that mitigation action helps decoupling economic growth and emission growth. [Government of Germany]
T2 A-1	Topic 2	56	3	56	6	Headline 2	The shaded box contains a very important statement, but please consider to add that emission reductions need to happen quickly, for example (on line 5) ".... substantial, immediate and sustained reductions" [Government of Norway]
T2 A-2	Topic 2	56	5	56	6	Headline 2	We suggest to change the order of the sentence at hand as follows: "A combination of substantial, sustained reductions in greenhouse gas emissions and adaptation can limit climate change risks." (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]

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T2 A-3	Topic 2	56	23	56	23	2.1	The sentence does not identify what is projected. Therefore the following wording is suggested: Projections of the climate are obtained from climate models. [Government of Austria]
T2 A-4	Topic 2	56	24	56	24	2.1	Delete "the simulation of." [Government of United States of America]
T2 A-5	Topic 2	56	28	56	28	2.1	The phrase "sea-ice" should be replaced to "sea ice" because "sea ice" is consistently used in the SPM of WG1 report. [Government of Japan]
T2 A-6	Topic 2	56	33	56	33	Box 2.1	Write:"There has been important improvement in climate models for simulating continental-scale ...". [Government of Switzerland]
T2 A-7	Topic 2	56	33	56	41	Box 2.1	Section 7.6.2 does not seem to be the best one to reference here. Sections 7.2, 7.3 and 7.4 are more relevant to back this up. [Government of France]
T2 A-8	Topic 2	56	54	56	54	2.1	For the sake of clarity the following wording is suggested: In order to obtain projections of the climate, the climate models ... [Government of Austria]
T2 A-9	Topic 2	56		81		general	Misspelling of IPCC in the header. [Government of Sweden]
T2 A-10	Topic 2	57	8	57	8	Box 2.2	The title of this box could be 'Representative Concentration Pathways' (RCPs) and comparison to other scenarios'. [Government of Belgium]
T2 A-11	Topic 2	57	11	57	11	Box 2.2	Please add "and the formation" following the term "emissions". [Government of Germany]
T2 A-12	Topic 2	57	14	57	14	Box 2.2	"Wider" than what? [Government of United States of America]
T2 A-13	Topic 2	57	17	57	17	Box 2.2	See comment on P 11 L 44, which reads: "The phrasing 'two stabilization scenarios' is incorrect or misleading. RCP 6.0 does not stabilize concentrations or forcing by 2100, but still shows strong upward trends. Furthermore, 'stabilization scenarios' misleadingly suggests that both scenarios RCP 4.5 and RCP 6.0 imply mitigation action. RCP 4.5 is at the SRES B1 level and RCP 6.0 in the middle of the range of former SRES baseline scenarios. Thus, a more neutral wording like 'medium-low and a medium-high scenario (RCP 4.5 and RCP 6.0)' seems more appropriate. Please rephrase." [Government of Germany]
T2 A-14	Topic 2	57	17	57	18	Box 2.2	Please include information about what is stabilized in the "stabilization scenarios" of RCP4.5 and 6 and when. It would be helpful, given that the RCPs are named according to their forcing level, if a Figure showing the RF pathways for the 4 RCPs were included. [Government of Canada]
T2 A-15	Topic 2	57	21	57	22	Box 2.2	"requires" should be replaced with the wording such as "characterized by" (e.g., WG3 SPM Page.10 paragraph.2) as this part is explanation of assumptions which mitigation scenarios are based on. [Government of Japan]
T2 A-16	Topic 2	57	27			Box 2.2	Please clarify that these natural forcings are short-term and thus not relevant for climate change and modify "Importantly, these future scenarios do not account for possible short-term changes in natural forcings (e.g. volcanic eruptions) that are not relevant for the long-term climate trend. [Government of Germany]
T2 A-17	Topic 2	58	7	58	7	Box 2.2	Footnote 21 is nearly identical to footnote in p.42. It would be better to refer same footnote to avoid confusion. [Government of Japan]
T2 A-18	Topic 2	58	21	58	32	2.1	This para should clarify that knowledge about future climate change and its impacts and risks is limited, not only due to a lack of understanding or scientific uncertainty but also and inherently due to the fact that the future remains unknown. [Government of Germany]
T2 A-19	Topic 2	58	34	59	8	Box 2.3	The information about how risk has been assessed by expert judgement should be added to this box for transparency reasons. See for example the information on how key risks have been identified by WG2:

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							"Identification of key risks was based on expert judgement using the following specific criteria: large magnitude, high probability, or irreversibility of impacts; timing of impacts; persistent vulnerability or exposure contributing to risks; or limited potential to reduce risks through adaptation or mitigation." (from WG2 SPM). This information is essential for users of the report. [Government of Germany]
T2 A-20	Topic 2	58	54	59	4	Box 2.3	This sentence is essentially the same as that on p. 54 lines 12 - 16. Suggest pick only one place to retain it (our preference would be retain it here). [Government of Canada]
T2 A-21	Topic 2	58				Box 2.3	Box 2.3: Models and methods for estimating climate change risks, vulnerability and impacts Many measurements still need to be standardized or automated. Technological progress are still challenging especially for aerosols. Observations are missing in great part of the world, particularly in Africa. Big efforts are needed to overcome the lack of data and knowledge in these regions. [Government of Algeria]
T2 A-22	Topic 2	59	17	59	42	2.2.1	Changes in air temperature are undoubtedly important. It would be unfair and misleading if there were no boldface statements here. We would suggest that the entire second paragraph (ll.28-31) and the first sentence of the fifth paragraph (ll. 39-40) be in boldface. [Government of Japan]
T2 A-23	Topic 2	59	24	59	24	2.2.1	Editorial: Replace "begins" with "begins to" [Government of New Zealand]
T2 A-24	Topic 2	59	28	59	28	2.2.1	A start year of reference period is not correct. "1851" should be corrected to "1850." [Government of Japan]
T2 A-25	Topic 2	59	36	59	36	2.2.1	Avoid use of "will," which appears 2x on this line, when describing expected future climate change. [Government of United States of America]
T2 A-26	Topic 2	59	36	59	37	2.2.1	Does the confidence statement on line 37 apply to both statements? Suggest including a confidence statement for both sentences to be clear, since they are referring to different findings. [Government of Canada]
T2 A-27	Topic 2	59	37	59	37	2.2.1	The current wording is confusing. In order to avoid confusion the following wording is suggested: Warming will be globally larger over the land than over the ocean. An alternative might be: Globally, warming will be larger over the land than over the ocean. [Government of Austria]
T2 A-28	Topic 2	60	1	60	1	Figure 2.1	We recommend being consistent with the presentation of material in the WGI SPM. This means including the information from all the available CMIP5 results for the NH sea ice projections, not only those from the small subset of models. [Government of Canada]
T2 A-29	Topic 2	60	1	60	1	Figure 2.1	In Figure 2.1 a), there is no legend for red and blue colours (RCP 2.6 and 8.5). These legends are available for panels b) though e), so suggest including this in panel A also to be consistent and avoid confusion. [Government of Canada]
T2 A-30	Topic 2	60	1			Figure 2.1	Figure 2.1. Please add a figure on the long-term sea level rise up to 2300 as for the temperature in panel a. [Government of Germany]
T2 A-31	Topic 2	60	8	60	8	Figure 2.1	The phrase "sea-ice" should be replaced to "sea ice" because "sea ice" is consistently used in the SPM of WG1 report. [Government of Japan]
T2 A-32	Topic 2	60	9	60	9	Figure 2.1	It would be better to say "one million" rather than "106" to keep consistency with the expression of footnote 7 in p14. [Government of Japan]
T2 A-33	Topic 2	60	14	60	14	Figure 2.1	The phrase "sea-ice" should be replaced to "sea ice" because "sea ice" is consistently used in the SPM of WG1 report. [Government of Japan]
T2 A-34	Topic 2	61	3	61	3	Table 2.1	Delete a superscript "a" placed after "Global Mean Sea Level Rise", because footnote a describes the explanation for temperature change. [Government of Japan]
T2 A-35	Topic 2	61	4	61	27	Table 2.1	Table 2.1 seems self explanatory and several of the half page of notes seem unnecessary. Each of the footnotes can be limited to their first two sentences. [Government of United States of America]

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T2 A-36	Topic 2	61	8	61	8	Table 2.1	Add "C" just after "o", i.e. it should be "oC" [Government of Japan]
T2 A-37	Topic 2	62	7	62	7	Figure 2.2	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM in both occurrences. [Government of Norway]
T2 A-38	Topic 2	62	8	62	8	Figure 2.2	Put a period before "Hatching". [Government of Japan]
T2 A-39	Topic 2	62	9	62	9	Figure 2.2	Please consider to use the phrase "natural internal variability" in line with approved language from WGI SPM. [Government of Norway]
T2 A-40	Topic 2	62	18	62	18	2.2.2	The sentence above is directly taken from WGI SPM E.2 (the first bullet on p.21); Therefore, please add WGI SPM E.2 in the reference list as: {WGI SPM, E.2, 7.62, 12.4.5, 14.3.1, 14.3.5} [Government of Japan]
T2 A-41	Topic 2	62		62		Figure 2.2	Figure 2.2 the figure should be larger, its difficult to see where areas are hatched and stipples, especially in the areas where the colouring is dark. [Government of Denmark]
T2 A-42	Topic 2	63	10	63	47	2.2.3	This subchapter does not specify the time horizons of the identified changes. The SPM includes now the sentence "The projected changes are for 2081-2100 relative to 1986-2005, unless otherwise indicated. (see page 13 of the SPM, lines 20, 21). A similar sentence should be inserted in clause 2.2.3 and 2.2.4. [Government of Austria]
T2 A-43	Topic 2	63	10			2.2.3	2.2.3 Ocean, Cryosphere and Sea Level The Ocean frontal zones are not cited in the report even though they are affected by the redistribution of biomass and marine species under the climate change pressure. [Government of Algeria]
T2 A-44	Topic 2	63	12	63	12	2.2.3	Avoid use of "will" when describing expected changes in future climate. [Government of United States of America]
T2 A-45	Topic 2	63	12	63	12	2.2.3	"21st century " replace for 21st century [Government of Argentina]
T2 A-46	Topic 2	63	19	63	20	2.2.3	Add the words "transition or" after "abrupt" to keep consistency with WG1 SPM E.4. WG1 SPM says that "It is very unlikely that the AMOC will undergo an abrupt transition or collapse in the 21st century." [Government of Japan]
T2 A-47	Topic 2	63	20	63	20	2.2.3	Please add "transition or" so that it reads: "will undergo an abrupt transition or collapse" (as it is formulated in the WGI SPM E.4). [Government of Germany]
T2 A-48	Topic 2	63	24	63	24	2.2.3	Please check the following information: "compared to a third reduction for RCP 2.6 (medium confidence) (Figure 2.1)." We neither find this wording in the SPM WGI nor in the Executive Summary of WGI Ch.12 or in WGI Ch 12.4.6.1. [Government of Germany]
T2 A-49	Topic 2	63	24	63	24	2.2.3	"...compared to a third reduction..." is unclear. Should it be "... compared to a reduction of one-third..."? [Government of United States of America]
T2 A-50	Topic 2	63	27	63	28	2.2.3	The description "by the end of 21 century" should be added as written in WG1 SPM. [Government of Japan]
T2 A-51	Topic 2	63	28	63	28	2.2.3	For clarification, we propose to add: "by the end of the 21st century", as it is expressed in the WGI SPM E.5 (P 35) [Government of Germany]
T2 A-52	Topic 2	63	34	63	35	2.2.3	The description "by the end of 21 century" should be added as written in WG1 SPM. [Government of Japan]
T2 A-53	Topic 2	63	37	63	37	2.2.3	Avoid use of "will" when describing future changes in climate. [Government of United States of America]

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T2 A-54	Topic 2	63	37	63	47	2.2.3	Please add: "Based on current understanding, only the collapse of marine-based sectors of the Antarctic ice sheet, if initiated, could cause global mean sea level to rise substantially above the likely range during the 21st century." See WG 1 SPM Section E6. [Government of Germany]
T2 A-55	Topic 2	63	42	63	42	2.2.3	Avoid use of "will" when describing expected changes in future climate. [Government of United States of America]
T2 A-56	Topic 2	63	45	63	45	2.2.3	It is suggested to delete "future" before "sea level extremes". [Government of Austria]
T2 A-57	Topic 2	63	48			2.2.4	2.2.4 Carbon cycle and biogeochemistry Compared to modeling projections and simulations, experimental data and studies are very limited especially the acidification of oceans which render the level of confidence of models very low. [Government of Algeria]
T2 A-58	Topic 2	63	50	63	50	2.2.4	Consider replacing "will" with "is projected to" in this sentence to be consistent with the second sentence in this paragraph. [Government of Canada]
T2 A-59	Topic 2	63	50	63	50	2.2.4	Avoid use of "will"... [Government of United States of America]
T2 A-60	Topic 2	63	50	63	50	2.2.4	"...will continue...through to 2100..." leaves the reader wondering about what is expected to happen after 2100. If this was not analyzed, might say "is projected to continue until at least 2100..." [Government of United States of America]
T2 A-61	Topic 2	63				2.2.4	Footnote 23. The phrase "sea-ice" should be replaced to "sea ice" because "sea ice" is consistently used in the SPM of WG1 report. [Government of Japan]
T2 A-62	Topic 2	63				2.2.4	Footnote 24. The phrase "sea-ice" should be replaced to "sea ice" because "sea ice" is consistently used in the SPM of WG1 report. [Government of Japan]
T2 A-63	Topic 2	63				2.2.4	Footnote 24. It would be better to say "one million" rather than "106" to keep consistency with the expression of footnote 7 in p14. [Government of Japan]
T2 A-64	Topic 2	64	6	64	6	2.2.4	"...more of the emitted carbon..." does this mean a greater absolute amount, or a higher proportion? Furthermore, should this be clarified to read, "a greater portion of emitted CO2 will remain in the atmosphere compared to a future scenario where only CO2 rises without a changing climate."? [Government of United States of America]
T2 A-65	Topic 2	64	9	64	9	2.2.4	"Increase in ocean acidification" it is unclear what this sentence means as acidification is a process already, this sentence currently means an acceleration of the process, but I suspect that the intention is that the meaning is one of continued or progressive acidification. [Government of United Kingdom of Great Britain & Northern Ireland]
T2 A-66	Topic 2	64	9	64	11	2.2.4	The description "by the end of 21 century" should be added as written in WG1 SPM. [Government of Japan]
T2 A-67	Topic 2	64	11	64	14	2.2.4	We suggest that this paragraph be bold. [Government of Spain]
T2 A-68	Topic 2	64	18	66	20	2.2.5	Section 2.2.5 contains a lot of information on impacts of cumulative emissions that is repeated in previous sections of Topic 2 and on irreversible warming that is detailed in 2.3. This section can be flagged for removal in case it is required. Specifically the figures and Tables in the section do not add much value. [Government of United States of America]
T2 A-69	Topic 2	64	25	64	25	2.2.5	Please consider adding "and removals" after "emissions". This is relevant to consideration of mitigation options especially in forestry. [Government of Norway]
T2 A-70	Topic 2	64	25	64	26	2.2.5	Please consider to include "and removals" after "Cumulative emissions". So that the sentence starts with "Cumulative emissions and removals of CO2....". Rationale: This is relevant to consideration of mitigation options in forestry. And therefore improves the conclusion for the most cost-effective mitigation options in forestry (page 29,

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							line 16-19); " The most cost-effective mitigation options in forestry are afforestation, sustainable forest management and reducing deforestation, with large differences in their relative importance across regions"Ta inn page 29 line 16-19) [Government of Norway]
T2 A-71	Topic 2	64	25	64	28	2.2.5	The black ellipse indicating observed 2000s (in Fig 2.3) seems to be below an assumed linear relationship from climate model simulations although it is within the uncertainty range. Some explanations would be useful for better understanding of this difference between observation and simulations. [Government of Japan]
T2 A-72	Topic 2	64	31	64	33	2.2.5	We suggest adding "until the time temperatures peak" (which is one of the requirements for TCRE), at the end of the sentence, just like WGI SPM page 15, Line 2. [Government of Japan]
T2 A-73	Topic 2	64	32	64	32	2.2.5	The wording, "multiple lines of evidence" could be more specific. [Government of Japan]
T2 A-74	Topic 2	64	35	64	45	2.2.5	Would like to request including the cases of >33% and >50% as in WG1 SPM for the information is very important for policy makers. [Government of Japan]
T2 A-75	Topic 2	64	35	64	46	2.2.5	These two paragraphs (lines 35-38 and lines 40-46) seem to be giving similar but somewhat different results and it's not easy to understand what is different, or why. Suggest using similar phrasing for introducing the results in both paragraphs which would help draw attention to what is different. One option would be to rephrase line 40 to say "Ensuring total human induced warming (accounting for CO2 and other human influences on climate) remains likely less than 2degC requires total accumulated CO2 emissions from all anthropogenic sources to be about 2900 GtCO2." This then makes it clear that the first paragraph only accounts for CO2 and the second paragraph accounts for non-CO2 drivers as well. [Government of Canada]
T2 A-76	Topic 2	64	35	64	46	2.2.5	These two statements are very complicated: is a 2-in-3 chance different from "likely" (> 66%) ?? [Government of Chile]
T2 A-77	Topic 2	64	35	64	46	2.2.5	Former paragraph describes about CO2 emission only, and latter paragraph describes about all GHGs emissions includes aerosols, but it seems to be difficult to understand their difference. It would be better to explain the difference between these paragraphs for clarification. [Government of Japan]
T2 A-78	Topic 2	64	37	64	37	2.2.5	To avoid confusion, replace 3650 GtCO2 with 3670 GtCO2 as it is in WGI SPM E.8 (page 25, the 4th line from the bottom), or remark that it is rounded to nearest 50. [Government of Japan]
T2 A-79	Topic 2	64	37	64	41	2.2.5	The MAGICC-derived value (2900GtCO2) is accompanied with an uncertainty range, while the CMIP5-derived one (3650GtCO2, which should be 3670 GtCO2) is not. Is there any specific reason for this difference? (Same for Table 2.2) [Government of Japan]
T2 A-80	Topic 2	64	40	64	41	2.2.5	The spatial range (2800-3200Gt) of the Working Group III given here is inconsistent with Table 2.2, which stands at 2550-3150 GtCO2 or 2900-3200 GtCO2. It is suggested to check the consistency. [Government of China]
T2 A-81	Topic 2	64	40	64	42	2.2.5	In the sentence "A two-in-three chance or higher that total human-induced warming remains less than 2 °C requires total CO2 emissions to be limited to about 2900 GtCO2 if other emissions follow the RCPs, with a range of 2800–3200 GtCO2 across the scenarios considered by WGIII (Table 2.2)", what does "other emissions follow the RCPs" mean? Are these emissions of other GHGs and aerosols? Suggest revising to be more clear and explicit. Plus, here and other places where 2 °C is mentioned it would be useful to be explicit and say "2 °C above1850-1900" . Alternatively, the current phrasing on lines 40-42 could be adopted in the first paragraph (lines 35-38). [Government of Canada]
T2 A-82	Topic 2	64	40	64	46	2.2.5	Delete: "A two-in-three chance or higher that total human-induced warming remains less than 2 °C requires total CO2 emissions to be limited to about 2900 GtCO2 if other emissions follow the RCPs, with a range of 2800–3200 GtCO2 across the scenarios considered by WGIII (Table 2.2). Almost 1900 [1630 to 2145] GtCO2 were emitted by 2011, leaving a budget of about 1000 GtCO2 consistent with this temperature goal. Estimated total fossil carbon reserves exceed this remaining budget by a factor of 4 to 7, with resources much larger still." See comment #31. [Government of Saudi Arabia]

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T2 A-83	Topic 2	64	40	64	46	2.2.5	Replaced with: "Limiting the warming caused by anthropogenic CO2 emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO2 emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO2), 0 and about 1210 GtC (4440 GtCO2), and 0 and about 1000 GtC (3670 GtCO2) since that period, respectively. These upper amounts are reduced to about 900 GtC (3300 GtCO2), 820 GtC (3010 GtCO2), and 790 GtC (2900 GtCO2), respectively, when accounting for non-CO2 forcings as in RCP2.6. An amount of 515 [445 to 585] GtC (1890 [1630 to 2150] GtCO2), was already emitted by 2011." Source: WG I, SPM p. 27. [Government of Saudi Arabia]
T2 A-84	Topic 2	64	40	64	46	2.2.5	Assuming that this is based on WGI P.27, suggest that probability be written as percentages, thus saying "66%" instead of "two in three chance" for clear understanding by non-native speakers. [Government of Japan]
T2 A-85	Topic 2	64	41	64	41	2.2.5	It is difficult to match the numbers given here to those in the referenced table (Table 2.2). While the 2900 GtCO2 limit based on the RCP scenarios can be found in the table easily, we cannot see the 2800-3200 range anywhere. The row below 2900 in the table gives a range of 2550-3150 for the WGI scenarios. Suggest reviewing [Government of Canada]
T2 A-86	Topic 2	64	43			2.2.5	Please replace the incorrect term "goal" by "limit". [Government of Germany]
T2 A-87	Topic 2	64	44	64	44	2.2.5	The difference between "reserves" and "resources" should be explained. [Government of United States of America]
T2 A-88	Topic 2	64	44	64	45	2.2.5	Adding reference to Table 2.2 would be helpful for readers as the sentence is about reserves and resources on the bottom cell of the Table. [Government of Japan]
T2 A-89	Topic 2	65	0			Figure 2.3	Figure 2.3. The oval for "530-580" extends almost horizontally, while the other ones extend more or less in parallel with the black line or RCP lines. This means that the uncertainty of TCRE for "530-580" is larger than for the other ovals. It is desirable to explain the reason for that in the caption. [Government of Japan]
T2 A-90	Topic 2	65	1	65	9	Figure 2.3	Fig. 2.3: This is a very helpful figure. However, it is not easy to access for non-native speakers. Please consider the following modifications: Please change the legend of the abscissa to "emissions since 1870", add a description of the numbers in the graph (e.g., 530-580...), and clarify the terms "total human induced warming" and "CO2- induced warming". [Government of Germany]
T2 A-91	Topic 2	65	2	65	2	Figure 2.3	figure caption: Insert "by 2100" after "temperature increase". [Government of Austria]
T2 A-92	Topic 2	65	3	65	3	Figure 2.3	"a hierarchy of climate carbon-cycle models" is not readily understandable, though I imagine that it is adjusted so it fits the original WG1 AR5. If it means CMIP5 models, it should be explicit stated, if it doesn't, it could desirably more specific. [Government of Japan]
T2 A-93	Topic 2	65	11	66	1	Table 2.2	Table 2.2. It is difficult to read the table when it is spread across two pages. [Government of United States of America]
T2 A-94	Topic 2	65	11	66	20	Table 2.2	The number 750-1400 GtCO2, which stands as the cumulative emissions from 2011 in Table 2.2, Simple model, WGI Scenarios, is inconsistent with Table SPM.1 of the WGI SPM. It is suggested to check the consistency. [Government of China]
T2 A-95	Topic 2	65		65		Figure 2.3	Figure 2.3 A mismatch between upper and lower x-axis. Captions indicates that both displays cumulative total anthropogenic co2 emissions from 1870, but the scales are different. [Government of Denmark]
T2 A-96	Topic 2	65		65		Figure 2.3	Figure 2.3. For better understanding of Figure 2.3, we would like to propose to add explanation as follows. - The description of the ellipses should be written as described in Figure SPM.5 (b) (page SYR12 of line 10-11) regarding model type and non-CO2 drivers. - Regarding figure, while ellipses have been added in the figure (b) from the First Order Draft, additional explanation

