

IPCC WGI SR15 Second Order Draft Review Comments And Responses - Chapter 5

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11036					Update chapter text and table 5.1 on Fossil Fuel with CCS with Chapter 5 update using the information from the 2017 IPEICA "Mapping the oil and gas industry to the Sustainable Development Goals: An Atlas" report [Wilfried Maas, Netherlands]	Noted. While there were several references to the SDGs in the report, we did not conclude that this reference would change the assessment.
12782					Table 5.1. The concept of this table is extremely helpful and the presentation and layout is excellent. However much of the text is simply generic statements that don't particularly apply to 1.5C and don't even necessarily apply to the particular technology in question (they could refer to a wide range of technologies). It is also oddly unbalanced - for example, the health implications of non-bio renewables (which also includes bio for some reason, despite that being a separate category) is very positive. However for nuclear, which has an excellent safety record, the health aspect is very negative - there are health impacts from mining of course but overall nuclear is clean and safe and this ought to be better reflected. The same applies for SDG1, no poverty - non bio renewables are given a green on the basis of an extremely generic statement about low carbon energy reducing climate change impacts. It's doubtful that such a broad statement is particularly policy meaningful. However, if it is, the same broad statement could also apply to nuclear and yet it does not. A more critical, in depth and balanced appraisal is needed for this potentially very useful figure. [United Kingdom (of Great Britain and Northern Ireland)]	Considering the wide range of topics assessed in this Table, there are many issues for which no studies distinctly addressing the difference between 1.5C vs. 2C are available, and many statements are by necessity more generic. We therefore used more general studies where necessary to indicate the direction of impacts of portfolios of mitigation measures. For SDG3 and nuclear, note that this is not a "very negative" assessment: it is an assessment of high confidence that more use of nuclear will have a limiting effect on global health mainly due to the risk of a catastrophic incident and the political infeasibility of building long-term waste storage facilities.
12978					Table 5.1 Panel B Part 2, row 3, column 4 The references used for this statement seem to have only been recycled from the AR5, with no new references or updated information. AR5 is from 2014 so it would be appropriate to include some more recent references. [Jessica Callen, Austria]	According to the analysis for this Table, there was not much significant new literature since AR5 with regard to the well-understood risks and potential of nuclear power.
12980					Table 5.1 Panel B Part 2, row 3, column 4 "Continued use of nuclear power poses a constant risk of proliferation" This is continually purported within the climate change community, however, it betrays a simplistic and limited understanding of the facts and indeed the technology required for development of a weapons programme. To date, civil nuclear power has not been the route or cause for nuclear weapons in any country that has nuclear weapons. For example, the DPRK has no civil nuclear reactor programme (only a research reactor) and Iran had centrifuge technology that was independent of its civil nuclear programme. South Africa actually developed nuclear weapons but then acceded to the Non-Proliferation Treaty and terminated and dismantled its weapons programme. See also comment below regarding enrichment and plutonium. [Jessica Callen, Austria]	Rejected. A civil nuclear program may well be used to camouflage military objectives, or to develop expertise in nuclear engineering which will facilitate the development of nuclear weapons.
12982					Table 5.1 Panel B Part 2, row 3, column 4 Uranium processed for electricity generation is not useable for weapons. The uranium used in power reactor fuel for electricity generation is typically enriched to about 3-4% of the isotope U-235, compared with weapons-grade which is over 90% U-235. Uranium is deemed to be 'highly enriched' when it reaches 20% U-235 for the purposes of safeguards. Few countries possess the technological knowledge or the facilities to produce weapons-grade uranium. Plutonium is produced in the reactor core from a proportion of the uranium fuel. Plutonium contained in spent fuel elements is typically about 60-70% Pu-239, compared with weapons-grade plutonium which is more than 93% Pu-239. Weapons-grade plutonium is not produced in commercial power reactors (i.e. for civilian use and electricity generation) but in a 'production' reactor operated with frequent fuel changes to produce low-burnup material with a high proportion of Pu-239, as was done in the DPRK. The only use for 'reactor grade' plutonium is as a nuclear fuel, after it is separated from the high-level wastes by reprocessing. It is not and has never been used for weapons, due to the relatively high rate of spontaneous fission and radiation from the heavier isotopes such as Pu-240 making any such attempted use extremely hazardous and essentially not viable. [Jessica Callen, Austria]	Rejected. A civil nuclear program may well be used to camouflage military objectives, or to develop expertise in nuclear engineering which will facilitate the development of nuclear weapons.
13566					ch5 - table 5.1 - please add explanation for different ratings - interaction, nilsson, confidence, etc. [Sergio Aquino, Canada]	Taken into account. Please see new Glossary term 'SDG-Interaction Score' also now included in the figure caption for Figure 5.3. This explains the different ratings used in our analysis.
13568					ch5 - table 5.1 - the role of the governments are missing - if industry and individuals are there, sp should the government [Sergio Aquino, Canada]	Rejected. There are many cells where governmental policy and their role have been mentioned where relevant. Energy demand sectors used here are consistent with past IPCC reports. There is no discussion of ownership regarding buildings, transport, industry and other sectors.
13570					ch5 - table 5.1 - industry and SDG 4 - product labels contribute to education [Sergio Aquino, Canada]	Accepted. Cell text revised to include SDG 4.7 along with a new reference added.
14124					Table 5.1: It is very good to sort out papers like this table. Please specify what is Nilsson Score at Glossary. [Zhen-Yi Wang, China]	Taken into account. Glossary entry added. Please see 'SDG-Interaction Score'.
29670					Table 5.1 Includes CCS and Bionenergy and CCS and Coal, but not CCS and Natural Gas, which will be a major application for CCS according to other chapters of this IPCC 1.5 report. It would be expected that upstream environmental impact and health impacts (SDG3) of natural gas extraction would be much less than coal mining. [Tim Dixon, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Our assessment maintained as much consistency as possible with options relevant to 1.5C pathways mentioned in Chapters 2 and 4 and in line with AR5 categories.
35404					Both 5.4.1.1 (Accelerating Efficiency in Resource Use) and 5.4.1.3 (Access to Modern and Reliable Energy and Fuel Switch) topics literally details about the use and challenges of adopting modern (renewable) energy in an efficient manner so as to promote mitigation and sustainable development paths. Hence, it is more comprehensive and ideal if we address both topic under one sub-topic than duplicating topics for similar issues/contents. [Regasa sagni, Ethiopia]	Section 5.4 has been restructured to discuss all aspects related to energy use under same sub-section in 5.4.1.1.

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12984					Table 5.1 Panel B Part 2, row 3, column 4 To discuss the topic of proliferation in a comprehensive and balanced way seems beyond the scope for the 1.5SR. The international safeguards regime is itself extensive, including: treaties, conventions and common (multilateral and bilateral) arrangements covering security and physical protection, export controls, nuclear test-bans and, potentially, fissile material production cut-offs). Not to mention the above 2 comments on the technological implications of proliferation. [Jessica Callen, Austria]	Noted. Indeed, a full-fledged discussion of the risks of proliferation and international treaties is beyond the scope of this report. However, it is self-evident that a global renaissance of nuclear power, in particular in developing countries that do not yet have domestic nuclear programs, will increase the risks of proliferation and may strain non-proliferation treaties and current observation and enforcement mechanisms.
12986					Table 5.1 Panel A Part 1, row 3, column 4 "Increased occurrence of childhood leukaemia in populations living within 5 km of nuclear power plants was identified by some studies, even though a direct causal relation to ionizing radiation could not be established and other studies could not confirm any correlation" There were many studies also showing that there was no increases observed around other NPPs by other studies. This is not reflected in this table.Consider revising to present full scientific literature/ dialogue. In addition, this presents only part of the findings, the subsequent studies have stated that the most likely explanation may pertain to a yet-to-be identified infectious agent. So stating that there is no causal relation to ionizing radiation is incomplete. The fact that another infectious agent is most likely the cause should be stated, otherwise the 1.5SR will leave itself open to criticism of bias. See also: Statement of the Commission on Radiological Protection (SSK) 'Assessment of the Epidemiological Study on Childhood Cancer in the Vicinity of Nuclear Power Plants (KiKK Study)', SSK, Bonn 2008 [Jessica Callen, Austria]	Rejected. The text clearly states that there is low agreement on the question of childhood leukaemia due to radiation exposure from nuclear power plants. The major component in the assessment of negative health impacts of nuclear power are the risk of nuclear accidents and long-term waste storage.
12988					Table 5.1 Panel A Part 1, row 3, column 4 Please consider findings of the German Commission on Radiological Protection who assessed the KiKK study, which is referred to in Table 5.1: "The natural radiation exposure within the study area, and its fluctuations, are both greater, by several orders of magnitude, than the additional radiation exposure caused by the relevant nuclear power plants. If one assumes that the low radiation exposures caused by the nuclear power plants are responsible for the increased leukaemia risk for children, then, in light of current knowledge, one must calculate that leukaemias due to natural radiation exposure would be more common, by several orders of magnitude, than they are actually observed to be in Germany and elsewhere." From, Statement of the Commission on Radiological Protection (SSK) 'Assessment of the Epidemiological Study on Childhood Cancer in the Vicinity of Nuclear Power Plants (KiKK Study)', SSK, Bonn 2008 [Jessica Callen, Austria]	Rejected. The text clearly states that there is low agreement on the question of childhood leukaemia due to radiation exposure from nuclear power plants. The major component in the assessment of negative health impacts of nuclear power are the risk of nuclear accidents and long-term waste storage.
12990					Table 5.1 Panel A Part 1, row 3, column 4 For completeness, the 1.5SR should also include studies of the health effects from ionizing radiation for inhabitants around geothermal power plants and coal power plants, as the doses from these sources of electricity are higher than for those populations living around nuclear power plants. Again, the 1.5SR is leaving itself open to bias or incompleteness in reviewing the available scientific literature. Please see the 2016 UNSCEAR report for more information: United Nations Scientific Committee on the Effects of Atomic Radiation, Sources effects and risks of ionizing radiation, UNSCEAR 2016, Report to the General Assembly, with Scientific Annexes, Annex B, Radiation exposure from electricity generation, New York: United Nations (2017). [Jessica Callen, Austria]	Rejected. The negative health effects from coal power plants are beyond doubt, and geothermal power plants are only a minor consideration at the level of aggregation of this analysis. The major component in the assessment of negative health impacts of nuclear power are the risk of nuclear accidents and long-term waste storage.
36672					The chapter has improved a lot since the FOD: congratulations! [Carmenza Robledo Abad, Switzerland]	Thank you.
44702					On the whole, better links with 1.5 are made in the chapter (although some sections have not yet done this), and the assessment is more nuanced and grounded in case studies, which could be taken further. As the authors will be aware, the chapter has become very long, which does tend to reduce readability and the clarity of the message. [Penny Urquhart, South Africa]	The chapter length has been reduced to be consistent with the 20 IPCC page allocation.
44704					Although a logical storyline of the chapter is set out, it is not always easy to follow this as the chapter unfolds. The author team could improve this by re-clarifying key messages for each sub-section in the process of revising and shortening the chapter. Some additional work is also needed on the Executive Summary to achieve these ends. [Penny Urquhart, South Africa]	Efforts have been made to ensure clarity of the narrative of the chapter, as introduced in section 5.1. A new section 5.6 on enabling conditions is the landing point of the chapter and builds on discussions that were previously scattered in different sections. The Executive Summary has been fundamentally reworked.
36974					The coherence of the chapter structure does not appear until p12. The contents/headings read like a series of loosely-related topics, rather than building towards a single cohesive argument. The elements are here: a) there remains a gap to realizing sustainable development, b) it will be harder in 1.5C world especially for vulnerable hot spots, and c) climate-resilient development pathways are needed (both to keep warming to 1.5C and to continue development progress in a warming world). In my opinion, the chapter would benefit from both greater specificity (which impacts where and for whom) and clarity (simple & repeated key message for the reader) in the arguments presented. [Bruce Currie-Alder, Canada]	The structure of the chapter (and the headings/sub-headings) has been reworked in order to improve the flow of arguments. The articulation between different sections is notably explained in Section 5.1.
37120					Given the relevance of the impact of climate change on the well-being in developing countries, there is a urgent need to put in place a government entity with needed resources from national budget to implement investment to mitigate and adapt to climate change. It is preferred to have a Minister of Climate Change Policy Implementation that could carry out climate change policies at the country level. The Minister should rely mostly on the national and international financial resources. I believe that this may be the only way to express our agreement with COP 21 instead of only signing the agreement without taking any visible action. [aklesso Egbendewe, Togo]	The need for financial flows suited to support the local needs for the transformation is identified as a key condition for achieving sustainable development in 1.5C warmer worlds (Section 5.6.1).
46486					Chapter length estimate is 39.3 IPCC pages (19.3 over the 20 page limit agreed by the IPCC panel). This estimate does not include figures, tables, references, FAQs, and cross-chapter boxes but does include chapter-boxes and main text and the executive summary. Please find areas of the chapter / sections of text than can be edited down to reduce the length of the final chapter draft. [Sarah Connors, France]	The chapter length has been drastically reduced to be consistent with the allocation by the IPCC panel.

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46618					Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	The text has been carefully edited to address this comment.
53902					Chapters 1,2,3 all define 1.5C pathways and/or worlds to some extent in their ES. I think only Chapter 1 ES should handle this [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]	1.5C-consistent pathways are defined in Chapter 1. Chapter 5 builds on definition of Sustainable Development to introduce Sustainable Development Pathways that are consistent with 1.5C and sustainable development objectives.
54286					The authors could consider discussing, in section 5.2.4 or 5.3, how the rate of change impacts sustainable development and human/ecosystem capacity to adapt. The absolute differences in impacts between 1.5C and 2C (discussed in section 5.2.3) are critical, but the speed at which the changes occur is also a critical metric for adaptation. This is also an important consideration for significant overshoot scenarios - the higher near-term forcing should translate into higher rates of change for many impacts. [Nathan Borgford-Parnell, Switzerland]	The rate of change is indeed a key factor challenging the alignment of sustainable development and 1.5C-consistent pathways. This point is made where supported by the literature.
61336					The Executive Summary emphasizes that climate risks for disadvantaged communities will be less under 1.5°C warming compared to 2°C. However, it does explicitly make the simple yet important parallel point that any negative outcomes (i.e. tradeoffs) associated with mitigation strategies will be enhanced under a 1.5°C world relative to 2°C. However, the increase in tradeoffs associated with risk of hunger, biodiversity, etc., are evident within the body of the chapter (e.g., Figure 5.4). [United States of America]	The trade-offs (and synergies) between mitigation actions consistent with 1.5C pathways and sustainable development dimensions are explicitly discussed in the revised Executive Summary.
61338					The terminology used for synergies and tradeoffs is not consistently used throughout the chapter. For instance, Figure 5.4 uses "co-benefits" and "side effects" and also refers to the direction of a co-benefit. Can co-benefits be negative? It would be more clear if the same terms are used throughout and well defined. [United States of America]	The language has been harmonized. In particular, "co-benefits" is not used anymore and we refer to "synergies" and trade-offs consistently throughout the chapter and in the figure.
61346					The chapter treatment of the poor and disadvantaged people is often focused on countries, and developing countries, and often ignores the fact that the poor and disadvantaged exist in all countries. While the physical challenges of climate change to the poor and disadvantaged may be the same regardless of country of origin, the solutions may vary significantly. Unfortunately, the chapter focus on developing countries does not provide this broader perspective. [United States of America]	The text has been edited to be clear that poor and disadvantaged is not only between countries but also within countries.
61348					The discussion of increasing and/or reaching 100% energy access in the context of 1.5°C pathways is relatively limited. Do the IAM runs indicate that full energy access and 1.5°C pathways are feasible? Basic understanding of the 2-3°C warming literature is that full energy access is possible, particularly if off-grid, micro-/mini-grid/distributed energy resources are prevalent in combination with end-use efficiency measures. [United States of America]	This point is discussed in 5.4.2.3. The results show that 1.5C-consistent pathways create trade-offs with energy access, but that these trade-offs can be compensated with targeted investments amounting to only a small fraction of total investment needs for mitigation per se.
61332					The chapter has very few case studies or examples from Africa, yet AR4 and AR5 demonstrated that the continent is highly vulnerable and will face the most adverse impacts. Sub-Saharan Africa is rapidly developing with more than 973 million people (in 2014), with 49 countries and great climatic, cultural, and ecological diversities. Population figures in Africa are projected to approach 1.5-2 billion people by 2050 (United Nations, Department of Economic and Social Affairs, Population Division, 2015) and the region is and will continue facing a range of climate risks that would have far reaching ramifications for its communities and economies in the future that could go beyond the continent. [United States of America]	Specific efforts have been made to include explicit examples from Africa, in different sections of the chapter, where most relevant. Notably: on impacts in section 5.2.2 and 5.2.3, on drylands as example of ecosystem- and community-based adaptation in box 5.1, on energy access in section 5.4.2.3, on cities in cross-chapter box 13.
61334					The use of "synergies" is confusing at times in this chapter. For instance, on page 5-20 in the discussion of agriculture (lines 10-26), adaptation is treated as a separate process that may or may not be synergistic with food security and other agriculture-related objectives. Adaptation may be a fundamental component of achieving a particular end, a means towards an end, rather than something that is synergistic. Hence we talk about 'climate-resilient approaches' to agriculture, infrastructure, etc. [United States of America]	Section 5.3 explicitly acknowledges that adaptation is mostly aligned with objectives of sustainable development, so that it is indeed a means towards the end goal of sustainable development. But, consistently with the mandate of this chapter (which is notably to investigate "positive and negative impacts of adaptation and mitigation measures", as described in the plenary-approved bullets), we analyse the interplays between different adaptation approaches and different SDGs, which feature mostly "synergies", but also "trade-offs" in specific cases.
61340					In this chapter, the discussion on mitigation focuses on the energy system, and approaches to reduce GHG emissions. However, the discussion on adaptation is silent on approaches to enhance the resilience of the energy system that will be necessary to meet 1.5°C scenario and sustainability goals. This approach ignores the fact that climate change will impact all aspects of society and all critical infrastructure including energy production, generation, distribution, and end use. Energy assets are increasingly vulnerable to the projected increases in frequency, duration, and intensity of extreme weather events, including coastal and inland floods, droughts, extreme heat events, ice storms, as well as sea level rise. These threats will result in increases in energy demand and decreases in energy supply, along with energy asset damage and operational interruptions. This chapter should include a discussion of the vulnerability of the energy system to climate change, adaptation solutions that are being pursued, and gaps and opportunities. This treatment can be done within the existing framework of the chapter. [United States of America]	Climate impacts on energy systems and need for adaptation in planning energy infrastructure design is discussed in Chapter 4 in subsection 4.3.1.5 Options for Adapting Electricity Systems to 1.5°C.
61342					The chapter discusses the nexus between sustainability and mitigation, as well as sustainability and adaptation. Unfortunately, neither this chapter nor the broader report addresses the nexus between mitigation and adaptation, including the synergies (e.g., use of distributed energy resources such as roof top solar can serve as back up when central power is interrupted) or unintended consequences (e.g., expanded use of biofuels or carbon capture and storage may significantly increase water use for energy production). It would be most appropriate to include this topic in this chapter. [United States of America]	The nexus between mitigation and adaptation is discussed in Chapter 4 (section 4.5.4). And the integration between mitigation, adaptation and sustainability is discussed in section 5.5.1, building on project-level examples available in the Climate-Compatible Development literature.

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61344					The chapter discusses co-benefit and synergies between mitigation and sustainability, but fails to adequately address unintended consequences particularly in the energy sector. For example use of carbon capture and storage can decrease GHG emissions but will also increase the water intensity of generation, putting additional demands on limited water resources for other purposes (drinking water, agriculture, etc.). Similar trends may be true for biofuels and water consumption. Or use of water for hydropower vs fisheries or agriculture. The tradeoff discussion should be enhanced. And in some cases, this discussion needs to be appropriately placed in the flow of the document. For example, some of these topics are addressed only under water security (5.4.3.4.) rather than "Synergies and Tradeoffs of Mitigation Options and Sustainable Development" (5.4.1). [United States of America]	Trade-offs of mitigation options with dimensions of sustainable development related to water are explicitly discussed in 5.4.1.2, 5.4.1.3 and 5.4.2.4.
61352					According to agreed outline, Chapter 5 is to be 20 pages, however the SOD is 69 pages (not counting references). Potential users are more likely to read the content if it is shorter and easier to digest. Suggest cutting redundant material and shortening long paragraphs, through a focus on what is most relevant to 1.5°C pathways rather than more general climate or development issues. [United States of America]	The chapter length has been drastically reduced to be consistent with the allocation by the IPCC panel.
61354					This chapter is very long and the Executive Summary is too detailed. Authors should look for opportunities to make the chapter more concise and reduce redundancy. [United States of America]	The chapter length has been drastically reduced to be consistent with the allocation by the IPCC panel.
61358					Serious grammar and English-language issues plague this chapter, in some cases altering the meaning or obscuring the meaning of sentences and confounding the findings. For example, incomplete sentences (page 5, line 5), improper word choice (page 5, line 51, should read "lack of" or "threats to" energy access), and poor English (page 5, lines 51-53) [United States of America]	The text has been carefully edited to ensure language quality.
61360					While some discussion of SDGs seems appropriate for this chapter, and this chapter only, such policy-relevant discussion should be limited to where peer reviewed literature exists to support it. [United States of America]	The discussion of SDGs is limited to assessments available from the peer-reviewed literature.
61364					The chapter is well beyond the recommended page limits agreed to by the Panel. The authors are highly encouraged to take the previous comment to heart to edit the chapter to the most salient points relevant to the topic of the report. This would increase the impact of the chapter and the relevance of the overall report to policymakers. [United States of America]	The length of the chapter has been significantly reduced to bring it back to the recommended page limits agreed to by the Panel.
61350					This chapter completely misses critical points that must be included for the report to be considered a comprehensive and balanced assessment of the effects of 1.5°C pathways on sustainable development. First, the report neglects to consider the "losers" in the pursuit of low emission pathways. Many individuals and firms, in countries at all levels of development, will likely suffer specific and lasting harm from a deep and fast reduction in emissions. The authors seem to consider these impacts acceptable versus the projected benefits from limiting warming. But a thorough cost/benefit assessment is not done. What happens to sustainable development of communities within wealthy countries which rely on access to cheap energy for their livelihoods? The authors' only response is that the climate resilient development pathways will leave no one behind. Making such egregious claims that effectively say "everyone can eat cake and the other guy will pay for it" is misguided and neither comports with reality nor the standards of the IPCC. Second, the concept of fairness between economic winners and losers is well understood and documented within the economic literature. Yet, the report neglects to cover any of this literature which includes discussions of the impacts on workers from unequal application of environmental regulations across countries which compete in a global marketplace and the accompanying spillover effects and leakage. These concepts of equity underlies the actions of nations as they seek to cooperate internationally (and is uncorrelated with simplified national indicators that make up most of the "equity frameworks" in the scientific literature). Discussions of these considerations must be included for the report to be considered comprehensive and balanced. [United States of America]	The existence of different categories of "losers" is acknowledged and pointed, notably in 5.5.3 and 5.6.4 as a key challenge in the pursuit of low-emission pathways, both between and within countries. No extensive cost-benefit analysis is conducted and rather we stick to a multi-dimensional approach of sustainable development which cannot be simply monetized. The discussion of climate-resilient development pathways in 5.5.3 has been edited to ensure it reflects a vision of equity and related challenges grounded on real-world examples. Notably, international cooperation is highlighted as a key condition for following climate-resilient pathways.
61356					As the authors of this chapter are undoubtedly aware, Africa represents a special case in terms of eradicating poverty and reducing inequalities. The inclusion of the results of a case study in Anambra State, located in the southeastern part of Nigeria, West Africa by Chizoba Chinweze may be instructive. With a landmass of 44,116 sq km and a human population of approximately 4,182,032, soil erosion constitutes the major ecological challenge in the state. The topography of the area – in addition to soil type, and the incidence of increases in precipitation levels and heavy surface water runoffs due to climate variability and change (according to the IPCC's 4th assessment report for the UNFCCC) – resulted in (1) soil transport as well as severe gully formation in 40% of the total land area concentrated in the higher regions and (2) flooding in the lower plane of the state, thus putting pressure on the ecological/earth life support system of the area. Anthropological factors also accelerate the development and expansion of these gullies, with attendant human vulnerability. This paper classifies the gully erosion/flooding in the area according to their severity and socio-economic impact. It further analyses their consequence and human vulnerability in the face of climate change challenges, and the limited adaptive capacity of the locals through the application of traditional knowledge. [United States of America]	Examples from Africa are explicitly discussed in many places in the chapter. The need to blend traditional knowledge with more scientific knowledge is elevated as one of the key enabling conditions for achieving sustainable development in 1.5C warmer worlds in section 5.6.3.

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61362					This chapter, like others in the special report, fails to narrowly focus its scope to the question of the overall report: impacts of global warming of 1.5°C above preindustrial levels and the associated greenhouse gas emission pathways. Broad topics such as equity and climate resilient development pathways should be limited to information published in the literature that is specific to 1.5°C. The authors claim to review the general climate change literature to find "insights" that are relevant to 1.5°C. While this may be a valid approach, its implementation in this draft leaves much to be desired. This report should focus on what is unique about 1.5°C pathways and not spend pages introducing material only to conclude with weak summations to the effect of "we expect this to be particularly the case for low carbon trajectories related to 1.5°C." The report should seek out insights that are particularly relevant to 1.5°C. If there is little or no information on this topic within the scientific literature, then that research gap should be noted and the authors should move on to what relevant information is known. The IPCC should not speculate on results relevant to 1.5°C simply because there is space to do so (which, in actuality, there is not given prescribed page limits in the approved outline). [United States of America]	The assessment conducted in the revised draft is based on literature that is specific to 1.5C, but also to the literature that is relevant to 1.5C given notably the characterization of 1.5C-consistent transformations in Chapters 2, 3 and 4. This approach is explicitly introduced in section 5.1.3.
61366					Because much of the chapter focuses on broad topics for which it doesn't have the space to fully explore, the chapter text contains key omissions and lacks a clarity that would come from focusing on the specific issue at hand. Broad topics, including climate resilient pathways, the multiple views on equity, relationships between sustainable development and mitigation or adaptation, and the integration of all of these concepts into a common approach, are all interesting and valid topics for the IPCC to explore and assess. Unfortunately, there is a relative lack of information directly relevant to 1.5°C in the literature on these topics. Not addressing these topics within this report does not weaken the report or lessen the likely impact of the overall report. There should be adequate space to explore all of these topics in the working group contributions to the AR6, where the reports are not limited to the narrow focus of a special report. [United States of America]	The text has been significantly edited and rewritten to limit its length and improve clarity. The assessment is based on literature which is specific and/or relevant to 1.5C, as explained in section 5.1.3.
61368					The chapter fails to include several key issues that are central to the understanding of 1.5°C-related pathways and their potential effects on sustainable development. First, consideration of sustainable development is necessary for all countries, even wealthy ones. They continue to make decisions on how to grow and develop in a manner that protects the environment and future populations. The effect on developed economies from severely limiting greenhouse gas emissions, steeply reducing in fossil fuel use, and potentially vast lifestyle changes, should be discussed in detail. Second, the report does not mention the potential long-term economic effects of reducing emissions more than what is necessary to limit warming. Because of the uncertainty in the sensitivity of warming to greenhouse gas emissions, it is possible, and potentially likely, that the globe will need to "over-correct" – i.e., reduce emissions by more than is strictly necessary – to prevent dangerous warming from occurring. What are the effects of an over-correction on global wealth? Does this divert funding away from other investments? [United States of America]	The text has been edited carefully to convey clearly the message that sustainable development is a question for all countries at all levels of development. Challenges posed by deep changes in fuel use and lifestyle changes are discussed in 5.4.1.1 and 5.4.1.3. The effect of uncertainties is not discussed explicitly because of absence of literature.
61370					The chapter suffers from a severe lack of empirical research. While modeled assessments of the potential pathways to reduce emissions, adapt to climate change, and promote sustainable development are of interest. There is little to no space given to the presentation of actual data. Instead, the authors make general statements based on expert judgment or make policy-prescriptive statements based on what can only be assumed is their own judgment. The work of the IPCC must only rely on the assessment of only the highest caliber scientific research, which is fully transparent. [United States of America]	The assessment in the chapter combines modelled assessment and empirical evidence, both based on available scientific research. The text has been carefully edited to avoid policy-prescriptive formulations but to convey clearly the policy-relevant messages that can be identified from the assessed literature.
61372					The report also confuses the broad issue of sustainable development with the specific global 2030 agenda on the sustainable development goals (SDGs). The SDGs do not encompass the entirety of sustainable development action taking place in the world today. The authors may explore ways that the SDGs are related to low carbon and high climate resilient pathways, but that is only a part of the story. They should consider the breadth of sustainable development beyond the framework of the SDG indicators [United States of America]	The distinction between sustainable development and SDGs and their connection with climate change are explicitly discussed in cross-chapter box 4, which serves as a framing for introduction to the chapter in 5.1. The text has been carefully edited to point to specific SDGs where relevant and to broader sustainable development in other cases..
61374					The authors present a framework for developing climate resilient development pathways without showing a single pathway! While the description of a pathway is interesting, it could have been similarly written for any other level of warming. What makes them unique to 1.5°C is what must be included here. If there are specific 1.5°C pathways studied in the literature, then the authors should discuss those results in detail. But a generic framework should not be included here. [United States of America]	The notion of climate-resilient development pathways was introduced in the AR5, WGII, Ch13. This notion of development pathways is now defined, both in the text (incl. in Ch1 and a cross-chapter box on pathways) and in the glossary. Section 5.5.3 summarises the relevant literature, highlighting that there are many possible paths and all of them are context-specific and need to be negotiated. Figure 5.1 illustrates the components of such pathways. Examples are given in 5.5.3., illustrating what elements are achieved in which particular contexts and which obstacles may be difficult to surmount and why. This notion of pathways differs from emission reduction/mitigation pathways that are assessed in Ch2. The particular relevance in a 1.5C warmer world is highlighted in Fig 5.1. It depicts not only emissions reductions and stabilising global temperature increase at 1.5C but also meeting the SDGs and goals of sustainable development, in equitable manners while ensuring well-being for all. Such pathways are described for the level of countries and communities. The literature on this topic is growing!

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8386					<p>This chapter discusses synergies and tradeoffs between mitigation and adaptation and sustainable development. However, the current emphasis is placed on synergies over trade-offs, while the latter is equally important to the ultimate goal of sustainable development. It is suggested to add a paragraph to summarize the synergies and trade-offs respectively.</p> <p>The Executive Summary fails to fully reflect the underlying report by giving an inadequate overview of the risk component. It is suggested to add such a statement, the key findings of which are outlined in bold. [China]</p>	The revised text considers synergies and trade-offs in a balanced way, including in the executive summary statements.
37116		1	27	11	In order to adress the issues related to energy poverty and justice (He?ron et al. 2017), there is a need to intensify investment in off-grid energies such biogas and bio-power for sustainable energy use in rural areas in Africa. This will have the potential to address emissions through deforestation. He?ron, R. J. and D. McCauley (2017). "The Concept of Energy Justice across the Disciplines", Energy Policy, 104, 658-667.. [aklesso Egbendewe, Togo]	Off-grid solutions (both benefits in terms of synergies and challenges) are discussed in section 5.4.1.2.
37114		9	23	19	In many subsaharan african countries people are still highly dependent on natural forests for firewood, charcaol and agricultural production. So, given the potential negative effects of climate change on agriculture (e.g. Gadédjisso-Tossou et al. 2016), people are likely to intensify charcoal production for income in order to make up of the agricultural losses due to climate change effects. The resulting deforestation requies some sort of intensification of actions like the REDD+ programs to stop the deforestation desaster. Also, the current design of the REDD+ program has to be review to give more power to universities and civil societies instead of government for transparency and the use of science in conducting the program. Gadédjisso-Tossou, A., A. Y. G. Egbendewe and G. A. Abbey (2016) "Assessing the impact of climate change on smallholder farmers' crop net revenue in Togo" Journal of Agriculture and Environment for International Development, 110 (2): 229-248 [aklesso Egbendewe, Togo]	<p>The challenge of integration between adaptation, mitigation and sustainable development is at the core of the discussion of pathways in section 5.5.</p> <p>The need for multi-level governance, ensuring articulation between government-led approaches and more civil-society/local-scale initiatives is explicitly pointed ins section 5.6 as a key enabling condition for aligning sustainable development and 1.5C-consistent transformations.</p>
37118		48	3	55	Several communities in developing countries are in need of investment in land restoration to sustain agricultural production and there is a need to design a program at country level to stimulate such investment (Ouattara et al. 2018). Ouattara, P. D., E. Kouassi, A. Y. G. Egbendewe, O. Akinkugbe (2017) "Climate Uncertainty and Agricultural Soil Conservation Investment Decisions" Forthcoming in Climate Change Economics. [aklesso Egbendewe, Togo]	The need for investment flows that are adapted to the specificities of local needs in general is pointed as a key enabling condition for aligning sustainable development and 1.5C-consistent transformations in section 5.6.1.
1332					Overall, the key scientific insights of the chapter can be communicated significantly more concise and clear to policy makes by shortening the review to no more than 20 pages (as agreed in the approved outlined) avoid repetitions across sections through a simplified structure, providing overview tables and figures synthesizing key messages from the literature and a more balanced approach to case studies and examples across the chapter. [Karen Olsen, Denmark]	The chapter length has been drastically reduced to be consistent with the allocation by the IPCC panel.
10196					In summary, for Chapter 5 many indications show that the achievement of both 1.5? and SDGs will face lots of difficulties which clearly indicated [Saudi Arabia]	The text identifies synergies and trade-offs between 1.5C and SDGs, which point to the opportunities and difficulties. The chapter seeks to identify key enabling conditions to maximize the synergies and address the difficulties.
10598					Chapter 5 needs a lot more work for improving clarity and key substance. The current text is long and contains many repetitions within the chapter. [Hong Yang, Switzerland]	The text has been significantly edited, shortened and streamlined notably to avoid repetitions.
10600					The SDGs are presented in Chapter 1 and repeated in Chapter 5. Should be presented in one Chapter. [Hong Yang, Switzerland]	The approach chosen is to have a presentation of sustainable development, SDGs and their link to climate change in a cross-chapter box (No. 4), in chapter 1 where the framing of the report belongs. And to refer to this box when introducing more specifically the SDGs in section 5.1.
8384					<p>1. This chapter needs to further explain the development pathway of climate resilience and its significance for different countries and for practical behavior. It will focus on the impact of 1.5? on developing countries in terms of development space, the additional cost and how to shoulder it. The discussion of coordinated adaptation and sustainable development without considering the mitigation factor may mislead policymakers.</p> <p>2. The classification of countries according to different criteria is found in more than one case in this chapter. For example, income differentiation, or poor country and rich country, which are not clear in reference or easy to understand. It is suggested to follow AR5 for the classification of developed and developing countries in all cases.</p> <p>3. This chapter contains too many long boxes. It is suggested to streamline it, taking into consideration the core issues of the chapter and the regional balance, representativeness and practical operability of the cases. It is also suggested that each box is no longer than one page.</p> <p>4. The figures in this chapter are informative and reader-unfriendly. It is suggested that the core issues reflected in the figures be briefly described in text. [China]</p>	<p>1. The discussion of climate-resilient development pathways has been reworked to clarify their meaning for different countries at different levels of development (section 5.5.3.1), clarifying the importance of coordination and cooperation for equitable sharing of effort (section 5.5.3.2)</p> <p>2. The text has been carefully edited to ensure that the terminology "developing country" is used unless there is a clear reason to adopt an alternative classification based on the literature.</p> <p>3. Boxes have been significantly reduced in length and refocused.</p> <p>4. Figures have been reworked to make them more informative and user-friendly, with more detailed caption and connection to the text (and some figures have also been deleted).</p>
10606					In general, key messages need to be specified more clearly and concisely. [Hong Yang, Switzerland]	The text has been edited to better highlight the key messages. Also the executive summary has been significantly reworked.
10612					Based on the schematic storyline shown in Figure 1.7, Chapter 5 should focus on response options which are in line with the achievement of SDGs. In other words, it should answer what are the benefits of response. In the current text of Chapter 5, this core is not reflected clearly. [Hong Yang, Switzerland]	Consistently with plenary-approved outline, Chapter 5 considers synergies and trade-offs of response options with sustainable development and the SDGs.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
18684					GENERAL COMMENT: The insights (and indeed scope) of this chapter are at times extremely difficult to disentangle from those of Ch4. In particular, sections 5.3 and 5.4 feature a walk-through of adaptation & mitigation options. It may be better for the options themselves to be addressed in Ch4. The relevant sections of Ch5 could then complement by providing insights into how the Ch4 options affect sustainable development etc. [Andrea TILCHE, Belgium]	The mandate of Chapter 5 is notably to investigate the synergies and trade-offs of response options with sustainable development, complementarily to analysis in chapter 4 where these response options are discussed in the light of strengthening and implementing the global response to the threat of climate change. Sections 5.3 and 5.4 conduct this synergy and trade-off analysis respectively for adaptation and mitigation.
18686					GENERAL COMMENT: Overall, the key scientific insights of the chapter can be communicated significantly more concisely and clearly to policymakers by shortening the review to no more than 20 pages (as agreed in the approved outlined) avoid repetitions across sections through a simplified structure, providing overview tables and figures synthesizing key messages from the literature and a more balanced approach to case studies and examples across the chapter. [Andrea TILCHE, Belgium]	The chapter length has been drastically reduced to be consistent with the allocation by the IPCC panel, notably through a revised structure avoiding repetitions and providing synthesis in tables where possible.
24108					This chapter is so important as the first occasion in IPCC process that focuses on relation between SDGs and climate actions. Generally, those two have synergy and complement each other, even though some trade-offs exist as shown in 5.4.3. But their implementation environments now differ quite a bit; GHG reduction, especially in 1.5 degree case, needs immediate action under very strict low, policy and guidance on behavior, investment with unified long/ mid term quantitative target aimed by each responsible nation and stakeholders, while SDGs movement is slow and only started now under abstract and diversified targets with loose commitments among voluntary actors. This degree of maturity and time delay in policy/action may prevent them from timely and full cooperation. So it is a bit risky to depend too much on each other from the practical points of view. [Shuzo Nishioka, Japan]	The assessment of synergies and trade-offs between climate action and SDGs is a core mandate for this chapter. The time dimension, and notably the urgency of action that is particularly essential for 1.5C objective, is highlighted throughout the chapter, notably in section 5.4 and 5.5.
29558					The water cycle disturbances (eg drought, heavy rains, floods) get attention and thus it would be good to focus more wider in SDG 6 in adaptation. The ecosystem-based or nature-based solutions in green and blue infrastructures are vital instruments in the adaptation. [Finland]	Water-related issues are discussed explicitly in terms of impacts (see section 5.2.3 and Table 5.1) and adaptation (notably 5.3.2).
33930					The English throughout this chapter is at times very abbreviated and somewhat difficult. Many of the sentence structures are very similar, so it reads in a monotone as if the same information keeps getting repeated. SDGs are also discussed in chapter 4, so some of the information seems already represented in there. [Norway]	The text has been carefully edited for language clarity. Sustainable Development and SDGs, and their link with climate action are discussed in Cross-Chapter Box 4 in Chapter 1, and Chapter 5 builds on this to introduced the SDGs which are a specific topic to be addressed comprehensively in Chapter 5 according to the plenary-approved outline.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
36168					<p>The chapter discusses the issue of justice in the transition to a green economy without paying adequate attention to the challenges faced by labor. Though Section 5.4.1.3 Access to Modern and Reliable Energy and Fuel Switch, acknowledges that in historical transitions managing the impact on workers would require retraining programs, especially in context of mining industries whose workforce is largely unskilled or semiskilled (Lines 54-56). However, the chapter also needs to engage with the literature on what the green economy/growth would entail for labor.</p> <p>The following may be added:</p> <p>ILO and OECD (2012) acknowledges that the "relationship between sustainable development, green growth and good labour market performance can be mutually reinforcing, but this is not automatic". They also call for recognizing that the "environmental policies required to achieve green growth will not always promote more and better quality employment". Insofar as green jobs involve higher skill levels, better working conditions and higher wages, they can be expected to improve social equity. However, statistical evidence suggests that many of the assumptions associated with green jobs are far too optimistic as there is research to show that working conditions in the classical environmental sector such as agriculture, construction, waste management and manufacturing are frequently characterized by low wages, heavy physical labor, considerable health risks and precarious employment relations (Nicky Gregson et al. 2014; Gregson et al. 2012; Leitner, Wroblewski, and Littig 2012; Wong 2017; Morris et al. 2009). What this could mean for labor in developed and developing countries, needs greater attention when talking about justice in historical transitions. According to the ILO and OECD (2012) "labour market and skill development policies, together with social dialogue, have an important role to play in promoting a just transition towards sustainable development and green growth". This entails assuring workers' rights in accordance with international labour standards in growing green sectors while promoting high-quality jobs. ILO and OECD (2012) also acknowledge that "while green growth probably does not call for different types of measures to promote these goals, it will be necessary to be especially vigilant about worker rights, promote social dialogue and ensure minimum job standards during this transition. In summary, although there is no automatic link between cleaner energy and stronger labour market performance, but these goals can often be made to be complementary (ILO and OECD 2012).</p> <p>Gregson, Nicky, Mike Crang, Farid Uddin Ahamed, Nasreen Akter, Raihana Ferdous, Sadat Faisal, and Ray Hudson. 2012. "Territorial Agglomeration and Industrial Symbiosis: Sitakunda-Bhatiary, Bangladesh, as a Secondary Processing Complex." <i>Economic Geography</i> 88 (1): 37–58. https://doi.org/10.1111/j.1944-8287.2011.01138.x.</p> <p>ILO, and OECD. 2012. "Sustainable Development, Green Growth and Quality Employment: Realizing the Potential for Mutually Reinforcing Policies." Background paper for the Meeting of G20 Labour and Employment Ministers.</p> <p>Leitner, Andrea, Angela Wroblewski, and Beate Littig. 2012. <i>Green. Jobs. Arbeitsbedingungen Und Beschäftigungspotentiale</i>. Vienna: Arbeiterkammer.</p> <p>Morris, Andrew P, William T Bogart, Andrew Dorchak, and Roger E Meiners. 2009. "Green Jobs Myths." <i>Mo. Env'tl. L. & Pol'y Rev.</i> 16: 326.</p> <p>Nicky Gregson, Mike Crang, Julie Botticello, Melania Calestani, and Anna Krzywoszynska. 2014. "Doing the 'Dirty Work' of the Green Economy: Resource Recovery and Migrant Labour in the EU." <i>European Urban and Regional Studies</i> 23 (4): 541–55. https://doi.org/10.1177/0969776414554489.</p> <p>Wong, Julia Carrie. 2017. "Tesla Factory Workers Reveal Pain, Injury and Stress: 'Everything Feels like the Future but Us.'" <i>The Guardian</i>. May 18, 2017. http://www.theguardian.com/technology/2017/may/18/tesla-workers-factory-conditions-elon-musk. [India]</p>	<p>Due to strict limits on page allocation to chapters, the final version had to be cut by half compared to the SOD. This meant deleting many parts of the full text. So, new additional text could not be added unless specific to 1.5C and relevant to the chapter. However, the essence of the comment is accepted and well acknowledged and included in the chapter by including more recent literature in our assessment. See Section 5.4.1.2.</p>
51456					<p>General comments on Chapter 5: The chapter has relied heavily on academic and scientific papers. It has also referred to the policies and strategies of countries and their governments and other non state actors like the private sector and industries etc. There is reference to Global CSO views of movements and struggles by international organisations like La Via Campesina, WFF, MST etc, confined to a box or to. But, IPCC has, perhaps, failed to take in to account more nuanced views, studies and research papers, presentations of global civil society organisations, movements, groups, IP and women groups. These groups have continuously fostered the debate over climate change, climate actions, adaptation, mitigation, fair share, loss and damage, human rights etc for over two decades now and have well supported views and contentions on adaptation, mitigation, sustainable development and pathways to 1.5 degrees. Issue such as carbon trade, carbon forestry, biodiversity offsets, PES, REDD+, CDM have been dealt with conviction, supported by field studies, research and interaction with vulnerable people and communities. This huge experience and repository of knowledge has given rise to the Climate Justice Movement which is well recognised globally today. We expect IPCC Report to provide much more importance to the voice and concern of Climate Justice Movement, Climate Justice Groups, Women's Groups, IP Groups and other community based groups and organisations to come out with a balanced position on 1.5 degree pathway. [Souparna Lahiri, India]</p>	<p>The IPCC provides a neutral assessment based on scientific evidence without any judgment on the respective positions of different groups. Evidence emerging from published studies by different groups are included in the assessment when estimated as relevant from a scientific point of view. The importance of civil society, vulnerable and marginalized communities, is acknowledged in the chapter. And inclusive processes ensuring that the voices of all groups are heard is pointed as one of the key enabling conditions for 1.5C-consistent pathways achieving sustainable development.</p>
53916					<p>Trump may have the best words but you have the best Figures, although text is very very small on some of them and although. They are pretty complex though- have you tried them on the average reader to see if they understand? [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]</p>	<p>The figures have been tested with users and edited to ensure they are not too complex and can be understood more easily.</p>

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55562					I have not found anywhere (I may have missed the info, sorry in advance if this is the case) that the Decision of the Paris Agreement refers to the need to promote universal access to sustainable energy in developing countries, in particular in Africa, through the enhanced deployment of renewable energy. Should be added. [Maryse Labriet, Spain]	Synergies and trade-offs related to the deployment of renewable energy are discussed in section 5.4.1.2.
57402					There is very different writing style and levels of English language. Several sections need thorough language revisions. [Hans Poertner, Germany]	The text has been carefully edited to ensure language quality.
57404					Inconsistent use of uncertainty language across chapter, some apply it consistently, others hardly [Hans Poertner, Germany]	The text has been carefully edited to ensure consistency of uncertainty language.
57406					There is a need for better explanation of certain concepts/terms (e.g. climate-smart forestry, iterative co-learning cycle of action research, etc.) [Hans Poertner, Germany]	The text has been edited to ensure that technical terms are systematically explained (including in the glossary where relevant).
57408					There is too little specific reference to the role of ecosystems and biodiversity (e.g. SDGs 14 & 15) in CRDPs [Hans Poertner, Germany]	We rely on the available literature. Most literature specific to CRDPs or in the context of CRDPs focuses on human development and inequalities, although the notion of 'well-being for all' (also depicted in Fig 5.1) includes ecosystem well-being. We expect the literature on CRDPs to have expanded by the time the AR6 assesses CRDPs in one full chapter, with significantly more space and not constrained to 1.5C warming.
9104					In this chapter there is several references to richer and poorer nations, this should be removed or clearly defined [Grenada]	The text has been carefully edited to use denomination for countries that are consistent with the literature.
9112					Define vulnerable, high-income, urban, disadvantaged and if it can't be defined they need to reworded or removed [Grenada]	The text has been carefully edited to use formulations for different categories of populations, consistent with the available literature.
10348					General comment: It is several times stated in the study that the impact of possible increases in food and energy prices needs to be compensated for poorer and disadvantaged social groups and regions. It would be useful to detail the compensation methods and the guarantees because it could ensure that during the fight against climate change inequalities will be reduced and equality will be reached. [Hungary]	The most detailed analysis available from the literature discusses the amount of investments that would be required to compensated the trade-offs of ambitious mitigation with most sustainable development dimensions. It is discussed in section 5.4.2.
12934					In this chapter there is several references to richer and poorer nations, this should be removed or clearly defined [Saint Kitts and Nevis]	The text has been carefully edited to use denomination for countries that are consistent with the literature.
12942					Define vulnerable, high-income, urban, disadvantaged and if it can't be defined they need to reworded or removed [Saint Kitts and Nevis]	The text has been carefully edited to use formulations for different categories of populations, consistent with the available literature.
28958					Ch 5 uses the term "cost-efficiency" while all other chapters talk about cost-effectiveness or cost-benefit. Please explain the concepts in this chapter or in the glossary. [Germany]	This term has not been retained in the last revision of the chapter.
32136					There is very limited discussion on limits to adaptation throughout the chapter. Limits to adaptation will impede the attainment of sustainable development, poverty eradication, reducing inequalities and pathways to limit global warming. Limits to adaptation should be included much more extensively in section 5.2 and also reflected in the Executive Summary as its own bolded point. [Jamaica]	The chapter now includes a specific cross-chapter box (No. 12) on "residual risks, limits to adaptation and loss and damage". This point is in addition explicitly discussed in section 5.2.1 and the challenges posed by these limits even at 1.5C are included as a specific headline statement in the executive summary.
28746					<p>The central concepts and terms should be defined clearly and subsequently used consistently. In particular this refers to equity / justice / fairness. There is a definition given on page 8 explaining that "equity [...] means treating everyone fairly and impartially [...] and is often associated with concepts of justice", which is slightly different from the definition given in Ch 1 (Instead of impartially, the term "a notion of justice" is used in Ch 1. Further, the terms distributive 'justice' and procedural 'justice' are used in Ch 1 instead of 'equity').</p> <p>Within the discussion in this chapter, we see some inconsistency, because 1) the terms are used in one sentence ("... in the context of equity, fairness, and justice", p 12) and 2) the precise relationship between the terms (is fairness part of equity? are equity and justice synonyms?) remains unclear. It seems that the terms are not used consistently throughout the chapter (and for sure, they are not used consistently in the cited literature and across the report). The relevance of justice / equity may be interpreted differently by readers of the report. One way of dealing with this problem might be to refer to the concrete aspects relevant for a certain statement. [Germany]</p>	Equity, justice, and fairness are introduced in Ch1 and defined in the glossary. Ch5 uses these terms in alignment with Ch1 and according to the glossary. The FGD no longer includes specific definitions to avoid redundancy with Ch1 and the glossary. Equity and fairness are treated largely synonymously. Yet, the word justice is used when the underlying literature refers specifically to justice, social justice, and/or climate justice, all defined in the glossary.
28748					We are concerned about the omission of education as a measure to promote transformational change in the current draft. For climate-resilient development pathways and low energy demand scenarios, dietary and behavioural change and responsible consumption and production play an important role. These involve deep and profound societal transformation on multiple scales and in multiple dimensions. As a measure to initiate and stimulate this transformation, education is not mentioned in this report, although SDG4 aims to "ensure that all learners acquire the knowledge and skills needed to promote sustainable development and sustainable lifestyle, [...]" (SDG4.7). In this chapter, quality education seems to be considered as an outcome of climate-resilient development rather than one of its enabling conditions. We strongly suggest to add a brief discussion on education as a measure to promote transformational change needed to reach the goals of the Paris Agreement, and include references to relevant literature. [Germany]	The role of education is pointed explicitly in section 5.2.3, 5.3.1, and though social learning defined in glossary and discussed in section 5.5.3.2 and 5.6.3.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28750					At the moment it is quite difficult to identify the central messages (apart from the executive summary) and on what type of evidence they build. Rather than trying to give a comprehensive picture of all relevant research fields and their respective fragmented results, the chapter could focus, in the first place, on those aspects that are well researched / well understood and then refer to research gaps / areas with little evidence at the end of the chapter. This could mean to structure the chapter more according to central, overarching factors affecting the relation between SD-mitigation-adaptation. [Germany]	The structure of the chapter has been adjusted to facilitate the understanding of the flow of argument and the identification of central messages, with notably a final Section 5.6 grouping the main overarching factors enabling the alignment of sustainable development and 1.5C-consistent transformations. The type of evidence used in the chapter is discussed in 5.1.3.
28752					We appreciate the recognition of differential experience of climate impacts according to "gender, caste or ethnicity within and across societies" (5.2, p. 13, ll. 32-33), which has also been stated in the AR5. However we are concerned about the inconsistencies regarding this issue both within chapter 5 and across the entire report, and the lack of a clear link to 1.5°C/2°C in line with the scope of the report. We would strongly encourage the authors to revise subchapter 5.2 and cross-check the entire report in order to ensure that information provided is relevant in the context of SR1.5, terminology and concepts are consistent, and the dimension of age and intergenerational aspects of climate change are included as appropriate. Also, please ensure that statements on these topics are backed by the scientific literature, and relevant sources are added. [Germany]	The revision of Section 5.2 has taken this comment into account, with notably important efforts for coordinating with other chapters (notably ch 3).
32202					In this chapter there are several references to richer and poorer nations, this should be removed or clearly defined [Jamaica]	The text has been carefully edited to use denomination for countries that are consistent with the literature.
32204					Define vulnerable, high-income, urban, disadvantaged. If these terms cannot be defined then they need to be reworded or removed [Jamaica]	The text has been carefully edited to use formulations for different categories of populations, consistent with the available literature.
36576					There is very limited discussion on limits to adaptation throughout the chapter. Limits to adaptation will impede the attainment of sustainable development, poverty eradication, reducing inequalities and pathways to limit global warming. Limits to adaptation should be included much more extensively in section 5.2 and also reflected in the Executive Summary as its own bolded point. [Snaliah Mahal, Saint Lucia]	The chapter now includes a specific cross-chapter box (No. 12) on "residual risks, limits to adaptation and loss and damage". This point is in addition explicitly discussed in section 5.2.1 and the challenges posed by these limits even at 1.5C are included as a specific headline statement in the executive summary.
36592					In this chapter there are several references to richer and poorer nations, this should be removed or clearly defined [Snaliah Mahal, Saint Lucia]	The text has been carefully edited to use denomination for countries that are consistent with the literature.
36594					Define vulnerable, high-income, urban, disadvantaged. If these terms cannot be defined then they need to be reworded or removed [Snaliah Mahal, Saint Lucia]	The text has been carefully edited to use formulations for different categories of populations, consistent with the available literature.
33142					The attention this chapter gives to equity, justice and ethics is very welcome. Attention to human rights is positive and could be strengthened, likewise attention to gender equality could be strengthened. The sections and references on participatory governance are good and should inform earlier chapters of the report. The understanding that 1.5 pathways pose risks and can have negative consequences is important and emphasis on the role of human rights in mitigating these negative impacts should be strengthened. The chapter should also refer to the literature on climate justice to support this approach. e.g. Henry Shue, 'Climate Justice: Vulnerability and Protection' OUP 2014 Clare Heyward and Dominic Roser, 'Climate Justice in a non Ideal World' OUP 2016 Catriona McKinnon, 'Climate Change and Future Justice', Routledge 2011 Stephen Gardiner, 'A Perfect Moral Storm: The Ethical Tragedy of Climate Change', OUP 2011 Darrel Moellendorf, 'The Moral Challenge of Dangerous Climate Change: Values, Poverty and Policy' CUP 2014 Okereke, C. and Coventry, P. (2016) Climate justice and the international regime: before, during and after Paris. Wiley Interdisciplinary Reviews: Climate Change, 7 (6). pp. 834-851. Jeremy Moss (ed), 'Climate Change and Justice', CUP 2018 Dominic Roser and Christian Seidel, 'Climate Justice: An Introduction', Routledge 2016 Ethics, Public Policy, and Global Warming' by Dale Jamieson. 'Global Environment and International Inequality' by Henry Shue. 'Cosmopolitan Justice, Responsibility, and Global Climate Change' by Simon Caney. 'Energy Policy and the Further Future' by Derek Parfit. 'Deadly Delays, Saving Opportunities' by Henry Shue 'One Atmosphere' by Peter Singer 'Selling Environmental Indulgences' by Robert E. Goodin. 'When Utilitarians Should Be Virtue Theorists' by Dale Jamieson. 'It's Not My Fault: Global Warming and Individual Moral Obligations' by Walter Sinnott-Armstrong [Tara Shine, Ireland]	These comments have been taken into account when revising the chapter, to ensure that the attention to equity, justice and ethics is maintained. Most recent literature relevant to strengthen this point has been included.
43086					The chapter is well-written, comprehensive and richly studied with the latest references. It contributes to strengthening of sustainable development including adaptation and mitigation measures needed to eradicate poverty and reduce inequalities by endeavouring to limit warming at 1.5C. [Muhammad Mohsin IQBAL, Pakistan]	Thank you.
43088					Majority of the references quoted in the text are at various stages of publication; most of them are "submitted", which is considered among the initial stages of publication. Hopefully the papers will be published by the time of Final Report in a form as quoted in the text. [Muhammad Mohsin IQBAL, Pakistan]	The final version includes only papers published before the cut-off date of 15th May.
58616					In this chapter there are several references to richer and poorer nations, this should be removed or clearly defined [Donovan CAMPBELL, Jamaica]	The text has been carefully edited to use denomination for countries that are consistent with the literature.

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5540	1		132		The chapter includes a lot of interesting new material, and I appreciate the attempt to include a broad range of studies, models, and methodological approaches [Kirsten Halsnaes, Denmark]	Thank you.
5550	1		132		null	Comment appears to be missing.
12586	1				General comment on chapter - some of the attempts to assess sustainability impacts are not particularly well balanced, with an undue negative focus on some mitigation technologies compared to others [United Kingdom (of Great Britain and Northern Ireland)]	The discussion of the sustainability impacts of mitigation options in 5.4.1 is based on the identification of key options for 1.5C-consistent pathways as emerging from analysis in Chap 2 and 4. The comprehensive analysis which covers all options and captures all relevant literature is presented in table 5.3 (available as an Annex).
5548	1		132		I have some general comments highlighting limitations: Economic SD dimensions are not well covered despite these could be very important to low income countries. It is furthermore not well explained how 1.5 versus 2.0 stabilization will influence climate vulnerabilities in the different part of the world. I suspect that the uncertainty of the climate scenarios for these two targets will be too large event to distinguish the difference. Another concern is that some of the response strategies as e.g. behavioral change and circular economy too much is based on conclusions from OECD countries. A final general comment is that it might be to ambitious to bring Figures showing modelling results and changes in relation to all SDG's. It could be questioned whether the models all together are comparable and consistent, and another concern is that the specific SDG impacts might be very context specific [Kirsten Halsnaes, Denmark]	Economic aspects of sustainable development are covered to the maximum extent possible given available literature, notably in pathways analysis (see in particular section 5.4.2). The differential impacts of climate vulnerabilities between 1.5C and 2C are discussed in section 5.2.2 and 5.2.3. The response strategies are analysed systematically based on the assessment from Chap 2 and 4 regarding what these response measures should be under 1.5C-consistent pathways. Behavioural aspects and circular economy are only one of them and they are treated as such in section 5.4.1. The assessment of relations to SDGs as presented in the figures emerges from detailed assessment from the literature which is compiled in Table 5.3 (provided in supplementary material).
12588	1				General comment on chapter - Chapter 5 ultimately does not succeed in providing clear messages for policy makers. The main body of the text does not always provide a clear overview of the challenges (e.g. limited land and water) - the cited literature often suggests that efficiencies can be found and, as a result, there will be benefits for individuals and society as a whole. There is then an implicit assumption that all of these efficiencies can be combined to develop a significantly improved food-energy-water-environment system. This may be true, but it does not seem to acknowledge some of the (seemingly) fundamental constraints on the Earth system and the possibility that further efficiencies may not always be possible. For example, projected changes in crop yields often assume that water is not limited - in reality, this is unlikely to be true. Conversely, in places (in particular in the Exec Summary) the wording implies that mitigation and adaptation while adhering to the SDGs represents an enormous challenge but it is not apparent how well founded such inferences are, when they are not always well supported in the main text. This leads to mixed messages and some potentially quite large inconsistencies between the evidence stated and some of the largescale implications. Ultimately a clearer and more consistent message on the extent to which mitigation and adaptation are compatible with SDGs needs to be made, and this needs to be supported more strongly with relevant literature [United Kingdom (of Great Britain and Northern Ireland)]	The text of the chapter and specifically the executive summary have been significantly restructured and edited to highlight better the key messages to policymakers in a balanced and systematic way. The chapter now assesses systematically, and based on the most up-to-date available literature, the synergies and trade-offs between adaptation and/or mitigation and sustainable development dimensions. In addition, a new sub-section 5.6 has been introduced to synthesise concrete policy-relevant messages on the overarching enabling conditions that would facilitate overcoming the constraints.
12590	1				General comment on chapter - Chapter is overly verbose and complex, some sections are well beyond the agreed scope. It needs to be re-written with a non-expert audience in mind as I do not think some sections are fit for this purpose (communicating science to decision-makers) in its current state. The reliance on jargon that will be unfamiliar to the typical reader of the report and the frequent lack of plain English will dilute the important messages you are trying to convey. It should be made significantly shorter and significantly clearer. Furthermore, in many places there are statements which are unreferenced; if a statement cannot be backed up by peer-reviewed evidence then it needs to be removed. Examples are provided where the text can be shortened, but please consider as a whole how it can be made shorter. [United Kingdom (of Great Britain and Northern Ireland)]	The text of the whole chapter, including the executive summary, has been rewritten to address this comment.
24426	1		69		the whole text should be justified [Nazan AN, Turkey]	The text layout has been corrected.
24428	1		69		The whole text, missing gaps between headlines and paragraphs [Nazan AN, Turkey]	The text layout has been corrected.
53910	1		7		I found the littering of confidence statements was over confident and became unbelievable. Have you really done an expert assessment of confidence for each one? The last para in the ES is a case in point. If you have very high confidence of lots of significant research gaps, it somewhat undermines all the high confidence statements from earlier. I would be more parsimonious with its use. [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised substantially and uncertainty statements used more carefully with assessment and traceability.
56474	1		13		In general, poverty is not a development country problem only. Subsidies have to be paid too.. There fore consumers should be given the right to generate their own power, at cost price and get the benefit from that. Because consumers have the cheapest money, next to governments, and wind turbines ans solar panels work automatically, consumers can simply own them, and have their power at cost price, given government regulations, that allow consumers the benefit of that. [Henk Daalder, Netherlands]	Off-grid renewables are discussed in section 5.4.1.2, with their synergies and trade-offs with sustainable development. Economy-wide economic costs are not available in the literature, but assessments of investments required to compensate trade-offs with some sustainable development dimensions are presented in 5.4.2.
16612	1	1	69	47	Inter-generational equity has been left out [Janet Stanley, Australia]	Inter-generational equity is listed in the glossary. However, the literature relevant to Ch5 did not have anything specific to say about intergenerational equity in the context of 1.5C warming. Hence , the term is also left out for the FAQs. We are confident that the AR6 full report will have sufficient literature on this angle to assess.
16614	1	1	69	47	I would have liked more to be said on the issue of transport as lack of mobility adds to social exclusion and the wrong type of mobility adds substantially to GHG emissions. The rapid growth of cars in developing countries is a huge problem. [Janet Stanley, Australia]	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence the growth of cars could not be addressed in our two FAQs.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
16616	1	1	69	47	Similarly, there is little comment on land use and integrated planning and the problems of CC and poverty [Janet Stanley, Australia]	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence land use and integrated planning could not be addressed in our two FAQs.
16618	1	1	69	47	I think more should be said about the growth of human population and the cc and equity issues this is creating. [Janet Stanley, Australia]	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence population growth could not be explicitly addressed in our two FAQs.
16620	1	1	69	47	More should be said on international conflict and subsequent inequity, where climate change impacts are one of the causal factors. [Janet Stanley, Australia]	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence, conflict could not be explicitly addressed in our two FAQs.
16622	1	1	69	47	Little is said about the association between extreme events and inequity/poverty [Janet Stanley, Australia]	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence, extreme events could not be explicitly addressed in our two FAQs.
16624	1	1	69	47	Loss of biodiversity and ecosystems leading to poverty needs greater attention. [Janet Stanley, Australia]	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence, loss of biodiversity could not be explicitly addressed in our two FAQs.
16626	1	1	69	47	This chapter is considerably improved since the first draft, well done. [Janet Stanley, Australia]	Thank you.
24398	1	1	132	1	Table 5.1 is an incredibly important table. To help readers understand what it is about, one might consider putting a schematic table on the first page, which just shows all measures as rows and all SDGs as columns. The table would not include the assessment yet, but indicate which parts can be found where in the subsequent pages. [Joeri ROGELJ, Austria]	Taken into account. Thank you for this great suggestion. Unfortunately due to space constraints we could not include a schematic table.
62818	1	1	8	6	Congratulations for the quality of the second order draft of the chapter. However, the chapter is twice too long compared to the initial target. My recommendation is to strongly shorten the following sections : Executive Summary (please aim for 2 word pages and harmonize the style with the executive summaries of other chapters with only 5-10 lines per item), and all elements of text which do not build on an assessment of the literature. My main concern with several parts of the chapter is related to the writing style, as the text reads as a thesis supported by references rather than an assessment of the literature leading to conclusions. The traceability of the lines of evidence used in the figures is not obvious; a detailed online supplementary material providing the "figure recipe" (source of information for each bar) would be needed. [Valérie Masson-Delmotte, France]	The text of the whole chapter, including the executive summary, has been rewritten to address this comment. Notably the length has been reduced to be consistent with the 20 IPCC page allocation.
62820	1	1	7	5	Please shorten the executive summary by about a factor of two, for instance by removing the initial paragraph, providing titles guiding the reader into a structure, and shorten detailed text under each bold key finding. The last paragraph highlights gaps, which may be referred to in earlier aspects, where relevant. The IPCC reports are not supposed to stress literature needs or be prescriptive of future studies, so the last item may be removed from the ES. [Valérie Masson-Delmotte, France]	Accepted. Text revised substantially to be within the page limits.