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							such as the description of the relevance of their areas and confidence of the temperature in its area should be written. Specifically, the description "The ellipses show the approximate position of samples, and the samples do not necessarily uniformly exist." [Government of Japan]
T2 A-97	Topic 2	65		65		Figure 2.3	Although Figure 2.3 is much improved over the iteration that appeared in the April 2014 version of the Synthesis Report, this Figure still remains very difficult to understand for readers not steeped in IPCC. Recommend one more round of iteration before the Synthesis Report goes final. [Government of United States of America]
T2 A-98	Topic 2	65		66		Table 2.2	Table 2.2. Acknowledging that the basis for some of the numbers have changed (e.g. 1) fractions of simulation s meeting goal: FOD 33%, 50%, 66% => FD 33-55%, 59-66%, 66-100%; 2) FOD 80% of scenarios (note c) => FD 90% (5-95%) (note d)), request explanation of why cumulative emissions from 2011 have been changed from FOD. Also, request confirmation that the numbers provided for "simple model WGIII scenarios" in Table 2.2 in particular, the lower bound of the range for <3°C for 66% of simulations, as some of these numbers, revised from the FOD, appear to be questionable. Further request explanation of why cumulative emissions for 1870-2011 are different from estimates on other pages the report. For example, cumulative emissions between 1879-2011 when warming is less than 3 degrees and 33% of simulations meet goal are 1550 (=4850-3300) in this table, in contrast to "1900 [1630 to 2145]" on p64, line 43. [Government of Japan]
T2 A-99	Topic 2	65				Figure 2.3	figure 2.3: The y-axis is not described precise enough. The following is suggested: Temperature change by 2100 relative to 1861-1880 (°C) [Government of Austria]
T2 A-100	Topic 2	65				Figure 2.3	Figure 2.3: Please consider to be more specific regarding the "observed 2000s" black filled ellipse. If it is eg. the 2003-2012 period or 2000-2009 period it should be specified explicitly. This should also be explained in the caption. Please consider to strengthen the shading for both total human-induced warming and CO2-induced warming. We believe it would communicate better with a legend box that shows the different shading instead of text in the Figure itself. [Government of Norway]
T2 A-101	Topic 2	66	1	66	1	Table 2.2	This table is much easier to understand now as a result of revisions from the FOD of the SYR. However, there is a lot of information in this table and very little discussion of it in the text. Given how important it is to understand the cumulative carbon emission limits, it would be helpful to have some text to explain why the range of values for the WGIII scenarios is so large for any given temperature target and likelihood. Readers are referred to footnote c which tells us that the range indicates variation in CO2 budgets arising from differences in non-CO2 drivers across the WGIII scenarios. So this implies considerable flexibility in the CO2 budget depending on how non-CO2 drivers are managed. And yet, we have no information about those non-CO2 drivers. A couple of examples, to describe scenarios accounting for the upper and lower ends of the WGIII scenario range would be helpful (e.g., the 750-1400 GtCO2 range for 66% of models limiting warming to <2degC). [Government of Canada]
T2 A-102	Topic 2	66	4	66	4	Footnote	Replace "similar budgets" with "similar, but slightly greater budgets", which is supposed to be more informative as non-CO2 forcing on RCP8.5 is greater than those on other RCP scenarios. [Government of Japan]
T2 A-103	Topic 2	66	24	66	25	Headline 2.3	This sentence would be more logical to follow the sequence and wording used in lines 32-34 on this same page. The revised statement would read "Climate change will amplify existing climate-related risks and will create new risks for natural and human systems in countries at all levels of development". Adding "climate-related" is needed to indicate that climate change will not amplify ALL risks. [Government of Canada]
T2 A-104	Topic 2	66	25	66	26	Headline 2.3	Suggest adding two sentences to the sentence beginning with 'Greater rates of magnitude' to provide context. First is a sentence describing the complexity of the term "adaptation limits," just as we agreed to at the WG2 approval session in Yokohama: Limits to adaptation occur when adaptive actions to avoid intolerable risk for an actor's objectives or for the needs of a system are not possible or are not currently available. Second is a sentence that recognize the critical role that non-climate related factors (like weak governance and land use planning) play in limiting the effectiveness of adaptation efforts. The relevant underlying chapter 16 clearly states in the executive summary that: "A range of biophysical, institutional, financial, social, and cultural factors constrain the planning and implementation of adaptation options and potentially reduce their effectiveness (very high confidence). Adaptation of

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							both human and natural systems is influenced by the rate of climate change as well as rates of economic development, demographic change, ecosystem alteration, and technological innovation." Not including these two points would result is an incredibly misleading statement. [Government of United States of America]
T2 A-105	Topic 2	66	36	66	36	2.3	The line would be easier to understand if the word "understanding" were removed. [Government of United States of America]
T2 A-106	Topic 2	66	36	66	43	2.3	Please modify L 36 as follows: "Key risks as defined by IPCC are potentially severe". In addition, please provide information about how the expert judgement has been made; see our comment on Box 2.3. [Government of Germany]
T2 A-107	Topic 2	66	36			2.3	This sentence would be more accurate if it stated that "Key risks are potentially severe impacts AND ARE relevant to understanding dangerous". The logic is that being relevant to understanding dangerous interference is not a criteria for defining a key risk. This paragraph should also include reference to the Box on Information relevant to Article 2 of the UNFCCC. [Government of Canada]
T2 A-108	Topic 2	66	45	67	2	2.3	WGII AR5 identifies eight key risks with high confidence. The information retained in the SYR needs to be presented in a consistent way according to the WGII assessment. For instance, the "risk of mortality and morbidity during periods of extreme heat, particularly for vulnerable urban populations and those working outdoors in urban or rural areas" as per WG II is currently translated in the SYR as "Risk of severe ill-health and disrupted livelihoods resulting from storm surges, sea level rise, and coastal flooding; inland flooding in some urban regions; and periods of extreme heat." Please ensure the information in this paragraph is accurately communicated. [Government of Switzerland]
T2 A-109	Topic 2	66	46			2.3	We recognize this is an effectively condensed list of the eight key risks listed on page 13 of the WGII SPM. However we recommend re-inserting "death, injury, and" before "severe ill health" on this line. [Government of Canada]
T2 A-110	Topic 2	67	10	67	13	2.3	This is important and could be included in the SPM as well. [Government of Sweden]
T2 A-111	Topic 2	67	13			2.3	Please check the reference; it does not seem to be correct. [Government of Germany]
T2 A-112	Topic 2	67	15	67	16	2.3	This phrase is adresssing two different topics and should be cut into two sentences. [Government of France]
T2 A-113	Topic 2	67	15	67	16	2.3	Suggest deleting the sentence beginning with 'Greater rates of magnitude' unless two key points are included. First is a sentence describing the complexity of the term "adaptation limits," just as we agreed to at the WG2 approval session in Yokohama: Limits to adaptation occur when adaptive actions to avoid intolerable risk for an actor's objectives or for the needs of a system are not possible or are not currently available. Second is a sentence that recognize the critical role that non-climate related factors (like weak governance and land use planning) play in limiting the effectiveness of adaptation efforts. The relevant underlying chapter 16 clearly states in the executive summary that: "A range of biophysical, institutional, financial, social, and cultural factors constrain the planning and implementation of adaptation options and potentially reduce their effectiveness (very high confidence). Adaptation of both human and natural systems is influenced by the rate of climate change as well as rates of economic development, demographic change, ecosystem alteration, and technological innovation." Not including these two points would result is an incredibly misleading statement. [Government of United States of America]
T2 A-114	Topic 2	68	1	68	1	Figure 2.4	There is a major concern about Figure 2.4 (and Fig. SPM.8, as a result). Although there are some changes in the wording from the previous version, e.g., to say "potential for adaptation to reduce risk." However, the problem still remains in that it still says that there is no potential for additional adaptation to reduce risk for ecosystems in polar regions (in top left box of the figure), and no such potential in the present, or in the short term, or in the long term. The implication from this is serious: would IPCC intentionally declare that not any additional adaptation may reduce any risk at all in the polar regions where the risk level with current adaption is all that can be done since there is zero potential for additional adaptation to reduce risk with high adaptation. This means that IPCC establishes the status

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							quo for ecosystem adaptation in the polar regions and thus encouraging inaction. [Government of United States of America]
T2 A-115	Topic 2	68	1			Figure 2.4	Figure 2.4: Having a single box for polar regions suggests that, for example, risks for health and well being of people are important in both the Arctic and Antarctic. The huge differences between these regions is lost; issues will clearly be different in the Arctic given that there are settlements, resource development, etc. Suggest that a note be added to indicate that some of socioeconomic risks are more relevant to the Arctic. [Government of Canada]
T2 A-116	Topic 2	68		68		Figure 2.4	I have zoomed 150% in the pdf and have a huge monitor. The figure has a low resolution which makes it hard to read on paper. The sea level will rise and one of the key risks to Belgium, The Netherlands and Denmark is coastal erosion which is not shown in the figure. [Government of Denmark]
T2 A-117	Topic 2	68		68		Figure 2.4	Figure 2.4 is hard to read. The small pictograms representing the key risks are difficult to read, the colours should be clearer. Also the regional texts are hard to read. An explanation for the two stages of adaptation needs to be described in more detail - either in the text or in the figure caption. [Government of Denmark]
T2 A-118	Topic 2	69	1	69	40	2.3.1	Section.2.3.1: Please consider to integrate the concept of food security related to aspect covered in this section, as it is done with food production on land in section 2.3.2. [Government of Norway]
T2 A-119	Topic 2	69	21	69	31	2.3.1	Could this statement be rephrased so that "upwelling regions" are mentioned? [Government of Chile]
T2 A-120	Topic 2	69	34	69	35	2.3.1	Suggest adding "projected" before "impacts". [Government of Canada]
T2 A-121	Topic 2	70	9	70	11	Figure 2.5	Figure 2.5 caption: Suggest revising the caption for panel C to highlight the projected changes in 2300, which is a perspective that is unique to sea level rise. Current discussion about return intervals of extreme sea level events is not supported by the figure per se - it is useful information but suggest it should be part of the main body of the text (e.g., p. 72, l. 16-24). [Government of Canada]
T2 A-122	Topic 2	70		70		Figure 2.5	Figure 2.5 is hard to read. Texts in panel b are almost invisible and textboxes in all 3 panels are blurry. [Government of Denmark]
T2 A-123	Topic 2	70				Figure 2.5	Figure 2.5: This figure has improved alot, especially Panel (A). Ideally Panel (B) should also include a bar showing the effect of temperature (warming) only. [Government of Norway]
T2 A-124	Topic 2	71	2	71	8	Figure 2.6	Figure 2.6 B appears significantly modified from figure WGII 6-10 b and c. Indicate that the figure was modified or use original figure information for consistency. [Government of United States of America]
T2 A-125	Topic 2	71				Figure 2.6	Figure 2.6: The word "mollusc" is not spelled the same way in the figure and the figure caption. [Government of Norway]
T2 A-126	Topic 2	71				Figure 2.6	Figure 2.6: Please consider to rephrase the title in the caption so that it also reflects corals. Suggestion, "Climate change risks for oceans; fisheries and corals." [Government of Norway]
T2 A-127	Topic 2	72	5	72	5	Figure 2.6	Delete "5" from "WG15 Box SPM.1". [Government of Japan]
T2 A-128	Topic 2	72	7	72	14	2.3.1	Why are results from WG1-Chapter 6 used here? Specifically: "There is high agreement between models that tropical ecosystems will store less carbon in a warmer climate. ...{6.4.2, 6.4.3}" [Government of Chile]
T2 A-129	Topic 2	72	8	72	10	2.3.1	The highlighted part in red may be added: "The direct effects of climate change on stored terrestrial carbon include high temperatures, drought and windstorms; indirect effects include increased risk of fires, pest and disease outbreaks; decrease increment of trees because of the deterioration of forest health." [Government of Turkey]
T2 A-130	Topic 2	72	10	72	12	2.3.1	"Increased tree mortality and associated forest dieback is projected to occur in many regions over the 21st century (medium confidence)..." - is this correct for all RCPs? Please specify if this is the case, or be explicit in which scenarios the statement are valid for. [Government of Norway]

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T2 A-131	Topic 2	72	14	72	14	2.3.1	Please consider to include a description about whether the feedback from melted permafrost and release of CO ₂ and CH ₄ are included in the model runs since this could be an important contributor to further temperature rise. [Government of Norway]
T2 A-132	Topic 2	72	28	72	30	2.3.2	To be consistent with the format used elsewhere, suggest providing additional information to support the bolded statement. [Government of Canada]
T2 A-133	Topic 2	72	28			2.3.2	What does "fractions of the global population" mean? Suggest considering whether there is a more clear way to state this. [Government of Canada]
T2 A-134	Topic 2	72	29			2.3.2	The phrase "...with the level of warming" is a bit unclear. Do you mean to say the level of warming experienced, or perhaps projected? Suggest reviewing and revising. [Government of Canada]
T2 A-135	Topic 2	72	48		50	2.3.2	This sentence could be read to imply that we currently have perfect or close to perfect global food security which is not the case. There are currently very significant risks to food security. Suggest considering whether it would be more appropriate to indicate that above 4 degrees C there would be even greater risks to food security, or similar wording. [Government of Canada]
T2 A-136	Topic 2	73	1	73	1	Figure 2.7	This Figure is confusing as it does not clarify which crops increase in yield and which decrease in yield. The easiest interpretation seems to be that the effects on crop yields are mixed though decreases seem to be much more dominant than increases but it's not clear if this is the intent. Recommend another review and iteration of the caption before the Synthesis Report goes final. [Government of United States of America]
T2 A-137	Topic 2	73	1	73	1	Figure 2.7	Figure 2.7: It should be explicitly stated that results that differ from one study to the next do not imply (necessarily) contradictions, since studies look at different crops, different regions, etc. [Government of United States of America]
T2 A-138	Topic 2	73	9	73	10	2.3.2	"Developing countries with low income" Venezuela in conjunction with others countries expressed its reservation to the use of this type of classification of countries based on income. This was part of the last debate for the acceptance of the Working Group III, and was reserved. [Government of Venezuela]
T2 A-139	Topic 2	73	10			2.3.2	"Up to mid century" sounds as if this would not be the case later on - please modify. [Government of Germany]
T2 A-140	Topic 2	73	11		12	2.3.2	Regarding the statement "Health impacts include greater likelihood of injury and death due to more intense heatwaves and fires", does this imply that heatwaves and fires are the only extreme weather events that are expected to increase injury and death due to climate change? What about droughts and floods as mentioned on the previous page, or in the next section that statement that climate change will increase risks for people from storms, extreme precipitation, flooding, water scarcity, sea level risk and storm surges? Suggest clarifying if possible. [Government of Canada]
T2 A-141	Topic 2	73	16			2.3.2	Regarding the phrase "...that become too hot", suggest being more explicit about what is meant here (e.g., too hot for what - extension of the infection area?). [Government of Canada]
T2 A-142	Topic 2	73	17			2.3.2	Regarding the phrase "Globally, the magnitude and severity of negative impacts will increasingly outweigh positive impacts (high confidence)." This could suggest that the negative impacts and positive impacts are roughly about equal currently - is this the case?. We have some estimates globally of negative impacts from WHO and very little information about positive impacts. Suggest clarifying if possible. [Government of Canada]
T2 A-143	Topic 2	73	22	73	22	2.3.2	Does the statement about risks being amplified have a confidence assessment associated with it? Or should the reader assume confidence is the same as the headline? This is unclear in the following paragraph as well. [Government of Canada]
T2 A-144	Topic 2	73	26	73	26	2.3.2	We suggest replacing "Rural areas ..." with "SOME rural areas ..." or "MANY rural areas" for the reasons already outlined in the New Zealand Government comments on SPM page SYR-18 line 7. [Government of New Zealand]
T2 A-145	Topic 2	73	32	73	33	2.3.2	The bold statement leading this paragraph omits an important caveat from WG2 SPM. The text should be revised to read: "Aggregate economic damages accelerate with increasing temperature (limited evidence, high agreement), BUT FEW QUANTITATIVE ESTIMATES HAVE BEEN COMPLETED FOR ADDITIONAL WARMING AROUND 3C

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							OR ABOVE." [Government of United States of America]
T2 A-146	Topic 2	73	32	73	39	2.3.2	Suggest that this paragraph should include a reference to Box 3.1 (The limits of the economic assessment of climate change risks). Consider adding "Also see Box 3.1". [Government of Canada]
T2 A-147	Topic 2	73	33	73	35	2.3.2	Two expressions, "or warming of ~2.5°C above preindustrial levels are 0.2% to 2.0% of income (SYR-73 line.33-35)" and " temperature increases of ~2 °C are between 0.2 and 2.0% of income (SYR-85 line.20-22)", exist, and they seem to have the same meaning. While we understand that this is due to differences in the base year, these two expressions should be unified. [Government of Japan]
T2 A-148	Topic 2	73	35		37	2.3.2	Regarding the phrase "Changes in population, age structure, income, technology, relative prices, lifestyle, regulation, and governance are projected to have relatively larger impacts than climate change, for most economic sectors (medium evidence, high agreement).", do these factors have larger impacts in aggregate or individually? It is assumed individually but this is not clear. [Government of Canada]
T2 A-149	Topic 2	73	38			2.3.2	What is "loss variability"? Suggest clarifying and avoiding jargon where possible. [Government of Canada]
T2 A-150	Topic 2	73	41			2.3.2	Suggest deleting "From a poverty perspective" and just maintain the main body of the sentence. An alternative formulation would also be "Climate change impacts will make poverty reduction more difficult. They are projected to slow down economic growth, further erode food security," [Government of Canada]
T2 A-151	Topic 2	74	12	74	15	2.3.2	Strongly suggest adding "In countries or regions without robust institutional arrangements to adapt,' climate change can indirectly increase risks of violent conflict.... This is one of the key discussions in underlying chapter. [Government of United States of America]
T2 A-152	Topic 2	75	1	76	0	Table 2.3	Table 2.3: Please add the "Flooding"-Symbol as a climate driver (in column three) to the lines "Displacement associated with extreme events" and "Violent conflict from deterioration..." as flooding can also play a an important role for these key risks. [Government of Germany]
T2 A-153	Topic 2	75	1	76	1	Table 2.3	Table 2.3: Suggest that this Table be redrafted to have the same appearance as Figure 2.4, as there is no reason why the global key risks presented here need additional text/information more than the key regional risks do. Suggest also that it would make more sense for the global key risks to appear before the regional key risks. [Government of Canada]
T2 A-154	Topic 2	75		76		Table 2.3	Table 2.3 texts are difficult to read [Government of Denmark]
T2 A-155	Topic 2	77	1	77	7	Box 2.4	It would be good if you could give examples of systems that could be threatened at higher temperatures. [Government of Sweden]
T2 A-156	Topic 2	78	1			Box 2.4	Box 2.4, Figure 1: It does not seem the most efficient use of the SYR to repeat the same diagram in this Box, in Figure 3.1, and in Figure Box Art. 2. Suggest the authors consider whether it would be appropriate to integrate this discussion of Reasons for Concerns into the Box on Article 2. [Government of Canada]
T2 A-157	Topic 2	78	1			Box 2.4	Please provide the projected temperature curves to accompany the figure at hand as in Assessment Box SPM.1 Figure 1 of the WG2 SPM. [Government of Germany]
T2 A-158	Topic 2	78	12	78	13	Headline 2.4	Please consider to replace the word "cease" with "are terminated immediately". We believe this is a formulation that better communicates the message and it also points towards the urgency needed for implementing mitigation measures. [Government of Norway]
T2 A-159	Topic 2	78	16	78	17	2.4	It would be helpful to give the main reason for this irreversibility (e.g. long lifetime of CO2, slow processes in the Earth system). [Government of Germany]
T2 A-160	Topic 2	78	17	78	18	2.4	We would propose the following modification: "stabilization of anthropogenic radiative forcing" or "stabilization of atmospheric greenhouse gases". [Government of Germany]

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T2 A-161	Topic 2	78	21	78	21	2.4	Could the phrase at the start of this sentence be deleted? ("The anthropogenic contribution to (surface temperatures will remain)"...). The WGI SPM simply stated that "Surface temperatures will remain approximately constant at elevated levels....etc." [Government of Canada]
T2 A-162	Topic 2	78	21	78	22	2.4	Should there be a confidence assessment associated with this statement? [Government of Canada]
T2 A-163	Topic 2	78	26	78	27	2.4	We propose to reconsider this sentence. Global surface temperature will continue to change as long as ocean temperatures, ice sheets and other parameters of the climate system keep changing. [Government of Germany]
T2 A-164	Topic 2	78	27	79	1	2.4	Should there be a confidence assessment associated with this statement? [Government of Canada]
T2 A-165	Topic 2	78		78		Box 2.4	Box 2.4 Fig. 1: This excellent figure illustrating RfCs ("the burning embers") is appearing also on page 85 and 126, now combined with other panels. This is probably OK but may seem somewhat repetitive [Government of Sweden]
T2 A-166	Topic 2	79	4	79	8	2.4	Please include the general explanatory statement as to the causes and impacts of ocean acidification where the topic is introduced in the SYR for the first time (see section on projected changes in the climate system). [Government of Switzerland]
T2 A-167	Topic 2	80	1	80	1	Figure 2.8	Panels (a) and (b) of Figure 2.8 need to be dropped. They do not effectively illustrate the concept described on p. 79, lines 10-18, which discuss inertia in the Earth system - and specifically in sea level rise. As a result, panel (c) should be retained, but the authors should plot the centennial SLR levels for each of the four RCPs, not some qualitative levels of CO2. Furthermore, panels (a) and (b) are ambiguous in terms of how the post-2100 scenario design was developed; these are not explained in the text or in the underlying WG reports. [Government of United States of America]
T2 A-168	Topic 2	80	1	80	2	Figure 2.8	Figure 2.8 gives very similar information as figure 2.1, table 2.1 and figure 2.2. Therefore, either this figure or one or two of the other figures can be removed. [Government of United States of America]
T2 A-169	Topic 2	81	18	81	18	2.4	"...to make a quantitative assessment." should be "...to make a quantitative assessment of the likelihood of this outcome." [Government of United States of America]
T2 A-170	Topic 2	81	21	81	21	2.4	"21st century " replace for 21st century [Government of Argentina]
T2 A-171	Topic 2	81	21	81	32	2.4	Reversing the order of the last two paras on P 81 seems to be more logical since the current last para addresses several parameters. [Government of Germany]
T2 A-172	Topic 2	81	31	81	31	2.4	It would be better to add "WGI 6.4.3.4" for reference. [Government of Japan]
T3 A-1	Topic 3	0				Topic 3	Topic 3: In the previous version there was a few very informative figures (Figure 3.1 and Figure 3.5) that have been removed in the current draft. Please consider reinserting them in a relevant place in the SYR. [Government of Norway]
T3 A-2	Topic 3	82	3	82	3	Topic 3	Adaptation and mitigation, the order should be reversed. See the general comment below [Government of France]
T3 A-3	Topic 3	82	23	82	29	Topic 3	The introductions of Topics 1 and 2 include references to the different Sections under the respective subtopics (e.g. P 35 L 10-12: "It discusses observed changes in climate (1.2) and external influences on climate (forcings), differentiating those forcings that are of anthropogenic origin, and their contributions by economic sectors and greenhouse gases (1.3)."). The introduction of Topic 3 does not provide such introduction. For reasons of clarity and coherence, we would suggest following the same approach as for Topics 1 and 2, and to provide an introductory overview to the five subSections of Topic 3. [Government of Germany]