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63112	1	1	132	6	The goal of the chapter 5 as to explore the linkage between sustainable development, poverty eradication, inequality reduction, and global warming is very important to protect livelihoods of the marginalized groups of people. The chapter also describes Sustainable Development Goals and targets as major base in developing climate-resilient development pathways with proper mitigation and adaptation approach. This sustainable development pathway seeks to describe equity and fairness for all of the countries and individuals, communities, and organizations. But when the sustainable development is biased toward the dominant discourse of corporate elite, it is not helpful for indigenous people, agriculture, and coastal livelihoods. This domination raises the concerns over the SOD mentioned in page no 4: issues of increasing food prices, food insecurity and hunger, income losses, lost livelihood opportunities, adverse health impacts, and population displacements. In this context, in 5-5, sentences 10-14 describe the negative outcomes of maladaptation or adverse outcome of particular adaptation strategy and the costs of adaptation can be included as increasing poverty and debt. To reduce these negative outcomes, the SOD emphasizes on promoting the dialogue between the different stakeholders. In 5-7, sentences 37-39 describe the methodologies of dialogues between different research communities, regarding processes of learning and deliberative decision making, and adequate and robust indicators to analyse the multiple dimensions of climate and development and to overcome persistent disciplinary knowledge fragmentation. These dialogues can produce the better outcomes if a research is not prescribed one and some disciplines like sociology are not marginalized in the learning process. Because of this prescribed research and marginalization, page 9 sentences 42-44 mentioned the frustrating outcomes of MDGs; MDGs failures in addressing disparities and key environmental concerns. In 5-35, 4-9 describes the causes of air pollution and health as greenhouse gases and air pollutants as the same sources, such as power plants, cars, factories, agriculture, forest and peatland fires. Hence, mitigation strategies that reduce GHGs or the use of fossil fuels typically also reduce emissions of pollutants, such as particulate matter (PM2.5 and PM20), black carbon (BC), sulphur dioxide (SO2), nitrogen oxides (NOx), and other harmful species, causing adverse health and ecosystem effects at various scales. The dialogues can overcome many of these concerns if they recognize local culture, history, and community in climate change adaptation policy. The SOD describes this ecocentric approach in page no 21 and sentences 18-24; Ecosystem-based adaptation (EBA) includes ecological restoration (e.g., of wetlands and floodplains), afforestation, fire management, and green infrastructure, and is found to yield mostly positive benefits for sustainable development. The EBA with mangrove restoration has reduced coastal vulnerability while protecting marine and terrestrial ecosystems; river basin EBA has reduced flood risk and improved water quality; and wetland and mangrove restoration has increased local food security. This is also very important to understand that the EBA may be more cost effective than other options, can be inclusive of local knowledge, and more easily accessed by the poor. In 5-22, 3-13 describes community-based adaptation that involves local people in a participatory and collaborative manner through the merging of scientific and local knowledge to improve resilience and ensure sustainability of adaptation plans. In 5-22, 32-45 focus on traditional knowledge-based adaptation. In this context, in 5-24, 27-33 describes importance of the situated and context-specific understanding of place that brings to the fore multiple knowledges, values, and contested politics helps to overcome dominant path dependencies, challenge scientific options detached from place, and advance joint place making. These insights suggest that win-win outcomes, even via socially-inclusive adaptation pathway approaches to plan and prepare for 1.5°C global warming and higher local warming, will be exceedingly difficult to achieve without a commitment to inclusiveness, place-specific trade-off deliberations, redistributive measures, and procedural justice mechanisms to facilitate equitable transformation while meeting the SDGs, particularly poverty eradication and reducing inequalities. Evidence from climate change-affected communities indicates that community based adaptation provides benefits by increasing local adaptive capacity in order to improve livelihood assets and security as well as addressing inequalities, gender biases, at the local level, in providing synergies with SDG 5 and SDG10. However, challenges of such adaptation are observed in national and local planning. Community based Omar Masera is the correct spelling of the contributing autor (without one "S") [Mexico]	The new section 5.6 which synthesises the main conditions to achieve sustainable development in 1.5C warmer worlds, representing insights from the literature on the specific needs of the local context, the multi-level institutions and inclusive processes ensuring participation by all communities.
34708	1	12	1	13	Omar Masera is the correct spelling of the contributing autor (without one "S") [Mexico]	The spelling will be corrected in the final version after the approval session.
32880	2	1	69	47	• Overall comment in Ch 5, including summary (p.4, 5, etc), main text like section 5.6.1, and Frequently Asked Questions (e.g. p.67): the whole report talks and equates synergies always as positive outcomes and trade-offs as negative ones (p. 23) in relation to sustainable development. It also talks about 'maximising' synergies and 'minimising' trade-offs. However not all trade-off are always negative, as in policy making there are always trade-offs and these are not necessarily between positive and negative outcomes, but can occur between various positive outcomes (e.g. between two SDG). In some instances of the report and in Ch5 the report correctly qualifies synergies and trade-off whether they are positive and negative (e.g., p34) and this practice should be followed in all the report. [J. David Tabara, Spain]	The chapter now explains that synergies are used to describe positive consequences and trade-offs for negative consequences.
32882	2	1	69	47	• Overall comment in Ch 5, including summary (p.4, 5, etc), main text like section 5.6.1, and Frequently Asked Questions (e.g. p.67): what a policy maker wants is not to maximise the number of synergies or trade-offs (this does not necessarily makes sense to me) but the number of positive outcomes derived from choosing the right climate resilient pathway or combination of transformative solutions given the existing mix of potential synergies and trade-offs which depends on the local/policy context in each concrete situation. In other words trade-offs have to do mostly with incompatibilities of different options or goals rather than whether they are between positive and negative options or outcomes. [J. David Tabara, Spain]	The chapter now explains that synergies are used to describe positive consequences and trade-offs for negative consequences.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32884	2	1	69	47	<p>• Whole report and in particular sections 5.1.1. and section 5.6: These sections talk about Sustainable Development but the word 'needs' is totally missing (!). This concept was at the core of the original definition of sustainable development and in my view the reference and analysis of needs still should play a central role in defining the scope of this chapter, for instance in the form of some kind of minimally comprehensive Global Needs Assessment. While it is true that the discussions on sustainable development have now moved from talking about needs to goals, that some concrete policy statements on the need to reframe and how to deal with needs –including a characterisation of different kinds of needs and their associated GHG emissions derived from fulfilling them- in the context of the 1.5°C target is required. In my view, both discussions on needs and on goals are not in opposition in the context of sustainability but complementary and both needed at the same time [J. David Tabara, Spain]</p>	The chapter has been further revised and shortened, and links between needs, emissions, and development were made more explicit where literature was available.
32886	2	1	69	47	<p>the report already talks about basic needs (e.g. p5), adaptation needs (p.21), cultural and social needs (p26) and mentions the word needs as a defining concept of sustainable development in the first Frequently Asked Question of page 67, line 8. But little or nothing more than that is provided, e.g. to describe which kind of needs the authors refer to. One should bear in mind that a large proportion both in the unsustainable consumption of global resources and its attendant GHG emissions currently come from meeting unnecessarily needs –specially by affluent societies- which if avoided or steered to other more sustainable purposes could be not only critical to ensure the meeting of basic needs by future generation but also in preventing a world exceeding the 1.5°C threshold*. This discussion is also related to the demand-based policies as reframing what people understand as need in order to align them to sustainability cannot be imposed but can only be done as a process of social learning or more specifically, as a process sustainability learning. Reference: Tabara, J. D. and C. Pahl-Wostl 2008. Sustainability Learning in Natural Resource Use and Management. Ecology and Society, 12 (2): 3. [online] URL: http://www.ecologyandsociety.org/viewissue.php?sf=28 [J. David Tabara, Spain]</p>	The term needs is used in alignment with relevant literature in the context of 1.5C warming. Needs as such are not defined in the glossary. Learning is addressed in a revised section 5.6 on enabling conditions.
32888	2	1	69	47	<p>Footnote of previous comment on the absence of needs discussion: "[In the manuals of conventional economics, all market demands tend to be equally treated as needs -whether they are actually oriented to meet basic or superfluous needs- and such liberal bias seem perhaps to have prevented the authors to actually thinking more critically about more transformative policy options –including pricing, demand-control or other incentive-based measures- towards a need-focused economy (instead of just a demand/supply one) in the context of meeting the Paris 2-1.5°C target in alignment with the core ambition of sustainable development. To understand the relevance of this point the famous quote by Gandhi reminding us that there are enough resources in the world to meet everyone's needs but not everyone's greed many be useful here: being inequality and poverty eradication so closely interlinked, I wondered how much 'global greed' (e.g., by the accumulation of few multi-national corporations profits or the rich consumers/polluters of few nations) will have the world be able to harness, turn it into satisfying real global needs and by which means in order to achieve a 1.5°C world in comparison to a 2°C one? I could not find any hint of an answer about this question in this report]. [J. David Tabara, Spain]</p>	Thank you. However, due to space constraints and requests to limit the assessment to 1.5C and 1.5-relevant literature, your suggestion is beyond the scope of the chapter. However, we have included two of your articles that we found highly relevant - thank you.
45060	3	3	3	4	<p>1- Pre-industrial is defined by IPCC glossary as: period before 1750. Paris agreement has defined it as period 1850-1900. need to be clarified/corrected in IPCC docs. 2- During 1850-1900, amount of sunspot was slightly more than normal, which makes the earth cooler than average. To remove the effect of sunspot cooling, I suggest to add a small warm bias to earth surface temperature during 1850-1900. [Iman Babaeian, Iran]</p>	Pre-industrial is defined in Chapter 1. All chapters use this term in accordance with Ch1.
2408	4		7		<p>Some of the bullet points in the Exec Summary are very wordy and this obscures the points of policy relevance being made. [Debra Roberts, South Africa]</p>	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
13286	4		69		<p>Quantitative analysis on positive and negative impacts should be introduced, including on response measures and economic diversification. [Eleni Kaditi, Austria]</p>	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence, quantitative analyses could not be explicitly addressed in our two FAQs.
13290	4		69		<p>Analysis should elaborate further on mitigation costs, providing quantitative findings. [Eleni Kaditi, Austria]</p>	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence, quantitative analyses could not be explicitly addressed in our two FAQs.
13292	4		69		<p>Analysis should elaborate further on issues related to equity, as mitigation policies could adversely affect the development aspirations of developing countries. [Eleni Kaditi, Austria]</p>	The FAQs are meant to be fairly short and accessible to a wide audience, without foreshadowing or repeating findings from the chapter. Hence, quantitative analyses could not be explicitly addressed in our two FAQs.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5248	4	1	5	39	Regarding the whole chapter, it seems focused on the effects of 1.5 C, or perhaps as much as 2 C, on the SDGs. However, the international community is now on a path, even assuming that the nations meet their NDCs, that will lead the global average temperature to overshoot with the temperature quite possibly going over 3 C and even higher. It seems to me that there needs to be some recognition of reality and to present its consequences. I would also very much encourage presenting the consequences of various levels of long-term warming for the SDGs. The Paris Accord wanted exploration of the value of limiting warming to 1.5 C, yet what is considered in this report is going up to 1.5 C and staying there. Given the very serious consequences relating to sea level rise (paleoclimate data suggest a sea level sensitivity of roughly 15-20 meters of sea level rise per degree C) and biodiversity and these impacts will be impacted most by the peak warming and its duration, but a number of weather extreme related consequences and displacement of storm tracks, expansion of the subtropics, Arctic sea ice, etc. may be moderated by returning to a lower overall global warming, and it would seem that returning to no more than 0.5 C over preindustrial would make achieving the SDGs easier than a global warming of 1.5 C or 1 C (and certainly easier than for higher overshoot levels). So, I'd urge consideration of the relative implications of both overshoot values and long-term values for achieving the SDGs. [Michael MacCracken, United States of America]	The mandate for this chapter (and the entire report) was to focus on 1.5C. The plenary approved outline for this chapter indicated relations between 1.5C and the SDGs, and not higher temperature levels. No literature is available that discusses the impacts of overshoot scenarios on the SDGs.
12592	4	1	7	39	Executive summary is not really a summary, many points are extremely long (>1 page paragraphs) and use very technical and/or complex language. Reminder that this report has a non-expert audience who will not take in these key messages unless they are communicated very clearly and concisely. In contrast Ch5 related SPM messages are good - the Ch5 executive summary could put more focus on bringing out these same messages as in the SPM. The sections highlighted in bold in the exec summary of ch5 could also be more specific in bringing out specific differences between 1.5 and 2C. [United Kingdom (of Great Britain and Northern Ireland)]	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
21712	4	1	7	41	The Executive Summary appears rather "crowded". Some of the detail could be accessed via references to the Chapter instead of stating explicitly here. [Sweden]	We have substantially revised the ES, in alignment with other chapters. Readers now find shorter and more accessible paragraphs and statements, with line of sight to underlying section text and evidence.
33932	4	1	7	39	Executive Summary: The current format of this Executive Summary is very different compared to the other chapters, and what we are used to from previous IPCC reports. The paragraphs themselves are currently too long. Please consider to summarise or split the information to make it more available to the readers. By doing this there will also be room for more paragraphs on these four pages. [Norway]	We have substantially revised the ES, in alignment with other chapters. Readers now find shorter and more accessible paragraphs and statements.
38552	4	1	7	39	I find it very hard to read and absorb the main messages in this ES. I strongly recommend that the authors reconsider the format adopted. Shorter statements in bold, but more importantly, the texts below the bold statements need shortening. As it is now, it is, in my view, too much general material that does not fit in an ES. Furthermore, the long text makes it difficult for the reader to see what is important here. [Jan Fuglestad, Norway]	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
38554	4	1	7	39	Closer coordination across the chapters is needed for a more consistent style for the ESs [Jan Fuglestad, Norway]	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
38558	4	1	7	39	Some of the messages in this ES are presented in the SPM in a shorter and clearer way. I suggest that the authors use some of these in the ES [Jan Fuglestad, Norway]	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
44014	4	1	7	39	There is very limited discussion on limits to adaptation throughout the chapter. Limits to adaptation will impede the attainment of sustainable development, poverty eradication, reducing inequalities and pathways to limit global warming. Limits to adaptation should be included much more extensively in section 5.2 and also reflected in the Executive Summary as its own bolded point. [Carl-Friedrich Schleussner, Germany]	Limits to adaptation are mainly discussed in Ch3, and also in Cross-chapter Box 12. in Ch5.
44706	4	1	7	39	The Executive Summary can be tightened up by removing unnecessary repetition e.g. the mention of the specific SDGs in the preamble. The text under many of the Key Messages in bold is too long - and considerably longer than that in the other chapters. It is recommended to rather have a few more Key Messages, as opposed to such large compendium-type Key Messages; and to reduce text under each key message, thereby distilling out the essence of what the author team wishes to convey. [Penny Urquhart, South Africa]	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
44716	4	1	7	39	Suggest that various statements on bioenergy and BECCS across the chapter and from different perspectives are brought together into an integrated and stand-alone Key Message in the Executive Summary. [Penny Urquhart, South Africa]	BECCS is covered under 2 statements in the ES, both under Mitigation and Sustainable Development.
50116	4	1	7	39	The Exec Summary does not clearly state main conclusions from the chapter. The lengthy text under the various headline messages makes it hard to see the key points of the assessment. I strongly suggest to shorten these texts considerably and divide them into separate bullets or paragraphs. [Bert Metz, Netherlands]	All statements in the ES have been thoroughly revised and refined to avoid verbose and unwieldy sentences and paragraphs.
50314	4	1	7	39	An editor should go through and break up the very overlong sentences throughout the executive summary, without changing their meaning (e.g. lines 18-22, page1) [Christopher Bataille, Canada]	We have substantially revised the ES, in alignment with other chapters. Readers now find shorter and more accessible paragraphs and statements.
52754	4	1	69	47	This chapter could benefit from more graphs and less long descriptive text [Iulain Florin VLADU, Germany]	We have significantly shortened the text to meet the agreed upon page allocation. We have included a few more figures and tables., incl. in the cross-chapter boxes.

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28754	4	3	7	39	The Executive Summary is quite comprehensive but largely lacks the risk framing that is introduced in AR5 as well as in section 5.1. This has substantial implications as many statements about impacts do not make explicit the important role of "different patterns of vulnerability" (see p. 13, l. 42). It may also explain the lack of statements about the important role of planning processes despite coverage of their importance in the body of the chapter (e.g. "governance and institutional adaptation" (p. 17, l. 23) as well as the indicators presented in Box 5.1 (p. 11, ll. 34 and 36)). Please add a short paragraph that introduces the AR5 risk framing. [Germany]	Risks and impacts are covered in the first sub-section of the ES, and then also in the context of risks from mitigation measures.
33244	4	3	4	3	suggestion: define 'reducing inequalities' in the glossary [Sergio Aquino, Canada]	Inequality is defined in the glossary. 'Reducing inequality' means reducing 'inequality' as defined in the glossary - no need to define the 2 words together. Reducing inequality is also SDG #10.
38556	4	3	4	17	I dont think this first para fits here. I would rather suggest having this in the main chapter. [Jan Fuglestedt, Norway]	Following consensus from LAM4, we have retained only a short introductory paragraph, as requested.
61376	4	3	4	12	The report also confuses the broad issue of sustainable development with the specific global 2030 agenda on the sustainable development goals (SDGs). The SDGs do not encompass the entirety of sustainable development action taking place in the world today. The authors may explore ways that the SDGs are related to low carbon and high climate resilient pathways, but that is only a part of the story. They should consider the breadth of sustainable development beyond the framework of the SDG indicators. [United States of America]	Throughout the chapter, efforts were made to distinguish between the two when appropriate and possible, including the notion that sustainable development will be relevant after 2030.
360	4	4	4	5	It would be necessary to qualify more precisely those pathways, and connect them with chapter 2 of the report for consistency. In particular, what probability is implied, and are overshoot considered. The whole chapter risks being considered as wishful-thinking if not reconciled with chapter 2 and SPM that state "historical emissions, current policies and patterns of investment have already placed scenarios limiting warming below 1.5°C without overshoot with at least 66% likelihood out of reach". [Céline Guivarch, France]	The pathways discussed in Ch5 have some similarity to the emission reduction/mitigation pathways discussed in Ch2 but there are also differences. Ch5 has an explicit bullet in the plenary approved outline entitled 'climate resilient development pathways', which we discuss in 5.5.3. 5.5 also explains similarities and differences between different notions of pathways, incl. different scales. References to Ch2 pathways are made where relevant (e.g. 5.4.2 and 5.5.2).
30712	4	4	4	5	« pathways to limit global warming to 1.5°C above-preindustrial times. » It would be necessary to qualify more precisely those pathways, and connect them with chapter 2 of the report for consistency. In particular, what probability is implied, and are overshoot considered. The whole chapter risks being considered as wishful-thinking if not reconciled with chapter 2 and SPM that state "historical emissions, current policies and patterns of investment have already placed scenarios limiting warming below 1.5°C without overshoot with at least 66% likelihood out of reach". [France]	The pathways discussed in Ch5 have some similarity to the emission reduction/mitigation pathways discussed in Ch2 but there are also differences. Ch5 has an explicit bullet in the plenary approved outline entitled 'climate resilient development pathways', which we discuss in 5.5.3. 5.5 also explains similarities and differences between different notions of pathways, incl. different scales. References to Ch2 pathways are made where relevant (e.g. 5.4.2 and 5.5.2).
30714	4	6	4	8	This sentence includes a list that recharacterizes the SDGs and omits some aspects (e.g. sustainable production, access to energy, sustainable growth). It would be better to avoid opening a forcibly partial list. [France]	Indeed, thank you. This sentence has been removed and the entire opening paragraph shortened.
3044	4	7	4	7	foster consumption ?? [Robert Shapiro, United States of America]	This sentence has been removed.
28756	4	7	4	8	Please change misleading "and foster sustainable cities, consumption, ecosystems." into "ensure the lasting protection of the planet's ecosystems and its natural resources, foster sustainable cities, and ensure sustainable consumption and production patterns." Therewith, the statement is more specified, because it is not only about fostering but also protecting ecosystems. [Germany]	This sentence has been removed.
33246	4	13	4	13	climate resilient [Sergio Aquino, Canada]	The English language favours a hyphen between climate and resilient, given that a noun follows (development pathways). We use the hyphen consistently throughout the chapter.
21714	4	15	4	17	Very likely so, but the statement does not provide much key information. Could let the calibrated uncertainty language speak for itself. [Sweden]	This sentence has been removed.
32708	4	16			The word "of" should be inserted after "understanding". [Christopher Campbell-Duruffé, Canada]	This sentence has been removed.
50312	4	16	1	16	Add "of" between "understanding" and "the" [Christopher Bataille, Canada]	This sentence has been removed.
5338	4	18	4	19	As public health practitioners that interested in climate change, I always asked how to do real action between countries, individuals, communities and organisations. I suggest IPCC report address this kind of question by mention chapter or another report that specific to this issue. [Sulistiyawati Sulistiyawati, Indonesia]	Health is addressed predominantly in Ch3. Yes, a special report on climate change and health could be an idea that IPCC may want to consider.
10134	4	18	4	22	High confidence needs a reference [Saudi Arabia]	This statement has been removed.
10602	4	18	4	22 Will be exceedingly difficult to reach'. The meaning is not clear. [Hong Yang, Switzerland]	This statement has been removed.
12998	4	18	4	22	Currently, the harsh realities of climate change already have a negative toll on public health, food and water security, migration, peace and security. If Climate Change is left unchecked hence we are unable to limit global warming by the end of the 21st century, there are strong chances that there will be a roll back in the development progress made in the last couple of decades, this includes the progress made in the area of poverty eradication. Hence it will be almost impossible to achieve the SDGs at this rate. [Denise Okpala, Nigeria]	Yes, thank you. We have captured the essence of your sentences in our revised ES, with evidence in the underlying chapter sections.

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28758	4	18	4	22	We suggest to lift this sentence to the SPM, because it underlines the framing of climate policy with respect to the parallel goals of mitigation and achieving the SDGs. It could be provide context for relevant figures in SPM4. "Without consideration for equity and fairness, and concerted efforts from all countries as well as individuals, communities, and organizations, the dual goal of limiting global warming by the end of the 21st Century to 1.5°C compared to pre-industrial times, including temperature overshoots along the way, and achieving the SDGs by 2030 and beyond, inclusive of poverty eradication, will be exceedingly difficult to reach (high confidence)." [Germany]	Thank you. Given space constraints and long discussions among authors, we no longer have this statement in our ES, and also not in the SPM. However, the essence of the important statement remains present in the chapter text, and in parts in the summaries.
33248	4	18	4	22	simplify phrase. Omit 'consideration for equity and fairness' [Sergio Aquino, Canada]	This entire bold statement has been removed.
38560	4	18	4	22	This statement contains much important information, but is in my view too long and heavy. I suggest splitting this up and/or leaving out some elements. [Jan Fuglestad, Norway]	This statement has been removed.
38562	4	18	4	22	It would be good if the ES could explain why it is so [Jan Fuglestad, Norway]	This statement has been removed.
52290	4	18	4	22	This statement is exactly the whole point of the document and should have been front and centre all along. That being said, the sentence is too long and may be better presented with bullet points. [Jason Donev, Canada]	Thank you. Given space constraints and long discussions among authors, we no longer have this statement in our ES, and also not in the SPM. However, the essence of the important statement remains present in the chapter text, and in parts in the summaries.
50114	4	18	4	22	This conclusion about the importance of (international) equity and fairness in achieving the 1.5C limit is too vague. What does it mean to "consider equity"? What is the message to policy makers? I repeat here my suggestions that I made for the equity paragraphs in the SPM: "What should have been said is that ensuring equitable 1.5C strategies will require a different implementation of the CBDR principle. Current implementation is that developing countries consider it fair to reduce emissions less and later than developed countries (see for instance page 5-49, lines 6-12). However, in 1.5C pathways the room for such differentiation is much smaller than in 2C pathways ("everything needs to be done everywhere"; this is illustrated by the fact that under SSP-3 conditions, with "late accession" of developing countries, 1.5C limits cannot be reached; see chapter 2.5.1) and that means equity should be sought much more in rich countries paying for part of the mitigation efforts of developing countries and assisting them in creating the right institutional and governance arrangements to enable them to strengthen their mitigation efforts and to assist them in strengthening their resilience against climate change." [Bert Metz, Netherlands]	This statement has been removed. However, we have tried to capture the important essence of your comment in the underlying text and different parts of the ES, and some elements also in the SPM.
61378	4	18	4	22	Recommend that the statement be simplified. At present, the sentence is very dense and includes many distracting (albeit important) concepts. Is it possible to write a simpler statement and then include the qualifiers and all the special interest points (e.g., 'inclusive of poverty eradication') in one or two subsequent sentences to support the main point? [United States of America]	This entire bold statement has been removed.
61380	4	18	4	22	This paragraph refers to a "dual goal of limiting global warming by the end of the 21st Century to 1.5°C ... and achieving the SDGs." It is not clear where a goal of 1.5°C has been set as such (Paris refers to "pursuing efforts"), so describing this as a goal is policy-prescriptive. In addition, the paragraph states that such goals will be exceedingly difficult to achieve "[w]ithout consideration for equity and fairness"; however, there are different conceptions of what equity and fairness mean in this context so it is not clear what this means. Who decides what is "fair"? [United States of America]	This statement has been removed.
61382	4	18	4	22	The inclusion of the phrase "without consideration for equity and fairness" into this headline statement is confusing. What definitions of fairness and equity are being applied here? The lack of any further explanatory text further complicates the ability of the reader to understand the statement. This statement should be clarified and the basis for this conclusion should be presented. [United States of America]	This statement has been removed.
21716	4	19	4	2	by the end of the 21st Century is not really specifically relevant for the temperature goals as they are absolute in the sense that they should apply for all time horizons (assumedly this does not refer to some class of overshoot scenarios?). [Sweden]	This statement has been removed.
29760	4	19	4	21	The 1.5 target is presented here in a way that seems at odds with the definition applied elsewhere in the report. The Paris Agreement does not specify temperature targets in relation to "the end of the 21st century", and says nothing about "temperature overshoots along the way". [Bård Lahn, Norway]	This statement has been removed.
61384	4	2	4	2	Need to define 'temperature overshoot' either in the glossary or with a parenthetical in the Executive Summary. Suggest removing mention in this headline (line 20 of first main finding) and explaining in a separate sentence. [United States of America]	This statement has been removed. Overshoot is defined in the glossary.
4504	4	23	4	27	Everybody agree with this statement that impact of 1.5C can be lower than that of 2C world. Real issue is that the difference of mitigation cost between two world would be huge (Marginal Abatement Cost will be 3-7 times higher in the former case. Without showing avoided damages (difference between 1.5 and 2 degree world), it may be hard for readers including policymakers whether they should proceed to aim at the 1.5 degree world. Please say something about the mitigation cost (even reference to the other chapter that describes cost issue would be better). [Mitsutsune Yamaguchi, Japan]	Thank you. We have highlighted the higher mitigation costs at 1.5C compared to 2C elsewhere in the ES (see Sustainable Development Pathways to 1.5C), with supporting evidence in 5.5.2.
10604	4	23	4	47	The key message states 'The impact of 1.5C warming above pre-industrial times still pose significant challenges for human and ecosystem well-being, poverty eradication and reducing inequalities'. In the text below, this point is not elaborated. [Hong Yang, Switzerland]	This sentence has been replaced in the final ES, with underlying evidence in section 5.2 and Cross-Chapter Box 12.

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29762	4	23	4	47	It would be highly recommended to split this paragraph into several smaller paragraphs to increase readability. Several of the points made (for example line 44-47) appear to be standalone conclusions that should be highlighted as such. [Bård Lahn, Norway]	Done. This long paragraph has been split into two.
31566	4	23	4	27	It is natural for the impacts to become smaller as the temperature goes down. We would like to know how much degree it differs and how much the cost increases between 1.5°C and 2°C. If agreement or evidence are limited to describe the impacts of 1.5°C, please clearly indicate so with scale of confidence. [Japan]	This sentence has been replaced in the final ES, with underlying evidence in section 5.2 and Cross-Chapter Box 12.
54408	4	23	4	47	Should these lines of evidence not come from chapter 3? Or at least strongly cross-reference? [Reinhard Mechler, Austria]	Impacts of 1.5C warming relevant to poverty eradication and reducing inequalities are covered in Ch5. Reference to Ch3 is made where relevant (e.g. Box 3.5)
61386	4	23	4	27	Suggest simplifying into three distinct points: (1) risks increase with additional warming; (2) the impacts of 1.5 still pose... (i.e., the last sentence); and (3) limiting warming to 1.5 vs 2°C can help avoid a higher number of potentially adverse future impacts. [United States of America]	This sentence has been replaced in the final ES, with underlying evidence in section 5.2 and Cross-Chapter Box 12.
61390	4	23	4	47	It is confusing why this statement and accompanying text are included in the Executive Summary. The discussion of impacts of 1.5°C of warming should be limited to Chapter 3. Many of the statements have neither enough evidence basis in the chapter to be included nor do they have specific relevance to 1.5°C. [United States of America]	Impacts of 1.5C warming relevant to poverty eradication and reducing inequalities are covered in Ch5. Reference to Ch3 is made where relevant (e.g. Box 3.5)
61388	4	23	4	27	This section could also include specifically how aridity is projected to spread due to changes in temperatures and precipitation (most notably in Southern Africa). Projections are increasingly demonstrating that rainfall and temperature variability patterns are directly being visualized across seasons (long rains vs short rains). Projected temperature shifts could result in a reduction in the extent of savanna grasslands. Beyond 2°C, savannas are projected to decrease to approximately one seventh of total current land area, reducing the availability of forage for grazing animals. Projections indicate that species composition of local ecosystems might shift and negatively affect the livelihood strategies of communities dependent on them (USAID, East Africa Vulnerability Impacts and Adaptation Assessment Report, 2017). [United States of America]	This sentence has been replaced in the final ES, with underlying evidence in section 5.2 and Cross-Chapter Box 12.
33250	4	25	4	25	for poor people [Sergio Aquino, Canada]	This sentence has been modified. What was meant was poor people and disadvantaged people, without repeating the word people.
24400	4	27	4	31	This, as well as further statement below, sound like repetition of Chapter 3 and can probably be removed here. [Joeri ROGELJ, Austria]	Ch5 does cover impacts/risks of 1.5C warming in relation to poverty, inequality, and sustainable development. References to Ch3 are made when relevant (e.g. Box 3.5).
38564	4	27	4	31	These sentences are more about findings in chapter 3, and are in my view not needed here. Leaving these (and similar statements about impacts) out will make it easier to see the findings of chapter 5. [Jan Fuglestad, Norway]	Impacts of 1.5C warming relevant to poverty eradication and reducing inequalities are covered in Ch5. Reference to Ch3 is made where relevant (e.g. Box 3.5)
44110	4	27	4	27	The other sections have a line break after the bold section. This carries on. [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Ch5 doesn't use line breaks between the bold and non-bold statements, but we have made all paragraphs shorter and more compelling.
22780	4	29	4	3	Those some of concrete specific impacts that bear clear differences when compared with case of 2.0 degree should be highlighted by bold letter or included in the phrase of line 23-27. [Shuzo Nishioka, Japan]	The task was to focus on 1.5C and impacts on poverty and inequalities. Differences between 1.5C and 2C and risks to sustainable development are explored in 5.2.3, incl. Table 1.
61392	4	31	4	31	This statement (on coral reefs) is contradictory to statements made in Chapter 3. [United States of America]	Reference to coral reefs has been removed from the final statement in the ES. Other references of corals reefs have all been cross-checked with Ch3 and updated where needed.
61394	4	31	4	35	The statement that the impacts of climate change will predominately affect the already disadvantaged may not be valid. In the face of a hurricane, doesn't the owner of a beach side retirement home lose more than someone who was living in an informal settlement nearby? One person lost a stable home that was the product of a life time of work. The other had no net change in circumstances, as terrible as they may be. [United States of America]	The evidence in section 5.2.1 supports the statement on disadvantaged populations being disproportionately affected, through a list of impacts. This does not preclude that rich people would be affected too (although somebody who can afford beach side property most likely also has insurance).
33252	4	32	4	32	affect the poor and vulnerable [Sergio Aquino, Canada]	We retain disadvantaged and vulnerable as 'disadvantaged' includes more than just poverty (esp. monetary poverty). See definitions of poverty in the glossary.
9596	4	33		34	Indigenous people should instead read "Indigenous peopleS" and the statement "particularly for Indigenous peoples and systems in the Arctic" should be explained with the reasons for this which are - (1) The Arctic is experiencing some of the most pronounced climate change and (2) Arctic Indigenous populations are intricately tied to the environment and rely on the land and ocean for sustenance, wellbeing, and culture. [Joanna Petrusek MacDonald, Canada]	We maintained 'people' as people already conveys the plural (without a plural S), in accordance with the underlying literature, but used 'indigenous populations' when relevant.
10614	4	33	4	35	Semi-arid regions have also been shown to be 'hotspots' where some places (e.g. Southern Africa) are already seeing temperature rises of > 1.5deg (can share 1.5-specific references if needed). Any indication of impacts on these regions (especially since they are already home to marginalised populations, often dependent on natural resource-based livelihoods). [Chandni Singh, Myanmar]	Chapter 3 no longer discusses semi-arid regions/drylands as hotspots, and 5.2 did not have sufficient evidence on future impacts in semi-arid regions relevant to poverty and inequality, although agricultural livelihoods capture farmers around the world. Box 5.1 discusses adaptation in drylands.
28760	4	33	4	35	For better understanding, please refer to people/livelihoods and planetary systems (Arctic) in separate (half) sentences [Germany]	This sentence has been modified. It now reads 'people and ecosystems in the Arctic'.
52292	4	34	4	34	Does 'Indigenous' have a capital 'I', it's inconsistent throughout. [Jason Donev, Canada]	No, lower case "i", used consistently throughout the ES and the chapter text.
28762	4	35	4	4	Please change into two sentences [Germany]	This long sentence has been modified and indeed split into two parts.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28764	4	35	4	4	Please highlight message from chapter 5.2.2. more clearly here: climate change causes environmental degradation/changes (e.g., coastal ecosystems, coral reefs) which leads to food insecurity. Add the following sentence (as quoted from Chapter 5.2.2, p.15, I.2-6: "There is high confidence between the link of increased ocean acidification and temperature warming, and the reduction of coral reefs leading to reduced fish species and other resources important for livelihood security of around 500 million coastal people in tropical and subtropical regions (Gattuso et al., 2015; Cramer et al., 2014) (see also Chapter 3, Box 3.6)." [Germany]	Given space constraints, we could not add additional sentences. Chapter 3 covers coral reefs in detail. Ch5 notes impacts on fisheries-dependent livelihoods and losses of coral reefs, with reference to Chapter 3, Box 3.4).
57410	4	35	4	35	In this very general statement, suggest writing "low-lying islands", which is more inclusive than "small-island developing states" (which considers only independent island states, mainly in the tropics). [Hans Poertner, Germany]	We retained Small Island Developing States given the evidence in the chapter and Box 3.5 in Chapter 3 and Cross-chapter box 9 in Chapter 4).
61396	4	35	4	4	Why are poorest people highlighted here? The list of impacts in this statement would effect everyone. The ability of the poorest to cope with these potential impacts (such as increased food prices) is likely wholly unrelated to climate change. The sentence should be revised: "Globally, [DELETE:the poorest] people are projected to experience..." [United States of America]	This sentence has been modified. See also response to comment #134 above.
36170	4	38	4	38	Also add - climate risk adaptation costs [India]	There is not sufficient evidence in the underlying section text to support the inclusion of climate risk adaptation costs in the ES.
40866	4	38	4	38	Consider adding 'climatic risk adaptation costs' [NARESH KUMAR SOORA, India]	There is not sufficient evidence in the underlying section text to support the inclusion of climate risk adaptation costs in the ES.
12594	4	39	4	4	100 million additional to what baseline? By when? How does it depend on future population growth? [United Kingdom (of Great Britain and Northern Ireland)]	This number and the entire statement has been removed.
28766	4	39	4	4	Please delete "with more than 100 million additional people anticipated in poverty". This number is only based on one scholar (see 5.2.2), which implicates "low agreement". Furthermore, this statement does not contribute to the general understanding of the paragraph. [Germany]	This number and the entire statement has been removed.
44114	4	39	4	39	It states "additional people anticipated in poverty". It is from page 14 Line 18 states "additional people could be in poverty". What does 'anticipated' mean? Perhaps need to be written more clearly [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been removed.
61398	4	39	4	39	Does this consider population growth or is it only due to climate change? [United States of America]	This number and the entire statement has been removed.
8388	4	4	4	47	The 1.5? measures imply synergies as well as trade-offs to SDGs. This paragraph overemphasizes the benefits of 1.5?, while ignoring the corresponding costs. It is suggested to delete this paragraph. Instead, the input on 'costs' is to be reprocessed into a key finding in bold. At the same time, words on risks to food security are to be added. [China]	This sentence has been modified, and now includes relevant numbers with supporting evidence in 5.2.2 and 5.2.3.
12596	4	4	4	41	Presumably limits to adaption and potential losses are higher for greater temperature increase rather than just 'at every level of temperature increase' [United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been removed.
21718	4	4	4	4	Confidence levels in line of "limited evidence, medium agreement" sounds like a rather "unconfident" finding. What is the reason of highlighting such in the Executive Summary? [Sweden]	This statement, incl. the confidence level, has been removed.
61400	4	4	4	42	This point could be emphasized more strongly by stating the inverse: mitigation facilitates adaptation. Without deep cuts in emissions and with continued warming, adaptation becomes more challenging as options close (or narrow). [United States of America]	This sentence has been removed.
61402	4	4	4	4	Losses of what? [United States of America]	This sentence has been removed.
61404	4	4	4	42	The statement "limits to adaptation and potential losses exist at every level of temperature increase" is not specific to 1.5°C and should be removed. Moreover, couldn't the same be said for current conditions, or even preindustrial times? There always have been limits to the ability to adapt to climate, and there will always be climate and weather related disasters. It is unclear what new information this sentence is conveying. It is also very unclear why a specific mention is made for Pacific small island developing states. This sentence along with the rest of the paragraph should be deleted. [United States of America]	This sentence has been removed.
32138	4	41	4	42	Rather than solely referring to Pacific Small Island Developing States, it would be more appropriate to refer to Small Island Developing States as a group. This is also supported by section 5.2.2 which refers to displacement in both Caribbean and Pacific SIDS. Section 5.2.3 makes reference to subtropical and tropical regions of which all SIDS are part of. [Jamaica]	This sentence has been removed here. Indeed, SIDS is more appropriate for other parts of the ES, and Pacific SIDS are only mentioned in reference to a case study (Box 5.3).
36578	4	41	4	42	Rather than solely referring to Pacific Small Island Developing States, it would be more appropriate to refer to Small Island Developing States as a group. This is also supported by section 5.2.2 which refers to displacement in both Caribbean and Pacific SIDS. Section 5.2.3 makes reference to subtropical and tropical regions of which all SIDS are part of. [Snaliah Mahal, Saint Lucia]	This sentence has been removed here. Indeed, SIDS is more appropriate for other parts of the ES, and Pacific SIDS are only mentioned in reference to a case study (Box 5.3).
38434	4	41	4	42	Rather than solely referring to Pacific Small Island Developing States, it would be more appropriate to refer to Small Island Developing States as a group. This is also supported by section 5.2.2 which refers to displacement in both Caribbean and Pacific SIDS. Section 5.2.3 makes reference to subtropical and tropical regions of which all SIDS are part of. [Grenada]	This sentence has been removed here. Indeed, SIDS is more appropriate for other parts of the ES, and Pacific SIDS are only mentioned in reference to a case study (Box 5.3).

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44016	4	41	4	42	Rather than solely calling out Pacific Small Island Developing States, it would be more appropriate to refer to Small Island Developing States as a group. This is also supported by section 5.2.2 which refers to displacement in both Caribbean and Pacific SIDS. Section 5.2.3 makes reference to subtropical and tropical regions of which all SIDS are part of. [Carl-Friedrich Schleussner, Germany]	This sentence has been removed here. Indeed, SIDS is more appropriate for other parts of the ES, and Pacific SIDS are only mentioned in reference to a case study (Box 5.3).
57412	4	41	4	42	Suggest to refer to SIDS in general (therefore, including also SIDS in the Indian Ocean and Caribbean, which are equally vulnerable) or even to low-lying islands/island states (which includes archipelagic states such as the Philippines) [Hans Poertner, Germany]	This sentence has been removed here. Indeed, SIDS is more appropriate for other parts of the ES, and Pacific SIDS are only mentioned in reference to a case study (Box 5.3).
10136	4	44	4	44	Contradicting with the conclusion that 1.5? will achieve SDGs [Saudi Arabia]	This sentence has been removed. A different sentence based on underlying evidence from 5.2.3 and Table 5.3 is now part of the first statement paragraph of the ES.
12598	4	44	4	47	Does this mean also taking into account the potential quick development gains that could be achieved by, for example, exploiting cheap (though dirty) local energy sources to power it? If so, then fine - but otherwise this could be accused of cherry picking evidence to suit an agenda. [United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been removed. A different sentence based on underlying evidence from 5.2.3 and Table 5.3 is now part of the first statement paragraph of the ES.
36670	4	44	4	46	differences will be also WITHIN countries. This has relevant impacts on national policies on climate changes because ask for differentiated policies within the countries and corresponding differences in implementing mechanisms [Carmenza Robledo Abad, Switzerland]	This sentence has been removed. A different sentence based on underlying evidence from 5.2.3 and Table 5.3 is now part of the first statement paragraph of the ES. Differences within countries are examined in 5.5.3.2.
40976	4	44	4	45	Adjective should go at the end of the first phrase: Should read: Limiting temperature to 1.5°C can reduce the risks of failure in achieving certain SDGs significantly, e.g. ... [Maria Pia Carazo Ortiz, Germany]	Indeed, 'significantly' was poorly placed in this sentence. The sentence has been removed. The so-called 'split infinitive' is no longer frowned upon.
10616	4	46	4	47	See Rao et al 2017 (http://www.tandfonline.com/doi/abs/10.1080/17565529.2017.1372266) for some evidence of climate variability and gendered vulnerability in semiarid Africa and Asia. May not be 1.5-specific but links can be made since the sites they speak of are already facing >1.5 deg temperature rises. [Chandni Singh, Myanmar]	This sentence has been removed. Not enough evidence was available in the literature on gender in a 1.5C warmer world.
21720	4	46	4	47	The sentence would seem to "disqualify" the preceding sentence. Please check and revise as needed. [Sweden]	This sentence has been removed. Not enough evidence was available in the literature on gender in a 1.5C warmer world.
33144	4	46	4	47	Throughout this chapter and the report in general there is inadequate attention given to the literature on gender and climate change. See for example: Social dimensions of climate change: equity and vulnerability in a warming world. Mearns, R & Norton, A. (2010). World Bank (Chapter 5 on gender); The Full View: second edition (2016) Mary Robinson Foundation and UN Women. https://www.mrfc.org/wp-content/uploads/2016/11/MRFCJ-Full-View-Second-Edition.pdf ; Turning Promises into Action – Gender Equality in the 2030 Agenda for Sustainable Development. UNW / UNDP (SDG 13 on page 119) http://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2018/sdg-report-gender-equality-in-the-2030-agenda-for-sustainable-development-2018-en.pdf?la=en&vs=948 ; Routledge handbook of gender and environment. MacGregor, Sherilyn, 1969- editor. Book. English. Published Abingdon, Oxon; New York, NY: Routledge, 2017. https://capitadiscovery.co.uk/dcu/items/930587?query=gender+and+climate+change&resultsUri=items%3Fquery%3Dgender%2Band%2Bclimate%2Bchange Gender and climate change. Rebecca Pearse. Wires Climate Change. First published 28 December 2016 Gender and Climate Change in Latin America: An Analysis of Vulnerability, Adaptation and Resilience Based on Household Surveys. Authors Lykke E. Andersen, Dorte Verner, Manfred Wiebelt. First published: 17 October 2016. Journal of International Development Climate change vulnerability, impacts, and adaptation: Why does gender matter? Fatma Denton. Pages 10-20 Published online: 01 Jul 2010 Journal – Gender and Development THE OUTBURST: Climate Change, Gender Relations, and Situational Analysis Nielsen, Jonas Østergaard Author Information View Profile. Social Analysis; Oxford Vol. 54, Iss. 3, (Winter 2010): 76-89 [Tara Shine, Ireland]	Thank you for these many references. However, they mostly don't address gender in a 1.5C warmer world. Hence they are best to be addressed in the AR6.
61406	4	47	4	47	There is limited evidence that literature is scarce? Please be more specific. [United States of America]	This sentence has been removed.
13288	4	48	4	48	Insert the text: "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: AR5, WG III, SPM p. 5. [Eleni Kaditi, Austria]	Rejected. We do not include findings from the AR5 in ES of this special report. The focus is on post-AR5 findings.
13000	4	49	5	1	Sustainability is achieved only when there is full reconciliation between: (1) economic development;(2) meeting, on an equitable basis, growing and changing human needs and aspirations; and (3) conserving the limited natural resources and the capacity of the environment to absorb the multiple stresses that are a consequence of human activities. Extensive research over the years has shown that climate change is an impediment towards achieving global sustainable development. By adopting necessary technology for reducing vulnerability to climate change, as well as SMART Agricultural techniques and policies, we improve chances of achieving sustainable development. [Denise Okpala, Nigeria]	Yes, thank you. Ch4 covers these aspects in great detail. Ch5 focuses on impacts of adaptation and mitigation on sustainable development and the SDGs, and enabling conditions for sustainable development, poverty eradication and reducing inequalities. technology is part of this mix.
18688	4	5	4	52	Some trade-offs are mentioned in the chapter, but it focuses much more on synergies. The trade-offs issue merits to be further developed in the report. [Andrea TILCHE, Belgium]	Trade-offs are covered in a separate statement, based on available evidence in the literature, see 5.3.2.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28768	4	5	4	52	Please shorten the sentence "Most adaptation strategies ... meet some SDGs (knowns as trade-offs)" and combine this sentence with the previous one, since both have the same meaning. [Germany]	This sentence has been modified. There are now two ES statements, one on synergies, the other on trade-offs.
43090	4	5	4	5	specifically' is suggested to be changed to 'in particular'. [Muhammad Mohsin IQBAL, Pakistan]	This sentence has been modified.
10618	4	52	4	54	Ch 4 uses synergies and tradeoffs in relation to adaptation and mitigation while Ch 5 discusses them between adaptation and SDGs - small issue that is easy to fix but needs to be corrected for cross-chapter consistency. [Chandni Singh, Myanmar]	Synergies and trade-offs exist for various dimensions. Ch5 is clear that our focus is on consequences for sustainable development and SDGs.
10620	4	52	4	53	IPCC AR5 glossary uses transformational adaptation - need to clarify use of terminology (also, based on FOD comments, Ch 4 now uses transformational adaptation) and ensure consistency. [Chandni Singh, Myanmar]	Transformational adaptation is now used consistently through the chapter.
54410	4	52	4	52	trade-offs, is there not a general trade-off related to the opportunity cost?: if a lot of adaptation is needed beyond 1.5 there is less scope for going after SDGs general [Reinhard Mechler, Austria]	The term 'trade-offs' is used as 'negative consequences'.
61408	4	52	5	53	It is too strong to say that transformational adaptation "needs to address" a given topic. It should be "needs to take into consideration the root ...". One cannot expect adaptation strategies and actions – even the transformational approaches, an emerging area of research – to address all socio-economic and cultural causes of vulnerability. These are development gap issues, not adaptation gap issues. Adaptation effectiveness is largely limited by these socio-economic and cultural root causes of vulnerability (i.e., "the development gap"). [United States of America]	This sentence has been modified and language has been adjusted throughout the ES and the chapter text to avoid such strong statements.
33254	4	53	4	53	Transformative adaptation is required [Sergio Aquino, Canada]	Transformational' is now used throughout the chapter, consistent with Ch4 and the rest of the report.
61410	4	53	5	18	It is unclear how this statement and paragraph is related specifically to 1.5°C of warming. It should be removed or refocused solely on information on how 1.5°C of warming lessens the needs for specific adaptation measures or potentially opens the opportunity for maladaptation. [United States of America]	Adaptation occurs in local contexts rather than in the context of a global average. Efforts have been made to highlight 1.5C contexts were possible while drawing from 1.5C relevant literature in other instances.
28770	5				The term "response measures" is used at several occasions across this chapter. Please specify if you are referring to the political concept under the UNFCCC, otherwise use the term "response options" or "response strategies" instead. [Germany]	ES summary statements use response options. Section 5.1, 5.7, box 5.2 use response measures but to imply response options.
61412	5	1	5	41	Much of the language in this chapter, and especially in this section of the Executive Summary, is not specific to 1.5°C, which is supposed to be the focus of this report. Excessive length and redundancies could be avoided by focusing the findings of this chapter on only the differences between impacts at 1.5 and 2°C. [United States of America]	Accepted. Text revised substantially and ES length reduced. Literature both specific and relevant for 1.5C is included in the assessment.
38566	5	2	5	18	In my view, this para contains too much general information; e.g. lines 7-14, which I think can be removed. [Jan Fuglestad, Norway]	Revised ES statements are more specific , generalities removed. Lines removed.
50318	5	4	2	4	Add "can" before "support" [Christopher Bataille, Canada]	Sentence reformulated and changed in the revised version.
61414	5	9	5	9	This list should include "energy" or "clean, reliable, and affordable energy" [United States of America]	Sentence deleted in revised ES.
3046	5	1	5	1	of particular' should be 'of a particular' [Robert Shapiro, United States of America]	Sentence deleted in the revised version.
61416	5	1	5	14	The sentence starts by saying that adaptation strategies can be maladaptive. For the first illustrative example (increasing poverty/debt), one purpose of adapting is to avoid higher costs in the future; it seems to miss this point. For the second, third, and fourth examples, if a strategy overlooks an issue that results in greater negative consequences than if that strategy were not taken, would that be adaptation? Perhaps the point is that actions taken in the name of adaptation that are not approached holistically or take a systems approach can instead be maladaptive (and adaptation strategies can have upfront costs whose benefits are realized over time), not that adaptation can be maladaptive. [United States of America]	Sentence deleted in revised ES.
10622	5	11	5	14	Other maladaptive outcomes (tradeoffs) can include adaptation interventions that have positive impacts for some people (and not for others), at a certain scale, or at a particular time. Gajjar et al 2018 Tracing back to move ahead: A review of development pathways that constrain adaptation futures, Clim & Dev discuss these to some extent. [Chandni Singh, Myanmar]	Sentence deleted in revised ES.
52804	5	12	5	13	Suggest to change "poor and women" to "marginalised groups". [Iulian Florin VLADU, Germany]	The paragraph has been rewritten and split into several short ES messages. One of the ES statement uses the phrase: 'the poor and disadvantaged populations'.
3048	5	13	5	13	expanded use air conditioning' should be 'expanded use of air conditioning' [Robert Shapiro, United States of America]	Sentence deleted in the revised version.
10138	5	13	5	13	Clarification is required on the example of air conditioning [Saudi Arabia]	ES statements have been thoroughly revised. Revised ES statement mentions trade-off of adaptation and various SDGs by referring relevant SDGs.
50316	5	13	2	13	Add "of" between "use" and "air" [Christopher Bataille, Canada]	Sentence deleted in the revised version.
3050	5	14	5	14	conflicts' should be 'conflict' [Robert Shapiro, United States of America]	Sentence deleted in the revised version.
28772	5	14	5	18	We would suggest to integrate this or a statement along these lines into the SPM, because it highlights the important role of social processes and dynamics (e. g. power structures, decision-making processes, stakeholder involvement, broad participation) as preconditions to achieve adaptation pathways in line with SDGs. "Adaptation pathways that use a mix of adaptation options and maximise synergies and minimise trade-offs with sustainable development are successful when they follow inclusive, deliberative, and place-specific processes and procedural justice mechanisms; yet, persistent uneven power structures that dominate decision making reinforce existing social inequalities (medium evidence, high agreement) {5.3.3}." [Germany]	Thank you. Given the page limits, the specific statement could not be included in the SPM. However, the essence of the message is contained in several statements with appropriate line of sight.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
44708	5	14	5	19	Could include policy suport as a success factor? I think a fair amount of the evidence cited does highlight this. [Penny Urquhart, South Africa]	Accepted. Similar as #196.
12602	5	2	6	21	One paragraph more than a page long! Just one example of how this is not very reader friendly. Additionally, I think the overarching point that is missed though alluded to here is that the risks of transitional impacts would be greater for the vulnerable if we aim for 1.5 rather than 2, unless carefully managed. [United Kingdom (of Great Britain and Northern Ireland)]	The paragraph has been restructured, rewritten in small separate key messages. One of the messages now states: "Redistributive policies that shield the poor and vulnerable can resolve trade-offs for a range of SDGs."
29764	5	2	6	21	The paragraph seems too long and detailed for a summary. There is potential to shorten by refrain from listing mitigation options in different sectors etc., and it should be considered to split it into a number of shorter and more to-the-point paragraphs that conveys key messages. [Bård Lahn, Norway]	The paragraph has been restructured, rewritten in small separate key messages.
31568	5	2	5	24	This sentence mentions synergy and trade-offs caused by mitigation options. It should also present difficulty of foreseeability of effects when these options are taken. For example, Feed-in-Tariff for PV gave incentive to introduce capacities, and the unit costs were expected to decrease by learning effect in Japan. However, the costs did not decrease as expected, and several capacities did not connect to grid. Periodic review of policy targets will be essential. [Japan]	Policy assessment is in Chapter 4 which also deals with feasibility issue from multi dimensional perspective. Discussion on Feed-in tariff is in Chapter 4.4.5.3.
36172	5	2	6	22	May be moved to chapter 2 [India]	Accepted. Text revised substantially and message reformulated. ES length reduced by deleting some sentences and reference to chapter text used for line of sight. Many overlaps avoided and boundary of the chapters have been made clear. Here individual options and link with sustainable development, poverty and inequality are highlighted while Chapter 2 considers various pathways.
38568	5	2	6	21	This is a very different type of ES than used in other parts of the report. But more importantly, it is very difficult to read. I recommend that the authors reconsider what is really important and needed here, and try to remove general material. In addition to reducing the text, splitting into different paragraphs could also be considered. [Jan Fuglestad, Norway]	This paragraph has been restructured. ES statements have undergone major changes and sentences have been modified by taking out general statements and highlighting specific messages.
54460	5	2	5	55	Consider inclusion of the following concepts: - nuclear waste disposal and management in a safe and environmentally friendly manner - inclusion of higher degree of safety in nuclear generation plants. - this can expand the deployment of more nuclear generating capacity [RABIZ FODA, Canada]	Whole paragraph has been rewritten to reduce length of the ES given the page limits. Many details have been deleted from the ES.
61418	5	2	6	21	More information is needed on how compensating the poorest would come at most costs. What about the middle class or rich? How will they be compensated for their losses in the global pursuit of mitigation to limit warming to 1.5°C? What policies and measures will shield them from losing on this pathway? The current text should be revised to explain where this free lunch would come from. [United States of America]	This paragraph has been restructured. ES statements have undergone major changes and sentences have been modified. Costs have been replaced by assessment of investment and expenditure in the section 5.4.2.
63288	5	2	5	24	Don't all actions have trade-offs, and what's missing here is that negatives must be weighed against positives/benefits to find those with the greatest net benefit = (positives - negatives)??? [Greg Rau, United States of America]	Net effects have not been assessed in the chapter. Chapter text in 5.4.1 and figure 5.3 mentions that gross interaction has been considered.
36676	5	21	5	23	The way mitigation options affect social groups and ecosystems varies OVER TIME, thus synergies and trade-offs are not stable but dynamic and the potential changes over time need to be considered when deciding which options and in which order should be pursued [Carmenza Robledo Abad, Switzerland]	Noted. Text revised substantially and message reformulated. ES length reduced by deleting some sentences and reference to chapter text used for line of sight. Chapter 2 focuses on portfolio choice and their implications.
4506	5	24	5	24	Is the expression "at moderate cost" is based on peer-reviewed literatures? If so, please let readers refer to those literatures. My understanding of this sentence is that some of these (trade-off) risks can be reduced at a moderate cost. I was not able to find any cost figure the cost to reduce trade-offs. What I found is "mitigation costs of 1.5 degree pathway is 2-6% of total GDP" in page 36, line 4 but I was not able to find any cost figure to reduce trade-offs. [Mitsutsune Yamaguchi, Japan]	Accepted. Text revised substantially and message reformulated. ES length reduced by deleting some sentences and reference to chapter text used for line of sight. Cost has been replaced by investment and expenditure implications.
10140	5	24	5	24	Unclear statement by referring to policy design and mechanisms with high confidence [Saudi Arabia]	Accepted. Text revised substantially and message reformulated.
31570	5	24	5	24	Please show a figure for the moderate cost. In p36 (L26-28), there is a description that costs of the distributional measures are estimated to be modest. This refers to Krey, but this is a submitted paper and not yet open to public (difficult to know the figure of the cost of reducing trade-offs). [Japan]	Accepted. Text revised substantially and message reformulated. ES length reduced by deleting some sentences and reference to chapter text used for line of sight. Cost has been replaced by investment and expenditure implications.
33146	5	24	5	25	important to state that mitigating these risks also respect for human rights and gender equality (as stated in the Paris Agreement) Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Accepted. Text revised substantially and message reformulated. Appropriate SDGs have been used to assess the synergies and trade-offs and mentioned wherever applicable with line of sight to the chapter text.
54458	5	24	5	24	Add ".....appropriate systems design and program planning" after " policy designs....." [RABIZ FODA, Canada]	ES statements have been modified substantially. One of the statements now includes 'design of policy'.
31572	5	27	5	3	Note that completely different type of demand could occur. For example, smartphones may substitute services provided by individual electronic products such as telephones, fax machines, radios, cameras, and televisions to a single multifunctional one, but on the other hand, along with the rapid increase of production of smartphones, the demand for rare metal, which was not so large in the past, will increase greatly. Also, the energy demand for air conditioning in each household will decline due to the cool sharing, but if the movement from the home to the public facility is done in the automobile, the energy consumption will increase accordingly. [Japan]	ES statements have been modified substantially. The sentence deleted. More nuanced assessment added in chapter text in 5.4.1.1.

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36174	5	27		3	Mitigation actions in the energy demand sectors and behavioural response options with appropriate management of rebound effects can advance multiple SDGs simultaneously, more so than energy supply side mitigation actions (very high confidence) to be changed to medium confidence (Fine et al. 2016) Fine, Ben, Deborah Johnston, Ana C. Santos, and Elisa Van Waeyenberge. 2016. "Nudging or Fudging: The World Development Report 2015." Development and Change 47 (4): 640–663. https://doi.org/10.1111/dech.12240 . [India]	The specific ES statement has been revised substantially combining messages from two subsections and varying levels of evidence and agreement are mentioned in the revised ES statement. The behavioural response related message has been deleted from ES statement. The suggested literature has been thoroughly checked and it is found to be a scholarly article on behavioural economics and policy design context. However, it is a general reading and discusses various developmental policies of World Bank through the lens of behavioural economics and especially HIV/AIDS related policies in particular.
49054	5	27	5	3	The statement concerning the sustainable development implications of supply side energy measures appears misleading. It implies a focus on trade-offs associated with supply side measures and thereby fails to properly the many synergies. It should explicitly note the many sustainable development benefits of supply side measures, e.g. the use of renewable energy for modern energy supply, sustainable transport, sustainable agriculture and land-use, etc., as noted in chapter 4 and elsewhere in chapter 5. If the intent is to focus specifically on the trade-offs involved with bioenergy in particular, that should be specifically articulated as a concern rather than conflating with a wide range of supply side measures that have sustainable development benefits. [David Waskow, United States of America]	Same as #207
24402	5	28	5	28	It has been suggested that rebound effects are not a trade-off for development but rather a benefit for development. For example, see: Nordhaus, T., (2017) "The Energy Rebound Battle," Issues in Science and Technology, Summer 2017, 51-58 [Joeri ROGELJ, Austria]	Same as #208
39062	5	28	5	28	Rebound Effects: Explain a little bit on what the rebound effects are. [Anish Paul Antony, United States of America]	Same as #209
61420	5	32	5	32	Suggest replacing the words "circular economy concept" with "resource efficiency concepts." There are a number of systematic approaches to resource efficiency that aim to "decouple" economic growth from GHG emissions through the more efficient use of natural resource. Suggest including the Sustainable Materials Management approach to use and reuse materials more productively over their entire life cycles in addition to the term circular economy. [United States of America]	Chapter section revised substantially and ES statement deleted.
5340	5	33	4	34	The same questions: how it performs? I suggest IPCC report address this kind of question by mention chapter or another report that specific to this issue. [Sulistiyawati Sulistiyawati, Indonesia]	Not clear what this question refers to as no page and line numbers are provided with the comment.
12600	5	35	5	35	Define acronyms! Same goes for rest of chapter [United Kingdom (of Great Britain and Northern Ireland)]	Done.
30716	5	35	5	37	Can this be linked with SPM sentence "However, climate-smart agriculture can be biased towards technological solutions and ignore (gender) inequalities" [France]	ES paragraph revised substantially and message reformulated. SPM content has also been edited substantially. But similar sentence is in 5.3.2.
61422	5	35	5	35	This is the first use of the term "AFOLU" in the document and chapter. Spell it out. [United States of America]	Done.
51054	5	37	5	39	include ecosystem and forest restoration, reforestation in this list [Doreen Stabinsky, United States of America]	Same as #213.
57814	5	37	5	37	Forestry mitigation options' should be presented as 'Forest mitigation' which represents a broader category of options than forestry (as forestry implies managed forests). In the same line, 'and restoring degraded forests' should be added after reducing deforestation. The substantive comments and supporting literature for restoring degraded forests as a mitigation option is included in comments below. [Kate Dooley, Australia]	This paragraph has undergone major revision and sentence deleted from ES but 5.4.1.3 covers the essence.
57816	5	4	5	4	The failure to mention indigenous peoples and rights in the context of forest mitigation options looks like an omission here. Suggested rewording would be: '... that take into account the needs and rights of local people and indigenous peoples, biodiversity and other SD concerns...' [Kate Dooley, Australia]	Same as #213.
3052	5	42	5	42	synergies' should be 'synergy' [Robert Shapiro, United States of America]	Substantial editing has seen some of these sentences deleted. However, synergies are still in use in many places. Necessary corrections will be done before sending out for publication.
50320	5	42	5	42	Replace "in high synergies" with "synergistic" [Christopher Bataille, Canada]	Substantial editing has seen some of these sentences deleted. However, synergies are still in use in many places. Necessary corrections will be done before sending out for publication.
44112	5	44	5	44	The other sections have a line break after the bold section. This carries on. [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	The paragraph has been restructured, rewritten in small separate key messages.
44710	5	47	5	48	Key point, could be a key message? [Penny Urquhart, South Africa]	To be consistent with page limits, this section has been deleted from the chapter.
24404	5	49	5	51	This statement is assessed based on a middle-of-the-road development only. However, the chapter already shows that alternative scenarios can minimize or eliminate these trade-offs, and thus do not require the "smart policy designs" indicated in the next sentence. This availability of options to reduce trade-offs could be presented in a more integrated way in the ES (as it is mentioned already further below). [Joeri ROGELJ, Austria]	Revised ES statements have been modified substantially and considers the suggested change.
36674	5	49	5	5	This is true depending on two aspects time frame and scale. With a short term perspective (e.g. until 2025 or even until 2030 which is the time frame for the SDGs) and at e.g. sub-national level that can be completely wrong. Thus include in the sentence that time frame and scale are decisive in the assessment of the relation between SDGs and CCA [Carmenza Robledo Abad, Switzerland]	The paragraph has undergone major revision. The message appears at a different level in ES statement and corresponds to section 5.4.2 where both scale and time have been considered while considering various pathways related literature.
50118	5	49	6	4	The text emphasises the problems (the trade-offs) much more than the possible solutions. The balance should be restored by expanding text on solutions, drawing on material from section 5.4.3. [Bert Metz, Netherlands]	This paragraph has been restructured. ES statements have undergone major changes and sentences have been modified. Costs have been replaced by assessment of investment and reference to assessment in 5.4.2 (5.4.3 in SOD) has been included more in ES.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29488	5	51	5	53	A quantification of the role of land use options in NDC would be useful. I suggest text addition in red bold. " Land-use options, and especially forestry, play a key role for emission reductions proposed by many countries to fulfil their NDCs (i.e. up to a quarter of planned global emission reduction in 2030, Grassi et al. 2017) and will be critical in longer-term strategies towards 1.5°C (Smith et al., 2014b)." REF: Grassi G., House J., Dentener F., Federici S., den Elzen M., Penman J. (2017) The key role of forests in meeting climate targets requires science for credible mitigation, Nature Climate Change, doi:10.1038/nclimate3227. [Giacomo GRASSI, Italy]	Chapter 4 and Chapter 2 consider NDC and key role of forests.
361	5	53	5	53	There is no figure 5.4.2 [Céline Guivarch, France]	Sorry for the inconvenience. It was in Section 5.4.3, Figures 5.4 a, b. In restructured and rewritten chapter text, figure numbers and figures have changed in newly numbered section 5.4.2 . Figures are now 5.4 panel a and panel b and 5.5.
30718	5	53	5	53	There is no figure 5.4.2 [France]	Sorry for the inconvenience. It was in Section 5.4.3, Figures 5.4 a, b. In restructured and rewritten chapter text, figure numbers and figures have changed in newly numbered section 5.4.2 . Figures are now 5.4 panel a and panel b and 5.5.
32980	5	53	5	55	Reducing these risks requires smart policy designs and mechanisms that shield the poor and redistribute the burden, so that the most vulnerable are not less affected. [Brazil]	This paragraph has been restructured. ES statements have undergone major changes and sentence has been modified.
47028	5	53	5	53	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted.
49056	5	53	5	55	This section should also note the potentially positive effects of taking mitigation measures that help to reduces inequality, including through well-devised carbon pricing policy, fossil fuel subsidy removal and other policies that ensure cash transfers, job opportunities, and other benefits from those policies. Other mitigation policies can also benefit energy access, mobility and access to transport, agricultural productivity, etc. [David Waskow, United States of America]	This paragraph has been restructured. ES statements have undergone major changes and sentence has been modified.
10142	5	54	5	54	Clarification is needed regarding the phrase of redistributed the burden [Saudi Arabia]	This paragraph has been restructured. ES statements have undergone major changes and sentence has been modified.
4508	5	55	6	1	Please make clear what does "this" mean? I thinks "this" does not mean modest cost to reduce trade-offs mentioned in lines 23-24 of page 5, but it means achieving 1.5 degree world. In any case, to avoid any misunderstandings, please replace "this" with other words. [Mitsutsune Yamaguchi, Japan]	Same as #226.
31574	5	55	6	1	1. "Recent scenario analyses with focus on 1.5°C show that this is possible at relatively modest costs" is an important description, but it is not clear what "this" refers to. Please replace "this" with other words. 2. In addition, figure in Figure 5.4.2, there is no corresponding figure and the figure number is wrong. [Japan]	Same as #226.
51056	5	55	6	4	Remove these sentences. See comment 42 below. [Doreen Stabinsky, United States of America]	Same as #226.
63290	5	55	5	55	you mean: "the most vulnerable are not disproportionately affected." - Everyone will be affected to some extent by a 1.5degC warmer world, the ideas is to make the impacts equitable (?) [Greg Rau, United States of America]	The paragraph has been restructured, rewritten in small separate key messages. One of the messages now states: "Redistributive policies that shield the poor and vulnerable can resolve trade- offs for a range of SDGs."
4408	6	1	6	1	In the Chapter 5 Table 5.1, Panel A Part 3, in the REDD+ section, there is a typo in the column "Food Security and promotion of Sustainable Agriculture (2.1/2.4/2a)." The text says "Food security, may lead to the conversation of productive land under forest." The word "conversation" should be replace by "conversion." [Thales A. P. West, Brazil]	Thank you. Missed that in this round of correction. Will be taken care of before sending for publication.
12604	6	1	6	4	Mentions the strategies that could be employed to reduce the potential impacts of bioenergy deployment yet I haven't yet seen a clear point made here that scaled-up bioenergy deployment could indeed have these impacts [United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been restructured. ES statements have undergone major changes and sentences have been modified. A separate bold statement does mention the problem associated with scale-up of deployment.
32982	6	1	6	4	For example, cash transfers, food subsidies, land distribution, and improvements in yields can reduce trade-offs of land-use change and bioenergy deployment which may threaten food and water security, cause biodiversity loss and competition for land, spikes in food prices, and lead to disproportionate consequences upon poor, rural, traditional and indigenous populations. [Brazil]	The comment copies the text, but what the comment is about is not clear.
61424	6	1	6	1	Which Figure is 5.4.2? [United States of America]	Sorry for the inconvenience. It was in Section 5.4.3, Figures 5.4 a, b. In restructured and rewritten chapter text, figure numbers and figures have changed in newly numbered section 5.4.2 . Figures are now 5.4 panel a and panel b and 5.5.
28774	6	3	6	4	According to our comment for page 37, line 15, please include the issue of land degradation, desertification in the Executive Summary, if appropriate. Then, the sentence should read: "..., cause biodiversity loss, LAND DEGRADATION, DESERTIFICATION and INCREASING competition for ..." [Germany]	This paragraph has been restructured. ES statements have undergone major changes and sentences have been modified so no longer valid.
50120	6	5	6	8	This text draws on section 5.4.2's discussion on delaying action. In my opinion this discussion is not derived from literature about 1.5C strategies, but from (older) literature about delay in general and with respect to 2C pathways. In 1.5C pathways there is hardly any room for delay. That should be made very clear. Delay and staying below 1.5C simply does not go together. [Bert Metz, Netherlands]	Accepted. Section deleted in the chapter and ES statements substantially changed.
12606	6	8	6	9	low energy demand': just to clarify, is this energy demand per se or could this also be rising energy demand (as would be consistent with a developing nation with a growing population) but with minimal emissions - i.e. using technologies that don't belch out CO2? [United Kingdom (of Great Britain and Northern Ireland)]	Text in the paragraph has undergone substantial changes, sentence deleted. However, pathways featuring low energy demand (LED) has been used in line with Chapter 2.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31576	6	9	6	12	It should also mention that proper choices are important because costs and availability of low-/zero-carbon energy sources are different among regions, which is pointed out at, for example, Hoogwijk, M.M. (2004). On the global and regional potential of renewable energy sources. https://dspace.library.uu.nl/bitstream/handle/1874/782/full.pdf [Japan]	Accepted. Text revised substantially and message reformulated. ES length reduced by deleting some sentences and reference to chapter text used for line of sight.
45078	6	1	6	1	...access to modern and affordable... should be "... access to modern, sustainable and affordable..." [ARI Izzet, Turkey]	Paragraph has been restructured substantially. Text modified and terms delete.
61426	6	12	6	15	Radical socio-cultural and organizational innovation should be defined better or alternative language used. The example given of electrification of the transport sector and associated rise in electricity prices seems to be more of an incremental techno-economic change with social consequences rather than a "radical innovation" per se. [United States of America]	Text has been deleted.
3054	6	14	6	14	lead to rise' should be 'lead to a rise' [Robert Shapiro, United States of America]	In restructured ES statements the particular statement has been deleted.
50122	6	15	6	17	These observations ("road expansion can lead to eviction" and "bioenergy can lead to land disputes") are not specific to 1.5C strategies and are therefore irrelevant. Drop them or turn them into statements about things in 1.5C strategies that are particularly difficult to handle and what solutions exist to avoid negative consequences. [Bert Metz, Netherlands]	Text has been deleted.
57818	6	16	6	16	Given the centrality of recognition of land rights to avoiding land disputes, suggested rewording here: '...unless appropriate recognition of land rights and other safeguarding strategies are built into the projects'. (for evidence see: Nolte, C., Agrawal, A., Silvius, K. M., & Soares-Filho, B. S. (2013). Governance regime and location influence avoided deforestation success of protected areas in the Brazilian Amazon. PNAS, 110(13), 4956–4961. https://doi.org/10.1073/pnas.1214786110 ; RRI. (2014). Recognizing indigenous and community rights: Priority steps to advance development and mitigate climate change. Washington, DC: Rights and Resources Initiative; Stevens, C., Winterbottom, R., Springer, J., & Reyter, K. (2014). Securing rights, combating climate change: How strengthening community forest rights mitigates climate change. Washington DC: World Resources Institute). [Kate Dooley, Australia]	To reduce chapter length by 50% in keeping with page limits, substantial deletion of text had to be implemented. ES statements had to be modified. Box 5.1 covers land and forest rights, FAQ5.1 also covers land rights, consideration of local people has been mentioned in ES in the context of CDR options such as bioenergy, BECCS and AFOLU.
10144	6	17	6	21	Very important and need to be capitalized on [Saudi Arabia]	Accepted. Revised text reformulates the message with appropriate line of sight.
33148	6	17	6	21	This section needs to include a reference to just transition. E.g. The Geographical Journal, 2013, doi: 10.1111/geoj.12008 The political economy of the 'just transition'. PETER NEWELL AND DUSTIN MULVANEY ; the ILO Guideline son a just Transition http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf [Tara Shine, Ireland]	Chapter section assessed most recent literature on the subject.
13246	6	19	6	19	Delete the text "necessary for ambitious climate goal despite multiple other sustainable development benefits". [Eleni Kaditi, Austria]	Paragraph has been restructured substantially. Text modified and message reformulated.
47214	6	19	6	19	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	ES statements and sentence has been reformulated . It says now: "Mitigation measures consistent with 1.5°C [...]".
18690	6	23	6	24	While integrated approaches between mitigation, adaptation and sustainable development are possible, they will not be necessary, suitable or efficient for all situations. Does it mean that non integrated approaches can be more efficient in certain circumstances? The wording seems to contradicts the main thesis of the chapter/report, which underlines the need to design an implement policies that figh climate change in sync with SDGs. Please clarify the sentence or explain - for instance giving an example of a situation where an integrated approach is not necessary or efficient. [Andrea TILCHE, Belgium]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'.
44712	6	23	6	26	Saying these integrated approaches will not be always necessary appears to contradict the requirement that the author team ahs set out for CRDPs to include "stringent mitigation". There is a need to harmonise the message in the different sections. [Penny Urquhart, South Africa]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'.
50124	6	23	6	4	The headline of this section does not match the underlying text. The headline says " they (integrated approaches) will not be necessary, suitable of efficient for all situations", while in the subsequent text only positive things about integrated approaches and how to realise them are being stated. Adjust the headline. [Bert Metz, Netherlands]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'.
61428	6	23	6	4	Although the chapter notes that 'coherent and integrated institutions and governance ... is a key enabling condition for integrated approaches between mitigation, adaptation and sustainable development at the level of policies, programs and projects, conflicting governing processes, actors raise issues.' It would be good to also note that, for Africa, global and continental studies have prompted more regional or country-focused studies, which is supporting current knowledge on climate change impacts on various sectors. There is need for increased focus on understanding the linkages or connectivity between mitigation, adaptation, and sustainable development across the continent. [United States of America]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'.
61430	6	23	6	26	This statement has too much jargon with undefined terms. The authors should revise for clarity. [United States of America]	This entire paragraph has been removed (as well as the underlying section). A short assessment of the integration of sustainable development, adaptation, and mitigation is provided in 5.5.1 and is captured in the last sentence of the first paragraph of the theme 'Sustainable Development Pathways to 1.5C' in the ES.