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T3 A-4	Topic 3	82	24	82	25	Topic 3	Reword with these edits IN CAPS to make this sentence clearer: "It considers the benefits, risks, incremental changes, and potential transformations from different combinations of ACTIONS TO MITIGATE, ACTIONS TO ADAPT, AND LEVELS OF TOLERANCE FOR RESIDUAL RISKS FROM climate-related impacts." [Government of United States of America]
T3 A-5	Topic 3	82	33	82	34	3.1	The bolded sentence in the shaded box is a concise summary of the section, but the wording is awkward because of the use of "benefits" as both a verb and a noun. An alternate wording would be, "Effective decision making about climate change can be informed by..." instead of "Effective decision making about climate change benefits from..." [Government of United States of America]
T3 A-6	Topic 3	82	37	82	37	3.1	Not only mitigation and adaptation raise issues of equity and justice etc but also the impacts of climate change!. Therefore the following wording is suggested: The impacts of climate change as well as mitigation and adaptation raise issues of equity, justice, and fairness, [Government of Austria]
T3 A-7	Topic 3	82	38	82	41	3.1	The authors need to use the language on p. 5 of the WG3 SPM with the paragraph that begins: "Issues of equity, justice..." That formulation was carefully crafted to adequately represent a range of perspectives and ought to be captured accurately in this Synthesis Report. As drafted, the current sentence does not properly reflect this framing. [Government of United States of America]
T3 A-8	Topic 3	82	38			3.1	Insert: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." Source: WG III, SPM p. 5. [Government of Saudi Arabia]
T3 A-9	Topic 3	82	47	82	48	3.1	Questionable statement "Effective mitigation will not be achieved..." Is there robust evidence for this? For collective goals, yes. However, even collective goals will require many diverse individual actions to sum up to significant action; universal monolithic action (which this sentence implies) is not the goal. Suggested re-write: "Effective mitigation requires a large number of individual mitigation efforts that together sum up to a significant collective action." [Government of United States of America]
T3 A-10	Topic 3	82		98		Topic 3	Misspelling of IPCC in the header. [Government of Sweden]
T3 A-11	Topic 3	83	2	83	3	3.1	Missing space between paragraphs [Government of Chile]
T3 A-12	Topic 3	83	2	83	3	3.1	Insert blank line to separate paragraphs. [Government of Japan]
T3 A-13	Topic 3	83	7			3.1	Please explain "social cost of carbon". [Government of Germany]
T3 A-14	Topic 3	83	9	83	9	3.1	replace "non-marketd" with "no-market" [Government of Italy]
T3 A-15	Topic 3	83	13	83	14	3.1	The sentence "Analytic methods are not able to identify a single target for climate policy or a single best balance between mitigation, adaptation, and residual climate impacts" is unclear, and could be written in a way that is more understandable, such as: "Given the social, cultural and emotional factors that influence decision making, analytical methods in and of themselves cannot identifyfor policy makers a single target for climate policy or a single best balance in between how much and what actions to take to mitigate, how much and what actions to take to adapt, and how much residual risk to accept." [Government of United States of America]
T3 A-16	Topic 3	83	13	83	20	3.1	It seems the intention of this paragraph is highlighting the fact that there are many options and strategies available. But in overstating this, it incorrectly suggests that no information about the priority of action is available, and that non-action, mitigation and adaptation are equal strategies to respond to climate change. The AR5 shows, however, that mitigation action to reduce GHG emissions is key to reducing the impacts and risks of climate change. Without significant mitigation, the risks of climate change, including tipping points, might become very high and the effects of adaption could be come limited. Therefore, the paragraph should be modified in order to correctly reflect the science

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							presented in AR5. (See also our general comment on the sequence of mitigation and adaption in the SYR.) [Government of Germany]
T3 A-17	Topic 3	83	30	83	30	3.1	The word "Laypersons" should be exchanged to "All people". [Government of Sweden]
T3 A-18	Topic 3	83	30	83	31	3.1	As for the wording of "Laypersons", climate change issues include a variety of topics and there is no expert who knows everything. Therefore, we propose the word to be replaced by "people". [Government of Japan]
T3 A-19	Topic 3	83	38	83	38	3.2	For the sake of clarity it is suggested to insert "in the near term" after "Without additional mitigation". [Government of Austria]
T3 A-20	Topic 3	83	40	83	42	3.2	Suggest that this second sentence in the bolded headline could be more clear and direct. For example, "Risks from mitigation can be substantial, but are not as great as the risk of severe, widespread and irreversible impacts of climate change. Near-term mitigation reduces risks more than delayed mitigation." [Government of Canada]
T3 A-21	Topic 3	83	40	83	42	3.2	Write:"Well designed measures reduce the risks of mitigation, and their impact involve less severe, widespread, and irreversible impacts as risks from climate change, increasing the benefits from near-term mitigation action." [Government of Switzerland]
T3 A-22	Topic 3	83	40			3.2	The presentation of mitigation is rather negative. Please modify so that it reads: "Risks from mitigation increase with delayed action and could become substantial, ..." [Government of Germany]
T3 A-23	Topic 3	83	44	83	51	3.2	Please add a sentence or two on the nature, timescale, magnitude and persistence of the benefits of adaptation and mitigation to this paragraph. Although, the first sentence suggests that the paragraph will discuss BOTH risks and benefits, the subsequent sentences focus entirely on risks. [Government of United States of America]
T3 A-24	Topic 3	83	44	84	4	3.2	Climate policy is negatively framed here. It should become clear that the option of non-action would be even more challenging. Please modify accordingly. [Government of Germany]
T3 A-25	Topic 3	83	53	83	53	3.2	It is suggested to delete the colon after "risks". [Government of Austria]
T3 A-26	Topic 3	83	57	83	57	3.2	For the sake of clarity the following wording is suggested: The level of mitigation in the near term will influence the rate and magnitude of climate change on the longer term, and ... [Government of Austria]
T3 A-27	Topic 3	84	1	84	1	3.2	Suggest deleting the sentence beginning with 'Greater rates of magnitude' unless a sentence providing context for the term 'adaptation limits' is also included. Otherwise the term 'adaptation limits' could be interpreted in any number of ways making the term highly subjective and completely useless. The sentence 'Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits' was agreed to at the WG2 approval session in Yokohama ONLY IF the following sentence was added as a means of describing the complexity of the term 'adaptation limits': Limits to adaptation occur when adaptive actions to avoid intolerable risk for an actor's objectives or for the needs of a system are not possible or are not currently available. In addition, the over-simplistic statement 'Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits' fails to recognize the other factors that play a role in limiting the effectiveness of adaptation efforts. For example, the relevant underlying chapter 16 clearly states in the executive summary that: "A range of biophysical, institutional, financial, social, and cultural factors constrain the planning and implementation of adaptation options and potentially reduce their effectiveness (very high confidence). Adaptation of both human and natural systems is influenced by the rate of climate change as well as rates of economic development, demographic change, ecosystem alteration, and technological innovation." Therefore, this additional text needs to be added to make the paragraph acceptable. By not providing context for the term 'adaptation limits' (which is new to this report) and failing to recognize non-climate stressors that contribute to the reduced effectiveness of adaptation actions, the result is an incredibly misleading statement. [Government of United States of America]

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T3 A-28	Topic 3	84	6	84	6	3.2	For the sake of clarity the following wording is suggested: Without additional mitigation in the near term and beyond, climate change risks are likely to be high ... [Government of Austria]
T3 A-29	Topic 3	84	6	84	11	3.2	Please indicate the base period to which these temperature changes (3.7 to 4.8°C; 4°C) refer - we suspect it is 1986-2005 ? [Government of New Zealand]
T3 A-30	Topic 3	84	7	84	8	3.2	Please delete the phrase ", and the potential of adaptation to reduce some of these risks will be limited." Underlying Chapter 16, sub-chapter 16.6 "Effects of Mitigation on Adaptation Opportunities, Constraints, and Limits," clearly states that "for many valued human and natural systems, the complex spatial and temporal dynamics of impacts, adaptive capacity, and adaptation make it difficult to quantitatively project with any degree of accuracy and confidence when and where limits to adaptation will be encountered. Furthermore, although constraints and limits have been demonstrated to have cross-scale and cross-level interactions (16.3.2.10; 16.4.1), there is little evidence that indicates how limits to adaptation experienced by actors, species, or ecosystems in individual regions or sectors scale to a global aggregate limit. Therefore, there is little evidence to either substantiate or refute the idea that global mean warming beyond 2°C represents a global adaptation limit." As such, there does not seem to be supporting text from the relevant underlying chapter justifying the inclusion of the text we request be deleted. [Government of United States of America]
T3 A-31	Topic 3	84	8	84	12	3.2	In order to make shorten the text, this sentence could be removed because it is overlapping with information already given in Topic 2. [Government of Finland]
T3 A-32	Topic 3	84	9	84	9	3.2	Text says temperature change is 2.5 to 7.8 C. Clarify compared to what this (1850-1900?) since the panel A of Fig 3.1. compares risks to 3 points: 1850-1090, 1986-2005 and 2003-2012. [European Union]
T3 A-33	Topic 3	84	9	84	9	3.2	Please indicate the baseline to which the statement on temperature changes refers to (the average between 1850-1990). [Government of Germany]
T3 A-34	Topic 3	84	13	84	14	3.2	Does the "increased likelihood of triggering points" in this paragraph, refer to the physical system?, Human, eco-systems? [Government of Chile]
T3 A-35	Topic 3	84	18	84	18	3.2	include: "Figure XX", in panel A) [Government of Chile]
T3 A-36	Topic 3	84	18	84	23	3.2	It could be useful to note that the reason why scenarios in the baseline categories are allowed to have emissions in 2100 higher than current emissions is that those scenarios do not stabilise concentrations during the study period. [Government of Belgium]
T3 A-37	Topic 3	84	20	84	20	3.2	"can involve" sounds very strange..."should involve" ? [Government of Chile]
T3 A-38	Topic 3	84	21	84	23	3.2	Stabilisation requires zero net CO2 emissions in the long term, but it does not requires zero net GHG emissions, except for the lowest scenarios. The need to stop emissions entirely only exist for long-lived gases like CO2, while emitting some short lived substances remains possible in the long term. [Government of Belgium]
T3 A-39	Topic 3	84	23	84	25	3.2	Suggest these edits IN CAPS: "Under all assessed scenarios for mitigation and adaptation, some risk from residual damages is unavoidable, INCLUDING AS A RESULT OF IMPERFECT ACTIONS TO ADDRESS NON-CLIMATE RELATED STRESSORS..." [Government of United States of America]
T3 A-40	Topic 3	84	28			3.2	Insert: "Under all assessed scenarios for adaptation and mitigation, some risk from adverse impacts remains (very high confidence). Source: WG II, SPM p. 14. [Government of Saudi Arabia]
T3 A-41	Topic 3	84	30	84	31	3.2	Please indicate the base period to which these temperature limits ("...2°C or even 3°C ...) refer - we suspect it is 1850-1900 ? [Government of New Zealand]

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T3 A-42	Topic 3	84	30	84	37	3.2	This sub-chapter has the title "climate change risks reduced by mitigation and adaptation". This paragraph does not fit under this sub-chapter and would confuse and should therefore be deleted. The risks of mitigation are addressed under topic 4. [Government of Austria]
T3 A-43	Topic 3	84	30	84	37	3.2	Climate policy is negatively framed here, see our comments above, e.g. P 83 L 44. [Government of Germany]
T3 A-44	Topic 3	84	30	84	37	3.2	The reference of this paragraph is WGIII SPM.4.1., but the text provided here is substantially different from what is found in the WGIII SPM. This paragraph globally associates mitigation with risk, with a long list of possible impacts that are all supposed to be negative. Please rewrite this paragraph to reflect the SPM of WGIII, in particular page 18 : "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified" (WGIII bold statement). [Government of Belgium]
T3 A-45	Topic 3	84	32	84	32	3.2	"associated" is repeated [Government of Italy]
T3 A-46	Topic 3	84	33	84	33	3.2	The notion "high aggregate economic costs" probably refers to the mitigation costs only excluding reductions in damage costs. If that is the case, replace the word "economic" with "mitigation costs". [European Union]
T3 A-47	Topic 3	84	34	84	36	3.2	add fossil fuel export revenues [Government of Saudi Arabia]
T3 A-48	Topic 3	84	34	84	37	3.2	"Other risks are associated with human health, food security, energy security, poverty reduction, biodiversity conservation, water availability, income distribution, efficiency of taxation systems, labour supply and employment, urban sprawl, and the economic growth of developing countries (Table 4.5)." As above, it is unclear how risks relate to "urban sprawl". [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-49	Topic 3	84	37	84	37	3.2	Please, replace "developing countries" by "developing regions" [Government of Russian Federation]
T3 A-50	Topic 3	84	37	84	52	3.2	Paragraph contains material that is already given in Topic 2 -> paragraph could be shortened. [Government of Finland]
T3 A-51	Topic 3	84	43	84	48	3.2	The sentence is too long, without any commas. Consider rephrasing. [Government of Italy]
T3 A-52	Topic 3	84	48	84	48	3.2	change order of punctuation (to before Irreversibilities) [Government of Chile]
T3 A-53	Topic 3	84	50	84	52	3.2	The sentence is not easily readable. Consider rephrasing. [Government of Italy]
T3 A-54	Topic 3	84	52	84	54	3.2	It is suggested to have a separate paragraph for the sentence "Delays in additional mitigation limit the mitigation options and increase the mitigation costs and risks that would be incurred in the medium to long term to maintain climate change risks at a given level." and to have this assessment in bold. [Government of Austria]
T3 A-55	Topic 3	85	1	85	1	3.2, Figure 3.1	In panels (b) and (c), the ellipses seem to be drawn arbitrarily in size and in orientation; describe how it's done. [Government of United States of America]
T3 A-56	Topic 3	85	1	85	14	3.2, Figure 3.1	Comment on Figure 3.1: As with the New Zealand Government comment on Fig Fig SPM.10, we suggest the label on the y-axis of panel C be changed to "Change in ANNUAL CO2-equivalent emissions..." (This is explained deep within the caption, but it would also be useful to see it on the figure itself). [Government of New Zealand]
T3 A-57	Topic 3	85	3	85	7	3.2, Figure 3.1	Figure caption 3.1 Panel (A): Please consider to include text that describes the observed temperature increase from the 1850-1900 period to 2003-2012 period since this level is explicitly marked on the white thermometer in Panel (A). [Government of Norway]

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T3 A-58	Topic 3	85	6	85	6	3.2, Figure 3.1	Here criteria for "key risk" are mentioned. These should be referred to in the caption to Figure 3.1 Suggestion: " that all four criteria for "key risk" are met (WGII 19.2.2.2) [Government of Sweden]
T3 A-59	Topic 3	85	6	85	8	3.2, Figure 3.1	Figure 3.1 (B): Please specify the end year for cumulative emissions presented in this figure in the figure heading and caption (1870 to when?). [Government of United States of America]
T3 A-60	Topic 3	85	8	85	10	3.2, Figure 3.1	Please modify: "In view of these limitations, it is outside the scope of science to identify a single climate change target and an optimal climate policy based on cost estimates". This addition reflects the value of non-monetary factors, which would be ignored by such a purely economic assessment. [Government of Germany]
T3 A-61	Topic 3	85	15	86	10	3.2, Box 3.1	The substance of this box is highly relevant and valuable to policymakers. As such, the authors should strongly consider elevating findings from this box to the SPM. In particular, the statement on p. 86, lines 1-2. [Government of United States of America]
T3 A-62	Topic 3	85	16	86	10	3.2, Box 3.1	This Box is as applicable to the discussion on p. 73 (l. 32-39) as it is to p. 84 (l. 16-28). Suggest the authors consider whether it may be more appropriate to move it up to Topic 2. [Government of Canada]
T3 A-63	Topic 3	85	16	86	10	3.2, Box 3.1	Box 3.1. gives estimated numbers for economic loss from climate change impacts in percent of global annual income loss. The numbers for the costs of mitigation action are not given in Box 3.1 but in Section 3.4, in particular in Table 3.2, and they are given in terms of a different parameter (consumption loss by 2100 or reduction of annual consumption growth). The costs of adaption are not indicated at all, Section 3.3 states that confidence in cost estimates of adaptation is very low. Despite the complexity and uncertainties of cost estimates, policy makers wish to compare the information on risks/potential impacts, mitigation and adaptation, because this information is highly relevant for decision making. Therefore, the information provided by the IPCC should be given in a transparent manner: It should not be spread across the report but given in Box 3.1 at a stroke. In addition, the numbers for risks and for mitigation should be given using the same parameter. This transparency of information together with the information that estimates are highly uncertain and cannot be compared would be a helpful real synthesis that we would expect from the SYR. [Government of Germany]
T3 A-64	Topic 3	85	21	85	21	3.2, Box 3.1	use italic for confidence level. [Government of Chile]
T3 A-65	Topic 3	85	21	86	3	3.2, Box 3.1	cancel ")" [Government of Italy]
T3 A-66	Topic 3	85	30	85	30	3.2, Box 3.1	replace "populations" with "communities" [Government of Italy]
T3 A-67	Topic 3	85	31	86	2	3.2, Box 3.1	The sentence, "Estimates of global aggregate economic losses exist only for limited warming that occurs in scenarios with additional mitigation action and associated costs" is confusing, as well as misleading because there are economic damage estimates available that do not assume mitigation. Consider replacing this sentence with the approved text from WGIII SPM (footnote 19), "The total economic effects at different temperature levels would include mitigation costs, co-benefits of mitigation, adverse side-effects of mitigation, adaption costs and climate damages." [Government of United States of America]
T3 A-68	Topic 3	85		85		3.2, Figure 3.1	Figure 3.1 is hard to read especially panels B and C. Panels B and C could be put in a seperate figure. [Government of Denmark]
T3 A-69	Topic 3	85		85		3.2, Figure 3.1	Figure 3.1. For better understanding of Figure SPM 3.1, we would like to propose the supplement as follows. - Regarding (c), the color difference between the emission in 2050 and 2100 are unrecognizable, so these colors

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							should be changed. If possible, the figure also should be made bigger. - Regarding figure (b) and (c), while ellipses have been added in the figure (b) from the First Order Draft, additional explanation such as the description of the relevance of their areas and confidence of the temperature in its area should be written. Specifically, the description "The ellipses show the approximate position of samples, and the samples do not necessarily uniformly exist." [Government of Japan]
T3 A-70	Topic 3	85				3.2, Figure 3.1	In Panel b) please consider to be more specific regarding the "observed 2000s" black filled ellipse. If it is eg. the 2003-2012 period or 2000-2009 period it should be specified explicitly. This should also be explained in the caption. [Government of Norway]
T3 A-71	Topic 3	85				3.2, Figure 3.1	Figure 3.1. It would be better to align x-axis between panel (B) and panel (C) to show their relation clearly. [Government of Japan]
T3 A-72	Topic 3	86	3	86	3	3.2, Box 3.1	"accurately estimating..." is not clear. Consider rephrasing. [Government of Italy]
T3 A-73	Topic 3	86	6	86	9	3.2, Box 3.1	It is suggested to delete the last part of the text starting from "Some limitations of current estimates And to include the much better statement: Determining a climate change target involves both risk assessment and value judgments and would be outside of science as well as of the IPCC mandate, independent of any limits of knowledge. [Government of Austria]
T3 A-74	Topic 3	86	10	86	10	3.2, Box 3.1	It seems important to include another sentence in order to avoid the impression that these limits of science are used as an excuse to further delay action. The following wording is suggested: The current understanding of climate change risks and the potential of adaptation and mitigation to reduce those risks clearly indicates that it is beneficial to strongly enhance actions on mitigation and adaptation beyond current efforts (see table 2.3). [Government of Austria]
T3 A-75	Topic 3	86	12			3.3	Please limit the title of Section 3.3. to "Characteristics of adaptation pathways", as "characteristics" already imply risks. If risks are mentioned, co-benefits need to be mentioned as well, for reasons of balance. [Government of Germany]
T3 A-76	Topic 3	86	15	86	17	3.3	Consider deleting "A longer term perspective" from this sentence as there is no context to help the reader interpret this (i.e., longer than what?). Suggest instead stating "Immediate adaptation actions serve as building blocks for future adaptations," [Government of Canada]
T3 A-77	Topic 3	86	44	86	44	3.3	"...overemphasizing short-term outcomes ALONE or failing to... [Government of United States of America]
T3 A-78	Topic 3	86	48	86	49	3.3	The wording is confusing. In order to enhance clarity the following wording is suggested: Assessment of adaptation options can be improved by including co-benefits and mitigation implications (see sections 3.5 and 4.2). [Government of Austria]
T3 A-79	Topic 3	86		86		3.3	Section 3.3 on characteristics of adaptation pathways is completely silent on costs of adaptation. This needs to be included here for better impact, one example of what can be included is moving the following statement from section 4.4.4. to here. "Limited evidence indicates a gap between global adaptation needs and the funds available for adaptation (medium confidence). There is a need for a better assessment of global adaptation costs, funding, and investment. Studies estimating the global cost of adaptation are characterized by shortcomings in data, methods, and coverage (high confidence)." [Government of United States of America]
T3 A-80	Topic 3	87	4	87	4	3.3	Suggest deleting the phrase 'there are limits to adaptation;' The affirmative, present tense phrase leads the reader to conclude that there is a large body of evidence supporting the claim that there are limits to adaptation. This is simply not the case, which is why there is no underlying text to support such an abrupt, standalone statement. [Government of United States of America]
T3 A-81	Topic 3	87	4	87	4	3.3	Instead of a semicolon, use a full stop. [Government of Switzerland]

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T3 A-82	Topic 3	87	4	87	5	3.3	Suggest deleting the phrase 'there are limits to adaptation;' The subsequent sentences in this paragraph do not provide context for such a statement. In fact, within the same paragraph, the sentence on lines 11-13 stating, "For most regions and sectors, empirical evidence is not sufficient to quantify magnitudes of climate change that would constitute a future adaptation limit" seems to be stating that there is no evidence of a current adaptation limit or future adaptation limit. The affirmative, present tense phrase leads the reader to conclude that there is a large body of evidence supporting the claim that there are limits to adaptation. This is simply not the case, which is why there is no underlying text to support such a strong statement. [Government of United States of America]
T3 A-83	Topic 3	87	4	87	16	3.3	This paragraph is very useful as it carefully frames the notion of "limits to adaption" within the risk-based approach defined in WG2. It would be helpful to move this para further to the beginning of the SYR, as the notion is first used in Section 2.3. [Government of Germany]
T3 A-84	Topic 3	87	16	87	16	3.3	It is suggested to substitute "reasonable" by "feasible". [Government of Austria]
T3 A-85	Topic 3	87	28	87	28	3.3	"...benefit from iterative learning AND DECISION-MAKING, deliberative... [Government of United States of America]
T3 A-86	Topic 3	87	38	94	6	3.4	Section 3.4 has too many figures stating very similar things in varying levels of detail. This makes the section hard to read and too long. It is suggested that the number of figures be reduced, by removing some. [Government of United States of America]
T3 A-87	Topic 3	87	38			3.4	3.4 Characteristics and risks of mitigation pathways: Overshoot scenarios typically rely on the widespread deployment of bioenergy with carbon dioxide capture and storage (BECCS) as outlined in the report. However, the deployment of BECCS in regions where agriculture lands are available with scarcity is quite challenging. BECCS are often competitive with food production with regards to land use, water resource, ecosystem change and overexploitation of soils. [Government of Algeria]
T3 A-88	Topic 3	87	38			3.4	Please limit the title of Section 3.4. to "Characteristics of mitigation pathways", as the term "characteristics" already includes risks. If risks are mentioned, co-benefits need to be mentioned as well for reasons of balance. [Government of Germany]
T3 A-89	Topic 3	87	40	87	41	3.4	The current wording lacks clarity. The following wording is suggested: Measures exist to achieve the substantial emissions reductions over the next few decades necessary to likely limit warming to 2 oC. [Government of Austria]
T3 A-90	Topic 3	87	40	87	44	3.4	The text in the box would need some changes to make it clear: the word "exist" is not clear because it does not indicate if these measures are already implemented or are potential measures only known from a theoretical point of view. The use of the word "likely" in this context is not appropriate. The words "such reductions" in the last sentence are unclear because there is no indication if they refer to limits of 2, 2.5 or 3 degrees. And should the order of the second and third sentences be reversed? [Government of Switzerland]
T3 A-91	Topic 3	87	40	88	42	3.4	Please clarify (e.g. by the use of a footnote) whether the temperature changes referred to in Section 3.4 are with respect to 1986 to 2005, or 1850-1900. [Government of New Zealand]
T3 A-92	Topic 3	87	42	87	42	3.4	The word "substantial" seems rather strong here. Without underestimating the challenges wording could perhaps be less daunting. Use "significant" instead of "substantial". [European Union]
T3 A-93	Topic 3	87	46	87	47	3.4	"growth" is repeated twice. [Government of Italy]
T3 A-94	Topic 3	87	46			3.4	Please replace the term "persist" by "increase". [Government of Germany]
T3 A-95	Topic 3	87	52	88	1	3.4	The wording in brackets lacks clarity. The following wording is suggested: (range based on median climate response; the range of climate response is from 2.5 oC to 7.8 oC when including the uncertainty of the climate sensitivity). [Government of Austria]