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61432	6	23	7	15	There is nothing in these statements that is specific or unique about 1.5°C. If there is no specific relationship between these statements and 1.5°C in the underlying scientific literature (or even if there is only limited evidence), authors should remove these statements from the chapter. [United States of America]	The entire Section 5.5 from the SOD has been removed from the chapter and hence also from the ES. Much more 1.5C specific literature is now available and assessed in what was 5.6 in the SOD (5.5. in the FGD), particularly 5.3, and summarised in the ES in the last broad section 'Sustainable Development Pathways to 1.5C'. Where 1.5C specific literature is not available (often for local contexts), 1.5C relevant literature was assessed.
63292	6	23	6	26	Rewrite: "While integrated approaches between mitigation, adaptation and sustainable development are possible, they will not be necessary, suitable efficient and sufficient in meeting goals. The efficiency of the integrated approaches that can deliver triple-wins depends on the satisfaction of several enabling conditions (medium evidence, high agreement)." [Greg Rau, United States of America]	This entire paragraph has been removed (as well as the underlying section). A short assessment of the integration of sustainable development, adaptation, and mitigation is provided in 5.5.1 and is captured in the last sentence of the first paragraph of the theme 'Sustainable Development Pathways to 1.5C' in the ES.
33934	6	24	6	26	Perhaps the term "triple-win" should be defined in this chapter or elsewhere? It might be a good idea to define it upon first use in this chapter. Perhaps a small box describing the concept of "triple-win" (and also other well-used terms) could be included? [Norway]	This entire paragraph has been removed (as well as the underlying section). A short assessment of the integration of sustainable development, adaptation, and mitigation is provided in 5.5.1 and is captured in the last sentence of the first paragraph of the theme 'Sustainable Development Pathways to 1.5C' in the ES.
5672	6	25			has the term 'triple-win' been defined in this chapter or elsewhere? It might be a good idea to define it upon first use in this chapter. What about a small box describing the concept here? [Marion Grau, Norway]	This entire paragraph has been removed (as well as the underlying section). A short assessment of the integration of sustainable development, adaptation, and mitigation is provided in 5.5.1 and is captured in the last sentence of the first paragraph of the theme 'Sustainable Development Pathways to 1.5C' in the ES.
32984	6	33	6	33	The involvement of stakeholders though through participatory mechanisms. [Brazil]	This entire paragraph has been removed (as well as the underlying section). A short assessment of the integration of sustainable development, adaptation, and mitigation is provided in 5.5.1 and is captured in the last sentence of the first paragraph of the theme 'Sustainable Development Pathways to 1.5C' in the ES.
10624	6	35	6	36	In some cases, regional context may not be a scale fine enough - perhaps 'local' could be appropriate? In countries like India, regional might mask finer-scale nuances. [Chandni Singh, Myanmar]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'.
12608	6	36	6	39	This whole paragraph could be reduced to these two sentences, adding the point that they will 'require a more proactive approach to the interlinkages... than reconciling these trade-offs towards a 2 degree warmer world' [United Kingdom (of Great Britain and Northern Ireland)]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'.
44714	6	36	6	38	Can this important point be stated in a way that would be clearer to readers, including policy makers? [Penny Urquhart, South Africa]	This entire section has been removed from the chapter and hence also from the ES. Relevant findings that speak to integrated approaches are now addressed in 5.5.1 and summarised in 1 sentence in the ES, at the very end of the first statement of 'Sustainable Development Pathways to 1.5C'. The dynamic view is made more explicit in the final section 5.5, especially 5.5.2 and 5.5.3.
10146	6	42	6	44	Misleading as SDGs is not only dependent on decarbonization [Saudi Arabia]	This sentence has been modified, and decarbonisation removed.
12610	6	42	7	15	Very confusing paragraph, please clarify language. [United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been substantially revised and shortened, and divided into 2 much more accessible paragraphs, with clear line of sight to the underlying evidence in the chapter sections and subsections.
18692	6	42	6	44	The sentence "Without strengthened contributions to decarbonization and commitment from countries, institutions, and communities to equity and fairness, pathways to 1.5°C will not allow to reach the Agenda 2030 objective to leave no one behind" seems to confront equity/fairness to 1.5°C pathways. We suggest to turn it positively: "Strengthened contributions to decarbonisations and commitment from countries, institutions and communities to equity and fairness need to accompany pathways to 1.5°C to reach the Agenda 2030 objective to leave no one behind". [Andrea TILCHE, Belgium]	This sentence has been revised. However, we retain the conditional phrasing while avoiding policy-prescriptive language (your suggestion 'need to accompany').
50126	6	42	7	15	The headline statement is a duplication of the statement on page 4, lines 18-22. So it would be good to merge the two paragraphs, focus them on the equity issues (and not on the need for faster decarbonisation), but then include strong statements about the need to change the implementation of international equity (CBDR) principles, as outlined in my comments on the statement on page 4, line 18. [Bert Metz, Netherlands]	There no longer is a headline statement in the FGD, hence no more duplication.
61434	6	42	6	44	The wording of this sentence is confusing. It seems to imply that the pathways to 1.5°C will not allow achievement of the Agenda 2030 objective to leave no one behind. What I think its meant to say is that, without a commitment to equity and fairness, the Agenda 2030 objective will not be reached. [United States of America]	This sentence has been modified, and equity is now part of the bold statement that follows.
3056	6	43	6	43	allow to reach' should be 'allow reaching' [Robert Shapiro, United States of America]	This particular formulation has been modified.
50322	6	43	6	43	Replace "to reach" with "attainment of" [Christopher Bataille, Canada]	This particular formulation has been modified.

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61436	6	43	6	43	How are the terms equity and fairness defined? It's an accurate truism that equity is in the eye of the beholder. There are no agreed upon frameworks for implementing decarbonization commitments on the basis of a single definition of equity and fairness. While these concepts are important to many, disparate groups define them differently. Should these topics be included in this chapter, the authors must capture the breadth of views on this topic in a balanced, non-prescriptive manner. [United States of America]	Equity and fairness are defined in Ch1 and in the glossary. Both are used accordingly throughout Ch5, incl. the ES. Furthermore, the chapter does not prescribe particular notions of equity and fairness but assesses the available and relevant literature for this chapter.
10148	6	44	6	55	Unclear linkages and using not agreed language such as climate justice [Saudi Arabia]	This sentence has been modified, and social justice is now part of the bold statement that follows. Justice, social justice, and climate justice are defined in the glossary and form a substantial amount of the literature which the authors are asked to comprehensively assess.
10626	6	48	6	48	Mortreux and Barnett (2017) - Wires Clim Change paper note that enhanced adaptive capacity does not necessarily translate into positive adaptation outcomes. Suggest adding in Line 48 '...need to enhance adaptive capacity...' and put in place enabling environments that translate this capacity into adaptation outcomes. [Chandni Singh, Myanmar]	This sentence has been removed. Enabling conditions are discussed in 5.6 and summarised in the last statement of the ES. Ch 4 provides more details on how to make adaptation succeed.
61438	6	52	6	55	The meaning of the last sentence on page 6 is not clear. What does it mean that emphasis on these issues "helps to overcome limitations in capacity" and what is the basis for asserting this? What specific capacity limitations are overcome by emphasizing each of these particular things? This seems far too general of an assertion. [United States of America]	This sentence has been removed.
61440	6	53	6	53	Human rights are defined through negotiations between countries and are far outside the scope of the consideration of the IPCC. This report should not attempt to define human rights or present only one view of human rights. [United States of America]	Human rights are no longer mentioned in the ES. However, there is growing literature on human rights and climate change, including specifically in the context of 1.5C (see Robinson and Shine 2018 in Nature Climate Change) and hence of relevance for this report and this chapter (in particular due to its importance for reducing inequalities, which Ch5 has in its title). Human rights are also defined in the glossary.
12612	6	54	6	54	limitations in capacity - capacity for what? Be specific [United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been removed.
10150	7	1	7	15	Required more clarification and evidence in particular when mentioning oil-producing countries in middle east [Saudi Arabia]	Oil-producing countries in the Middle East are now addressed under 5.4, with a ES statement under the mitigation section (see Box 5.2).
13248	7	1	7	4	Delete the text "Initial evidence of partially successful pathways points toward significant possibilities as well as inherent difficulties to the achievement of sustainable, robust and equitable climate-resilient development, including considerable albeit incomplete efforts in so-called emerging green states in the Global South and oil-producing countries in the Middle East and North Africa." [Eleni Kaditi, Austria]	This sentence has been removed.
52294	7	4	7	4	The term 'Global South' is problematic. [Jason Donev, Canada]	The term has been removed from the chapter.
57414	7	5	7	6	Suggest to refer to SIDS in general (therefore, including also SIDS in the Indian Ocean and Caribbean, which are equally vulnerable) or even to low-lying islands/island states (which includes archipelagic states such as the Philippines) [Hans Poertner, Germany]	Pacific SIDS are retained here as they refer exclusively to the case study in Box 5.3. Otherwise, SIDS is used in the ES and throughout the chapter text.
61442	7	5	7	6	SIDS is an acronym for Small Island Developing, not Development, States. [United States of America]	Thank you. Corrected.
49912	7	6	7	7	Authors may consider revising the sentence as the meaning of the part: "will not prevent limits to adaptation and residual impacts." is not clear. [Himangana Gupta, India]	This sentence has been modified and the particular part mentioned in the comment removed.
16582	7	1	7	15	The statement that 'participatory governance and iterative social learning constitute key aspects to enable transformative social change...' is made despite the last sentence saying there is little evidence. While this is important, good policy, strong leadership and strategic planning is also needed. [Janet Stanley, Australia]	Thank you. This has been addressed, and a relevant ES statement now describes enabling conditions that include but are not limited to governance and social learning, with substantial supporting literature.
54412	7	1	7	11	Does "transformative" refer to governance and learning only? Or is there anything about technology, lifestyles etc. to be mentioned? [Reinhard Mechler, Austria]	This sentence has been removed here. Transformation is now addressed in 5.6 and in the last statement of the ES. It indeed involves more than just governance and learning.
12614	7	12	7	13	What is the evidence for this? [United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been removed.
33150	7	14	7	15	Human rights can be the amongst the indicators needed for fair and equitable low carbon transitions Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. [Tara Shine, Ireland]	Thank you. We have included this article in Ch5.
5342	7	17	7	19	Is there any guideline from IPCC on how to assess climate change knowledge in the community? If so, probably better to cite the guideline. [Sulistiyawati Sulistiyawati, Indonesia]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
10152	7	17	7	2	How it becomes high confidence where there is no evidence in linkages between 1.5? and SDGs [Saudi Arabia]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
12618	7	17	7	39	A less wordy version of this paragraph could usefully go at the top of the exec summary, because it sets the context of the statements that would follow. [United Kingdom (of Great Britain and Northern Ireland)]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
21722	7	17	7	39	The paragraph ventures into recommendations on research and judges its relevance for policy. This would seem to be at the margins of the scope and should be reconsidered. The writing is furthermore rather unspecific to provide value ("more structured literature is needed"... "suggests inadequately demonstrate"... "leaving questions unanswered"). There is, indeed, room for more research, but this should already come across in the findings with their confidence statements, in the Executive Summary etc. [Sweden]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
52296	7	17	7	39	This entire point needs to be read out loud. The writing is very awkward and hard to follow. I think I get what you're trying to say, but please just try again. [Jason Donev, Canada]	This entire paragraph has been removed from the ES.
61444	7	21	7	23	If there is indeed so limited evidence in existence, why are there so many findings on this here and in the SPM? Why such an emphasis on SDGs? And why such lengthy chapters? [United States of America]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
3692	7	22	7	23	"Reducing equalities" should be replaced with "Reducing inequalities". "goals of SDGs" should be SDGs. [Ying Chen, China]	This entire paragraph has been removed from the ES.
50324	7	22	7	22	Remove "and" before "reducing" [Christopher Bataille, Canada]	This entire paragraph has been removed from the ES.
51062	7	22	7	22	reducing INequalities [Doreen Stabinsky, United States of America]	This entire paragraph has been removed from the ES.
61446	7	22	7	22	Assuming this should say "reducing inequalities" rather than "reducing equalities." [United States of America]	This entire paragraph has been removed from the ES.
38570	7	28	7	29	I dont think the ES should write what is needed, but can rather point to where literature is scarce. [Jan Fuglestedt, Norway]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
12616	7	32	7	36	Current wording doesn't make sense. [United Kingdom (of Great Britain and Northern Ireland)]	This entire paragraph has been removed from the ES.
362	7	33	7	34	? phrasing to correct [Céline Guivarch, France]	This entire paragraph has been removed from the ES.
3058	7	33	7	33	suggests inadequately' should be 'inadequately' [Robert Shapiro, United States of America]	This entire paragraph has been removed from the ES.
30720	7	33	7	34	« Existing literature [...] climate-resilient suggests inadequately demonstrate how governance structures enable or hinder different groups » Phrasing to correct [France]	This entire paragraph has been removed from the ES.
32710	7	33			The part of the sentence that reads "suggests inadequately demonstrate" should be corrected. [Christopher Campbell-Durufflé, Canada]	This entire paragraph has been removed from the ES.
43092	7	33	7	34	The phrase ----'suggests inadequately demonstrate how governance' ---- has apparently some disconnect. May be reviewed again. [Muhammad Mohsin IQBAL, Pakistan]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
50326	7	34	7	34	Remove "demonstrate" [Christopher Bataille, Canada]	This entire paragraph has been removed from the ES.
10628	7	36	7	39	Very glad to see the point on the need for methodological innovation. Would help to cross-reference to the relevant section in the SOD where this is elaborated on. [Chandni Singh, Myanmar]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
24800	7	36	7	39	I would highlight the important role of multi-disciplinary models in a rational assessment of alternatives: Modeling approaches integrating information coming from different disciplines (climate, hydrology, urban hydraulics, agronomy, water-energy nexus, economics, ecology, etc) will be required to perform a rational assessment of alternatives to help in the decision making process taking into account the significant number of aspects that should be taken into account simultaneously (Escriba-Bou et al., 2017). Escriba-Bou, A., Pulido-Velazquez, M. and Pulido-Velazquez, D, 2017. The Economic Value of Adaptive Strategies to Global Change for Water Management in Spain's Jucar Basin. Journal of Water Resources Planning and Management: 143, Number: 5, (May 2017) DOI: 10.1061/(ASCE)WR.1943-5452.0000735. [David Pulido-Velazquez, Spain]	The bold statement on knowledge and knowledge gaps, as well as the text underneath, has been removed from the ES. Knowledge gaps are however addressed in the last section of the Chapter (5.7).
52758	8	1	14	8	The introduction section could be made more concise, it is quite repetitive of the information that follows in the preceeding sections [Julain Florin VLADU, Germany]	Accepted. The section has been cut by more than 50%.
62822	8	1	9	55	It would help the reader to introduce the structure of the chapter (what is assessed and what is not / cannot be assessed) and the links with earlier chapters. I am puzzled by the lack of a timeline related to the assessment, given the time horizon for SDGs (2030), for ambitious mitigation (from now to 2030 related to NDCs and beyond), and the timescale where climate impacts are expected (notion of time of emergence). [Valérie Masson-Delmotte, France]	Noted and taken into account. We were unable to expand the discussion due to space limits. There is a brief discussion of time scales in Cross-Chapter Box 4 on Sustainable Development in Chapter 1.
51458	8	5	8	5	delete 'on sustainable development' [Souparna Lahiri, India]	Rejected. Not sure why this comment was made. No adjustment made.
61448	8	8	8	8	SDGs do not encompass or represent the entirety of sustainable development. [United States of America]	Accepted. Sentence now reads 'sustainable development and the Sustainable Development Goals'.
33256	8	9	8	1	This chapter builds on previous IPCC reports and offers insights [Sergio Aquino, Canada]	The section has been significantly edited and reworked. Links to previous IPCC reports are made in Section 5.1.1.
28776	8	14	13	24	As stated on p. 8, line 21-23 sustainable development is defined in a variety of ways. This makes it difficult to consistently summarize the respective literature. Still, the chapter would profit much from a more focussed discussion of central aspects of sustainable development that are clearly defined at the beginning of the chapter. The SDG are one attempt to organize / prioritize aspects of sustainable development and given there international political relevance, we would recommend using this set of SD aspects. [Germany]	Noted. We were unable to expand the discussion due to space limits but there is now a Cross-Chapter Box which discusses SD in Chapter 1 (see Cross-Chapter Box 4).
44718	8	14	9	3	Much of this sub-section repeats what is already said in Chapter 1, and it could thus be substantially reduced . in length [Penny Urquhart, South Africa]	Accepted. This section has been cut by 50% with much less overlap with Chapter 1. We have retained some introduction to SD and SDGs because of their importance to the chapter.

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45420	8	14	9	3	This conceptual section appears to cover definitions going back to chapter 1. Can't it just re-cap briefly? [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. This section has been cut by 50% with much less overlap with Chapter 1. We have retained some introduction to SD and SDGs because of their importance to the chapter.
56434	8	14	8	14	As commented on the FOD, in this section or even earlier in the chapter, it is vital that due acknowledgement is given to the North-South divide in research and its implications for climate change policy and practice: Blicharska, M.*; Smithers, R.J.*; Kuchler, M.; Agrawal, G.K.; Gutiérrez, J.M.; Hassanali, A.; Huq, S.; Koller, S.H.; Marjit, S.; Mshinda, H.M.; Masjuki, H.H.; Solomons, N.W.; Van Staden, J. and Mikusi?ski, G. (2017) Steps to overcome the North-South divide in research relevant to climate-change policy and practice. Nature Climate Change, 7(1), 21-27. *These authors contributed equally to this work. [Richard J. Smithers, United Kingdom (of Great Britain and Northern Ireland)]	Noted. This chapter does not address this issue explicitly but research gaps are noted throughout the report.
1298	8	16	11		The sentence refers to 'an overview of ethical issues and the Sustainable Development Goals' in (Box 5.1). However, Box 5.1 (p. 11) is titled Climate and the Sustainable Development Goals (SDGs) and does not mention ethical issues, it only repeats the content of SDG 13 on Climate Action, and not in a very readerfriendly/overview format. Hence, there are inconsistencies between references to the box and what it contains. If Box 5.1 only talks about SDDG 13, this should be reflected in the title. If the purpose of Box 5.1 is to show, how climate and SDGs are related more broadly, i.e. synergies and trade-offs another content is needed. [Karen Olsen, Denmark]	Noted. This discussion is no longer in this section. Chapter 1 now discusses equity. The box is no longer in the chapter.
3060	8	16	8	16	introduction of the concepts' should be 'introduction to the concepts' [Robert Shapiro, United States of America]	Taken into account. The text for this sentence has significantly changed and 'introduction of the concepts' is no longer part of the sentence.
18694	8	16	11		The sentence refers to 'an overview of ethical issues and the Sustainable Development Goals' in (Box 5.1). However, discussion of ethics seems to take place primarily in the text before Box 5.1. [Andrea TILCHE, Belgium]	Noted. This discussion is no longer in this section. Chapter 1 now discusses equity.
52760	8	16	9	3	The IPCC does not need to take the role of explaining what the SDGs are, this is well-known and public knowledge. This section could be shortened considerably. [Iulain Florin VLADU, Germany]	Accepted. This section has been cut by 50% with much less overlap with Chapter 1. We have retained some introduction to SD and SDGs because of their importance to the chapter.
1300	8	21		24	This sentence 'The scientific literature and development organizations define sustainable development in a variety of ways and see it as difficult to measure precisely but commonly see it as meeting environmental, social and economic goals (Bebbington and Larrinaga, 2014; 24 Redclift and Springett, 2015)' is problematic. It does not reflect the new thinking behind the SDGs. Namely, that the pillar-approach that tends to see the three dimensions of SD in isolation, has been further developed through the SDGs towards integrating the environmental dimension as the basis for the social and economic dimensions, i.e. a stronger notion of SD that sees the social and economic spheres of sustainability as embedded in the environmental sphere. The section 5.1.1 as a whole does not do a good job to define core concepts; it does not provide a clear definition of how the key concept of sustainable development is understood in this chapter/report, nor does it discuss, how the concept of SD has developed over the years and what is the current status reflecting thinking behind the SDGs. [Karen Olsen, Denmark]	Noted. There is now an introduction to Sustainable Development in Chapter 1 (see Cross-Chapter Box 4) but we are still limited by space constraints and unable to provide a full discussion of all aspects.
13576	8	21	8	21	Review bibliographic citation indicates United Nations, 2015c, if previously 2015a [Poot-Delgado Carlos, Mexico]	This citation is no longer in this section.
18696	8	21		24	This sentence 'The scientific literature and development organizations define sustainable development in a variety of ways and see it as difficult to measure precisely but commonly see it as meeting environmental, social and economic goals (Bebbington and Larrinaga, 2014; 24 Redclift and Springett, 2015)' is problematic. It does not reflect the new thinking behind the SDGs. Namely, that the pillar-approach that tends to see the three dimensions of SD in isolation, has been further developed through the SDGs towards integrating the environmental dimension as the basis for the social and economic dimensions, i.e. a stronger notion of SD that sees the social and economic spheres of sustainability as embedded in the environmental sphere. The section 5.1.1 as a whole does not do a good job to define core concepts; it does not provide a clear definition of how the key concept of sustainable development is understood in this chapter/report, nor does it discuss, how the concept of SD has developed over the years and what is the current status reflecting thinking behind the SDGs. [Andrea TILCHE, Belgium]	Noted. There is now an introduction to Sustainable Development in Chapter 1 (see Cross-Chapter Box 4) but we are still limited by space constraints and unable to provide a full discussion of all aspects.
51460	8	25	8	25	include 'buen vivir' or before well being [Souparna Lahiri, India]	Rejected. This sentence is no longer in the chapter. Buen Vivir is discussed in FAQ 2.
33258	8	32	8	32	font looks different [Sergio Aquino, Canada]	Taken into account. Fonts double-checked for consistency.
48138	8	36	8	36	The reference 'United Nations 2015, p5' should be 'United Nations 2015c', as there are multiple references in the reference list from 2015 by the UN [Sarah Connors, France]	This citation is no longer in this section.
12620	8	38	8	38	Space after full stop [United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed prior to publication.
24430	8	38	8	38	2016a).Chapter", adjacency [Nazan AN, Turkey]	Editorial - copyedit to be completed prior to publication.
44116	8	38	8	38	needs space between '2016a). Chapter 1" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed prior to publication.
48140	8	38	8	38	Hallegatte et al., 2016a' should be 'Hallegatte et al., 2016'. The reference is duplicated three times in the reference list. [Sarah Connors, France]	Editorial - copyedit to be completed prior to publication.
52298	8	38	8	38	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed prior to publication.
31578	8	41	8	43	Generally, sustainable development treated in this section focuses too much on poverty. All targets in SDGs must be achieved simultaneously, and there is no priority. Well-balanced description between poverty and other sustainable development targets is recommended. [Japan]	Taken into account. The new Sustainable Development Box in Chapter 1 (1.4) partly addresses this comment and SDGs other than poverty are discussed throughout Chapter 5.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
36968	8	45	9	19	This discussion of what is equity and equality represents an instance of this report speaking about broad issues in development, rather than the specificity of the implications of 1.5C warming. [Bruce Currie-Alder, Canada]	Noted. This discussion is no longer in this section. Chapter 1 now discusses equity. Also see Glossary.
45476	8	45	9	4	this largely just repeats chapter 1 [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. This section has been cut by 50% with much less overlap with Chapter 1. We have retained some introduction to SD and SDGs because of their importance to the chapter.
61450	8	45	9	4	Concepts of equity, justice, fairness, and ethics have been noted as important, but they enjoy a diversity of definitions from different perspectives. If there is to be a discussion of these topics. The report should present all views in a balanced and comprehensive manner. [United States of America]	Noted. This discussion is no longer in this section. Chapter 1 now discusses equity. Also see Glossary.
57766	8	45	9	4	Section 5.1.1. introduces ethical concepts like equity. It does not, however, include "intergenerational equity". This, however, is an important concept in the context of climate change. It features in the UNFCCC and Paris Agreement. Furthermore, it plays a central role in accounts of climate justice and economic analyses of the social cost of carbon. There is a discussion in Simon Caney (2014) 'Climate Change, Intergenerational Equity, and the Social Discount Rate', Politics, Philosophy & Economics, vol.13 no.4 (2014), 320-342. And a fuller analysis of intergenerational equity in Simon Caney (2018) 'Justice and Future Generations' Annual Review of Political Science vol.21. [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	Noted. This discussion is no longer in this section. Chapter 1 now discusses equity. Also see Glossary.
2410	8	47			1.5 is not a target - this is a politically sensitive point so needs to be framed correctly. [Debra Roberts, South Africa]	Accepted. This sentence is no longer in the chapter.
61452	8	48	8	49	Language on human rights should not be included in this report. [United States of America]	We maintain human rights in this section, in the chapter, and in the report, including in Ch1. Human rights is also defined in the glossary for this report. Our task is to assess the literature, and there is literature on human rights and 1.5C pathways (see for instance Robinson and Shine 2018, in Nature Climate Change). Human rights are indeed an important element of reducing inequalities (chapter title and SDG10) and relevant to SDG16 (on just societies).
33260	8	51	8	51	no need for italics [Sergio Aquino, Canada]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
51462	8	51	8	51	include 'social exclusion' after health [Souparna Lahiri, India]	Noted. This paragraph is no longer in the chapter.
57820	8	53	8	53	Equity should be referred to as a principle under the UNFCCC, as opposed to saying 'equity generally means'. Equity has a specific meaning in International environmental law, which should be acknowledged. See comment no. 4. [Kate Dooley, Australia]	Noted. This sentence is no longer in the chapter (equity is discussed in Chapter 1).
28778	8	55	8	55	Last word: 'people' is a rather vague term. To clarify we suggest to add: "people, including inequalities between generations and gender" or clarify the term within the glossary. [Germany]	This sentence is no longer in the section as a result of word constraints. Equity is mostly discussed in Chapter 1.
54774	9				It seems odd that the report says that the Warsaw international mechanism and the Paris Agreement address loss and damage but does not go much further. Certainly the Convention also addresses or tries to address adaptation and was designed to guide the global effort mitigation but that doesn't deter the report from looking at these policies. Loss and damage is a critical component of the response to climate change, particularly after the warmest year without an El Nino in recent history and with massive economic losses and damage and untold non-economic loss and damage from extreme events that hit countries all over the world. [Erin Roberts, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Loss and Damage is now discussed in Box 12.
13578	9	2	9	4	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
33152	9	2	9	3	Additional reference: Cameron, E, Shine, T and Bevins, W. (2013) Climate justice: Equity and justice informing a new climate agreement. WRI working paper [Tara Shine, Ireland]	Noted. This sentence no longer in chapter and equity is now discussed in Chapter 1.
48144	9	2	9	3	Please indicate whether 'Caney, 2016' refers to 'Caney, 2016a' or '2016b' in the reference list. [Sarah Connors, France]	Noted. But this reference and sentence no longer in chapter.
48142	9	3	9	3	Please check to see whether 'Robiou et al, 2017' is in the reference list. [Sarah Connors, France]	Reference no longer cited in Section 5.1, but is in the Chapter reference list.
57768	9	3	9	3	Caney 2016 should be "Caney 2016b". [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	Noted. But this reference and sentence no longer in chapter.
33262	9	6	9	6	individuals and societies [Sergio Aquino, Canada]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
13580	9	8	9	1	Review the format of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
36176	9	9	9	9	Add - year of publications for articles Vinyeta, Whyte etc. [India]	Reference details have been updated.
36178	9	9	9	13	Please also refer - Winkler, Harald, Randall Spalding-Fecher, Stanford Mwakasonda, and Ogunlade Davidson. "Sustainable development policies and measures: starting from development to tackle climate change." In Building on the Kyoto Protocol: Options for protecting the climate, pp. 61-87. WRI, 2002; Halsnaes, Kirsten, and Priyadarshi Shukla. "Sustainable development as a framework for developing country participation in international climate change policies." Mitigation and Adaptation Strategies for Global Change 13, no. 2 (2008): 105-130; Byravan, Sujatha, Mohd Sahil Ali, Murali Ramakrishnan Ananthakumar, Nihit Goyal, Amit Kanudia, Pooja Vijay Ramamurthi, Shweta Srinivasan, and Anantha Lakshmi Paladugula. "Quality of life for all: A sustainable development framework for India's climate policy reduces greenhouse gas emissions." Energy for Sustainable Development 39 (2017): 48-58. [India]	Noted. This paragraph is no longer in the chapter. Chapter 1 now hosts a cross-chapter box on SD (see Cross-Chapter Box 4) but the references are limited due to space constraints.
12622	9	1	9	14	Repeated further down page in section 5.1.2, remove [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text for this section has changed significantly, the SDGs are now introduced only at the beginning of section 5.1.1 to avoid repetitions.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33264	9	1	9	14	SDGs should be in Box 5. [Sergio Aquino, Canada]	Taken into account. The Box on SDGs is now in Chapter 1, but the SDGs are still in the introduction to the chapter because they are critical to the discussion in the Chapter, many climate scientists are not familiar with the SDGs, and we did not want readers to have to keep referring to Chapter 1.
49982	9	16	9	19	It is better to add examples of disadvantages people in the brackets, is it including children? [Perdinan Perdinan, Indonesia]	Noted. This sentence is no longer in the chapter.
13582	9	17	9	17	Review bibliographic citation [Poot-Delgado Carlos, Mexico]	Citation reviewed and finalised.
48146	9	17	9	17	There seems to be a missing reference here. [Sarah Connors, France]	Citation reviewed and finalised.
61454	9	21	9	27	No mention is made about the impacts on those not living in poverty. These impacts are also important and should be noted by a comprehensive and balanced report. [United States of America]	Noted and taken into account. This paragraph is no longer in the chapter. Impacts for all people are discussed in Chapter 4. And we now use the term 'some and not others' in this section which would cover those not living in poverty.
44720	9	22	9	26	Leave this out, if it is stated in sections 5.3 and 5.4. [Penny Urquhart, South Africa]	Noted. This paragraph is no longer in the chapter.
44018	9	26	9	27	This is a very brief discussion of limits to adaptation. Limits to adaptation are a serious concern in reducing poverty and achieving other SDGs. Chapter 16 of AR5 WG2 goes into great detail on limits to adaptation but this is not reflected here [Carl-Friedrich Schleussner, Germany]	Noted and taken into account. This discussion is no longer in this section. Limits to adaptation are discussed in Cross-Chapter Box 12.
32140	9	27	9	28	Discussion of loss and damage should include how loss and damage intersects with poverty, equality and equity. Cross-chapter box 4.4 does not discuss these issues. [Jamaica]	Noted and taken into account elsewhere. This is no longer in this section, but these issues are discussed in Cross-Chapter Box 12.
36580	9	27	9	28	Discussion of loss and damage should include how loss and damage intersects with poverty, equality and equity. Cross-chapter box 4.4 does not discuss these issues. [Snialah Mahal, Saint Lucia]	Noted and taken into account elsewhere. This is no longer in this section, but these issues are discussed in Cross-Chapter Box 12.
38436	9	27	9	28	Discussion of loss and damage should include how loss and damage intersects with poverty, equality and equity. Cross-chapter box 4.4 does not discuss these issues. [Grenada]	Noted and taken into account elsewhere. This is no longer in this section, but these issues are discussed in Cross-Chapter Box 12.
44020	9	27	9	28	Discussion of loss and damage should go beyond this single sentence that does nothing besides saying that the issue is addressed in the UNFCCC. Discussion of how loss and damage intersects with poverty, equality and equity is needed here. These would be the impacts of climate change that exist after adaptation and mitigation and would have implications on sustainable development. Cross-chapter box 4.4 does not discuss these issues. [Carl-Friedrich Schleussner, Germany]	Noted and taken into account elsewhere. This is no longer in this section, but these issues are discussed in Cross-Chapter Box 12.
48148	9	27	9	27	Barnett et al., 2016a' should be 'Barnett et al., 2016'. The reference is duplicated in the reference list. [Sarah Connors, France]	Editorial - copyedit to be completed prior to publication.
61456	9	27	9	3	This statement on the Warsaw International Mechanism is factual, yet completely out of place. It should be deleted. [United States of America]	Noted and taken into account elsewhere. This is no longer in this section, but these issues are discussed in Cross-Chapter Box 12.
12624	9	33	1	12	In the interests of reducing chapter length, is there really any need to state what the SDGs are here? They are covered in chapter 1. [United Kingdom (of Great Britain and Northern Ireland)]	They are no longer listed here but are in the introduction to the chapter because they are critical to the discussion in the Chapter, many climate scientists are not familiar with the SDGs, and we did not want readers to have to keep referring to Chapter 1.
28780	9	33	1	39	General Comment to subchapter 5.1.2: We appreciate the focus on the SDGs within this chapter and the entire report very much, as it is a very helpful and globally accepted concept to organize and describe sustainable development. However, to our understanding, 5.1.2 should generally link (all) SDGs with the purpose of the entire report (climate change/1.5 global warming) in a balanced manner. But only a limited numbers of goals are addressed in section 5.1.2. Please either combine 5.1.2 with 5.1.1, since SDGs are a core concept of SD, or also address and discuss the following goals regarding their relevance for climate change: ecosystem/biodiversity (SDG 14, 15), sustainable economic development (SDG 8, 9, 12), equality and justice (SDG 5, 10, 16), and education (SDG4) to provide a more holistic discussion of the relevance of the SDGs for climate change. If some SDGs are discussed to a lesser extent than others or not at all, please provide the reasons, e.g. the limited availability of literature. [Germany]	Accepted. This paragraph is no longer in the chapter. Please see Cross-Chapter Box 4 'Sustainable Development and Sustainable Development Goals'.
61458	9	33	12	5	The extensive presentation on the SDGs is unneeded and should be removed. It is not specific to 1.5°C, and the IPCC does not have the mandate to focus on the SDGs. [United States of America]	Accepted. This paragraph is no longer in the chapter. Please see Cross-Chapter Box 4 'Sustainable Development and Sustainable Development Goals'.
10154	9	35	9	41	More evidence required on linkage of more income cause more GHG emissions [Saudi Arabia]	Noted. We were unable to add more evidence here due to space limitations, but links from income to GHG emissions are discussed in section 5.4 and Chapter 4.
61460	9	4	9	41	It seems it would only be fair to mention that this linkage does not always hold true. For instance, for some countries (e.g., U.S.), economic growth (measured by GDP) has been decoupled from GHG emissions over the past few years. If this is not mentioned, one might get the impression that increases in income cannot occur with rising greenhouse gas emissions. Perhaps, though, the point is if this is not considered as a possibility and addressed (if and as possible) than it can occur? [United States of America]	Noted. The link from income to GHG and decoupling is discussed in Chapter 4 (section 4.2.2.1) and in Chapter 5 (see Sections 5.4.1.2 and 5.5.2).
13002	9	41	9	44	Studies show that the progress across all MDGs were uneven and limited across all countries. There have also been some limitations in MDG content, structure, development process, implementation and enforcement. However it was observed that the reasons for the slow progress were complex and with a global recession as well as inherent challenges with most of the goals, the limitations in the MDG framework are not fully responsible for the shortfalls in the progress. [Denise Okpala, Nigeria]	Noted. Unfortunately we were unable to discuss more extensively given space limitations.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
52300	9	41	9	44	This sentence is very awkward. Break it into several sentences. [Jason Donev, Canada]	Accepted. The sentence has been split into two.
43094	9	42	9	42	Please see if the phrase 'between-country' can be replaced with 'inter-country'. Similarly on page 46, line 11. [Muhammad Mohsin IQBAL, Pakistan]	Noted. No longer in this section.
13584	9	44	9	44	Review the format of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
24410	9	44	9	44	(Fukuda-Parr, Yamin, and Greenstein 2014; Langford, Sumner, and Yamin 2013)" reference should be pointed as "et al." [Nazan AN, Turkey]	Editorial - copyedit to be completed prior to publication.
28782	9	46	9	55	The entire paragraph is redundant (see Chapter Box 1.2) and could be deleted. [Germany]	Accepted. This paragraph is no longer in the chapter. Please see Cross-Chapter Box 4 'Sustainable Development and Sustainable Development Goals'.
33266	9	46	9	55	SDGs should be in Box 5. [Sergio Aquino, Canada]	Taken into account. The Box on SDGs is now in Chapter 1, but the SDGs are still in the introduction to the chapter because they are critical to the discussion in the Chapter, many climate scientists are not familiar with the SDGs, and we did not want readers to have to keep referring to Chapter 1.
36970	9	46	9	55	The sustainable development goals are fairly well known... it may be sufficient to refer to them without listing all of them. Plus this paragraph does not inform the reader of the targets and indicators underpinning the SDGs [Bruce Currie-Alder, Canada]	They are no longer listed here but are in the introduction to the chapter because they are critical to the discussion in the Chapter, many climate scientists are not familiar with the SDGs, and we did not want readers to have to keep referring to Chapter 1.
44722	9	46	9	55	Unnecessary to repeat as already in Box 1-2. [Penny Urquhart, South Africa]	Accepted. This paragraph is no longer in the chapter. Please see Cross-Chapter Box 4 'Sustainable Development and Sustainable Development Goals'.
45422	9	46	9	55	The SDGs are already listed fully in a Chapter 1 Box [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. This paragraph is no longer in the chapter. Please see Cross-Chapter Box 4 'Sustainable Development and Sustainable Development Goals'.
16584	9	5	9	5	While there is a later discussion on degrowth, I think that many of the SDGs have little hope of achievement and that 'promoting inclusive economic growth in the context of climate change is unachievable. The chapter doesn't explain anyway (that I have found) what inclusive economic growth actually means. [Janet Stanley, Australia]	Accepted. This paragraph is no longer in the chapter. Please see Cross-Chapter Box 4 'Sustainable Development and Sustainable Development Goals'.
45080	9	5	9	5	energy (SDG7) should be "affordable and clean energy (SDG7)" [ARI Izzet, Turkey]	Accepted and changed.
45082	9	54	9	55	strengthening partnerships (SDG17) should be means of implementation (SDG17)" [ARI Izzet, Turkey]	Rejected. Partnerships for the goals is listed as the short version of SDG17 in many UN documents.
13250	1		1		In Figure 5.1, countries to be presented as "developed" and "developing". [Eleni Kaditi, Austria]	The figure has been removed from the chapter.
36972	1	2	1	12	The general statement describing differing development achievements by region does not speak to the specificity of achieving development in the decades ahead in 1.5C warming. Moreover, the statements mask substantial variation within each region. [Bruce Currie-Alder, Canada]	The figure has been removed from the chapter.
51464	1	2	1	12	development indicators also indicate growing inequality in these countries [Souparna Lahiri, India]	The figure has been removed from the chapter.
57416	1	2	1	12	Please clarify in the text whether this analysis and selection of indicators is a new assessment or based on existing literature [Hans Poertner, Germany]	The figure has been removed from the chapter.
8390	1	2	1	39	Figure A groups countries by income, which is not suitable since the differences in the development stage are more important. Differences between different income groups are not the focus of this report. Therefore, it is suggested to delete this figure or follow AR5 for the classification of developed and developing countries. [China]	The figure has been removed from the chapter.
24412	1	13	1	4	Figure 5.1", low resolution [Nazan AN, Turkey]	This figure has been removed from the final report.
13586	1	14	1	14	Delete text [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
28784	1	14	1	39	Figure 5.1: the information shown in the diagram is very selective and the set of indicators does not represent comprehensively neither climate change in general nor issues of 1.5°C global warming. There is data showing a bigger picture, for example the yearly SDG report. However, considering the limited length of this chapter and the lack of linkages to and support of statements of Ch 5, we suggest the deletion of this diagram. Instead a reference to various data available in the SDG context would be more helpful. [Germany]	The figure has been removed from the chapter.
5360	1	14	1	17	The text is not too clear. It is like shadowing and a bit grey. Suggest switching it to black. [Sulistiyawati Sulistiyawati, Indonesia]	This figure has been removed from the final report.
33268	1	15	1	15	figure missing title [Sergio Aquino, Canada]	This figure has been removed from the final report.
47034	1	15	1	39	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	The figure has been removed from the chapter.
61462	1	15	1	4	The figure should be enlarged to allow the reader to identify results for the various countries/regions. [United States of America]	This figure has been removed from the final report.
52302	1	16	1	17	The words in this graphic are a bit small, not as bad as future graphics, but be aware, they are hard to read. [Jason Donev, Canada]	This figure has been removed from the final report.
36976	1	18	1	39	This figure and caption read as if pulled from an introductory course on development studies, rather than what I would expect in an IPCC report with a particular and narrow focus. Specifically, I would expect this chapter to simply refer/cite certain ideas& concepts, and then identify which goals are most at risk of not being realized in a +1.5C world (and why). [Bruce Currie-Alder, Canada]	The figure has been removed from the chapter.
47000	1	34	1	34	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	This figure has been removed from the final report.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
13252	1	38	1	38	Replace "MDG7" with "SDG7". [Eleni Kaditi, Austria]	This figure has been removed from the final report.
4230	11	1	11	6	For example, Nunes et al. (2016) show that despite the considerations above, it is possible to reconcile the tensions between a more focused health and well-being framework to the SDGs, and a wider integrated approach that considers the interdependences among goals, targets and indicators across the sweep of sustainable development. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	The figure has been removed from the chapter.
49984	11	1	11	6	Information on advancement of regulations on climate change in different countries will help to understand how the SDG goals particularly SDG 13 is translated in the countries. An example in a box will also help. [Perdinin Perdinin, Indonesia]	Noted. This paragraph no longer in the chapter. There is a related discussion on SD in Cross-Chapter 4 in Chapter 1.
45084	11	3	11	3	SGDs should be "SDGs" [ARI Izzet, Turkey]	Taken into account. The spelling for SDGs was checked throughout the report.
54164	11	3	11	3	Should say SDGs instead of SGDs [Ayman Bel Hassan Cherkaoui, Morocco]	Taken into account. The spelling for SDGs was checked throughout the report.
54168	11	3	11	6	Not in full agreement with that logic. There should be mention of the National SDG plans countries have been submitting. [Ayman Bel Hassan Cherkaoui, Morocco]	Noted but this paragraph is no longer in the chapter.
50328	11	4	11	4	Replace "," with ".This is" [Christopher Bataille, Canada]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
54166	11	4	11	4	should say require instead of requireS [Ayman Bel Hassan Cherkaoui, Morocco]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
47216	11	5	11	5	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
36978	11	1	12	5	This box seems extraneous and could be replaced with a hyperlink or reference to the SDGs. As written, this text merely copies existing documents without adding anything to the core purpose of SR15 [Bruce Currie-Alder, Canada]	Noted. This box has been removed. However, sustainable development and the Sustainable Development Goals remain important concepts in the context of this report and therefore are addressed in Cross-Chapter Box 4.
44724	11	1	11	51	Could be cut or at least substantially reduced as it is not specific to 1.5. Preferable anyway to have this kind of text in Chapter 1, as it sets the context for the entire report. [Penny Urquhart, South Africa]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
52776	11	1	12	5	Box 5.1 may not be necessary, this is public info that the IPCC does not need to present. [Iulain Florin VLADU, Germany]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
45086	11	12	11	12	Sustainable Development Goal 13 commits to... should be "Sustainable Development Goal 13 aims to..." [ARI Izzet, Turkey]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
13588	11	13	11	13	Review bibliographic citation indicates United Nations, 2015 [Poot-Delgado Carlos, Mexico]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
363	11	14	11	14	why are you using "include"? it appears that all 5 targets listed in SDG13 are also listed here [Céline Guivarch, France]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
30722	11	14	11	14	Why are you using "include"? it appears that all 5 targets listed in SDG13 are also listed here [France]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
13254	11	21	11	21	Replace "13.4" with "13.A". [Eleni Kaditi, Austria]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
45088	11	21	11	21	13.4 should be "13.a" [ARI Izzet, Turkey]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
13256	11	26	11	26	Replace "13.5" with "13.B". [Eleni Kaditi, Austria]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
45090	11	26	11	26	13.5 should be "13.b." [ARI Izzet, Turkey]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
364	11	33	11	33	why are you using "include"? it seems only indicator 13.1.3 is missing... why not include it? [Céline Guivarch, France]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
30724	11	33	11	33	These indicators have been adopted [France]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
30728	11	33	11	33	Why using "include"? it seems only indicator 13.1.3 is missing... why not include it? [France]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
48150	11	33	11	33	Please provide a proper reference for the SDGs [Sarah Connors, France]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.
30734	11	53	11	54	The progress towards achieving SDG13 and not "the goal" will be reviewed. The current formulation can be read as the goal (that is its targets) will be renegotiated. [France]	This paragraph is no longer in Chapter 5 (see instead Cross-Chapter Box 4). Policy prescriptive language has been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
63116	11	54	11	55	The primary vehicle in assessing progress of the implementation of the SDGs will be through the Voluntary National Reviews. This element is missing in this box story. The indicators (13.1.1 to 13.3.2) reflect consensus at the multilateral level. It is therefore ideal that this box story focuses on the official UN review processes that reflect multilateral consensus. The SDG Index and Dashboards report is an independent study with uses its own measures, and recognises that it is complementary to the official SDG monitoring, and is not an official product endorsed by any governments or the UN. [Singapore]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
44118	11	55	11	55	CO2, 2 should be subscript [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed prior to publication.
61464	12	1	12	5	The following statement is inaccurate in several respects and should be deleted or modified: "It is important to note that the SDGs have the short-term target of 2030, whereas the Paris Agreement focuses on 2100, with stock takes every 5 years from 2023. The Paris Agreement does not set a date for limiting temperatures to 2°C or 1.5°C, achieving a global goal on adaptation, or mobilizing the \$100 billion for responses." First, the Paris Agreement does not reference 2100 or include a particular focus. Second, the \$100 billion mobilization goal is not part of the Paris Agreement; and, moreover, there is a date for mobilizing the \$100 billion (2025), though it is an aspirational and non-binding goal. [United States of America]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
16556	12	2	12	2	It is incorrect to state that the Paris Agreement focuses on 2100 -- it aims to achieved a balance of emissions and removals in the second half of the century, in addition to global peak emissions as soon as possible. Many Parties interpret the second half of the century to mean closer to 2050 than 2100 [Australia]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
31580	12	2	12	2	The Paris Agreement does not mention "2100" explicitly. As there are several interpretation regarding the time scale of the Paris Agreement, we would suggest to change it to "long-term" targets. [Japan]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
34266	12	2	12	5	The Paris Agreement does not set a date for limiting temperatures to 2°C or 1.5°C, achieving a global goal on adaptation, or mobilizing the \$100 billion for responses. With regard to the \$100bn goal, this is not actually stated in the Paris Agreement itself, but rather in the accompanying COP decision 1/CP.21. Here, it does imply the date by which it would be reached, and furthermore specifies that an increased goal would be agreed before 2025, per paragraph 53: "Also decides that, in accordance with Article 9, paragraph 3, of the Agreement, developed countries intend to continue their existing collective mobilization goal through 2025 in the context of meaningful mitigation actions and transparency on implementation prior to 2025 the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement shall set a new collective quantified goal from a floor of USD 100 billion per year, taking into account the needs and priorities of developing countries". The "existing mobilization goal" referred to here is the commitment made in 2010, COP decision 1/CP.16, paragraph 98: "Recognizes that developed country Parties commit, in the context of meaningful mitigation actions and transparency on implementation, to a goal of mobilizing jointly USD 100 billion per year by 2020 to address the needs of developing countries." Therefore, reading both of these decisions together, the \$100 billion goal should already be met by 2020, and in Paris Parties committed to continue this level of mobilization through 2025. [Joe Thwaites, United States of America]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
61466	12	2	12	4	The Paris Agreement talks about \$100 billion per year starting in 2020, not in total. Also, the word "responses" is confusing. The agreement calls for \$100 billion for adaptation and mitigation. "Responses" may imply that it is reactionary rather than preparatory. [United States of America]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
365	12	3	12	4	The part on the 100 billion is a little misleading. The date for the 100 billion does not appear in the paris agreement text per se, however, it is in the accompanying decision, art 115 stated "... to achieve the goal of jointly providing USD 100 billion annually by 2020". [Céline Guivarch, France]	Accepted. This box is no longer in the chapter. There is a Cross-Chapter Box on SD now in Chapter 1 (see Cross-Chapter Box 4) where this comment is taken into account.
50330	12	4	12	4	Replace "including" with ". They include". Watch for long run on sentences. [Christopher Bataille, Canada]	This sentence has been removed from the report.
13590	12	5	12	5	Review bibliographic citation indicates United Nations, 2015 [Poot-Delgado Carlos, Mexico]	This box is no longer in the chapter. Some of the content is discussed Cross-Chapter Box 4, but no longer contains this reference.
13592	12	7	12	7	Delete text [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
1302	12	1	12	49	Section 5.1.3 on Pathways to 1.5 degrees C could be left out to shorten the chapter. It is repetitive of the later section 5.6 and core concepts are defined both in the glossary and again in section 5.6. Rather, the focus on pathways to 1.5 degrees for the report/chapter can be explained up front in the scope and delineation part. [Karen Olsen, Denmark]	This paragraph has been shortened substantially and now refers to a Cross-Chapter Box on pathways in Chapter 1 (see Cross-Chapter Box 1). The box (and section 5.1.2) also introduces the concept of CRDPs which are discussed at length later in this chapter. This introductory section is designed to briefly introduce key concepts.
12626	12	1	12	49	Intro is unnecessarily long and difficult to read, can it be made more concise? Moreover this whole section can probably be cut down - we know what pathways are. You might want to define climate resilient pathways, but overall it's too long. [United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been shortened substantially and now refers to a Cross-Chapter Box on pathways in Chapter 1 (see Cross-Chapter Box 1). The box (and section 5.1.2) also introduces the concept of CRDPs which are discussed at length later in this chapter. This introductory section is designed to briefly introduce key concepts.
18698	12	1	12	49	Section 5.1.3 on Pathways to 1.5 degrees C could be left out to shorten the chapter. It is repetitive of the later section 5.6 and core concepts are defined both in the glossary and again in section 5.6. Rather, the focus on pathways to 1.5 degrees for the report/chapter can be explained up front in the scope and delineation part. [Andrea TILCHE, Belgium]	This paragraph has been shortened substantially and now refers to a Cross-Chapter Box on pathways in Chapter 1 (see Cross-Chapter Box 1). The box (and section 5.1.2) also introduces the concept of CRDPs which are discussed at length later in this chapter. This introductory section is designed to briefly introduce key concepts.

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45424	12	1	12	49	This is a very long-winded exposition of what the chapter is about - isn't this part of the chapter 1 roadmap? [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Noted. This section has been reduced to one paragraph.
61468	12	1	12	49	The authors have expanded the scope of their task to issues unrelated to climate policy. While a discussion on the potential for interrelationships between climate policy and development policy may be warranted, it is not the task of the IPCC and certainly not this special report author team to provide solutions to problems well outside the climate space such as poverty eradication. [United States of America]	Noted. This section has been shortened and revised and now focuses mainly on climate-resilient development pathways, following the adopted outline which asked us to assess "climate-resilient development pathways" (see approved outline http://www.ipcc.ch/meetings/session44/l2_adopted_outline_sr15.pdf). The notion of such pathways were introduced in the AR5, WGII, Ch13. The text summarises the available literature in this domain, without being policy-prescriptive.
44726	12	12	12	19	Unnecessary - already stated in Chapter 1. [Penny Urquhart, South Africa]	Noted. This paragraph has been removed.
61470	12	12	12	12	There is no mandate to the authors to "identify the pathways and strategies through which the world could limit warming to 1.5°C while also achieving sustainable development." To do so would be policy-perspective. The authors should assess the available literature and provide policy-relevant but not -prescriptive advice, as is contained in the IPCC's mandate. [United States of America]	This sentence has been removed. This section has been shortened and revised and now focuses mainly on climate-resilient development pathways, following the adopted outline which asked us to assess "climate-resilient development pathways" (see approved outline http://www.ipcc.ch/meetings/session44/l2_adopted_outline_sr15.pdf). The notion of such pathways were introduced in the AR5, WGII, Ch13. The text summarises the available literature in this domain, without being policy-prescriptive.
13994	12	13	12	14	this section does a nice job of introducing important concepts. Pathways is defined again in chapter 5, and there is a reference to chapter 1, but probably needs a reference to chapters 2, 3 and 4 also, and maybe distinguishing how your definition of pathway is similar or different? [Natalie MAHOWALD, United States of America]	This paragraph has been shortened substantially and now refers to a Cross-Chapter Box on pathways in Chapter 1 (see Cross-Chapter Box 1). The box (and section 5.1.2) also introduces the concept of CRDPs which are discussed at length later in this chapter. This introductory section is designed to briefly introduce key concepts.
10630	12	28	12	34	Need to include page numbers for IPCC quotes. [Chandni Singh, Myanmar]	Taken into account. The citation has been paraphrased and no longer needs a page number.
33270	12	28	12	28	no need for italics [Sergio Aquino, Canada]	Taken into account. The text for this section has changed significantly, "climate-resilient pathways" no longer appears, but "climate-resilient development pathways" do, without italics.
44728	12	28	12	42	Largely in chapter 1, with the exception of lines 39 to 42. [Penny Urquhart, South Africa]	Noted. This paragraph has been removed.
49986	12	31	12	34	Many countries need to define the single goal of adaptation such as those for mitigation that is emission reduction. Resilience is often seen as a target for adaptation. More elaboration on resilience and how to measure resilience will help. [Perdian Perdinan, Indonesia]	Noted. This paragraph is no longer in the chapter but resilience is mentioned often later in the chapter. It is defined in the glossary. Space limits constrain detailed discussion.
28786	12	36	12	39	Please add an acknowledgement that transformational change can also unfold in an incremental way, and does not necessarily require large-scale, ad-hoc changes. This acknowledgement is important to stress that transformational and incremental responses to climate change are not necessarily opposing ends of a spectrum, but rather go hand in hand. See Tremeer et al. (2016) - https://doi.org/10.1080/09640568.2016.1168288 ; Kates et al. (2012) - DOI: 10.1073/pnas.1115521109, Pelling (2011): Adaptation to climate change: from resilience to transformation, Routledge, London; Pelling (2015) - as cited in the references in Chapter 5. [Germany]	Thank you. However, this sentence is no longer in this section.
54170	12	4	12	42	in the context of sustainable development, and poverty eradication, and reducing inequalities is problematic as it is not agreed language from the Paris Agreement. See Article 2.1: "in the context of sustainable development and efforts to eradicate poverty". Not sticking to agreed language opens potential debates around picking and choosing [Ayman Bel Hassan Cherkaoui, Morocco]	Noted. This sentence is no longer in this section. But note that the approved outline for the report asked us to assess 1.5C and "Sustainable development, poverty eradication, and reducing inequalities" in this chapter.
6994	12	42	12	42	after transformative change add "such as green policies" [Flintull Annica Eriksson, Sweden]	Noted but this sentence is no longer in this section. Transformation is discussed in section 5.5.3.
54172	12	44	12	46	The adoption of the SDGs and the efforts to achieve both sustainable development and the Paris Agreement, the word 'development' is combined with climate objectives through 'climate-resilient development pathways'. This is incorrect. That interface is significantly more complex and deep than that single reference in article of the PA. There is also the important linkage established between SD and LD in article 8: "role of sustainable development in reducing the risk of loss and damage," as well as the article 7.1 that also puts adaptation in the context of SD. Furthermore there is the whole SDM of Article 6 ! There are other occurrences but I'll leave it at that. [Ayman Bel Hassan Cherkaoui, Morocco]	Noted. This paragraph is no longer in this chapter.
61472	12	44	12	46	There appears to be a garble in this first sentence. Needs to be clarified. [United States of America]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
16586	12	45	12	45	Similar to the above comment, I don't think 'development' is adequately defined. This is a value-loaded word that means many things to many people. [Janet Stanley, Australia]	Noted. This paragraph is no longer in this chapter. A more detailed overview is now provided in Cross-Chapter Box 4.
33272	12	45	12	45	no need for italics [Sergio Aquino, Canada]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
1304	13		16		It is difficult to get an overview of the concrete impacts and risks of 1.5 degree warming and the implications for poverty, equality and equity from sections 5.2.1 and 5.2.2. While section 5.2 starts pointing out the scarce literature available, the assessment of existing relevant knowledge is presented quite generic and with no overview illustrations. It would be helpful to include tables, maps or other illustrations of how impacts and risks are distributed geographically and/or across income groups. Boxes with illustrative case studies/examples from the sub-regional and sub-national levels complementing the overview would also be helpful. [Karen Olsen, Denmark]	Taken into account. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3. We have also included a table detailing avoided impacts between 1.5C and 2C to aid readability.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
18700	13		16		It is difficult to get an overview of the concrete impacts and risks of 1.5 degree warming and the implications for poverty, equality and equity from sections 5.2.1 and 5.2.2. While section 5.2 starts pointing out the scarce literature available, the assessment of existing relevant knowledge is presented quite generic and with no overview illustrations. It would be helpful to include tables, maps or other illustrations of how impacts and risks are distributed geographically and/or across income groups. Boxes with illustrative case studies/examples from the sub-regional and sub-national levels complementing the overview would also be helpful. [Andrea TILCHE, Belgium]	Taken into account. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3. We have also included a table detailing avoided impacts between 1.5C and 2C to aid readability.
40978	13	4	13	4	emission reductions and not emissions reductions [Maria Pia Carazo Ortiz, Germany]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
50332	13	4	13	44	Replace "for instance" with ", for instance" [Christopher Bataille, Canada]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
33274	13	1	13	1	climate resilient [Sergio Aquino, Canada]	Rejected. The term is correctly written. See Ch13, WGII in the AR5.
40980	13	16	13	18	Sentence is too long - and not clear. [Maria Pia Carazo Ortiz, Germany]	Taken into account. The text for this sentence has changed significantly and the comment is no longer relevant.
12628	13	27	13	27	In the interests of reducing chapter length, can you please reconsider how much of section 5.2 is strictly necessary. Would it not be best addressed in chapter 3. A simple summary of impacts is arguably out of scope for the chapter - it could potentially be covered under "linkages between achieving SDGs and 1.5C" but that's quite a specific topic and much of the material in this section is quite general on the subject of impacts. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3. We have also included a table detailing avoided impacts between 1.5C and 2C to aid readability.
52762	13	27	17	8	Sections 5.2 and 5.6 could be grouped together as one section, to make the storyline more logical, and because they are so linked. [Iulain Florin VLADU, Germany]	Noted. We have significantly revised both sections as well as the Chapter structure to improve logic and flow. Section 5.2 now examines impacts of 1.5C and 2C warming on sustainable development, poverty, inequality and equity, whereas Section 5.5 (the former Section 5.6) examines integrated development pathways (including CRDPs) towards limiting warming to 1.5C in the context of SD, eradicating poverty and reducing inequalities.
45426	13	31	13	48	couldn't this paragraph be dropped and start with p.13 lin 50? Repetitious of Ch 3 [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Noted. We have substantially revised the text. We build on findings from Ch3 to examine 1.5C and 2C impacts on development, poverty, inequality and equity, across scales where appropriate. We have revised the text to more clearly distinguish between the aims and content of both sections.
57418	13	31	13	31	How is "extreme poverty" defined? [Hans Poertner, Germany]	Poverty is defined in this report as: "Poverty is a complex concept with several definitions stemming from different schools of thought. It can refer to material circumstances (such as need, pattern of deprivation or limited resources), economic conditions (such as standard of living, inequality or economic position) and/or social relationships (such as social class, dependency, exclusion, lack of basic security or lack of entitlement)" (see Glossary).
47030	13	32	13	32	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted . The text is now as "The AR5 concluded, with very high confidence, that climate change and climate variability worsen existing poverty and exacerbate inequalities, especially for those disadvantaged by gender, age, race, class, caste, indigeneity and (dis)ability (Olsson et al. 2014)."
51466	13	32	13	34	also vulnerability within and across societies [Souparna Lahiri, India]	Rejected. We have tried to be as specific as possible regarding differential impacts of climate change at 1.5C and 2C warming between different groups. The text reads: " The AR5 concluded, with very high confidence, that climate change and climate variability worsen existing poverty and exacerbate inequalities, especially for those disadvantaged by gender, age, race, class, caste, indigeneity and (dis)ability (Olsson et al., 2014)."
16588	13	33	13	33	Future impacts will be felt by a much wider group that listed e.g. people with a disability, children, aged. [Janet Stanley, Australia]	Taken into account. We have revised the text accordingly: " The AR5 concluded, with very high confidence, that climate change and climate variability worsen existing poverty and exacerbate inequalities, especially for those disadvantaged by gender, age, race, class, caste, indigeneity and (dis)ability (Olsson et al., 2014)."
32986	13	33	13	33	(...) be experienced differentially according to gender, caste class, or ethnicity within and across societies. [Brazil]	Taken into account. We have revised the text accordingly: " The AR5 concluded, with very high confidence, that climate change and climate variability worsen existing poverty and exacerbate inequalities, especially for those disadvantaged by gender, age, race, class, caste, indigeneity and (dis)ability (Olsson et al., 2014)."
48152	13	34	13	34	Please check to see whether "Vincent et al., 2014" is in the reference list . [Sarah Connors, France]	Noted. The citation is removed from the text.
61474	13	34	13	35	Attribution science is a field of active inquiry, and the statement that "some of these can be easily detected and attributed to climate change" is a mischaracterization. Which ones, for example? Are they fully or partly attributable, or are the impacts exacerbated by climate change? [United States of America]	Accepted. The sentence has been deleted.
51468	13	36	13	37	loss of livelihood [Souparna Lahiri, India]	Accepted. We examine implications of 1.5C warming on livelihoods and poverty in Section 5.2.1.

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5344	13	38	13	38	Climate data scarcity is a problem in the most of poor and maybe developing countries. As a reader and perhaps policymaker, I hope to find solution on this report by what should do if I found that situation (climate data scarce) [Sulistiyawati, Indonesia]	Noted. Due to space constraints this sentence has been deleted and discussion on climate data scarcity removed.
8392	13	39	13	39	'Global South poor countries' is not clear in reference. It is suggested to follow AR5 for the classification of developed and developing countries or make an explicate statement. [China]	Accepted. The sentence has been deleted. We have adopted consistent terminology throughout the Chapter and the Special Report. Also see Glossary.
31090	13	39	13	41	the statement here contradicts the findings of chapter 3 (i.e. " manifest itself in higher warming and/or extreme events mostly in countries in the Global South.") the most warming based on my reading in chp3 is in the Arctic and central Europe at 1.5C - needs checking [James FORD, Canada]	Taken into account. This sentence has been deleted.
61476	13	39	13	39	The term "Global South" is used without definition. [United States of America]	Taken into account: we have removed all references to 'Global South'.
61478	13	4	13	42	What is the basis for saying that higher temperatures and extreme events will take place predominantly in the global south? Please provide references beyond the single one listed that apparently only focuses on health impacts. [United States of America]	Taken into account. This sentence has been deleted.
32142	13	43	13	45	Should also include SIDS as particularly vulnerable to temperature overshoots given impacts on coral reefs and sea level rise that are likely to have severe consequences for SIDS. [Jamaica]	We report impacts on SIDS at 1.5C warming in Section 5.1.1 and cross-reference Chapter 3, Box 3.5 and Cross-Chapter-Box 12. The latter cross-reference examines potential soft and hard limits to adaptation in the context of 1.5C and 2C. Discussion on overshoot and implications for SD has been removed from this section due to lack of literature.
36582	13	43	13	45	Should also include SIDS as particularly vulnerable to temperature overshoots given impacts on coral reefs and sea level rise that are likely to have severe consequences for SIDS. [Snialah Mahal, Saint Lucia]	We report impacts on SIDS at 1.5C warming in Section 5.1.1 and cross-reference Chapter 3, Box 3.5 and Cross-Chapter-Box 12. The latter cross-reference examines potential soft and hard limits to adaptation in the context of 1.5C and 2C. Discussion on overshoot and implications for SD has been removed from this section due to lack of literature.
38438	13	43	13	45	Should also include SIDS as particularly vulnerable to temperature overshoots given impacts on coral reefs and sea level rise that are likely to have severe consequences for SIDS. [Grenada]	We report impacts on SIDS at 1.5C warming in Section 5.1.1 and cross-reference Chapter 3, Box 3.5 and Cross-Chapter-Box 12. The latter cross-reference examines potential soft and hard limits to adaptation in the context of 1.5C and 2C. Discussion on overshoot and implications for SD has been removed from this section due to lack of literature.
44022	13	43	13	45	Should also include SIDS as particularly vulnerable to temeprature overshoots given impacts on coral reefs and sea level rise that are likely to have severe consequences for SIDS. [Carl-Friedrich Schleussner, Germany]	We report impacts on SIDS at 1.5C warming in Section 5.1.1 and cross-reference Chapter 3, Box 3.5 and Cross-Chapter-Box 12. The latter cross-reference examines potential soft and hard limits to adaptation in the context of 1.5C and 2C. Discussion on overshoot and implications for SD has been removed from this section due to lack of literature.
45998	13	44	13	44	Arctic System may require examples or its large coverage. "System in Arctic" was appeared in SPM 10-10. But system is too broad meaning. [Hiroyuki ENOMOTO, Japan]	Taken into account. The phrase 'Arctic System' has been deleted. Instead, we simply refer to the 'Arctic.'
13594	13	45	13	45	Review bibliographic citation indicates O'Neill et al., 2017b, if previously 2017a [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before final submission.
5346	13	5	13	5	I found the sentence "This section focuses" quite often, it seems like repetitive and monotonous. Consider changing to another sentence with the same meaning [Sulistiyawati Sulistiyawati, Indonesia]	Taken into account the sentence is changed to: "This section examines anticipated impacts and risks of 1.5°C and higher warming on sustainable development, poverty, inequality, and equity (see Glossary), building on relevant findings from Chapter 3 (see Section 3.4)."
8394	13	5	13	53	The title of this paragraph indicates a discussion of sub-regional and sub-national issues. However, the content of this paragraph only involves the former - sub-regional without the latter - sub-national. It is suggested to add relevant words by reformulating "from countries, or groups of countries to households" as "This section focuses on ...sub-regional levels and sub-national levels..., such as from countries or groups of countries to household", or delete 'sub-national' in the title. [China]	Taken into account. We have substantially revised the text to more explicitly focus on the implications of 1.5C and 2C warming for sustainable development, poverty, inequality and equity. Our assessment now includes global-scale data, as well as regional-scale examples where appropriate. We have renamed the section 'Impacts and Risks of a 1.5C Warmer World: Implications for Poverty and Livelihoods' to better reflect the content of the underlying assessment.
40982	13	51	13	51	Parenthesis) after regions is wrong [Maria Pia Carazo Ortiz, Germany]	Noted. The sentence was removed from the text.
40984	13	54	13	55	Should read: We acknowledge the difficulty in making the future impacts and risks at these lower levels visible, [Maria Pia Carazo Ortiz, Germany]	Noted. The sentence was removed from the text.
61480	13	54	13	55	There are quite a few vulnerability and risk assessments at these scales available in the grey literature, though they may not look specifically at 1.5°C issues. [United States of America]	Thank you. However, we have revised the text substantially to more explicitly focus upon on the implications of 1.5C and 2C warming for sustainable development, poverty, inequality and equity. Our assessment now includes global-scale data, as well as regional-scale examples where appropriate.
40986	13	55	13	55	the preposition "to" between experiences and emerge does not sound correct. "Experiences that emerge?" [Maria Pia Carazo Ortiz, Germany]	Noted. The sentence was removed from the text.
40988	14	2	14	2	should read "...deprivation, as well as social inclusion... " for more clarity [Maria Pia Carazo Ortiz, Germany]	Accepted. The new sentence is "The AR5 concluded, with very high confidence, that climate change and climate variability worsen existing poverty and exacerbate inequalities, especially for those disadvantaged by gender, age, race, class, caste, indigeneity and (dis)ability (Olsson et al. 2014)."
13596	14	3	14	3	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before final submission.
48154	14	3	14	3	Please check to see whether 'Brandi, 2015' is in the reference list. [Sarah Connors, France]	Noted. The Brandi, 2015 reference was removed from the text. Order of citations will be addressed before final submission.
57420	14	3	14	3	Unclear expression "uneven development patterns" [Hans Poertner, Germany]	Thank you. Text deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
61482	14	3	14	7	This paragraph accurately states that the literature on 1.5°C-specific risks is scarce, while there is substantial literature on the links between climate change and inequality. However the existence of such literature does not mean that a report on 1.5°C-specific impacts is the most appropriate place to assess that literature, however substantial. This and other statements in the report regarding the treatment of ethics and equity are potentially policy-prescriptive material and unrelated to 1.5 vs 2°C. Moreover, there is no consensus on the application of such principles within the international system. It is not the role of the IPCC to force a consensus where there is none. Such material is beyond the decided scope of report and should be removed. [United States of America]	Addressing inequalities is core to the plenary-approved outline of Chapter 5 (see title: 'Sustainable development, poverty eradication and reducing inequalities'). We have removed policy-prescriptive language throughout the Chapter. Since the SOD, the literature on inequalities, development pathways, including at the community level, has been growing and is now part of the assessment (see e.g. Patterson et al. 2018; Fazey et al. 2018). We retain relevant literature that explicitly examines the equity implications of 1.5C and 2C warming where appropriate. Definitions of key terms can be found in the Glossary, and in Ch1. Assessing this literature is not in itself policy-prescriptive.
13598	14	7	14	8	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before final submission.
43246	14	7	14	7	The poor will experience climate change severely... (cite: Byers et al submitted; Harrington, L.J., Frame, D.J., Fischer, E.M., Hawkins, E., Joshi, M., Jones, C.D. (2016) Poorest countries experience earlier anthropogenic emergence of daily temperature extremes. Environmental Research Letters 11, 055007.) [Edward Byers, Austria]	Thank you. We have included Byers et al. (2018) in our assessment.
48156	14	7	14	7	O'Neill et al., 2017c' should be 'O'Neill et al., 2017b'. The reference is duplicated in the reference list. [Sarah Connors, France]	Duplicated references have been removed from the reference list and the citations updated accordingly.
61484	14	11	16	27	This discussion should be removed. Impacts of 1.5°C are covered extensively in Chapter 3. [United States of America]	Taken into account. We cross reference Ch 3 and revised the text to more concretely focus upon the implications of 1.5C ad 2C warming on poverty, inequality and SDGs.
44730	14	13	14	25	Check for repetition with what is already stated above, and in Chapter 1. [Penny Urquhart, South Africa]	Taken into account. We have refocused our discussion to sustainable development and SDGs and addressed instances of repetition.
51472	14	13	14	53	please include risks of displacement, livelihood and habitat loss from forest fires and there are many case studies, research papers to substantiate [Souparna Lahiri, India]	Thank you. However, we couldn't find specific references discussing forest fires and implications for SD, specifically in the context of 1.5°C.
61486	14	13	15	17	Though the authors state that literature is limited, there is a lot of reliance on one citation (Hallegatte) in these paragraphs. [United States of America]	Taken into account. We have now included other references (i.e. Byers et al., 2018 and Pretis et al., 2018), although the literature is still limited.
62824	14	13	16	8	Sections 5.2.2 and 5.2.3 have a very strong overlap with chapter 3, and repeat an assessment of a limited pool of literature (sometimes with an overlap with the literature assessed in chapter 3). The sections must strongly build on the outcomes of chapter 3 and refer to it at the beginning, not the end of paragraphs. Some statements are confusing (e.g. line 13 of page 15, "with regional temperature increase greater than 1.5°C", how does this relate to the level of global warming). [Valérie Masson-Delmotte, France]	Taken into account. We have revised the text to more concretely focus upon the implications of 1.5C ad 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3.
5348	14	15	14	17	As public health practitioners that interested in climate change, I always asked how to do bottom-up approach. I suggest IPCC report address this kind of question by mention chapter or another report that specific to this issue. [Sulistiyawati Sulistiyawati, Indonesia]	Noted. We have significantly revised the text and deleted this sentence. Research and knowledge gaps are addressed in Section 5.7.
12630	14	15	14	25	Whilst acknowledging that future impacts are down to modelling of future demographic and socioeconomic change (in addition to climate) they use an SSP4 study, with big implicit assumptions about economic development (low) and demographic changes (lower than UN central population projection for 2050 and 2100). Feels a bit imbalanced to leave these statements hanging without this qualification. [United Kingdom (of Great Britain and Northern Ireland)]	Noted. It is beyond the scope of this section to explicate the assumptions of the SSPs. For discussion on the SSPs, see Cross-Chapter Box 1as well as Chapter 2, Section 2.3.1.
13600	14	15	14	15	Review bibliographic citation indicates O'Neill et al., 2017 [Poot-Delgado Carlos, Mexico]	Duplicated references have been removed from the reference list and the citations updated accordingly.
31092	14	15	14	15	The O'Neill ref really doesn't talk about Arctic indigenous peoples! A better ref would be the Arctic Councils recent AACA assessments, or a whole host of Arctic specific papers on IPs and CC [James FORD, Canada]	Thank you. However, O'Neill et al (2017) does discuss livelihood impacts for Arctic indigenous people (see RFC 1, p. 29).
12632	14	17	14	25	Why not use SSPs? What affect does this have on the results and whether we can compare them to other studies? [United Kingdom (of Great Britain and Northern Ireland)]	We report findings from studies employing SSP scenarios (see Pretis et al., 2018 and Byers et al., 2018). Comparisons between SSP model runs and other studies is difficult due to lack of literature. See Section 5.7 on research and knowledge gaps.
61488	14	17	14	17	Methodological alternative to what? [United States of America]	Accepted. We have deleted this sentence.
45428	14	2	16	26	a lot of this is pure Chapter 3 impacts - could be shorter [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. We have revised the text to more concretely focus upon the implications of 1.5C ad 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3.
51470	14	23	14	23	include "intergenerational equity" after redistributive policies [Souparna Lahiri, India]	Noted. However, this sentence has been removed from the final government draft.
35394	14	25			On the citation (Hallegatte and Rozenberg 2017), there should be comma between the author and year of publication hence, should be corrected as (Hallegatte and Rozenberg, 2017) [Regasa sagnii, Ethiopia]	Editorial - copyedit to be completed before final submission.
35396	14	25			On the sub-topic of 5.2.2 (Risks of a 1.5°C Warmer World), the risks of 1.5°C warmer world is explicitly explained from livelihood security (i.e. labor productivity, economic loss), health, displacement perspectives. However, it not clearly articulated for which social group (in terms of age and gender) and regions of world this risks are moderate and harsh nor highlighted other section where these ideas may be explained. It became more comprehensive and inclusive if such ideas are added possibly on page 14, line 25 of this specific section considering its spatial and temporal level. [Regasa sagnii, Ethiopia]	Taken into account. We have substantially revised the text to assess more concretely the impacts of 1.5C warming on sustainable development, poverty and inequality. Our assessment includes global-scale data, as well as regional-scale examples where appropriate. Ultimately, our analysis of regional and sub-regional impacts on these themes are constrained by a lack of literature (see Section 5.7).
12634	14	27	14	38	Look at chapter 3 for further evidence and citations - missing a lot here [United Kingdom (of Great Britain and Northern Ireland)]	Chapter 3 does not discuss labour productivity. We have revised the section text to better delineate the focus of Section 5.2 from Chapter 3.

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31096	14	29	14	38	A good ref here would also be Sherman et al 2016 in WIRES Climate Change who systematically review the adaptatino and development scholarship [James FORD, Canada]	Thank you. However, adaptation is covered in section 5.3.
61490	14	29	14	29	Do the authors mean an increase from now, so 2°C? [United States of America]	This sentence has been modified, retaining only one (the most relevant) reference. The focus in on 'each 1C increase' and '1-3% reduction in work productivity', defined in the article as 'per degree C point impact magnitude'. Park et al. (2015) report results averaged from previous studies exploring the implications of extreme heat on labour productivity and macroeconomic output. The result are given in relation to extreme heat.
31582	14	32	14	34	This sentence mentions only about impacts by heat stress. How about benefits by global warming in cold districts and other adverse impacts by increasing extreme events such as downpour? [Japan]	Noted. Our assessment is limited by the available literature. We note that the 'regional variation in the warming experience at 1.5C is large' and provide examples where appropriate.
47002	14	32	14	32	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted. The sentence was removed from the text.
48386	14	32	14	34	Future impacts are differently experienced by gender, caste, ethnicity within and across society. Agree but other factor such house hold income, social modality, and education will define how people anticipate future impacts [Agus Susatya, Indonesia]	Thank you. While we have strived to provide such detail in our assessment, we are constrained by a lack of relevant literature specific to 1.5C.
12636	14	34	14	38	I'd have thought some numbers would be available for 2 degree trajectory - what about the Arnell et al paper published after AVOID2, which considers the impacts of the RCP2.6 maybe not for 2030 but certainly for the century, albeit at a global scale rather than DCs only. [United Kingdom (of Great Britain and Northern Ireland)]	Thanks and we have included (Arnell and Gosling 2016) reference in Section 5.2.1.
52304	14	34	14	37	It's unclear if all of these deaths would specifically be in Kolkata, or in a larger area. [Jason Donev, Canada]	Noted. The sentence was removed from the text.
52306	14	34	14	37	Mention country with the name of the city [Jason Donev, Canada]	Noted. The sentence was removed from the text.
40990	14	35	14	35	insert comma after '1990' [Maria Pia Carazo Ortiz, Germany]	Corrected to [".. 1961-1990, climate change .."].
4232	14	4	14	45	For example, Nunes (2016) shows gaps in the literature and research concerning the need to mitigate the impacts of climate change on human health, which include a need for better understanding the role assets (tangible: financial, physical, place-based) and intangible: human and social) play in human vulnerability, resilience and adaptation; http://www.tyndall.ac.uk/sites/default/files/publications/twp163.pdf [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thanks but mitigation is addressed in details on section 5.4.
28788	14	4	14	4	It is not entire clear what the term "health shock" means in this context (e.g. variation in health conditions/chronic or acute illness or disability?). Consider to specify the term to facilitate understanding. [Germany]	Noted. The sentence was removed from the text.
40992	14	4	14	41	caregiver is one word [Maria Pia Carazo Ortiz, Germany]	Noted. The sentence was removed from the text.
43250	14	4	14	45	This section is very good and important. Another key point to add could be: "the high frequency of natural and climate hazards prevent asset accumulation (Carter and Barrett, 2006)" [Edward Byers, Austria]	Thanks However, our assessment focuses on new literature after the AR5. We refer to older studies in only exceptional circumstances.
33276	14	41	14	41	new phrase for impact: Moreover [Sergio Aquino, Canada]	Noted. The sentence was removed from the text.
39064	14	41	14	42	A point can me made on the migration to the cities from rural places due to impacts of climate change which will also impact the welfare impacts for poor households [Anish Paul Antony, United States of America]	Taken into account. We have added internal migration that broadly address this point (see Section 5.2.1, as well as Chapter 3, Box 3.5 and Cross-Chapter Box 12).
33278	14	43	14	43	may not reflect [Sergio Aquino, Canada]	Noted. The sentence was removed from the text.
33280	14	43	14	43	new phrase for impact: They often [Sergio Aquino, Canada]	Noted. The sentence was removed from the text.
12638	14	47	14	53	Look at chapter 3 for further evidence on displacements and citations - missing a lot here. Also, this needs editing for clarity. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. See Section 5.2 and Cross-Chapter Box 12).
40994	14	47	14	5	Sentence is too long - and not clear. [Maria Pia Carazo Ortiz, Germany]	Noted. The sentence was removed from the text.
44024	14	47	14	53	See also "Thomas, A., & Benjamin, L. (2018). Policies and mechanisms to address climate-induced migration and displacement in Pacific and Caribbean small island developing states. International Journal of Climate Change Strategies and Management, 10(1), 86-104." for further discussion on displacement in SIDS and lack of capacity to address these issues leading to greater inequality within states [Carl-Friedrich Schleussner, Germany]	Thank you. We have included Thomas, A. and L. Benjamin, 2017: Management of loss and damage in small island developing states: implications for a 1.5C or warmer world. Regional Environmental Change, in Cross-Chapter Box 12 as it fits very nicely there. Due to space limitations, we had to reduce the section on migration (in 5.3).
43248	14	5	14	53	Byers et al found that the number of exposed population to multi-sectoral climate impacts (across water / energy / land sectors) almost doubles between 1.5 to 2.0°C for the "Small Islands Regions / Caribbean and Central America / Mexico" regions (Supplementary information, Table section 4). Furthermore, the vulnerable (with income <\$10 / day) are even more exposed, with the the "exposed & vuilnerable" population tripling between 1.5 to 2.0°C. [Edward Byers, Austria]	Thank you. We have added this reference (see Sections 5.2.1, 5.2.2 and 5.2.3).
48158	14	5	14	53	It is not immediately clear how 'Aitsi-Selmi and Murray, 2016' is related to the statement preceding it, or to the rest of the paragraph. While the paper provides an overview of the Sendai Framework, it does not mention 1.5C or links 1.5C to higher levels of poverty and inequality. It also does not appear to include projections for the Bahamas or small island states in the Caribbean and the Pacific. [Sarah Connors, France]	Thank you. We have corrected it the error and deleted the reference.
33328	14	51	14	51	SIDS is already plural [Sergio Aquino, Canada]	Noted.
57422	14	51	14	51	What about SIDS in the Atlantic (e.g. Cape Verde) and Indian Ocean (e.g. Maldives)? [Hans Poertner, Germany]	Taken into account. We are constrained in our assessment by a lack of literature specific to 1.5C. Please see cross references to Chapter 3, Box 3.5; and Chapter 4, Cross-Chapter Box 9 for fatter detail on SIDS in this report.
46350	14	52	14	52	I don't understand what "5.9% of displacements" means here: 5.9% of what ? [Etienne Piguet, Switzerland]	Taken into account. We have deleted this sentence in our new version of the section.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
61492	14	52	14	52	The text reads "... suggest annual average of 5.9% of displacements by tropical ...". Not clear what is meant and the sentence should be revised to more clearly make the point. [United States of America]	Taken into account. We have deleted this sentence in our new version of the section.
16590	14	55	15	1	I think the spilling of food due to higher temperatures and bacterial growth needs to be mentioned as a food security issue. Also this section needs to mention the threat to many recreational activities due to higher temperatures. [Janet Stanley, Australia]	Thanks but given space constraints and the specific mandate of 1.5 C several of these nuances cannot be addressed in this section.
33330	14	55	14	55	For food security or heterogeneous effects... [Sergio Aquino, Canada]	Noted. The sentence was removed from the text.
48388	14	55	15	55	On food security and risk of 1.5C warmed world. Discussions focused on fresh water fishery and ocean acidification. However not much discussion On rice farming society, such as within South East Asia and south Asia countries. The risks of warmed world will be great in rice farming society, not only because its rice production depends on climate, but also its socio culture developed around rice farming. The risk faced by these rice farming societies become even greater, by the fact that most its rice production are consumed by rice farmers [Agus Susatya, Indonesia]	We agree that is important but given space limitation and literature availability we could not address all the possible impacts at 1.5C and 2C, such as rice farming and attendant socio-cultural implications. See Chapter 3, Section 3.4.6.1 for further detail on climate change impacts on crop production (including rice).
61494	14	55	14	55	The discussion of food security could mention the interrelationships with impacts related to water scarcity. Other sections talk about the importance of systems approaches and looking holistically at food/water/energy interactions. [United States of America]	Taken into account. We have included additional details on food and water scarcity (see for example Table 5.1). It is beyond the scope of our assessment in this section to assess interactions between these systems. We note that little literature has examined cross-sector and cascading impacts at 1.5C (see Section 5.7).
12640	15	1	15	1	How are net consumers of food products likely to be harmed? Not clear [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Phrase has been deleted.
12642	15	1	15	17	Again look at chapter 3 for evidence and literature - missing a lot [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3.
47004	15	1	15	1	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted. The sentence was removed from the text.
47032	15	2	15	2	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted. The sentence was removed from the text.
12644	15	4	15	5	500 million people by when? 2050? [United Kingdom (of Great Britain and Northern Ireland)]	Figure deleted.
33154	15	4	15	5	There is a literature on the risks posed to human rights from 1.5 and more of warming: Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf ; Report by the Special Mandate holders of the Human Rights Council. OHCHR (2015) The Effects of Climate Change on the Full Enjoyment of Human Rights. [Tara Shine, Ireland]	Thank you. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3. Assessment of issues related to equity and human rights are discussed further in Section 5.5.3.
13602	15	5	15	5	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before final submission.
12646	15	6	15	8	These impacts for Bangladesh in 2050 - under what warming scenario? [United Kingdom (of Great Britain and Northern Ireland)]	Multiple scenarios taken from the AR4 are provided by Dasgupta et al (2017) (A1B, A2, B1) across different global circulation models. Results indicate that freshwater species experience habitat loss with increased salinization.
21564	15	6	15	8	In Bangladesh, they developed aquaculture in brackish waters. By exporting this aquaculture production, the revenue may increase. [Nathalie HILMI, France]	Noted. However, we must report evidence available in the literature.
51474	15	9	15	9	accelerated retreat of glaciers leading to increased flooding of river basins, loss of habitat, loss of crops and livelihood, posing danger to river basins with hydro power projects [Souparna Lahiri, India]	Noted. However, given space constraints and the specific mandate of 1.5 C several of these nuances cannot be addressed in this section.
13604	15	14	15	14	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Duplicated references have been removed from the reference list and the citations updated accordingly.
43254	15	14	15	17	See study by Byers et al submitted on global exposure and vulnerability to multi-sectoral climate impacts. Also featured section 3.4.12 chapter 3. [Edward Byers, Austria]	Taken into account. We have added this reference to our assessment where appropriate, as well as cross-references to Chapter 3. The sentence has, however, been deleted.
47006	15	15	15	15	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account, we have corrected it to be in accordance to the IPCC uncertainty language.
28790	15	2	16	26	Avoided impacts will also lead to a significant saving in financial and material resources, due to reduced damages as well as lower adaptation costs. These dimensions needs to be highlighted throughout the report and in particular in subchapter 5.2, with references to Ch 3 as appropriate. Please add a short discussion of the relevant literature here, or highlight the gap in literature explicitly. [Germany]	Noted. However, this is beyond the scope of this section. Please see Chapter 4, Section 4.4.5.5 for discussion on adaptation finance. Losses and damages are discussed in Cross-Chapter Box 12.
44732	15	2	15	55	There is a great deal of overlap with this section and chapter 3, and it is not immediately clear how this text adds to what is already said in various sections in chapter 3. It would be good to clarify this. [Penny Urquhart, South Africa]	Thank you. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3.
50128	15	2	16	27	This section fully overlaps with ch 3. Why have it here? Figure 5.2 that is included here however is good and wood be useful (if expanded) to replace figure SPM3 that only shows the risks for 2oC. [Bert Metz, Netherlands]	Thank you. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3. The figure is now located in Cross-Chapter Box 12.

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12648	15	22	15	28	This is a consideration of the impacts of the changing climate only rather than the combined impact of climate change with , for example, a greater drive towards BECCS than under a 2 degree scenario. There may be no literature that considers both side-by-side but the point should at least be made that the compounds impacts of both, if not planned adequately, could be greater with a push for 1.5 as opposed to 2. [United Kingdom (of Great Britain and Northern Ireland)]	Rejected. This is beyond the scope of this section. The sustainable development implications of CDR are discussed in Section 5.4.1.3.
16592	15	22	15	22	I think 'some' needs to be put prior to 'avoided' [Janet Stanley, Australia]	Noted. The text has been substantially revised to improve clarity.
33282	15	22	15	55	italy not used in accordance with the rest of the text [Sergio Aquino, Canada]	Taken into account, we have corrected it to be in accordance with the rest of the text.
40996	15	3	15	32	Better syntax for the sentence would be: "For instance, and particularly in subtropical regions such as Central America and countries such as South Africa and Australia, risks for food, water and ecosystem security can be reduced in 1.5°C compared to higher risks at 2°C." Please notice the removal of some commas. [Maria Pia Carazo Ortiz, Germany]	Taken into account, and the corrected sentence is: "The risks for food, water, and ecosystems, particularly in subtropical regions such as Central America, and countries such as South Africa and Australia, are expected to be lower at 1.5°C than at 2°C warming (Schleussner et al. 2016)."
61496	15	3	15	38	The paragraph discusses how many additional people would be at risk under 1.5°C scenario but does not provide values for current or projected population at risk to allow comparisons. [United States of America]	Taken into account. We provide more explicit detail between 1.5C and 2C projected impacts in Table 5.1.
43096	15	31	15	31	The word 'in 1.5C' is suggested to be changed to 'at 1.5C'. [Muhammad Mohsin IQBAL, Pakistan]	Taken into account, the corrected sentence is: "The risks for food, water, and ecosystems, particularly in subtropical regions such as Central America, and countries such as South Africa and Australia, are expected to be lower at 1.5°C than at 2°C warming (Schleussner et al. 2016)."
43256	15	32	15	34	This is by a factor of 2, between 1.5 and 2.0C (Byers et al, see supplementary information, Tables S5 to S6) [Edward Byers, Austria]	Thank you. We have provided further detail in section 5.2.2.
31984	15	33	38	3	warming below 1.5°C will significantly reduce the population exposed to poverty: this statement need to more clarify. In which process you mention, how it happen. Here, we can add the with the controlling temprature, the unexpected weather patterns and long-term climate based seasonal effect to the harvest will reduce and then, the average temprature will create unnecessary insect/microbiological attecj on harvests. So, reducing pr keeping the temprature as it the harvest used to be, the negative consequences will reduce. [Sisira S. Withanachchi, Germany]	Noted. The text has been substantially revised to improve clarity.
43098	15	33	15	33	The first word 'temperature' is suggested to be deleted. [Muhammad Mohsin IQBAL, Pakistan]	Thank you. Temperature has been deleted and the text significantly revised.
12650	15	34	15	38	As above, see chapter 3 for further evidence [United Kingdom (of Great Britain and Northern Ireland)]	Thank you. We have revised the text to more concretely focus upon the implications of 1.5C and 2C warming on poverty, inequality and SD/SDGs, and thus to more strongly delineate these sections from Chapter 3.
13606	15	34	15	34	The year is missing Byers et al [Poot-Delgado Carlos, Mexico]	Taken into account, it is now corrected to: Byers et al. 2018.
52308	15	34	15	35	The presentation of the numbers are unclear, could this be re-worded for clarity please? [Jason Donev, Canada]	Taken into account, the sentence was removed from the text.
43100	15	36	15	38	The sentence 'In warming -----(Byers et al)' is suggested to be rewritten as 'In the warming scenario above 1.5C, Africa and Asia regions have higher fractions of the vulnerable population exposed to poverty; from 8-21% at 1.5C and 29-54% at 3C warming (Byers et al (?)). [Muhammad Mohsin IQBAL, Pakistan]	Thank you. The text has been substantially revised.
43258	15	36	15	38	Byers et al found disproportionate increases in the number of vulnerable people exposed to multi-sector climate impacts (using 14 indicators across water / energy / land sectors) when compared to the global population as a whole. Whilst the global population of "exposed and vulnerable" (with income <US\$10 / day 2011PPP) approximately doubles between 1.5 to 2.0°C (depending on SSP scenario), in Southern and Western African regions the change factor is ~5x, and in East Africa is projected up to a 10x increase. (Supplementary information, Table S6, section 4). [Edward Byers, Austria]	Thank you. We have included your reference where appropriate.
40998	15	37	15	37	Higher fractions of the global ... population? Something is missing [Maria Pia Carazo Ortiz, Germany]	Taken into account, the sentence was removed from the text.
13608	15	38	15	38	The year is missing Byers et al [Poot-Delgado Carlos, Mexico]	Taken into account, it is now corrected to: Byers et al. 2018.
36180	15	38			Add year to the reference Byers et al. [India]	It was added (2018).
5674	15	4	15	43	The SPM and other chapters state quite clearly that keeping warming at 1.5. is an extremely ambitious, if not entirely unlikely scenario. The tone of this chapter does not quite reflect this, especially in these lines where it sounds as if this was actually somehow easily within the realm of possibility. I think it makes sense to have this chapter as realistic and clear in its urgency as the others. As is now, it feels just a bit out of sync with SPM or Ch4 the other chapters read by this reader. It seems more of a heuristic exercise to show what the difference between 1.5 and 2.0 degrees would be, but as the beginning of SPM states very clearly this is so unlikely that it is not a realistic scenario. this should be clear in this chapter that the difference is pointed out here just to show the impact of half a degree of difference, rather than this is a possible scenario. [Marion Grau, Norway]	A more nuanced discussion of the feasibility of limiting warming to 1.5C is now included in the Special Report. See Section A of the SPM for high-level synthesis.
16558	15	4	15	44	Please separately identify impacts on these two countries. [Australia]	This sentence has been modified. Unfortunately, the Lange et al piece referenced in the SOD as 'submitted' was not completed in time for the submission of the final government draft. Given space limitations, we could not present the details differential impacts for the 2 countries but focused on the commonalities (less exposure and health impacts).
36980	15	4	15	42	Congratulations on this clear statement. This is precisely the sort of estimates I expected to see in this Report [Bruce Currie-Alder, Canada]	Thanks! Unfortunately the paper was not accepted in time for the Special Report. The statement has been deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
41000	15	4	15	42	I suppose that limiting warming to 1.5 will reduced the total populations... from 781 million at 2°C to 455 million at 1.5°C. Correct? It is written the other way around [Maria Pia Carazo Ortiz, Germany]	Taken into account, the sentence was removed from the text.
33936	15	4	15	44	The SPM and other chapters state quite clearly that keeping warming at 1.5. is an extremely ambitious, if not entirely unlikely scenario. The tone of this chapter does not quite reflect this, especially in these lines where it sounds as if this was actually somehow easily within the realm of possibility. Please consider to have this chapter as realistic and clear in its urgency as the others. As is now, it seems just a bit out of sync with SPM and Ch. 4. It seems more of a heuristic exercise to show what the difference between 1.5 and 2.0 degrees would be, but as the beginning of SPM states very clearly this is very unlikely. Please consider to be clear in this chapter that the difference is pointed out here is just to show the impact of half a degree of difference, rather than this being a possible scenario. [Norway]	A more nuanced discussion of the feasibility of limiting warming to 1.5C is now included in the Special Report. See Section A of the SPM for high-level synthesis.
61498	15	4	15	42	Include confidence rating for this statement. [United States of America]	Unfortunately the paper was not accepted in time for the Special Report. The statement has been deleted.
43102	15	41	15	41	The word 'people' is suggested to be deleted from from both places. Also, the phrase ---'to more than one extreme drought'--- has apparently some disconnect which may be looked into. [Muhammad Mohsin IQBAL, Pakistan]	The sentence has been deleted.
33334	15	42	15	42	submitted). Specifically [Sergio Aquino, Canada]	Taken into account, the sentence was removed from the text.
36182	15	42	15	44	Projections made for future risks are based on RCP8.5 scenario (2.6–4.8°C range of global temperatures) and assumes full exposure of the resident human population, with no shelter or other means of limiting direct exposure. This may result in an overestimation of the climate risk and failure to address the existing responsibility of addressing the issue in terms of work safety laws as observed in- Jay, Ollie, and Glen P. Kenny. "Heat exposure in the Canadian workplace." American journal of industrial medicine 53.8 (2010): 842-853. Further there is evidence that even existing worker safety is often not implemented. https://www.osha.gov/OshDoc/data_Hurricane_Facts/heat_stress.pdf [India]	This sentence no longer exists in this section, but the references were moved to section 5.2.3 on "Risks from 1.5°C versus 2°C Global Warming and the SDGs" as "Less people would be exposed to droughts and heat waves and the associated health impacts in countries such as Australia and India (King et al. 2017; Mishra et al. 2017)." We could not include your recommended literature due to our mandate to assess literature published after the AR5 (except in exceptional circumstances) and literature that confirms to IPCC guidelines for assessment.
13610	15	44	15	44	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Accepted and corrected the order of citation as: "Less people would be exposed to droughts and heat waves and the associated health impacts in countries such as Australia and India (King et al. 2017; Mishra et al. 2017)."
43104	15	44	15	44	For instance' seems to be redundant, may be deleted. [Muhammad Mohsin IQBAL, Pakistan]	Taken into account. The text has been substantially revised.
52310	15	44	15	44	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Noted.
43106	15	45	15	45	The phrase ---'reduced precipitation decline compared to 2C reducing crop failure'--- is not self explanatory. Needs to be checked again. [Muhammad Mohsin IQBAL, Pakistan]	Taken into account. The text has been substantially revised.
61500	15	46	15	47	This is not an accurate representation of the findings in Karmalkar et al. (2017), which found drier summers under both 1.5 and 2°C scenarios. Furthermore, precipitation in the northwest United States is of comparatively low importance to impacts expected elsewhere in the country. [United States of America]	Taken into account. Text has been deleted.
12652	15	49	15	55	As above, see chapter 3 for further evidence [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. We have updated the text and added appropriate cross-references to Chapter 3. Also please see Table 5.1
16560	15	49	15	55	Additional evidence is available on impacts avoided at 1.5C compared to 2C for coral reefs and the services they provide, e.g. King et al. 2017 Australian climate extremes at 1.5 C and 2 C of global warming DOI: 10.1038/NCLIMATE3296 They found warm seas associated with bleaching of the Great Barrier Reef in 2016 would be substantially less likely, by about 25%, if warming is kept to the lower levels. [Australia]	Thanks. We have included the reference in Section 5.2.3. For further discussion, please see Chapter 3, Box 3.4.
16562	15	49	15	55	Schleussner et al. (2016) found the warming difference between 1.5°C and 2°C is likely to be decisive for the future survival of tropical coral reefs and only the 1.5°C scenario offers some potential for these ecosystems to adapt. See also Hare et al. Climate Analytics 2016 report. However, their modelling and other evidence in chapter 3 does not indicate 1.5C is 'safe' and so I question the high confidence level given to the statement about safeguarding livelihoods in lines 49-50, but recognise it is likely to be better than at 2C. [Australia]	Accepted. Text has been substantially revised and the confidence statement removed.
16594	15	49	15	49	Reducing reef mortality at 1.5 degree C is not that relevant when 50% of the Great Barrier Reef in Australia is already dead at an average of 1 degree C. [Janet Stanley, Australia]	Noted. See Chapter 3, Box 3.4 for further discussion on tropical coral reefs.
41002	15	49	15	49	coral reef mortality (or the mortality of coral reefs) - not coral reefs mortality [Maria Pia Carazo Ortiz, Germany]	Taken into account and the sentence was removed from the text.
50334	15	49	15	49	Replace 'reefs' with 'reef' [Christopher Bataille, Canada]	Taken into account and the sentence was removed from the text.
61502	15	49	15	52	This is contradictory to statements made in Chapter 3. [United States of America]	Taken into account. We have updated the text and added appropriate cross-references to Chapter 3. Also please see Table 5.1
13612	15	5	15	52	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Taken into account and the sentence was removed from the text.
41004	15	52	15	54	should read: "Specifically, 1.5°C limiting in temperature will reduce the exposure of coral reefs in the coast of.....until 2050 by 40% (in comparison to 2°C of warming), with implications...." [Maria Pia Carazo Ortiz, Germany]	Taken into account and the sentence was removed from the text. The references from Reyer et al 2017 is now merged on 5.3.2: "There is high confidence that constraining warming to 1.5°C rather than 2°C would reduce risks for unique and threatened ecosystems, safeguarding the services they provide for livelihoods and sustainable development, and making adaptation much easier (O'Neill et al. 2017b), particularly in Central America, the Amazon, South Africa, and Australia (Schleussner et al. 2016; Reyer et al. 2017b; O'Neill et al. 2017b; Bathiany et al. 2018)."

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
43108	15	52	15	52	The phrase '1.5C limiting in temperature' is suggested to be rewritten as 'limiting warming at 1.5C'. [Muhammad Mohsin IQBAL, Pakistan]	Accepted. Text has been corrected.
43110	15	53	15	54	What is meant by ---'exposure of coral reefs - - -to annual bleaching events? [Muhammad Mohsin IQBAL, Pakistan]	Accepted. Text has been deleted.
33284	16	2	16	2	Another way of assessing the impact of the 1.50C to 20C scenario [Sergio Aquino, Canada]	Text has been substantially revised.
28792	16	2	16	3	Please indicate how these risk assessments correspond with the Reasons for Concerns. They seem not to. [Germany]	The figure has been moved to Cross-Chapter Box 12 on residual risks and limits to adaptation where it ensures a better fit. The figure caption explains that illustrations are based the AR5 WGII risk tables where expert judgments were made to assess risk at different degrees of warming with and without adaptation, across many more areas than the five Reasons for Concern. The examples in panels A-C speak explicitly about contexts of livelihoods and poverty which do not appear in the reasons for Concern figures, not even in the updated and expanded ones in Ch3. The advantage of this figure is the intuitive visual understanding of contexts in which risks can be reduced ('dialled back') between 2C and 1.5% warming, with and without additional adaptation, and contexts where limits to adaptation would need to be envisioned. This is relevant for an appreciation of potential losses.
61504	16	3	16	3	Should 2014 be 2040? [United States of America]	Corrected it to "Near-term (2030-2040) risks can be used as a proxy for 1.5°C warming by the end of the century, and compared to longer-term (2080-2100) risks associated with an approximate 2°C warming."
33286	16	11	16	11	delete 'context and place' [Sergio Aquino, Canada]	Accepted and deleted.
49988	16	11	16	15	In addition to gender, children and youth may should be considered in risk assessment. Particularly for children and youth, their participation in adaptation should also be considered. In Indonesia, an initiative has been made on child centered climate change risk assessment (C4RA) and Child Centered Climate Change Adaptation (C4A) , www.apifa.or.id [Perdinan Perdinan, Indonesia]	Noted. We have added discussion on children in Section 5.2.1.
5676	16	13		14	Again the language here does not communicate any kind of clarity and urgency but rather seems to assume adaptation will be merely 'important.' Given the realities to face, this seems understate the issues at hand. This is especially surprising given the human cost that is outlined in this chapter. [Marion Grau, Norway]	Taken into account. The urgency of pursuing 1.5C pathways consistent with SD, reducing inequalities and poverty eradication is discussed in Section 5.5.
8396	16	15	15	26	Figure 5.2 is not reader-friendly enough. The degree of avoided impact represented by the ring is difficult to be captured from the figure that lacks a quantitative description. It is suggested to make such an addition. [China]	This figure is based on the expert judgement of IPCC authors, WGII, AR5. No quantification was attempted, but rather an in-depth understanding of a particular social system, as anticipated for a 2C world, and 1.5C world (suining the proxy of near term 2030-40). Given the short time frame of this Special Report, it was not possible to replicate the expert judgement for risks, but it is reasonable to assume that the AR6 report will attempt to do so. The figure now appears in Cross-chapter box 12 on residual risks and limits to adaptation, illustrating 3 examples. The 'dials' offer a visual illustration of how risk could be reduced, from 2C to 1.5C warming, wit hand without adaptation, something that was not visually intuitive in the AR5 risk bars, on which this figure is based.
13614	16	15	16	15	Delete text [Poot-Delgado Carlos, Mexico]	Accepted.
28794	16	15	16	26	Figure 5.2: We suggest to revise this figure, since it is complicated to understand and the scale used is inconsistent with chapter 3. If this figure only bases on the AR5, it could be deleted and a reference to AR5 might be enough. But if there are new results presented and the figure is revised regarding its perceivability, we consider this figure very helpful. [Germany]	This figure now appears in Cross-Chapter Box 12 on residual risks and limits to adaptation, upon consensus from authors involved in this box. Given the short time frame of this Special Report, it was not possible to replicate the expert judgement for risks, but it is reasonable to assume that the AR6 report will attempt to do so. Hence, no more recent science could be included. Ch3 does not provide comparable findings on avoided risks between 1.5C and 2C for the 3 examples provided here and did not attempt an updated expert judgment. As explained, the information provided here, based on the AR5 risk bars, serve as a proxy to illustrate (rather than quantify) the range of possible residual risks and limits to adaptation, particularly for areas that cannot be quantified through monetary assessments.
32144	16	15	16	27	This figure does not seem to take into account more recent science available since AR5. Particularly, figure B does not take into account high risk of deterioration of coral reefs and implications on coastal livelihoods. The risk for B should be higher than medium [Jamaica]	This figure is based on the expert judgement of IPCC authors, WGII, AR5. No quantification was attempted, but rather an in-depth understanding of a particular social system, as anticipated for a 2C world, and 1.5C world (suining the proxy of near term 2030-40). Given the short time frame of this Special Report, it was not possible to replicate the expert judgement for risks, but it is reasonable to assume that the AR6 report will attempt to do so. Hence, no more recent science could be included, although attempts were made, esp. in Ch3, to update an illustration for coral reefs. The figure now appears in Cross-chapter Box 12 on residual risks and limits to adaptation, illustrating 3 examples. The 'dials' offer a visual illustration of how risk could be reduced, from 2C to 1.5C warming, wit hand without adaptation, something that was not visually intuitive in the AR5 risk bars, on which this figure is based.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
36584	16	15	16	27	This figure does not seem to take into account more recent science available since AR5. Particularly, figure B does not take into account high risk of deterioration of coral reefs and implications on coastal livelihoods. The risk for B should be higher than medium [Snaliah Mahal, Saint Lucia]	This figure is based on the expert judgement of IPCC authors, WGII, AR5. No quantification was attempted, but rather an in-depth understanding of a particular social system, as anticipated for a 2C world, and 1.5C world (using the proxy of near term 2030-40). Given the short time frame of this Special Report, it was not possible to replicate the expert judgement for risks, but it is reasonable to assume that the AR6 report will attempt to do so. Hence, no more recent science could be included, although attempts were made, esp. in Ch3, to update an illustration for coral reefs. The figure now appears in Cross-chapter Box 12 on residual risks and limits to adaptation, illustrating 3 examples. The 'dials' offer a visual illustration of how risk could be reduced, from 2C to 1.5C warming, with and without adaptation, something that was not visually intuitive in the AR5 risk bars, on which this figure is based.
44026	16	15	16	27	This figure does not seem to take into account more recent science available since AR5. Particularly, figure B does not take into account high risk of deterioration of coral reefs and implications on coastal livelihoods. The risk for B should be higher than medium [Carl-Friedrich Schleussner, Germany]	This figure is based on the expert judgement of IPCC authors, WGII, AR5. No quantification was attempted, but rather an in-depth understanding of a particular social system, as anticipated for a 2C world, and 1.5C world (using the proxy of near term 2030-40). Given the short time frame of this Special Report, it was not possible to replicate the expert judgement for risks, but it is reasonable to assume that the AR6 report will attempt to do so. Hence, no more recent science could be included, although attempts were made, esp. in Ch3, to update an illustration for coral reefs. The figure now appears in Cross-chapter Box 12 on residual risks and limits to adaptation, illustrating 3 examples. The 'dials' offer a visual illustration of how risk could be reduced, from 2C to 1.5C warming, with and without adaptation, something that was not visually intuitive in the AR5 risk bars, on which this figure is based.
61506	16	15	16	26	Panel c of this figure appears inaccurate, as it seems nearly impossible that there would be no differences between 1.5 and 2°C for these impact areas, or that there should be any influence of adaptation. [United States of America]	The expert judgement was based on literature on work productivity of outdoor workers, especially those cited in the figure caption (e.g. women who have to walk long distances to collect water, for instance in rural areas in Africa). Given the state of the art technology and financial investment, the authors concluded it would be far fetched to imagine plausible scenarios in which air conditioning or other technological innovations would be available to disadvantaged rural women for such outdoor activities. Hence, the authors' judgement was that after a certain degree of warming (higher on land such as the Africa continent than a global average), essentially no meaningful adaptation would be possible, neither at a global average at 1.5C nor 2C. The risk bars on which panels A-C are based have been approved in the AR5, WGII.
366	16	16	16	19	The representation in Figure 5.2 with different areas give the impressions that "avoided" impacts are summable. Is it really the case? [Céline Guivarch, France]	It is not clear what 'summable' means in this context. The figure shows avoided risks between 2C and 1.5C warming, with and without adaptation. These are not summed up but rather reduced by using the visual analogy of 'dialling back' risks, something the original risk bars from the AR5 WGII were not able to convey. This figure now is part of Cross-Chapter Box 12 on residual risks and limits to adaptation where it fits well.
5362	16	16	16	16	The text is not too clear. It is like shadowing and a bit grey. Suggest switching it to black. [Sulistyawati Sulistyawati, Indonesia]	Reject. Black and grey text was used to differentiate between the level of risk applicable to the specific sectors/systems.
10608	16	16	16	17	Figure 5.2 needs to be improved for visibility. [Hong Yang, Switzerland]	Taken into account, we hope its visibility is improved.
30736	16	16	16	26	Figure 5.2 : This figure is unclear/difficult to understand because of the 3 variables (level of impact, reducing the risk,type of impacts) and should be explained in the text for the 3 type of impacts A, B and C. Also the representation with different areas give the impressions that "avoided" impacts are summable. Is it really the case? [France]	It is not clear what 'summable' means in this context. The figure shows avoided risks between 2C and 1.5C warming, with and without adaptation. These are not summed up but rather reduced by using the visual analogy of 'dialling back' risks, something the original risk bars from the AR5 WGII were not able to convey. This figure now is part of Cross-Chapter Box 12 on residual risks and limits to adaptation where it fits well and consistency with the relevant text is more obvious and intuitive to the reader.
52312	16	16	16	16	The words in this graphic are a bit small, not as bad as future graphics, but be aware, they are hard to read. [Jason Donev, Canada]	Taken into account, we hope its visibility is improved.
61508	16	16	16	16	How do the experts judge that there is no adaptation to heat waves? [United States of America]	The expert judgement was based on literature on work productivity of outdoor workers, especially those cited in the figure caption (e.g. women who have to walk long distances to collect water, for instance in rural areas in Africa). Given the state of the art technology and financial investment, the authors concluded it would be far fetched to imagine plausible scenarios in which air conditioning or other technological innovations would be available to disadvantaged rural women for such outdoor activities.
33158	16	31	16	34	add a reference to human rights in addition to human capabilities - see UNEP (2015) Human Rights and Climate Change. [Tara Shine, Ireland]	Thank you. Issues pertaining to equity and human rights are discussed in Section 5.5.3.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12654	16	37	16	39	Overly political - perceptions what is an unacceptable risk are subjective. Furthermore, impacts on health from anthropogenic climate change do not include impacts caused by climate variability. If climate variability changes as a result of anthropogenic climate change and there are health impacts as a direct consequence of this, then this could apply but attribution science as it stands currently can't do this. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text has been deleted.
41006	16	37	16	38	It should read: "For example, there is no 'safe limit' for health, as ..." [Maria Pia Carazo Ortiz, Germany]	Taken into account, the sentence was removed from the text.
36184	16	37	16	4	The reasons for the absence of safe limits and estimating impacts from climate variability are unexplained. In the case of vector borne diseases an important factor is the – "Decreased resources for infectious diseases in general resulted in the discontinuation or merger of many programs and ultimately to the deterioration of the public health infrastructure required to deal with these diseases." Gubler, Duane J. "Resurgent vector-borne diseases as a global health problem." Emerging infectious diseases 4.3 (1998): 442. [India]	Taken into account. The sentence was removed from text and health impacts are cross referenced from Ch 3.4.7 and displayed in table 5.1. Also, given space constraints and the need to include references after AR5 (2014) onwards, we haven't included 1998 reference.
61510	16	37	16	37	double and triple injustices and losses is unclear. Please clarify. [United States of America]	Taken into account. Text has been substantially revised for clarity. Specific phrasing has been deleted.
12656	16	42	16	44	Reference/evidence for this? Especially given following sentence. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. There is evidence indicating that limiting warming to 1.5C will make it easier to achieve some of the SDGs (see Section 5.2.3), but we do note that no modelled development pathway in the literature currently achieves all 17 SDGs (see Section 5.5.2). The text has been revised to reflect this.
16596	16	42	16	43	This sentence is overly optimistic - the SDGs will have considerable problems being achieved even without the issue of global warming at 1.5 degrees. [Janet Stanley, Australia]	Taken into account. There is evidence indicating that limiting warming to 1.5C will make it easier to achieve some of the SDGs (see Section 5.2.3), but we do note that no modelled development pathway in the literature currently achieves all 17 SDGs (see Section 5.5.2).
61512	16	42	16	43	What is the basis for this statement, particularly given that the very next statement indicates that literature remains scarce and that the different timelines further compounds the challenge of meaningful conclusions? More fundamentally, what does it mean that global warming of 1.5 compared to 2°C by the end of the century provides a better chance to achieve the SDGs by 2030 (i.e., 70 years earlier)? This sentence should be removed if there is not a factual basis. [United States of America]	Taken into account. There is evidence indicating that limiting warming to 1.5C will make it easier to achieve some of the SDGs (see Section 5.2.3), but we do note that no modelled development pathway in the literature currently achieves all 17 SDGs (see Section 5.5.2). The text has been revised to reflect this.
6990	16	43	16	43	add the word peace, after " Reduce inequality, foster equity and peace". [Flintull Annica Eriksson, Sweden]	Noted. However, this sentence has been deleted.
1306	17		24		It is difficult from the current comprehensive assessment of adaptation options and pathways to get a clear, concrete overview of the two-way relationship to SD synergies and trade-offs. Figures, tables and maps would be helpful to enable an overview complemented by boxes to help give concrete examples. [Karen Olsen, Denmark]	Taken into account. Due to time constraints these figures/tables/maps could not be produced.
18706	17		24		It is difficult from the current comprehensive assessment of adaptation options and pathways to get a clear, concrete overview of the two-way relationship to SD synergies and trade-offs. Figures, tables and maps would be helpful to enable an overview complemented by boxes to help give concrete examples. [Andrea TILCHE, Belgium]	Taken into account. Due to time constraints these figures/tables/maps could not be produced.
12658	17	1	17	8	This entire paragraph needs backing up by evidence and peer-reviewed references. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. There is evidence indicating that limiting warming to 1.5C will make it easier to achieve some of the SDGs (see Section 5.2.3), but we do note that no modelled development pathway in the literature currently achieves all 17 SDGs (see Section 5.5.2). The text has been revised and additional literature added to strengthen the assessment.
52756	17	1	24	34	The adaptation section is too long, and could be condensed, including through the use of graphs. [Iulain Florin VLADU, Germany]	Taken into account. We have substantially revised the text to reduce length and to improve readability.
62832	17	1	24	34	The whole section could be relevant for the AR6 WGII report. What is new since the AR5? What are the specificities for a 1.5°C versus a 2°C warmer world? What are the links with limits to adaptive capacities and residual risks? A closer integration with outcomes of chapters 3 and 4 is needed. [Valérie Masson-Delmotte, France]	Indeed, this is a very valid comment. The authors of this section have attempted to enhance the relevance for a 1.5C warmer world where literature is available, knowing that adaptation occurs in local contexts and not under a global average. Limits to adaptation and residual risks are addressed in Cross-Chapter Box 12, located in 5.2.
24414	17	2	17	2	(equivalent to RCPs 2.6 and 2.4.5) and 2.6–4.8°C (equivalent to RCP 8.5)", RCP 8.5 should be written as adjacent, please check the whole text [Nazan AN, Turkey]	Taken into account, the new text reads as "One indication of how lower temperatures benefit the SDGs is to compare the impacts of IPCC scenarios RCP4.5 (lower emissions) and RCP8.5 (higher emissions) on the SDGs (Ansuategi et al. 2015)."
62826	17	2	17	2	The purpose here is not the comparison between RCP8.5 and RCP2.6 [Valérie Masson-Delmotte, France]	Taken into account. We have retained and updated the comparison to illustrate how lower temperatures allows for greater success in achieving some of the SDGs. In this sense, we consider the example to be 1.5C-relevant, despite not being explicitly focused on 1.5C (and not 2C either).
51476	17	4	17	5	please include Goal 15 on forests and biodiversity loss [Souparna Lahiri, India]	Taken into account. Please see Table 5.1.
13616	17	6	17	6	Delete the symbol [Poot-Delgado Carlos, Mexico]	Accepted.
33336	17	8	17	8	human well-being [Sergio Aquino, Canada]	Taken into account, the sentence was removed from the text.
35398	17	8			On the citation (OECD 2016), there should be a comma between the author and year of publication hence, should be corrected as (OECD, 2016). [Regasa sagni, Ethiopia]	Taken into account, the citation was removed from the text.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28796	17	11	24	34	The current discussion on interrelation of adaptation and the SDGs is very generic and has little to no focus on a 1.5°C world, which is the mandate of this report. If no literature specific to this topic exists, please note this gap and trim the section accordingly in order to provide the general context in a very concise way. You may consider to use a table format for the more general context to save space and improve readability. Within the current discussion, we miss clear references to issues related to biodiversity (SDG 14 and 15), education (SDG4) and economic implications (SDG 8, 9, 11 and 12). With space constraints in mind, we'd still encourage the authors to include to these dimensions, that are very important for sustainable development and inherently linked to climate change adaptation. [Germany]	Taken into account. The text has been substantially revised to reduce length. We note that the assessment for this section is constrained by a lack of 1.5C-specific literature, given that adaptation always occurs in local contexts and not within a global average (see Section 5.7). The author team of this section focused on domains for which the literature provided most solid evidence, not implying that those domains selected and SDGs addressed were more important than others.
32146	17	11	17	38	Discussion of limits to adaptation should be included in this introduction as limits affect how impacts will be felt in various regions, human and natural systems. Currently this is not included which makes it seem that adaptation is able to prevent all impacts of climate change. [Jamaica]	Taken into account. Please see Cross-Chapter Box 12 which discusses limits to adaptation, residual risks and losses in a 1.5C warmer world.
34672	17	11	24	37	The development of section 5.3. Climate Adaptation and Sustainable Development, is very interesting, since it is based fundamentally on the accumulation of ideas that various authors and institutions have raised on the issues of adaptation to climate change and sustainable development, which gives scientific support to this section. We suggest to incorporate into the section the discussion of the ideas proposed as well as the connection between them. [Mexico]	Taken into account and thank you. Please note that we have substantially revised section 5.3 to reduce length and improve readability.
36586	17	11	17	38	Discussion of limits to adaptation should be included in this introduction as limits affect how impacts will be felt in various regions, human and natural systems. Currently this is not included which makes it seem that adaptation is able to prevent all impacts of climate change. [Snialah Mahal, Saint Lucia]	Taken into account. Please see Cross-Chapter Box 12 which discusses limits to adaptation, residual risks and losses in a 1.5C warmer world.
44028	17	11	17	38	Discussion of limits to adaptation should be included in this introduction as limits affect how impacts will be felt in various regions, human and natural systems. Currently this is not included which makes it seem that adaptation is able to prevent all impacts of climate change. [Carl-Friedrich Schleussner, Germany]	Taken into account. Please see Cross-Chapter Box 12 which discusses limits to adaptation, residual risks and losses in a 1.5C warmer world.
45430	17	11	17	27	Is this primer on adaptation really needed here? [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Text shortened for focus.
52778	17	11	38	33	Sections 5.3 and 5.4 could have more how and why sentences, rather than general statements. For example, "evidence shows that education promotes adaptation through/because"...Each section could be about 5 pages each, with another section that combines compare/contrast tables combining adaptation and mitigation. This may be more helpful for decision-makers. [Iulain Florin VLADU, Germany]	Taken into account. We have substantially revised the text to reduce length and improve readability. Where appropriate and possible, we have added additional detail that we hope will be more helpful for decision-makers.
61514	17	11	24	34	How is sustainable being defined? Does it include being sustainable to the impacts of climate change? It seems like an unnecessary construct to separate sustainable development and adaptation. Adaptation is an element of sustainable development. In other words, development that is done in a holistic manner that takes into account the past and anticipates the future, naturally includes adaptation. Development that is not done holistically can be un-sustainable (either over time and/or across geographies). [United States of America]	Indeed - these two concepts are linked. The rationale for this section is to examine literature that deals with both notions as possible entry points, respectively. This is a subtle yet important difference, also reflected in the literature. Please see Glossary for how Sustainable Development and Adaptation are defined in this Special Report. Synergies between SD and adaptation (or balanced two-way interactions) cannot always be assumed. Indeed, there is a large body of literature documenting the complexities inherent in the pursuit of concomitant, though differing, climate and development goals (see Sections 5.3.3 and 5.5.1 to 5.5.3).
33340	17	13	17	13	substantial impact will be felt around the world [Sergio Aquino, Canada]	Taken into account. Sentence rewritten to convey urgency.
33938	17	13	17	14	Again the language here does not communicate clearly the urgency, but rather seems to assume adaptation will be merely 'important.' Given the realities to face, this seems understate the issues at hand. This is especially surprising given the human cost that is outlined in this chapter. [Norway]	Taken into account. Sentence rewritten to convey urgency.
44734	17	13	17	27	Much of this paragraph may not be necessary as it is already stated in Chapter 4. [Penny Urquhart, South Africa]	Taken into account. The introductory paragraph has been revised and cross-referenced with Chapter 4 to reduce overlap.
10632	17	14	17	14	Use of the term 'robust' - what does this mean in IPCC uncertainty language? [Chandni Singh, Myanmar]	Rejected. The use of the term robust is consistent with IPCC guidelines on the use of uncertainty language.
33338	17	14	17	14	human, and natural systems [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
61516	17	16	17	18	Effectiveness of adaptation depends on more than just adaptive capacity; effective governance systems, political will, etc., play a role in either hindering or fostering effective adaptation. [United States of America]	Accepted. Text revised accordingly.
10634	17	18	17	2	Can cross reference to Ch 4 (Sections 4.4) for details on these enabling environments. [Chandni Singh, Myanmar]	Accepted. Text revised to include cross-references to Chapter 4, Sections 4.4.1 to 4.4.5.
10156	17	19	17	19	Refers to financial investment in IPCC which is out of mandate and it is policy perspective [Saudi Arabia]	Taken into account. Section text has been revised and specific reference to financial commitments removed from this paragraph.
51478	17	2	17	27	adaptation and resilience is not possible without the participation and consultation including FPIC of the communities concerned or where adaptation is planned. [Souparna Lahiri, India]	Taken into account. Due to space limitations; some specific details in 5.3.2. Inclusive processes are discussed as enabling conditions for achieving SD, eradicating poverty and reducing inequalities in Section 5.6.3.
61518	17	21	17	27	The measures and options do not include any that address efforts to adapt the energy system and enhance resilience. [United States of America]	Thank you. However, the adaptation of energy systems is beyond the scope of Section 5.3. The text has been substantially revised and reduced in length, with a focus on those sectors for which adaptation literature and implications for sustainable development and the SDGs was most solid. Please see section 5.4 on energy-related options and measures and Chapter 2, Section 2.4.1 for further discussion.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31584	17	22	17	22	Please note that behavior change by education and information could contribute not only to mitigate climate change as pointed out, for example, Grubler et al. (submitted) [Japan]	Thank you. Unfortunately due to space constraints we were not able to include the recommended reference. We have included Grubler et al (2018) in our assessment in Section 5.4.
28798	17	23	2	2	Insurance is listed here as a governance and institutional adaptation option. This categorization might be too narrow. Overall, the assessment of climate risk or weather insurance and other risk finance instruments seems not to be substantially considered in the chapter including their potential to incentivize risk reduction. Please look at the potential of insurance integrated into a comprehensive climate risk management approach for increasing financial and social resilience. [Germany]	Taken into account. Insurance has been deleted as a governance and institutional adaptation option. Please see Chapter 4, Section 4.3.5.2 for further discussion on insurance for adaptation.
31094	17	25	17	27	The references cited here to say the focus on CBA, EBA etc are increasing in prominence do not explicitly analyze the literature or survey broader developments to substantiate this claim. Is this an absolute or relative increase? Are we talking about research or actual policies? [James FORD, Canada]	Taken into account. The text has been removed.
36818	17	25	17	27	Please elaborate or provide examples of "engineering and technological measures" in the statement. [CHI KEUNG TAM, Singapore]	Taken into account. The text has been removed.
61520	17	25	17	27	The sentence says that "engineering and technological measures currently dominate adaptation efforts". Is this referring to efforts taken by donors? People and communities have been adapting for thousands of years, and much of that "bottom-up" approach does not take the form of engineering and technology. If referring to donors, the sentence should make that clear. [United States of America]	Taken into account. The text has been removed.
5350	17	29	17	29	I found the sentence "This section investigates" quite often, it seems like repetitive and monotonous. Consider changing to another sentence with the same meaning [Sulistiyawati Sulistiyawati, Indonesia]	Taken into account. Section rewritten.
33342	17	29	17	3	options and sustainable development [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
61522	17	29	17	29	The word "response" is again strange in association with adaptation. Response indicates reaction to an issue as it is occurring or after it occurred. Adaptation is about preparation. Seems the word "response" should be deleted here (and throughout the chapter unless not referring to adaptation). [United States of America]	Thank you. Text revised to reflect the change in the section. We adopted the term 'adaptation options' and 'adaptation measures' where appropriate.
28800	17	31	17	32	adaptation can assist --> in the following sections also possible negative relations to SD are discussed, therefore not only the positive relation should be mentioned here. [Germany]	The text has been substantially revised to reduce length. The sentence has been deleted .
12660	17	32	17	34	How does development affect adaptive capacity - positively? Negatively? Be specific [United Kingdom (of Great Britain and Northern Ireland)]	Text in the section is revised; some specific aspects discussed in section 5.3.1. Our assessment indicates: "Making sustainable development a priority, and meeting the SDGs, is consistent with efforts to adapt to climate change (very high confidence)" (section 5.3.1).
18702	17	34	17	35	This section assesses how prioritizing sustainable development enhances or impedes climate adaptation efforts. In fact, the chapter and report defends that synergies are possible, desirable and a condition sine qua non. The word "impede" seems to contradict this thesis. We suggest to replace by "This section assesses how prioritizing sustainable development enhances climate adaptation efforts, even if some trade-offs can appear". It is indeed arguable that adaptation would "impede" sustainability. If it happened, it may be considered as "maladaptation". [Andrea TILCHE, Belgium]	Taken into account. However, we have retained our original formulation as the section does indeed discuss interactions between development and adaptation.
45092	17	36	17	36	SGDs should be "SDGs" [ARI Izzet, Turkey]	Accepted. Text revised.
61524	17	36	17	36	Typo: Should be SDGs. [United States of America]	Accepted. Text revised.
44736	17	41	19	45	This section could be tightened and linked to 1.5. [Penny Urquhart, South Africa]	Taken into account. We have substantially revised the text to reduce length. We have been constrained by a lack of 1.5C specific literature (see Section 5.7), but have included in our assessment literature relevant for showing how prioritising SD can enhance or impede adaptation efforts.
45432	17	41	19	45	All good stuff but it's not 1.5 specific - is this AR6 material? [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. We have substantially revised the text to reduce length. We have been constrained by a lack of 1.5C specific literature (see Section 5.7), but have included in our assessment literature relevant for showing how prioritising SD can enhance or impede adaptation efforts.
52784	17	41	17	42	Perhaps this would be better entitled "Climate adaptation in support of sustainable development" [Iulian Florin VLADU, Germany]	Rejected. The section discusses the impact of sustainable development on adaptation
55734	17	41	19	45	This section should include a note that biodiversity, ecosystem services, ecosystem resilience, protection of habitats and ecosystem restoration, through SDGs 14 and 15, can support both climate adaptation and mitigation. See, eg: Popp A, et al. 2014a. Land-use protection for climate change mitigation. Nature Climate Change 4:1095-1098.see als Eppele, C., Garcia Rangel, S., Jenkins, M., & Guth, M. (2016). Managing ecosystems in the context of climate change mitigation: A review of current knowledge and recommendations to support ecosystem-based mitigation actions that look beyond terrestrial forests. Technical Series No.86. Secretariat of the Convention on Biological Diversity, Montreal, 55 pages.) available at: https://www.cbd.int/doc/publications/cbd-ts-86-en.pdf : [David Cooper, Canada]	Thank you. The text has been substantially revised and reduced in length. Unfortunately, due to space constraints, we were not able to include the recommended articles here. Please note however that we have referenced Popp et al. (2014) and Popp et al. (2017) in Section 5.4.
57424	17	41			Lack of coverage of ecosystems adaptation/conservation [Hans Poertner, Germany]	Ecosystem-based adaptation is discussed in Section 5.3.2.
18704	17	43	17	48	Please add the Strategic Plan for Biodiversity and its Aichi Targets https://www.cbd.int/sp/ , which also plays a key role for sustainable development. [Andrea TILCHE, Belgium]	Noted. However, the text has been deleted from the final government draft.
28802	17	43	17	43	Please change "2030 SDGs" into "SDGs" (or "targets of the 2030 Agenda" [Germany]	Noted. '2030' removed. SDGs retained.

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33288	17	43	17	43	is consistent with the effort to adapt [Sergio Aquino, Canada]	Taken into account. Sentence revised.
43260	17	43	19	45	Albeit quite lengthy, this 4-point section is really good. Could possibly benefit by highlighting or adding subtitles the four dimensions for adaptation... or how about make it a Box? [Edward Byers, Austria]	Taken into account. We have substantially revised the text to reduce length and to improve readability.
61526	17	43	17	43	Clarify the rationale for prominence of SDGs in this report, which could be interpreted as policy-prescriptive. Not every country and municipality is using the SDG targets and framework to guide national development planning, but the consistent references to the SDGs presupposes that they are and therefore limits the relevance of the report. SDGs have a specific meaning in international policy and are not interchangeable with sustainable development. It appears that in this chapter they are used as a proxy for the concept of sustainable development. The text and terminology should be carefully examined. [United States of America]	Taken into account. Please see Cross-Chapter Box 4 in Chapter 1 for details.
28804	17	5	17	55	The concept of "adaptive capacity" should be clearly defined, incl. its relation to vulnerability. [Germany]	Taken into account. Please see Glossary.
49058	17	5	18	4	This section should amplify its attention to the synergies between sustainable development and transformational adaptation approaches that address long-term risks for livelihoods and community well-being, particularly in terms of agricultural livelihoods, slow onset climate impacts (including sea-level rise, crop productivity, etc.). [David Waskow, United States of America]	Taken into account. The text for Section 5.3.1 has been revised substantially. Space limitations prevent us from addressing each recommendation in depth. However, we do show that sustainable development enables transformational adaptation in contexts where SD efforts do indeed reduce underlying sources of vulnerability for livelihoods.
44738	17	51	17	55	Key point, could be a key message? [Penny Urquhart, South Africa]	Thank you! Key message has been included in the ES (see third headline statement).
61528	17	51	17	54	This statement captures most of the root causes of vulnerability; however, it leaves out the most critical ones: socio-economic and cultural. There is significant literature detailing socio-economic development issues and cultural norms as the largest contributor to vulnerability and exposure. [United States of America]	Taken into account. We acknowledge the role sustainable development might play in the reduction of vulnerability via efforts that consider local knowledge and cultural contexts (see Sections 5.3.1 and 5.3.3). We also discuss in Section 5.6.5 how the reconsideration of values may act as an important enabling condition for achieving SD, eradicating poverty and reducing inequalities. The AR6 will further assess literature on the main drivers of vulnerability and exposure.
33344	17	52	17	52	prior activities per se (hazard,... [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
61530	17	55	17	55	Transformative adaptation is mentioned here and throughout the report, but it does not seem to be characterized both in terms of what it means (relative to other forms or degrees of adaptation) and why it is necessary in a 1.5°C world. [United States of America]	Taken into account. Please see Glossary for how the term is used in the context of this report. The final draft more clearly explains why transformational adaptation is needed in the context of a 1.5C warmer world (see for instance 5.3.1), also in Ch4, and what it entails.
48160	18	1	18	1	Please check the reference list - there is no corresponding 'IPCC, 2014d' in the list [Sarah Connors, France]	Reference has been removed from the section.
28806	18	2	18	45	The discussion of the "four significant dimensions by which sustainable development can lead to effective adaptation" is greatly appreciated. We suggest to add a figure that will depict these discussion in a very straightforward way. [Germany]	Taken into account. Thank you for your kind comment. We have substantially revised the text to improve readability and to reduce length. We did not feel it necessary to include a figure given the significant reduction in text length (i.e. 2/3 reduction).
36186	18	2	18	4	Four significant dimensions are presented. Investment cost or cost effectiveness also needs to be included. Most adaptation interventions require investment cost. (For eg: Establishment of irrigation infrastructure, coastal protection measures, malaria control measures, etc). [India]	Rejected. This is beyond the scope of our assessment in this Section. Please see Section 4.4.5 for further detail.
16598	18	6	18	55	I find this discussion very aspirational rather than based in reality. As in other places, an adequate discussion on the role of policy and planning is missing. While participation by locals is important, much of the change needs to come from governments - social exclusion is largely due to a policy deficit. [Janet Stanley, Australia]	Noted. This is beyond the scope of our assessment in Section 5.3. For more detailed discussion on the role of governance, see Chapter 4, Section 4.4.1. We also consider governance to be an enabling condition for achieving SD, eradicating poverty and reducing inequalities in a 1.5C warmer world (see Section 5.6.2).
61532	18	6	18	8	This statement should be made clearer. It seems to confuse the terms sustainable development and adaptation midway through the sentence. Are the authors trying to say that sustainable development strategies should aim to reduce poverty, inequality, etc., while also addressing issues of environmental degradation and climate change in order to enable transformational adaptation? As such it is accurate. However, that is not what this statement says. It says that sustainable development shouldn't just focus on stand-alone climate adaptation. Why would sustainable development do that when the primary goal of sustainable development is development itself, not climate change adaptation? [United States of America]	Thank you. This sentence has been removed to better reflect the literature.
48162	18	9	18	9	Mathur et al., 2014a' should be 'Mathur et al., 2014'. The reference is duplicated in the reference list. [Sarah Connors, France]	Editorial - copyedit to be completed prior to publication.
48164	18	9	18	9	Shackleton et al., 2015a' should be 'Shackleton et al., 2015'. The reference is duplicated in the reference list. [Sarah Connors, France]	Editorial - copyedit to be completed prior to publication.
10636	18	14	18	14	Rao et al 2017 (http://www.tandfonline.com/doi/abs/10.1080/17565529.2017.1372266) may be a useful reference to add to Cutter 2016. [Chandni Singh, Myanmar]	Page and line numbers do not correspond with appropriate text. This, the comment could not be addressed.
21566	18	14	18	21	Developing countries may oppose that CC adaptation strategies can also increase poverty and/or inequalities. That is why they expect funding and support from developed countries and international organisations. [Nathalie HILMI, France]	Accepted. Text revised.
43262	18	14	18	21	Byers et al (Fig 4, supplementary info Tables S5 / S6) show that sustainable development (in line with the ambitious SSP1 sustained to 2050) that reduces income inequality, has the potential to reduce the number of climate exposed and vulnerable population (income <\$10/day) by as much as an order of magnitude (comparing SSP1 with SSP3). The difference between SSP1+ 1.5°C and SSP3 with 2°C or 3°C is between 30-40x. [Edward Byers, Austria]	Thank you for the reference. We have included Byers et al. (2018) in our assessments in Sections 5.2 and 5.4.