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T3 A-96	Topic 3	88	1	88	2	3.4	Please clarify that these natural forcings are short-term and thus not relevant for climate change. Please modify "Importantly, these future scenarios do not account for possible short-term changes in natural forcings (e.g. volcanic eruptions) that are not relevant for the long-term climate trend." [Government of Germany]
T3 A-97	Topic 3	88	8			3.4	"below" could mean anything from 431 to 999 ppm. Please exchange "below" with "almost". [Government of Germany]
T3 A-98	Topic 3	88	12	88	30	3.4	This information from WG3 should be complemented by and compared to that from WG1 - as this is the SYR. [Government of Germany]
T3 A-99	Topic 3	88	19	88	19	3.4	Suggest replacing "will" by "is projected to" in this sentence. [Government of Canada]
T3 A-100	Topic 3	88	24	88	24	3.4	Please insert the word "availability and" before "widespred deployment" to be in line with approved language from WGIII and the text in SYR SPM. [Government of Norway]
T3 A-101	Topic 3	88	24	88	26	3.4	See our comment on P 34 L 3-5: The sentence "Overshoot scenarios typically rely on the widespread availability and deployment of bioenergy with carbon dioxide capture and storage (BECCS) and afforestation in the second half of the century (Table SPM.1)." is not fully coherent with Figure SPM.11, upper panel, that shows negative emissions for RCP 3.6 (10-90 percentile) only after 2080. This incoherence already occurs in the WG3 SPM, please clarify. [Government of Germany]
T3 A-102	Topic 3	88	25	88	25	3.4	Suggest that this paragraph would benefit from additional explanation of "overshoot" and the role of deployment of BECCS and afforestation in the second half of the century. We appreciate that the SPM is trying to avoid referring to "negative emissions", which can be a confusing term, but some explanation of the relationship between the overshoot and the deployment of these technologies/methods would be helpful. [Government of Canada]
T3 A-103	Topic 3	88	26	88	29	3.4	Please be aware that this is also dealt with in the SYR SPM page 24 line 6-8 and Topic 3 page 96 line 14-16 with different language. [Government of Norway]
T3 A-104	Topic 3	88	28	88	28	3.4	It is not clear what the term "risks" implies - risks of mitigation, risks of higher costs, etc. When referring to CDR technologies it might be useful to summarize the risks discussed in the WGIII main report as environmental and socio-economic. Therefore, we suggest to improve the wording's clarity so it reads "environmental and socio-economic risks". [Government of Germany]
T3 A-105	Topic 3	88	29	88	29	3.4	The following wording is suggested: CDR is also included in many scenarios without overshoot. [Government of Austria]
T3 A-106	Topic 3	88	29	88	29	3.4	Please replace "CDR" by "BECCS und afforestation": Reason: According to Box 3.3. these are the only CDR methods included in future scenarios. [Government of Germany]
T3 A-107	Topic 3	88	30	88	30	3.4	We suggest adding CO2eq after ppm. [Government of Spain]
T3 A-108	Topic 3	88	30			3.4	It would be very useful to transfer the information from AR4 to the same reference year and either CO2 or GHG so the reader can easily asses the significance of the difference. [Government of Germany]
T3 A-109	Topic 3	88	32	88	32	3.4	The following wording is suggested: Likely limiting temperature change to 2 oC will require ... [Government of Austria]
T3 A-110	Topic 3	88	33	88	33	3.4	The phrase "and possibly land use" is not a very useful statement on its own. Is it possible to more clearly explain in the following text what is meant by "possibly"? As written, it implies that limiting to 2degC might not require cuts in emissions from land use (including from deforestation). This would seem to conflict with previous findings and statements. [Government of Canada]
T3 A-111	Topic 3	88	33	88	33	3.4	Please include the following statement from SPM WG III, Section 4.2.1: "Mitigation scenarios reaching around 450 ppm CO2eq concentrations by 2100 show large-scale global changes in the energy supply sector. In these selected

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							scenarios, global CO2 emissions from the energy supply sector are projected to decline over the next decades and are characterized by reductions of 90% or more below 2010 levels between 2040 and 2070." This information is highly relevant for policy makers. [Government of Germany]
T3 A-112	Topic 3	88				3.4, footnote 30	Foot note 30. We want some explanations for whether or not revised climate science, in particular for equilibrium climate sensitivity (ECS), affects the difference of emissions reduction range between AR4 and AR5, considering that the best estimate of ECS was not given in AR5 while it was assessed as about 3 degC in AR4 and used for the basis of its reduction range. [Government of Japan]
T3 A-113	Topic 3	89	5	89	41	3.4, Table 3.1	Footnotes are too lengthy. Consider to make them more concise. [Government of Japan]
T3 A-114	Topic 3	89				3.4, Table 3.1	Table 3.1: In the version of this Table from WGIII SPM it was a reference to the time horizon. Please include "over the 21st century" in the upper-row, right column after "Likelihood of staying below specific temperature levels " [Government of Norway]
T3 A-115	Topic 3	89				3.4, Table 3.1	Table SPM.1: This table is very clear and hence central to the understanding of SYR. [Government of Norway]
T3 A-116	Topic 3	89				3.4, Table 3.1	Table 3.1. Request explanation of why the columns for Cumulative CO2 emissions in 2011-2050 and 2011-2100 and 2100 temperature change which were included in WG3 SPM, Table SPM.1 have been omitted from current table. If explanations are difficult to provide, request use of original WG3 SPM Table SPM.1 in the SYR as well. [Government of Japan]
T3 A-117	Topic 3	89				3.4, Table 3.1	Table 3.1. Please check the value in this table. "-52 to -42" in row "500 CO2eq concentration in 2100, No overshoot of 530 ppmCO2eq", column "Change in CO2eq emission compared to 2100, for 2050" is different from that in WGIII SPM Table SPM.1, where "-57 to -42. [Government of Japan]
T3 A-118	Topic 3	90	15	90	16	3.4	The following wording is suggested: (these scenarios likely limit warming this century to 2 oC). [Government of Austria]
T3 A-119	Topic 3	90	16			3.4	Insert: "not including benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation". Source: WG III, SPM p. 15. [Government of Saudi Arabia]
T3 A-120	Topic 3	90	24	90	24	3.4	It could be explicitly noted in this section that these costs do not include benefits of reduced climate change. [Government of Sweden]
T3 A-121	Topic 3	90				3.4, Figure 3.2	Figure 3.2 I would add also the upscaling requirement for 2030 (the percentage). Also, it is not very clear to me why the min for 430-480 of 2030 is lower than 2010. Does it mean that, possibly, we do not need to up-scale low-carbon energy supply before 2030? My opinion is that the figure's message is misleading, I would suggest to revise accordingly. [Government of Italy]
T3 A-122	Topic 3	91	4	91	10	3.4	Delete this paragraph as it may be implied that future mitigation efforts should be in large developing countries. [Government of Saudi Arabia]
T3 A-123	Topic 3	91	5	91	7	3.4	delete as this implies that future mitigation efforts should be in large developing countries. Might be misleading [Government of Saudi Arabia]
T3 A-124	Topic 3	91	7	91	7	3.4	We suggest adding likely after than. [Government of Spain]
T3 A-125	Topic 3	91	12	91	12	3.4, Figure 3.3	Footnote is missing. [Government of Sweden]
T3 A-126	Topic 3	91	19	91	19		This line could end with "without including benefits of reduced climate change". [Government of Sweden]

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T3 A-127	Topic 3	91				3.4, Figure 3.3	Figure 3.3: Please consider including the following sentence from the WGIII SPM (page 17) as part of the explanatory text for Figure SPM.13: "Estimates at the high end of these cost ranges are from models that are relatively inflexible to achieve the deep emissions reductions required in the long run to meet these goals and / or include assumptions about market imperfections that would raise costs.". We believe this provides important context helping explain the ranges provided in the figure. [Government of Norway]
T3 A-128	Topic 3	92	1	92	25	3.4, Table 3.2	<p>This table classifies energy technologies according to the scenarios, but the description of line 33-37 in page 25 of body text is too biased; it only mentions CCS and BECCS while there is no description about the situations of nuclear and/or renewable energy, both of which are on the table. Added to that, the number of samples in the table is too small.</p> <p>The situations of nuclear energy and renewables should be clearly described as written in page 21 of WG3 SPM, such as follows:</p> <p>Under the absence or limited availability of technologies, mitigation costs can increase substantially depending on the technology considered. Among those technologies, a growing number of RE technologies have achieved a level of maturity to enable deployment at significant scale since AR4 (robust evidence, high agreement) and nuclear energy is a mature low-GHG emission source of baseload power, but its share of global electricity generation has been declining (since 1993). Nuclear energy could make an increasing contribution to lowcarbon energy supply, but a variety of barriers and risks exist (robust evidence, high agreement).</p> <p>Delaying additional mitigation further increases mitigation costs in the medium- to long-term. Many models could not reproduce temperature increase below 2 °C with a likely chance, if additional mitigation would be considerably delayed, or if availability of key technologies, such as bioenergy, CCS, and their combination (BECCS) would be limited (high confidence). [Government of Japan]</p>
T3 A-129	Topic 3	92	6	92	7	3.4, Table 3.2	Table 3.2: The top two rows of the table seem redundant--can they be consolidated into a single row? [Government of United States of America]
T3 A-130	Topic 3	92	28	92	29	3.4	Does this statement require a confidence assessment? [Government of Canada]
T3 A-131	Topic 3	92	32	92	36	3.4	Request explicit explanation that "3%/yr" is a comparison from scenarios with emissions above 50GtCO ₂ eq. [Government of Japan]
T3 A-132	Topic 3	93	1	93	16	3.4, Figure 3.4	See comments #14 above – information about Cancun pledges should be removed from Figure 3.4 and from the text in line 6. [Government of Russian Federation]
T3 A-133	Topic 3	93	18	93	23	3.4	What peer-review publications support the statements about the Cancun Pledge being insufficient? If there is no peer-review publication to support it, then what is the validity of such paragraph? Then should say that such conclusion is "low confidence"? [Government of United States of America]
T3 A-134	Topic 3	93	18	93	23	3.4	The text describing Cancun pledges should be removed, since it is a political matter. Anyway, by the end of 2015 they will be out of date. [Government of Russian Federation]
T3 A-135	Topic 3	93	25	93	27	3.4	Please consider inserting "Kyoto", so that it reads; "Emissions of non-CO ₂ Kyoto gases" [Government of Norway]
T3 A-136	Topic 3	93	25			3.4	Box 3.2 begins by emphasizing the difference between two metrics without providing actual information on their nature or to the question why such difference is important in the first place. This seems to be no appropriate approach for a SYR as the report is supposed to be easily accessible for policy makers and informed lay people. Please delete or modify. [Government of Germany]
T3 A-137	Topic 3	93	26	93	26	3.4	Please harmonize the wording used for greenhouse gases: do not use a mix of chemical symbols and names. - for example, use "methane, nitrous oxide, ...", not "methane, N ₂ O...". [Government of Belgium]

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T3 A-138	Topic 3	93	27	93	28	3.4	What is meant by "key non-CO2 gases"? Please consider to explain this, be more specific, or delete "key". If non-co2 Kyoto gases are appropriate you should consider to insert "Kyoto" [Government of Norway]
T3 A-139	Topic 3	93	28	93	28	3.4	It is suggested to substitute "other" by "some". [Government of Austria]
T3 A-140	Topic 3	93	28	93	29	3.4	It is not generally so that N2O emissions from fertilizer and methane from livestock are difficult to mitigate. Reducing fertilizilizer use can also reduce costs if timing is optimized for example. And reducing methane emissions from livestock through anearobic digestion can also have (net) revenues or low costs. Hence the text is too generic. Replace the word "are" by "appear to be more". [European Union]
T3 A-141	Topic 3	93	30	93	30	3.4	Write:"... CO2 components will not be reduced to zero ...". [Government of Switzerland]
T3 A-142	Topic 3	93	34	94	1	3.4	Does this statement require a confidence assessment? [Government of Canada]
T3 A-143	Topic 3	94	2	94	2	3.4	The abbreviation "BC" should be explained when it is mentioned for the first time -> change to "black carbon (BC)" [Government of Finland]
T3 A-144	Topic 3	94	3	94	3	3.4	The acronym "BC" for black carbon should be spelled out upon first usage. [Government of United States of America]
T3 A-145	Topic 3	94	3	94	3	3.4	The acronym "BC" has not been used before. Please provide an expansion here (Black Carbon) [Government of New Zealand]
T3 A-146	Topic 3	94	4	94	5	3.4	Please consider to delete "possible" in this sentence since it is redundant because "can have" is already used earlier in the sentence. Please also consider to replace "air pollution" with "health and environment". The revised sentence would then read: "Near-term reductions in short-lived forcings can have a relatively fast impact on climate change and co-benefits for health and environment." [Government of Norway]
T3 A-147	Topic 3	94	5	94	5	3.4	Should this say "co-benefits for air quality" instead of "co-benefits for air pollution"? [Government of Canada]
T3 A-148	Topic 3	94	8	95	23	3.4, Box 3.2	Box 3.2: In general the text in this box does not incorporate some very important points which was expressed in WGI SPM page 17, last bullet point of section D.2. E.g. about the most appropriate metrics and time horizon, about limitations and uncertainties, and the resonably understandable description from WGI SPM of what GWP and GTP are not used in this text. The description of different use of time horizon for these two seems to be important to describe since the time horizon is used in a different way for these two metrics. [Government of Norway]
T3 A-149	Topic 3	94	8	95	23	3.4, Box 3.2	In chapter 8.7.1.4 WGI page 713, it is explicitly mentioned uncertainties for both GWP and GTP, eg. for CH4. Since it is obvious from this text that there are large differences when it comes to uncertainties we believe that it is a need to address this in this box. [Government of Norway]
T3 A-150	Topic 3	94	10	94	13	3.4, Box 3.2	Box 3.2. starts by emphasizing the difference between two metrics without explaining what they actually are, and why this difference would be important. This information is not needed and not useful for the SYR, which should be understandable for policy makers and informed lay people. The box could start with the text in L 15. [Government of Germany]
T3 A-151	Topic 3	94	12	94	13	3.4, Box 3.2	Please check these footnotes, we believe it would be better to explicitly mention the footnote number with respect to the full Synthesis report. So that e.g. Footnote 1 and 5 in Topic 1 should rather be Footnote 13 and 17 in the current draft version of the SYR. Given the extensive use of "ppm CO2-eq" please also consider to actually explicitly explain what CO2 equivalent concentration is, not only refer to the glossary. [Government of Norway]
T3 A-152	Topic 3	94	13			3.4, Box 3.2	Please check footnotes. [Government of Germany]

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T3 A-153	Topic 3	94	15	94	27	3.4, Box 3.2	Box 3.2: This Box does not present any information about uncertainties associated with metrics. However, WGI, chapter 8, states that there are significant uncertainties related to both GWP and GTP. Suggest the authors consider whether this information would be relevant to include in the SYR, potentially in the paragraph from line 23 to line 27. [Government of Canada]
T3 A-154	Topic 3	94	17	94	19	3.4, Box 3.2	Box 3.2 "where it was also used to illustrate the difficulties in comparing components with differing physical properties using a single metric." This is not correct - AR1 mentions them, but it isn't a very well developed discussion. [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-155	Topic 3	94	19	94	21	3.4, Box 3.2	Box 3.2 The phrase 'potentially relevant' is not helpful. All metrics are relevant in some way, or they wouldn't have been constructed. Also, it could sound like the IPCC is making a comment on the relevance of metrics. To keep it purely scientific, we would suggest 'only one of several metrics which have been constructed' or similar. [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-156	Topic 3	94	20	94	20	3.4, Box 3.2	Delete "but" and start a new sentence at "It is only". [European Union]
T3 A-157	Topic 3	94	23	94	24	3.4, Box 3.2	Suggest that a similar sentence used in the WGI Chapter 8 Executive Summary was more clear than the current phrasing in the SYR. E.g., "The choice of metric and time horizon depends on the type of application and which aspects of climate change are considered relevant in a given policy context." The remainder of this bolded sentence after the semi-colon could be deleted as it is implicit from the first part of the sentence. [Government of Canada]
T3 A-158	Topic 3	94	23	94	24	3.4, Box 3.2	We believe the word is choice is not the most appropriate in this setting because the role of science is more to describe the pro et cons with different options. Please consider to insert "The suitability of a given" instead of "The choice of" [Government of Norway]
T3 A-159	Topic 3	94	23	94	27	3.4, Box 3.2	Box 3.2 Suggest deleting this para as it is potentially confusing and this point is covered below more clearly. [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-160	Topic 3	94	23	94	38	3.4, Box 3.2	The discussion of GHG metrics should make note of the fact that GTP has a wider uncertainty range than GWP due to the need to make assumptions about climate sensitivity and ocean heat uptake (per WG1 8.7.1.3, 8.7.1.4). [Government of United States of America]
T3 A-161	Topic 3	94	29	94	30	3.4, Box 3.2	Box 3.2 Delete 'strongly' [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-162	Topic 3	94	29	94	38	3.4, Box 3.2	Box 3.2 This whole para, plus table 1 should go directly after para 1, to explain what metrics are, before going into their uses, pros and cons etc. [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-163	Topic 3	94	30	94	33	3.4, Box 3.2	Please consider to also elaborate about the maturity of these two metrics. In our understanding GTP are much less mature than GWP. Furthermore the GTP is dependent on other factors which are uncertain eg. climate sensitivity which means that the values of GTP may be changed in the future as knowledge increases. [Government of Norway]
T3 A-164	Topic 3	94	31	94	32	3.4, Box 3.2	Suggest deleting "...a widely discussed alternative,...". This information is somewhat subjective and not important to the central message of this box. [Government of Canada]
T3 A-165	Topic 3	94	31	94	33	3.4, Box 3.2	Box 3.2 'widely discussed' is a subjective statement - we suggest 'an alternative way of weighting GHG's' - or alternatively you could remove 'widely discussed alternative' [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-166	Topic 3	94	35	94	36	3.4, Box 3.2	Table 1 would suggest that choice of time horizon also affects some long-lived gases too - see CF4 - so not sure this is valid only for short-lived forcers. [European Union]
T3 A-167	Topic 3	94	40	94	54	3.4, Box 3.2 Table 1	Box 3.2 Table 1: In our view this table has several shortcomings and can easily be misunderstood. Since GWP based on cumulative RF over a particular time period while GTP is based on the temperature response at a chosen point in time we believe that it is unfortunate to put these time references in a similar way for both metrics without explicit text that describes the differences in method. E.g. for GWP it would be better to say "cumulative RF

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							over a 20 year period" instead of just "20 yr", and for GTP it would be better to say "temperature in 20 years" instead of "20 yr". Please consider to include uncertainty values in the table as given in Chapter 8.7.1.4 WGI. [Government of Norway]
T3 A-168	Topic 3	94	40	94	54	3.4, Box 3.2 Table 1	Please check numbers in the table, e.g. the 28 for GWP 100 for CH4. Furthermore, the lifetimes should be stated consistently with AR5 WG1. Given that the second commitment period under the Kyoto Protocol adopted the updated IPCC AR4 GWP values, it seems pertinent to display GWPs from SAR, AR4 and AR5. [Government of Germany]
T3 A-169	Topic 3	94	54	94	54	3.4, Box 3.2 Table 1	Add "WGI" before "Box 6.1, 6.1.1, 8.7" for clarification. [Government of Japan]
T3 A-170	Topic 3	94	56	94	57	3.4, Box 3.2	We believe the word is choice is not the most appropriate in this setting because the role of science is more to describe the pro et cons with differnt options. In this case it will be more natural to choose the timing and emphasis first than to start with the choice of metric. Please consider to insert "The suitability of a given emission metric is affected by the ..." instead of "The choice of emission metrics affects the". [Government of Norway]
T3 A-171	Topic 3	94			3	3.4	Please, explain abbreviation "BC" at first appear [Government of Russian Federation]
T3 A-172	Topic 3	95	1	95	1	3.4, Box 3.2	Suggest that text is changed to "for some individual countries and sectors" as it does not affect countries individually. [European Union]
T3 A-173	Topic 3	95	2	95	2	3.4, Box 3.2	Suggest "Different" is used instead of "Alternative". [European Union]
T3 A-174	Topic 3	95	2	95	23	3.4, Box 3.2 + Box 3.2 Figure 1	We believe that the description of reponse to CO2 emissions in in this text and figures are mainly relevant to CO2 from fossile fuel. Please consider to describe this in the text. This is elaborated on in Figure 6.1 FAQ, WG I which illustrates the different time scales. This is also reflected upon in text from WG III CH 11 (11.13.4 page 89) "While the warming from fossil fuels is nearly permanent as it persists for thousands of years, direct impacts from renewable bioenergy systems cause a perturbation in global temperature that is temporary and even at times cooling if terrestrial carbon stocks are not depleted" (House et al., 2002; Cherubini et al., 2013; Joos et al., 2013; Mackey et al., 2013). [Government of Norway]
T3 A-175	Topic 3	95	11			3.4, Box 3.2	Box 3.2, Fig.1 Panel B: this box in general seems to draw a comparison between GWP100 and GTP100, but there would appear to be no scientific reason for this. In Panel B it would be better to also show different time horizons for GTP, not just GTP100. [European Union]
T3 A-176	Topic 3	95	13	95	23	3.4, Box 3.2 Figure 1	Box 3.2, Figure 1. Please consider adding in the Figure caption a short description of where emissions from some sectors stems from eg. that emissions in the FOLU sector are mostly due to deforestation and forest degradation and that emissions from electricity and heat production are mostly due to combustion from fossile fuel. [Government of Norway]
T3 A-177	Topic 3	95	30	95	31	3.4, Box 3.3	We again suggest (building on comments on the FOD) that it would be better to use the IPCC glossary definitions of geoengineering methods (CDR and SRM) or shortened versions thereof, rather than writing more general descriptors of what these techniques aim to do. The description of CDR here - techniques that aim to slow or reverse increases in atmospheric CO2 concentrations - would seem to encompass any technology that reduced emissions of CO2 to the atmosphere as well as those that could actively remove CO2 from the atmosphere. The IPCC definition of CDR is different and restricts CDR to technologies or measures that remove CO2 directly from the atmosphere. It might be helpful to include a short discussion of overlap between CDR methods and mitigation methods involving carbon sink enhancement so readers understand better what distinguishes these methods. [Government of Canada]
T3 A-178	Topic 3	95	30	95	31	3.4, Box 3.3	Write:"There are two clusters of technologies envisioned: 1) Carbon Dioxide Removal (CDR) and 2) Solar Radiation Management (SRM). CDR aims to slow or reverse increases in atmospheric CO2 concentrations. SRM aims to counter". [Government of Switzerland]