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61534	18	14	18	21	While the point that ending poverty in its multiple dimensions would likely help societies adapt to climate change, eradicating poverty is not the goal of climate policy. This framing by the authors is overly prescriptive and should be revised heavily. [United States of America]	Taken into account. The sentence has been tuned down by including 'often' and a follow up sentence that makes clear that ending poverty is not sufficient. Both elements are well represented in the literature. The text does not state, in any way, that eradicating poverty is the goal of climate policy.
33290	18	17	18	17	2017) and [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
28808	18	18	18	21	Are there examples of such "complementary measures" and an assessment of what these measures need to address in detail? Please add more information on such measures. [Germany]	Taken into account. The text has been revised and detail added: "However, ending poverty is not sufficient, and the positive outcome as an adaptation strategy depends on whether increased household wealth is actually directed towards risk reduction and management strategies (Nelson et al., 2016), as shown in urban municipalities (Colenbrander et al., 2017; Rasch, 2017) and agrarian communities (Hashemi et al., 2017), and whether finance for adaptation is made available (Section 5.6.1)."
28810	18	19	18	19	Consider to replace "...to ensure that increased household wealth is channelled into risk reduction and risk management strategies enhancing adaptive capacities (Nelson et al 2016)" with "...to increase resilience." This would facilitate understanding and leaves more room for interpretation. Complementary measures should not only ensure that sufficient household wealth is re-directed to disaster risk reduction and management. In the spirit of the Sendai framework, also more public funds need to be dedicated to risk reduction and risk management to save human and economic losses. [Germany]	Taken into account. We have revised the text accordingly: "However, ending poverty is not sufficient, and the positive outcome as an adaptation strategy depends on whether increased household wealth is actually directed towards risk reduction and management strategies (Nelson et al., 2016), as shown in urban municipalities (Colenbrander et al., 2017; Rasch, 2017) and agrarian communities (Hashemi et al., 2017), and whether finance for adaptation is made available (Section 5.6.1)."
51480	18	19	18	2	this argument is debatable and should not be uses since it talks of sharing increasing household wealth. The vulnerable communities need financial support to channel in to risk reduction and managemnet strategies rather than using their own wealth... [Souparna Lahiri, India]	Taken into account. We have revised the text accordingly: "However, ending poverty is not sufficient, and the positive outcome as an adaptation strategy depends on whether increased household wealth is actually directed towards risk reduction and management strategies (Nelson et al., 2016), as shown in urban municipalities (Colenbrander et al., 2017; Rasch, 2017) and agrarian communities (Hashemi et al., 2017), and whether finance for adaptation is made available (Section 5.6.1)."
5352	18	23	18	23	As public health practitioners that interested in climate change, I always asked how to do real action between countries, individuals, communities and organisations,including the local people. I suggest IPCC report address this kind of question by mention chapter or another report that specific to this issue. [Sulistyawati Sulistyawati, Indonesia]	Noted. However, this is beyond the scope of this report. Health will be a standalone chapter in the AR6, WG11.
33160	18	23	18	25	Express participation as a right - it is a procedural right. [Tara Shine, Ireland]	Taken into account. 'Inclusive Processes' are considered as a key enabler for achieving SD, eradicating poverty and reducing inequalities in a 1.5C warmer world (see Section 5.6.3).
48390	18	23	18	25	Participation of local people. I agree that participation of local effective to enabling effective adaptation. But this discussion need to address the presence of local government institution on this matter. Willingness of the local government, expressed in its mid and long local development plants to involve the participation of local people on the adaptation will be pivot points to ensure the participation. [Agus Susatya, Indonesia]	Noted. However, due to space constraints we could not address these themes further. Please see Chapter 4, Section 4.4.1 for further detail on multi-level governance. We also consider 'Inclusive Processes' to be a key enabling condition for achieving SD, poverty eradication and reducing inequalities in a 1.5C warmer world (see Section 5.6.3).
49990	18	23	18	45	Child and adoloscent participation in climate change adaptation actions are important as most climate change projections are used for future risk assessment. However, how we can endorse their participation is the development process and climate adaptation. [Perdinan Perdinan, Indonesia]	Noted. However, due to space constraints we could not address these themes further.
24416	18	25	18	25	Nyantakyi-Frimpong and Bezner-Kerr, 2015)." should be pointed as "et al.", please check the whole text [Nazan AN, Turkey]	Rejected. Reference corresponds to two authors.
33292	18	25	18	25	2015). Sustainable [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
28812	18	26	18	27	It is not entirely clear why sustainable development is "particularly effective in advancing public engagement in planning when it is associated with peace building" and what is meant by this claim. Please specify and provide scientific evidence to this statement. [Germany]	Accepted. This sentence has been removed.
48166	18	27	18	28	Gupta and Arts, 2017b' should be 'Gupta and Arts, 2017'. The reference is duplicated in the reference list. [Sarah Connors, France]	Reference has been removed from the section.
9598	18	28		3	An important point to make linking incorporation of Indigenous knowledge to adaptive capacity - would be useful to expand on this point and provide further examples. This should be especially emphasized to policy makers. But again, there needs to be more context around the process of "incorporating", "including", or "using" Indigenous knowledge as it is dangerous to throw out these recommendations without qualifying that this must be done in a way that respects and upholds UNDRIP and is not tokensitic. [Joanna Petrasek MacDonald, Canada]	Taken into account. Unfortunately due to space constraints we were unable to provide extra detail. Plus, the text was substantially revised to reduce overlap with Chapter 4. Discussion on Indigenous and Local Knowledge is located in Section 5.3.2 (see also cross-chapter references to Cross-Chapter Box 9; Chapter 4, Box 4.3, and Section 4.3.5.5).
51482	18	28	18	29	please include traditional knowledge on forests and biodiversity [Souparna Lahiri, India]	Taken into account. The text has been significantly revised and shortened. Unfortunately, due to space constraints, we are unable to address these themes further.
52314	18	28	18	28	Does 'Indigenous' have a capital 'I', it's inconsistent throughout. [Jason Donev, Canada]	Accepted. Text revised to read 'indigenous'.
62828	18	28	18	28	Harmonized references to local and indigenous knowledge across chapters is needed. SROCC authors will refer to ILK (indigenous and local knowledge). [Valérie Masson-Delmotte, France]	Noted. Harmonised use of Indigenous and local knowledge maintained throughout the report. Also see Glossary.

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28814	18	3	18	35	Recent analyses of behaviour amongst high consumers in China (Wang, 2017), Finland (Ala-Mantila et al., 2016), the United Kingdom (Butler et al., 2016a) and the United States (Dickinson et al., 2016) highlight the complex way in which motivations, values and social norms, together with household structures, opportunities to participate in new practices and household incomes, reinforce, undermine or lock-in behaviours that strengthen climate adaptation over the short-, medium- and long-term (Dilling et al., 2015).: this is one example for a statement from which most readers / target groups of the report will not learn much. Interesting would be what one can learn from these studies regarding the design of participatory processes. [Germany]	Taken into account. The text has been deleted. Elaborating on the particular design of participatory processes is beyond the scope of the assessment in Section 5.2. We do, however, consider 'Inclusive Processes' to be a key enabling condition for achieving SD, poverty eradication and reducing inequalities in a 1.5C warmer world (see Section 5.6.3).
12662	18	31	18	35	How? Be explicit and specific [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been deleted.
13618	18	32	18	32	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
13278	18	34	18	34	Delete the text "or lock-in". [Eleni Kaditi, Austria]	Rejected. The term 'lock in' is contained within the plenary-approved outline for this Special Report (see Ch4). Also see Glossary.
33294	18	34	18	34	undermine, or lock-in [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
33346	18	35	18	35	short, medium, and long-term [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
52772	18	37	18	55	This part is very general, could be made more specific to add value. There is a need to answer why/how. How to SDGs promote adaptation? Evidence could be provided here. Why is education important for climate change? There is a need to explain why. [Iulain Florin VLADU, Germany]	Taken into account. The text has been substantially revised to reduce length. Unfortunately, due to space constraints, we were unable to further address these themes.
61536	18	37	19	9	The discussion of transformative adaptation raises interesting relationships between adaptation strategies and other development priorities. However, the language used to describe these efforts is often overly policy-perspective. Suggest revising this paragraph to clarify that these are potential solutions which have some co-benefits. The text should not prescribe their use. [United States of America]	Taken into account. The text has been substantially revised and policy-prescriptive language has been removed.
4234	18	42	18	5	For example, Nunes et al. (2016) show that gender equality promotes educational attainment, work opportunities and empowerment to be an active citizen and seek better health. Equal access to quality healthcare, sanitation and justice for better women's health as well as reductions of violence and discrimination against women. For achieving this goal it is essential to look at its links with education, employment and health. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you very much for your recommendation. We have substantially revised the text to reduce length. Unfortunately, due to space constraints, we were unable to include this reference.
49914	18	42	18	5	Role of women in climate change has been recognised by the UNFCCC during COP 18 (Doha) also known as the 'Gender COP'. May substantiate this part with more references from other countries. Consider adding about policy making: It is necessary to make women equal partners in policy making for effective climate change mitigation and adaptation. The knowledge capital from their practices needs to be optimised (Reference: Gupta, Himangana (2015). Women and climate change: Linking ground perspectives to the global scenario. Indian Journal of Gender Studies, 22(3), 1–13. DOI: 10.1177/0971521515594278). Case studies are available with MS Swaminathan Research Foundation [Himangana Gupta, India]	Thank you very much for your recommendation. We have substantially revised the text to reduce length. Unfortunately, due to space constraints, we were unable to include this reference.
33162	18	44	18	45	this literature on gender and adaptation should be shared with the authors of chapters 1 and 4 in particular. [Tara Shine, Ireland]	Noted!
48168	18	44	18	45	It is not immediately clear how 'Pearse, 2016' is related to the statement preceding it. The article provides an insight into Australia's environmental movement - it does not appear to discuss climate adaptation measures that take into account gender equality. [Sarah Connors, France]	Accepted. Reference has been removed.
61538	18	49	18	51	How is the Green Climate Fund expected to bridge the knowledge gap in gender and climate research? This is not a specific mandate of the GCF. [United States of America]	Taken into account. The reference and the sentence have been removed from the final government draft.
28816	18	5	18	51	Consider to include "The incorporation of gender aspects in climate policies, programs and projects could help to address the disproportionate risk burden" before "Emerging research suggests the Green Climate Fund may help bridge this gap (Ihalainen et al., 51 2017). Another example that could be highlighted in this context is the Gender Action Plan adopted at COP23. [Germany]	Thank you. However, the sentence has been removed from the final government draft.
4236	18	51	19	1	For example, Nunes et al. (2016) show that quality education impacts on the ability to get out of poverty, finding work, being able to afford appropriate housing, access to drinking water and sanitation, contributing to better health and well-being throughout the life span. On the other hand, health is crucial for high levels of educational attainment for all men, women and children, increasing opportunities for employment and living a meaningful life. For achieving this goal it is important to understand the existing barriers and limits for equal access to education (gender, race, ethnicity). http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
33298	18	53	18	55	Investing in universal education and improving literacy around the world is an effective strategy to strengthen adaptive capacities. [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
6992	18	54	18	54	after "improving literacy" add "strengthening human capital" is therefore... [Flintull Annica Eriksson, Sweden]	Thank you. However, the sentence has been removed from the final government draft.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
4238	19	1	19	5	For example, Nunes et al. (2016) show that more equitable societies can be achieved through integration and coherence for sustainable development. Monitoring and accountability of all other SDGs and targets is needed to address and support improvements in all areas of society. For achieving this goal it is crucial to involve multistakeholders (eg. governments, private sector, civil society) at the local, national and global levels for more open and participative decision-making processes for sustainable development. For the purposes of the framework developed, health and well-being awareness should be embedded in all aspects of goal evaluation and achievement. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. However, these sentences have been removed from the final government draft.
52774	19	1	19	9	This part is very general, could be made more specific to add value. There is a need to answer why/how. [Iulain Florin VLADU, Germany]	Taken into account. The text has been substantially revised to reduce length and to improve specificity.
4240	19	3	19	5	For example, Nunes et al. (2016) show that reducing disparities and inequalities in general and health inequalities in particular can result in reductions in morbidity and mortality. An equal society for all with distributive, redistributive, regulatory and constituent policies (ie, economic, education, social, fiscal, energy, housing, health) enhances access to education, services and work, among other. For achieving this goal it is crucial to take into account the social and economic gradients of health in order to health and well-being. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
24418	19	3	19	8	SGD17 and SDG 17", please check the whole text, are they should be separate or adjacent? [Nazan AN, Turkey]	Accepted. It should be separate. Text revised.
45094	19	3	19	3	SGD17 should be "SDG17" [ARI Izzet, Turkey]	Taken into account. Text has been rewritten and comment is no longer relevant.
57426	19	3	19	3	Should be "SDG17" not SGD [Hans Poertner, Germany]	Taken into account. Text has been rewritten and comment is no longer relevant.
6998	19	4	19	4	after carbon taxation add environmentally-motivated subsidies have been identified... [Flintull Annica Eriksson, Sweden]	Taken into account. Text has been revised.
10158	19	4	19	5	Linking to carbon taxation in order to reduce inequality more evidence is required and is not a mandate of IPCC and it is policy perspective [Saudi Arabia]	Taken into account. We have revised the text substantially to reduce length and improve readability. We have retained the sentence in a revised form: "Mobilisation of climate finance, carbon taxation, and environmentally-motivated subsidies can reduce inequalities (SDG 10), advance climate mitigation and adaptation (Chancel and Picketty, 2015), and be conducive to strengthening and enabling environments for resilience building (Nhamo, 2016; Halonen et al., 2017)." Our mandate is to report and assess the available literature. As such, it is difficult to see how this constitutes being policy prescriptive.
4242	19	5	19	9	For example, Nunes et al. (2016) show that violence, crime and war affect those most vulnerable (eg. children, women and older persons) and poor in society leading to increases in hunger, poverty, ill health. Ensuring peace, reducing all forms of crime, violence, injuries and death rates has positive impacts on the health and well-being of individuals and communities. Implementing sustainable development policies and laws is critical to make societies more just and secure for all. For achieving this goal it is key to ensure individual and community security and safety. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
33348	19	6	19	6	extra space in SDG 16 [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
33350	19	11	19	11	Finally... [Sergio Aquino, Canada]	Taken into account. Text has been revised and sentence now starts with "Forthy...".
49992	19	11	19	45	Information on advancement of regulations on climate change in different countries will help to understand how the SDG goals, for example how SDG 13 is translated in the countries. An example in a box may help. [Perdinan Perdinan, Indonesia]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include country-specific examples.
61540	19	11	19	35	While there are numerous examples of concrete actions that address energy system adaptation and sustainability, this paragraph does not address this aspect. [United States of America]	Taken into account. The text has been substantially revised and shortened. Discussion of energy system adaptation and sustainability could not be discussed here due to space constraints. However, please see Chapter 2, Section 2.4 for detailed discussion on energy system transformation in the context of 1.5C.
4244	19	12	19	13	For example, Nunes et al. (2016) show that improved housing quality, efficient public transport, safe roads, walking and cycling routes can be achieved to enhance the resilience of urban places where individuals live and work. Policies that focus on improving planned urban growth, adequate housing, adequate infrastructures for energy, water and sanitation, access to green spaces in highly populated areas can improve among other objectives air quality, soil quality, water quality, waste management and human health (eg. communicable and non-communicable diseases). For achieving this goal actions need to focus on planned urbanisation, safe drinking water and food security, health systems especially within the urban poor as ways for coordinating health and environmental well-being. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
33352	19	12	19	33	review all SDGs as to spacing [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
13620	19	19	19	2	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
48170	19	19	19	19	Please check to see whether 'Zougmore et al., 2016' is in the reference list. [Sarah Connors, France]	Reference has been removed from the section.

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4246	19	2	19	27	For example, Nunes et al. (2016) show that access to safe drinking water, adequate sanitation and hygiene are essential to the health of individuals and communities, reduces pollution and the risk of communicable and non-communicable diseases (eg, diarrhoeal, vector-borne diseases) and improves housing quality and environmental conditions (eg, reduced water contamination). For achieving this goal it is key to understand the links with poverty, urbanisation, education, water scarcity and water management, as well as hygiene for reducing the health risks of unsafe water and sanitation. As such, patterns of development for water have bearing on health. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
58216	19	24	19	28	The link to energy is missing here: water managment is crucial for ensuring water resource quality...tackling increase in urban wastewater production... Line 27: for instance, wastewater reuse will be necessary as part of climate change adaptation meausre- need to make link that this will require energy and therefore type of energy used could further exacerbate cliamte change (Water-Energy Excerpt from IEA World Energy Outlook 2016). Important to bring out this synergy here. [Andrew Prag, France]	Taken into account. The text has been substantially revised and shortened. Unfortunately, due to space constraints, we have not been able to further address this theme. Please see Section 5.4.2 which examines the sustainable development implications of 1.5C and 2C pathways (and specifically Section 5.4.2.3).
4248	19	3	19	33	For example, Nunes et al. (2016) show that hunger and food scarcity result in malnutrition and ill health. For achieving this goal it is crucial to incorporate the health benefits of sustainable agriculture, food production and distribution. Having access to food improves human health and enables better chances in life, including educational achievement (see SDG 4). As such, patterns of development for food have bearing on health. http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
33302	19	32	18	33	delete '– all strategies that are also those for adapting agricultural and food systems to 33 climate change' [Sergio Aquino, Canada]	Taken into account. Text has been rewritten and comment is no longer relevant.
4250	19	33	19	35	For example, Nunes et al. (2016) show that improved health for all countries, communities, families and individuals has implications for achieving all SDGs. Investing in health is both a necessary and effective way to achieve all the other goals. Health is a major contributor to sustainable development, but much of the economic, social and environmental determinants of health are outside the health sector so there needs to be intersectoral coordinated action. On the other hand, better overall health improves social and economic outcomes. For achieving this goal it is imperative to increase the provision of and access to health services, guarantee and expand UHC for reductions in mortality and morbidity (eg, communicable and non-communicable diseases, mental health). http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the suggested reference. We have substantially revised the section to reduce length and improve specificity. Unfortunately, due to space constraints, we were unable to include your article.
33354	19	34	19	35	delete all after finance as the rest of the phrase is understood already. [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
54174	19	37	19	45	There is no mention here of the important article of the paris agreement that clearly outlines that. See art 7.1 of PA [Ayman Bel Hassan Cherkaoui, Morocco]	Thank you. The text has been substantially revised to reduce length. Unfortunately we could not include your suggestion due to space limitations.
52316	19	38	19	38	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed prior to publication.
12664	19	39	19	4	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The sentence has been deleted.
32994	19	41	19	43	Transformative and context-specific adaptation, takes into consideration root socio-economic and cultural causes of vulnerability, including poverty and existing inequalities, and local specificities including indigenous and traditional knowledge. [Brazil]	The text has been substantially revised. The sentence has been removed from the final government draft.
41008	19	41	19	41	insert comma after the word adaptation [Maria Pia Carazo Ortiz, Germany]	Taken into account. Text revised and comment no longer applies.
21568	19	42	19	42	cultural causes have been developped previously in the text? [Nathalie HILMI, France]	Accepted. Text has been revised to 'local cultural specificities'.
61542	19	44	19	44	The conclusion in this statement is not specific to 1.5°C. The paragraph leading up to this statement constitutes an adaptation pathway that facilitates achievement of the SDGs in any warming scenario, INCLUDING 1.5°C. [United States of America]	Thank you. The sentence has been revised - making it easier to achieve the SDGs. Since authors were asked to provide finings that are 1.5C specific or 1.5C relevant, this statement is defensible as 1.5C relevant, hence in a 1.5C warmer world. No attempt was made to assess the literature whether this statement would also hold true for 2C, 3C or 4C warmer worlds.
5546	19	48	23	29	Many different adaptation sectors and approaches are mentioned, but it is not very clear what the SDG relationship is, and what 1.5 degrees imply (I expect that the difference to 2.0 degrees will be very small due to inertia in the climate system) [Kirsten Halsnaes, Denmark]	Taken into account. The text has been substantially revised to reduce length and improve specificity, particularly with regards to the relation between adaptation measures and SD/SDGs. The assessment was constrained by a lack of literature specific to 1.5C, appreciating that local adaptation synergies and trade-offs with sustainable development don't occur in the context of a global average (see Section 5.7). In turn, the aim of this section was to examine specific adaptation options and their interrelations with SD (synergies and trade-offs), which in turn is relevant for understanding adaptation needs in a 1.5C warmer world.

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36684	19	48	23	29	Section 5.3.2 is interesting and well developed. However synergies and trade-offs (specialy trade-offs) across scales need to be included in a realy clear manner. This has implications on governance, more specifically on the role that sub-national agencies, actors, programmes and policies could have. The report shall include an clear analysis of synergies and trade-offs accross scales [Carmenza Robledo Abad, Switzerland]	Thank you. The text has been substantially revised to reduce length. Unfortunately we could not include your suggestion due to space limitations. Please see Chapter 4, Section 4.4.1 for discussion on multi-level governance.
44740	19	48	23	29	This section could be tightened by shortening it and making stronger links to 1.5 - even if it is about adaptation and SD, it would seem to need to be at least set out in the context of 1.5. It could also be clearer on how it builds on what ch 3 says of the impacts, and what chapter 4 says of the response options. The author team could consider placing greater emphasis on section 5.3.3 than on 5.3.2. [Penny Urquhart, South Africa]	Taken into account. Yes, greater emphasis has been placed now on 5.3.2 and 5.3.3. The text has been substantially revised to reduce length and improve specificity, particularly with regards to the relation between adaptation measures and SD/SDGs. The assessment was constrained by a lack of literature specific to 1.5C, appreciating that local adaptation synergies and trade-offs with sustainable development don't occur in the context of a global average (see Section 5.7). In turn, the aim of this section was to examine specific adaptation options and their interrelations with SD (synergies and trade-offs), which in turn is relevant for understanding adaptation needs in a 1.5C warmer world.
49994	19	48	21	54	The discussion on the trade-off is interesting. Can the authors add about how to utilize the trade-off analysis for adaptation assessment? [Perdinan Perdinan, Indonesia]	Noted. However, this is beyond the scope of our analysis.
61544	19	49	24	34	The discussion in this section is not specifically relevant to 1.5°C and is therefore outside the scope of the report. It should be largely removed (to be taken up later in the AR6 possibly) or revised to provide information that is directly relevant to the scope of the report. [United States of America]	Taken into account. The text has been substantially revised to reduce length and improve specificity, particularly with regards to the relation between adaptation measures and SD/SDGs. The assessment was constrained by a lack of literature specific to 1.5C, appreciating that local adaptation synergies and trade-offs with sustainable development don't occur in the context of a global average (see Section 5.7). In turn, the aim of this section was to examine specific adaptation options and their interrelations with SD (synergies and trade-offs), as mandated in the plenary approved outline, which in turn is relevant for understanding adaptation needs in a 1.5C warmer world.
32998	19	5	23	29	Although it is mentioned diffusely in the chapter, it might be important to highlight the impacts of climate change that threaten food security in terms of production and access to healthy and diverse diets. Malnutrition, food shortage and harms in production are some of the effects that could raise the number of undernourished people and increase hunger. It is not only a matter of increasing production, but also a matter of adaptation strategies, enhancing technical knowledge, implementing resilient agricultural practices, and developing a whole protection system against the consequences of climate change on food access and production, especially on vulnerable areas, and those already known as "food deserts". [Brazil]	Taken into account. This is largely beyond the remit of this section. Please do see Chapter 3, Cross-Chapter Box 6 for discussion on food security.
33356	19	5	19	5	There are short, medium, and long term synergies.... [Sergio Aquino, Canada]	Accepted. Text revised.
52764	19	5	23	29	The discussion on trade-offs, in general, could be placed after the discussion on pathways. This would make more sense logically, and the storyline would be more clear [Iulain Florin VLADU, Germany]	Taken into account. We have retained the SOD structure as logically it makes sense to move from a relatively 'static' understanding of Adaptation-SD interactions towards a more dynamic perspective as assessed in Section 5.3.3.
3062	2	1	2	1	AR5for' SPACING 'AR5 for' [Robert Shapiro, United States of America]	Taken into account. Text revised and comment no longer applies.
33362	2	1	2	1	AR5 for details [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
9600	2	7		9	Is it possible to include here examples of ecosystem-based and cultural-based adaptation among Indigenous peoples? [Joanna Petrasek MacDonald, Canada]	Taken into account. The text has been substantially revised and shortened. The specific sentence has been removed from the final government draft. Please see Cross-Chapter Box 9 for further discussion.
32996	2	7	2	9	Most robust evidence of positive synergies stems from the agricultural and health sectors, and from ecosystem-based and cultural-based adaptation particularly among indigenous and traditional peoples. [Brazil]	The text has been substantially revised and shortened. The specific sentence has been removed from the final government draft. .
33358	2	7	2	7	delete 'across many adaptation measures' [Sergio Aquino, Canada]	Taken into account. Sentence rewritten.
33364	2	9	2	9	adaptations [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
18708	2	1	2	12	...and SDG2 (eliminating hunger)... is mentioned twice in the same sentence [Andrea TILCHE, Belgium]	Accepted. Text revised.
48392	2	1	2	15	Agriculture adaptation. The impacts of warmed climates add uncertainty on agriculture sector in tropical countries. Meanwhile farmers appear do not have sufficient knowledge to make proper adaptation to the very dynamic climatical changes. Discussion of agriculture adaptation should also address the role of agriculture extension officers (AEO). In rural community, The immediate people that has sufficient knowledge on climate change and its related to agriculture to whom the farmers to seek advices are AEO. AEO at least will help to reduce the uncertainty and risk faced by farmers, and bridge between agriculture policy on adaptation and agriculture practices. [Agus Susatya, Indonesia]	Noted. Institutional and other aspects are mentioned in different parts of 5.3; space constraints limit addition of details.
49654	2	1	2	12	between SDG2 and SDG2? It should, I guess, be SDG1 and 2. [Karlheinz ERB, Austria]	Rejected. SDG 2 was repeated.
55894	2	1	2	12	SDG2 is mentioned twice [Debora Ley, Guatemala]	Accepted. Text revised.
33304	2	11	2	11	livestock, and food systems [Sergio Aquino, Canada]	Accepted. Text revised.
13622	2	12	2	12	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
41010	2	12	2	12	Delete "and SDG2 (eliminating hunger)" [Maria Pia Carazo Ortiz, Germany]	Accepted. Text revised.
43112	2	12	2	12	The phrase 'and SDG2 (eliminating hunger)' seems to be redundant, hence may be deleted. [Muhammad Mohsin IQBAL, Pakistan]	Accepted. Text has been edited.

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48172	2	12	2	12	There are two 'Rockstrom et al., 2017' in the reference list. Please specify which one this statement refers to. [Sarah Connors, France]	Reference checked and finalised.
61546	2	12	2	14	Suggest adding a caveat here to clarify that the evidence pertains to farmers in Pakistan. [United States of America]	Thank you. More references from other parts of the world added to illustrate the point.
33366	2	14	2	14	poverty (Ali... [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
41012	2	14	2	14	I suppose the author means "report strong positive returns" (not strongly) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text revised.
7050	2	18	2	25	Declines in phenotypic, genetic materials and diverse 'goods and services' [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	Rejected: Not addressed as comment and its applicability to the section not clear.
28818	2	2	2	36	The assessment of the role of insurance instruments is contradictory in these two paragraphs. While the first paragraph mentions the positive role for protecting incomes and livelihoods, the second paragraph points to the tendency to overlook the poor. Further differentiation is necessary to make clear which characteristics of insurance instruments advance synergies with adaptation (e.g. specified target group for schemes funded under InsuResilience) and which characteristics may not (e.g. crop insurance incentivizing monoculture). Additionally, the current draft does not represent a balanced account of the literature, which does provide evidence on positive effects of insurance on resilience measured by production and investment outcomes (e.g. Karlan et al., QJE, 2014, doi: 10.1093/qje/qju002), as well as recovery to a more limited extent (e.g. Bertram-Huemmer and Krahnert, AJAE 2017, doi: 10.1093/ajae/aax069). While these important empirical studies (and references cited therein) are not taken into account, much space is devoted to a single paper (Müller et al.) that merely focuses on potentially adverse ecological outcomes without presenting any empirical evidence of such effects. While it is important to address such second-order effects on ecological outcomes by complementary policy designs, they do not serve as an example for increasing inequality as implied by the current draft. Given the focus of more recent insurance schemes on channelling pay-outs to the poor (e.g. the rural resilience initiative R4), backed up by pre-agreed contingency plans (e.g. in the case of the African Risk Capacity), the statement about the risks to inequality in its generality is not substantiated. Given that the topic is high on the political agenda, such general statements need to be avoided. See, e.g. Bertram-Huemmer and Kraehnert, 2017 and Yuzva et al. 2018, doi: 10.1016/j.jidrr.2018.01.001 for a more balanced literature review. [Germany]	Text revised; reference added.
10638	2	21	2	26	Useful references for CSA: Taylor, M. (2017). Climate-smart agriculture: what is it good for?. The Journal of Peasant Studies, 1-19. AND Chandra, A., McNamara, K. E., & Dargusch, P. (2017). Climate-smart agriculture: perspectives and framings. Climate Policy, 1-16. [Chandni Singh, Myanmar]	Thank you. Relevant reference added.
51484	2	21	2	21	Climate smart agriculture is a misnomer and has emerged to be debatable concerned mostly with techno fixes and GMO seeds. This needs to be rephrased and can be called as close to " climate resilient agriculture or climate adaptive agriculture. [Souparna Lahiri, India]	Text is written to reflect literature assessed; text and references revised.
56846	2	21	2	26	The following critical review of the concept of CSA may be relevant here: Arakelyan, I., Moran, D., & Wreford, A. (2017). Climate Smart Agriculture. In F. Nunan (ed.) Making Climate Compatible Development Happen, Routledge [John Morton, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. Reference added.
39066	2	24	2	26	These lines bring out the fact that men find it easier to use technology and hence CSA might benefit men more, another important aspect to be noted here is access to technology is important and once access is given then behaviour change is important. Giving training in technology adoption is equally important [Anish Paul Antony, United States of America]	Text in section revised.
36188	2	24	2	26	The following may be added: While some scholars see CSA as an excellent option for adaptation, others are concerned that climate-smart agriculture is biased to technological solutions, and it may not be gender sensitive and does not significantly address issues of scale in agricultural production Reference- 1. Campbell, Bruce M., et al. "Sustainable intensification: What is its role in climate smart agriculture?." Current Opinion in Environmental Sustainability 8 (2014): 39-43. 2. Newell, Peter, and Olivia Taylor. "Contested landscapes: the global political economy of climate-smart agriculture." The Journal of Peasant Studies 45.1 (2018): 108-129. [India]	Text in the section has been edited and references added as deemed most relevant; unfortunately space constraints limit more additions.
36190	2	26	2	26	Add - In addition, small and marginal farmers face additional adaptations costs (Naresh Kumar et al., 2016); Reference: Naresh Kumar S., Anuja, Md. Rashid, S.K. Bandyopadhyay, Rabindra Padaria and Manoj Khanna 2016 Adaptation of farming community to climatic risk: does adaptation cost for sustaining agricultural profitability? Current Science, 110 (10): 1216-1224. [India]	Text in the section has been edited and references added as deemed most relevant; unfortunately space constraints impose limits.
40868	2	26	2	26	In addition, small and marginal farmers face additional adaptations costs (Naresh Kumar et al., 2016); ref Reference: Naresh Kumar S., Anuja, Md. Rashid, S.K. Bandyopadhyay, Rabindra Padaria and Manoj Khanna 2016 Adaptation of farming community to climatic risk: does adaptation cost for sustaining agricultural profitability? Current Science, 110 (10): 1216-1224. [NARESH KUMAR SOORA, India]	Text in the section has been edited and references added as deemed most relevant; unfortunately space constraints limit more additions.

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50336	2	27	2	36	You might wish to mention that fertilizer production, if not decarbonized, is a highly GHG intense in production. Sources: Bazzanella, A.M., Ausfelder, F., 2017. Technology study: Low carbon energy and feedstock for the European Chemical Industry [WWW Document]. Dechema: Gesellschaft für Chemische Technik und Biotechnologie e.V. URL https://dechema.de/dechema_media/Technology_study_Low_carbon_energy_and_feedstock_for_the_European_chemical_industry-p-20002750.pdf ; Philibert, C., 2017. Renewable Energy for Industry: From Green Energy to Green Materials and Fuels [WWW Document]. URL https://www.iea.org/publications/insights/insightpublications/Renewable_Energy_for_Industry.pdf ; A review of technology and policy deep decarbonization pathway options for making energy intensive industry production consistent with the Paris Agreement ". Under review with the Journal of Cleaner Production– October 2017. Bataille, C., Ahman, M., Fischedick, M., Lechtenböhmer, S., Neuhoﬀ, K., Nilsson L.J., Solano-Rodriguez, B., Denis-Ryan, A., Steibert, S., Waisman, H., Sartor, O., and Rahbar, S. [Christopher Bataille, Canada]	Section has been revised in general; space constraints limit addition of specific details.
61548	2	27	2	3	The paragraph starts with "Agriculture response options" and mentions increased use of fertilizer/pesticides and expanding crop land. The third sentence starts with "Other adaptations". So, is the paragraph saying the the first two sentences represent adaptation options? Far more likely the approaches taken in the first two sentences would be taken for the purpose of increasing productivity, not in the name of adaptation. If these are maintained, identify the climate impacts these practices address. [United States of America]	Text in the section has been edited and references added as deemed most relevant; unfortunately space constraints limit more additions.
31098	2	3	2	32	Also see chapter 4 analysis of insurance which is consistent with the conclusion here but also notes new insurance products which may have potential to address some of the equity concerns [James FORD, Canada]	Noted. Cross-reference to chapter 4 added in the context of insurance/finance discussion.
52806	2	3	2	36	The G7 has called for insurance for the poor, perhaps this can be mentioned. [Iulain Florin VLADU, Germany]	the text has made the link between agricultural insurance and the poor; space constraints limit further elaboration.
36678	2	32	2	32	For example, agricultural insurance, can have maladaptive outcomes --> this is a too general statement. Maladaptive outcomes for when and under which circumstances? [Carmenza Robledo Abad, Switzerland]	Text has been revised; going into specific details limited by space constraints.
33306	2	33	2	33	There is mixed evidence...In the case where it increases the usage [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
41014	2	33	2	35	Sentence is not clear [Maria Pia Carazo Ortiz, Germany]	Accepted. Text revised.
33370	2	34	2	34	pesticide use, the increase of agrochemicals has negative effects on ground water... [Sergio Aquino, Canada]	Taken into account. Text revised for clarity.
43114	2	35	2	35	SDG15 should be in parenthesis, on the pattern of (SDG6) and (SDG3). [Muhammad Mohsin IQBAL, Pakistan]	Taken into account. Sentence revised and no longer mentions specific SDGs.
13624	2	36	2	36	Review the format of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
33360	2	38	2	38	increae the workload for women. Changes in crop mix.... [Sergio Aquino, Canada]	Taken into account. Text has been revised.
33372	2	38	2	39	especially for women. Changes in crop mix can result.... [Sergio Aquino, Canada]	Taken into account. Text has been revised.
36680	2	38	2	4	The contrary can be true as well. The important issue here is to clarify under which circumstances and at which scales happen the one or the other [Carmenza Robledo Abad, Switzerland]	Text has been revised; going into specific details limited by space constraints.
57428	2	4	2	4	Specify "cradle-to-grave evaluations" [Hans Poertner, Germany]	Specific text removed; section revised to improve clarity in general.
10640	2	42	2	44	See paper Gajjar et al 2018 Tracing back to move ahead: A review of development pathways that constrain adaptation futures, Clim & Dev where the need to reconcile adaptation agendas with past development trajectories are discussed. The exampe from India is from regions that are already facing 1.2deg temp increases. [Chandni Singh, Myanmar]	Text revised in section in general for clarity; unfortunately space constraints limit too many details.
32890	2	42	2	42	• Section 5.3.2., p.20, line 42 and section 5.6, p. 43: these two sentences use the old terminology of 'transformational' while in the executive summary and in section 5.3.1., in my opinion the more correct terminology of 'transformative' adaptation is use. Consider use transformative instead of transformational (as per Tàbara, Jäger et al. 2018). [J. David Tabara, Spain]	Text revised.
33308	2	42	2	42	Agricultural adaptation [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
41016	2	43	2	43	insert comma after word 'environments' [Maria Pia Carazo Ortiz, Germany]	Taken into account. Text revised and comment no longer applies.
12666	2	46	2	5	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Text revised; relevant referencing done.
5354	2	47	2	47	What kind of early warning system? And how to address the cost and human resource problem? [Sulistiyawati Sulistiyawati, Indonesia]	Text revised; relevant referencing done.
41018	2	48	2	48	should read: "during heat waves and other extreme wheather events, as well as during..." [Maria Pia Carazo Ortiz, Germany]	Taken into account. Text revised and that part of the sentence has been removed.
43116	2	48	2	48	Please see if the word 'and' in 'extreme and weather' is redundant. If so, may be deleted. [Muhammad Mohsin IQBAL, Pakistan]	Accepted - edited.
3064	21	1	21	1	use air conditioning' should be 'use of air conditioning' [Robert Shapiro, United States of America]	Accepted. Text revised.

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31586	21	1	21	3	Although various energy sources (e.g. biomass, fossil fuels and electricity) are available for space heating, only limited energy sources (i.e. electricity and gas) are available for space cooling. In addition, energy efficiency for space cooling is better than that for space heating. Therefore, the increase of energy demand for space cooling could become smaller than the decrease of energy demand for space heating by overall global warming. It should be careful to not specially stress the increase of using air conditioning by heat stress but to discuss overall change. Furthermore, regional difference is large. Reference: IEA ETP2017?Gi, K., Sano, F., Hayashi, A., Tomoda, T., Akimoto, K. (2018). A global analysis of residential heating and cooling service demand and cost-effective energy consumption under different climate change scenarios up to 2050. Mitigation and Adaptation Strategies for Global Change, 23:51-79. doi:10.1007/s11027-016-9728-6 [Japan]	Thank you. Text revised.
41020	21	1	21	1	should read "increased use of air conditioning" [Maria Pia Carazo Ortiz, Germany]	Accepted. Text revised.
33310	21	7	21	7	synergies or trade-offs [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
36682	21	7	21	39	Very good paragraph! They uses a balanced way to addressing synergies and trade-offs also including time constraints in the assessment (lines 7-16). Well done! [Carmenza Robledo Abad, Switzerland]	Thank you.
61550	21	1	21	16	This text is extremely confusing. The last sentence in particular is unclear. More of what? Not sufficient for what? Please clarify. [United States of America]	Text edited.
61552	21	11	21	11	Provide one of these "many examples". [United States of America]	Text edited.
21570	21	12	21	13	role of insurance and health care are maybe needed to be included here. [Nathalie HILMI, France]	Noted. Chapter 4 discusses insurance. Discussion limited here to synergies and trade-offs as can be accommodated within space constraints.
31100	21	12	2	12	Woodward et al is an old ref. I have a paper on this for the Arctic (Ford et al 2014 in AJPH). Lancet Commission reports also state this (Watts et al 2015) [James FORD, Canada]	Reference added.
33374	21	14	21	14	Floods can lead to.... [Sergio Aquino, Canada]	Taken into account. Text revised and sentence has been removed, comment no longer applies.
7052	21	18	2	25	Altered precipitation [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Unclear.
18710	21	18	21	3	Ecosystem-based adaptation is a key element that, in our view, merits to be included in the SPM. [Andrea TILCHE, Belgium]	Noted. Thank you.
61554	21	18	21	3	Ecosystem-based adaptation should be defined, particularly as it is often mischaracterized. [United States of America]	Noted. Unfortunately space limitations constrain getting into definitions in the text.
61556	21	18	21	39	Worth highlighting that Indigenous knowledge can be important to an ecosystem-based adaptation approach, in addition to local knowledge. [United States of America]	Text revised.
16600	21	19	21	19	There is little evidence that fire management is currently assisting ecosystem-based adaptation - indeed it is commonly leading to the destruction of ecosystems. [Janet Stanley, Australia]	Text revised in accordance with literature assessed within given space constraints.
51486	21	19	21	19	please do not use the term afforestation at random as this term is misleading and promotes monoculture plantations. Instead the term reforestation may be used and currently there are fresh thinking on reforestation and many programmes are carried out through reforestation [Souparna Lahiri, India]	Text revised in section.
52318	21	22	21	22	Please explain why mangrove forests are of particular importance. [Jason Donev, Canada]	Taken into account. Sentence has been revised to convey that mangrove forests are just one example.
57430	21	25	21	25	"the poor" is very generalised and it should be specified why EBA is more accessed by "them" [Hans Poertner, Germany]	Noted. Citations provided; space constraints limit further details.
41022	21	26	21	27	should read: "As noted in the AR5, improving ecosystem services brings biodiversity, hazard reduction and water protection co-benefits, as well as economic benefits such as ecotourism." [Maria Pia Carazo Ortiz, Germany]	Taken into account. Sentence has been removed and comment no longer applies.
47008	21	29	21	29	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account. Sentence has been removed and comment no longer applies.
9642	21	32	21	34	My previous comments are well incorporated in the following sentence. "As EBA has become mainstreamed into adaptation, more evaluations of synergies and trade-offs with sustainable development and agreements such as the Convention on Biological Diversity are available (Conservation International, 2016; Huq et al., 2017; Morita and Matsumoto, 2015; Szabo et al., 2015)". [Morita Kanako, Japan]	Noted.
33376	21	33	21	33	extra space: development and [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
61558	21	35	21	37	Throughout this chapter the word "tradeoffs" is often used when what seems to be meant is "issues to consider". This sentence provides an example of that. Tradeoff means "a balancing of factors all of which are not attainable at the same time". This sentence implies that EBA (or EBA mainstreamed in adaptation) cannot be attainable at the same time as "respect for local knowledge". That is not the case, as it says in the previous paragraph, "EBA ... can be inclusive of local knowledge, ...". Suggest a closer look at the word tradeoff throughout the chapter. [United States of America]	Text has been edited for clarity throughout section.
13626	21	38	21	39	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
48174	21	39	21	39	Please check to see whether 'Chan et al., 2017' is in the reference list. [Sarah Connors, France]	Reference checked and finalised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32148	21	41	21	54	Include discussion of limits to coastal adaptation. For SIDS and states with extensive coastal regions, coastal adaptation has limits and not all areas of land will be able to be protected, either via hard or soft adaptation measures, due to lack of feasibility both financially and logistically. This will thus lead to loss and damage which has implications on sustainable development. Relocation of coastal communities has negative implications for SDG 8- decent work and economic growth if there is loss of livelihoods associated with movement away from coastal areas. [Jamaica]	Text edited. Cross referencing done for SIDS.
36588	21	41	21	54	Include discussion of limits to coastal adaptation. For SIDS and states with extensive coastal regions, coastal adaptation has limits and not all areas of land will be able to be protected, either via hard or soft adaptation measures, due to lack of feasibility both financially and logistically. This will thus lead to loss and damage which has implications on sustainable development. Relocation of coastal communities has negative implications for SDG 8- decent work and economic growth if there is loss of livelihoods associated with movement away from coastal areas. [Snialah Mahal, Saint Lucia]	Text edited. Cross referencing done for SIDS.
38440	21	41	21	54	Include discussion of limits to coastal adaptation. For SIDS and states with extensive coastal regions, coastal adaptation has limits and not all areas of land will be able to be protected, either via hard or soft adaptation measures, due to lack of feasibility both financially and logistically. This will thus lead to loss and damage which has implications on sustainable development. Relocation of coastal communities has negative implications for SDG 8- decent work and economic growth if there is loss of livelihoods associated with movement away from coastal areas. [Grenada]	Text edited. Cross referencing done for SIDS.
44030	21	41	21	54	Here there must be discussion of limits to coastal adaptation. Particularly for SIDS and states with extensive coastal regions, coastal adaptation has its limits and not all areas of land will be able to be protected, either via hard or soft adaptation measures, due to lack of feasibility both financially and logistically. This will thus lead to loss and damage which has implications on sustainable development. Also, relocation of coastal communities has negative implications for SDG 8- decent work and economic growth if there is loss of livelihoods associated with movement away from coastal areas. [Carl-Friedrich Schleussner, Germany]	Text edited. Cross referencing done for SIDS.
48394	21	41	21	54	Coastal adaptation. It should also address also ecological approach on coastal adaptation, such as restoration of mangrove ecosystem. Not only it is cheaper, but also provides economic benefits for coastal communities, and more sustainable, technological and social acceptable [Agus Susatya, Indonesia]	Space constraints. Mangroves have been mentioned in the section.
57432	21	41	22	1	Very unclear and unspecific method of referencing in this section. [Hans Poertner, Germany]	Taken into account. This paragraph has been significantly rewritten and referencing revised for clarity.
41024	21	43	21	43	comma after '2°C' - should read "(1.5°C and 2°C)," [Maria Pia Carazo Ortiz, Germany]	Taken into account. Text revised and comment no longer applies.
12668	21	45	21	5	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Text revised.
13628	21	45	21	45	Space [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
41026	21	45	21	45	insert space before 'Adaptation' [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
52320	21	45	21	45	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed prior to publication.
6996	21	47	21	47	Replace " Such so called" with These hard adaptation... [Flintull Annica Eriksson, Sweden]	Taken into account. Sentence has been removed and comment no longer applies.
41028	21	47	21	47	so-called (insert -) [Maria Pia Carazo Ortiz, Germany]	Taken into account. Sentence has been removed and comment no longer applies.
31102	21	48	21	48	hard adaptations can also affect amenity value of coastal systems [James FORD, Canada]	Space constraints limit getting into specifics here; cross referencing done in relevant parts.
12670	22	3	22	29	This section needs editing for both content and clarity. There are some sweeping statements and clumsy language around community-based adaptation. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been substantially revised to reduce length and improve readability.
31104	22	3	22	15	A new paper here might be of interest, and documents on the ground perspectives of CBA among communities in Uganda, Peru & Arctic: Ford, J., Sherman, M., Berrang-Ford, L., Carcamo, C., Harper, S., Llanos, A., Lwasa, S., Namanya, D., Marcello, T., Edge., V. Preparing for the health impacts of climate change in Indigenous communities: The role of community based adaptation. Global Environmental Change. Ensor et al (2018) also have an interesting paper just out in Climate & Development [James FORD, Canada]	Noted. Reference Ford et al. 2018 added and updated reference on Ensor et al. 2018
50338	22	3	2	29	Not critical, but I was curious to not see reference to Ostrom's body of work on community/common pool resource management mentioned as an adaptation strategy for communities and ecosystems under climate stress. E.g. Ostrom, Elinor. Governing the commons. Cambridge university press, 2015. One of your Lead or Contributing authors could probably offer a better referencing suggestion. [Christopher Bataille, Canada]	The text has been substantially revised to reduce length. Due to space limitations, we unfortunately could not further discuss your suggestion.
51488	22	3	22	45	Community adaptation or community controlled resilience or adaptation initiatives should be facilitated where the community has the governance rights, tenurial rights and use traditional knowledge and wisdom. If there are legal and policy deficits, those needs to be addressed at the national level. Currently, Global Forest Coalition, an international coalition of NGOs and IPOs defending social justice and the rights of forest peoples, have undertaken a project titled "Community Conservation Resilience Initiative" through participatory site based assessments by communities in 22 countries. Their summary and full country reports can be consulted for more insights and information. The reports and associated resources can be accessed at http://globalforestcoalition.org/resources/supporting-community-conservation/ [Souparna Lahiri, India]	Thank you for your suggested reference. The text has been substantially revised and reduced in length. Due to space constraints, we were unable to include your suggested reference.
13630	22	8	22	8	Missing n dash [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.

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41034	22	9	22	9	community-based (insert -) [Maria Pia Carazo Ortiz, Germany]	Taken into account. This paragraph has been revised and community-based is used once with (-).
41030	22	1	22	1	insert comma after 'security', delete 'at the local level' (it is obvious) [Maria Pia Carazo Ortiz, Germany]	Taken into account. Text revised and comment no longer applies.
41032	22	11	22	13	should read: "The challenges are mainstreaming community-based adaptation into national and local planning, ..." [Maria Pia Carazo Ortiz, Germany]	Taken into account. Text revised and comment no longer applies.
33312	22	17	22	17	Community based adaptation grounded on community values [Sergio Aquino, Canada]	Taken into account. Text revised and comment no longer applies.
44032	22	17	22	19	These factors also affect the response options that are available for community based adaptation [Carl-Friedrich Schleussner, Germany]	Text has been omitted due to page limit.
7054	22	18	21	25	Bio diversity loss and eco system functions damaged [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Text has been revised.
13632	22	19	22	2	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
61560	22	2	22	2	Adaptation responses induced by climate change interventions: It is unclear what is meant by this. Without understanding this, it is unclear why there is a discussion of biofuel use in this section. [United States of America]	Text has been omitted due to page limit.
13634	22	24	22	24	The year is missing Chambwera et al [Poot-Delgado Carlos, Mexico]	Reference has been removed from the section.
41036	22	25	22	26	should read: "Moving flood defenses inland as part of a managed realignment project which results in taking agricultural land out of production, is another example of an adaptation measure that affects farmers' livelihoods..." [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
3066	22	26	22	26	in which' should be 'which' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication.
33314	22	26	22	26	out of production affecting farmers' livelihoods... [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
43118	22	26	22	26	The word 'in' before 'which' is redundant. May be deleted. [Muhammad Mohsin IQBAL, Pakistan]	Editorial - copyedit to be completed prior to publication.
43120	22	28	22	28	leads (instead of lead) and reduces (instead of reduce). [Muhammad Mohsin IQBAL, Pakistan]	Editorial - copyedit to be completed prior to publication.
1308	22	31		45	The sub-section 'Traditional knowledge-based adaptation' is exceptionally rich in references with 26 references in just 15 lines. Perhaps a box is more appropriate to give justice to the rich literature under this adaptation option. [Karen Olsen, Denmark]	Thank you. The importance of indigenous knowledge-based adaptation is referred in the Cross-Chapter Box 9.
18712	22	31		45	The sub-section 'Traditional knowledge-based adaptation' is exceptionally rich in references with 26 references in just 15 lines. Perhaps a box is more appropriate to give justice to the rich literature under this adaptation option. This section should also be checked for consistency (and elimination of duplication) with the sections of Ch5 covering traditional knowledge. [Andrea TILCHE, Belgium]	Thank you. The importance of indigenous knowledge-based adaptation is referred in the Cross-Chapter Box 9.
31106	22	31	22	35	Pearce et al (2015) in Arctic is an excellent ref to have in here as it really teases out the link between TK and adaptation. [James FORD, Canada]	Noted. Pearce et al. 2015 added.
31108	22	31	22	35	Note here and elsewhere: in chapter 4 we use the term "Indigenous knowledge". Our rationale is that the term "traditional" implies that knowledge is static, unchanging, and outdated, undervaluing its adaptive and evolving nature [James FORD, Canada]	Accepted.
57434	22	31	22	45	This section should be specific whether it addresses only traditional knowledge of indigenous communities, or traditional knowledge in general (i.e. also in modern societies, local environmental knowledge, etc.). For sustainable and resilient development pathways also existing traditional knowledge in modern/Western societies should be considered. [Hans Poertner, Germany]	Noted. Addressed in CBA and Indigenous knowledge-based adaptation text.
62830	22	31	22	31	Harmonized references to local and indigenous knowledge across chapters is needed. SROCC authors will refer to ILK (indigenous and local knowledge). [Valérie Masson-Delmotte, France]	Noted. Harmonised use of Indigenous and local knowledge maintained throughout the report. Also see Glossary. This section has been removed from the final government draft.
13636	22	33	22	34	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
48176	22	33	22	33	Please check to see whether 'Whyte, 2015' is in the reference list. [Sarah Connors, France]	Reference has been removed from the section.
48178	22	33	22	34	Please check to see whether 'CTKW, 2015' is in the reference list. [Sarah Connors, France]	Reference has been removed from the section.
41038	22	38	22	42	sentence not clear. Is the author saying that multiple forms of knowledge should be incorporated to complement adaptation processes because traditional knowledge is diminishing? That is how one understands it. [Maria Pia Carazo Ortiz, Germany]	Taken into account. Paragraph has been significantly rewritten and this sentence has been removed.
13638	22	42	22	42	Missing n dash [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
28820	22	44	22	45	As the report highlights, mitigation and adaptation measures may have unintended negative impacts on the livelihoods of people, such as on the socio-economic situation of land-poor farmers. Implementing agencies , bilateral and multilateral financial institutions and multilateral climate financing initiatives (e.g. Green Climate Fund) need to have effective and robust safeguard systems as well complaints and redress mechanisms in place to avoid and/or mitigate such negative impacts. Please reflect this in the text and refer, for example, to Horstmann and Hein, 2017, https://www.die-gdi.de/uploads/media/Study_96.pdf ; Finley-Brook, M., & Thomas, C., 2011, https://doi.org/10.1080/00045608.2011.568873 ; Schade, J., & Obergassel, W., 2014, http://dx.doi.org/10.1080/09557571.2014.961407 [Germany]	The issue is addressed in other sections in this Chapter.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10642	22	47	23	7	This section on 'migration as adaptation' can link with recent literature on migration and wellbeing and when migration is not an adaptation necessarily. See Schwan, S., and X. Yu, 2017: Social protection as a strategy to address climate-induced migration. Int. J. Clim. Chang. Strateg. Manag., doi:10.1108/JCCSM-01-2017-0019. AND Ober, K., and P. Sakdapolrak, 2017: How do social practices shape policy? Analysing the field of "migration as adaptation" with Bourdieu's "Theory of Practice." Geogr. J., doi:10.1111/geoj.12225. http://doi.wiley.com/10.1111/geoj.12225 . [Chandni Singh, Myanmar]	Noted. References suggested added.
36982	22	47	23	7	This brief discussion of migration excludes the distinctions between slow and rapid onset dislocation, and the indirect impact of climate change impacts on natural resources eroding the viability of certain livelihoods. A fuller discussion would also mention the interlinkages that connect sending and receiving areas (e.g. remittances, education) as families diversify the opportunities they seek across different places. Finally, I encourage some consideration of how these phenomena mentioned in section 5.3 differ in magnitude under 1.5C versus 2C warming. [Bruce Currie-Alder, Canada]	Thank you. Due consideration are given throughout 5.3 on the 1.5C vs. 2C warming.
44034	22	47	23	7	See also "Thomas, A., & Benjamin, L. (2018). Policies and mechanisms to address climate-induced migration and displacement in Pacific and Caribbean small island developing states. International Journal of Climate Change Strategies and Management, 10(1), 86-104." for further discussion on displacement in SIDS and lack of capacity to address these issues leading to greater inequality and other impacts within states [Carl-Friedrich Schleussner, Germany]	Noted. Addressed in Box 5.3 and Chapter 4, Cross-Chapter Box 9.
46354	22	47	23	7	Additional cross-referencing should be made with chapter 3 (esp. 3.4.10.2) [Etienne Piguet, Switzerland]	Taken into account. The text has been substantially revised to reduce length.
57436	22	47	23	7	The relevance of migration on small islands should be considered here – not only as an adaptation strategy but as an important element of islanders' life. There is an increasing number of literature on this topic, showing that migration on small islands is nothing new, and not necessarily related to environmental change, e.g. : Stojanov, R., et al., 2016: Local perceptions of climate change impacts and migration patterns in Malé, Maldives. The Geographical Journal, doi:10.1111/geoj.12177. And : Connell, J., 2016: Last days in the Carteret Islands? Climate change, livelihoods and migration on coral atolls. Asia Pacific Viewpoint, 57 (1), 3-15. [Hans Poertner, Germany]	Noted. Addressed in Box 5.3 and Chapter 4, Cross-Chapter Box 9.
13640	22	49	22	49	Comma space [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
33378	22	49	22	49	Frankhauser, 2015 [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
41040	22	49	22	49	comma should be placed to after Frankhauser and a space between the comma and 2015. "and" should be inserted after "changes," (to read "changes, and climate..." [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
52322	22	49	22	49	Missing () [Jason Donev, Canada]	Editorial - copyedit to be completed prior to publication.
5356	22	5	22	52	The sentence is good. However, I suggest adding knowledge as one of the key factors on climate change adaptation. Thus, as mentioned by some references that knowledge has a role in the process of climate change adaptation. (Kumar, 2015; Naess, 2013). Kumar, V. (2015). Role of Indigenous Knowledge in Climate Change Adaptation Strategies: A Study with Special Reference to North-Western India. Journal of Geography and Natural Disasters, 5(1), 1–5. http://doi.org/10.4172/2167-0587.1000131 Naess, L. O. (2013). The role of local knowledge in adaptation to climate change. Wiley Interdisciplinary Reviews: Climate Change, 4(2), 99–106. http://doi.org/10.1002/wcc.204 [Sulistiyawati Sulistiyawati, Indonesia]	Thank you. The message on the importance of knowledge is addressed in the text on indigenous knowledge-based adaptation.
12672	22	5	22	51	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Sentence omitted due to page constraint.
41042	22	52	22	52	centuries-old (insert -) [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
28822	23	1	23	7	The section could be more explicit in highlighting the challenges for human security as well as for the public sector. While migration can be an effective way to cope with climate change, the increased movement of people could lead to local and regional instability, if migration and resettlement is poorly managed. At worst, it might lead to violence towards migrants and push people into more informal or illegal sources of income. [Germany]	The text has been substantially revised and reduced in length. Due to space limitations, much of this paragraph has been removed from the final government draft.
33316	23	5	23	7	not sure if resource pressure is on the refugee camps, the final destination, or both. [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
35400	23	5		7	The sentence "When 5 migrants end up in refugee camps, they may experience poor health and hunger and may increase pressure on water and energy resources at their destination (McMichael, 2015; Patrozou, 2015)." should be re-structured as "When 5 migrants end up in refugee camps, they may experience poor health and hunger and may increase pressure on water and energy resources at their destination (McMichael, 2015; Patrozou, 2015)". [Regasa Sagni, Ethiopia]	The text has been substantially revised and reduced in length. Due to space limitations, the sentence has been removed from the final government draft.
61562	23	5	23	7	The reference to refugee camps seems surprising in a discussion of migration as an (intentional) adaptation strategy. This is more likely a coping strategy or a reactive response rather than adaptation. [United States of America]	Noted. Sentence removed from the final government draft.
36192	23	9	23	19	This paragraph does not recognize the issues of PES as an adaptation system and is in contradiction to the description of PES in a previous section within this report. Page line 37-39: "PES schemes that trade social outcomes for market-based business models risk perpetuating inequality and injustice (e.g., Fairhead 39 et al., 2012; Muradian et al., 2013; Hahn et al., 2015; Calvet-Mir et al., 2015; Chan et al., 2017)." [India]	Assessment of PES has been removed from the final government draft.
41044	23	1	23	1	ecosystem-based (insert -) [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
7056	23	18	21	25	Fresh Water decline due to pollution, water quantity and safety [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	We could not address this comment as it did not include specific line and page details.
41046	23	22	23	22	insert space between robust and evidence [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
52324	23	22	23	22	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed prior to publication.
49060	23	32	24	34	This section should address the need for transformational adaptation more fully, particularly given the potential need to address how to shift livelihoods, crop types, and even locations of communities. It should also address the need for planning that assesses and responds to climate impacts in long-term time horizons. [David Waskow, United States of America]	Transformational adaptation is addressed in Ch4. This section focuses on sustainable development implications of adaptation pathways; however, adverse side effects of adaptation pathways that promote transformation but reinforce economic hegemony are now acknowledged.
49996	23	32	24	34	The discussion on linkages between SDG and CCA is very interesting. Is it possible to provide a matrix of their linkages? CCA and each goal of SDG? [Perdinan Perdinan, Indonesia]	The previous sub-sections examine SDG and CCA linkages. Some linkages are more prominently addressed in the literature while others are absent. We have attempted a matrix but it was not conclusive. This section focuses on adaptation pathways.
52786	23	32	23	32	This heading could be worded a bit more clearly. [Iulain Florin VLADU, Germany]	Rejected. Heading seems clear to the authors.
8398	23	34	23	34	The description is not clear. There should be an indication of the scenarios being compared in this sentence. If compared with 2°C, the required adaptation at 1.5°C should be lower than that in a higher warming scenario, in the case of which adaptation measures need not be 'intensified, accelerated, and scaled up'. It is suggested to restate it. [China]	This entire section focuses on 1.5C warmer worlds compared to now, not 2C global warming.
47218	23	34	23	34	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text revised to 'would'.
61564	23	35	23	35	The reference to SDGs is unnecessary here. Referring to sustainable development is more widely relevant and less policy-prescriptive. [United States of America]	The entire sentence has been removed.
61566	23	36	23	37	Please clarify the reference to "long-term goal". What is the long-term goal, whom is it for, and how was it agreed to? [United States of America]	The entire sentence has been removed.
13642	23	45	23	45	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
48180	23	52	23	52	Gorddard et al., 2016a' should be 'Gorddard et al., 2016'. The reference is duplicated in the reference list. [Sarah Connors, France]	Editorial - copyedit to be completed prior to publication.
13644	23	55	24	1	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
16604	24	1	24	25	The problem is bigger than implied as it is ideologically based approaches around economic growth and market economies that prevent much poverty reducing adaptation. [Janet Stanley, Australia]	Correct. There is now a reference to dominant political-economic structures and processes (without explicit reference to neoliberal economic hegemony though).
12674	24	4	25	26	This paragraph is very long and difficult to read, please edit for conciseness and brevity [United Kingdom (of Great Britain and Northern Ireland)]	This paragraph (p24, lines 4-25) has been shortened and edited for clarity.
16564	24	4	24	9	Please be more precise about which countries you are attributing these statements to. [Australia]	The sentence has been restructured to make this attribution clear.
28824	24	4	24	4	Dominant or normative pathways: which normative pathways? [Germany]	Accepted. The word 'normative' has been removed.
13280	24	8	24	8	Delete the text "lock-in". [Eleni Kaditi, Austria]	Deleted.
33380	24	8	24	9	what happened in Romania, Solomon Islands, and Australia? [Sergio Aquino, Canada]	The sentence has been restructured to link the examples from these countries with the problem of dominant pathways.
13646	24	9	24	9	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
4704	24	11	24	37	the section about biodiversity must be improved to give more details and explain the relation between the conservation of biodiversity, the use on natural resources and sustainable development in poor countries [Wael EL ZEREY, Algeria]	This section does not address biodiversity. Biodiversity is addressed elsewhere in the chapter and in Ch3.
13648	24	12	24	13	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
41048	24	15	24	15	Insert stop after "measures", start new sentence with "It increasingly..." [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
41050	24	16	24	16	insert comma after 'populations' [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
7058	24	18	21	25	Famine as a result of climate fluctuations [Cate Tuit, United Kingdom (of Great Britain and Northern Ireland)]	There is no line number with this comment, and no line in this sub-section mentions hunger. Wrong section?
41052	24	21	24	21	insert comma after 'values' [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed prior to publication.
16606	24	22	24	22	Cost-benefit analysis as a method is not the problem, it is the narrow application which doesn't account for all externalities - manipulated to achieve an end. [Janet Stanley, Australia]	Correct. The example of 'cost-benefit analysis' has been removed given lack of space to explore the subtleties at play.
2412	24	29	34		This section suggests that a deep, deliberative process is required (the implications being that this is something that cannot be rushed and may take a long time) which is at odds with the sense of urgency related to immediate and bold action emphasised elsewhere in the report. This apparent contradiction in messaging will need to be dealt with if we are not to confuse the policy makers. [Debra Roberts, South Africa]	Taken into account. Discussion on the related challenges of the rapid pace of change has been added.
28826	24	29	24	34	These insights suggest that win-win outcomes, even via socially-inclusive adaptation pathway approaches to plan and prepare for 1.5°C global warming and higher local warming, will be exceedingly difficult to achieve without a commitment to inclusiveness, place-specific trade-off deliberations, redistributive measures, and procedural justice mechanisms to facilitate equitable transformation while meeting the SDGs, particularly poverty eradication and reducing inequalities: this is an example for a statement where purpose and instruments are not clearly separated but confused. Please revise the text. [Germany]	This sentence has been revised to avoid confusion.
33164	24	3	24	34	include a reference to human rights as a factor necessary to capture win wins: Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. [Tara Shine, Ireland]	Thank you for your suggested reference. Due to space restrictions we have not been able to include it here. However, we have included your reference in Sections 5.5 and 5.6.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28828	24	35	28	4	Subchapter 5.4 asses literature on mitigation options that are "crucially needed to accelerate the reductions of emission and to deepen them [...] for 1.5 pathways" (Ch 5, p 24, l 41). "Crucially needed" is a value judgement that is not appropriate for an IPCC report, please revise. In addition, to us it is not clear how "switching to natural gas to replace coal" (Ch 5, p 28, l 35) can be in line with such mitigation options. Please revise. [Germany]	Accepted. Text revised.
61568	24	35	34	35	The discussion in this section is not specifically relevant to 1.5°C and is therefore outside the scope of the report. It should be largely removed (to be taken up later in AR6 possibly) or revised to provide information that is directly relevant to the scope of the report. [United States of America]	Taken into account. The text has been substantially revised and reduced in length. Where possible, we have focused our assessment on 1.5C specific literature, and reviewed literature relevant to 1.5C where pertinent for the scope of this report.
62840	24	35	32	4	There is also strong overlap between this section and chapter 4. More explicit anchor to key findings of chapter 4 is needed, rather than re-assessing the literature. [Valérie Masson-Delmotte, France]	Taken into account. Text substantially revised and reorganised to more explicitly strengthen the focus of this Chapter on mitigation options and SD/SDG implications.
12676	24	37	38	33	There is a lot of information in this section, highlighting both synergies and trade-offs, but with too much emphasis on the latter because the section doesn't sufficiently highlight the benefits of avoided impacts (buried in note to Fig 5.4). More emphasis also needs to be placed on evidence that costs of mitigating any adverse effects (eg on hunger) can be low. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: We added cost estimates in 5.4.2. The avoided impacts are discussed clearly, however, elsewhere in the report (Chapter 3, also Section 5.2.2).
28830	24	37	38	33	Subchapter 5.4 should reflect findings from Ch 2 and Ch 4. Please revise in particular the discussion on mitigation pathways and response options. For instance, the issues concerning the feasibility of BECCS and other negative emission technologies need to be mentioned more clearly. [Germany]	Taken into account. The feasibility of BECCS and related concerns are discussed in detail in Chapter 4. This Chapter deals with the sustainable development implications of such options.
44742	24	37	32	37	Many important points are made in this too-long section, which need better signposting so that the thrust and evolution of the message are clearer. [Penny Urquhart, South Africa]	Taken into account. Text substantially revised and reorganised to more explicitly strengthen the focus of this Chapter on mitigation options and SD /SDG implications.
51490	24	37	26	55	Currently, in the UNFCCC negotiations there is almost a stalemate on the issue of supporting adaptation first or mitigation. Supporting adaptation first is forwarded by the southern countries while it seems that the developed countries want their financial support to go towards mitigation as the trade off is obvious in case of mitigation. And this debate should be highlighted here and would be of great interest for the future of climate actions. It is generally pointed out that adaptation does not usually makes business sense and generates business or is not appropriately market based while mitigation is market based, makes business sense and therefore, is fit for financial support. This needs a trade off itself, first and foremost. Secondly, efficiency, though, reduces demand, does not address or change consumption pattern which is so important to address climate change. And, finally, energy equity has to be addressed even when we target consumption and efficiency. Otherwise, the boons of (sustainable development) will remain within a few and will not contribute to equity, equality and democratisation of access to resources. Mitigation, as a measure has to respond to these issues rather than trade offs. [Souparna Lahiri, India]	Noted. However, your first point is beyond the scope of our assessment in Section 5.4. Section 5.4.1 makes an assessment of literature to understand possible areas of synergies and trade off between mitigation response options and sustainable development dimensions. 5.4.2 then makes an assessment of how various complementary measures can help to manage potential inequalities resulting from mitigation portfolios consistent with 1.5C. Section 5.5 discusses issues of power and equity in the context of integrated pathway approaches, which goes some way to addressing your final point. See in particular the Section of climate-resilient development pathways (Section 5.5.3).
61570	24	37	32	37	This section largely focuses on mitigation in developing economies. Sustainable development spans all levels of development, therefore to be comprehensive and balanced the report should also consider the synergies and tradeoffs between GHG mitigation and sustainable development in developed countries. [United States of America]	Taken into account. Available literature assessed covers countries at various levels of development.
12678	24	39	25	1	This introduction is too long - it could easily be reduced to two sentences and convey all the information you wish it to. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been significantly revised to reduce length and editorials addressed.
41054	24	4	24	4	should read: "poverty eradication, inequalities and the SDGs, across sectoral and regional contexts." [Maria Pia Carazo Ortiz, Germany]	Taken into account. The text has been significantly revised and editorials addressed.
53496	24	41	24	44	the sentence is gramatically incorrect/incomplete [Christian Holz, Canada]	Taken into account. The text has been significantly revised and editorials addressed.
54308	24	41	24	43	Complex sentence with unnecessary parts; replace with "the literature in this section, although it does not directly address 1.5C, writes about the critical mitigation actions that need to be deepened for 1.5C pathways" [Christopher Bataille, Canada]	Taken into account. The text has been significantly revised and editorials addressed.
57164	24	41	24	44	There is a wording problem in this sentence, it is hard to read. [Philippe Marbaix, Belgium]	Taken into account. The text has been significantly revised and editorials addressed.
47220	24	42	24	42	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Taken into account. The text has been significantly revised and editorials addressed.
63294	24	44	24	55	Aligning mitigation actions to sustainable development objectives can ensure public acceptance (IPCC, 2014c) since development can be an important motivation for pro-environmental change, across diverse publics (Bain et al., 2016; Roy et al., 2016). In other words, we are going to hold mitigation actions hostage to SDGs regardless of whether or not climate goals are met?!?! While we all want perfect solutions (silver bullets), the central issue here is are these alone sufficient to stabilize warming at 1.5degC? By demanding that both climate and SD goals be solved simultateously you risk that neither will be solved. What you should be addressing in this report is that climate goals must be pursued in a way that at least does not impeded progress on SDGs (and visa versa), and where possible in ways that provide synergy in reaching climate and SD goals. See my related comments on chapters 1 and 2. [Greg Rau, United States of America]	Taken into account. Text revised. Assessment of link between mitigation action and sustainable development dimensions (synergies and trade-offs) and what can strengthen synergies is the main focus of the Section 5.4. Sufficiency of options in 1.5C context is beyond the scope of this Chapter. How various combination of mitigation options can help in 1.5C context is dealt with in Chapter 2 with SDG implications.
13650	24	46	24	46	Space [Poot-Delgado Carlos, Mexico]	Taken into account. The text has been significantly revised and editorials addressed.
33318	24	46	24	46	2016; Roy et al., [Sergio Aquino, Canada]	Taken into account. The text has been significantly revised and editorials addressed.
57438	24	46	24	46	Unclear term "publcs" [Hans Poertner, Germany]	Taken into account. The text has been significantly revised and editorials addressed.
45096	24	48	24	48business-as-usual development should be "...business-as-usual development pathway" [ARI Izzet, Turkey]	Noted. The text has been revised so the comment is longer valid.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
57166	24	48	24	52	This sentence is very unclear, please reformulate, clarify the key point being made and why it is related to synergies. [Philippe Marbaix, Belgium]	Accepted. Text revised.
41056	24	5	24	5	advances (not advance) [Maria Pia Carazo Ortiz, Germany]	Taken into account. The text has been significantly revised and editorials addressed.
13652	24	51	24	52	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
33166	24	51	24	51	there are two Mary Robinson Foundation references which need to be differentiated. This one is: Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf and an additional reference (forthcoming) is Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. [Tara Shine, Ireland]	The text has been substantially revised and the reference removed from this paragraph.
33384	24	51	24	51	no comma after target [Sergio Aquino, Canada]	Taken into account. The text has been significantly revised and editorials addressed.
53452	24	51	24	52	three references in this line have now been assigned to a journal issue and should be updated (the references appear in several places throughout but I won't highlight the other spots in my comments): Gupta and Arts, 2017; Holz et al 2017; Winkler et al 2017 are now all 2018. Here the correct references for convenience: Gupta, Joyeeta and Karen Arts (2018) "Achieving the 1.5°C Objective: Just Implementation Through a Right to (Sustainable) Development Approach" in International Environmental Agreements: Politics, Law and Economics, 18, Special Issue: Achieving 1.5°C and Climate Justice, pp. 11–28. [doi: 10.1007/s10784-017-9376-7]; Holz, Christian, Sivan Kartha and Tom Athanasiou (2018) "Fairly Sharing 1.5 – National Fair Shares of a 1.5°C-compliant Global Mitigation Effort" in International Environmental Agreements: Politics, Law and Economics, 18, Special Issue: Achieving 1.5°C and Climate Justice, pp. 117–134. [doi: 10.1007/s10784-017-9371-z]; Winkler, Harald, Niklas Höhne, Guy Cunliffe, Takeshi Kuramochi, Amanda April and Maria Jose de Villafrance Casas (2018) "Countries Start to Explain How Their Climate Contributions Are Fair – More Rigour Needed" in International Environmental Agreements: Politics, Law and Economics, 18, Special Issue: Achieving 1.5°C and Climate Justice, pp. 99–115. [doi: 10.1007/s10784-017-9381-x] [Christian Holz, Canada]	Thank you. We have updated the reference details.
33382	24	52	24	52	extra spaces - UNEP, 2017). [Sergio Aquino, Canada]	Taken into account. The text has been significantly revised and editorials addressed.
34606	24	53	24	53	It's suggested to change from "sustainable development" to "green growth" given that throughout all the 5.4 section the key topics of green growth are mentioned and many of them, like decent job, equality, etc are not cover by sustainable development as well as they are cover by green growth (Page 52 lines 8-20, page 26 line 48, page 29 line 13) [Mexico]	Rejected. Chapter 5 is mandated by our plenary approved bullets to address sustainable development. It is made clear in the text that there are various dimensions of sustainable development.
41058	24	54	24	55	Should read "Section 5.4.1 presents a short assessment of the distributional impacts of delayed mitigation actions." [Maria Pia Carazo Ortiz, Germany]	Taken into account. The text has been significantly revised and editorials addressed.
54310	24	54	24	54	Add "a" between "presents" and "short" [Christopher Bataille, Canada]	Taken into account. The text has been significantly revised and editorials addressed.
2414	25		3		Sections 5.4.1.2, 5.4.1.3and 5.4.1.4 needs grammatical editing in order to improve readability. [Debra Roberts, South Africa]	Accepted. Text changed substantially and revised.
45434	25	4	25	4	This section is largely independent of mitigation ambition - largely about "low hanging fruit". [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Partially accepted. Text revised to capture the spirit of the comment. The assessment indicates that mitigation ambition does not mean these options will not be needed, but rather that there is need for acceleration of these in scale and speed and also from justice point of view. Many countries/regions are debating on how ambitious energy efficiency improvement target should be (i.e. Santarius et. al 2016). Also in this Section we include assessment from recent literature which says rebound management becomes important in 1.5C context. Chapter 2 also shows in some scenario demand side actions can help achieve ambitions. Chapter 4 also mention efficiency as necessary condition although not sufficient.
50156	25	4	32	37	This section heavily overlaps with section 5.4.3, as both are discussing the SD implications of 1.5C pathways. 5.4.3 claims (on page 34, lines 37-42) that 5.4.1 discussed individual mitigation options and 5.4.3 a systems perspective. However, in fact there is a lot of overlap, while the assessment conclusions are quite different. Generally speaking, 5.4.1 is putting the emphasis on the problems for SD, while 5.4.3 shows there are solutions to avoid or compensate for potential negative SD impacts. That is very confusing. It would be much better to integrate the two sections so a balanced picture for policy makers can be presented. [Bert Metz, Netherlands]	Noted and taken into account. 5.4.1 focuses on mitigation options and SD linkages, whereas 5.4.2 takes a more systemic approach to quantitatively examine the SD implications of 1.5C and 2C mitigation pathways.
12680	25	6	25	47	Some of this implies that it's not really possible to mitigate/adapt to climate change while meeting SDGs, contrary to what the text asserts later on - please be consistent. Also, if we can't do both, then this is incredibly important and needs to be brought out in the SPM and executive summary [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Assessment of linkages between sustainable development, mitigation and stringent climate ambitions have been strengthened, the conclusions of which have been more directly addressed in Sections 5.4.2, 5.5.2, and reflected in the ES.
33320	25	6	25	7	sectors: energy supply, industry.... [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
1314	25	7		9	This sentence states that in Section 5.4.1 the focus is on mitigation option categories, as opposed to past IPCC assessment reports that focus on mitigation strategies for specific sectors. It is unclear, how 'categories' of mitigation options are defined. Also, there is no explanation of how the 'categories' are related to the very long Tab. 5.1 assessing links between mitigation options and SDGs. The level of aggregation in the assessment is accordingly unclear - whether mitigation options are assessed based on sectors, sub-sectors, technology types - or categories. This terminology and explanation of the data source should be clarified. [Karen Olsen, Denmark]	Accepted. Text revised.
18714	25	7		9	This sentence states that in Section 5.4.1 the focus is on mitigation option categories, as opposed to past IPCC assessment reports that focus on mitigation strategies for specific sectors. It is unclear, how 'categories' of mitigation options are defined. Also, there is no explanation of how the 'categories' are related to the very long Tab. 5.1 assessing links between mitigation options and SDGs. The level of aggregation in the assessment is accordingly unclear - whether mitigation options are assessed based on sectors, sub-sectors, technology types - or categories. This terminology and explanation of the data source should be clarified. [Andrea TILCHE, Belgium]	Accepted. Text revised.
41060	25	8	25	9	Either "In this section, the focus is set on a comprehensive assessment..." or "This section focuses on a comprehensive assessment of the interaction" [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
7062	25	1	21	25	Dietary insufficiency leadong to widespread malnutrition. Susceptibility to infectious disease and low life expectancy [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	We could not address this comment as the page and line details are absent.
63296	25	1	25	17	I can't beleive that you are risking the planet's climate by insisting that SDGs be achieved simultaneously and in a way that may not be cost-effective. Where in this document have you shown that basing climate actions purely on also achieving SDGs will be sufficient to avoid climate catastrophe? And if climate goals are not achieved, the impacts will assure that SDGs will not be attained either. If the non-climate demands of the 3rd world are being put ahead of climate goals, the catastrophe will not be confined to climate. [Greg Rau, United States of America]	Rejected. Mandate is to assess literature to better understand the link between mitigation options and sustainable development dimensions, poverty eradication and inequality. The paragraph specifically mentions multiple benefits of mitigation options along sustainable development dimensions. Text has also been revised.
3068	25	13	25	13	short-term tragets' should be 'short-term targets [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
1310	25	13			Tab. 5.1 (annex with 19 pages of systematic assessment of links between mitigation options and SDGs - at sector or category level?) is introduced for the first time p. 25 under section 5.4.1 Synergies and Trade-offs between mitigation options and sustainable development. However, it is unclear what the sources of data are. A short explanation in the text is that it draws on literature stating five different references. However, there is no indication of specific sources/data/references in the annex, where the table is presented and it is not clear, exactly which literature, methodologies or data set is at the basis of the table. Furthermore, the table is so long, small in font,overloaded with information and with no guide/explanation how to make sense of the information. [Karen Olsen, Denmark]	Accepted. Table is long but is used to present the level and source of evidence used to arrive at the assessment. Table cells contain details of the assessment based on the literature listed in the Table cells and subsequently in the bibliography.
18716	25	13			Tab. 5.1 (annex with 19 pages of systematic assessment of links between mitigation options and SDGs - at sector or category level?) is introduced for the first time p. 25 under section 5.4.1 Synergies and Trade-offs between mitigation options and sustainable development. However, it is unclear what the sources of data are. A short explanation in the text is that it draws on literature stating five different references. However, there is no indication of specific sources/data/references in the annex, where the table is presented and it is not clear, exactly which literature, methodologies or data set is at the basis of the table. Furthermore, the table is quite long, small in font,overloaded with information and with no guide/explanation how to make sense of the information. [Andrea TILCHE, Belgium]	Same as row #662.
18718	25	13			Tab. 5.1 (annex with 19 pages of systematic assessment of links between mitigation options and SDGs - at sector or category level?) is introduced for the first time p. 25 under section 5.4.1 Synergies and Trade-offs between mitigation options and sustainable development. However, it is unclear what the sources of data are. A short explanation in the text is that it draws on literature stating five different references. However, there is no indication of specific sources/data/references in the annex, where the table is presented and it is not clear, exactly which literature, methodologies or data set is at the basis of the table. Furthermore, the table is so long, small in font,overloaded with information and with no guide/explanation how to make sense of the information. [Andrea TILCHE, Belgium]	Accepted. Table is long but is used to present the level and source of evidence used to arrive at the assessment. Table cells contain details of the assessment based on the literature listed in the Table cells and subsequently in the bibliography.
32988	25	13	25	13	(...) also Table 5.1 and Figure 5.3) and advancing multiple short-term tragets targets under the SDGs. [Brazil]	Accepted. Text changed substantially and revised.
34574	25	13	25	13	It should say "targets" and it says tragets [Mexico]	Accepted. Text changed substantially and revised.
38572	25	13	25	13	This is, as far as I can see, the first time figure 5.3 is pointed to. Such a sophisticated and rather complex figure needs a thorough introduction in the main text - not only in the figure caption. [Jan Fuglestedt, Norway]	Taken into account. The figure caption has been revised to aid interpretation and a glossary term added describing the SDG-Interaction score.
61572	25	13	25	13	Figure 5.3 is mentioned on this page, but found many pages later (i.e., page 33). [United States of America]	Accepted. Text changed substantially and revised.
367	25	14	25	14	Table 5.1 and Figure 5.3 are extremely difficult to read. [Céline Guivarch, France]	Taken into account. Edits have been made to the figure and associated figure caption to aid interpretation. The Table is included as an Annex and has been revised.
41062	25	14	25	14	two-way (insert -) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
7060	25	18	21	25	Drowds of water as a result of man made climate change [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	We could not address this comment as the page and line details are absent.
42834	25	2	25	33	Replacing high-GWP HFCs under the Kigali Amendment provides an opportunity to increase the energy efficiency of appliances utilizing refrigerants. Shah N., Wei M., Letschert V., & Phadke A., (2015) BENEFITS OF LEAPFROGGING TO SUPEREFFICIENCY AND LOW GLOBAL WARMING POTENTIAL REFRIGERANTS IN AIR CONDITIONING, Ernest Oriando Lawrence Berkeley National Laboratory. [Kristin Campbell, United States of America]	Taken into account. Reference included in revised Section 5.4.1.1.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
43082	25	2	25	33	Replacing high-GWP HFCs under the Kigali Amendment provides an opportunity to increase the energy efficiency of appliances utilizing refrigerants. Shah N., Wei M., Letschert V., & Phadke A., (2015) BENEFITS OF LEAPFROGGING TO SUPEREFFICIENCY AND LOW GLOBAL WARMING POTENTIAL REFRIGERANTS IN AIR CONDITIONING, Ernest Orlando Lawrence Berkeley National Laboratory. [Durwood Zaelke, United States of America]	Taken into account. Reference included in revised Section 5.4.1.1.
57168	25	2	25	47	This section about "Accelerating Efficiency in Resource Use" appears superficial, limited, and sometimes too simplified and strangely worded (the industrial sector that generates synergies, "it" creates decent jobs...) [Philippe Marbaix, Belgium]	Taken into account. The text has been revised substantially and the assessment updated.
41064	25	21	25	21	insert a after with (to read "with a large number of..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52326	25	21	25	24	While this statement is true about the different sectors, Canadians use a "lot" more residential energy for heating than for lighting. See, for example, here: http://energyeducation.ca/simulations/canada/enduse/resenduse.html . Reducing home heating is considerably more important than lighting or even appliances. Also, improved insulation may often provide more energy savings than an improved furnace. [Jason Donev, Canada]	Noted. The text has been deleted.
12682	25	22	25	22	Is this true? IEA figures for 2015 suggest that residential sector accounts for ~21% of global energy consumption. Please check numbers and perhaps look for alternative references [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Section shortened. Text deleted.
34566	25	23			It can make explicit the decrease in gas demand by using water-saving devices [Mexico]	It is unclear how the comment refers to the text. Do note, however, that the text has been substantially revised for the final government draft.
57440	25	24	25	26	What does "removal of local barriers in buildings" mean? [Hans Poertner, Germany]	Accepted. Text revised.
34568	25	25	25	29	Take into account the relation between poverty and energy consumption or discuss on how to reverse the direct links between poverty reduction and increases in families' energy consumption. Poverty reduction and energy efficiency strategies are not always synergistic. [Mexico]	Taken into account. Please see Table 5.3 in annex under SDG 1 for buildings and transport sector in the row on energy efficiency mitigation option.
41066	25	26	25	26	insert a after with (to read "with a large number of..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3070	25	27	25	27	There are robust evidence' should be 'There is robust evidence' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
5678	25	27	25	41	Fix english in line 27 and line 41 [Marion Grau, Norway]	Accepted. Text changed substantially and revised.
33940	25	27	25	3	Please consider to be clear about what "they" are, that generate the benefits etc. [Norway]	Accepted. Text changed substantially and revised.
41068	25	27	25	27	there is robust evidence (not are) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41070	25	27	25	27	who are "they"? [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41072	25	27	25	28	sentence unclear: does author want to say that: "There is robust evidence that this generates health benefits, reduces morbidity, and brings about cost savings, local employment, food security..."? [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41074	25	29	25	29	should read "air quality, as well as..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
54312	25	29	25	29	Move "and" from before "energy" to before "local" [Christopher Bataille, Canada]	Accepted. Text changed substantially and revised.
57442	25	3	25	33	Too many combined references. This is very confusing to the reader. [Hans Poertner, Germany]	Accepted. Text changed substantially and revised.
3072	25	33	25	33	The industrial sector generate synergies' should be 'The industrial sector generates synergies' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
36194	25	33	25	35	The reference provided in the sentence makes an Anti-subsidy argument which is problematic because the paper has made its assessment with respect to Ghana which might not be globally applicable in other developing countries and LDCs. Similar subsidy reform strategies might not be replicated in other countries because the underlying socio-economic and political situations might vary. Subsidies form a prerequisite condition for developing nations like India for providing access to reliable source of electricity and modern fuels to its citizens by promoting energy security, domestic energy production and access to energy. Withdrawal of such subsidies might make it infeasible to provide targeted assistance to those who need it most. Some literature contradicting the anti-subsidy argument should also be reviewed before propagating it as a effective mitigation strategy, especially for developing nations. References: 1. C. P. Chandrasekhar & Jayati Ghosh, (2006). Tracking the Macroeconomy: Selections from Macroscan, 2001-05 2. http://www.unrisd.org/unrisd/website/document.nsf/240da49ca467a53f80256b4f005ef245/d7ee58f01e903b2fc1256dd60046e504/\$FILE/patnaik.pdf 4. http://regulationbodyofknowledge.org/wp-content/uploads/2013/03/Barnes_The_role_of.pdf 5. http://www.jstor.org/stable/pdf/3518206.pdf?refreqid=excelsior%3A8247cdd3f2cccf386bcb8ad695274116 [India]	Accepted partially. New Section draft has undergone major revision so the sentence is deleted. However, the reference was with respect to industry sector barriers for progress with energy efficiency improvements. The argument put forward is with respect to poverty reduction, energy access and policy relevance of subsidy for domestic energy access and security which was not the case. Section 5.4.2 does mention pro-poor redistributive policy instruments which is in line with the comment. The Chapter uses similar but more recent literature.
41076	25	33	25	33	industrial sector generates synergies (insert s) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
44036	25	33	25	39	While industrial sector energy efficiency is beneficial, there are often many barriers that prevent the feasibility of this strategy in developing countries or for smaller industries. The limitations to energy efficiency should be discussed. See for e.g.: Apeaning, R. W., & Thollander, P. (2013). Barriers to and driving forces for industrial energy efficiency improvements in African industries—a case study of Ghana's largest industrial area. Journal of Cleaner Production, 53, 204-213. [Carl-Friedrich Schleussner, Germany]	Accepted. Given space constraints we had to cut text in final version by 50%. However, the reference is adequately included in the assessment and is included in Table 5.3 in annex in industry row corresponding to accelerating energy efficiency, low carbon fuel switch under SDG 4.
41078	25	35	25	35	insert 'the' after 'through' (to read "through the removal of" [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
54314	25	35	25	35	Comma between "barriers" and "especially." [Christopher Bataille, Canada]	Accepted. Text changed substantially and revised.
12684	25	36	25	39	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Noted. The text has deleted.