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T3 A-179	Topic 3	95		95		3.4, Box 3.2	Box 3.2. Explain more clearly difference between three similar values of CO2 FOLU in pie chart on the left by GWP 100 AR5 at SYR-95 (10%), in bar graph by GWP 100 SAR in Figure SPM.2 at SYR-8 (11%), and in bar graph by GWP 100 AR5 in Figure SPM.2 at SYR-8 (10%) in order to understand these three values. Additionally, request explanation on difference in AFOLU values between pie chart on the left by GWP 100 AR5 (25%, adding Agriculture, 14% and Forestry and other land use, 11%) and WGIII SPM Figure SPM.2 (24%). (resulting from rounding off?) [Government of Japan]
T3 A-180	Topic 3	96	5	96	12	3.4, Box 3.3	The current text does not provide adequate and balanced information on CDR. The statement in line 5 implies that all or most CDR technologies play a major role in many of the ambitious mitigation scenarios. However, in line 9 you note that only BECCS and afforestation are included. This must already be clarified in the first sentence. We recommend to replace the current paragraph by the carefully drafted text from the WG3 SPM P 15 including footnote 18: "Mitigation scenarios reaching about 450 ppm CO2eq in 2100 typically involve temporary overshoot of atmospheric concentrations, as do many scenarios reaching about 500 ppm to 550 ppm CO2eq in 2100. Depending on the level of the overshoot, overshoot scenarios typically rely on the availability and widespread deployment of BECCS and afforestation in the second half of the century. The availability and scale of these and other Carbon Dioxide Removal (CDR) technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks (high confidence) (see Section SPM.4.2). (footnote 18). CDR is also prevalent in many scenarios without overshoot to compensate for residual emissions from sectors where mitigation is more expensive. There is only limited evidence on the potential for large-scale deployment of BECCS, large-scale afforestation, and other CDR technologies and methods. [2.6, 6.3, 6.9.1, Figure 6.7, 7.11, 11.13]" Footnote 18: "According to WGI, CDR methods have biogeochemical and technological limitations to their potential on the global scale. There is insufficient knowledge to quantify how much CO2 emissions could be partially offset by CDR on a century timescale. CDR methods carry side-effects and long-term consequences on a global scale. [WGI SPM.E.8]". [Government of Germany]
T3 A-181	Topic 3	96	12	96	12	3.4, Box 3.3	Delete the word "very". This depends on how fast learning-by-doing operates. If it goes as fast as solar PV where learning rates of 20% have been observed (for doubling of capacity costs are cut with 20%) the scale does not have to be very large. Lacking any empirical for BECCS one needs to be more careful here. [European Union]
T3 A-182	Topic 3	96	14	96	16	3.4, Box 3.3	Please consider whether this statement is relevant to CDR technologies in general. We believe that there is easier to quantify the potential related to some CDR technologies, such as afforestation and probably BECCS as well, than for other CDR technologies. Please consider inserting "to varying degrees," before "make it difficult..." [Government of Norway]
T3 A-183	Topic 3	96	14	96	24	3.4, Box 3.3	There seems to be a somewhat unbalanced assessment of carbon dioxide removal (CDR) since it is a large difference between eg. CDR related to forestry and other CDR techniques such as ocean fertilization. Potential risks related to forestry seems to be over-emphasized in relation to its potential benefits. [Government of Norway]
T3 A-184	Topic 3	96	15	96	17	3.4, Box 3.3	One can understand what is meant here, but it remains a fact that 1 ton CO2 mitigated by conventional mitigation will have the same impact on the C cycle and CO2 concentrations than 1 ton CO2 captured and stored by CDR ; thus, it is not clear why this is highlighted so much here and in WGI report. [Government of France]
T3 A-185	Topic 3	96	19	96	20	3.4, Box 3.3	Box 3.3: CDR approaches are aimed at reduction of CO2 concentration in the global atmosphere. From this viewpoint, CDR cannot lead to any "... climatic... side (negative) effects...". Altered surface reflectance caused by afforestation is not a relevant example, because in this case possible change in global albedo would be negligible. In addition, afforestation is just one of a dozen proposed CDR methodologies. [Government of Russian Federation]
T3 A-186	Topic 3	96	37	96	38	3.4, Box 3.3	Is there a confidence assessment that could be associated with this sentence about the decrease in global precipitation? [Government of Canada]
T3 A-187	Topic 3	96	39	96	40	3.4, Box 3.3	Box 3.3: Obviously "SRM would not prevent the CO2 effects on ecosystems and ocean acidification...". However, SRM is not at all intended for such tasks. This should not be considered as a shortcoming of SRM. Similarly, one can say that no adaptation measures can prevent the CO2 effects on ocean acidification. However, it does not mean that adaptation to climate change is a senseless business. [Government of Russian Federation]

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T3 A-188	Topic 3	96	48	96	49	3.4, Box 3.3	The following wording is suggested: There are significant challenges emerging for international institutions and mechanisms that would be needed, e.g. to possibly restrain testing and deployment. [Government of Austria]
T3 A-189	Topic 3	97	3	97	4	3.5	Please expand the headline statement and mention also potential action using text from L 31-33 of the same page: "Strategies and actions can be pursued now that will move towards climate-resilient pathways for sustainable development, while at the same time helping to improve livelihoods, social and economic well-being, and responsible environmental management" [Government of Germany]
T3 A-190	Topic 3	97	6	97	10	3.5	The origin of this text is not clear. Some part of sentences comes from WGIII SPM. The concept that change is considered most effective when it reflects country and local visions and approaches to achieving sustainable development according to national circumstances and priorities (footnote 17, page 15, SPM WGIII [Government of Saudi Arabia]
T3 A-191	Topic 3	97	9			3.5	Suggest it would be useful to use wording more specific than "current pathways", which implies that there are no current examples of sustainable / resilient development pathways. [Government of Canada]
T3 A-192	Topic 3	97	31	97	33	3.5	The current wording might be perceived as being policy prescriptive. A better wording might be: Strategies and actions pursued now could move the world towards climate-resilient pathways for sustainable development, while [Government of Austria]
T3 A-193	Topic 3	97				3.5, Figure 3.5	Figure 3.5 is a very illustrative and important figure. It shows the co-benefit of climate mitigation for air pollution, and it also shows that under the baseline scenario there is a risk that both BC and SO2 exceeds 2005 levels in 2050 [Government of Norway]
T3 A-194	Topic 3	98	9	98	11	3.5, Box 3.4	Suggest deleting this sentence about adaptation deficit as it is not relevant to the topic of the Box. [Government of Canada]
T3 A-195	Topic 3	98	9			3.5, Box 3.4	Insert: "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence)." Source: WG III, SPM p. 18. [Government of Saudi Arabia]
T3 A-196	Topic 3	98	10			3.5, Box 3.4	Please modify sentence, so that it reads: "... current climate variability and change is often..." [Government of Germany]
T3 A-197	Topic 3	98	17	98	19	3.5, Box 3.4	The sentence is confusing because income distribution, labour supply, and urban sprawl are not "objectives." Consider rewriting rephrasing "...effects on objectives, such as energy security..." as "effects related to energy security...." [Government of United States of America]
T3 A-198	Topic 3	98	17	98	21	3.5, Box 3.4	"Co-benefits of mitigation could include effects on objectives, such as energy security, air quality with positive human health and ecosystem impacts, income distribution, labour supply and employment, and urban sprawl" it is unclear how co-benefits relate to urban sprawl, is it through increased physical activity or more compact cities? [Government of United Kingdom of Great Britain & Northern Ireland]
T3 A-199	Topic 3	98	19	98	19	3.5, Box 3.4	a cobenefit of mitigating climate would be addressing sprawl, not sprawl. (or mitigation, diminution, combatting, sprawl...) [Government of United States of America]
T3 A-200	Topic 3	98	19	98	21	3.5, Box 3.4	"complementary" here is a bit confusing. Be more specific, or give an example of complementary policies and the downside. Anything that can result in an impact should be more clearly explained, as it will be used in counter-arguments. Note the short term disadvantage, long term benefits issue, with an example. [Government of United States of America]
T3 A-201	Topic 3	98	21	98	23	3.5, Box 3.4	The side effects of adaptation are missing in this para, please add. [Government of Germany]
T3 A-202	Topic 3	98	23	98	23	3.5, Box 3.4	Please consider to include possible adverse side-effects of adaptation to give a more balanced view comparable with the text in the same para regarding mitigation. [Government of Norway]

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T3 A-203	Topic 3	98	26	98	35	3.5, Box 3.4	Does this sentence on SO2 policies consider the negative radiative forcing of SO2, and by extension, the net positive/negative impacts of SO2 policies for air quality/human health/climate change mitigation? Suggest clarifying if possible. [Government of Canada]
T4 A-1	Topic 4	99	1	124	9	Topic 4	Topic 4 includes discussion of co-benefits and adverse side effects (also referred to as synergies and trade-offs) in several different sections, and much of these discussions are redundant. There is also some overlap with Box 3.4 in Topic 3. These discussions should be consolidated and reduced in the interest of a more concise section. [Government of United States of America]
T4 A-2	Topic 4	99	4	99	5	Topic 4	Write: "Effective mitigation and adaptation requires efficient implementation of policies that integrate a range of responses as well as policies that focus on specific issues and sectors, and can ...". [Government of Switzerland]
T4 A-3	Topic 4	99	8	99	14	Topic 4	The introductions of Topics 1 and 2 include references to the different Sections under the respective Subtopics (e.g. P 35 L 10-12: "It discusses observed changes in climate (1.2) and external influences on climate (forcings), differentiating those forcings that are of anthropogenic origin, and their contributions by economic sectors and greenhouse gases (1.3)."). The introduction of Topic 4 does not provide such introduction. For reasons of clarity and coherence, we suggest following the same approach as for Topics 1 and 2, and to provide an introductory overview to the five subSections of Topic 4. [Government of Germany]
T4 A-4	Topic 4	99	16	100	14	4.1	Some of the text in section 4.1 can be removed as it is repeated in Table 4.1. [Government of United States of America]
T4 A-5	Topic 4	99	22	105	4	4.1, 4.2	There is a lot of text on these pages that overlaps with Tables 4.1-4.3. Since the report needs to be shortened, such text that is overlapping with those tables could be removed. [Government of Finland]
T4 A-6	Topic 4	99	33	99	35	4.1	Adaptation and Mitigation are constrained by Livelihoods and Lifestyle as well. To explained clearly mean that Livelihoods and Lifestyle are the major factors impact Adaptation and Mitigation. [Government of Thailand]
T4 A-7	Topic 4	99	41	99	42	4.1	Insert " cultures" between "lifestyles" and "and behaviours"; Insert " and cultures" between "lifestyles" and "can contribute" [Government of United States of America]
T4 A-8	Topic 4	99	42	124	46	4.1	Communication and integration of adaptation strategies into national development policies will empower national network: (a) contribute to dissemination of information on variability and climate change (b) contribute to dissemination of information on activities in the field of climate change (c) raise awareness, opinion leaders and policy makers about the potential impacts of climate change (d) encourage responsible media to give greater emphasis to climate change (e) promote exchange of experiences on the treatment and recovery information materials on climate change, (f) promote international cooperation on climate change issue. [Government of Côte d'Ivoire]
T4 A-9	Topic 4	100	2	100	2	4.1	It is suggested to substitute "nations" by "countries". [Government of Austria]
T4 A-10	Topic 4	100	10	100	11	4.1	Strongly suggest that this statement should be accompanied by a confidence statement. The implication of this statement is that only limited progress can be expected through existing institutions / governance. Reference to Table 4.1 is inappropriate as it simply lists constraining factors and the implications for adaptation and mitigation - it does not make the case for the need for new institutions / institutional arrangements. [Government of Canada]
T4 A-11	Topic 4	100	10	100	11	4.1	The following sentence should be deleted because it contradicts the notion of mainstreaming that is broadly recognized as the appropriate approach: "The implementation of effective adaptation and mitigation options may necessitate new institutions and institutional arrangements that span multiple scales". [Government of Austria]
T4 A-12	Topic 4	100	15	101	1	4.1, Table 4.1	Table 4.1: At present this table is not well anchored in the text. Consider addressing this issue or deleting the table from the SYR. [Government of Canada]
T4 A-13	Topic 4	100	16	100	16	4.1, Table 4.1	Table 4.1, 1st column, 5th row: Please change "lack of access to climate finance" to "lack of access to national and international climate finance". Reason: The term "climate finance" is often associated with international climate finance. However, both national and international climate finance are of great importance. [Government of Germany]

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T4 A-14	Topic 4	100	16	100	16	4.1, Table 4.1	In Table 4.1, "energy consumption" should be changed "energy use" (energy can not be consumed). [Government of Sweden]
T4 A-15	Topic 4	101	8	101	8	4.2	It is suggested to substitute "firms" by "the private sector". [Government of Austria]
T4 A-16	Topic 4	101	19	101	20	4.2	This statement is not supported by the references provided. While there is much evidence of the value of integrating strategies and actions into wider development plans and other policy priorities, this is not a necessity (i.e., does not "depend upon" as cited in the text). For example, WGII SPM A-2 states "Governments at various levels are starting to develop adaptation plans and policies and to integrate climate-change considerations into broader development plans". Suggest reviewing. [Government of Canada]
T4 A-17	Topic 4	102	16	102	18	4.2	Table 4.2 Category: Ecosystem management : In example of Ecosystem category, natureal forest conservation should be included. [Government of Thailand]
T4 A-18	Topic 4	102		102		4.2, Table 4.2	Table 4.2. The text in the field with Examples is blurry [Government of Denmark]
T4 A-19	Topic 4	102		102		4.2, Table 4.2	Table 4.2. The text in the field with Examples is blurry [Government of Denmark]
T4 A-20	Topic 4	102		102		4.2, Table 4.2	Table 4.2: this misses the critical importance of water and sanitation services in building resilience of communities. Furthermore, the comments on water resource management are very general and rather unhelpful. [Government of United Kingdom of Great Britain & Northern Ireland]
T4 A-21	Topic 4	103	4			4.2	Limits are not discussed in the subsequent paragraphs with the exception of the marine systems and oceans paragraph. Consider revising. [Government of Canada]
T4 A-22	Topic 4	103	41	103	41	4.2	It is suggested to substitute "Human adaptation" by "Adaptation". [Government of Austria]
T4 A-23	Topic 4	103	47	103	54	4.2	In this case we want to contrast with the comment made in the page SYR-19, lines 53-54 Determining a level of climate change as dangerous would involve value judgments, wich is outside the mandate of the IPCC. If the scintific aspects are extremly delicate to determine, we think it is the same case when the IPCC is proposing trade reform for agricultural markets. [Government of Venezuela]
T4 A-24	Topic 4	104	13	104	16	4.2	Consider deleting phrase "Adaptation measures for health in the near-term include" from this sentence. The resulting factual statement is more effective in making the important point about basic development being the foundation for adaptation to climate change. [Government of Canada]
T4 A-25	Topic 4	104	18	104	18	4.2	Make clear what is meant by:"improvements to the built environment". [Government of Switzerland]
T4 A-26	Topic 4	104	24	104	35	4.2	This paragraph is largely redundant with discussions of co-benefits and adverse side-effects appearing elsewhere in the text and could be deleted entirely. [Government of United States of America]
T4 A-27	Topic 4	104	27	104	27	4.2	It is suggested to reword 'insect-borne diseases' as 'vector-borne diseases', since it is worded as such in the original WGII chapter 11 (human health). [Government of China]
T4 A-28	Topic 4	104	27	104	27	4.2	Use "vector-borne diseases" instead of "insect-borne diseases", which would technically exclude tick-borne diseases (ticks are arachnids - not insects) [Government of United Kingdom of Great Britain & Northern Ireland]
T4 A-29	Topic 4	104	32	104	33	4.2	Consider deleting phrase "while protection of ecosystems can assist adaptation to climate change and enhance carbon storage" from this sentence, as this is not relevant to the examples of trade-offs. [Government of Canada]
T4 A-30	Topic 4	105	6	122	35	4.3, 4.4	The boxes that give the headline statements/main messages of the different sections are very useful. More of them could be added to sections 4.3 and 4.4. [Government of Finland]

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T4 A-31	Topic 4	105	6			4.3	4.3 Response options for mitigation: Important projects are being implemented in Sahara for creating new cities and settlements and also for promoting agriculture which plays a key role in carbon sequestration. Such projects should be also highlighted in the report. [Government of Algeria]
T4 A-32	Topic 4	105	8	105	9	4.3	Same remark as in SPM page 29 line 3 on the word "exist". Write: "Cost-effective mitigation combines integrated approaches with measures to reduce energy...". [Government of Switzerland]
T4 A-33	Topic 4	105	14	105	16	4.3	The highlighted part in red may be added: "In addition, direct options in AFOLU involve reducing CO2 emissions by reducing deforestation, forest fires and forest degradation, storing carbon in terrestrial systems (for example, through afforestation) and providing bioenergy feedstocks." [Government of Turkey]
T4 A-34	Topic 4	105	14			4.3	Include % of mitigation from AFOLU, in particular deforestation and agriculture. [Government of Saudi Arabia]
T4 A-35	Topic 4	105	16	105	16	4.3	Suggest that this paragraph could be more clear about the circumstances in which bioenergy can make a contribution to mitigation. Discussion in Section 11.13.4 of the underlying WGIII report addresses these issues, and they are also alluded to on page 110 of this SR. Given this, and the high profile of bioenergy in this report, it would add clarity here to say something like: "... terrestrial systems (for example, through afforestation) and providing bioenergy feedstocks, recognizing the need to consider the full emission effects of bioenergy." [Government of Canada]
T4 A-36	Topic 4	105	17	105	17	4.3	It is suggested to delete "energy supply" because the GHG emissions from non-CO2 greenhouse gases in the energy supply sector are not very relevant. [Government of Austria]
T4 A-37	Topic 4	105		105		4.3, Table 4.3	Table 4.3: This table is not cited in the text and appears a bit homeless. [Government of Sweden]
T4 A-38	Topic 4	106	5	106	5	4.3	replace "determining" with "affecting" [Government of United States of America]
T4 A-39	Topic 4	106	8	106	8	4.3	It is not a balance approach to only make reference to the decarbonization of energy supply. It is already a complexity the recognition of this terminology. [Government of Venezuela]
T4 A-40	Topic 4	106	14	106	16	4.3	This sentence contains key messages to policy makers, highlighting opportunities for mitigation in urban development, as urbanisation is an ongoing global trend possibly locking in a large share of future GHG-emissions. Please consider to include this sentence in the corresponding part of the SPM. Also, relevant key findings for urban development provided in the SPM and TS from WGIII should be included in the SYR, as these are new and important findings of the AR5, and relevance for policy makers. [Government of Norway]
T4 A-41	Topic 4	106	15			4.3	Please insert "in particular", so that it reads: "...in particular in urban areas, ..." [Government of Germany]
T4 A-42	Topic 4	106	18	106	21	4.3	This para and the para on page 110 line 1-9 deals both with decarbonizing electricity generation we feel that these two paragraphs could be merged or at least located after each other. [Government of Norway]
T4 A-43	Topic 4	106	19	106	25	4.3	In L 19 "low stabilization levels" are referred to be "(about 430 and 530 ppm CO2eq)", whereas in L 25 these scenarios are referred to be "about 450 or 500 ppm". Please clarify. [Government of Germany]
T4 A-44	Topic 4	107	1	107	8	4.3, Figure 4.1	Figure 4.1 is very complex. At least, state the purpose of it in the first line of the caption. [Government of United States of America]
T4 A-45	Topic 4	108	1			4.3, Figure 4.2	Figures 4.2: This is a useful figure. Many thanks to the authors. [Government of Germany]
T4 A-46	Topic 4	109	1	109	5	4.3, Table 4.4	Editorial: For the AFOLU sector, the last box on demand side measures refers to "use of long-lives wood products", this should be "use of long-lived wood products". [Government of New Zealand]

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T4 A-47	Topic 4	109		109		4.3, Table 4.4	Table 4.4. Request that "sustainable forest management" to be added as an example of mitigation methods in AFOLU sector and change the sentence to "... conservation of existing carbon pools (sustainable forest management, reduced deforestation and forest degradation, ...". [Government of Japan]
T4 A-48	Topic 4	109				4.3, Table 4.4	Table 4.4: The addition of this table provides a very good sectoral overview of the energy system implications of the mitigation scenarios. We strongly support the inclusion of this table. [Government of Norway]
T4 A-49	Topic 4	110	11			4.3	delete 'energy use and associated' [Government of Saudi Arabia]
T4 A-50	Topic 4	110	14	110	14	4.3	To reduce ambiguity it might be helpful to add "low carbon" following "new" and "environmentally sound" following "and" so that the modified sentence reads: "In the transport sector, technical and behavioural mitigation measures for all modes, plus new low carbon infrastructure and environmentally sound urban redevelopment investments,... " [Government of Germany]
T4 A-51	Topic 4	110	22	110	27	4.3	Based on approved WG3 SPM text (p.24), we would like to propose to add effectiveness of measures such as information programs, regulatory approaches and voluntary actions. e.g. Information programmes are a prevalent approach for promoting energy efficiency, followed by economic instruments, regulatory approaches and voluntary actions. [Government of Japan]
T4 A-52	Topic 4	110	29	110	41	4.3	The previous version had a very important statement in bold shaded text (p. 100, lines 16-17) "REDD+ and sustainable bioenergy have a critical role to play in mitigating climate change, especially in the near term, if food security, socioeconomic and biodiversity concerns are addressed." This is now lacking from the draft. Please consider including it as a bold statement to the para starting on line 29. [Government of Norway]
T4 A-53	Topic 4	110	32			4.3	Insert: "The economic mitigation potential of supply-side measures is estimated to be 7.2 to 11 GtCO ₂ eq / year in 2030 for mitigation efforts consistent with carbon prices up to 100 USD / tCO ₂ eq, about a third of which can be achieved at a < 20 USD / tCO ₂ eq (medium evidence, medium agreement)." Source: WG III, SPM p. 25. [Government of Saudi Arabia]
T4 A-54	Topic 4	110	33	110	33	4.3	The statement "can be achieved" seems rather strong and raises the question whether the empirical evidence is indeed that strong. Suggest replacing "can" by "could" or "might". [European Union]
T4 A-55	Topic 4	110	43	110	45	4.3	Replace the first two sentences with: "Climate policy intersects with other societal goals creating the possibility of co-benefits or adverse sideeffects. These intersections, if well-managed, can strengthen the basis for undertaking climate action." Source: WG III, SPM p. 5. [Government of Saudi Arabia]
T4 A-56	Topic 4	111	1	112	5	4.3, Table 4.5	We support the inclusion of Table 4.5. [Government of New Zealand]
T4 A-57	Topic 4	111	5	111	5	4.3, Table 4.5	Economics column, row 3: also extra costs/impacts for energy needed to capture and store CO ₂ [Government of United States of America]
T4 A-58	Topic 4	111	5	111	5	4.3, Table 4.5	Economics column, transport section: Don't forget explicitly calling out fuel cost savings, and transit supports equity and location efficiency for housing affordability. [Government of United States of America]
T4 A-59	Topic 4	111		111		4.3, Table 4.5	About energy security: Table 4.5 on page 111 shows potential co-benefits and adverse side-effects of various mitigation measures, including energy supply. A side effect that is not emphasized enough in this table is that solar and wind power production varies depending on the weather. If renewable energy sources, such as solar and wind power, replace energy sources that are currently used as regulating power, there may eventually be difficulties in balancing electricity supply and demand. This in particular when the demand is extra high, such as during cold winter days. This could have both economic and social impacts. Further down in the table (below "Transport") it states that the reduction of carbon intensity of fuel contributes to energy security through diversification, reduced oil dependence and exposure to oil price volatility. This can of course be seen as potential co-benefits, but there is also risk for adverse side-effects, as with diversification for example since this may lead consumers to rely on various special solutions and thus make them more vulnerable to shortages. In some perspective, oil may therefore tend to be