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35558	25	38	25	39	Why is only energy efficiency in tourism transport mentioned? Surely, all transport has room for efficiency improvement. [Ashok Sreenivas, India]	Accepted. Deleted in revised text.
3074	25	41	25	41	the managing' should be 'the' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
54316	25	41	25	41	remove "managing" [Christopher Bataille, Canada]	Accepted. Text changed substantially and revised.
58218	25	45	25	47	Need to integrate efficiencies is more than just in in extractive industries, in water sector too, improved energy efficiency can reduce the amount of energy required in water processes by 13% (see Water-Energy Excerpt from IEA World Energy Outlook 2016); and increasing efficiency in the energy sector lowers the amount of water needed. For example shifting away from subcritical coal-fired power generation in the IEA New Policies Scenario towards more efficient coolings systems results in reductions in water withdrawal of over 100 bcm from that technology. [Andrew Prag, France]	Literature taken into account.
41080	25	46	25	46	synergetic - not synergistic [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
47222	25	46	25	46	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
33322	25	48	25	49	delete extra lines [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
28832	25	51	26	44	Although behavioural changes are critical elements of 1.5°C scenarios (see chapter 2, p 7, l 39), this subchapter misses a detailed description of important concepts as well as a detailed discussion of behavioural changes and the implicated transformation towards sustainable development. Please add in particular a broader literature assessment on behavioural options with respect to extension of lifetime of resources and goods (e.g. repair/reuse, functionality vs. novelty) and the implicated potential lifestyle changes. [Germany]	Partially accepted. Some changes in the text included. Given space constraints, detailed discussion is avoided. Please see Chapter 4, Section 4.4.3 for more detailed discussion of behaviour change.
36196	25	51			<p>This section is formulated around the idea that "consumption perspective strengthens the environmental justice discourse while possibly increasing an individualized environmental discourse" and that behavioral responses and right incentives help realizing the full potential of intermittent renewable energy and energy efficiency improvements. In the arguments and evidence presented in this section, the need to go beyond "individualist and structuralist perspectives" to analyze sustainable consumption is acknowledged but not discussed.</p> <p>This section can benefit from adding the following qualifications: Although governments are putting emphasis and considerable effort on changing consumer behavior, arguably the most significant impacts on climate change will be through changes in production. Even changes in consumption will have consequences for production (Räthzel and Uzzell 2011).</p> <p>Individualized environmental discourse and behavioral responses overlooks the issue of power and institutions. This is because when response of, for example residents and transport users, are individualized, it over looks institutions, the nature and exercise of political power and the distribution of power and influence in society. (Maniates 2014), for example, argues that individual consumers may be the final agents of consumption but their behavior is influenced by external actors who shape information flows, foster particular sets of norms and values, and shape options to privilege some consumption practices over others (See also Maniates 2001). Fuchs et al. (2016) argues that "sustainable consumption and absolute reductions research and action need to consider who or what sets the agenda, defines the rules and the narratives, selects the instruments of governance and their targets, and thus influences peoples behavior, options, and their impacts. Moreover, individualized environmental discourse and behavioural remedies "despite reference to the social nature or determinants of behavior are decontextualized, implicitly reflecting asocial, ahistorical and universal notions of human, as individual, behavior " (Fine et al. 2016). Such as approach, overlooks the role of power, conflict, class, gender, race, etc., in and of themselves, let alone as the raw materials for understanding the systemic origins of (non-rational) behaviour. Further, Fine et al. (2016) argue that as a consequence such an approach neglects the systemic sources of climate change, with an implicit presumption that this is driven by inappropriate individual (consumer) behaviour that can therefore be remedied behaviourally</p> <p>Fine, Ben, Deborah Johnston, Ana C. Santos, and Elisa Van Waeyenberge. 2016. "Nudging or Fudging: The World Development Report 2015." Development and Change 47 (4): 640–663. https://doi.org/10.1111/dech.12240. Fuchs, Doris, Antonietta Di Giulio, Katharina Glaab, Sylvia Lorek, Michael Maniates, Thomas Princen, and Inge Røpke. 2016. "Power: The Missing Element in Sustainable Consumption and Absolute Reductions Research and Action." Journal of Cleaner Production 132 (September): 298–307. https://doi.org/10.1016/j.jclepro.2015.02.006. Maniates, Michael. 2014. "Sustainable Consumption – Three Paradoxes." GAIA - Ecological Perspectives for Science and Society 23 (3): 201–8. https://doi.org/10.14512/gaia.23.S1.8. Maniates, Michael F. 2001. "Individualization: Plant a Tree, Buy a Bike, Save the World?" Global Environment Politics 1 (3): 31–52. https://doi.org/10.1162/152638001316881395. Räthzel, Nora, and David Uzzell. 2011. "Trade Unions and Climate Change: The Jobs versus Environment Dilemma." Global Environmental Change 21 (4): 1215–23. https://doi.org/10.1016/j.gloenvcha.2011.07.010. [India]</p>	Accepted partially. This Section is about various mitigation options and how they interact with SDGs. We have revised and reduced the text substantially in accordance with our mandated page limit. The references are extremely helpful for conceptual understanding and for exclusive research on framing sustainable consumption and production discourse. Reference of 2012 by same author on similar issue (Räthzel and Uzzell 2011) has been referenced in AR5 and thus has not been included in our assessment. Fuchs et al. (2016) is included appropriately in the new Section 5.4.1. Given our text restrictions, such conceptual references and argumentative discussion could not be included as they are more useful for framing Chapters. Questions of power, equity and justice are dealt with in Section 5.5.3 and 5.6.

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50130	25	51	26	44	This section overlaps with chapter 4.4.3. Reconcile and decide what is going into ch 4 and what (SD related) material stays here. [Bert Metz, Netherlands]	Noted and taken into account. Efforts have been made in the revised text to more clearly delineate both Sections.
57180	25	51	26	32	Section 5.4.1.2 needs more work: it does not provide an overview of the potential links between mitigation and sustainable development that relate to behavior. The reader should get an idea of the extent to which behavior change can be beneficial to both SD and mitigation, and a general idea (a list ?) of the topics that can be relevant. There are elements of this in the text but it is presented in a confusing way. [Philippe Marbaix, Belgium]	Taken into account. See revised Section 5.4.1.1.
57444	25	51			This section needs thorough language revisions. It is partly difficult to understand the meaning of certain sentences. [Hans Poertner, Germany]	Accepted. Text changed substantially and revised.
61574	25	51	26	44	This section is too full of specialized language and is difficult to understand. It also contains too much detailed information. [United States of America]	Accepted. Text changed substantially and revised.
41082	25	52	25	52	should read: "Consumption perspectives strengthen..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
33324	26	3	26	3	not sure of what 'declaration for premature obsolescence for appliances' mean. Is it significant for climate change? [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
54318	26	3	26	3	Add "and" between "transport" and "high" [Christopher Bataille, Canada]	Accepted. Text changed substantially and revised.
57170	26	3	26	4	I do not understand this sentence. Is "declaration of" needed? [Philippe Marbaix, Belgium]	Accepted. Text has been revised.
35560	26	4	26	8	There is an inherent conflict/tension between desiring longer life for goods/appliances and addressing consumer inertia to switch to newer technologies/appliances. [Ashok Sreenivas, India]	Taken into account. Revised text reflects the same.
33386	26	5	26	5	2014). At [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
41084	26	6	26	8	Sentence not well drafted. Could read: "More than 50% of an efficient building's energy efficiency cannot be utilised due to the occupants' inertia to change habits quickly." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
57172	26	6	26	8	This sentence is unclear and seems to rely on the details of specific study. Please provide a more general analysis and/or explain the context. [Philippe Marbaix, Belgium]	Taken into account. Text revised for clarity.
33388	26	7	26	7	extra space - change habits [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
34572	26	7	26	7	Include locally adapted infrastructure perspective. [Mexico]	Taken into account. The text has been substantially revised.
3076	26	1	26	1	in literature' should be 'in the literature' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
12686	26	1	26	36	Is all of this text necessary? Very long. And seems unbalanced compared to the small amount of text on the equally important issue of AFOLU behaviour change below. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text changed substantially and revised.
41086	26	1	26	1	high agreement should be in italics [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41088	26	11	26	14	why SDG 7 to a large extent? What makes SDG 7 a different case than "multiple SDGs" mentioned before. [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3078	26	14	26	14	also to large extent' should be 'also to a large extent' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
3080	26	14	26	14	if rebound effect' should be 'if the rebound effect' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
58224	26	14	26	14	SDG 7.3 instead of "SDG 7" [Andrew Prag, France]	Taken into account. The text has been substantially revised. The appropriate SDG is mentioned now which is consistent with the revised text.
3082	26	15	26	15	help in energy saving, building survey' should be 'helps in energy savings. Building surveys' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
41090	26	15	26	15	thermostats, not thermostat [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
48182	26	15	26	16	It is not immediately clear how 'Song et al., 2016' is related to the statement preceding it. The article is about bioenergy and water resources in the United States, and not about buildings. [Sarah Connors, France]	Taken into account. Text revised and sentence with reference removed.
62834	26	15	26	15	Rebound effect. This is mentioned in chapters 2 and 4 as well (rather implicitly). A coordination across chapters and a common message would be relevant. [Valérie Masson-Delmotte, France]	Taken into account. The text have been substantially revised and areas of overlap removed.
3084	26	16	26	16	have positive' should be 'have a positive' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
41092	26	16	26	16	impacts, not impact [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41094	26	16	26	19	Sentence not clear. English is not easily understandable. Please redraft. [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
57174	26	16	26	19	This sentence is unclear, please reformulate. [Philippe Marbaix, Belgium]	Taken into account. Text revised and sentence with reference removed.
33390	26	17	26	17	extra space - programmes and help [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
35402	26	19		21	The sentence "Promoting low-emission options for households requires taking account of the cultural and social needs of users, such as recognizing that stoves often serve as a gathering point for families (Bielecki and Wingenbach, 2014): can be restructured as "Promoting low-emission options for households requires consideration of the cultural and social needs of users, such as recognizing that stoves often serve as a gathering point for families (Bielecki and Wingenbach, 2014)" in replacing the phrase 'taking account' by the 'consideration' that give a better sense to the whole sentence without loss of relevant information. [Regasa sagni, Ethiopia]	Accepted. Text changed substantially and revised.
41096	26	19	26	19	Should read: "taking into account the cultural and ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
34570	26	22	26	27	Take into account the relation between poverty and energy consumption or discuss on how to reverse the direct links between poverty reduction and increases in families' energy consumption. Poverty reduction and energy efficiency strategies are not always synergistic. [Mexico]	Same as #680

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55560	26	22	26	26	The following Brief supports the idea shared here. This is grey literature: Labriet M., C. Fiebig and M. Labrousse, 2015. Inside Story: Working towards a Smart Energy Path – Experience from Benin, Mali and Togo. Climate Development Knowledge Network, Inside Stories on climate compatible development. http://cdkn.org/resource/inside-story-working-towards-a-smart-energy-pathway/?loclang=en_gb [Maryse Labriet, Spain]	Noted. The text has been substantially revised. The reference has been retained in Section 5.6.2.
28834	26	26	26	36	Within the discussion on "toward decarbonisation in transport sector", we are missing the mentioning of other concepts such as car sharing as well as e-mobility including the linkage of these two concepts. We suggest a broader discussion and adding of relevant literature or a statement that such other concepts exist but is not discussed in the SR1.5 due the lack of the scientific evidence. [Germany]	Taken into account. Text revised and sentence with reference removed.
41098	26	26	26	27	Should read: "User behaviour plays a much more important role toward decarbonization in the transport sector..." Also: is it british spelling or american spelling / decarbonization or decarbonisation? [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3086	26	27	26	27	transport sector' should be 'the transport sector' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
13654	26	27	26	27	Review the format of bibliographic citations [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
41100	26	27	26	33	English not clear. Sentence too long. Please redraft. [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
48184	26	27	26	27	Please check to see whether 'Mattauch, Ridgway & Creutzig, 2016' is in the reference list. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
54320	26	28	26	38	Paragraph is confusing and needs to be clarified with plain language regarding rebound effects in developing countries. [Christopher Bataille, Canada]	Taken into account. The text has been substantially revised for content and clarity.
47224	26	31	26	31	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
57176	26	31	26	32	I do not understand what role "public intervention to reduce road accidents" might have here. Please clarify. Getting less cars, even as compared to a baseline growth, might help reducing the risks for pedestrians as well as GHG emissions - is that what you mean? [Philippe Marbaix, Belgium]	Taken into account. The text has been substantially revised for content and clarity.
33392	26	33	26	33	SDG16) (Partnership [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
48186	26	33	26	33	Please check to see whether 'Partnership on Sustainable Low Carbon Transport, 2017' is in the reference list. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
52328	26	33	26	33	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
48188	26	34	26	36	It is not immediately clear how 'Kagawa et al., 2015' is related to the statement preceding it. The article is about emissions in global supply chains, and does not appear to mention individual automobile use behaviour change. [Sarah Connors, France]	Taken into account. Reference removed.
28836	26	38	26	44	dietary change is suggested to exhibit strong benefits with many SDGs. However, key aspects of this specific behavioural change are not discussed in detail in the SR1.5, neither in Ch 5 nor in Ch 4. Issues to be addressed would include: What kinds of a dietary change might be included and what consequences would this have, e.g. decrease in livestock, consumption of more regional available food, etc.? Are there studies available quantifying the mitigation potential or the social acceptance of such measures? How could policy measures support dietary changes? If these issues cannot be discussed in the SR1.5 due the lack of the scientific evidence this should please be clearly stated in order to avoid the conclusion that dietary changes are not addressed because they are not relevant. [Germany]	Besides Chapter 5, Chapter 4 covers dietary choices in ES and in 4.3.2, 4.4.5, 4.5.2, 4.5.3 also mentions the policy challenges. Chapter 2 also covers this in 2.3.4.2, 2.4.4. Please also see #705.
36198	26	38		44	There is robust evidence and high agreement that in the AFOLU sector, behavioural change leading to dietary change toward global healthy diets and waste reduction could reduce emissions to be changed to Medium evidence medium agreement", as changing individual behaviour by themselves are not adequate to reduce emissions. Fuchs et al. (2016) argues that "sustainable consumption and absolute reductions research and action need to consider who or what sets the agenda, defines the rules and the narratives, selects the instruments of governance and their targets, and thus influences peoples behavior, options, and their impacts Fuchs, Doris, Antonietta Di Giulio, Katharina Glaab, Sylvia Lorek, Michael Maniates, Thomas Princen, and Inge Røpke. 2016. "Power: The Missing Element in Sustainable Consumption and Absolute Reductions Research and Action." Journal of Cleaner Production 132 (September): 298–307. https://doi.org/10.1016/j.jclepro.2015.02.006 . [India]	Partially accepted. Text revised. "There is robust evidence and high agreement that in the AFOLU sector, behavioural change leading to dietary change toward global healthy diets and waste reduction could reduce emissions, though the process followed in making the transition could affect the efficacy of these measures (Fuchs et al., 2016)".
49656	26	38	26	41	Erb et al. 2016 Nature Communications show that dietary change is also a key for protecting (and restoring) forest, with a larger option space than supply side measures. [Karlheinz ERB, Austria]	We include dietary change under agriculture sector as a behavioural option, and behavioural option in forestry sector covers literature in responsible sourcing. However, Chapter 4 covers more on dietary changes and includes Erb et al. studies from 2009, 2016a, 2016b, 2017. Chapter 2 also covers these and some more additional references in the similar context. Please also see #706.
48190	26	41	26	44	It is not immediately clear how 'Hejazi et al., 2015' relates to the statement preceding it. The article is about mitigation and water stress, and does not appear to mention forests. [Sarah Connors, France]	Taken into account. Reference removed.
57178	26	41	26	44	Sustainable use of forests also contributes to SDG 15 (ecosystems, biodiversity). In addition, it is only partly related to the "behavioral options" (topic of this section), and I doubt that just "encouragement" can be sufficient - it also needs regulations and legislation enforcement in both wood extraction and use countries? A key of that problem is illegal trade, so the link to trade seems more complex than suggested here. [Philippe Marbaix, Belgium]	Taken into account. The text has been substantially revised. More discussion in Chapter 4. Please also see #705, 706.
33394	26	43	26	43	technology, encourages [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.

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52330	26	43	26	43	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
56	26	47	27	11	There is no reference to the possibility that improved energy access could lead to an expansion use of fossil fuels. I think this is, all else being equal, a very likely possibility and should be mentioned, with appropriate citations, here. [Tommi Ekholm, Finland]	Taken into account. Text revised and sentence removed.
57	26	47	29	2	The text doesn't cover much of "Access to Modern and Reliable Energy and Fuel Switch", which is the title of this subsection. An example: how does the statements on CCS and nuclear on page 28 relate to energy access? A lot of the topics are covered somewhere else (e.g. health effect in section 5.4.3.1). Please do a major revision of the text and focus on the topic. [Tommi Ekholm, Finland]	Taken into account. Text revised substantially.
33168	26	47	26	47	modern and reliable energy should be replaced with sustainable energy as in SDG7 [Tara Shine, Ireland]	Rejected. To reduce text by 50% to be within page limit of Chapter 5 text had to be deleted without compromising the main messages. This sentence has been deleted in the revised text.
50132	26	47	29	2	This section needs to be better organised. Put material on transport (now found on page 27, lines 4-11 and on page 27, lines 40-49) and industry/CCS (now found on page 28, lines 3-13 and page 28, lines 28-30) together. The statement that CCS can lead to "significant adverse implications for health and water security" (page 28, lines 28-29) comes out of the blue and is not justified based on available literature (see e.g. the IPCC Special Report on CO2 Capture and Storage). [Bert Metz, Netherlands]	Taken into account. Text revised.
55554	26	47	29	2	The references by the WB (multitier approach for example) and the IEA (the WEO now focuses on this topic) on energy access (and climate change) should be added. [Maryse Labriet, Spain]	Accepted. Text changed substantially and revised.
55556	26	47	29	2	This section gives a very partial view of the challenges between energy access and climate change. Especially in developing countries. It would need to be revised. The literature on the topic is extremely large (my own references on the topic are in Spanish or in French, and therefore not valid here). I would be pleased to provide more support on this topic if needed. [Maryse Labriet, Spain]	Taken into account. Text revised substantially.
57186	26	47	29	2	Can access to modern energy be made compatible with net-zero CO2 emissions, and if so, how can it be? Section 5.4.1.3 provides parts of the response to this question, but the section is long and it is hard to come to an overview / general conclusion about it. [Philippe Marbaix, Belgium]	Taken into account. Text revised substantially.
57446	26	47			Thorough language revision needed [Hans Poertner, Germany]	Accepted. Text changed substantially and revised.
52	26	48	26	49	Is the first claim even necessary? That millions of people escaping poverty is perhaps rather obvious by just looking at some relevant statistics; it doesn't require IPCC approval of "robust evidence and agreement". Moreover, is the escape driven by the "by accessing modern energy forms", as the text now implies; or do these developments instead go hand-in-hand or perhaps the other way round? Is the book a good reference for this claim? [Tommi Ekholm, Finland]	Noted. Text substantially revised.
48192	26	48	26	51	It is not immediately clear how 'Chowdhury, 2010' relates to the statement preceding it. The article discusses the impact of infrastructure on work opportunities in Bangladesh, but does not appear to mention accessing modern energy forms and the subsequent impact on poverty. [Sarah Connors, France]	Taken into account. Text revised and sentence with reference removed.
52332	26	48	26	48	I dislike the term 'global south', but if you are going to use it, shouldn't it be Global South? [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
57182	26	53	26	55	Where? "in the developing countries" ? Are countries such as China or South-Africa included? For those countries at least, just "to offset increased demand" would not appear consistent with anything like a 1.5 or even 2°C World. [Philippe Marbaix, Belgium]	Taken into account. Text revised and sentence removed.
41102	26	54	26	54	demand in the residential sector (insert 'the') [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
53	26	55	27	3	The phrase is very confusing. It is not clear for me what it intends to say. Does it really mean that less-carbon-intensive energy systems are inherently better at resolving access and energy poverty issues? I would not believe that it would be so, even if I would like such thing to be true. Please revise the text and check whether the claim actually holds. [Tommi Ekholm, Finland]	Taken into account. Text revised and sentence removed.
41104	26	55	26	55	Delete 'The'. Either "Systems that are..." or "Those systems that are..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
61576	26	55	27	3	Suggest to change the sentence: ""The systems that are less carbon intensive and vital for advancing human development, resolve energy access and energy poverty issues in rapidly growing countries like Vietnam, Brazil, India, South Africa, and poorest countries transitioning from agrarian to industrial societies."" to: ""Low carbon intensive technologies are vital for advancing human development in a sustainable manner both in developing countries like (...), and in rapidly growing economies like in Vietnam, Brazil, India, South Africa. Sustainable development is achieved by making use of low carbon intensive technologies like (...) to increase energy access and decrease energy poverty."" [United States of America]	Taken into account. Text revised substantially.
12688	27	1	27	3	What does this mean? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Text revised substantially.
12690	27	1	27	11	Please write in full sentences [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text changed substantially and revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
51492	27	1	27	55	Renewables are still an evolving and emerging sector and IPCC should be very careful in discussing the issue of renewables lest it is seen as supporting one or the other. Rather, it should facilitate the debate with credible research and technical papers keeping the marginalised and vulnerable communities in mind. Large scale solar and wind projects impact on land and food security while biofuels, biomass or bioenergy promote monoculture plantations, taking over of subsistence agricultural and community lands, can promote logging, deforestation and may not reduce carbon emissions actually. By all measures, hydro power should not be promoted as source of renewable energy. [Souparna Lahiri, India]	Taken into account. Text revised substantially.
41106	27	2	27	2	Either "and those poorest countries transitioning..." or "and poor countries transitioning..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41108	27	3	27	3	Should read: "In crowded cities in Africa, informal transport and high cost of commuting limit ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52334	27	3	27	8	This just isn't clear, could this please be re-written? [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
61578	27	3	27	4	Suggest to change: ""In Africa in crowded cities informal transport, high cost of commuting limits access to jobs"". to: ""In crowded cities in Africa, the high cost of transport used for daily commuting limits access to jobs"". [United States of America]	Accepted. Text changed substantially and revised.
54	27	4	27	4	triple informality (transport, jobs, housing) is not clear, please explain [Tommi Ekholm, Finland]	Accepted. Text changed substantially and revised.
61580	27	4	27	7	In Latin American cities, triple informality (transport, jobs, housing) is leading to low productivity and living standards (CAF Corporacion Andina de Fomento, 2017), poor road infrastructure reduces safety in cities and by increasing risks of road accidents (Vasconcellos and Mendonça, 2016).: The concept of "triple informality" needs clarification. If "poor road transport" is not linked with "triple informality" then the writer needs to use full stop to separate both concepts. The sentence "poor road infrastructure reduces safety in cities and by increasing risks of road accidents" doesn't make sense. [United States of America]	Taken into account. Text revised substantially.
41110	27	5	27	5	Should read: "... 2017), and poor road..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3088	27	6	27	6	cities and by increasing' should be 'cities by increasing' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
3090	27	7	27	7	need to include' should be 'needs to include' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
41112	27	7	27	8	Should read: "In cities, such infrastructure expansion needs to include pro-poor strategies into construction and operation, as sometimes ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
47226	27	7	27	7	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
57184	27	7	27	8	The expansion of which infrastructure? [Philippe Marbaix, Belgium]	Taken into account. Text revised substantially.
61582	27	7	27	9	However, in cities such infrastructure expansion need to include pro-poor strategies into construction and operation as sometimes such constructions lead to eviction from informal settlements (Colenbrander et al., 2016). The infrastructure that the author is talking about in this sentence refers only to road infrastructure in previous sentence? [United States of America]	Taken into account. Text revised substantially.
47228	27	9	27	9	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
55	27	1	27	1	Please clarify "e-mobility". I take that you are referring to electric public transportation. With such description, the list of trolleys etc is not necessarily needed. [Tommi Ekholm, Finland]	Accepted. Text changed substantially and revised.
41114	27	11	27	11	Insert stop after 'buses'. New sentence: "Walking and biking, especially for short distances, should also be promoted." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
34576	27	13	27	18	It could be beneficial to add the conclusions and inputs produced by special report "Energy Access Outlook 2017: from poverty to prosperity" Given that the reports not only provides prove of cost-effective access to off grid solutions but gives the modelling and data evidence to support policy making for African countries that could potentially be bridge the expertise to other developing countries [Mexico]	Taken into account. Reference included.
50134	27	13	27	26	This paragraph is supposed to be on "regional cooperation" as stated online 13. However, the rest of the paragraph does not say anything about it. Needs to be adjusted. [Bert Metz, Netherlands]	Taken into account. Text substantially revised .
54462	27	13	27	37	Consider inclusion of the following concepts: - Encourage use of electricity instead of coal / gas based fuels for various activities in rural areas. - Develop infrastructure for expanded use of electricity including power generation, transmission and distribution in rural areas. [RABIZ FODA, Canada]	Taken into account. Text revised substantially based on available recent literature.
55900	27	13	27	26	There are examples of trade-offs of off-grid renewable energy when safety and quality codes and standards aren't followed, examples that come to mind are from Central America, Mexico, Kenya, and Nigeria. Lit is from Kenya, Foster, R (Mexico and Central America), Ley, D (Central America) and technical reports of Sandia National Laboratories and the National Renewable Energy Laboratory. [Debora Ley, Guatemala]	Noted. No reference cited.

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61584	27	13	27	14	Suggest to include ""development"" after ""renewable energy"". Suggest to change ""promoting"" to ""promote"". ""Effective regional cooperation in renewable energy is key to promoting a synergetic approach between enhanced access to electricity, cooking energy, and emission reductions (Uddin and Taplin, 2015)."" [United States of America]	Accepted. Text changed substantially and revised.
33170	27	14	27	18	social protection can also be used to enable access to sustainable energy: Mary Robinson Foundation (2016b) The Role of Social Protection in Ending Energy Poverty Making Zero Carbon, Zero Poverty the Climate Justice Way a Reality Policy Brief First published: June 2016 https://www.mrfcj.org/wp-content/uploads/2016/09/The-Role-of-Social-Protection-in-Ending-Energy-Poverty.pdf [Tara Shine, Ireland]	Noted. Text substantially revised.
61586	27	14	27	18	The author suggests that the deployment of small-scale renewables and/or off-grid solutions requires measures such as baseload energy. This is far from reality. Suggest the author to include a paragraph for small-scale renewables and/or off-grid solutions and necessary measures for a smooth functioning, and another for large-scale renewables, as they are designed for a very different market with very different reliability measures. If the author includes hydro as baseload source, then also would have to include solar. Hydro can be from a plant used for peaking to run-off river with a continuous supply of water, as solar can be from solar PV without storage to concentrating solar power (CSP) plants equipped with thermal storage, which provide baseload power. Reference: "Potential for concentrating solar power to provide baseload and dispatchable power" (https://www.nature.com/articles/ncimate2276) [United States of America]	Noted. Text substantially revised.
58226	27	16	27	18	Suggestion to add citation of IEA Energy Access Outlook 2017: "The deployment of small-scale renewables (Sovacool and Drupady, 2012), or off-grid solutions for people in remote areas (Sanchez and Izzo, 2017; Sovacool, 2012) has strong potential for synergies with access to energy (IEA, 2017) but requires adopting ..." [Andrew Prag, France]	Accepted. Reference added. Similar as #726.
58228	27	18	27	18	Suggestion to add content after Giwa 2017, Heard 2017 citation: "Bundling energy efficient appliances and lighting with off-grid renewables can reduce the cost substantially while increasing reliability (IEA, 2017) [Energy Access Outlook]." [Andrew Prag, France]	Accepted. Text revised. Similar as #726.
61588	27	18	27	22	Suggest to insert a sentence in between which connects the supply and needs of baseload energy to the energy needs of growing cities of the Global South. The following paper "Impact of political and economic barriers for concentrating solar power in Sub-Saharan Africa" (https://www.sciencedirect.com/science/article/pii/S0301421516306644) discusses the potential of a renewable baseload technology in the growing cities of sub-Saharan Africa. [United States of America]	Accepted. Reference included.
3092	27	19	27	19	renewable like geothermal' should be 'renewables like geothermal' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
41116	27	19	27	19	renewables' not 'renewable' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41118	27	19	27	19	ensure the reliability (insert 'the') [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41120	27	21	27	21	main source for meeting, not "main source of" [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52336	27	22	27	26	This just isn't clear, could this please be re-written? [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
31588	27	23	27	24	Traditional biomass which could cause indoor air pollution is included in "low-carbon fuels". [Japan]	Accepted. Text revised substantially.
3094	27	28	27	28	need to keep' should be 'needs to keep' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
10160	27	28	27	38	More clarification is needed as this referring to carbon price/carbon tax under the energy access section [Saudi Arabia]	Accepted. Text revised substantially.
12692	27	28	27	38	This paragraph is very confusing to read. What is rebound? [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised substantially.
28838	27	28	27	35	Please describe more clearly that the energy rebound-effect has different impacts in developed and in developing countries (generation of growth effects and access to energy in developing countries and increase in energy service demand in developed countries) and that consequently the phenomenon should be treated differently and how. I61 [Germany]	Accepted. Text revised substantially.
41122	27	28	27	29	should read "...needs to keep the differential magnitudes and welfare implicatinos in the context of developed and developing countries in sight, ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
50136	27	28	27	38	What is this paragraph trying to say. Very unclear. [Bert Metz, Netherlands]	Accepted. Text revised substantially.
61590	27	28	27	28	Suggest to change "addressing" in "Incentive design to addressing the behavioural response" to "address". Suggest to change "behaviourial" to "behavioural". [United States of America]	Accepted. Text changed substantially and revised.
41124	27	31	27	35	Should read: "In developing countries, higher rebound effects help in achieving affordable access to energy (SDG 7.1) faster. Rebound-suppressing policies, such as carbon price/carbon tax, can harm poor energy consumers disproportionately. Thus, they need to be regionally differentiated (Krieger et al., under review) and be made revenue neutral to avoid trade-offs, also in developing country contexts ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
47230	27	33	27	33	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.

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412	27	35	27	35	<p>This paragraph includes a citation that it not included in the References list: "...and be made revenue neutral to avoid tradeoff even in [the] developing country context (Saunders, 2011..."</p> <p>The reference is: Saunders, H.D., 2011 (revision submitted to peer-reviewed journal and under review as of 1-25-18): Mitigating rebound with energy taxes. Available at: https://works.bepress.com/harry_saunders/41/.</p> <p>In BibTex format: @article{sxx, author = {Saunders, H. D.}, journal = {under review}, title = {Mitigating rebound with energy taxes}, year = {2011}, doi = {https://works.bepress.com/harry_saunders/41/}, } [HARRY SAUNDERS, United States of America]</p>	Reference removed.
13656	27	35	27	35	comma space [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
28840	27	35	27	38	What is meant by "synergies" in this context? Can you give an example? [Germany]	Accepted. Text revised substantially.
33396	27	35	27	35	2011; Colbert [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
48194	27	35	27	35	Please check to see whether 'Saunders, 2011' is in the reference list. [Sarah Connors, France]	Reference removed.
58230	27	35	27	35	Suggestion to add content after Winkler 2017 citation: "Providing universal access to clean and modern cooking and heating fuels and technologies (7.1.2) to the 2.8 billion people currently without can reduce the unsustainable harvesting of biomass and associated GHG emissions, leading to a net climate benefit, while improving household air pollution and gender equality, freeing up time spent gathering fuelwood, largely done by women (IEA, 2017)." [Andrew Prag, France]	Accepted. Text revised substantially. Reference included.
18720	27	4	27	49	Please mention also the trade-off between electrification of transport and the need for (scarce and polluting) raw materials. Electric vehicles can lead to further exploitation of scarce resources, with many possible negative consequences (exploitation of workers, pollution, health issues, etc.). [Andrea TILCHE, Belgium]	Noted. Needed a reference .
28842	27	4	27	41	How does the use of "natural gas" lead to a "deep decarbonised transport system"? We suggest to revise this sentence and focus on technologies that are not fossil-fuel based. [Germany]	Accepted. Text revised substantially.
34578	27	4	27	4	It is important to always keep in mind that the source of biodiesel should be agricultural residues or non-food crops, otherwise food security could be endangered. Also it shouldnt be encourage to use agricultural land to grow fuel crops when it threatens food supply. [Mexico]	Accepted. Text revised substantially.
41126	27	4	27	44	Should read something like: "For the transport sector, the use of sustainable biodiesel, natural gas and electric vehicles is considered [vital] [important] to achieve a deep decarbonised transport system, as well as climate and local air pollution benefits (Alakahoon, 2017; Nanaki and Koroneos, 2016; Sundseth et al., 2015). For electrical vehicles, environmental benignity and consistency with SDG 7 will depend on the electricity generation mix." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
34580	27	42	27	43	environmental benignity of electric vehicles not only resides on the source of the electricity they use, it also depends on the energy and materials use for its production. Current EV technology is based on lithium which mainly comes from developing countries and it is extracted using heavy machinery which consumes large amounts of fossil fuels. It is very important to consider the ecological footprint of EV technology and it would be advisable to be noted by this report. [Mexico]	Noted. Needed a reference.
10162	27	44	27	44	More clarification is needed as SDG7 is calling for energy access affordable, sustainable [Saudi Arabia]	Accepted. Text substantially revised. No longer valid.
28844	27	44	27	47	Is "social acceptance" the only determining factor for the "large-scale deployment of bioenergy"? In previous chapters it is stated that increased usage of bioenergy might, for instance, also compete with other landuses such as reforestation/afforestation as well as the food production. Please clarify. [Germany]	Accepted. Text substantially revised. No longer valid.
41128	27	45	27	45	Delete 'the' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41130	27	47	27	48	Should read: "With more electrification of the transport sector, electricity price can go up and adversely affect the poor, unless redistributive policies are implemented." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3096	27	49	27	49	Improving and Promoting' should be 'Improving and promoting' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
41132	27	49	27	49	Should read: "Improving and promoting of public transportation systems make cities sustainable." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
48196	27	49	27	49	It is not immediately clear how 'Song et al., 2016' relates to the statement preceding it. The article does not appear to be about public transport systems, or the sustainability of cities. [Sarah Connors, France]	Taken into account. Text revised and sentence removed.
3098	27	51	27	51	due to reduction' should be 'due to the reduction' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
50138	27	51	28	1	The issue of air quality improvement due to a shift away from fossil fuels is one of the most important SD benefits. A much broader discussion would therefore be appropriate. [Bert Metz, Netherlands]	Accepted. Text revised substantially. More discussion is in Section 5.4.2.

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54288	27	51			the nexus between climate mitigation and air quality deserves more discussion than this one paragraph. According to the WHO, indoor and outdoor air pollution are responsible for 6.5 million premature deaths globally every year - improving access to modern and reliable energy and fuel sources would provide measurable public health benefits by reducing both indoor and outdoor air pollution. Shindell et al. 2012 found that SLCP mitigation could avoid 2.4 million premature deaths per year from improved outdoor air quality alone (the health benefits from indoor air quality were not modeled, but can be assumed to be significant). [Nathan Borgford-Parnell, Switzerland]	Taken into account. Text revised substantially. More recent literature included.
41134	27	52	27	52	Delete 'The' (Health benefits, not The health benefits) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3100	27	53	27	53	to reducing' should be 'of reducing' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
32990	27	53	27	53	(...) benefit for reducing GHG emissions". [Brazil]	Accepted. Text changed substantially and revised.
41136	27	53	27	55	Should read: "This would be the case, for example, of transport solutions that improve air quality at the street and pedestrian levels in cities, and that contribute to lower the emission intensity of transport activities through inter-city passenger transport management ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
5680	28				The english throughout is at times abbreviated and inelegant. A language edit would benefit this chapter. Many of the sentence structures are very similar, so it reads in a monotone as if the same information keeps getting repeated. Overall this seems the weakest of the chapters read. SDGs are also discussed in chapter 4, so some of the information seems already represented in ch 4. The role of education and religious communities is even less pronounced than in previous versions of the report. This seems unsatisfactory, given the importance of public education in advancing adaptation and mitigation acceptance. [Marion Grau, Norway]	Accepted. Text changed substantially and revised.
52338	28	2	28	4	Could you please list some of these industries? It's not clear what they are. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
30740	28	3	28	5	« For energy intensive processing industries (EPI) [...] have an urgent need for zero carbon energy sources (Ahman et al., 2017; Denis-5 Ryan et al., 2016). » Rephrase by deleting « For » at the beginning of the sentence to make sense. [France]	Accepted. Text changed substantially and revised.
51494	28	3	28	55	CCS is an untested technology and there is considerable opposition to nuclear energy with most of the developed countries phasing out nuclear power plants. Therefore, these cannot be energy options and climate solutions. Hydropower leads to deforestation and undermining SDG on water and rights of riverine communities, becomes untenable with retreating glaciers and possible water scarcity; biomass and bioenergy are air polluting and emits black carbon. [Souparna Lahiri, India]	Noted. Relevant literature reviewed and assessed. Text revised substantially.
3102	28	4	28	4	have an urgent' should be 'there is an urgent' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
33398	28	4	28	4	sources (Ahman... [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
47232	28	4	28	4	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
41138	28	6	28	6	Change 'besides' for 'in addition' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41140	28	7	28	8	Should read: "Studies on energy-intensive processing industries (EPI) in the EU show the need for radical technology ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
3104	28	9	28	11	However, strong synergies with multiple SDGs due to progressing decoupling, innovation, scope of cross sectoral, supranational partnership, scope for sustainable production' Needs to be rewritten!! [Robert Shapiro, United States of America]	Taken into account. Text revised and sentence removed.
10164	28	9	28	13	More evidence is needed to prove that the risk of CCS carbon leakages while it's proven it is matured technology and it is implemented in many places for long period. [Saudi Arabia]	Noted. Text substantially revised.
47234	28	9	28	13	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
41142	28	1	28	1	empty space before comma (after decoupling) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
43122	28	1	28	1	Please see if the word 'progressing' can be changed to 'progressive'. [Muhammad Mohsin IQBAL, Pakistan]	Accepted. Text revised so no longer valid.
41144	28	11	28	13	Should read: "... partnership, and scope for sustainable production need to be strengthened by attending to the trade-offs [due to] the risks of CCS-based carbon leakage..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
13658	28	15	28	23	It's not understood [Poot-Delgado Carlos, Mexico]	Taken into account. Text revised.
41146	28	15	28	15	Either "Phasing out coal" or "The phasing out of coal" (not Phasing out of coal) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52340	28	15	28	16	I understand that the authors don't like nuclear power and CCS, but it really must be considered. Specifically, the authors should either talk with experts in the field, or do an extensive literature review. [Jason Donev, Canada]	Noted. Text revised substantially based in literature assessment.
3106	28	16	28	16	enhance health goal' 'enhance the health goal' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
28846	28	16	28	16	and by reducing GHG emission should be added. [Germany]	Taken into account. Text revised.
33400	28	17	28	17	11, 12 (Chaturverdi [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.

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35406	28	18			Following the context of the sentence,the citation Rao et al (2016) is the extension of other and shuld be putted in a similar form.Hence,the corrected version of the whole sentece will be "it also advances SDGs 1 and 10, 16 11,12(Chaturvedi and Shukla, 2014; Haines et al., 2007; IEA, 2016; McCollum et al., 2017; Riahi et al., 17 2015, 2017; Rose et al., 2014a; Smith and Sagar, 2014; West et al., 2013; Rao et al., 2016). " [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before final submission.
48198	28	18	28	18	Rose et al., 2014a' should be 'Rose et al, 2014'. The reference is duplicated in the reference list. [Sarah Connors, France]	Corrected.
41148	28	19	28	19	... offshore installations (with SDG 14)... - add parentheses [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
35408	28	2			Following the context of the sentence,the citation Buck and Krause (2012) is the extension of other and shuld be putted in a similar form or brackets.Hence,the corrected version of the whole sentece will be "However, some 18 conflict with SDGs can emerge from offshore installations with SDG 14 based on local context (Inger et al., 19 2009; McCollum et al., 2017; Michler-Cieluch et al., 2009; WBGU, 2013;Buck and Krause ,2012). " [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before final submission.
48200	28	2	28	23	Please check to see whether the following references are in the reference list: 'Buck and Krause (2012)', 'Wiser et al, 2011', Lovich and Ennen, 2013, Garvin et al 2011, Grodsky et al 2011, Dahl et al 2012, de Lucas et al 2012, Jain et al 2011. [Sarah Connors, France]	These references have been removed from the assessment.
3108	28	21	28	21	due to landscape and wild life from wind' should be 'due to impact on landscape and wildlife from wind' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
33402	28	21	28	23	rethink parenthesis [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
41150	28	21	28	21	wildlife, not wild life [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41152	28	24	28	24	Delete 'But' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52342	28	24	28	3	Nuclear power also improves energy security. Look, I understand that nuclear power has a bad reputation; I was really reluctant to consider nuclear power until my teaching schedule forced me to look into it. It was very hard for me to accept, but I was wrong about nuclear power. The more I looked into it, the more I realized that it's essential to our future in a carbon-constrained world. [Jason Donev, Canada]	Noted: the literature indicates that Nuclear has also negative effects on energy security due to e.g. proliferation risk.
57822	28	24	28	25	The following paper would provide an appropriate reference for this or the preceding sentence, on the trade-offs between large-scale modern bioenergy for BECCs, and SDG 15: Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98. doi.org/10.1007/s10784-017-9382-9 [Kate Dooley, Australia]	Accepted. Included in Table 5.1.
48396	28	26	28	35	For developing countries low-carbon growth needs longer time frame. It needs deep reforms on their development plans, changes on mindset of industrial and economical sectors, which is difficult to carry out due to social, economical, and political reasons. [Agus Susatya, Indonesia]	Noted.
10166	28	28	28	29	Needs evidence that CCS for deep cut in emissions has an impact on health and water security (SDG 3 & 6) [Saudi Arabia]	Accepted: underlying evidence is provided in the Table 5.3.
10350	28	28	28	3	As regards the risks related to nuclear energy, the phrase "abandoned reactors" might be misleading, therefore, we suggest the use of "decommissioned reactors" instead. In line with international requirements, nuclear reactors should be decommissioned after cessation of operation and withdrawal from service, and all waste generated should be safely managed. Decommissioning involves all activities from shutdown and removal of nuclear material to the environmental restoration of the site. [Hungary]	Noted: text on waste was removed since the trade-offs are mute if waste is managed appropriately.
12694	28	28	28	3	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: Underlying citations are provided in Table 5.3.
12976	28	28	28	3	can also have significant adverse implications for health What is the basis of this statement? Needs a reference to support such statement. Table 5.1a does not state anywhere that nuclear power would mean there would be significant adverse implications for health. [Jessica Callen, Austria]	Accepted: Underlying citations are provided in Table 5.3.
19762	28	28	28	28	"Achieving deep cut in emissions through CCS and nuclear options can also have significant adverse implications for health and water security (SDGs 3, 6) and increase the societal costs and risks associated with the handling of waste and abandoned reactors (see SDG8)" But : "Certain elements of nuclear energy infrastructure are inherently dual-use, which makes the promotion of nuclear energy fraught with uncertainty." Dual use is referring to military and civilian use, which contradicts many SDGs. See Proliferation risks from nuclear power infrastructure, Sharon Squassoni. American Institute of Physics, AIP Conference Proceedings, 1898, 040005 (November 2017); https://doi.org/10.1063/1.5009228. Please revise language to reflect that inconsistency and warn the reader of the opposing of dual use nuclear energy infrastructure with SDGs. [Jennifer Morgan, Netherlands]	Accepted: the risk of proliferation has been added.

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29668	28	28	28	3	It is wrong to place CCS equal with nuclear in this context. The potential health and water impacts are of orders of magnitude lower for CCS. This is reflected in the tables Panel A Part 2. In terms of water use, SDG 6, there are ways to reduce or negate increased water use by CO2 capture, see IEAGHG report 2010/05 "Evaluation and Analysis of Water Usage of Power Plants with CO2 Capture" (March 2011) and Magneschi et al "The Impact of CO2 Capture on Water Requirements of Power Plants", GHGT-13, Energy Procedia 114 (2017) 6333-6347. In terms of health aspects of CO2 leakage, SDG3, see this IPCC 1.5 report Chapter 2, p58 lines 27-39. This draws on Jones et al (2015) "Developments since 2005 in understanding potential environmental impacts of CO2 leakage from geological storage. International Journal of Greenhouse Gas Control, 40, pp350-377. This concludes "Studies to date suggest that the impacts from many lower level fault- or well-related leakage scenarios are likely to be limited spatially and temporarily and recovery may be rapid. Larger releases, with potentially higher impact, would be possible from open wells or major pipeline leaks but these are of lower probability and should be easier and quicker to detect and remediate". CO2 leakage from storage would have small impact, we have many natural CO2 releases to study to understand this. [Tim Dixon, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: text has been revised to separately discuss nuclear and CCS. Note that the magnitude of the SDG impact is in addition also differentiated between the options in Table 5.3. Unfortunately, we cannot add all details for every mitigation option and SDG in the text and need to bundle where we see similarities of the impacts across options.
31590	28	28	28	3	Need reference with regard to the contents. [Japan]	Accepted: Please note that references are given in Table 5.3.
37126	28	28	28	3	Achieving deep cut in emissions through CCS and nuclear options can also have significant adverse implications for health and water security (SDGs 3, 6) and increase the societal costs and risks associated with the handling of waste and abandoned reactors (see SDG8) (see Table 5.1a and d and Figure 5.3). This § is highly speculative, irrespectfull of the human and technical capabilities of developping countries; it is not comprehensive, not objective and not balanced compared to other energy sources (for which water and waste issues can have even more adverse consequences than CCS and nuclear; speculative because no one has yet abandonned CCS plants or nuclear reactors; on the other hand, last century abandonned cemeteries of wind and solar farms in California could also be mentionned). I suggest replacing these 3 lines by: "Achieving deep cut in emissions through CCS and nuclear options should not be discarded. They can have positive implications in developping countries and in regions with limited energy grids and infrastructures, which could benefit in particular from the current development of small modular reactors, gas-cooled and air-cooled reactors or floating nuclear reactors." [Jean-Luc SALANAVE, France]	Accepted. Text changed substantially and revised.
41154	28	28	28	28	should read: "Achieving deep cuts in emissions..." (add s) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52344	28	28	28	3	Nuclear power is mis-represented here. It's quite suspicious that the authors don't even cite anything here. Please, I implore you, look into nuclear power. No one has ever been hurt by the nuclear waste. It's safely managed, it's easy to dispose of. In my home country of Canada, different communities are actively competing for the right to bury nuclear waste in their backyards. It is grossly inaccurate to characterize the state of nuclear waste disposal in this way. Review, for example, the NWMO's 'choosing a path forward': https://www.nwmo.ca/~media/Site/Reports/2015/11/11/06/53/342_NWMO_Final_Study_Summary_E.ashx?la=en and https://www.iaea.org/OurWork/ST/NE/NEFW/Technical-Areas/WTS/disposal.html . Nuclear waste becomes less hot with age, this means that nuclear waste must be stored above ground for decades before burying it. Nuclear power is now of an age where we can start looking at burying the waste. To start burying waste before 2020 would always have been irresponsible. The nuclear industries in the 30 different countries with nuclear waste have all come up with almost exactly the same plan for disposing of nuclear waste: store it safely above ground and then bury it deep underground. They're doing it safely and economically. The waste disposal has been paid for, the plans are going forward. In Canada there are several host communities that are all fighting desperately to try to get nuclear waste buried in their backyards. They absolutely want, demand and are even competing for the right to have spent fuel being buried in their backyards. This report is grossly mis-characterizing the state of affairs and I implore you to speak with actual experts on the subject, like the IAEA, before making such egregiously defaming statements. [Jason Donev, Canada]	Accepted: we added references, and please note that health impacts are due to accidents rather than waste. Waste was removed from the text.
54106	28	28	28	3	This information cannot be generalized, since it is contradicted by facts (Sweden and France have reduced water and air pollution thanks to nuclear power). Scientifically validated health impact studies like that of the European Commission (ExternE, http://www.externe.info/externe_d7/) show that nuclear power is the safest source of energy. Many other sources, including former IPCC executives show that nuclear power actually saved lives, see Kharecha and Hansen in Environ. Sci. Technol. 47, 9, 4889-4895: https://pubs.acs.org/doi/10.1021/es3051197 . Nuclear waste is perfectly handled in Finland, Sweden and France. Recycling technology used in France reduces radioisotope activity and lifetime to 300-600 years. Worldwide data have been compiled and summarized in this graphics: https://exitcoalnow.org/NRdeath.png [Stephan Savarese, France]	Accepted: we added references, and please note that health impacts are due to accidents rather than waste. Waste was removed from the text.

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58220	28	28	28	3	Nuclear and CCS are not the only water-intensive technologies deployed in a low-carbon scenario. Our analysis shows that the more a decarbonisation pathway relies on biofuels, concentrating solar power, CCS and nuclear, the more water it consumes. For instance, despite lower energy demand in low-carbon scenarios, water consumption from the energy sector was slightly higher than in the IEA New Policies Scenario (based on existing policies and trends) [Andrew Prag, France]	Accepted: Point is made now explicitly in the discussion of water trade-offs in the next section.
61592	28	28	28	3	What is the basis for these statements regarding CCS and nuclear energy? One is a technology that has not been fully developed and the other has proven to result in far less health impacts than others. These technologies and their role in sustainable development deserve closer examination. [United States of America]	Accepted: Please note that we rely here on the assessment in AR5 and literature sources are provided in the related cells in Table 5.3 and 5.2.
50140	28	32	29	2	Lines 32-33 give a strange statement: it says that "development could be impeded unless low cost energy is going to be made available". What might be the intent is to warn that there are no low cost alternatives to coal. That line is further developed in lines 47-53 where the claim is made that renewable energy is more expensive than coal. It seems these statements are based on outdated literature. It has been well established that in most places renewable electricity from wind or solar is now cheaper than coal. This needs to be brought out clearly. That does not mean that the transition away from coal is easy. Job loss of coal miners and retraining are key to ensure a "just transition" can be realised. The cost argument however is false. The whole section needs to discuss how to realise a coal phase-out (an inevitable consequence of 1.5C strategies) and not why coal is so attractive. See chapter 5 in the UN Environment's 2017 Emissions Gap Report. [Bert Metz, Netherlands]	Taken into account. Text revised. UNEP 2017 report included.
62836	28	32	28	4	This paragraph is addressing an important issue but with only a limited assessment of available literature. Some statements appear strong generalization of limited studies. [Valérie Masson-Delmotte, France]	Accepted: Please note that we rely here on the assessment in AR5 and literature sources are provided in the related cells in Table 5.3 and 5.2.
58222	28	34	28	37	This is dependent on the type of cooling technology deployed. Combined cycle gas turbines have some of the lowest rates of water withdrawals and consumption among thermal power plants as they require less cooling and have a higher thermal efficiency. It is also because of an increase in the average level of efficiency of the global coal fleet, reflecting the retirement of less efficient plants and the increase in power generation from more efficient designs. It also reflects the shift away from coal-fired generation using once-through cooling systems which lowers withdrawals, but shifting to more efficient coal-fired power plants using wet-tower cooling systems tempers the rate of decline in water consumption. [Andrew Prag, France]	Accepted: Text has been removed due to space limitations.
13660	28	35	28	35	Missing comma [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
35410	28	35			On the citation (UNEP 2017), there should be a comma between the UNEP and the year of publication hence, should be corrected as (UNEP, 2017). [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before final submission.
39068	28	35	28	37	Natural gas helps reduce cooling water demands might be true when compared to coal plants but producing natural gas by fracking is water intensive and when you take that into account the benefits of reduced quantity of water used in cooling natural gas plants may even out [Anish Paul Antony, United States of America]	Accepted: Text has been removed due to space limitations.
3110	28	36	28	36	gas to replace' but natural gas has other problems. Shouldn't this be mentioned? [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
33404	28	37	28	37	demands. Combining [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
52346	28	37	28	37	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
13662	28	4	28	4	Missing comma [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
35412	28	4			The citation (Hatfield-Dodds et al. 2015) shall be corrected as (Hatfield-Dodds et al., 2015). [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before final submission.
10168	28	42	28	46	More clarification is needed [Saudi Arabia]	Accepted: text edited for clarity.
12696	28	42	28	51	This is interesting but I don't think it fully captures an important aspect to the debate (though it touches on it) - phasing out fossil fuels will have a negative impact for economies currently dependent on it. However, it's a wider question about the balance between pursuing a fossil fuel trajectory and pursuing a low carbon one. For example, for developing countries (e.g. in Africa) that need new energy infrastructure to alleviate poverty etc, will have a choice to go fossil or to go low carbon. What are the SDG implications of this choice? Pursuing fossil may, in the short term (as it remains cheaper generally and is reliable generally) may be beneficial in the short term for some of the SDGs. This balance is important and it will be an area that the report is critiqued on - many sceptics of mitigation argue that the pursuit of low carbon is harmful for poverty alleviation in developing countries. This should be drawn out more than it currently is in this section. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised within mandated page limits.
45436	28	42	28	46	Highly robust indeed but phrased in what could be interpreted as a policy prescriptive way [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised. Added Box 5.2.
31592	28	45	28	45	climate should be "climate." [Japan]	Accepted. Text changed substantially and revised.
34582	28	45	28	45	It says "climate goals" it should say "climate goals" [Mexico]	Accepted. Text changed substantially and revised.
41156	28	45	28	45	climate, not cimate [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
13664	28	46	28	46	Missing comma [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
35414	28	46			The citation (Johnson et al. 2015; McGlade and Ekins 2015, UNEP 2017) shall be corrected as (Johnson et al., 2015; McGlade and Ekins, 2015; UNEP, 2017). [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before final submission.