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							a better solution for energy security since both supply and trade is widespread on the global market. And moreover, many countries are holding oil stocks as response measures in case of oil shortages, but not for other energy sources such as bio fuel. [Government of Sweden]
T4 A-60	Topic 4	111				4.3, Table 4.5	In respect to Table 4.5 which highlights that 'road safety (via higher crash-worthiness) (m/m)', Australia notes that the use of lighter automotive materials (composites) may be at the expense of optimal crashworthiness. Suggested edit to Table 4.5, Row: Reduction of energy intensity; column: Social -- add red text at the end of the list "road safety concerns (possible lower crash-worthiness due to the use of lighter automotive materials (composites)". [Government of Australia]
T4 A-61	Topic 4	111				4.3, Table 4.5	Table 4.5: For a comprehensive assessment we recommend to modify row 3 ("Nuclear replacing coal power"), column 4 ("Environmental"), as follows: "Ecosystem impact via upstream supply-chain activities (Uranium-Mining), Ecosystem impact related to nuclear-waste-treatment and storage." The proposed wording is based on the following information: IPCC WGIII AR5, Ch 7 Environmental and Health Effects, P 50: „The handling of radioactive material poses a continuous challenge to the operation of the nuclear fuel chain and leads to releases of radionuclides. The most significant routine emissions of radionuclides occurs during fuel processing and mining (Simons and Bauer, 2012). The legacy of abandoned mines, sites, and waste storage causes some concerns (Marra and Palmer, 2011; Greenberg, 2013b; Schwenk-Ferrero, 2013; Skipperud et al., 2013; Tyler et al., 2013)." [Government of Germany]
T4 A-62	Topic 4	111				4.3, Table 4.5	Table 4.5: Please reverse the order of the measures under "Energy Supply" in the left column. According to their potential, RE should be placed first. [Government of Germany]
T4 A-63	Topic 4	111				4.3, Table 4.5	Table 4.5: The space is often missing between the abbreviation for evidence (e.g. m/h) and the subsequent word. [Government of Norway]
T4 A-64	Topic 4	112	1	112	1	4.3, Table 4.5	Again, for buildings/economics: cost savings for the average person, as well as for businesses, should be explicitly conveyed here [Government of United States of America]
T4 A-65	Topic 4	112	1	112	1	4.3, Table 4.5	human settlements/economics column: location efficiency (living in a transit or walk-able place) adds to housing affordability, a cost savings issue [Government of United States of America]
T4 A-66	Topic 4	112	1	112	1	4.3, Table 4.5	human settlements/social column: location efficiency (living in a transit or walk-able place) adding to housing affordability, is also an equity issue (don't have to own a car to have a job) [Government of United States of America]
T4 A-67	Topic 4	112				4.3, Table 4.5	Table 4.5: Mitigation options in Forestry could be better specified as it is done in the leftmost column in Table 11.2 in WGIII under forestry. [Government of Norway]
T4 A-68	Topic 4	113	4	113	5	4.4	The description of support for treasury and technology transfer was deleted through the approval process of WG3 SPM, thus this description should be deleted. Otherwise, we would like to propose to quote from page 113 line25-26 of SYR as follows: "Existing and proposed international climate change cooperation arrangements vary in their focus and degree of centralization and coordination". [Government of Japan]
T4 A-69	Topic 4	113	4	113	5	4.4	Mitigation, Adaptation and technology and financing are crucial to deal with climate change, a challenge that would be almost impossible to meet without the latter two. It is necessary to emphasize the role of technology and funding not just as a complement to mitigation and adaptation. It is suggested to replace 'complement' with a more appropriate word. [Government of China]
T4 A-70	Topic 4	113	9			4.4.1	Suggest deleting the first part of the sentence so that it begins with "Effective mitigation will not be achieved" which is a repeat of text on p. 82. The term "Collective action problem" seems like jargon and should be avoided if possible. [Government of Canada]
T4 A-71	Topic 4	113	12	113	12	4.4.1	It is suggested to substitute "scales" by "levels" as this term seems in this context more appropriate. [Government of Austria]
T4 A-72	Topic 4	113				4.4, 4.4.1	Figure 4.4 should be deleted, since it might give an impression that AR5 recommends the indicated policy measures among various ones.

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							Otherwise, following revision should be made, i) unify color of all policy measures since the classification of agreed ones and not-agreed ones are vague and ii) add the following note; "This figure is not exhaustive, as it is a compilation of policy measures/frameworks which are subjects of study in many articles. Also, this figure doesn't indicate priority of each of the measures/frameworks." [Government of Japan]
T4 A-73	Topic 4	114	1			4.4.1, Figure 4.3	<p>Figure 4.3 rather confuses the reader and does not give additional value to the SYR as it is a purely theoretical attribution of policy measure to the degree of authority and cooperation. It is not clear whether the figure is based on any quantitative/criteria-based analysis. We therefore suggest not to include this figure in the SYR. If kept, we have the following comments:</p> <ul style="list-style-type: none"> - The terms in the figure refer to very different terms and concepts. Some of them are specific elements of regimes (e.g. "Kyoto targets", "FCCC/Kyoto/Copenhagen MRV rules"), some of them are institutions ("Green Climate Fund"), some describe broader approaches ("pledge and review"; "loose coordination of policies"). - To which extent does the "FCCC objective" have a more centralized authority than the "2°C long term goal"? - Why is "global carbon tax" placed on the far right side of the diagram? Does a global carbon tax necessarily require a high degree of authority to be conferred to an international institution? - Why are "harmonized carbon taxes" placed in the middle of "cooperation over ends" and "cooperation over means" whereas the "global carbon tax" is placed much closer to "cooperation over means"? - Why are the "Kyoto-" and "Copenhagen-MRV rules" placed in the same box? Wouldn't you agree that the Kyoto MRV rules have a higher degree of centralized authority? - What is meant by "Copenhagen MRV rules?" In Copenhagen, only some very short sentences on MRV have been included in the Copenhagen Accord. In Cancun, a more detailed set of MRV rules was adopted in an official COP decision. - Furthermore, the distinction between "existing agreements" (blue) and "proposed structures" (pale pink) is not coherent. E.g., if the Cancun pledges are considered "pledge and review", then why is "pledge and review" displayed as a "proposed" instead of an "existing" structure? <p>[Government of Germany]</p>
T4 A-74	Topic 4	114	15	114	17	4.4.1	The SYR repeatedly states that mitigation, adaptation, and sustainable development are closely related and feature potential synergies and trade-offs (e.g. P 97 L 3-4, P 104 L 24-26, P 123 L 3-6). In addition, it is stressed that mitigation and adaptation reduce risks over different timescales (P 83 L 53, P 84 L 2). However, within the context of regional cooperation concerned with adaptation and mitigation, the SYR states: "Inclusion of adaptation is increasingly important to reduce the risk of damages and may engage a greater number of countries. Other possible synergies and trade-offs between adaptation and mitigation, particularly those related to the timing of actions, are not well understood." (P 114 L 15-17). As this citation seems to contradict the above-mentioned statements, we suggest revising it or adding an additional sentence for explanation. [Government of Germany]
T4 A-75	Topic 4	114	15			4.4.1	The meaning of "Inclusion of adaptation" with respect to institutions and policy is unclear. Suggest deleting "inclusion of", so the sentence starts "Adaptation is increasingly important..." [Government of New Zealand]
T4 A-76	Topic 4	114	16	114	16	4.4.1	Write: "...may engage a greater number of countries and organisations." [Government of Switzerland]
T4 A-77	Topic 4	114	22	114	26	4.4.1	In light of discussions at IPCC-39, suggest that this text more closely reflect the approved text of the WGIII SPM and focus on lessons offered towards international mechanisms for addressing climate change. [Government of Canada]
T4 A-78	Topic 4	114	22	115	3	4.4.1	1) The Kyoto Protocol is one the most important achievement on international cooperation to address climate change. Although it has limitation in its implementation, its positive effect can't be denied and neglected. The Kyoto Protocol is mandated by the Convention, thus implements the principles and objectives of the Convention. It contains comprehensive and reasonable rules for setting emission reduction and limitation targets and means of implementation. The limited reduction effect by the Kyoto Protocol is mainly due to the insufficient participation of Annex I countries, lack of ambition and failure in fulfilling its commitments by Annex I countries. There are clear

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							provisions in Article 10 of the Protocol with regard to the responsibilities and obligations of Non-Annex I Parties. One cannot attribute the limited reduction effect by the Protocol to its failure to cover all of the global economy. 2) Whether Annex I parties surpassed their collective emission reduction target needs verification procedures under the Kyoto Protocol. 3) According to Article 12 of the Kyoto Protocol, the purpose of CDM involves two aspects, namely "to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3." Thus, the assessment of CDM here should be described from both aspects. It is suggested to make revisions according to the above comments. [Government of China]
T4 A-79	Topic 4	114	25	114	25	4.4.1	Regarding your statement that some countries did not ratify the Protocol and others who had ratified did not meet their commitments: It seems that you are generalising the fact that one country did not ratify and that one other country did not meet the commitments but rather withdrew from the Protocol. If this is the case it should be indicated. [Government of Germany]
T4 A-80	Topic 4	114	25	114	25	4.4.1	It is suggested to delete the wording "others who had ratified did not meet their commitments" because such statement is premature when it comes to the assessment of the fulfillment of GHG emission reduction obligations - the true-up period will only finish next year!!! [Government of Austria]
T4 A-81	Topic 4	114	25			4.4.1	Given that compliance with the first commitment period of the Kyoto Protocol is yet to be assessed (true-up doesn't happen until late next year), it is too soon to say that "others that ratified did not meet their commitments" [Government of New Zealand]
T4 A-82	Topic 4	115	5	115	5	4.4.1	To be consistent with the WGIII report, it is suggested to reword 'burden sharing' as 'effort sharing'. [Government of China]
T4 A-83	Topic 4	115	5	115	8	4.4.1	This paragraph should be deleted because of the following reasons: 1) The sentence "Several models (...)" introduces only results shown by a couple of models and is not so important as to be written on SYR. 2) In the current UNFCCC, each country is to take its own appropriate actions so that the expression "developed and developing countries" is not appropriate. 3) The basis and certainty of the part "Distributional impacts (...)" is not clear, therefore is not so important to be written on SYR, whose number of pages is limited. [Government of Japan]
T4 A-84	Topic 4	115	6	115	8	4.4.1	Suggest changing the sentence as follows: "Distributional impacts from international cooperative agreements depend on a number of factors INCLUDING THE EXENT OF ACTION BY ALL PARTICIPANTS, the approach taken....and the manner in which developing countries' emissions REDUCTION plans are financed." Rationale: any support received is for emissions reduction, not emissions. [Government of New Zealand]
T4 A-85	Topic 4	115	6	115	8	4.4.1	The 'Distributional impacts' of agreement is rather dependent on the availability of an efficient and adequate financial support to developing countries. Thus it is suggested to reformulate the sentence as "The distributional impacts of the Agreement will depend, in part, on sources of financing for developing-country emission plans, including the successful fulfillment by developed countries of their expressed joint commitment to mobilize \$100 billion per year by 2020 for climate action in developing countries." (Page7, Chapter 13, WGIII) [Government of China]
T4 A-86	Topic 4	115	8	115	9	4.4.1	In which way do the distribution impacts from internat. coop. depend on the manner of financing emission plans? This might be referring to the CDM mechanism (from WG3 Ch13.4) but the sentence is unclear without such background information. Please modify the text so that lay people will understand. [Government of Germany]
T4 A-87	Topic 4	115	8			4.4.1	Insert: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." Source: WG III, SPM p. 5. [Government of Saudi Arabia]
T4 A-88	Topic 4	115	15	115	16	4.4.1	Why is the inclusion of adaption "increasingly important"? If you are referring to increased climate change risks and impacts due to a lack of mitigation action, then please say so. Otherwise this supplementary statement is not clear and could be omitted. [Government of Germany]

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T4 A-89	Topic 4	115	18	115	21	4.4.1	Delete: "Some climate policies could be more environmentally and economically effective if implemented across broad regions, such as by embodying mitigation objectives in trade agreements or jointly constructing infrastructures that facilitate reduction in carbon emissions." [Government of Saudi Arabia]
T4 A-90	Topic 4	115	31	115	32	4.4.1	Consider deleting the word "substantive", as it seems like it may be too early to judge this (given that results are not rapid). Alternatively, there should be a confidence statement associated with this sentence. [Government of Canada]
T4 A-91	Topic 4	115	34			4.4.2	4.4.2 National and Sub-National Policies Any successful plan strongly depends on financial and technological capacity of a given country. It is very critical to avoid that any measures would not further enhance the gaps in the development and economic growth between developed and non developed countries. [Government of Algeria]
T4 A-92	Topic 4	115	45	116	1	4.4.2.1, Table 4.6	Table 4.6 contains very little substantive information and could be deleted in the interest of length. [Government of United States of America]
T4 A-93	Topic 4	115	45			4.4.2.1, Table 4.6	Table 4.6: Recent adaptation actions in the public and private sector across regions. Some African countries have developed an appropriate adaptation plan. For instance in Algeria, the mega project so-called the green dam to stop the advancing of desert to the north is one of the most important adaptation projects in Africa. [Government of Algeria]
T4 A-94	Topic 4	115	46	116	1	4.4.2.1, Table 4.6	It will be helpful to suggest a methodology for building resilience and increasing mitigation for climate-related risks (droughts and floods) in different region of the world. This methodology on adaptation opportunities and constraints must provide an overview of the challenges and opportunities for climate change adaptation in different regions of the world such as Climate Change Opportunities for Africa because a large number of Africans depend more strongly and directly on climate and environmental resources than any other region in the world. Africa is extremely vulnerability to climate change and climate variability because of her wide exposure, high sensitivity and limited adaptive capacity. [Government of Côte d'Ivoire]
T4 A-95	Topic 4	115		115		4.4.2.1, Table 4.6	Table 4.6 - For Europe the wording in "Examples of actions" need to be changes from "Adaptation policy" to "Adaptation policies". [Government of Denmark]
T4 A-96	Topic 4	116	4	116	6	4.4.2.1	The SYR states: "This includes National Adaptation Programmes of Action (NAPAs) by least developed countries, National Adaptation Plans, and strategic frameworks for national adaptation in OECD countries." In line with the original formulation in WG II, 15.2, we suggest adding the abbreviation "NAPs" to the term "National Adaptation Plans" to make clear that it refers to the NAP process established under the UNFCCC. [Government of Germany]
T4 A-97	Topic 4	116	5	116	5	4.4.2.1	The correct term is "the National Adaptation Plan process," NOT "National Adaptation Plans." Please correct. [Government of United States of America]
T4 A-98	Topic 4	116	10	116	10	4.4.2.1	We suggest to use the plural, so that it reads "Subnational governments and...". [Government of Germany]
T4 A-99	Topic 4	116	31	116	37	4.4.2.1	he original text of WG II, Ch. 1, p. 22 is as follows: Linkages among regional, national, and sub-national programs may complement international cooperation. We should take the section SPM.5.2 of WGIII as it is, with no change and no addition. [Government of Saudi Arabia]
T4 A-100	Topic 4	117	21	117	23	4.4.2.2	These are very strong statements on the effects of cap and trade systems i.e the last part saying that "caps have not proved to be constraining". In the latter case the carbon price would have to be zero during the whole operation period of the trading schemes and the effect on reducing emissions zero. Unless this evidence really exists the text need to be change. We would suggest deletion of the text "or caps that have not proved to be constraining". [European Union]
T4 A-101	Topic 4	117	26	117	27	4.4.2.2	Delete: "Revenues from carbon taxes or auctioned emission allowances reduce other taxes and/or to provide transfers to low-income groups." This text does not exist in SPMs of WGs. [Government of Saudi Arabia]
T4 A-102	Topic 4	117	28	117	28	4.4.2.2	Insert the word "can" after "generally". This is a matter of design and i.e. depends on how the government revenues are used. If they are used to lower labour taxes in a situation of unemployment this might work. If used to lower capital taxes e.g. they might not increase welfare. [European Union]

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T4 A-103	Topic 4	118	1	118	1	4.4.2.2, Table 4.7	Info Programmes row/Transport column: There are many NGOs working on transit, transit-oriented development, and walkability/bikeability programmes. [Government of United States of America]
T4 A-104	Topic 4	118	1	118	1	4.4.2.2, Table 4.7	Info Programmes row/ Human settlements column: Would argue that EPA's entire Smart Growth program is to educate communities on the cobenefits and how-to's that can move them toward lowering Vehicle Miles Travelled and hence, Carbon. I would think other countries do as well. Also, there are many relevant NGOs with resources and information on Smart Growth, e.g. Smart Growth America. [Government of United States of America]
T4 A-105	Topic 4	118				4.4.2.2, Table 4.7	Table 4.7: In the transport column and the row for tradable allowances, "Fuel and vehicle standards" does not fit in this category. This is rather covered under regulatory standards. One could however envision emissions trading also for the transport sector and there are also some CDM projects in the transport sector. [Government of Norway]
T4 A-106	Topic 4	119	1	119	1	4.4.2.2, Table 4.7	Voluntary actions row/transport column: Bike shares, walkability programs, etc. [Government of United States of America]
T4 A-107	Topic 4	119	1	119	1	4.4.2.2, Table 4.7	Voluntary actions row/human settlements column: programs like labelling for smart growth neighborhoods (LEED-ND); Resilient Communities for America agreement and resources, etc [Government of United States of America]
T4 A-108	Topic 4	120	1	120	9	4.4.2.2	Please add information from WG3 TS that says a reduction of subsidies to fossil energy can achieve significant emission reductions at negative social cost (very high confidence). The modified sentence would read: "The reduction of subsidies for GHG-related activities in various sectors can achieve significant emission reductions at negative social cost, depending on the social and economic context (high confidence)." [Government of Germany]
T4 A-109	Topic 4	120	4	120	5	4.4.2.2	delete in all countries and subsidies (P120, P 91. P 92 and P 25 of SPM of SYR) [Government of Saudi Arabia]
T4 A-110	Topic 4	120	9	120	9	4.4.2.2	WGIII SPM, seems an incomplete reference - this should read SMP 5.1 [Government of Italy]
T4 A-111	Topic 4	120	14	120	14	4.4.2.2	WGIII SPM, seems an incomplete reference - this should read SMP 5.1 [Government of Italy]
T4 A-112	Topic 4	120	16	120	20	4.4.2.2	Insert: " "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The effect of mitigation on natural gas export revenues is more uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of CCS would reduce the adverse effect of mitigation on the value of fossil fuel assets (medium confidence)." Source: WG III, SPM p. 18. [Government of Saudi Arabia]
T4 A-113	Topic 4	120	30	120	34	4.4.2.2	Mention that climate change adaptation is a process of adjustments in response to a climatic or climate-induced event. Adaptation to climate change and variability may be autonomous or spontaneous when it is led by households and communities acting on their own without public-policy interventions, or it may be planned (formal) through adaptation program of actions that is the result of a deliberate policy decision [Government of Côte d'Ivoire]
T4 A-114	Topic 4	120	37	120	38	4.4.2.2	Consider deleting this statement, given that it is expressed with "low confidence." The following sentence could be revised to say, "The potential adverse side effects of policies that raise the price of energy services can be avoided with the adoption of complementary policies such as income tax rebates or other benefit transfer mechanisms." [Government of United States of America]
T4 A-115	Topic 4	120	37	120	43	4.4.2.2	Re insert Some mitigation policies raise the prices for some energy services and could hamper the ability of societies to expand access to modern energy services to underserved populations (low confidence). These potential adverse side-effects can be avoided with the adoption of complementary policies (medium confidence). Most

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							notably, about 1.3 billion people worldwide do not have access to electricity and about 3 billion are dependent on traditional solid fuels for cooking and heating with severe adverse effects on health, ecosystems and development. Providing access to modern energy services is an important sustainable development objective. The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 to 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement). A transition away from the use of traditional biomass and the more efficient combustion of solid fuels reduce air pollutant emissions, such as sulfur dioxide (SO ₂), nitrogen oxides (NO _x), carbon monoxide (CO), and black carbon (BC), and thus yield large health benefits (high confidence). (WGIII SPM page 32 para 2) [Government of Saudi Arabia]
T4 A-116	Topic 4	120	37	120	43	4.4.2.2	<p>Mitigation policy is very negatively framed on P 120, see also our comment on P 30 L 46-51 of the SYR.</p> <p>L 16-20: This paragraph indicates the side effects of mitigation but there is no such paragraph on the co-benefits. Please add to avoid presenting a biased picture in the SYR.</p> <p>L 37-43 In this paragraph, part of the original text from the WG3 SPM is omitted: "Most notably, about 1.3 billion people worldwide do not have access to electricity and about 3 billion are dependent on traditional solid fuels for cooking and heating with severe adverse effects on health, ecosystems and development. Providing access to modern energy services is an important sustainable development objective. The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 and 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement). A transition away from the use of traditional biomass and the more efficient combustion of solid fuels reduce air pollutant emissions, such as sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and black carbon (BC), and thus yield large health benefits (high confidence). [4.3, 6.6, 7.9, 9.3, 9.7, 11.13.6, 16.8]" Please modify accordingly. [Government of Germany]</p>
T4 A-117	Topic 4	120	40	120	40	4.4.2.2	<p>We recommend adding the sentence: "In particular, renewable energy technologies could offer the potential to expand access to modern energy services to underserved populations." The proposed sentence is based on several information given in IPCC SRREN 2011: First: p. 191, chap. 1.4.1.2 Energy Access: "In particular, reliance on RE in rural applications, use of locally produced bioenergy to produce electricity, and access to clean cooking facilities will contribute to attainment of universal access to modern energy services (IEA, 2010d). For electricity, small and standalone configurations of RE technologies such as PV (chap. 3), hydropower (chap. 5), and bioenergy (chap. 2) can often meet energy needs of rural communities more cheaply than fossil fuel alternatives such as diesel generators." Second: p. 879, chap. 11.3.2 Energy Access: "RE can enhance access to reliable, affordable and clean modern energy services (DBCCA, 2009), it is particularly well-suited for remote rural populations, and in many instances can provide the lowest cost option for energy access (Lucena et al., 2009; Mahapatra et al., 2009; Section 9.3.2)." [Government of Germany]</p>
T4 A-118	Topic 4	120	43			4.4.2.2	<p>Insert: "Current climate action plans focus largely on energy efficiency." Source: WGIII, SPM p. 27; "Scenarios reaching 450 ppm CO₂eq are also characterized by more rapid improvements of energy efficiency." Source: WGIII, SPM p. 13; "The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 and 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement)." Source: WG III, SPM p. 30; "Barriers to implementing energy efficiency relate largely to initial investment costs and lack of information." Source: WG III, SPM p. 24; "Annual incremental energy efficiency investments in transport, buildings and industry is projected to increase by about USD 336 (1 – 641) billion (limited evidence, medium agreement)." Source: WGIII SPM p. 27. [Government of Saudi Arabia]</p>
T4 A-119	Topic 4	120	45			4.4.3	<p>4.4.3 Technology development and transfer Great portion of the population of the world still have not access to energy and therefore they feel not concerned by the carbon reduction. Even the new source of energy such as solar/wind and others are not affordable for these countries due to the prize as well as to the technological challenges. [Government of Algeria]</p>