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29766	28	47	28	49	The point that coal remains attractive should probably be qualified in light of emerging trends to place moratoria on coal development. Such developments are however often framed in non-climate terms, highlighting the importance of more holistic development approaches that recognize co-benefits (Blondeel & Van de Graaf, https://doi.org/10.1007/s10584-017-2135-5). More generally, the emergence of "global moral norms" may be seen as a driver of change in fossil-fuel producing regions (Green, https://doi.org/10.1007/s10584-017-2134-6) - as evidenced, for example, by increasing regulatory action against hydraulic fracturing ("fracking") as a means of developing unconventional fossil-fuel resources. [Bård Lahn, Norway]	Accepted. Text substantially revised. Box 5.2 added.
41158	28	47	28	47	Should read: "Despite global climate goals, investment..." (add comma) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
57188	28	47	28	51	This sentence is very long and should be made clearer. It could be split in two, + consider adding "air pollution" next to "climate goal" in the beginning. To what extent are those incentives together still insufficient to trigger change in fossil energy user countries? It might also be clearer that you are not referring to net job losses (unless I wrongly interpreted your text). [Philippe Marbaix, Belgium]	Accepted. Text revised. You are right. As per literature it is not net job loss.
41160	28	49	28	49	Add stop after '2017'. Start new sentence with "Under such circumstances ..." (correct word circumstances) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
47236	28	5	28	5	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
30746	28	51	28	51	The impact on employment is not always clear. Does "job losses" mean net losses and increase in unemployment, or job shifts (e.g. from thermal power plants to variable renewable). Socio-political implications can be very different. Is it possible to assess the job potential of the 1.5°C target? [France]	Accepted. Text changed substantially and revised.
30748	28	51	28	51	« job losses, relatively higher prices » Words are missing : "the effects of"? [France]	Accepted. Text changed substantially and revised.
30752	28	51	28	51	Typo : alternative [France]	Accepted. Text changed substantially and revised.
41162	28	51	28	51	Add 'and' after "job losses," [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
45438	28	51	28	51	There is evidence elsewhere that "alternative" energy could be cheaper [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Sentence qualified with reference mentioned earlier also that some alternative energy can be economically costly but also mentioned as is in literature (Labordena et al. 2017) how can that cost be reduced. Also Comment #734
41164	28	54	28	54	the phase down of the mining industry (add 'the') [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
16608	29	1	29	54	Somewhere around here (or elsewhere), in a chapter on equity, there needs to be a discussion not only on poverty but the inequity that arises from extreme wealth - both in terms of resource use, power and GHG emissions. In Australia a wealthy person emits about 2 1/2 times the annual emissions as a poor person. [Janet Stanley, Australia]	Rejected. Outside the mandate of the Chapter.
43242	29	1	29	1	This section on cross-sectoral response options could also consider targeting the most impacted areas. [Edward Byers, Austria]	Accepted. Text revised substantially.
44744	29	6	29	8	Important, can this be strengthened into a key message for the Executive Summary? [Penny Urquhart, South Africa]	Noted. Contradicts #781. Text revised.
61594	29	6	29	8	This statement needs to be expanded and clarified, and may need a confidence level. [United States of America]	Taken into account along with related comments #781, #784, #786. Text revised substantially.
61596	29	7	29	7	Suggest replacing the words "circular economy concept" with "resource efficiency concepts such as sustainable materials management and the circular economy concept." There are a number of systematic approaches to resource efficiency that aim to "decouple" economic growth from GHG emissions through the more efficient use of natural resource. Suggest including the Sustainable Materials Management approach to use and reuse materials more productively over their entire life cycles in addition to the term circular economy. [United States of America]	Noted. It is there in AR5 WGIII Chapter 10.
50142	29	1	29	24	This section discusses the issue of decoupling (reducing emissions while growing the size of the economy). It questions if decoupling is possible, while not mentioning that there are several countries (EU, US) that are showing absolute decoupling for some time, the text also argues that reductions in energy demand are needed (suggesting that is inconsistent with decoupling), but many 1.5C scenarios do assume energy demand reductions, while showing GDP growth. It is of course OK to discuss literature that argues GDP decline as a necessary condition, but it goes way too far to suggest that decoupling is impossible. The text needs to be adjusted. [Bert Metz, Netherlands]	Accepted. Section deleted and text revised.
57150	29	1	29	24	The statement that "The potential for decoupling economic growth and GHG emissions is highly debated" is a very important one, but the paragraph does not appear to provide all the relevant information: As the text first says, one might question the reliance on decoupling alone amongst developed states. But then the paragraph continues saying that "Others argue that economic growth can be compatible", however the 3 references provided refer, as far as I know, to developing states. Hence these do not appear to refute the papers saying that decoupling is not sufficient in developed states. The compatibility of continued substantial continued growth in developed countries should receive more attention, because that is where the controversy, and relevant question in the framework of SR 1.5 might be. Please also pay attention to the links with chapter 2. [Philippe Marbaix, Belgium]	Accepted. Section deleted and text revised.
61598	29	1	29	12	This statement is incorrect. The UNFCCC does not make this recognition. The references provided do not appear to be in a position to be authoritative on this matter. [United States of America]	Noted. Sentence deleted.

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13666	29	12	28	12	Missing n dash [Poot-Deigado Carlos, Mexico]	Accepted. Text changed substantially and revised.
10170	29	13	29	13	The concept of decoupling economic growth from GHG emissions has no sufficient evidence to support [Saudi Arabia]	Accepted. Section deleted and text revised.
10172	29	15	29	18	Linking ambitious climate goal to deep cut to energy demand and GDP growth needs more evidence, while in this Chapter 1.5? and sustainable development [Saudi Arabia]	Accepted. Section deleted and text revised.
12698	29	15	29	16	Chapter 4 states that, for a period, we have already achieved "absolute decoupling" (page 14). Clearly you are (rightly) more sceptical on this point, but there should be greater consistency on this point between chapters. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Section deleted and text revised.
48202	29	15	29	15	Ley, 2017b' should be 'Ley, 2017'. The reference is duplicated in the reference list. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
62838	29	16	29	16	Please check if several terms used in the chapter are defined in the glossary (de-growth, global South and others). [Valérie Masson-Delmotte, France]	Accepted. Section deleted and text revised.
33406	29	19	29	19	2016). Others [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
52348	29	19	29	19	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
52788	29	2	29	2	Dematerialisation under specific circumstances meaning not clear [Iulain Florin VLADU, Germany]	Accepted. Section deleted and text revised.
13668	29	22	29	22	Space [Poot-Deigado Carlos, Mexico]	Accepted. Text changed substantially and revised.
41166	29	22	29	22	Add space between '2015' and 'Creutzig'. [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
33408	29	24	29	24	decrease trade deficits, and create employment. [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
10174	29	26	29	27	Using carbon pricing is a Policy perspective and out of mandate of the IPCC [Saudi Arabia]	Accepted. Section deleted and text revised.
13258	29	27	29	27	Delete the text ", and the ability of carbon pricing schemes to close infrastructure access gaps". [Eleni Kaditi, Austria]	Accepted. Section deleted and text revised.
41168	29	31	29	31	to manage the transition (not the transitioning) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41170	29	32	29	32	add 'and' before 'direct investment' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
13260	29	33	29	34	Delete the text ", particularly fossil fuel subsidy reforms.". [Eleni Kaditi, Austria]	Accepted. Section deleted and text revised.
33410	29	35	29	35	extra space - poverty (Jacob [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
13670	29	39	29	39	Space [Poot-Deigado Carlos, Mexico]	Accepted. Text changed substantially and revised.
52350	29	39	29	39	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
12700	29	42	27	54	This could be cut down significantly - just give a single succinct example of the benefits of a circular economy approach. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised substantially.
61600	29	44	29	44	We suggest replacing the words "circular economy concept" with "resource efficiency concepts." There are a number of systematic approaches to resource efficiency that aim to "decouple" economic growth from GHG emissions through the more efficient use of natural resource. We suggest including the Sustainable Materials Management approach to use and reuse materials more productively over their entire life cycles in addition to the term circular economy. [United States of America]	Accepted. Section deleted and text revised.
41172	29	5	29	5	add 'and' before 'ecosystem service value' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
39070	29	51	29	54	This is valid only when a country has the money and resources to implement systems that make use of wate heat etc and set up industrial parks. China for example is one such country and so too will be the case for some countries in the middle east. Poorer countries may not be able to do this due to lack of funds [Anish Paul Antony, United States of America]	Accepted. Section deleted and text revised.
41174	29	51	29	51	suppliers (not supplier) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41176	29	52	29	52	Should read: "...rooftops for solar energy production help..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
31594	29	53	29	54	The contents are duplicated. The sentence "It creates a new opportunity for energy enhancing independency of specific regions, total energy demand reductions by towns, primary energy demand reduction and heating energy demand for towns beings met" does not distinguish between total energy demand, primary energy demand and heating energy demand. Therefore, either three should be collectively referred to as "energy demand", or the difference between them should be specified. [Japan]	Accepted. Text changed substantially and revised.
3112	29	54	29	54	towns beings met' should be 'towns being met' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
10176	3	1	3	3	Subsiding the renewable energy and taxing fossil fuel is not achieving SDG 7 [Saudi Arabia]	Accepted. Section deleted and text revised.
34586	3	4	3	4	and biofuel... could clash with SDG 2 (food security)". It would be advisable to state the complexity [Mexico]	Accepted. Section deleted and text revised.
41178	3	6	3	7	Should read: "However, electrification of the transpor sector cannot deliver the sedired climate goals unless supplemented by an increasing decarbonisation of electricity." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
58232	3	6	3	6	Suggestion to add SDG 7 to the list [Andrew Prag, France]	Accepted. Section deleted and text revised.
34584	3	7	3	7	it says "deacarbonisation" it should say "decarbonisation" [Mexico]	Accepted. Text changed substantially and revised.
28848	3	1	3	12	If trade-offs for "industrial symbiosis" are only reported in one publication, we suggest to add a confidence statement accordingly. [Germany]	Accepted. Section deleted and text revised.

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61602	3	14	3	15	There is an important omission in the text in this section. It's not a matter whether the private sector "can" – as they manage enough assets globally to do so – but more of a would they or would they not under different policy circumstances. "It is unclear whether private finance [DELETE: can][ADD: would] deliver the full range of actions required for a low carbon transition [ADD: under the current policy contexts that exists within countries], or what role the public sector can and should play to mobilize these resources." [United States of America]	Accepted. Section deleted and text revised.
12702	3	15	3	17	How does Kolkata show this? [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Section deleted and text revised.
33412	3	15	3	15	public sector should play [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
52352	3	15	3	16	An awkward phrasing, please re-work. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
21572	3	21	3	21	typo: developing [Nathalie HILMI, France]	Accepted. Text changed substantially and revised.
33414	3	21	3	21	rapidly developing countries [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
34588	3	21	3	21	it says "develping" it should say "developing" [Mexico]	Accepted. Text changed substantially and revised.
13262	3	22	3	22	Delete the text "green". [Eleni Kaditi, Austria]	Accepted. Section deleted and text revised.
47238	3	22	3	23	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
12704	3	23	3	24	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Section deleted and text revised.
1316	3	26		35	The paragraph about the CDM's contribution to sustainable development does not reflect an updated and comprehensive knowledge of the literature with regard to the issue. Suggested additional references are as follows: 1) UNFCCC. (2012b). Synthesis Report of the call for input on the CDM Policy Dialogue. 2) Olsen, K. H., Arens, C., & Mersmann, F. (2017). Learning from CDM SD tool experience for Article 6.4 of the Paris Agreement. Climate Policy, 1-13. doi: 10.1080/14693062.2016.1277686, 3) Olsen, K. H., Fenhann, J., Hinostrza, M., Arens, C., Mersmann, F., Rudolph, I. F., & Beuermann, C. (2015). Assessing Usefulness - Do Stakeholders Regard the CDM's SD tool as Practical? Berlin.: 4) He, J. J., Huang, Y. F., & Tarp, F. (2014). Has the Clean Development Mechanism assisted sustainable development? Natural Resources Forum, 38(4), 248-260. doi: 10.1111/1477-8947.12055, 5) Schade, J., & Obergassel, W. (2014). Human rights and the Clean Development Mechanism. Cambridge Review of International Affairs, 27(4), 717-735. doi: 10.1080/09557571.2014.961407. A conclusion from this literature is that many stakeholders regard the CDM as successful in contributing to sustainable development, whereas other stakeholders hold the position that the CDM has not contributed significantly to SD for a number of reasons, such as negative impacts in some cases including human rights violations. [Karen Olsen, Denmark]	Accepted. Section deleted and text revised.
8266	3	26	3	35	There is substantial literature showing that the CDM has had little mitigation benefit, and has had in some cases very negative impacts on local populations. This paragraph is misleading as it presents the CDM as an effective tool to reduce mitigation costs, while only allocating half a sentence to the "limited sustainable development benefits" it has had. Studies have shown that the effectiveness of the CDM in reducing mitigation costs is mostly due to the large environmental integrity issues of projects, as well as the lack of MRV and the conflict of interests in the private standard setting organisations. Below are studies which should be included in the IPCC report to give a more balanced view on the outcome of the CDM. - M. Cames et al. (2016), "How additional is the Clean Development Mechanism?", European Commission, DG Clima. - J. Alexeew et al. (2010), "An analysis of the relationship between the additionality of CDM projects and their contribution to sustainable development", International Environmental Agreements , 10(3), pp. 233-248 - L. Schneider (2009), "Assessing the additionality of CDM projects: practical experiences and lessons learned", Climate Policy, 9 (3), 242-254 - J. Schade and W. Obergassel (2014), "Human rights and the Clean Development Mechanism", Cambridge Review of International Affairs, 27 (4), pp. 717-735 [Kelsey Perlman, France]	Noted. Text substantially revised so no longer valid.
18722	3	26		35	The paragraph about the CDM's contribution to sustainable development does not reflect an updated and comprehensive knowledge of the literature with regard to the issue. Suggested additional references are as follows: 1) UNFCCC. (2012b). Synthesis Report of the call for input on the CDM Policy Dialogue. 2) Olsen, K. H., Arens, C., & Mersmann, F. (2017). Learning from CDM SD tool experience for Article 6.4 of the Paris Agreement. Climate Policy, 1-13. doi: 10.1080/14693062.2016.1277686, 3) Olsen, K. H., Fenhann, J., Hinostrza, M., Arens, C., Mersmann, F., Rudolph, I. F., & Beuermann, C. (2015). Assessing Usefulness - Do Stakeholders Regard the CDM's SD tool as Practical? Berlin.: 4) He, J. J., Huang, Y. F., & Tarp, F. (2014). Has the Clean Development Mechanism assisted sustainable development? Natural Resources Forum, 38(4), 248-260. doi: 10.1111/1477-8947.12055, 5) Schade, J., & Obergassel, W. (2014). Human rights and the Clean Development Mechanism. Cambridge Review of International Affairs, 27(4), 717-735. doi: 10.1080/09557571.2014.961407. A conclusion from this literature is that many stakeholders regard the CDM as successful in contributing to sustainable development, whereas other stakeholders hold the position that the CDM has not contributed significantly to SD for a number of reasons, such as negative impacts in some cases including human rights violations. [Andrea TILCHE, Belgium]	Accepted. Section deleted and text revised.

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34590	3	26	3	35	If there is mention of the CDM and the lack of private funding, it should be mention the achievements of the Voluntary Carbon Markets to gather funds for a wide variety of projects leading to the decarbonisation of the economy and the conservation of natural resources. The voluntary carbon market gives hints of achieving SDG 12 since most of the transactions are influenced by corporate social responsibility and the need to comply with new "green" consumption patterns (revise the "State of the Voluntary Carbon Markets" from Ecosystem Marketplace). [Mexico]	Noted. Text substantially revised so no longer valid.
41180	3	26	3	27	Should read: "Assessments of the As an instrument for emission trading and sustainable development benefits were presented in AR5" [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
51496	3	26	3	35	There is also a considerable amount of literature on pitfalls of carbon trade and CDM being referred to as false solutions. Why the IPCC is not considering referring to such literatures is surprising. There are country studies on impact of CDM projects. And how do we argue in keeping temperature within 1.5 if carbon credits is business as usual; and allow emitters to continue emit simply because they have carbon credits with them? So far, there is no study to conclude that CDM can, therefore, lead to higher emissions (where carbon credits enable higher emissions or continued emissions) and thus can breach 1.5. It is true that CDM, emission trading bring down mitigation costs but such market mechanisms have very high impact on southern countries, communities, forests, biodiversity and land also. Cheap mitigation cost benefits developed countries, not the southern countries and do not result in positive climate action. Also, IPCC needs to show how SDG can be attained or how mitigation mechanisms like carbon trading and CDM leads to sustainable development. [Souparna Lahiri, India]	Noted. Text substantially revised to keep within mandate and page limits.
51498	3	26	3	45	Please also refer to the following publications: J Kill, S Ozinga et al, Trading Carbon, How it works and why it is controversial, Fern, 2010; B Stephen, R Lane edited, The Politics of Carbon market, Routledge, 2015; [Souparna Lahiri, India]	Noted. Text substantially revised to keep within mandate and page limits.
12706	3	29	3	3	Don't refer to other papers, discuss them! [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Text substantially revised to keep within mandate and page limits.
13672	3	3	3	3	Space [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
41182	3	3	3	31	Should read: "While CDM activities focused initially on Asia and Latin America, ..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
55336	3	3	3	3	add space: "in(Michaelowa) [ELISA BERDALET, Spain]	Accepted. Text changed substantially and revised.
41184	3	34	3	34	higher, not higer [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
7502	3	35	3	35	Please replace "Bodnar et al. in press" by "Bodnar et al. 2018". Reference: Bodnar, Paul; Ott, Caroline; Edwards, Rupert; Hoch, Stephan; McGlynn, Emily; Wagner, Gernot (2018): Underwriting 1.5°C: competitive approaches to financing accelerated climate change mitigation, Climate Policy, 18:3, p. 368-382, [Axel Michaelowa, Switzerland]	The reference has been removed from the assessment.
8250	3	35	3	35	Please replace "Bodnar et al., in press" by "Bodnar et al., 2018". Reference: Bodnar, Paul; Ott, Caroline; Edwards, Rupert; Hoch, Stephan; McGlynn, Emily F.; Wagner, Gernot (2018): Underwriting 1.5°C: competitive approaches to financing accelerated climate change mitigation, Climate Policy, 18:3, p. 368-382. [Angela Geck, Germany]	The reference has been removed from the assessment.
37432	3	35	3	35	Please replace "Bodnar et al., in press" by "Bodnar et al. 2018". – full reference: Bodnar, Paul; Ott, Caroline; Edwards, Rupert; Hoch, Stephan; McGlynn, Emily; Wagner, Gernot (2018): Underwriting 1.5°C: competitive approaches to financing accelerated climate change mitigation, Climate Policy, 18:3, p. 368-382, [Matthias Honegger, Germany]	The reference has been removed from the assessment.
47010	3	37	3	37	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
50144	3	37	3	45	What message is this paragraph trying to give? [Bert Metz, Netherlands]	Accepted. Text deleted.
1914	3	42	3	45	I assume the authors mean the costs of NDC implementation. AS far as I understand, the reference (Fujimori et al., 2016a) does not refer to costs mentioned in NDCs, but to the costs of implementation the aggregated mitigation targets of NDCs. Pauw et al. (2016) is a source for the former, if that is what is actually meant (see e.g. https://klimalog.die-gdi.de/ndc/#NDCExplorer/worldMap?INDC??climatechangemitigation???cat2) [Willem Pieter Pauw, Germany]	Accepted. Text deleted.
31596	3	42	3	44	The contents are duplicated. Therefore please change the sentence to "Emission reduction costs associated with Nationally Determined Contributions (NDCs) also differ significantly across countries (Akimoto et al., 2016; Fujimori et al., 2016a)." [Japan]	Accepted. Text changed substantially and revised.
8268	3	44	3	45	The sentence "At the same time, the emissions trading system can reduce the mitigation cost largely by 80%." is unclear. Which ETS does it refer to? Mitigation costs in which sectors/countries? What is the counterfactual to the 80% reduction in costs? [Kelsey Perlman, France]	Accepted. Text changed substantially and revised.
12708	3	44	3	45	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text deleted.
31598	3	44	3	45	Need reference with regard to the contents. [Japan]	Accepted. Text deleted. Same as # 819.
35562	3	44	3	45	80% mitigation cost reduction through emissions trading is a bold claim (given that it has not happened so far!). Some references/justification is required. [Ashok Sreenivas, India]	Accepted. Text deleted. Same as # 819.
48204	3	44	3	45	Please indicate what source the statistic that emission trading system can reduce mitigation cost largely by 80% comes from. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
1318	3	45			The statement: 'At the same time, the emissions trading system can reduce the mitigaion cost largely by 80%' - lacks a reference. It comes across as quite generic, non-specific and not a claim that is valid without stating the context. Please include a reference. [Karen Olsen, Denmark]	Accepted. Section deleted and text revised.
3114	3	45	3	45	mitigaion' should be 'mitigation' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.

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18724	3	45			The statement: 'At the same time, the emissions trading system can reduce the mitigaion cost largely by 80%' - lacks a reference. It comes across as quite generic, non-specific and not a claim that is valid without stating the context. Please include a reference. [Andrea TILCHE, Belgium]	Accepted. Section deleted and text revised.
34592	3	45	3	45	it says "mitigaion" it should say mitigation" [Mexico]	Accepted. Text changed substantially and revised.
45440	3	48	3	48	Not specific to 1.5, relevant at lower levels of mitigation ambition [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text changed.
49062	3	48	31	24	The AFOLU measures identified in this section do not include the mitigation benefits of protecting indigenous legal rights to forests (see, for example, Ding et al., Climate Benefits, Tenure Costs, WRI 2016. [David Waskow, United States of America]	Accepted. Reference included.
50146	3	48	31	6	This is a repetition of material that is already discussed in other chapters. Can be delted and replaced with a reference. [Bert Metz, Netherlands]	Noted.
51500	3	48	31	54	The arguments put forward in this part is mostly from one school of thought which is based on the market reliance on carbon, carbon trading and offsets in land sector and forests. Since 2003, there has been a huge literature published on the detrimental and negative effects of carbon trading, offsets, REDD+, biofuel on land, land use, livelihood, communities and on forests and biodiversity. IPCC needs to balance its arguments referring to the other schools of thoughts also. Please refer to: Carbon Trade Watch, Paths Beyond Paris: Movements, Action and Solidarity Towards Climate Justice, 2015; A Tree for a Fish, The (i)logic Behind Selling Biodiversity, Carbon Trade Watch, 2014; TNI, FDCL, IGO edited, Protecting carbon to destroy forests, land enclosures and REDD+, Carbon Trade Watch, 2013; Key Arguments against Reducing Emissions from DEforestation & Degradation (REDD+), Carbon Trade Watch, Global Justice Ecology Project, Indigenous Environmental Network, 2011; B Horstmann and J Hein, Aligning Climate Change Mitigation and Sustainable Development nder the UNFCCC: A Critical Assessment of the Clean Development Mechanism, the Green Climate Fund and REDD+, German Development Institute, 2017; Also please refer to valuable series of reports from CIFOR's Global Comparative Study on REDD+ [Souparna Lahiri, India]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
58654	3	48	32	37	This section would be improved by considering literature that demonstrates options for mitigation in agriculture that are consistent with other sustainable development objectives, such as ending hunger, improved livelihoods, building resilience. For example, FAO proposes the following three ways to substantially reduce emissions from livestock production: productivity improvements that reduce emission intensities; carbon sequestration through improved pasture management;? and better livestock integration in the circular bioeconomy. These solutions can be combined and they also contribute to increase resilience to climate change. http://www.fao.org/3/a-i8098e.pdf . Another example, are the five principles of sustainable food and agriculture that FAO member states have endorsed: Improving efficiency in the use of resources is crucial to sustainable agriculture; Sustainability requires direct action to conserve, protect and enhance natural resources; Agriculture that fails to protect and improve rural livelihoods, equity and social well-being is unsustainable; Enhanced resilience of people, communities and ecosystems is key to sustainable agriculture; Sustainable food and agriculture requires responsible and effective governance mechanisms. http://www.fao.org/3/a-i7994e.pdf The FAO, in its 2016 report on Food Security, Climate Change and Agriculture has also pointed out that the agriculture sectors face a unique challenge: to produce more food while reducing greenhouse gas emissions caused by food production. Agriculture could reduce its emission intensity, but not enough to counterbalance projected increases in its total emissions. Addressing emissions from land use change driven by agricultural expansion is essential, but sustainable agricultural development will determine its success. Although improvements in carbon and nitrogen management also reduce emissions, they are likely to be driven by adaptation and food security objectives, rather than mitigation goals. Reducing emissions from agriculture also hinges on action to minimize food losses and waste and to promote sustainable diets. This is outlined in detail in http://www.fao.org/publications/sofa/2016/en/ Other relevant references include: http://www.fao.org/ag/aginfo/resources/en/publications/tackling_climate_change/index.htm http://www.fao.org/docrep/018/3288e/i3288e.pdf [New Zealand]	Accepted. Text revised substantially.
52794	3	49	31	24	A discussion on BECCs would benefit this section [Iulain Florin VLADU, Germany]	Accepted. Text revised.
41186	3	51	3	51	play, not plays [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
57826	3	51	3	52	The statement that forestry, plays a key role for emission reductions proposed by many countries to fulfil their NDCs could be further supported with the following reference: Grassi, G., & Dentener, F. (2015). Quantifying the contribution of the land use sector to the Paris climate agreement, EUR 27561. [Kate Dooley, Australia]	Noted. To be within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
12710	3	52	3	53	More recent references available? [United Kingdom (of Great Britain and Northern Ireland)]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.

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10232	3	53	3	55	<p>Some of the world's largest forested areas span across national boundaries. Accordingly, many of the most ambitious conservation programmes are implemented across borders. To date, the bulk of these programmes are funded from bilateral and multilateral aid budgets (Norman and Nakhouda, 2015). Nonetheless, as national climate change funds are increasingly adopted to finance domestic climate change policy efforts (CPI, 2017), it is likely that an increasingly larger share of forest conservation programmes in developing countries will be funded from national budgets, possibly involving transboundary forests. While data for developing countries are lacking, new evidence from developed countries suggests that not only distance to the resources, but also - and especially - nationality may influence people's willingness to commit funding to conservation measures administered by a neighbouring country (Bakhtiar et al. 2017). This could have non-negligible implications for the effectiveness of future forest conservation programmes in transboundary settings and, by extension, for the long-term mitigation potential that can actually be attributed to transboundary forest conservation in developing countries.</p> <p>Norman, M. and Nakhouda, S. (2015): The state of REDD+ finance. Center for Global Development Working Paper No. 378.</p> <p>CPI (2017): The global landscape of climate finance. Climate Policy Initiative. London.</p> <p>Bakhtiar, F., Jacobsen, J.B., Jellesmark, B., Lundhede, T.H., Strange, N., Boman, M. (2017): Disentangling distance and country effects on the value of conservation across national borders. Ecological Economics (147), 11-20. [Fateme Bakhtiar, Denmark]</p>	Noted. Text substantially revised. No longer valid.
9644	3	54	3	54	<p>Although the word "climate smart agriculture" is often used in the existing literature, "climate smart forest management" is not commonly used in the existing literature. "Sustainable forest management" which includes mitigation and adaptation, is more commonly used in the literature. If you use the word "climate smart forest management", it is important to add references that are using that word. [Morita Kanako, Japan]</p>	Accepted. Text changed substantially and revised.
57448	3	54	3	54	"climate-smart forest management" needs to be explained [Hans Poertner, Germany]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
10178	31	1	31	3	Using wood products for energy substitutes fossil fuels. [Saudi Arabia]	Noted.
12712	31	1	31	3	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
44746	31	1	31	24	So what is the main lesson from REDD+ for SD and 1.5? This would be very useful for policy makers to know. [Penny Urquhart, South Africa]	Noted. Text substantially revised so no longer valid.
48398	31	1	31	24	. Agree the success stories of REDD+. But most activities are pilot project, which is small scale, and rather isolated. It will be better if, the program is mainstreamed into long term development plan in local sites. [Agus Susatya, Indonesia]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
57828	31	1	31	3	The significant contribution that forest ecosystem restoration can make to negative emissions should be included as an option in this sentence. Given this important mitigation option is not included in Griscom et al 2017, or Siagian et al., 2016, two additional references can be added to support the inclusion of forest restoration as a negative emissions option: Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98. doi.org/10.1007/s10784-017-9382-9; and Houghton et al (2015) A role for tropical forests in stabilizing atmospheric CO2, Nature Climate Change, 5:1022-1023. [Kate Dooley, Australia]	Accepted. Reference added.
61604	31	1	31	24	Note that, per UNFCCC decisions, REDD+ is national or subnational in scale. The examples cited in this section are all project-level, which is inconsistent with the definition of REDD+. Revise the section to reflect a national/subnational scale, and use citations relevant to programs at this scale. [United States of America]	Noted. Text substantially revised so no longer valid.
9640	31	3	31	6	<p>The following sentence is important to show that REDD+ produces multiple benefits including biodiversity conservation and adaptation. Since the target of REDD+ is developing countries, I suggest to add the word "in the developing countries" in the end of the sentence as follows, or include "in the developing countries" in the explanation of REDD+ like REDD+ (Reducing Emissions from Deforestation and Forest Degradation in Developing Countries).</p> <p>"Implementation of mitigation in forest sector through REDD+ (Reducing Emissions from Deforestation and Forest Degradation) not only contributes to emissions reductions, but also contributes to biodiversity conservation and climate change adaptation in the developing countries (Bustamante et al., 2014; Morita and Matsumoto, 2018)." [Morita Kanako, Japan]</p>	Accepted. Text changed substantially and revised.
28850	31	3	31	3	Wood products can also substitute (replace) products made from fossil carbon and / or that require a higher amount of C emissions from fossil fuels than a functionally equivalent product made from wood. This "material substitution" is not considered here. Wood that is used in such products can still be used as feedstock for bioenergy at the end of the product's lifetime. If these issues cannot be addressed in the SR1.5 due the lack of the scientific evidence this should please be clearly stated. [Germany]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.

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29768	31	3	31	24	The discussion of REDD+ in the context of sustainable developmetn is in need of some more nuance. While there are indeed co-benefits to highlight, much of the extant literature also underlines the contextual characted of such co-benefits and the risks associated with implementing REDD+ under conditions of, for example, strong inequality, weak public access to decision-making processes or remedial justice, unclear land tenure conditions, power differentials etc. (see, e.g., Brockhaus et al. https://doi.org/10.1016/j.forpol.2013.07.003). The impacts of REDD+ implementation on human rights are strongly linked to the application of the principle of "Free, Prior, Informed Consent" (FPIC), which is in turn strongly shaped by "contextual factors such as government laws and policies, the socio-political environment and the overall distribution of rights and resources" (Mahanty & McDermott, https://doi.org/10.1016/j.landusepol.2013.06.014). It has been claimed that REDD+ ignores the political economy of resource-rich states (Karsenty & Ongolo, https://doi.org/10.1016/j.forpol.2011.05.006) in ways that creates powerful incentives to inflate baselines and fail to induce structural change in forest-based economies (Seyller et al., https://doi.org/10.1505/146554816818966336). A recurring finding in the literature seems to be that "greater tenure security and effective participation of local communities in management will not only prevent adverse social outcomes, but will also enable better forest outcomes and improved capacity for forest governance" (Cchatre et al., https://doi.org/10.1016/j.cosust.2012.08.006). In a discussion of sustanability and REDD+, this is an imperative point to highlight. [Bård Lahn, Norway]	Noted. Text substantially revised so no longer valid.
33942	31	3	31	6	Please consider to include in this statement information about REDD+ safeguards, and how applying these could contribute to biodiversity and climate change adaptation. The contribution to biodiversity conservation depends on the application of the REDD+ safeguards. One of the references for the statement is Bustamante et al., 2014, which also elaborates: "There are concerns about the impacts of REDD+ design and implementation options on biodiversity conservation, as areas of high C content and high biodiversity are not necessarily coincident" [Norway]	Noted. Text substantially revised so no longer valid.
4398	31	4	31	4	REDD+ does not stand for "Reducing Emissions from Deforestation and Forest Degradation" as the text suggests, rather for "Reduced Emissions from Deforestation and forest Degradation, plus the roles of conservation, sustainable management of forests, and enhancement of forest carbon stocks." [Thales A. P. West, Brazil]	Noted. Text substantially revised so no longer valid.
28852	31	4	31	4	Instead of immediately starting off with REDD it may be useful to insert a more general sentence that addresses the need for incentives to reduce emissions from deforestation and forest degradation, and also outlining the strong need for a correct implementation of any strategies to create co-benefits regarding mitigation and adaptation. [Germany]	Accepted. Text changed substantially and revised.
41188	31	4	31	4	add 'the' before 'forest sector' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
61606	31	5	31	5	Should restate as 'can contribute' to these other goals. There can be tradeoffs here too. [United States of America]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
4404	31	6	31	12	It seems relevant to cite the work by Jayachandran et al., which was based on a randomized-controlled trial and found positive effects of REDD+ payments in Uganda. It is an important work that answers the call for high-quality evaluations of market-based mechanisms for conservation and promotion of more sustainable practices, such as REDD+: "Jayachandran S et al., 2017, Cash for carbon: A randomized trial of payments for ecosystem services to reduce deforestation. Science 357, 267–273." [Thales A. P. West, Brazil]	Noted. Text substantially revised so no longer valid.
28854	31	6	31	24	The paragraph on REDD+ already points out that there are differences between different REDD+ projects. It would be helpful if not only trade-offs encountered in certain projects are depicted, but more general conclusions on the potential of REDD+ could be included. [Germany]	Noted. Text substantially revised so no longer valid.
50148	31	6	31	24	This is too much on the problems encountered and not enough on how to avoid or overcome these problems. The paragprah would be much more valuable if it presents "lessons for REDD+ sustainability" [Bert Metz, Netherlands]	Noted. Text substantially revised so no longer valid.
41190	31	8	31	9	add comma after 'activities' and after 'Vietnam)' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
12714	31	11	31	11	What are the consequences? Be explicit [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Text substantially revised so no longer valid.
48206	31	15	31	15	Please check to see whether 'Nobre et al., 2016' is in the reference list. [Sarah Connors, France]	Accepted. Text changed substantially and revised.
28856	31	16	31	19	What are the reasons for the gender sensitivity of REDD+ initiatives? We suggest to add relevant literature discussing preventive strategies of this gender sensitivity, and equally include references addressing the effect of REDD+ initiatives on other marginalized groups, such as indigenous groups" [Germany]	Noted. Text substantially revised so no longer valid.
4402	31	19	31	2	There is no referece for the claim "REDD+ projects have also been shown to negatively affect indigenous groups in some cases." While there are certainly examples of those in the literature, there are also examples of positive effects of REDD+ projetcos on indigenous groups. One of those positive effects is described in: "West TAP, 2016, Indigenous community benefits from a de-centralized approach to REDD+ in Brazil. Climate Policy 16, 924-939." [Thales A. P. West, Brazil]	Noted. Text substantially revised so no longer valid.
61608	31	19	31	22	Cite any references to systematic negative impacts on indigenous people from national/subnational level REDD+ programs. Note that REDD+ safeguards (Decision 1/CP16) prohibit the conversion of natural forests to plantations; the second sentence here should be deleted as it is not relevant to REDD+. "REDD+ projects have also been shown to negatively affect indigenous groups in some cases. Promoting land-use changes through planting monocultures on biodiversity hot spots can have adverse side-effects for biodiversity and local food security (IPCC, 2014c)." [United States of America]	Noted. Text substantially revised so no longer valid.

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54506	31	2			This observation of Indigenous peoples and REDD is true but needs a citation and also some elaboration--presumed benefits do not materialise? Inequality is exacerbated? [Thomas Thornton, United Kingdom (of Great Britain and Northern Ireland)]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
28858	31	21	31	22	Please consider expanding on the issues arising from monocultures that can also hamper the ability of local populations to diversify land management activities to support adaptation to climate- and market-related risks.189 [Germany]	Noted. Text substantially revised so no longer valid.
12716	31	22	31	24	Are there other cases? [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text removed. Same as #852.
16566	31	22	31	24	The reference cited here assesses how natural resource management regimes affect indigenous populations in the Cape York Peninsular. The study explicitly states that its analysis applies only to the specific circumstance of this region. It is not valid to generalise the conclusions to 'the case of Australia'. Further, the term 'excluded' significantly overstates the study conclusions for the Cape York Peninsula. In Australia, traditional owners are involved in natural resource management and in managing carbon stocks (for e.g. in the Northern Territory under the Emissions Reduction Fund). A number of National Parks are managed by traditional owners and projects under the ERF fund traditional owners' carbon sequestration through fire management. Australia's Indigenous Protected Areas, covering more than 65 million hectares, provide a wide range of ecosystem services, including carbon sequestration. Indigenous Protected Areas are areas of land or sea country owned by Indigenous groups and voluntarily managed through an agreement with the Australian Government to promote biodiversity conservation and cultural maintenance. The Indigenous Protected Areas Program supports traditional owners to choose when, where and how they will manage their country. Indigenous Protected Areas comprise 45 percent of Australia's National Reserve System. [Australia]	Accepted. Text removed.
8252	31	24	31	24	After "(Winer et al., 2012)." please insert "The Forest Landscape Restoration Approach attempts to reconcile REDD+ with sustainable development as well as biodiversity protection (Bastos et al., 2017; Mansourian et al., 2017; Nielsen, 2016; Pistorius et al., 2017; Weatherley-Singh and Gupta 2017)." References: Bastos Lima, Marion G.; Visseren-Hamakers, Ingrid J.; Braña-Varela, Josefina; Gupta, Aarti (2017): A reality check on the landscape approach to REDD+: Lessons from Latin America. Forest Policy and Economics, 78, p. 10–20. Mansourian, Stephanie; Dudley, Nigel; Vallauri, Daniel (2017): Forest Landscape Restoration: Progress in the Last Decade and Remaining Challenge, Ecological Restoration 35:4, p. 281–288. Nielsen, Tobias D. (2016): From REDD+ forests to green landscapes?: Analyzing the emerging integrated landscape approach discourse in the UNFCCC. Forest Policy and Economics, 73, 177–184. Pistorius, Till; Carodenuto, Sophia; Wathum, Gilbert (2017): Implementing Forest Landscape Restoration in Ethiopia, Forests, 8, 3, p. 61. Weatherley-Singh, Janice; Gupta, Aarti (2017): An ecological landscape approach to REDD + in Madagascar: Promise and limitations?, Forest Policy and Economics, 85, p. 1–9. [Angela Geck, Germany]	Noted. Text substantially revised so no longer valid.
50150	31	26	31	46	It is not clear what message this paragraph tries to give. [Bert Metz, Netherlands]	Noted. Text substantially revised so no longer valid.
13674	31	28	31	28	Space [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
41192	31	28	31	28	add a space after 2011). What should "and so on" mean? Too vague and unnecessary. [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
52354	31	38	31	38	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
32932	31	43	31	46	It seems odd to bury the important linkages between short-lived climate pollutant (SLCP) mitigation and sustainable development in a single sentence within a sub-section on "land-based agriculture, forestry and ocean" when the measures noted in the sentence cut across sectors and especially since Ch.4 (p.33) notes that "[SLCPs] provide an opportunity for expeditious emission reduction, whose tangible co-benefits can be realised within a generation or less." Suggest pulling this out and expanding it in its own section in this chapter - i.e., SLCP linkages to sustainable development, poverty reduction, and reduced inequality. Or else specifically noting SLCPs and linkages as part of section 5.4.3, for example. There is significant literature available through the Climate and Clean Air Coalition (CCAC) and others. [Thomas Damassa, United States of America]	Taken into account. The text has been substantially revised and shortened. Unfortunately, due to space limitations, we could not expand on this theme.
35416	31	46			On the citation (UNEP 2017),there should be a comma between the UNEP and year of publication hence,should be corrected as (UNEP,2017). [Regasa sagni, Ethiopia]	Accepted. Text changed substantially and revised.
12718	31	48	32	12	This is a key issue and is not only buried deep in this section but also doesn't provide any numbers, for example, on the land use requirement for BECCS in the IAMs under the 1.5 scenarios vs 2 scenarios. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: Implications of CDR options are lifted also to the Executive Summary.
28860	31	48	32	1	While renewable energy options are indispensable to achieve the 1.5°C goal, their implementation may also carry a risk of negative environmental and human rights impacts (e.g. displacements, violations of indigenous peoples' economic and social rights as well as worker's rights). Please highlight the need to take appropriate measures (such as prior human rights impact assessments) to avoid increasing human rights impacts, e.g. from increasing mineral resource use in mitigation scenarios (see Figure 5.4, based on CD-LINKS scenario runs and respective IAM literature). [Germany]	Noted: Unfortunately we had to remove the findings with regards to the increasing use of resources, since the underlying literature (Krey et al) was not published in time.
33172	31	48	31	54	this negative effects can also be expressed as negative effects on human rights - the right to food for example. See the work of the UN special rapporteur on the right to food. https://www.mrfcj.org/media/pdf/Human-Rights-FNS-Climate-Justice.pdf ; http://www.srfood.org/en/biofuels ; and UNEP (2015) Human Rights and Climate Change [Tara Shine, Ireland]	Accepted. Text revised.

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41194	31	48	31	48	biodiesel-based transformations (add -) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
49668	31	48	31	48	I doubt that biofuel/diesel will result in any deep decarbonization, given the large carbon debts and the additionality condition, as well as the large losses / energy requirements during processing - therefore I suggest reformulating this particular half-sentence [Karlheinz ERB, Austria]	Noted. To stay within mandate of page limits substantial cuts in text had to be implemented and the sentence no longer appear in the text.
50152	31	48	31	48	insert "and large scale hydropower" after "biodiesel" [Bert Metz, Netherlands]	Accepted. Text changed substantially and revised.
55736	31	48	31	48	replace "biofuel/biodiesel" by "bioenergy/BECCs". Biodiesel and many biofuels do not give deep emission reductions. [David Cooper, Canada]	Noted. Changed.
13676	31	5	31	51	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
33416	31	51	31	51	2017) (Zhang [Sergio Aquino, Canada]	Accepted. Text changed substantially and revised.
41196	31	51	31	51	why is Zhang and Chen, 2015 in different, separate parentheses? [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
48208	31	51	31	55	Please check whether the references 'Grill et al., 2015, Grubert et al., 2014, Fricko et al., 2016, and de Stefano et al., 2017' support the statement preceding it that 'unjust and adverse outcomes have been documented amongst biofuel and large hydropower projects [...] predominantly via the displacement of subsistence food economies' etc. Grubert et al appears to be an article about desalination plants, and not biofuels or hydropower. Only Grill et al., 2015 makes a brief statement about food insecurity. [Sarah Connors, France]	Accepted. Text revised.
41198	31	52	31	52	Should better read: "...predominantly due to the displacement of people and replacement..." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
57830	31	55	32	1	References to support the statement that dedicated crops for bioenergy will increase water (and other nutrient) needs: Boysen, L.R., Lucht, W. & Gerten, D., 2017. Trade-offs for food production, nature conservation and climate limit the terrestrial carbon dioxide removal potential. Global Change Biology, 23(10): 4303–4317.; and Smith, L. J., & Torn, M. S. (2013). Ecological limits to terrestrial biological carbon dioxide removal. Climate Change, 118: 89–103. https://doi.org/10.1007/s10584-012-0682-3 . [Kate Dooley, Australia]	Accepted. Included in Table 5.1.
58244	31	55	32	1	Scale fo water use for biofuels depends on whether or not crops are rain-fed. Dedicated irrigated bioenergy crops may increase water needs and exacerbate water stress. In addition to concerns about water quantity, there are also concerns about the impact on quality, due to potential run-off of effluent, and soil erosion. Water is also required for teh biofuel conversion process adn refining. Compared to oil and gas, bio refineries need significant amounts of water, mostly in teh form of steam for fermentation (Water-Energy Excerpt from WEO 2016) [Andrew Prag, France]	Rejected: The text already says that bioenergy may increase water use. Unfortunately, we could not add also a discussion of the increased water needs in refineries due to space limitations.
12720	32	1	32	1	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Added.
50154	32	3	32	12	This paragraph contradicts the more nuanced discussion of the potential negative consequences of "large scale mitigation" (whatever that may mean) in section 5.4.3 (where the possibilities to avoid or compensate potential negative impacts are prominently discussed. The texts need to be reconciled or this paragpah to be deleted. [Bert Metz, Netherlands]	Accepted. Text revised.
52790	32	3	32	12	This paragraph could be included in the executive summary [Iulain Florin VLADU, Germany]	Noted. Contradictory with # 867. Decided to delete the text .
63298	32	3	32	4	While "triple-wins" are desired, where is the evidence that they, collectively, will be sufficient to stabilize warming at 1.5degC. Shouldn't we be discussing the reality that in order to stabilize climate there will need to be tradeoffs and obviously we want to make decisions on methods that avoids or minimizes impacts on non-climate goals. Where is this discussion? [Greg Rau, United States of America]	Accepted. Text revised.
57832	32	7	32	11	The following ppaer makes the point that "proposals for large-scale reliance on land-based mitigation for negative emissions pose clear and significant risks to sustainable development". This could be integrated into the existing sentence and added to the references in line 11: Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98, https://doi.org/10.1007/s10784-017-9382-9 . [Kate Dooley, Australia]	Noted. Reference added.
7504	32	12	32	12	Insert after "Mac Dowell 2017": "(Honegger and Reiner 2018)". Reference: Honegger, Matthias; Reiner, David (2018): The political economy of negative emissions technologies: consequences for international policy design, Climate Policy, 18, p.306-321 [Axel Michaelowa, Switzerland]	Noted. Reference added.
29772	32	12	32	12	In the discussion of large-scale mitigation efforts in the forest sector, it is worth pointing out that there are likely important differences in trade-offs with other sustainability goals between different forms of bio-carbon sequestration options. For example, Dooley & Kartha (https://doi.org/10.1007/s10784-017-9382-9) assess different CDR options including afforestation, reforestation, and ecosystem restoration, and find that there is a significant potential in options that are less likely to be constrained by risks to non-climate sustainability goals. [Bård Lahn, Norway]	Noted. Reference added.
12722	32	14	32	17	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Reference added.
21574	32	14	32	17	Is this a sustainable solution, ecologically and economically speaking? [Nathalie HILMI, France]	Noted. Text revised substantially based on assessment of new literature.
45442	32	14	32	17	A jarring leap from incremental to a speculative and largely untested approach! [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Text revised substantially based on assessment of new literature.
54322	32	14	32	17	Several sentence construction and grammatic errors. [Christopher Bataille, Canada]	Accepted. Text changed substantially and revised.
55738	32	14	32	16	OIF can increase food availability for fish stocks. This sttmnt is unsupported and should be deleted. [David Cooper, Canada]	Noted. Reference added.

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57450	32	14	32	17	References needed [Hans Poertner, Germany]	Accepted. Text changed substantially and revised.
3116	32	16	32	16	nutrients Maintaining mangrove' should be 'nutrients maintaining mangrove' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
41200	32	16	32	16	Should there not be a stop after 'nutrients'? I suppose the next sentence could read: "Maintaining mangroves, seaweed aquaculture, and the greening of aquacultures can not only help with carbon sequestration, but also in creating sources of employment." [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
43124	32	16	32	16	Please see if dot (.) is needed after the word 'nutrients'. [Muhammad Mohsin IQBAL, Pakistan]	Noted.
52356	32	16	32	16	An awkward phrasing, please re-work. [Jason Donev, Canada]	Accepted. Text changed substantially and revised.
3118	32	18	32	18	action sand the' should be 'actions and the' [Robert Shapiro, United States of America]	Accepted. Text changed substantially and revised.
231	32	19	32	29	While discussing the issue of "Protecting oceans and strengthening the health of coastal and marine ecosystems, including preserving ocean fauna,...." I would suggest to add few sentences on the coral reefs and also to discuss the approach of reef restoration as a mitigation tool. An example: Rinkevich B. (2015) Climate change and active reef restoration—Ways of constructing the 'reefs of tomorrow'. Journal of Marine Science and Engineering 3, 111-127. [Baruch RINKEVICH, Israel]	Noted. Text revised substantially based on assessment of new literature.
62842	32	19	32	26	Need to coordinate with other chapters and build on the AR5 (role of coastal ecosystems for carbon sinks; potential for carbon sinks). [Valérie Masson-Delmotte, France]	Noted. Text revised substantially based on assessment of new literature.
57190	32	19	32	2	key enabler for strong emission reductions is an expression that seems unclear to me. If you mean "an important ingredient for low temperature pathways" (such as 1.5 or 2°C), I have no doubt that it is correct, but it would be better to say so. Describing the "sink" aspect as an "emission reduction" is confusing because emissions are anthropogenic emissions, while the IPCC separates the sink directly due to human activities (such as afforestation) from the sink that only results from the excess CO2 in the atmosphere (due to past human activities). Preserving oceans, as preserving forests, is certainly beneficial but it does not create an anthropogenic sink. It is important to keep clarity on this because only (direct) anthropogenic sinks can be included when calculating emissions if one wishes to keep the proportionality between cumulative emissions and temperatures, now widely considered in particular in the framework of carbon budgets for 1.5 or 2°C. [Philippe Marbaix, Belgium]	Noted. Text revised substantially based on assessment of new literature.
57192	32	21	32	21	Gattuso 2015 deals with protecting oceans by following a low emission scenario (and the ability of oceans to absorb a larger fraction of the fossil CO2 in that case), but does it deal with the benefit from protecting the oceans on the carbon sinks? (as your sentence implies). [Philippe Marbaix, Belgium]	Noted. Text revised substantially based on assessment of new literature.
41202	32	25	32	25	have, not has [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
13678	32	28	32	28	Review n dash [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
43126	32	31	32	31	The spellings of word 'assement' need to be corrected. [Muhammad Mohsin IQBAL, Pakistan]	Accepted. Text changed substantially and revised.
45444	32	31	32	37	There could be a larger synthetic discussion based on the detail in Figure 5.3 [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised.
52792	32	31	32	37	This paragraph could be included in the executive summary [Iulian Florin VLADU, Germany]	Accepted. Executive summary revised.
12724	32	32	32	32	This point seems important, draw it out mkore and put in Exec Sum [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Executive summary revised.
41204	32	32	32	32	in the near term (not in near term), and trade-offs (not tradeoffs) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
63300	32	33	32	36	Mitigation actions that advance multiple SDGs should obviously be favored, but to what extent do they collectively fail to solve the climate crisis. Won't also we need to carefully consider trade-offs and net benefits in solving the 1.5degC dilemma? Ca we really afford to ignore actions that may not have synergies with SDGs? [Greg Rau, United States of America]	Taken into account. Section 5.4.2 addresses this question with systemic approach highlighting need for portfolio approach in deployment of mitigation options and role of complementary policies.
41206	32	34	32	34	add comma after 'simultaneously' [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41208	32	35	32	35	portfolios (not portfolio) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
41210	32	36	32	36	approaches (not approach) [Maria Pia Carazo Ortiz, Germany]	Accepted. Text changed substantially and revised.
1312	33				Fig. 5.3 illustrates synergies and trade-offs between selected mitigation options categories as 'Energy demand', 'Energy supply' and 'Land and oceans'. It builds on Tab. 5.1 which means the source/data/literature it builds on is unclear. The six circles in one figure are so small, the text is unreadable. A suggestion is to just show one circle/element of the figure at a time, so as to make the icons big enough to be read. As is, the figure adds little value to readers, as it is too overloaded with information and the text is too small to read. [Karen Olsen, Denmark]	Noted. Explanatory notes and captions of Figure changed.
5682	33				The figure 5.3. is identical to one used in chapter 4. Is this intentional? Again, how much of chapter 5 is redundant to chapter 4, including that Chapter 5 is a less sophisticated and less well written chapter. [Marion Grau, Norway]	Rejected. Cross Chapter overlap deleted.
18730	33				Fig. 5.3 illustrates synergies and trade-offs between selected mitigation options categories as 'Energy demand', 'Energy supply' and 'Land and oceans'. It builds on Tab. 5.1 which means the source/data/literature it builds on is unclear. The six circles in one figure are so small, the text is unreadable. A suggestion is to just show one circle/element of the figure at a time, so as to make the icons big enough to be read. As is, the figure adds little value to readers, as it is too overloaded with information and the text is too small to read. [Andrea TILCHE, Belgium]	Noted. Explanatory notes and captions of Figure changed.

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63302	33		33		All fine and dandy, but where is capacity and sufficiency to solve the 1.5degC problem shown on this figure. If these are not sufficient or timely enough actions, what's the point? [Greg Rau, United States of America]	Noted. This figure and underlying Table is to bring out a detailed assessment of SDG implications for each of the mitigation options. The message about action and impacts are in Chapter 2 which uses the Table with Figure. Also in the revised draft and Section 5.4 2 brings out how portfolio of actions rather than just individual actions are consistent with 1.5 (also see Ch 2) deg C.
100	33	1	33	3	Figure 3. A nice figure, but a little hard to grasp or to draw conclusions. It needs a whole page, or two linked pages. Now the text is to small and details to hard to get. But it is a good figure. [Leviñ Fabian, Sweden]	Noted. Figure guidance and readability improved.
368	33	1	33	19	This figure is extremely difficult to read, even more to understand and interpret. [Céline Guivarch, France]	Noted. Some explanatory notes added to help readability.
369	33	1	33	19	it is problematic to represent the same way two very different cases: the one where we have information that indicate there are no positive or negative interaction, and the one where we have no information. Having no information does not mean the goals are "consistent". [Céline Guivarch, France]	Noted. The final assessment in the current draft resolves this.
370	33	1	33	19	when comparing the wheels of synergies and trade-offs, for a given goal and a given segment, there seem to be cases that are both "reinforcing" and "counteracting" (eg. non-biomass renewable for SDG 6), this may appear as not making sense, and probably indicates that a different representation (disaggregation of hydropower?) is needed. [Céline Guivarch, France]	Noted. Yes indeed for some measures there is two way interaction.
371	33	1	33	19	the difference between low evidence and agreement and medium or even high evidence and agreement seems thin: in table 5.1 the difference between those can be just two or three references (for medium or high) instead of just one (for low). [Céline Guivarch, France]	Noted. It is just not the counts of the cited literature rather assessment is based on the contents.
372	33	1	33	19	giving on top of Figure 5.3 all 17 SDGs (including the 13 on climate) makes it difficult to relate the colors of the 16 SDGs represented in the wheels. [Céline Guivarch, France]	Noted. Figure guidance and readability improved.
5542	33	1	33	2	This Figure goes too far in providing conclusions about SDG implications, see my comments above. Is there a reference to this figure? [Kirsten Halsnaes, Denmark]	Noted. Text revised substantially to reflect what the figure can say and more in-depth assessment is in Section 5.4.2 and Chapter 2.
13680	33	1	33	1	Delete text [Poot-Delgado Carlos, Mexico]	Accepted. Text changed substantially and revised.
13996	33	1	33	1	Figure 5.3: I think this figure is a great approach. I worry about making figures so difficult to read that one has to zoom in so far. Wouldn't it be better to spread over multiple pages? [Natalie MAHOWALD, United States of America]	Noted. Figure guidance and readability improved.
29770	33	1	33	3	Figure is unreadable and incomprehensible [Bård Lahn, Norway]	Noted. Figure guidance and readability improved.
38574	33	1	33	19	Figure 5.3: This is a potentially fascinating figure. I support trying out new types of figures and formats, but as this is now I think it is too complicated and contains too much information. I actually do not understand what the figure is telling, and I am afraid that it will not communicate well with the readers. It may work very well in an oral presentation were it is built up stepwise with explanations. It may work better here in the chapter than in the SPM if you introduce it carefully. [Jan Fuglestad, Norway]	Noted. Yes with some improvements in readability guidance the figure stays in Chapter and an improvisation is in different format and level of aggregation is in SPM.
47036	33	1	33	19	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. As these colours are the official SDG colours, perhaps consider numbering the colours to help make the sections of each wheel more distinguishable? [Sarah Connors, France]	Noted. Yes with some improvements in readability guidance the figure stays in Chapter and an improvisation is in different format and level of aggregation is in SPM.
49658	33	1	33	3	I really have a hard time understanding this overcomplex figure. Is there no chance to reduce complexity, e.g. by reducing dimensions, aggregating, grouping, etc. This figure is rather for an annex, higher aggregate info would be better (and, in particular, for the SPM) [Karlheinz ERB, Austria]	Noted. Figure guidance and readability improved.
52358	33	1	33	21	Wow, I love these graphics, they are so important, an amazing way to communicate such an important concept, but it's impossible to read. These are nice ways of showing this, but take up the space, I promise, it will be worth it. [Jason Donev, Canada]	Noted. Figure guidance and readability improved.
61610	33	1	33	3	Figure 5.3 is very hard to read. [United States of America]	Noted. Figure guidance and readability improved.
61612	33	1	33	2	This figure is overly complex and near impossible to understand. Figures should make understanding a topic easier, not more difficult. [United States of America]	Noted. Tried to improve readability.
55740	33	1	33	19	Figure 5.3: This figure is confusing in a few ways. First need to be very clear that figure is portraying gross impacts of mitigation measures (not net of reduced negative impacts of climate change itself.) The Nilsson scale is perhaps not the best: there could, for example, be an interaction that is overall positive but still "constraining" in the sense of the particular approach taken. The daisy wheels are so subdivided it is difficult to follow. Perhaps this level of subdivision is unnecessary (eg the sub-sib division of the "Energy demand" set may not be needed. On the other hand, sustainable diets and reduced food waste could be moved into the demand category.) [David Cooper, Canada]	Noted. Yes with some improvements in readability guidance the figure stays in Chapter and an improvisation is in different format and level of aggregation is in SPM.
55742	33	1	33	19	Figure 5.3: This figure is confusing in a few ways. (continued). The sub-categories in the "Land and Oceans" wheel are problematic. Firstly the set is not very coherent, some are demand reduction, some means rather than ends (responsible sourcing). As noted, the behavioral change related ones would be better grouped together under demand reduction. It is misleading to include unproven (and in some cases illegal) approaches here like enhanced weathering and ocean fertilization. A better set might be "Soils; Livestock; Reduced loss of ecosystems (REDD etc); Afforestation and restoration of land; protection of blue carbon). Taking, this and previous comment together could simplify the wheels to one level of subdivision within each goal, each with 4 or 5 bars. [David Cooper, Canada]	Noted. Revisions in many places inserted in the final assessment and the Table and the corresponding figure.

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62844	33	1	33	21	Provide traceable accounts for the assessment of the literature supporting the establishment of the figure (e.g. a detailed figure recipe). [Valérie Masson-Delmotte, France]	Accepted. Added in revised version.
28862	33	2	33	4	<p>Figure 5.3: informative, but complex figure, suggestions to improve readability:</p> <ul style="list-style-type: none"> (i) add "synergies" to upper "row of wheels", and trade-offs to lower "row of wheels" (ii) add SDG numbers to coloured "wheel sections" to make the connection of strong (iii) larger dimensions in order to better capture/comprehend the details. For instance, the size of the icons used for describing the segments of the wheels have to be increased. <p>Content wise: We suggest to be more specific with the category "Mitigation Options". Some of the options presented in this figure are rather CDR options than mitigation options. Please see our overall comment regarding the definition of CDR and the relation to the definition of mitigation options.</p> <p>Also: It would also be useful to have a similar Figure on adaptation actions in various sectors. Please see also our comments on the SPM regarding this figure. [Germany]</p>	Noted. Figure guidance and readability improved.
29552	33	2	33	2	This infographic is really difficult to understand. We appreciate efforts to combine multiple data/infosets in a visual form, but when there is too much data in one graphic, it makes it difficult to comprehend [Finland]	Noted. Figure guidance and readability improved.
61614	33	2	33	2	Figure 5.3: The red-green color scale is indecipherable to the significant population of readers who are color blind. Moreover, there are so many different pieces of information packed into this figure that it is nearly impossible to digest. Consider collapsing across the sectoral dimension to produce a more legible figure. [United States of America]	Noted. Yes with some improvements in readability guidance the figure stays in Chapter. A different format and level of aggregation is in SPM.
12726	33	5	33	19	This is very hard to follow [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Tried to improve readability.
57452	33	8	33	8	SDG 13 "climate action" does not only refer to mitigation, but also adaptation. In fact, target 13.1 is: "Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries". [Hans Poertner, Germany]	Accepted. Made it clear now what this Section 5.4 addresses i.e. only mitigation as the response option.
1320	33	24	34	25	Tabel 5.1 (19 pages) is indicated to be inserted into section 5.4.2 titled Temporal and spatial trade-offs and distributional impacts. However, Tabel 5.1 does not describe temporal and spatial trade-offs but rather map links between mitigation options and SDGs. Hence, it is suggested to insert Tabel 5.1 earlier in section 5.4.1 when it is referenced the first time, if needed. [Karen Olsen, Denmark]	Section deleted. Table appears as an Annex.
12728	33	24	34	23	Is this section necessary? It basically states that 1) delayed action is bad - we know that from chapter 2, where it is laid out clearly and 2) fossil fuel dependent countries will be negatively affected, which has already been discussed earlier in this chapter and is therefore repetition. At the very least this point should be cut. [United Kingdom (of Great Britain and Northern Ireland)]	Section deleted. Table appears as an Annex.
18726	33	24	34	25	Tabel 5.1 (19 pages) is indicated to be inserted into section 5.4.2 titled Temporal and spatial trade-offs and distributional impacts. However, Tabel 5.1 does not describe temporal and spatial trade-offs but rather map links between mitigation options and SDGs. Hence, it is suggested to insert Tabel 5.1 earlier in section 5.4.1 when it is referenced the first time, if needed. [Andrea TILCHE, Belgium]	Section deleted. Table appears as an Annex.
18728	33	24	34	25	Tabel 5.1 (19 pages) is indicated to be inserted into section 5.4.2 titled Temporal and spatial trade-offs and distributional impacts. However, Tabel 5.1 does not describe temporal and spatial trade-offs but rather map links between mitigation options and SDGs. Hence, it is suggested to insert Tabel 5.1 earlier in section 5.4.1 when it is referenced the first time, if needed. [Andrea TILCHE, Belgium]	Section deleted. Table appears as an Annex.
41212	33	27	33	3	Reference to Chapter 1 would be good here [Maria Pia Carazo Ortiz, Germany]	Section deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
40396	33	28	34	6	<p>In this part of the chapter, in order to address probable intergenerational inequities derived from the rapid scale-up of future mitigation efforts, we consider that it would be so relevant to have an international defensive mechanism for future generations (ombudsman or high commissioner, as a proxy), as part of a framework of highly supportive innovative governance arrangement. This mechanism could contribute to establish a system of checks and balances in the design and implementation of global climate policies.</p> <p>It is important to note that intergenerational equity and the duties of present generations towards future generations have long been recognized as fundamental principles of international environmental law. In this regard, the Normative Framework on Climate Change of the Andean Parliament, approved by Recommendation n.º 228 (Bogotá D.C., Colombia, October 29, 2015) in its article 11 states (Duties with future generations): «The States members of the Andean Parliament –within the framework of the principles of international law of equity, solidarity and intergenerational justice– recognize and assume the duty of responsibility of current generations with future generations, promoting policies, strategies, mechanisms and actions that allow them to bequeath a life in balance on Earth». / a) Defender (Ombudsman, Rapporteur or High Commissioner) for future generations: The Sates Members of the Andean Parliament will promote the creation –at the international level– of a defensive mechanism for future generations, in order to guarantee the ethical supervision of multilateral agreements on climate and environment that compromise the sustainability of life on the planet».</p> <p>Another relevant aspect to take into consideration is that judges of the International Court of Justice (ICJ) have increasingly relied on the intergenerational equity principle. In a 1993 opinion in Denmark v Norway, Judge Weeramantry emphasized that global jurisprudence supported the notion of equity, with «respect for the rights of future generations, and the custody of Earth resources with the standard of due diligence expected of a trustee» as the key principle contained in this notion». See: Maritime Delimitation in the Area between Greenland and Jan Mayen (Denmark v. Norway), Separate opinion of Judge Weeramantry, Judgment, I.C.J. Reports 1993, paragraph 240.</p> <p>Till the date, approximately forty-four international legal instruments explicitly incorporate or reference the principle of intergenerational equity and/or to the need to preserve the rights and the interests of future generations. [Erick Pajares, Peru]</p>	Section deleted.
61616	33	29	33	3	It is not simply coal resource assets that are that are at risk, all fossil fuel resources and long-lived fossil fuel using capital stocks are at risk. [United States of America]	Accepted. Draft revised substantially , Box 5.2 added.
16610	33	3	33	3	In relation to the statement about job losses if mitigation efforts are increased, there is research evidence that in Australia the harder the emission reduction the higher the creation of jobs. [Janet Stanley, Australia]	Noted. No reference cited.
41240	34		47		There are very few (or no) indications as to the degree of the evidence or of the agreement in these sections [Maria Pia Carazo Ortiz, Germany]	Noted: evidence statements are added to the text that is elevated to the ES.
33174	34	1	34	3	correct this reference after intergenerational and inter regional inequities to : Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf AND add 'and impacts on human rights' and add the current referenc after that - Mary Robinson Foundation – Climate Justice (2015a) Rights for Action: Putting People at the Centre of Action on Climate Change. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Rights-for-Action-edition-2.pdf [Tara Shine, Ireland]	Thank you. This Section has been removed due to overlap with previous chapters.
54464	34	1	34	1	Add the need for "reliability requirements of the power system" for sustained growth. [RABIZ FODA, Canada]	Thank you. This Section has been removed due to overlap with previous chapters.
46326	34	2	34	2	delete 'a' after 2016 and indicate J.-Y. Liu in line with previous comment [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Section deleted.
47012	34	3	34	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Section deleted.
46330	34	5	34	6	Another source is: Shue, H. (2018). Mitigation gambles: uncertainty, urgency and the last gamble possible. Philosophical Transactions of the Royal Society A 20170105. doi:10.1098/rsta.2017.0105. [in press] [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. We have added your suggested reference to 5.5.3.2.
57834	34	8	34	8	A second point could be made at the end of the sentence on constraining mitigation options increasing mitigation risk. That reliance on CDR as a mitigation strategy poses a fundamentally different type of risk: that of lock-in, which may substantially undermine society's overall mitigation efforts if negative emissions do not emerge at the scale envisaged. See: Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98, https://doi.org/10.1007/s10784-017-9382-9 . [Kate Dooley, Australia]	Thank you. This section has been removed due to overlap with previous chapters.
41214	34	9	34	9	incur in higher associated financial costs (add 'in') [Maria Pia Carazo Ortiz, Germany]	Section deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10180	34	12	34	23	Highly important talking about fossil fuel as stranded asset. [Saudi Arabia]	Please now see Box 5.2: Challenges and Opportunities of Low-Carbon Pathways in Gulf Cooperative Council (GCC) Countries.
28864	34	16	34	2	Message and context is not entirely clear. Please specify [Germany]	Section deleted.
47014	34	16	34	16	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Section deleted.
62846	34	2	34	23	Coherency of these sentences with the findings of chapters 2 and 4? [Valérie Masson-Delmotte, France]	Thank you. The Section have been removed due to review comments noting significant overlap with previous chapters.
13294	34	24	34	24	Insert the text: "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: AR5, WG III, SPM p. 18. [Eleni Kaditi, Austria]	Noted. Text substantially revised. Box 5.2 added.
13682	34	25	34	25	Delete text [Poot-Delgado Carlos, Mexico]	Section deleted.
28866	34	25	34	25	The details of table 1 are appreciated. Due to page limitations, we suggest to move this table into the annex. [Germany]	Accepted: Table is moved in Annex.
61618	34	27	34	28	This table is beyond the mandate of this report in particular. Many of the linkages drawn are not specific to 1.5°C warming. The IPCC does not have a specific mandate to study or provide assessments of literature related to the SDGs, so the authors would do well to revise this table so that only information within the mandate of the IPCC and within the mandate of this report is presented. It is also entirely too long and detailed, so much so that it will have limited utility to readers. [United States of America]	Rejected. 1.5C- specific and 1.5C- relevant literature reviewed. Evidence is overwhelming and consistent across all studies assessed in Chapter 2 and Chapter 5.
373	34	35	38	33	It seems that some text is missing in this section on some dimensions, for eg there is nothing in the text on unemployment or on mineral resources, whereas it is represented in Figure 5.4 [Céline Guivarch, France]	Rejected: Unfortunately the underlying paper on mineral resources and employment implications was not published in time, and needed to be removed also from the figure 5.4.
4510	34	35	38	33	There are so many citations of literature earmarked as "submitted". We are never be able to make comment as we can not read those (examples are Krey et al submitted, Fujimori submitted, Rogelj et al submitted, Gruebler submitted). Among them, important figure 5.4 are made up mainly based on Krey et al. and Gruebler both of which are "submitted" papers. My concern is whether there are such literatures submitted to several journals or not. Please try to find those and, if yes, please add those research results. [Mitsutsune Yamaguchi, Japan]	Accepted: All references that were not accepted by May 15 were removed from the draft.
28870	34	35	38	38	Low energy demand (LED) scenarios avoid most of the trade-offs and are one solution to align SDGs and the goals of the Paris Agreement. We suggest to highlight more clearly such scenario approaches that do not rely on BECCS or other negative emission technologies, including their key assumptions and characteristics, since such scenarios seems to be more sustainable. [Germany]	Accepted: We will further emphasize results from the LED study where possible.
31600	34	35	38	33	Many cited references are "submitted" and it is in a state that cannot be verified. IPCC has a wide and unbiased collection of literature and has an obligation to describe its contents, but the problem is that it cannot be known whether that is the case. Please delete descriptions when these submitted paper will not pass peer review. [Japan]	Accepted: All references that were not accepted by May 15 were removed from the draft.
28868	34	35	38	38	Please include the dimension of avoided risks in the discussion on the interaction of mitigation and sustainable development in section 5.4.3, both in the introductory text and in the analysis in the subsections. The current discussion ignores the avoided risks and lower impacts associated with 1.5°C warming compared to 2°C or a baseline (with the exception of the section on food on p36 In 10), hence presents conclusions about trade-offs between mitigation pathways and SD goals that might be misleading without the appropriate framing and context. While we commend the efforts of the scientific community to enhance our knowledge about co-benefits and systemic risks and trade-offs that may be associated with very rapid low stabilization pathways, the presentation of those findings, in particular in generic figures such as figure 5.4/SPM6 must take the SD benefits of avoided climate change impacts into account in order to present a balance picture concerning the overall SD impacts of such pathways, or at the very least state this caveats clearly and repeatedly. Risks in a 1.5°C warmer world are summarized in 5.2.2, with a focus on risks to food and energy security, economic losses and health shocks, poverty and livelihoods. Chapter 3 (and the WGI and II contributions to the AR5) clearly show the increasing risk with higher levels of warming. In order for conclusions concerning the benefits/trade-offs to be comprehensive, we strongly suggest to add the dimension of avoided risks to the discussion, with quantitative estimates/comparable orders of magnitude where available in the literature. If no literature is available, please note the gaps accordingly. [Germany]	Accepted: Figure 5.4 will be removed and replaced by a Figure showing investment implications for selected SD dimensions. In addition, we will refer to the appropriate places in the report that illustrate the benefits of avoided impacts (so that the presentation of the mitigation implications for SD are put into perspective) (see for example: Chapter 3, Section 3.5; Chapter 5, Section 5.2.3).
44748	34	35	38	33	Very important section. [Penny Urquhart, South Africa]	Accepted. Thanks!