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T4 A-120	Topic 4	120	45			4.4.3	4.4.3 Technology development and transfer Technology development and transfer could brings benefits to developing countries and can be efficient only if the capacity building locally and in house manufacturing are given high priorities in any given plan. [Government of Algeria]
T4 A-121	Topic 4	120	47	120	48	4.4.3	"...GHG mitigation AND ADAPTATION is small relative..." Believe the same can be said for investments in adaptation research as for mitigation research. [Government of United States of America]
T4 A-122	Topic 4	120	50	120	52	4.4.3	Request revision to match text on policy support for technological development in WGIII SPM, p30, para2, with a view to facilitate discussion at the plenary. [Government of Japan]
T4 A-123	Topic 4	121	1			4.4.3	We question whether "development" should be included in the context of technologies for adaptation. This is one fact that strongly distinguishes adaptation from mitigation - for the most part adaptation involves use of existing technologies. Suggest the authors review. [Government of Canada]
T4 A-124	Topic 4	121	10	121	11	4.4.4	It is strongly suggested to include this assessment also in the SPM in bold letters as this is an important statement based on high agreement and robust evidence. [Government of Austria]
T4 A-125	Topic 4	121	11	121	18	4.4.4	Please consider to include the quantifications of the changes in the investment flows given in WGIII SPM Section 5.1 page 27. The draft text is unbalanced since it only quantifies the present investments in the energy system. [Government of Norway]
T4 A-126	Topic 4	121	16	121	18	4.4.4	What is meant by "respective downstream activities"? Do these already relate to the end-use sector? [Government of Germany]
T4 A-127	Topic 4	122	2	122	3	4.4.4	Please clarify whether the respective public climate finance flows concern only flows from developed countries to developing countries or South-South flows as well. [Government of Germany]
T4 A-128	Topic 4	122	3	122	6	4.4.4	"Estimates of international private climate finance..." i cannot find these references in the main IPCC WG3 report, but the figures come from the SPM and they are reported correctly [Government of Italy]
T4 A-129	Topic 4	122	3	122	6	4.4.4	This sentence is confusing in relating to the previous information. Please specify whether the 2008-2011 period is included in the 2011-2012 figure or if it is a different estimate for a different time period or source. [Government of Germany]
T4 A-130	Topic 4	122	8	122	10	4.4.4, Figure 4.5	Figure 4.5: it's not commented in the text at all.It seems to refer to the share of private capital in the flows, but the message doesn't come clearly from the chart [Government of Italy]
T4 A-131	Topic 4	122	20	122	20	4.4.4	Please include "price signals" after "institutions". The importance of appropriate carbon prices for investments is mentioned throughout the IPCC reports and should hence be mentioned here as well. [Government of Germany]
T4 A-132	Topic 4	122	22	122	22	4.4.4	Please insert the words "Besides these enabling factors" before "Dedicated policy instruments". Reason: Institutions, price signals, regulations, also provide incentives which improve the risk adjusted rate of return on investments. [Government of Germany]
T4 A-133	Topic 4	122	29	122	30	4.4.4	The sentence "limited evidence indicates a gap between global adaptation needs and the funds available for adaptation (medium confidence) " is very likely to be misread. As we understand, the above statement is meant to reflect that there is a funding gap and growing adaptation deficit while the relevant research is limited. It is suggested to use the original words in bold in the last paragraph on page 3, Chapter 17, WGII instead: "Global adaptation cost estimates are substantially greater than current adaptation funding and investment, particularly in developing countries, suggesting a funding gap and a growing adaptation deficit.". [Government of China]
T4 A-134	Topic 4	122	29	122	35	4.4.4	If there is limited evidence, how can the confidence level attributed to this statement be "medium confidence"? With respect to the content, the picture presented here is rather unbalanced. There is a financing gap for both adaptation and mitigation. However, the latter is not mentioned. There is not only a need for a better assessment of adaptation funding and investment, but also of mitigation funding and investment, although the knowledge gaps might be more substantial on the adaptation side.

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							Presenting only the knowledge gap related to adaptation presents a biased picture. The sentence should be either omitted or amended by respective mitigation findings. Assessment results could be borrowed inter alia from the executive summary of chapter 16, WG3, second paragraph, that reads: "Scientific literature on investment and finance to address climate change is still very limited and knowledge gaps are substantial; there are no agreed definitions for climate investment and climate finance. Quantitative data are limited, relate to different concepts, and are incomplete. Accounting systems are highly imperfect." [Government of Germany]
T4 A-135	Topic 4	122	30	122	30	4.4.4	Please insert "national and international" previous to "Financial resources" so that it reads: "National and international financial resources...". Reason: In the present context, "financial resources" are often associated with "international financial resources". However, both national and international financial resources are of great importance. [Government of Germany]
T4 A-136	Topic 4	123	1	124	9	4.5	Section 4.5 could be cut entirely to reduce redundancies with discussion of co-benefits and adverse side-effects appearing elsewhere and in the interest of length. [Government of United States of America]
T4 A-137	Topic 4	123	15	123	17	4.5	The substantive content of this paragraph is important, but it is not clear how increase efforts to mitigate and adapt "imply" increasing complexity. There is abundant evidence of this complexity. Suggest reviewing this wording. [Government of Canada]
T4 A-138	Topic 4	123	43	123	44	4.5	For better comprehensibility and acuteness we suggest adding: "Cost analysis should take into account external costs such as environmental impacts, climate costs etc." The proposed sentence is based on several information given in IPCC WGIII AR5: 1) Ch7.8.2 Cost assessment of mitigation measures, P 39: "Investment decisions therefore should not be based on the LCOE data provided here; instead, site-, project-, and investor-specific conditions are to be considered. Integration costs, time-dependent revenue opportunities (especially in the case of intermittent renewables), and relative environmental impacts (e.g., external costs) play an important role as well (Heptonstall, 2007; Fishedick et al., 2011; Joskow, 2011; Borenstein, 2012; Edenhofer et al., 2013; Hirth, 2013). 2) Ch12.5 Spatial Planning and Climate Change Mitigation, P 46: "Market Failures are the result of individuals and firms ignoring the external costs and benefits they impose on others when making economic decisions (see Ch15)." 3) Ch13.2 Framing concepts for an assessment of means for international cooperation, P 9: "Enhancing production of public goods may be achieved by internalizing external costs (i.e., those costs not incorporated into market prices) or through legal remedies. Economic instruments can incorporate external costs and benefits into prices, providing incentives for private actors to more optimally reduce external costs and increase external benefits (Baumol and Oates, 1988; Nordhaus, 2006; Buchholz et al., 2012)." 4) Ch15.5.4.3 Cost effectiveness of energy efficiency regulations, P 40: "Muller, Mendelsohn, and Nordhaus (2011) found that the external costs of coal-fired utilities in the United States exceeded value-added in that sector. These and other costs and benefits have to be taken into account when evaluating policies." [Government of Germany]
T4 A-139	Topic 4	124	56	124	56	?	The current wording lacks clarity. It is suggested to substitute "in consonance with" by "in the context of". [Government of Austria] [NB THIS COMMENT REFERS TO ART 2 BOX ON P.125 L. 56 -SYR TSU]
Art2 A-1	Box Art.2	0					In general we appreciate and acknowledge the structure and hard work that must have gone into producing this very policy-relevant box. We feel that in its current state presents the main messages from all three WGs in the fifth assessment report in a balanced way. [Government of Norway]
Art2 A-2	Box Art.2	125	0				We regard the content of this box as very relevant for policymakers and we suggest to include the box in the SPM. [Government of Belgium]
Art2 A-3	Box Art.2	125	1	127	11		Overall comment on Box on Article 2: We are supportive of this Box being structured around the specific phrases of Article 2. However, to do this most clearly we suggest that the Box have 4 subsections: 1 - Stabilization of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference in the climate system.; 2 - Such a level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change.; 3 - ... to ensure food production is not threatened; and 4 ... and to enable economic development to proceed in a sustainable manner. In this structure much of the text currently on pages 125 though

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							127 Line 11 would be more appropriately placed under subsections 2, 3 or 4. For example, the bullet on future impacts related to food production starting on p. 126, line 35 would be placed under section 3. The paragraph on p. 125 (lines 38-49), useful background information found elsewhere in the SYR, does not directly relate to the text of Article 2 and therefore could be deleted. [Government of Canada]
Art2 A-4	Box Art.2	125	1	127	46		This Box on information relevant to Article 2 of the UNFCCC is particularly relevant to policymakers. However its placement right at the end of the SYR seems inappropriate, and runs the risk of being overlooked. The New Zealand Government suggests that it is either moved to become part of the SPM (our preference), or to the beginning of the SYR. [Government of New Zealand]
Art2 A-5	Box Art.2	125	1	127	46		We welcome the Box overall, which summarizes very well information in relation to Art. 2 of UNFCCC. For completeness, however, it might be worth to add in page 127 after line 28 a section in relation to the part of Art. 2 which has not been mentioned, i.e. "...allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened...", which can be completed by a couple of paragraphs on ecosystem adaptation and on food production. [European Union]
Art2 A-6	Box Art.2	125	3				Suggest inserting "ultimate" before objective to be consistent with the wording of the Convention. [Government of Canada]
Art2 A-7	Box Art.2	125	9	125	9		In the Cancun agreement was established to hold the global average temperature below 1.5 to 2° C above pre industrial levels. [Government of Venezuela]
Art2 A-8	Box Art.2	125	10	125	11		No need to restate the mandate of the IPCC [Government of Ireland]
Art2 A-9	Box Art.2	125	12	125	12		The idea to structure the box following the wording of Article 2 is convincing. However, after the introductory paragraph a reference should be included to the first part of Article 2, i.e. "stabilization of greenhouse gases in the atmosphere". We suggest adding the following information: "...stabilization of greenhouse gases in the atmosphere..." "Stabilization of greenhouse gas concentrations at any level will require deep reductions in greenhouse gas emissions, ultimately bringing net global CO2 emissions essentially to zero." In case there is not enough space in the box, the two paras from P 125 L 15 to P 125 L 26 could easily be shortened, since there is no necessity to unroll the details of the observed changes at this point of the text. [Government of Germany]
Art2 A-10	Box Art.2	125	23	125	24		Here, finally and not very visible, we find the two systems that are already in the phase of passing a threshold as depicted in Box 2.4 Fig.1 RfC #1: arctic ecosystems and tropical coral reefs. This should be brought up in the main text in Topic 2 and the SPM. [Government of Sweden]
Art2 A-11	Box Art.2	125	28	125	29		Is risk assessment outside of the remit of the IPCC. Suggest more clarity is needed and again no need to repeat the mandate [Government of Ireland]
Art2 A-12	Box Art.2	125	29	125	29		Replace "would be" by "is" to read "is outside the mandate ...", as is correctly written in Background Box SPM.1 on p. 19. [Government of Switzerland]
Art2 A-13	Box Art.2	125	29	125	30		Recommend deleting "provides a basis for" from this sentence and replacing it with "provide scientific information to consider in". The revised sentence would read "IPCC assessments provide scientific information to consider in such a judgement by..." [Government of Canada]
Art2 A-14	Box Art.2	125	29	125	32		This can be shorter on what the IPCC does. Does it "determine" the magnitude of etc..? [Government of Ireland]
Art2 A-15	Box Art.2	125	29	125	36		This can be shorter the audience is clear on its role and that of the IPCC [Government of Ireland]

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Art2 A-16	Box Art.2	125	32	125	36		Consistent with our comment on the SPM, suggest this paragraph needs to be presented carefully to avoid perception that IPCC is overstepping its mandate by making value judgements. The IPCC should not give the impression that the Convention suggests that Dangerous Anthropogenic Interference can be defined by impacts at a single location. Recommend deleting the first part of the sentence on line 32 that says "Because climate change is expected to disproportionately affect poor populations", and revising the remaining sentence as follows: "Conditions which might be considered dangerous anthropogenic interference are not affecting and will not affect all communities and locations at the same time or in the same way." Recommend deleting the last sentence of this box (lines 34-36) to focus on factual statements. [Government of Canada]
Art2 A-17	Box Art.2	125	34	125	34		Add "as such" or "as dangerous" to sentence to read "before these are experienced as such [OR as dangerous] in other parts of the globe." both here and in the same sentence in the SPM on p. 20. [Government of Switzerland]
Art2 A-18	Box Art.2	125	34	125	36		The part "Depending on value judgments (...)" is not included in WG1,2 and 3 reports, thus this should be deleted. [Government of Japan]
Art2 A-19	Box Art.2	125	38	125	49		There is some important information in this section but it can be shortened. [Government of Ireland]
Art2 A-20	Box Art.2	125	42	125	44		This is a key statement [Government of Ireland]
Art2 A-21	Box Art.2	125	44	125	45		"widest possible" may be a misleading try and capture the meaning in a more practical manner [Government of Ireland]
Art2 A-22	Box Art.2	125	46	125	49		Not clear on risks and why they are large scale and are there comparitors? This can be shortened into a concise statement. Also the impacts of the action on overall Global Production as provided earlier from WGIII could be included here. [Government of Ireland]
Art2 A-23	Box Art.2	125	51	125	53		Clear and important messages but perhaps the sentences could be better linked. [Government of Ireland]
Art2 A-24	Box Art.2	126	1	126	4		Clear and important message for consideration of Art 2. Perhaps this could come earlier in the box, also state that a human intervention is needed to limit or remove carbon dioxide from the atmosphere. [Government of Ireland]
Art2 A-25	Box Art.2	126	1	126	4		Clear and important message for consideration of Art 2. However, the opening sentence is too. This could stop after time scales. The state that 15-14% etcand stop after "1000 years". Then state "Only in the case of ..."
Art2 A-26	Box Art.2	126	1	126	4		[Government of Ireland]
Art2 A-27	Box Art.2	126	1	127	11		What are the levels of removals required? How long is a sustained period? [Government of Ireland]
Art2 A-28	Box Art.2	126	1	127	11		The bullets on future impacts are very well written and comprehensive. However, it is difficult to link them to the eight key risks given in WG2 SPM B-1, P 13. Please give references to these bullets and indicate criteria why these particular impacts have been chosen. [Government of Germany]
Art2 A-29	Box Art.2	126	1	127	46		Please clarify whether the temperature increases are relative to the present or to preindustrial times. [Government of Germany]
Art2 A-30	Box Art.2	126	4	126	7		Please clarify whether the temperature thresholds and temperature targets discussed in these paragraphs are with respect to a base period of 1986-2005, or 1850-1900. (This is important because of the high policy-relevance of this section). [Government of New Zealand]
Art2 A-31	Box Art.2	126	9	126	11		A key message but "some threshold" is quite a vague statement, perhaps just use the temperature range. [Government of Ireland]
							Key for informing article 2, can a temperture limit or range be given rather than RCP2.6 which is policy opaque [Government of Ireland]

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Art2 A-32	Box Art.2	126	14	126	16		Is there any definition of what "extensive" means here, considering that it is already flagged that such loss as occurring now. [Government of Ireland]
Art2 A-33	Box Art.2	126	16	126	18		Figure Box Art 2. As 2C has been adopted in the Policy arena it would be useful to have this temperature line included in this figure. This would assist in informing policy. [Government of Ireland]
Art2 A-34	Box Art.2	126	16	126	33		The "Reasons for Concern" figure is duplicated into two other places of the text (not including the SPM)--Box 2.4 (p. 78) and Figure 3.1(A). Consider eliminating these duplications in the interest of conciseness. [Government of United States of America]
Art2 A-35	Box Art.2	126	22	126	33		Figure caption Box Art. 2 Panel b): Please consider to include text that describes the observed temperature increase from the 1850-1900 period to 2003-2012 period since this level is explicitly marked on the white thermometer in Panel b). [Government of Norway]
Art2 A-36	Box Art.2	126	28				Consider deleting the word "Arctic" from the figure caption if the vulnerabilities of ecosystems broadly are also high (e.g., potentially irreversible impacts faced by marine corals). Also, suggest clarifying whether extinction of individual species is considered as part of this RFC or whether here, the intent is to capture regime changes within entire ecosystem. [Government of Canada]
Art2 A-37	Box Art.2	126	35	126	40		There are a lot of important statements in this paragraph but the order in which they are stated could be improved to increase clarity. What is the reference for the temperature increase [Government of Ireland]
Art2 A-38	Box Art.2	126	35	126	40		The key statement here is that Food production is already been impacted, this is projected to increase as temperature increases and the risks are projected to be greater in low latitude regions. [Government of Ireland]
Art2 A-39	Box Art.2	126	35	126	40		There are a lot of important statements in this paragraph but the order in which they are stated could be improved to increase clarity. What is the reference for the temperature increase [Government of Ireland]
Art2 A-40	Box Art.2	126	35	126	40		What is the reference for the temperature increase numbers provided? [Government of Ireland]
Art2 A-41	Box Art.2	127	4	127	6		Are there numbers for the slowing of economic growth that could be included? It is of interest to compare these with the values for mitigation if included. [Government of Ireland]
Art2 A-42	Box Art.2	127	8	127	9		It may be of value to have some numbers for these statements [Government of Ireland]
Art2 A-43	Box Art.2	127	12	127	15		The finding in bold is a bit too declarative considering the underlying chapter text that is cited (Chapter 12, section 12.5). Suggest modifying sentence to include the phrase that is included in quotation marks in the following sentence: "Climate change can indirectly increase risks of violent conflict in the form of civil war and intergroup violence "in certain circumstances" by amplifying well-documented drivers of these conflicts, such as poverty and economic shocks. Also the underlying chapter text notes that there is medium evidence that only some of these factors (that relate to civil war) are actually sensitive to climate change. [Government of United States of America]
Art2 A-44	Box Art.2	127	14	127	15		This can start at "Rapid and deep...", and it's the Temperature increase rather than warming. [Government of Ireland]
Art2 A-45	Box Art.2	127	14	127	21		This is essential information. As a linear phase-out illustration is more relevant than the 'current rates' illustration, please add the following brief information following L 19: 'With a linear phase-out, the remaining budget will be exhausted by 2055 to 2075' (which simply multiplies the stated 20 to 30 year timeframe by two to account for the triangular linear phase-out shape). [Government of Germany]
Art2 A-46	Box Art.2	127	14	127	21		The article 2 box should reflect on the fact that, given the urgency of the climate challenge, a rather rapid transition will be required if the global temperature rise is to remain below the 2°C target. We propose to add the following sentence from page 15 of the WGIII SPM: "Delaying mitigation efforts beyond those in place today through 2030 is

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							estimated to substantially increase the difficulty of the transition to low longer-term emissions levels and narrow the range of options consistent with maintaining temperature change below 2°C relative to pre-industrial levels (high confidence)". [Government of Belgium]
Art2 A-47	Box Art.2	127	14	127	21		Singling out 2°C here may mislead readers into equating 'such a level' to 2°C. The box should give information on multiple warming levels based on a wider range of scenarios. It is noted in the longer report of the Synthesis Report (lines 28-29, page 125) that "Determining whether anthropogenic interference is 'dangerous' involves both risk assessment and value judgment and would be outside the IPCC mandate". Therefore, the mandate of the present report is to present policy makers with a full account of the scientific assessment of the current knowledge to inform their policy decisions related to the "dangerous level". It is suggested that the box should give complete information related to Article 2 by reflecting in the box text all the warming scenarios and corresponding pathways represented in Table 2.2 on page 65-66 and Table 3.1 on page89. [Government of China]
Art2 A-48	Box Art.2	127	15	127	16		The statement on "Cumulative CO2 emissions is very important and could in a shorter version be the headling statement which leads to the statement on "Rapid and deep" [Government of Ireland]
Art2 A-49	Box Art.2	127	15	127	16		It would be useful to add an explanation here about how the stabilization of greenhouse gas concentrations in the Article 2 is not the same as the newest knowledge of AR5 on the budget of cumulative emissions. Therefore, please consider to mention that, stabilizing concentrations, i.e., stabilizing radiative forcing, would result in an ongoing global warming under gradual increase of cumulative emissions. [Government of Japan]
Art2 A-50	Box Art.2	127	15				The correct formulation of the UNFCCC is "below 2 °C". Please modify accordingly. [Government of Germany]
Art2 A-51	Box Art.2	127	16	127	19		Would like to request to include the cases of >33% and >50% as in WG1 SPM P.27 for the information is very important for policy makers. [Government of Japan]
Art2 A-52	Box Art.2	127	16	127	21		These are very important statments to inform decision makers. Numbers should be included in a table alsong with information on the trajectories of CO2 and other key gases, to the end of century. [Government of Ireland]
Art2 A-53	Box Art.2	127	17	127	17		'1000 GtCO2 (750-1400 GtCO2)' – the numbers in the parentheses are inconsistent with Table SPM.1 of WG III SPM and hence need a check. [Government of China]
Art2 A-54	Box Art.2	127	20	127	21		Would like to request to quote exactly from the WG3 report. Specifically, "the possibility of achieving less than 2°C(eg. likely or >66%)", "CO2 concentration (eg. 450ppmCO2eq or 430-480ppmCO2eq)" and "concentrations achieved with other possibilities than likely and the range of reductions" should also be written here. Please refer to SYR-88 Line13-16: "Scenarios reaching concentration levels of about 500 ppm CO2eq by 2100 are more likely than not to limit temperature change to less than 2 °C, unless concentration levels temporarily exceed roughly 530 ppm CO2eq before 2100. In this case, temperature is about as likely as not to remain below 2 °C." [Government of Japan]
Art2 A-55	Box Art.2	127	20	127	21		The case which requires 40-70% of GHG is the case which limits likely warming to 2°C. Therefore, "limiting temperature increases to 2°C" should be replaced with "limiting likely warming to 2°C". [Government of Japan]
Art2 A-56	Box Art.2	127	23	127	28		Again these are key staments but could some clarity/numbers be provide on words such as "Rapid upscaling", "Large scale", and "slower timescale" [Government of Ireland]
Art2 A-57	Box Art.2	127	24	127	26		"requires" should be replaced with the wording such as "characterized by" (e.g., WG3 SPM Page.10 paragraph.2) as this part is explanation of assumptions which mitigation scenarios are based on. [Government of Japan]
Art2 A-58	Box Art.2	127	30				Suggest there should be a period after "manner" rather than three dots. That is a full stop in the Convention text. [Government of Canada]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
Art2 A-59	Box Art.2	127	32	127	34		Stating that various risks/cost benefit cannot be directly compared, and cannot be used to do anything, does not add much information here? [Government of Ireland]
Art2 A-60	Box Art.2	127	32	127	34		The IPCC is not asked to identify a goal, This statement is not needed. [Government of Ireland]
Art2 A-61	Box Art.2	127	32	127	34		Suggest edits IN CAPS: "Climate change risk estimates and those on the costs and benefits of mitigation cannot be directly compared or used to identify a single best climate change goal or a best combination of ACTIONS TO MITIGATE, ACTIONS TO ADAPT, AND LEVELS OF TOLERANCE FOR RESIDUAL RISKS FROM CLIMATE-RELATED IMPACTS, and their associated benefits and risks. [Government of United States of America]
Art2 A-62	Box Art.2	127	32	127	40		The information is not usable as it is. Please provide more concrete information or remove the paragraph. It would be policy relevant to have some information on costs of mitigation and costs of climate change impacts, even if it is uncertain and/or incomplete. [Government of Belgium]
Art2 A-63	Box Art.2	127	32	127	40		It is suggested to delete this paragraph as this issue is addressed in box 3.1. It would be only confusing to include just that paragraph. [Government of Austria]
Art2 A-64	Box Art.2	127	35	127	37		As indicated earlier information on impacts on global production are available and perhaps could be used here. [Government of Ireland]
Art2 A-65	Box Art.2	127	37	127	39		This statement should be reformulated for clarity on the key points being made on 1. mitigation ambition (not stringency). 2 delays in actions (any numbers on this?) 3. Limiting technologies (such as). [Government of Ireland]
Art2 A-66	Box Art.2	127	39	127	40		The box should be as stand alone as possible and summary values included. [Government of Ireland]
Art2 A-67	Box Art.2	127	42	127	43		This could be stated as the "level of mitigation ambition" rather than "accomplishes etc". [Government of Ireland]
Art2 A-68	Box Art.2	127	44	127	45		Could a statement on mitigation be included here also? [Government of Ireland]
Art2 A-69	Box Art.2	127	50	127	51		The supporting statements in the text section regarding food securities focus only on terrestrial food sources, yet the list of references includes reference to marine food resources (WGII 6.2-5). Either remove reference to marine food resources, or add supporting statements regarding marine food resources. [Government of United States of America]

Additional material referred to in Government Comments

Annex pertaining to comment nr SPM A-1033 from Belgium related to Table SPM.1/3.1.

Table SPM.1: Key characteristics of the scenarios collected and assessed for WGIII AR5. {Table 3.1}

CO ₂ eq Concentrations ¹ in 2100 (CO ₂ eq) Category label (conc. range)	Subcategories ^{2,3}	Relative position of the RCPs	Change in CO ₂ eq emissions compared to 2010 (in %) ^{2,4}		Likelihood of staying below specific temperature levels (relative to 1850-1900) ⁵
			2050	2100	
< 430	Only a limited number of individual model studies have explored levels below 430 ppm CO ₂ eq				
450 (430 – 480)	Total range ¹	RCP2.6	-72 to -41	-118 to -78	<i>likely</i> to stay below 2°C , < 50% chances to stay below 1.5°C
500 (480 – 530)	No overshoot of 530 ppm CO ₂ eq		-52 to -42	-107 to -73	> 50% chances to stay below 2°C
	Overshoot of 530 ppm CO ₂ eq		-55 to -25	-114 to -90	About 50% chances to stay below 2°C
550 (530 – 580)	No overshoot of 580 ppm CO ₂ eq		-47 to -19	-81 to -59	<i>likely</i> to stay below 3°C , < 50% chances to stay below 2°C
	Overshoot of 580 ppm CO ₂ eq		-16 to 7	-183 to -86	
(580 – 650)	Total range	RCP4.5	-38 to 24	-134 to -50	
(650 – 720)	Total range		-11 to 17	-54 to -21	> 50% chances to stay below 3°C
(720 – 1000)	Total range	RCP6.0	18 to 54	-7 to 72	<i>likely</i> to stay below 4°C , < 50% chances to stay below 3°C
>1000	Total range	RCP8.5	52 to 95	74 to 178	< 50% chances to stay below 4°C

¹ The CO₂-equivalent concentration includes the forcing of all GHGs including halogenated gases and tropospheric, ozone, aerosols and albedo change. The CO₂ equivalent concentration in 2011 is estimated to be 430 ppm (uncertainty range 340 – 520 ppm) .

² For all parameters, the 10th to 90th percentile of the scenarios is shown (this is called the « total range », unless the presence or absence of overshoot is mentioned).

³ Baseline scenarios fall into the >1000 and 750–1000 ppm CO₂eq categories. The latter category includes also mitigation scenarios. The overall 2100 temperature range is 2.5–7.8 °C for baseline scenarios.

⁴ Global 2010 emissions are about 30% above the 1990 emissions. CO₂eq emissions include the basket of Kyoto gases (CO₂, CH₄, N₂O as well as F-gases), calculated based on GWP100 values from the Second Assessment Report.

⁵ The assessment in this table is based on the probabilities calculated for the full ensemble of scenarios in the WGIII report by using a simple climate model and the assessment in WGI of the uncertainty of the temperature projections not covered by climate models. The likelihood statements are indicative only.

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
Gen B-1	General	0	0	0	0	Whole Report	The Synthesis Report is a well written and well organized document which covers salient features of all the three AR5 Working Group Reports and the relevant Special Reports of IPCC. It provides a balanced assessment of of climate change at the global and regional levels, its impacts on all the key socio-economic sectors, and strategies for adaptation and mitigation. [Government of Pakistan]
Gen B-2	General	0	0	0	0	Whole Report	Some Tables in the Report (e.g. Table SPM-3 on page 28; Table 2.3 on page 75-76; Table 4.2 on page 102; Table 4.4 on page 109; Table 4.5 on page 111-112) are not reader-friendly; it is not comfortable to read them without an optical aid. May consider making such Tables more legible. [Government of Pakistan]
Gen B-3	General	0	0	0	0	Whole Report	At several places in the text, a comma (,) has been put before the word 'and' (e.g. page 6, line 31; page 6, line 18; page 11, line 20; page 15, line 13; page 81, line 22) whereas at some of the places it does not appear desirable. The text editor may like to review such placements of ',' and delete them where considered appropriate. [Government of Pakistan]
SPM B-1	SPM	5	14	5	14	SPM Introduction	The phrase 'Working Group' may be changed to 'Working Group Reports'. [Government of Pakistan]
SPM B-2	SPM	5	31	5	31	Headline 1.1	The comma between 'diminished' and 'and' is suggested to be removed. [Government of Pakistan]
SPM B-3	SPM	9	13	9	16	SPM 1.2	Replace the last sentence of the paragraph with: "There is low confidence in the scientific understanding of the small observed increase in Antarctic sea ice extent due to the incomplete and competing scientific explanations for the causes of change and low confidence in estimates of natural internal variability in that region." Source: WG I, SPM p. 19. [Government of Iran, Islamic Republic of]
SPM B-4	SPM	10	3	10	5	Headline 1.3	Also include in the text "islands" because the impacts of climate change in the continent and the islands are not appreciated in the same way. Moreover, in FIG impacts, we see the appearance of "small islands". We believe it would be appropriate to add "and the islands" in the box on the impacts of climate change. [Government of Comoros]
SPM B-5	SPM	11	21	11	21	SPM 1.4	In the line 2 of footnote, '2' in 'CO2' may be written as subscript. [Government of Pakistan]
SPM B-6	SPM	12	16	12	20	SPM 2.1	Insert: "Limiting the warming caused by anthropogenic CO2 emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO2 emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO2), 0 and about 1210 GtC (4440 GtCO2), and 0 and about 1000 GtC (3670 GtCO2) since that period, respectively. These upper amounts are reduced to about 900 GtC (3300 GtCO2), 820 GtC (3010 GtCO2), and 790 GtC (2900 GtCO2), respectively, when accounting for non-CO2 forcings as in RCP2.6. An amount of 515 [445 to 585] GtC (1890 [1630 to 2150] GtCO2), was already emitted by 2011." Source: WG I, SPM p. 27. [Government of Iran, Islamic Republic of]
SPM B-7	SPM	12				Figure SPM.5	Correct: Figure SPM.5 illustrates GHGs and not CO2 emissions. [Government of Iran, Islamic Republic of]
SPM B-8	SPM	14	29	14	29	SPM 2.2	Spacing is needed between the word 'of' and '0.45'. [Government of Pakistan]
SPM B-9	SPM	15	13	15	19	SPM 2.3	Insert: "International dimensions such as trade and relations among states are also important for understanding the risks of climate change at regional scales." Source: WG II, SPM p. 11. [Government of Iran, Islamic Republic of]
SPM B-10	SPM	19	7	19	7	SPM 3.1	Insert: "Mitigation and adaptation can positively or negatively influence the achievement of other societal goals, such as those related to human health, food security, biodiversity, local environmental quality, energy access, livelihoods, and equitable sustainable development; and vice versa, policies toward other societal goals can influence the achievement of mitigation and adaptation objectives." Source: WG III, SPM p. 5. [Government of Iran, Islamic Republic of]
SPM B-11	SPM	19	14	19	16	SPM 3.1	Insert: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." Source: WG III, SPM p. 5. [Government of Iran, Islamic Republic of]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM B-12	SPM	19	22	19	22	SPM 3.1	There is a repetition of words 'take account of' in this sentence. [Government of Pakistan]
SPM B-13	SPM	19	45	19	45	SPM 3.2	The letter 'F' in the word 'Five' may be written small as 'five'. [Government of Pakistan]
SPM B-14	SPM	19	45	19	45	SPM 3.2	The full stop at the end of the line may be deleted. [Government of Pakistan]
SPM B-15	SPM	20	15	20	19	SPM 3.2	This paragraph does not make it clear that stabilizing temperature change (at 2oC or even 3oC) requires zero net emissions over the long term. This point is made in the SYR Section 3.2 (the sentence reads "Maintaining climate change risks below a threshold (Panel A) requires keeping cumulative emissions below a certain level (Panel B), which means that global net emissions eventually must decrease to zero (Panel C)". This point should be mentioned in the SPM, considering its importance for designing climate policies" (Government of France)
SPM B-16	SPM	21	2	21	2	Figure SPM.10	Spacing is needed between the word 'chapter' and '6'. [Government of Pakistan]
SPM B-17	SPM	21	48	21	48	SPM 3.4	Delete extra 'C' before the word 'above'.. [Government of Pakistan]
SPM B-18	SPM	23	17	23	17	Table SPM.1	Full stop needs to be added after the word 'mode'. [Government of Pakistan]
SPM B-19	SPM	24	1	24	8	SPM 3.4	Insert: "CDR technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks (high confidence). CDR is also prevalent in many scenarios without overshoot to compensate for residual emissions from sectors where mitigation is more expensive. There is only limited evidence on the potential for large-scale deployment of BECCS, large-scale afforestation, and other CDR technologies and methods." Source: WGIII, SPM p. 13. [Government of Iran, Islamic Republic of]
SPM B-20	SPM	25	18	25	24	SPM 3.4	Insert: "Estimates of the aggregate economic costs of mitigation vary widely and are highly sensitive to model design and assumptions as well as the specification of scenarios, including the characterization of technologies and the timing of mitigation (high confidence). Scenarios in which all countries of the world begin mitigation immediately, there is a single global carbon price, and all key technologies are available, have been used as a cost-effective benchmark for estimating macroeconomic mitigation costs. Under these assumptions, mitigation scenarios that reach atmospheric concentrations of about 450 ppm CO ₂ eq by 2100 entail losses in global consumption—not including benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation—of 1 % to 4 % (median: 1.7 %) in 2030, 2 % to 6 % (median: 3.4 %) in 2050, and 3 % to 11 % (median: 4.8 %) in 2100 relative to consumption in baseline scenarios that grows anywhere from 300 % to more than 900 % over the century." Source: WG III, SPM p. 15. [Government of Iran, Islamic Republic of]
SPM B-21	SPM	27	29	27	29	SPM 4.2	Insert: "Large-scale public-private risk reduction initiatives and economic diversification are examples of adaptation actions." Source: WG II, SPM p. 19. [Government of Iran, Islamic Republic of]
SPM B-22	SPM	28	3	28	3	Table SPM.3	In table SPM3, "Mitigation is considered essential for managing the risks of climate change". We propose to replace the term "management" with "reduction". [Government of Comoros]
SPM B-23	SPM	28	5	28	6	Table SPM.3	In table SPM3, at the social category, we propose to add in the text the phrase "promote formal and informal education." [Government of Comoros]
SPM B-24	SPM	28	5	28	6	Table SPM.3	In the table SPM3 at the "Livelihood security" category, , we propose to add "Access to water services." [Government of Comoros]
SPM B-25	SPM	29	7	29	7	SPM 4.3	Insert: "Climate policy intersects with other societal goals creating the possibility of co-benefits or adverse sideeffects. These intersections, if well-managed, can strengthen the basis for undertaking climate action." Source: WG III, SPM p. 5. [Government of Iran, Islamic Republic of]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM B-26	SPM	29	12	29	14	SPM 4.3	Insert: "Decarbonization happens more rapidly in electricity generation than in the industry, buildings, and transport sectors (medium evidence, high agreement). In the majority of low-stabilization scenarios, the share of low-carbon electricity supply (comprising renewable energy (RE), nuclear and CCS) increases from the current share of approximately 30 % to more than 80 % by 2050, and fossil fuel power generation without CCS is phased out almost entirely by 2100." Source: WG III, SPM p. 21 and "GHG emissions from energy supply can be reduced significantly by replacing current world average coal-fired power plants with modern, highly efficient natural gas combined-cycle power plants or combined heat and power plants, provided that natural gas is available and the fugitive emissions associated with extraction and supply are low or mitigated (robust evidence, high agreement). Carbon dioxide capture and storage (CCS) technologies could reduce the lifecycle GHG emissions of fossil fuel power plants (medium evidence, medium agreement)." Source: WG III, SPM p. 22. [Government of Iran, Islamic Republic of]
SPM B-27	SPM	29	12	29	16	SPM 4.3	Insert: "Efficiency enhancements and behavioural changes, in order to reduce energy demand compared to baseline scenarios without compromising development, are a key mitigation strategy in scenarios reaching atmospheric CO ₂ eq concentrations of about 450 or 500 ppm by 2100 (robust evidence, high agreement)." Source: WG III, SPM p. 21. [Government of Iran, Islamic Republic of]
SPM B-28	SPM	29	16	29	16	SPM 4.3	Insert: "Bioenergy can play a critical role for mitigation, but there are issues to consider, such as the sustainability of practices and the efficiency of bioenergy systems (robust evidence, medium agreement)." Source: WG III, SPM p. 26. [Government of Iran, Islamic Republic of]
SPM B-29	SPM	29	19	29	19	SPM 4.3	Insert: "The economic mitigation potential of supply-side measures is estimated to be 7.2 to 11 GtCO ₂ eq/year in 2030 for mitigation efforts consistent with carbon prices up to 100 USD/tCO ₂ eq, about a third of which can be achieved at a < 20 USD/tCO ₂ eq (medium evidence, medium agreement)." Source: WG III, SPM p. 25. [Government of Iran, Islamic Republic of]
SPM B-30	SPM	29	20	29	20	SPM 4.3	Insert: "Some mitigation policies raise the prices for some energy services and could hamper the ability of societies to expand access to modern energy services to underserved populations (low confidence). These potential adverse side-effects can be avoided with the adoption of complementary policies (medium confidence). Most notably, about 1.3 billion people worldwide do not have access to electricity and about 3 billion are dependent on traditional solid fuels for cooking and heating with severe adverse effects on health, ecosystems and development. Providing access to modern energy services is an important sustainable development objective. The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 and 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement). A transition away from the use of traditional biomass and the more efficient combustion of solid fuels reduce air pollutant emissions, such as sulfur dioxide (SO ₂), nitrogen oxides (NO _x), carbon monoxide (CO), and black carbon (BC), and thus yield large health benefits (high confidence)." Source: WG III, SPM p. 30. [Government of Iran, Islamic Republic of]
SPM B-31	SPM	30	40	30	44	SPM 4.4	Insert: "Although most economic theory suggests that economy-wide policies for the singular objective of mitigation would be more cost-effective than sector-specific policies, since AR4 a growing number of studies has demonstrated that administrative and political barriers may make economy-wide policies harder to design and implement than sectorspecific policies." Source: WG III, SPM p. 29. [Government of Iran, Islamic Republic of]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
SPM B-32	SPM	30	52			SPM 4.4	Insert: "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The effect of mitigation on natural gas export revenues is more uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of CCS would reduce the adverse effect of mitigation on the value of fossil fuel assets (medium confidence)." Source: WG III, SPM p. 18. [Government of Iran, Islamic Republic of]
SPM B-33	SPM	31	2	31	4	SPM 4.4	Insert: "Current climate action plans focus largely on energy efficiency." "Annual incremental energy efficiency investments in transport, buildings and industry is projected to increase by about USD 336 (1 – 641) billion (limited evidence, medium agreement), frequently involving modernization of existing equipment." Source: WG III, SPM p. 27. [Government of Iran, Islamic Republic of]
Intro B-1	Introduction	33	11	33	12	Introduction	Governments are also partners in the development process of the IPCC assessment reports. It is in this context that we propose to add in the text "as well as the contribution of governments." [Government of Comoros]
Intro B-2	Introduction	34	6	34	6	Introduction	The word 'the' may be added before 'uncertainties'. [Government of Pakistan]
T1 B-1	Topic 1	36	30	36	30	1.2.1	Spacing is needed between ',' and 'over'. [Government of Pakistan]
T1 B-2	Topic 1	38	18	38	20	1.2.3	Here, the expansion in Arctic sea ice extent is reported with strong regional differences (High Confidence) while on the same page in lines 39-42, it is stated that the change in Arctic ice sheet is also contributing to the global mean sea level rise. There is an apparent contradiction between these two statements, which needs to be clarified. [Government of Pakistan]
T1 B-3	Topic 1	54	19	54	19	1.6	Delete: "Differences in vulnerability and exposure arise from non-climatic factors ..." [Government of Iran, Islamic Republic of]
T2 B-1	Topic 2	59	24	59	24	2.2.1	The word 'to' needs to be added between 'begins' and 'vary'. [Government of Pakistan]
T2 B-2	Topic 2	61	6	61	6	Table 2.1	The font size of 'a' before the word 'based' needs to be made at par with those of the corresponding letters 'b' in line 13, 'c' in line 17 and 'd' in line 25. [Government of Pakistan]
T2 B-3	Topic 2	63	38	63	38	2.2.3	The word 'that' may be replaced by 'the' in the phrase ' - - - the rate of sea level will very likely exceed that observed rate of 2 - - -'. [Government of Pakistan]
T2 B-4	Topic 2	64	40	64	46	2.2.5	Delete: "A two-in-three chance or higher that total human-induced warming remains less than 2 °C requires total CO2 emissions to be limited to about 2900 GtCO2 if other emissions follow the RCPs, with a range of 2800–3200 GtCO2 across the scenarios considered by WGIII (Table 2.2). Almost 1900 [1630 to 2145] GtCO2 were emitted by 2011, leaving a budget of about 1000 GtCO2 consistent with this temperature goal. Estimated total fossil carbon reserves exceed this remaining budget by a factor of 4 to 7, with resources much larger still." See comment #31. [Government of Iran, Islamic Republic of]
T2 B-5	Topic 2	64	40	64	46	2.2.5	Replaced with: "Limiting the warming caused by anthropogenic CO2 emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO2 emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO2), 0 and about 1210 GtC (4440 GtCO2), and 0 and about 1000 GtC (3670 GtCO2) since that period, respectively. These upper amounts are reduced to about 900 GtC (3300 GtCO2), 820 GtC (3010 GtCO2), and 790 GtC (2900 GtCO2), respectively, when accounting for non-CO2 forcings as in RCP2.6. An amount of 515 [445 to 585] GtC (1890 [1630 to 2150] GtCO2), was already emitted by 2011." Source: WG I, SPM p. 27. [Government of Iran, Islamic Republic of]

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T2 B-6	Topic 2	71	5	71	5	Figure 2.6	The word 'mollusc' may be changed to 'molluscs'. Also, 'Mollusk' and 'Mollusks' appearing on different places in Figure 2.6 may be changed to 'Molluscs' for the sake of uniformity. The same correction is also needed on page 15, line 23 and on page 69, line 35. [Government of Pakistan]
T3 B-1	Topic 3	82	38			3.1	Insert: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." Source: WG III, SPM p. 5. [Government of Iran, Islamic Republic of]
T3 B-2	Topic 3	82	40	82	40	3.1	The word 'on' at the end of the line may be deleted. [Government of Pakistan]
T3 B-3	Topic 3	84	27	84	27	3.2	The words 'decision on' may possibly be deleted. [Government of Pakistan]
T3 B-4	Topic 3	84	28			3.2	Insert: "Under all assessed scenarios for adaptation and mitigation, some risk from adverse impacts remains (very high confidence). Source: WG II, SPM p. 14. [Government of Iran, Islamic Republic of]
T3 B-5	Topic 3	84	31	84	31	3.2	The word 'potentially' may be replaced by 'possibly'. [Government of Pakistan]
T3 B-6	Topic 3	84	41	84	41	3.2	The word 'today' may be replaced by 'now', OR, the phrase 'in the future' may be replaced by 'tomorrow'. [Government of Pakistan]
T3 B-7	Topic 3	90	16			3.4	Insert: "not including benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation". Source: WG III, SPM p. 15. [Government of Iran, Islamic Republic of]
T3 B-8	Topic 3	91	4	91	10	3.4	Delete this paragraph as it may be implied that future mitigation efforts should be in large developing countries. [Government of Iran, Islamic Republic of]
T3 B-9	Topic 3	98	9			Box 3.4	Insert: "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence)." Source: WG III, SPM p. 18. [Government of Iran, Islamic Republic of]
T4 B-1	Topic 4	110	32			4.3	Insert: "The economic mitigation potential of supply-side measures is estimated to be 7.2 to 11 GtCO ₂ eq / year in 2030 for mitigation efforts consistent with carbon prices up to 100 USD / tCO ₂ eq, about a third of which can be achieved at a < 20 USD / tCO ₂ eq (medium evidence, medium agreement)." Source: WG III, SPM p. 25. [Government of Iran, Islamic Republic of]
T4 B-2	Topic 4	110	43	110	45	4.3	Replace the first two sentences with: "Climate policy intersects with other societal goals creating the possibility of co-benefits or adverse sideeffects. These intersections, if well-managed, can strengthen the basis for undertaking climate action." Source: WG III, SPM p. 5. [Government of Iran, Islamic Republic of]
T4 B-3	Topic 4	115	8			4.4.1	Insert: "Countries' past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances, and have different capacities to address mitigation and adaptation." Source: WG III, SPM p. 5. [Government of Iran, Islamic Republic of]
T4 B-4	Topic 4	115	18	115	21	4.4.1	Delete: "Some climate policies could be more environmentally and economically effective if implemented across broad regions, such as by embodying mitigation objectives in trade agreements or jointly constructing infrastructures that facilitate reduction in carbon emissions." [Government of Iran, Islamic Republic of]
T4 B-5	Topic 4	117	26	117	27	4.4.2.2	Delete: "Revenues from carbon taxes or auctioned emission allowances reduce other taxes and/or to provide transfers to low-income groups." This text does not exist in SPMs of WGs. [Government of Iran, Islamic Republic of]

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Comment No	Chapter	From Page	From Line	To Page	To Line	(Sub)Section	Comment
T4 B-6	Topic 4	120	16	120	20	4.4.2.2	Insert: " "There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The effect of mitigation on natural gas export revenues is more uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of CCS would reduce the adverse effect of mitigation on the value of fossil fuel assets (medium confidence)." Source: WG III, SPM p. 18. [Government of Iran, Islamic Republic of]
T4 B-7	Topic 4	120	43			4.4.2.2	Insert: "Current climate action plans focus largely on energy efficiency." Source: WGIII, SPM p. 27; "Scenarios reaching 450 ppm CO2eq are also characterized by more rapid improvements of energy efficiency." Source: WGIII, SPM p. 13; "The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 and 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement)." Source: WG III, SPM p. 30; "Barriers to implementing energy efficiency relate largely to initial investment costs and lack of information." Source: WG III, SPM p. 24; "Annual incremental energy efficiency investments in transport, buildings and industry is projected to increase by about USD 336 (1 – 641) billion (limited evidence, medium agreement)." Source: WGIII SPM p. 27. [Government of Iran, Islamic Republic of]
T4 B-8	Topic 4	121	4	121	6	4.4.3	We propose the phrase "strengthen the capacity of countries on how these new technologies can be implemented taking into account the context of each country." [Government of Comoros]