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45446	34	35	34	35	In terms of mitigation, this is the heart of the chapter for me. [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: thanks!
52768	34	35	37	34	5.4.3 Trade-offs- adaptation and mitigation are currently seperated. Would be more meaningful if you could have a contrast and compare section. 5.4.3 could offer contrasts and comparisons between adaptation and mitigation. This would give a more holistic picture for decision makers. [Iulain Florin VLADU, Germany]	Noted: A more integrated picture of mitigation and adaptation is provided in 5.5.
1322	34	39			Section 5.4.3 has a stated focus on 'fundamental transformations and thus stringent mitigation policies consistent with 1.5 and 2 degree C'.... However, references to the field of literature on sustainability transition in developed and developing countries and notions such as 'paradigm shift' are almost absent from the review. The following literature is relevant to this focus and should be included: [Karen Olsen, Denmark]	Noted: Unfortunately no literature is provided.
3120	34	39	34	39	path depednent evolutions' should be 'path dependent evolutions' [Robert Shapiro, United States of America]	Accepted: text changed accordingly.
18732	34	39			Section 5.4.3 has a stated focus on 'fundamental transformations and thus stringent mitigation policies consistent with 1.5 and 2 degree C'.... However, references to the field of literature on sustainability transition in developed and developing countries and notions such as 'paradigm shift' are almost absent from the review. The following literature is relevant to this focus and should be included: [Andrea TILCHE, Belgium]	Noted: Unfortunately no literature is provided.
34594	34	39	34	39	it says "dependnent" it should say "dependent" [Mexico]	Accepted: text changed accordingly.
41216	34	39	34	39	dependent (not depednent) [Maria Pia Carazo Ortiz, Germany]	Accepted: text changed accordingly.
57454	34	4	34	4	What are "fundamental transformations"? [Hans Poertner, Germany]	Noted: fundamental is meant here as opposed to incremental.
10182	34	43	34	44	Linking the reaching of 1.5? by deep cut in the energy supply and demand more evidence required [Saudi Arabia]	Rejected: Evidence is overwhelming and consistent across all studies assessed in Chapter 2 and Chapter 5.
12730	34	43	35	2	This can be cut down. We know what IAMs are, don't need another description. Just state that you've used some IAM frameworks in this assessment [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: We removed the IAMs.
13684	34	43	34	43	Suggestion 1.5 or 2°C [Poot-Delgado Carlos, Mexico]	Accepted: text changed accordingly.
33418	34	44	34	44	delete line 44 - GHG emissions. [Sergio Aquino, Canada]	Rejected: 1.5/2C pathways require deep cuts in GHG emissions.
41218	34	44	34	44	comma before 'as well' [Maria Pia Carazo Ortiz, Germany]	Accepted: added comma.
52360	34	46	34	46	I am concerned that CD-LINKS 2017 isn't a good source for this information. I realize that we have to do the grey literature here, but this seems a bit too informal. [Jason Donev, Canada]	Accepted: we added new references (see Grubler et al 2018; McCollum et al., 2018; Rogelj et al., 2018).
3122	34	51	34	51	Unsing multiple IAMs' should be 'Using multiple IAMs' [Robert Shapiro, United States of America]	Accepted: corrected.
34596	34	51	34	51	it says "unsingit" it should say "Using" [Mexico]	Accepted: corrected.
41220	34	51	34	51	Using multiple IAMs and disciplinary models is important (not are) [Maria Pia Carazo Ortiz, Germany]	Accepted: corrected.
43128	34	51	34	51	Unsing? [Muhammad Mohsin IQBAL, Pakistan]	Rejected: not clear what the question is.
54324	34	51	34	51	Using or better "Combining", not "unsing" -) [Christopher Bataille, Canada]	Accepted: corrected.
41222	34	53	34	53	is it not 'estimates' instead of estimations? [Maria Pia Carazo Ortiz, Germany]	Accepted: text was removed.
41224	34	53	34	54	either 'including' or 'particularly' - not both words [Maria Pia Carazo Ortiz, Germany]	Accepted: text was removed.
33420	34	54	34	54	delete particularly [Sergio Aquino, Canada]	Accepted: text was removed.
41226	34	55	34	55	eliminate 'and' [Maria Pia Carazo Ortiz, Germany]	Rejected: "and" is needed here.
33176	35	4	35	23	These impacts on health should be related to the right to health. See this submisison to the UNFCCC from the OHCHR https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/676.pdf 29 August 2016 [Tara Shine, Ireland]	Noted: the right to health needs to be covered in earlier (conceptual) discussions, not here where the focus is on the synergies and trade-offs of 1.5C pathways.
38580	35	4	35	23	Please check consistency across chapters when Air Pollution and SLCF are discussed. This is one of the cross cutting issues that need attention for consistency. [Jan Fuglestedt, Norway]	Accepted: We'll check any consistency issues with other chapters.
12732	35	5	35	1	This is really basic content, probably don't need (i.e. everyone reading it will be aware that GHGs and air pollutants often come from the same source). Just use the paragraph below this one. [United Kingdom (of Great Britain and Northern Ireland)]	Partially accepted: Shortened text, but did not remove it.
32832	35	5	35	1	You might include my paper on climate and health benefits of low emission scenarios for the US here (Shindell et al., Nature Climate Change, 2016), though I also wanted to comment as the text reads strangely and it seems as if the reduction in co-emissions causes adverse impacts rather than the opposite. Could be revised to make this clearer. [Drew SHINDELL, United States of America]	Rejected: Sorry, but this section is focusing on implications of 1.5C pathways. General papers on the co-benefits need to be cited in 5.4.1.
42836	35	5	35	23	Reducing air pollutants is necessary to protect human health, but in doing so, we must be aware of the unmasked warming that will result so as to properly compensate for that additional warming. Xu and Ramanathan (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, Proc. Natl. Acad. Sci., doi: 10.1073/pnas.1618481114. Ramanathan and Xu (2010) The Copenhagen Accord for limiting global warming: Criteria, constraints, and available avenues, Proc. Natl. Acad. Sci., doi: 10.1073/pnas.1002293107. [Kristin Campbell, United States of America]	Noted: This is a valid point. We assume that the compensatory mitigation is factored into the 1.5C pathways assessed in Chapter 2.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
43084	35	5	35	23	Reducing air pollutants is necessary to protect human health, but in doing so, we must be aware of the unmasked warming that will result so as to properly compensate for that additional warming. Ramanathan and Xu (2010) The Copenhagen Accord for limiting global warming: Criteria, constraints, and available avenues; and Xu and Ramanathan (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, Proc. Natl. Acad. Sci., doi: 10.1073/pnas.1618481114. [Durwood Zaelke, United States of America]	Noted: This is a valid point. We assume that the compensatory mitigation is factored in in the 1.5C pathways assessed in Chapter 2.
55040	35	5	35	1	There is no mention of the role of Short Lived climate pollutants as part of the mitigation action that can help to achieve 1.5 oC. Also there is no mention of the importance of ozone and their impacts on human health and crop yields and other vegetation impacts. [Johan Carl Ivar Kuylenstierna, United Kingdom (of Great Britain and Northern Ireland)]	Rejected: There is no literature on the implications of these measures in 1.5C pathways for SDGs , which is the focus of this section.
35564	35	6	35	7	The correlation between air pollution improvement and GHG reduction may not always hold. E.g. if one switches from using solid fuels for cooking to modern (perhaps fossil-based) fuels, it may reduce air pollution and have good health impacts but increase GHG emissions. [Ashok Sreenivas, India]	Noted: This is why the text says "typically". The co-benefit effect is much larger. Unfortunately a more detailed discussion is not possible because of space limitations.
52362	35	6	35	6	The noun 'fire' has unclear modifiers. Are these agriculture fires? Forest fires or just peatland fires? It's ambiguous. [Jason Donev, Canada]	Partially accepted: text was removed following comment 619.
33422	35	7	35	7	substitute reduce for lower as reduce already used in line 6 [Sergio Aquino, Canada]	Rejected: Repeating the word is purposeful do here: reducing one source, reduces the other source.
52364	35	7	35	7	Is it PM20 or PM10, normally PM10 is more commonly talked about. [Jason Donev, Canada]	Accepted: It's all sources, which was clarified.
32816	35	12	35	18	The text refers generically in the first sentence to 'significant synergies', citing several papers, but then only gives quantitative results from the Krey et al paper and the scenario database in subsequent lines. It would be useful to add quantitative results from the Shindell et al study cited in the opening line of this paragraph as well, as that study examined precisely this issue and used a full three-dimensional atmospheric composition model and included both PM and ozone and incorporate climate change. In contrast, the relatively simple estimates in Krey et al come from linearized estimates rather than 3D modeling, even though conditions in the far future may depart greatly from current conditions, undermining the linear response for present day conditions, and neglected both ozone and the impacts of climate change on pollution. Studies such as Silva et al., Nature Climate Change, 2017 have shown the importance of the latter. Note that this is not to say the IAM-based study is wrong - the studies had different emissions scenarios so you wouldn't expect the same impacts - but there should be at least as much description of the results of the more physically realistic model as of the simpler one I'd think. Our study reported much larger values, finding that a 1.5C pathway relative to a 2C pathway would yield about 150 +/- 40 million fewer premature deaths worldwide over the century, with ~40% occurring during the next 40 years. This is in the case in which the lower warming is not achieved by greater reliance on NETs. Regarding urban impacts, quoting directly from the abstract "More than a million premature deaths would be prevented in many metropolitan areas in Asia and Africa, and >200,000 in individual urban areas on every inhabited continent except Australia". Citation is: Shindell, D., G. Faluvegi, K. Seltzer, and C. Shindell, Quantified, Localized Health Benefits of Accelerated Carbon Dioxide Emissions Reductions, Nature Climate Change, in press, 2018. [Drew SHINDELL, United States of America]	Accepted: we have included the effect. Thanks for pointing us towards the results.
38400	35	12	35	23	I think here you could mention a recent paper from Markandya et al 2018 that compares the extra co-benefits in terms of health with the extra-cost of mitigation. The study shows that the extra effort of trying to pursue the 1.5°C objective instead of the 2°C would generate a substantial net benefit in India (7-15 trillion US\$) and China (0.6-3.5 trillion US\$) under different criteria for effort sharing. These co-benefit are remarkable and indicate that the statement in the Paris Agreement to "pursue efforts" to limit temperature increase to 1.5°C would make economic sense in some scenarios and countries if health co-benefits are considered. Markandya et al 2018 Health co-benefits and mitigation costs of the Paris Agreement: a modelling study, The Lancet (Planetary Health), Volume 2 ,3e64 - e73. [Mikel González-Eguino, Spain]	Accepted. We added the reference.
55042	35	12	35	23	There is no mention here of the link between strategies to reduce reliance on cooking using traditional methods with wood and other biomass, the potential to reduce warming (by reducing BC) and the substantial health benefits, especially to women and children. [Johan Carl Ivar Kuylenstierna, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: This is discussed in 5.4.2.3.
62848	35	12	35	23	Please also refer to the literature reporting health costs associated with air pollution [Valérie Masson-Delmotte, France]	Accepted: we added cost benefits of avoided pollution control.
13686	35	13	35	14	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Accepted: Some citations were actually deleted.
38576	35	14	35	14	Which paper is Shindell et al. 2017? Not in the reference list. [Jan Fuglestad, Norway]	Accepted: Shindell et al was added to the reference list.
38578	35	14	35	14	The paper by Stohl et al. is also relevant here. Stohl, A., Aamaas, B., Amann, M., Baker, L. H., Bellouin, N., Bernsten, T. K., et al. (2015). Evaluating the climate and air quality impacts of short-lived pollutants. Atmospheric Chemistry and Physics 15, 10529–10566. doi:10.5194/acp-15-10529-2015. [Jan Fuglestad, Norway]	Rejected: It is relevant but does not add much compared to the other citations, and also given the space limitations.
39052	35	14	35	14	The paper by Stohl et al. is also relevant here. Stohl, A., Aamaas, B., Amann, M., Baker, L. H., Bellouin, N., Bernsten, T. K., et al. (2015). Evaluating the climate and air quality impacts of short-lived pollutants. Atmospheric Chemistry and Physics 15, 10529–10566. doi:10.5194/acp-15-10529-2015. [Jan Fuglestad, Norway]	Rejected: It is relevant but does not add much compared to the other citations, and also given the space limitations.
36200	35	17	35	17	The statement is on basis of one submitted paper. More citations from peer reviewed publications need to be added to substantiate the argument. [India]	Accepted: There are now two papers supporting the statement: McCollum et al (2018) and Shindell et al (2018).

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
41228	35	17	35	18	The co-benefits for air pollution are highest in the developing world (sounds better than 'bigger') [Maria Pia Carazo Ortiz, Germany]	Accepted: text changed accordingly.
52366	35	17	35	17	I've usually heard numbers in the 3-4 million, this seems low, please re-check this number. [Jason Donev, Canada]	Noted: Numbers were updated from Shindell et al (2018).
18734	35	25	39	36	Next to DACCS, BECCS, afforestation and biochar, the Panel may wish to consider the importance of 'forest management' (enhancing sinks in existing forest stocks) in CO ₂ removal, as highlighted in p. 22, line 25, and more comprehensively illustrated by GHG inventories. Same would apply for the relevant paragraph in p. 84. [Andrea TILCHE, Belgium]	Noted: This needs to be addressed in 5.4.1.
33178	35	26	35	55	These impacts on food should be related to the right to food. See this submission to the UNFCCC from the OHCHR https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/676.pdf 29 August 2016 [Tara Shine, Ireland]	Taken into account. Unfortunately, due to space limitations, we could not expand further on this theme here.
51060	35	26	36	11	This section should be completely rewritten. There are significant issues with several of the references you choose to use in this section, in particular the references by Fujimori and by Krey, and the conclusions you come to based on these papers. This section should be rewritten to include work done by actual scholars of food security and food policy. There are decades of scholarship on the causes of food insecurity and policy measures to end hunger. Of course there are also decades of failure of addressing hunger, and scholarship thereon. The authors of these articles ignore all that scholarship -- a review of the citations in the articles shows NO attempt to situate the IAM analysis into the broader context of food security policy, approaches, history, successes and failures. Apparently one intent of these articles is to justify a level of BECCS in IAM models that not only would cause significant hunger because of competition for land, but also exceeds published analyses of biogeophysical feasibility (100 EJ/yr). The point of the articles seems to be to come up with two "simple" solutions -- food aid and food subsidies -- as options in an IAM that can then determine that it won't cost so much to pay people not to be hungry, therefore we can justify a fantastical level of BECCS. This chapter section devotes 2 sentences to an article illustrating a 1.5C pathway that does not rely on NETs (Grubler et al) and then goes on to repeatedly cite Fujimori, Krey, Hasegawa, Rogelj (all IAM modelers who are NOT writing about food security) and conclude that "simple complementary measures, such as food price support, may entirely eradicate the identified trade-off between climate mitigation and food security." Anyone with a basic understanding of the last century of food policy would not call food price support "a simple measure." A sweeping conclusion -- based on the output of an IAM! -- that this "simple" measure may ENTIRELY eradicate a trade-off is completely unjustifiable. This is a simplistic and intellectually compromised effort, which relies on ignoring a substantial and significant body of academic literature on hunger and food security, as well as literature on the biogeophysical limits to the utilization of BECCS, in order to justify the massive BECCS dependence of most IAM models, written by the same group of authors of the works cited in this section. [Doreen Stabinsky, United States of America]	Accepted partially: We have removed Fujimori et al and Krey et al. However we disagree with the main point: 1) The text makes clear that food subsidies and aid are not the only mechanisms and also that they are not "simple", 2) we need to assess the entirety of the literature and don't understand why scientific papers on food security should be excluded. 3) this section is about the implications of 'pathways', and thus relies on the literature that have looked into pathways. Chapter 4 includes a more broader discussion of bioenergy and food.
55044	35	26	36	11	There is no mention here of the importance of tropospheric ozone on food production - which can lead typically from 5-16% reductions in yield of many crops. 40% reductions of wheat yield from ambient concentrations have been observed in experiments in Lahore, for example. And some mitigation actions to reduce ozone (e.g reducing methane, CO and NMVOCs) can lead to reductions in near-term warming (see Shindell et al 2012) and so this is a case where mitigation and improvements in yields can go hand in hand. [Johan Carl Ivar Kuylensstierna, United Kingdom (of Great Britain and Northern Ireland)]	Rejected: sorry there is no literature on tropospheric ozone in 1.5C pathways.
55492	35	26	36	11	My sense is that this section underplays the role of improving productivity and efficiency of agricultural production systems to address food security and hunger, while delivering mitigation co-benefits. See e.g. FAO & New Zealand Agricultural Greenhouse Gas Research Centre. 2017. Low emissions development of the beef cattle sector in Uruguay -- reducing enteric methane for food security and livelihoods. Rome. 34 pp.; FAO & New Zealand Agricultural Greenhouse Gas Research Centre. 2017. Supporting low emissions development in the Ethiopian dairy cattle sector -- reducing enteric methane for food security and livelihoods. Rome. 34 pp.; FAO & New Zealand Agricultural Greenhouse Gas Research Centre. 2017. Options for low-emission development in the Sri Lanka dairy sector -- reducing enteric methane for food security and livelihoods. Rome. 38 pp.; plus of course Gerber et al (2013), Tackling climate change through livestock, FAO (Rome), pp139; who show that emissions reductions of 30% are possible without impinging on food security and improving production efficiencies (or, vice versa, increasing food production without increasing emissions). Given the scale of this, I find the focus on compensatory measures such as food price support and cash payments disproportionate, and the discussion of the productivity/efficiency route should be expanded for balance. [Andy Reisinger, New Zealand]	Accepted: we have emphasized the option, and added two of the references.
61620	35	26	35	55	This section does not fully reflect (1) the additional impacts 2°C scenarios would have on food production and food security, beyond those experienced at 1.5°C; (2) the potential to generate mitigation benefits while enhancing food production through the implementation of better agricultural practices; and (3) the benefits forests bring to communities in terms of greater resilience, access to wild foods, and livelihoods. Suggest revising this section to reflect a more comprehensive picture. [United States of America]	Accepted: (1) is already noted and we refer to Chapter 3 for avoided impacts. Text revised to include elements of (2) and (3).

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58656	35	26	36	11	Too narrow a focus on carbon pricing as a means to incentivise mitigation, with its corresponding potential negative impact on food prices and consequential impact on food security. There is literature to support mitigation that would not come at the expense of food production, would not necessarily need a carbon price (real or imputed) in order to incentivise the behaviour change. Education and awareness raising, as well as innovation could lead to significant reductions in emissions intensity of food production, while improving livelihoods, e.g. FAO has determined that in South Asian mixed dairy farming systems, emission can potentially be reduced by 38 percent by improving feed and feeding practices, as well as animal health and husbandry. For specialized beef production in South America, feasible improvements in forage quality, animal health and husbandry and grazing management could lead to an emission reduction of 19 to 30 percent. Similar mitigation interventions could reduce emission from West Africa's small ruminant sector by 27 to 41 percent. Improved manure management, adoption of energy efficient technologies, sourcing of low carbon energy and upgrading of feed, health and animal management in commercial systems can reduce emissions of pig production by 28 to 36 percent in East and Southeast Asia. In mixed dairy systems in OECD countries, reductions of emission by 14 to 17 percent are possible, through feed supplements, treatment of manure in anaerobic digesters and energy efficiency. Many mitigation interventions of this nature can provide both environmental and economic co-benefits. Efficient practices and technologies can boost productivity and thus contribute to food security and poverty alleviation. http://www.fao.org/docrep/018/i3437e/i3437e.pdf [New Zealand]	Accepted: see response to previous comment by Andy Reisinger.
12734	35	27	36	11	Section relies on only a few references [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: some references were added. Note also that there are not so many 1.5C pathways studies that have quantified effects on food security.
51058	35	27	35	29	Reword. Many IAMs include ONLY afforestation and BECCS as CDR options in the models. The sentence you have written is misleading. Model outputs are not strategies, they are model outputs, completely dependent on model assumptions and inputs. [Doreen Stabinsky, United States of America]	Accepted (partially): text revised to indicate that we refer to pathways not strategies.
52796	35	27	35	38	The trade-offs of supply-side mitigation could be highlighted more in this paragraph [Iulain Florin VLADU, Germany]	Accepted: We highlight "bioenergy supply" in the sentence.
49660	35	29	35	3	Even in the case of "only" forest conservation, many constraints render about one third of future sceanrios unfeasible, and cropland constraints are about as frequent as grazing land constraints (Erb et al., nature communications, 2016) [Karlheinz ERB, Austria]	Noted: Unfortunately not possible to discuss these constraints in detail due to space limitations.
13688	35	31	35	31	Suggestion 1.5 or 2°C [Poot-Delgado Carlos, Mexico]	Noted: text says 1.5 or 2C.
13690	35	32	35	33	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: All references that were not accepted by May 15 were removed from the draft.
12736	35	33	35	38	This is an important point and deserves highlighting (e.g. in exec summary). However it slightly contradicts that narrative elsewhere in the report that the extra effort in 1.5c scenarios is really all about mitigation and not so much co2 removal. I agree with your approach, but needs to be consistency between chapters. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: we will make sure we are consistent with other Chapters.
28872	35	34	35	47	The section could highlight the political implications of decreasing food production/rising or volatile food prices. Combined with other pressures and trends (e.g. poor governance, population growth and rising energy demand) this increases the risk of public unrest, food riots, local or civic conflict. For a reference see, for instance, Rüttinger et al (2015): A New Climate for Peace [Germany]	Rejected: We did not add the study, since it is grey literature and since it did not make a point that is specific the 1.5C pathways.
13692	35	37	35	37	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Noted: the citations are in no specific order, and I assume the typesetters will do this.
57836	35	4	35	47	This paragraph seems to ignore the food security (and other livelihood) impacts of bioenergy and other forms of land-based mitigation on subsistence and natural resource-dependent communities and peoples who do not use financial income streams to purchase food, but rather rely on direct access to land and other natural resources. It would be very important to balance this analysis out with consideration of impacts of those reliant on subsistence agriculture. [Kate Dooley, Australia]	Accepted partially: traditional populations and indigenous populations are discussed in 5.4.1.5. Unfortunately there is no study on the effect on these populations in 1.5C pathways, hence we have not added text here.
31602	35	43	35	47	We would appreciate more explanation of the causality between limiting bioenergy and the negative effects of increased GHG prices on food security as this is important information. This sentences appear to be in contradiction with the Executive Summary of this chapter (from page 5 line 1 to page 5 line 4) and Table 5.1, which discuss the negative effect of bioenergy deployment on food prices. [Japan]	Noted: The effect is discussed. We deleted some text however in response of comment #951.
28874	35	43	35	47	We suggest deletion. Rationale: This is based on the undifferentiated, non-peer-reviewed interpretation that Hallegatte 2016b has made of a single study from Havlik et al 2015 and is therefore misleading. On page 36 of the underlying study, Havlik himself says "These results should however be interpreted with some prudence, due to the large number of uncertainties in the climate change impacts, and to the "naive" mitigation policy design implemented in the model where a uniform tax is applied to all the emission sectors and its revenue stays outside of the sector both on the producer and on the consumer side." On page 40 of his study, Havlik further says this is only if "all economic sectors and all regions were taxed". He also admits "this is not a realistic, and probably even not a desirable scenario." It is obvious that the cause of the high food prices in the model is driven by a method of quantifying price which has no relation to reality. It is therefore misleading to include such a statement here based on an oversimplification in modelling described in a single non-peer-reviewed study and even disputed as misleading in that very same study. [Germany]	Accepted: text was deleted due to space limitations.
33424	35	43	35	43	2015) (Fujimori [Sergio Aquino, Canada]	Noted: I assume a typesetter will correct the citation designs.

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36202	35	43	35	47	Limiting bioenergy may have negative effect on food security..... Citations are required to substantiate this statement. [India]	Accepted: text deleted due to space limitations.
50158	35	43	35	47	This sentence refers to a study that comes to radically different conclusions about the impact of bioenergy on food prices. I would expect from a scientific assessment that the validity of these results are critically examined, so that policy makers can be given a clear picture of what to expect. Just mentioning the various studies, with their results is not enough. [Bert Metz, Netherlands]	Accepted: text deleted due to space limitations.
56066	35	43	35	47	This argument that limiting bioenergy drives up food prices is based on the argument that by excluding or limiting BECCS, faster decarbonization is required and so carbon price increases drive up food price. This assumes that carbon price is assigned to all food production and that agriculture has not yet adapted to be low-emissions, which could easily not be the case based on many policy options available. [Kelly Stone, United States of America]	Noted: text was deleted.
12738	35	49	35	5	In what way? [United Kingdom (of Great Britain and Northern Ireland)]	Noted: In what way is explained in Chapter 2.
33426	35	49	35	49	Grubler et al. (xxxx) show that [Sergio Aquino, Canada]	Accepted: The year is now given (i.e. 2018).
34598	35	49	35	49	It would be advisable to define BECCS at the beginning of the chapter or when it is first mentioned [Mexico]	Noted: BECCS is defined elsewhere in the report (Chapter 2).
35418	35	49			According to the context of the sentence, the citation (Grubler et al. submitted) should be corrected as Grubler et al. (submitted). [Regasa sagni, Ethiopia]	Accepted: citation was updated to "accepted".
41230	35	49	35	49	Grubler et al. (submitted) show that... [Maria Pia Carazo Ortiz, Germany]	Accepted: text was changed to (accepted).
49662	35	49	35	52	This scenario is interesting and should be referred to in chapter 2 as well. [Karlheinz ERB, Austria]	Accepted: The scenario is referred to in Chapter 2 as well.
52798	35	49	35	52	More discussion on BECCs needed. [Julain Florin VLADU, Germany]	Accepted: see Section 5.4.1.
57838	35	49	35	52	This paragraph should be rounded out to more fully cover the paragraph topic. In addition to the Grubler paper, there is at least one other 1.5C mitigation scenario which does not rely on BECCS, but on afforestation: Holz C et al (2017) Ratcheting Ambition to Limit Warming to 1.5°C – Trade-offs Between Emission Reductions and Carbon Dioxide Removal. Complementary to these papers, would be two references that show a significant amount of CDR can be achieved from measures that are less likely to significantly impact on food security: Griscom, B.W. et al., 2017. Natural climate solutions. PNAS, 114(44): 11645–11650.; and Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98, https://doi.org/10.1007/s10784-017-9382-9 . [Kate Dooley, Australia]	Rejected: the suggested scenario contains no detailed assessment of energy system evolution. This prohibits an adequate assessment of its sustainable development consequences.
57456	35	5	35	5	It is not clear what "fundamental transformation of the service sectors" implies. [Hans Poertner, Germany]	Noted: it means that the changes need to be structural, and also limited energy demand (as explained in the text).
4514	35	54	36	4	It looks like the cost of complementary food security policies is compared with the cost of mitigation to reach 1.5 degree world i.e. 2-6% of GDP loss. This comparison is wrong. Please reword to avoid any misunderstandings. [Mitsutsune Yamaguchi, Japan]	Accepted: We are showing now investment needs.
12740	35	54	36	2	This seems significant but the point being made is not entirely clear. A major concern about 1.5C scenarios is that BECCS and bioenergy more broadly may negatively effect food security. Yet here it seems to be saying that this problem is easily solved through simple measures. Is this really the case? And what are the implications? We don't need to rely on changes in diet, reduced demand and increased production efficiency? Just fix through food price support? if so, this really needs making into a bigger point and communicating to policy makers (and reflecting in the sustainability trade-offs sections of chapters 2 and 4). Or are these simple fixes only the case in low energy demand scenarios, where we use less bioenergy and less BECCS. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: the text was edited to make clear that there are many different complementary measures (not only price support), and that implementation is not "simple". Food security is at the first place a distributional issue and not one of running out of physical resources to produce sufficient food.
31604	35	54	36	4	In this sentence the costs measured by welfare changes for these complementary food security policies is compared with the cost of mitigation to reach 1.5°C world. But these two costs are not directly comparable because achievement of 1.5°C requires a large amount of BECCS and competition of food with energy is pointed out to lead food prices enhancement. This sentence seems to be misleading. Please reconsider whether to include it accordingly. [Japan]	Accepted: we compare now investment needs/expenditures.
47240	35	54	35	54	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Avoided, language changed.
57840	35	54	36	8	The focus in this paragraph on food price support to compensate for food security in the face of increased pressure on land for mitigation purposes is worrying (see comment 16 above). Such interventions would not account for the myriad of livelihood, cultural, and spiritual benefits access to land provides for small-holder and rural communities and indigenous peoples. I would suggest restructuring the paragraph so that the points made at the end (food subsidies are not the only measures for eradicating food security concerns) are presented first – perhaps by saying that a variety of measures can be used to prevent food security concerns in the opening line of the paragraph. This paragraph could also be linked to the points made on page 5-42, lines 40-42. [Kate Dooley, Australia]	Accepted: Edited the text to make clear that food price support are one out of many options.
13694	35	55	35	55	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: All references that were not accepted by May 15 were removed from the draft.

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56064	35	55	36	4	Food price supports may be a simple way of solving the problem of food price spikes in the model, but they are incredibly difficult to actually implement effectively. Direct food aid is expensive and in the long-term ineffective. Artificially keeping prices at an affordable level is politically unpopular with farmers (who are likely seeing costs go up while revenues are being held down). Nor is there any global mechanism to artificially keep food prices at affordable rates, so individual national governments would need to step in. That leaves developing countries - who are going to be taking the brunt of the negative impacts to agriculture in the short term - in a very difficult spot as they likely won't have the capacity to implement food price supports (which, it is worth noting, are often considered illegal in international trade regimes). Developed countries may not feel the need to respond internationally, and historically when they do it has too often been with ineffective and insufficient food aid. Additional discussion of these risks is needed. [Kelly Stone, United States of America]	Accepted: We deleted "simple".
58250	36		37		Struck by the fact that the water security discussion has no mention of the water sector and the energy needs and potential to both reduce energy and generate energy and improve the security of water supply via the water sector. See WEO 2016 for quantification of energy needs from water sector and opportunities to reduce energy. [Andrew Prag, France]	Accepted: We added a reference to the WOE study.
40960	36	1	36	8	The subsidy amount for food policy could be not very small (still the order of the magnitude is a few % of GDP), the net welfare change is almost zero. This is because the issue described here is just distributional issue. In that sense, how to formulate more progressive income distribution instruments is the essential discussion point where it should have synergy effect on SDG1. [Shinichiro Fujimori, Japan]	Accepted: we now compare investment numbers rather than welfare implications.
62850	36	2	36	8	What does "forthcoming" mean for literature? Please check coherency of mitigation costs of 1.5°C pathways across chapters (with 2 and 4). [Valérie Masson-Delmotte, France]	Accepted: all forthcoming references that were not published in time were removed.
12742	36	4	36	4	Are these costs the same as those quoted in Chapter 4 (page 11, lines 23-29)? The range looks higher than the values quoted there (and the source differs too). Again, need to be consistent. [United Kingdom (of Great Britain and Northern Ireland)]	Noted text was removed, since study could not be published in time for the assessment cut-off.
13696	36	4	36	4	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: all forthcoming references that were not published in time were removed.
4512	36	4	36	4	1) Here is a description of mitigation cost of 1.5 degree pathways as 2-6% of total GDP (2050). This is the only description of mitigation cost (GDP loss) throughout 1.5 SR. This information should be moved to SPM and executive summary of this chapter. In Figure 6.2.1 of AR5/WG3 (p. 450), GDP loss in 2050 for "likely" 2 degree target seems to be around 2.2-4% (median seems to be 3.5%). In comparison to the AR5 report, 2-6% of GDP for 1.5 degree pathway (no probability is mentioned here) is rather low. Please make sure whether 2-6% figure was calculated in the same way as shown in AR5 or not. If not caveat should be inserted here that this figure cannot be compared with AR5 figure with reason. 2) In Chapter 4, text says MAC for 1.5 degree figures "are not yet available (p.70, lines 23-24)" and silent for GDP loss. GDP loss information in this chapter should be communicated to chapter 4 authors. [Mitsutsune Yamaguchi, Japan]	Accepted: The low cost of the compensatory measures have been added to the ES. There is also a figure on investments now.
31606	36	4	36	4	The mitigation cost of 1.5°C pathways as 2-6% of total GDP (2050) shown here is important as it is the only information for the mitigation cost through the report. Therefore, it should also be mentioned in the SPM and the summary of chapters. This figure, 2-6% (Figure 6.21 in AR 5 WGIII) seems low compared with around 2.2-4% (median seems to be 3.5%) when 2 °C is achieved with likely level. The basis should be described? It is described that MAC for 1.5°C are not yet available (p.70, lines 23-24) in Chapter 4, but in SPM and Chapter 2, there is a description that MAC (=Carbon Price) for 1.5°C is about 3 to 7 times higher than those of 2°C world (p.21 lines 22-23 and 99, lines 11-12 respectively). They are not consistent. [Japan]	Rejected: Unfortunately we had to remove the sentence as the underlying study was not published in time.
52368	36	9	36	9	Desalination is possible with thermal plants (like nuclear) and should be discussed as a possible co-benefit of an increased electricity use. [Jason Donev, Canada]	Rejected: There is no literature of the possible co-benefit of desalination in 1.5C pathways.
12744	36	1	36	11	This is important but without quantifying, the value of this statement is reduced. What exactly is the net impact? [United Kingdom (of Great Britain and Northern Ireland)]	Noted: The avoided impacts are quantified in Chapter 3.
61622	36	1	36	11	Please explain how these impacts offset each other, and provide citations. [United States of America]	Accepted partially: Unfortunately there is no studies on how these effects offset each other in 1.5C pathways. We clarified that the avoided impacts are not captured comprehensively in mitigation studies.
12746	36	14	36	14	This section is really interesting but seems quite narrowly focused on energy for cooking. What are implications costs of energy more broadly in energy poor countries during low carbon transition. [United Kingdom (of Great Britain and Northern Ireland)]	Rejected: This section focuses on energy access implications of the pathways. Broader implications are summarized in 4.1 and 4.2. See also the annex (Table 5.3) which includes further broader literature.

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32834	36	14	36	29	As with the air quality section, this seems overly reliant on IAM results. There is a lot of work from the energy access community that has looked at the multiple benefits of policies to accelerate the transition to clean cooking (and in some places, heating), and they have identified both climate benefits and multiple non-climate benefits (health, time savings, reduced exposure of women to violence during fuel collection, reduced biodiversity loss etc.). Taking into account both the effects of BC & co-emissions and of avoided deforestation in cases where solid fuel use is unsustainable, analysis shows the transition to cleaner energy could have substantial climate benefits (e.g. Bond et al., JGR, 2013; Jeuland & Pattanayak, PLOS One, 2012; Shindell et al., Science, 2012; Scovronick et al., Lancet, 2015; Greishop et al., 2011; Anenberg et al., 2013; and many others). So what's presented in the current draft is correct if one were to focus on climate policy alone - there could be trade-offs with energy access - but if we consider the scope of the report which is to look at climate in the context of sustainable development, then one could envision efforts for the sake of public health, gender equality, etc. that would yield climate change mitigation as the co-benefit. If the studies done thus far with IAMs have only looked at optimizing achievement of climate policies, which I believe is the case, then the chapter should go beyond IAM studies and include the broader perspective of how sustainability-related interventions might affect climate and not only how climate might affect energy access. [Drew SHINDELL, United States of America]	Accepted: literature taken into account in Section 5.4.1 (and appendix Table) which discusses broader implications. In this Section, however, we are focusing on the implications of the IAM pathways.
33180	36	14	36	29	add a reference to access to energy as part of the right to development. E.g. Mary Robinson Foundation (2016b) The Role of Social Protection in Ending Energy Poverty Making Zero Carbon, Zero Poverty the Climate Justice Way a Reality. Policy Brief. First published: June 2016 https://www.mrfcj.org/wp-content/uploads/2016/09/The-Role-of-Social-Protection-in-Ending-Energy-Poverty.pdf [Tara Shine, Ireland]	Rejected: This section is on the literature on 1.5C relevant scenarios/pathways. Broader discussion of energy poverty can be found in 5.4.1.
55046	36	14	36	29	This section only relies on the results of IAMS, and does not include any reference to the considerable literature on cooking using biomass in developing countries, which seems strange and misses a lot of important knowledge. [Johan Carl Ivar Kuylenstierna, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: There is indeed a large body of non-IAM literature, which is taken into account in 5.4.1. In this section we thus focus on insights from IAM pathways.
55552	36	14	36	29	This paragraph gives a very incomplete perspective on the linkages between climate change, lack of energy access and energy poverty. It must be either removed, or much extended (not only South Asia, not only cooking). Literature on this topic is now extremely large, from international agencies (reports by the WB, by the IEA) to specific case studies. [Maryse Labriet, Spain]	Rejected: This section is on the literature on 1.5C relevant scenarios/pathways. Broader discussion of energy poverty can be found in 5.4.1.
58236	36	15	36	17	Update to IEA's latest data on clean cooking access: "...especially in Africa and developing countries in Asia, where 81% and 49% of people do not have access to clean cooking fuels respectively (IEA, 2017)." [Andrew Prag, France]	Accepted: We added Africa, but removed the detailed numbers from the text due to space limitations.
3124	36	19	36	19	climate policycould' should be 'climate policy could' [Robert Shapiro, United States of America]	Rejected: the use of need in this context is not policy prescriptive.
13698	36	19	36	2	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: All references that were not accepted by May 15 were removed from the draft.
34600	36	19	36	19	A space between "policy" and "could" is needed [Mexico]	Rejected: the use of need in this context is not policy prescriptive.
54326	36	19	36	19	Separate "policy could" [Christopher Bataille, Canada]	Rejected: the use of need in this context is not policy prescriptive.
58240	36	2	36	2	Suggestion to add content after Krey citation: "...submitted). However, recent analysis shows that achieving universal energy access does not have to run counter to achieving climate change goals. There could even be a net climate benefit from universal access, as the small increase in CO2 emissions is more than offset by a reduction in methane emissions from biomass combustion, due to switching from the traditional use of biomass for cooking to modern fuels including LPG, natural gas, and electricity (IEA, 2017) [Energy Access Outlook]. [Andrew Prag, France]	Rejected: This section is about impact of 1.5C pathways on energy access (not the other way around).
54328	36	22	36	25	Add "fuels" to "clean cooking". Wouldn't ~1.1 billion more people using wood, peat, or dung for cooking have land pressures as well? [Christopher Bataille, Canada]	Accepted: fuels added.
61624	36	22	36	29	What are the redistributive measures included in the IAM assessments? It is not enough to simply say that these costs would be a fraction of the overall costs, as this issue will likely be a major issue for many domestic constituencies. [United States of America]	Rejected: It is important to be explicit about the implied costs. The IAMs are used to estimate the range of possible price-effects, which are then used in energy access tools for the estimation of distributional impacts (see McCollum et al. 2018).
52370	36	23	36	25	It's unclear what the numbers mean in this sentence. Could this be re-worked? [Jason Donev, Canada]	Accepted: numbers had to be deleted, since the underlying study was not published in time.
13700	36	28	36	28	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: All references that were not accepted by May 15 were removed from the draft.
33182	36	32	36	55	These impacts on water should be expressed in terms of the right to water : See this submission to the UNFCCC from the OHCHR https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/676.pdf 29 August 2016 [Tara Shine, Ireland]	Rejected: this is not the right section of general discussions about water.
55896	36	32			You might want to make a reference to 4.3.2.5, which discusses water management in the energy sector (although [Debora Ley, Guatemala]	Accepted: cross-reference added.
58246	36	35	36	41	Suggest to make a distinction on what is meant by water demand- more useful would be to frame the discussion in terms of withdrawals and consumption. Additionally, CSP needs to be added to the list of technologies and IEA 2016 citation needs to be added. The impact on water is dependent on the fuel and technology mix. The more a decarbonisation strategy relies on biofuels, nuclear, CCS and CSP, the more water it consumes. [Andrew Prag, France]	Accepted: IEA reference was added.

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52372	36	37	36	41	The water security issues for CCS and nuclear power are fundamentally different and should be treated differently here. Please break them out and cite the papers differently. Nuclear power consumes practically no water, but it does withdraw and return a fair amount. CCS, on the other hand, can (depending on how its done) withdraw and not return water, thereby consuming it. Nuclear power also has considerable ability to desalinate water, especially new small modular reactors, a disruptive technology that is currently being developed and is close to deployment. This subject should be treated more carefully and thoroughly. I was surprised to discover when I looked into it how much nuclear power can improve water security. [Jason Donev, Canada]	Rejected: This section deals with systemic changes in 1.5C pathways. Individual options are discussed in 5.4.1 .
58256	36	37	36	41	Suggest to add reference, "Water-Energy Nexus, except from WEO-2016" IEA, 2016 [Andrew Prag, France]	Accepted: IEA reference was added.
43244	36	38	36	39	Could also mention the water intensity of carbon capture and storage, and or cite paper on this : Byers, E.A., Hall, J.W., Amezaga, J.M., O'Donnell, G.M. and Leathard, A., 2016. Water and climate risks to power generation with carbon capture and storage. Environmental Research Letters, 11(2), p.024011. [Edward Byers, Austria]	Rejected: individual options are discussed in Section 5.4.1.
6842	36	4	36	4	replace perquisites by prerequisites [Thomas Heyd, Canada]	Noted: there is no prerequisite in this sentence.
6844	36	44	36	44	in "that can inform that so far limited" replace the second that by the [Thomas Heyd, Canada]	Noted: statement seems to be about text somewhere else.
33428	36	45	36	45	2017). However [Sergio Aquino, Canada]	Accepted: text corrected.
57842	36	45	36	47	It would seem likely that prioritizing arable rain-fed areas for bioenergy crops would undermine food security. I would suggest a sentence here that speaks of the limits imposed on bioenergy utilisation by food and biodiversity goals, as well as the planetary boundaries concept. Suggested references: Boysen, L.R., Lucht, W. & Gerten, D., 2017. Trade-offs for food production, nature conservation and climate limit the terrestrial carbon dioxide removal potential. Global Change Biology, 23(10), pp.4303–4317. Heck, V. et al., 2018. Biomass-based negative emissions difficult to reconcile with planetary boundaries. Nature Climate Change, 10, p.105007. [Kate Dooley, Australia]	Accepted: the trade-off is now noted in the text.
10184	36	49	36	5	Linking the water conservation and GHG with the reduction of energy demand needs more evidence [Saudi Arabia]	Accepted: We added another reference about this link in Saudi Arabia.
52374	36	49	36	52	This paragraph is very much at odds with section 5.4.3.3. Please remember that there is a strong need for consistency as well as clarity across the entire document. [Jason Donev, Canada]	Accepted: we will make clear that reducing energy demand in this paragraph needs to be achieved in a way that it does not compromise the energy needs of the poorest.
61626	36	49	36	52	It would be good to reference the food/water/energy nexus here, and not just water/energy. [United States of America]	Accepted: Reference expanded to food and water.
13702	36	54	36	54	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: all publications that are not published by the literature cut-off date (May 15th) were removed.
6840	37	1	37	13	Social enabling conditions should explicitly include the concept of supporting autonomously engendered development pathways, which also support mitigation or adaptation goals, that originate directly from marginalised populations. In other words, pathways should go beyond 'participatory governance' implicating those most affected and marginalised in decision-making and go as far as to endorse endogenous initiatives, such as informal wastes recycling (King and Gutberlet 2013; Tremblay, Gutberlet, Peredo 2010; Heyd and Guberlet in press) [Thomas Heyd, Canada]	Rejected: Unfortunately this is not directly connected to 1.5C pathways literature, which is assessed in this section.
31608	37	3	37	8	Suggest to consider a paper with respect to decomposition analysis of future water stress (Hayashi et al., 2018). The main implication is that change of irrigation water consumption and water resource is a major factor for change of water stress even under the 2°C or 1.5°C scenarios. Hayashi, A., Sano, F., Nakagami, Y., Akimoto, K. (2018). Changes in terrestrial water stress and contributions of major factors under temperature rise constraint scenarios. Mitigation and Adaptation Strategies for Global Change. doi: 10.1007/s11027-018-9780-5 [Japan]	Accepted: reference added.
61628	37	5	37	5	A number of adaptation options exist (e.g., dry cooling), which can effectively reduce electricity-related water tradeoffs (Fricko et al., 2016). Suggest to include an example to facilitate reader's comprehension on the topic. A renewable technology that can use either wet-cooling or dry-cooling is concentrating solar power (CSP), which can be equipped with thermal storage to supply electricity on demand. The use of dry-cooling is mostly used in places with water scarcity. This reference provides an example of the use of CSP with dry-cooling for developing African countries: "Impact of political and economic barriers for concentrating solar power in Sub-Saharan Africa" (https://www.sciencedirect.com/science/article/pii/S0301421516306644). [United States of America]	Rejected: Sorry, we can't go into details in this section given space limitations.
232	37	11	37	35	Section: 5.4.3.5 Biodiversity- Please specify if the discussion is within-organismal genetic biodiversity, within-species genetic biodiversity or at the level of species biodiversity. Each level needs special consideration as global change may impact each level in a different way. I think that the text is on species biodiversity, but this should be specified. [Baruch RINKEVICH, Israel]	Noted: Biodiversity Section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
28876	37	11	38	33	Section 5.4.3.5 focuses on bioenergy with capture and storage and particularly afforestation. It would be helpful if this section also expands on non-BECCs forms of carbon dioxide removal (e.g. biochar) particularly regarding those approaches that might also support native species, prevent land degradation/desertification and support local livelihoods to adapt to climate change. [Germany]	Rejected: this is discussed in 5.4.1. This section focuses on the literature on 1.5C pathways, and literature on pathways using these other options is missing.
28878	37	11	37	34	How does literature define "biodiversity loss"? Are all changes (for example landuse) considered in the high demand/baseline scenarios? It seems surprising that only 0.2 - 0.3% biodiversity is lost in the baseline scenarios, considering all the impacts discussed in Ch 3, and Ch 5.2 (loss of coral reefs for instance) on the one hand, and, on the other hand, losses due to, for instance, further clearing woodland, accessing fossil fuel sources and other AFOLU related developments that are consistent with baseline pathways. [Germany]	Noted: Biodiversity Section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.

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36204	37	11			Add - A paragraph on REDD+ stating that its implementation as a mitigation measure will have positive impact on biodiversity especially in the tropical forest which are rich in biodiversity is required. [India]	Rejected: Unfortunately this information is not available for 1.5C pathways, which are assessed in this section.
31610	37	12	37	13	Suggest to include a latest paper of EMF33 (Bauer, N., Rose, S., Van Vuuren, D., Weyant, J., Wise, M., Leblanc, F., Cui, Y., Daigoglou, V., Fujimori, S., Gidden, M., Kato, E., Kitous, A., Sands, R., Sano, F., Streifer, J., Tsutsui. Global energy sector emission reductions and bio-energy use: overview of the EMF33 model comparison. submitted.) [Japan]	Rejected: paper is not published yet.
55744	37	12	37	13	replace "afforestation" by "AFOLU" or "ecosystem-based approaches [David Cooper, Canada]	Noted: Biodiversity Section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
13704	37	13	37	13	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: we removed all references to unpublished documents.
28880	37	15	37	2	The large-scale deployment of bioenergy might also lead to land degradation and desertification. Please evaluate the literature with respect to these topics and add statements accordingly. [Germany]	Rejected: If done right, bioenergy should not lead to desertification and land degradation. In 1.5C scenarios, bioenergy is replacing agricultural land and not forests.
13706	37	16	37	17	Review parentheses [Poot-Delgado Carlos, Mexico]	Noted: text deleted.
41232	37	16	37	16	eliminate) before Edenhofer [Maria Pia Carazo Ortiz, Germany]	Noted: text deleted.
41234	37	18	37	19	Should read: "In addition, the reclamation of so-called marginal land for biomass-energy [purposes][uses] is often associated with a detrimental impact on biodiversity." [Maria Pia Carazo Ortiz, Germany]	Noted: text deleted.
34602	37	19	37	2	it would be advisable to mention options such as agroforestry and silvopastoral systems as examples [Mexico]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
13708	37	2	37	2	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
28882	37	2	37	2	Please ensure that the term 'biodiversity preservation' is not being used interchangeably for 'biodiversity conservation' because there is a difference in meaning, and thus in the delineation of options required for actions. [Germany]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
55746	37	21	37	21	Add some text along the following lines. There are a wide range of potential ecosystem-based approaches to climate mitigation which have a potential for positive co-benefits for various aspects of biodiversity. These may include reducing deforestation and forest degradation, ecosystem restoration, reducing loss and degradation of wetlands, peatlands, coastal ecosystems, and better management of agricultural crop and pasture lands. (Griscom et al, 2017; Eppler, et al. (2016). Managing ecosystems in the context of climate change mitigation: A review of current knowledge and recommendations to support ecosystem-based mitigation actions that look beyond terrestrial forests. Technical Series No.86. Secretariat of the Convention on Biological Diversity; Chazdon et al (2016)). [David Cooper, Canada]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
233	37	22	37	28	The discussion is on "afforestation". Suggest to add restoration of one of the marine ecosystem, such as the coral reefs, to show the commonality and specific issues. Suggested literature: Rinkevich, B. (2014). Rebuilding coral reefs: does active reef restoration lead to sustainable reefs? Current Opinion in Environmental Sustainability 7, 28–36; Rinkevich B. (2015) Climate change and active reef restoration—Ways of constructing the 'reefs of tomorrow'. Journal of Marine Science and Engineering 3, 111-127; Rachmilovitz, E.N., Rinkevich, B. (2017). Tiling the reef - exploring the first step of an ecological engineering tool that may promote phase-shift reversals in coral reefs. Ecological Engineering 105, 150-161. [Baruch RINKEVICH, Israel]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
12748	37	22	37	28	This is where it would be helpful to link to what the scenarios themselves are saying. Does the afforestation in the models assume native tree species or is it plantations of high carbon stock forests (which have a greater climate benefit). If it's the latter then this needs to be scrutinised and if the alternative is native then the lower carbon reduction potential and the implications of this on mitigation discussed. [United Kingdom (of Great Britain and Northern Ireland)]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
13710	37	22	37	22	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
29774	37	22	37	28	For assessments of biodiversity impacts, it is particularly appropriate to distinguish more clearly between "afforestation", "reforestation", and potentially also "ecosystem restoration" - as they differ in whether they entail the establishment of forest on previously unforested land or a restoration to an approximation of a previous state of an existing ecosystem. See Dooley & Kartha (https://doi.org/10.1007/s10784-017-9382-9) [Bård Lahn, Norway]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
57844	37	23	37	23	I would suggest that it is reforestation with native species, rather than afforestation, that is considered superior to plantations and can contribute to biodiversity protection goals See: Lamb, D., Erskine, P. D., & Parrotta, J. A. (2005). Restoration of degraded tropical forest landscapes. Science, 310: 1628–1632. https://doi.org/10.1126/science.1111773. This reference also explains the difference between forest restoration and reforestation, which is important in terms of maximising both biodiversity and climate benefits. Forest restoration, where possible, should be considered superior to reforestation, as peak ecosystem capacity with regards to biodiversity and carbon storage is more attainable through forest restoration. Afforestation, on the other hand (planting forests on land that does not historically support forest biomes) is likely to require high water and nutrient inputs and so should be avoided. See also Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98, https://doi.org/10.1007/s10784-017-9382-9, for a further explanation of these differences. [Kate Dooley, Australia]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
13712	37	24	37	24	Missing points and commas [Poot-Delgado Carlos, Mexico]	Noted: text deleted.

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35420	37	24			The citation (Hall et al 2012, McKinley et al 2011) shall be corrected as (Hall et al 2012, McKinley et al., 2011) [Regasa sagni, Ethiopia]	Noted: Reference style will be harmonized by typesetters.
51192	37	24	37	26	It appears doubtful that monoculture tree plantations would perform better in terms of carbon sequestration. Provide evidence for this claim, please. The reserve is likely to be more accurate. [Linda Schneider, Germany]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
13714	37	27	37	28	Review parentheses [Poot-Delgado Carlos, Mexico]	Noted: text deleted.
35422	37	27			The citation (Locatelli et al., 2015) (Diaz et al 2009, Venter 27 et al 2012) shall be corrected as (Locatelli et al., 2015;Diaz et al., 2009; Venter 27 et al.,2012) [Regasa sagni, Ethiopia]	Noted: Reference style will be harmonized by typesetters.
1324	37	3		34	Section 5.4.3 is a well-referenced section presenting the SD implications of 1.5 and 2 degree mitigation pathways. A question for clarification is the sentence explaining biodiversity loss for the 1.5 degree pathway compared to 2 degrees and a baseline scenario. The numbers state that biodiversity loss is highest (0.5 - 3%) under a 1.5 degree compared scenario than a 2 degree scenario (0.2 - 0.3 %). This is opposite of what to expect, assuming more warming means more extreme weather and higher impacts. Fig. 5.4 states that avoided impacts from mitigation are not factored in. However, reading the sentence on its own without the note in the Fig. 5.4, the results come across as intuitively wrong. Please clarify. [Karen Olsen, Denmark]	Noted: Biodiversity Section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
13716	37	3	37	3	Suggestion 1.5 or 2°C [Poot-Delgado Carlos, Mexico]	Noted: text deleted.
13718	37	3	37	31	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Noted: text deleted.
18736	37	3		34	Section 5.4.3 is a well-referenced section presenting the SD implications of 1.5 and 2 degree mitigation pathways. A question for clarification is the sentence explaining biodiversity loss for the 1.5 degree pathway compared to 2 degrees and a baseline scenario. The numbers state that biodiversity loss is highest (0.5 - 3%) under a 1.5 degree compared scenario than a 2 degree scenario (0.2 - 0.3 %). This is opposite of what to expect, assuming more warming means more extreme weather and higher impacts. Fig. 5.4 states that avoided impacts from mitigation are not factored in. However, reading the sentence on its own without the note in the Fig. 5.4, the results come across as intuitively wrong. Please clarify. [Andrea TILCHE, Belgium]	Noted: Biodiversity Section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
34604	37	3	37	34	Further explanation of this paragraph would render a more complete idea. From this lines it difficult to know why there will be a biodiversity loss [Mexico]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
41236	37	3	38	16	I do not understand why the percentage of biodiversity loss is higher in 1.5°C pathways than in 2°C pathways. Or is it the reduction of biodiversity loss? Not clear. The chart on page 38 is also not so clear / the tones of grey are all very similar and it is hard to distinguish between them [Maria Pia Carazo Ortiz, Germany]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
55748	37	3	37	34	The Krey et al data (which is not available to the reveiwer) should not be overstated. (1) this is one indicator of biodiversity - a multifacted concept. (2) the impacts on biodiversity will depend on (a) pathway taken (inlc. BECCS vs AFOLU) and (b) safeguards implemeneted. There is much more literature suggesting that AFOLU measurs have potential for improvements in biodievrstiy. [David Cooper, Canada]	Accepted: Krey et al has been removed, since the paper is still under review.
61630	37	3	37	34	These model results seem somewhat counter-intuitive and may need to be explained. Why is the range of loss for 1.5°C pathways greater (0.5-3%) than that of 2°C pathways (0.4-1.6%)? Is this because land-use change related to land-based mitigation actions would have more negative impacts than climate change itself? Similarly, how can the baseline range (without mitigation) be even lower, given that the climate-induced impacts on biodiversity might be expected to be greater? [United States of America]	Accepted: Krey et al has been removed, since the paper is still under review.
35566	37	33	37	34	It is suprising that there is greater biodiversity loss in the 1.5 pathway than the 2 deg pathway, which in turn has greater biodiversity loss than the baseline. Are these numbers correct or misreported? [Ashok Sreenivas, India]	Noted: Biodiversity section had to be removed unfortunately, since the main 1.5C pathways paper that looked into biodiversity (Krey et al) was not accepted in time.
63304	38		38		Fig 5.4. Seems very misleading to exclude consideration of the SDG benefits achieved via stabilizing warming to 1.5degC. Need more contrasting color scheme for baseline, 2deg and 1.5deg scenarios. Panel b: you are saying that relative to baseline (BAU?) there is more biodiversity loss at 1.5degC warming than at BAU? This panel is hard to figure out. Perhaps graph both baseline (define) and 1.5degC together and let the reader figure out the the benefit or impact of achieving 1.5degC. [Greg Rau, United States of America]	Accepted: figure caption has been extended to clarify that the number do not include feedbacks from avoided impacts.
374	38	1	38	15	The time horizon chosen (2050) is different from the SDG time horizon (2030). [Céline Guivarch, France]	Rejected: Note that the scenario without BECCS (LED) is shown explicitly in the figure, and the conclusions are consistent with the assessment elsewhere in the report.
375	38	1	38	15	The presentation of SDGs only with their number (2, 3, 14...), and not in the usual order makes it difficult to know immediately which SDGs they are. Maybe add the titles of the SDGs, and present them in order. [Céline Guivarch, France]	Accepted: Figure has been improved for readability.
376	38	1	38	15	some of the Y-axis labels are not complete: first of SDG2 - what is the index=1?; first of SDG7: % of what?; last of SDG7: million people without access; first of SDG12: what mineral resources are concerned?. [Céline Guivarch, France]	Accepted: figure has been updated.
377	38	1	38	15	results on food price on panel b does not seem consistent with panel a SDG2. [Céline Guivarch, France]	Accepted: figure has been updated.
378	38	1	38	15	some of the representation chosen here give only partial elements, thus misleading, compared to the text. For instance, 5.4.3.3. indicates that in absence of compensatory measures, people without access increase; but that compensatory measure can fully offset this negative effect. Whereas the figure represents only the negative effect. [Céline Guivarch, France]	Accepted: figure caption has been updated to clarify this point.

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379	38	1	38	15	The fact that benefits from avoided impacts are excluded is problematic for some of the dimensions shown, in particular for the food price where the impacts from climate change are a major driver. [Céline Guivarch, France]	Accepted: caption extended to clarify this point.
380	38	1	38	15	The X-axis scale from panel b is unspecified. What do trade-offs from 0 to 10 mean, and co-benefits from 0 to -5 mean? how can the various indicators be compared on a common scale? [Céline Guivarch, France]	Accepted: caption extended to clarify this point.
4516	38	1	38	2	Figure 5.4 is quite useful and this should be moved up to SPM. That's said, this figure is too small and cannot read. Isn't it possible to separate panel a) and b) and make panel a) much bigger. Secondly, what is the unit of scale in panel b)? Please add the unit in the bottom of panel b). [Mitsutsune Yamaguchi, Japan]	Partially accepted: Figure has been improved for readability.
5358	38	1	38	1	The colour of some texts in the legend, it seems a bit grey. Suggest changing it to black colour. [Sulistyawati Sulistyawati, Indonesia]	Accepted: Figure has been improved for readability.
5544	38	1	38	17	Same comment on the figure as above, the conclusions are too firm. The unemployment category is difficult to understand as part of IAM studies. Such an element needs to be based on shorter term macroeconomic modelling and it will be very time and context specific [Kirsten Halsnaes, Denmark]	Accepted: employment bars were removed, since the underlying study was not published in time.
13720	38	1	38	1	Delete text [Poot-Delgado Carlos, Mexico]	Noted: will be done by the typesetter.
24420	38	1	38	1	Figure 5.4 (b)", low resolution [Nazan AN, Turkey]	Accepted: High resolution figures were provided to the designers.
30756	38	1	38	15	Figure 5.4: The time horizon chosen (2050) is different from the SDG time horizon (2030). [France]	Accepted: The SDGs are relevant also for 2050, which is the more relevant time frame for the 1.5C pathways. We have added another figure though to show investment implications of the SDGs for 2030.
28884	38	1	38	33	Please provide more information in subsection 5.4.3 about the benefit/trade-off discussion of "mineral resources for renewables" in order to substantiate the graphs shown in Fig. 5.4 and the summary text. We have some questions on Fig. 5.4: 1) Which minerals are referred to in detail? 2) Are these minerals only used for renewables or also used in other applications? If this is the case, it will be very important to assess the use in baseline scenarios that might include higher consumptions of resources in general. This might lead to an reduction of the stated trade-off. 3) Are these minerals only used for a specific renewable technology or is a broader issue of renewable energy in general? [Germany]	Noted: Unfortunately conclusions on mineral resources had to be removed, since the underlying study was not published in time.
28886	38	1	38	16	We suggest either to revise this Figure 5.4 significantly or delete it due to a couple of reasons: 1) General comment: The figure does not include the effect of avoided impacts. Baseline scenarios by 2050 might reach temperatures well above 1.5°C. Having in mind the discussion of subchapter 5.2.2 and 5.2.3, and the findings from Ch 3 and 3.5, there are significant impacts and risks in a baseline world in particular concerning food security (also mentioned in 5.4.3.2) and biodiversity. Leaving out findings about avoided impacts, it is difficult if not impossible to gain a holistic understanding of how mitigation and sustainable development goals are linked. 2) Instead of using a line to indicate the zero level between trade-offs and co-benefit ("middle-of-the-road" baseline scenario), we suggest to use a range, since the baseline scenarios presented in a) are also not only one value but a range. Therewith overlaps are much better presented. In addition, just using a line seems wrong for example in the case of the parameter "Mineral Resource": In a) the baseline scenarios range from values with more co-benefits than all 1.5°C pathways to values with huge overlaps with the 1.5°C pathways. However, in b) 1.5°C pathways seem only to result in trade-offs. 3) The scale on the X-Axis used in Figure 5.4b is not clear. 4) Please indicate also in Fig 5.4-b) the LED scenarios. [Germany]	Accepted partially: figure and its caption have been improved.
30760	38	1	38	15	Figure 5.4: The presentation of SDGs only with their number (2, 3, 14...), and not in the usual order makes it difficult to know immediately which SDGs they are. Maybe add the titles of the SDGs, and present them in order. [France]	Accepted: Figure has been improved for readability.
30766	38	1	38	15	Figure 5.4: Some of the Y-axis labels are not complete: first of SDG2 - what is the index=1?; first of SDG7: % of what?; last of SDG7: million people without access; first of SDG12: what mineral resources are concerned?. [France]	Accepted: Figure has been improved for readability.
30768	38	1	38	15	Figure 5.4: Results on food price on panel b does not seem consistent with panel a SDG2. [France]	Accepted: Figure updated.
30772	38	1	38	15	Figure 5.4: Some of the representation chosen here give only partial elements, thus misleading, compared to the text. For instance, 5.4.3.3. indicates that in absence of compensatory measures, people without access increase; but that compensatory measure can fully offset this negative effect. Whereas the figure represents only the negative effect. [France]	Accepted: figure caption has been updated to clarify this point, and another figure was added that shows the investments of the complementary measures.
30776	38	1	38	15	Figure 5.4: The fact that benefits from avoided impacts are excluded is problematic for some of the dimensions shown, in particular for the food price where the impacts from climate change are a major driver. Also the negative impact on food prices is true if you take the "no carbon fertilization effect scenario" into account. But with the opposite scenario there is a decrease in food prices. the conclusion -underlined in the AR5 - is that future evolution is uncertain. Note also that there is a weak agreement among economic models concerning prices change in the future. here you refer to a specific scenario. [France]	Accepted: figure caption has been extended to clarify that the number do not include feedbacks from avoided impacts.

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30782	38	1	38	15	Figure 5.4 panel b : The X-axis scale from panel b is unspecified. What do trade-offs from 0 to -5 mean? how can the various indicators be compared on a common scale? [France]	Accepted: Figure has been improved for readability.
31612	38	1	38	2	We find that trade-offs between 1.5°C pathways and the reduction of unemployment require more explanation in this chapter. Figure 5.4 panel (a) and panel (b) seem to be in contradiction with Table 5.1, which explains the co-benefits of mitigation actions on SDG 8. [Japan]	Accepted: text has been removed.
31614	38	1	38	2	The unit of x-axis of Figure 5.4 panel(b) is not described. [Japan]	Accepted: Figure has been improved for readability.
31616	38	1	38	2	As Figure 5.4 is quite useful for policy makers, this should be moved to SPM, but the figure is too dense and not user-friendly (e.g. no unit of scale and no unit in the bottom of panel b). [Japan]	Partially accepted: Figure has been improved for readability.
31618	38	1	38	24	Figure 5.4 b) indicates that there are adverse side-effects of 1.5°C pathways with regard to Biodiversity loss (SDG15), risk of hunger, mineral resource and food prices (SDG2). This assessment, however, seems to be not consistent with Figure 5.3 and Figure SPM5. For example, Figure SPM5 suggests that 1.5°C consistent scenario creates synergies in terms of SDG2; one minus with low confidence, one plus with low confidence and three plus with high confidence. This contradicts Figure 5.4 b). See the second bar from the bottom: "risk of hunger". Figure 5.3 and Figure SPM5 intuitively give a strong impression that synergies are larger than trade-offs, but Figure 5.4 b) implies adverse side-effects are bigger than, or at least the same degree with, co-benefits. [Japan]	Accepted: figure has been updated and improved.
49664	38	1	38	2	I wonder if it would not make sense to separate biomass energy from other renewables (and nuclear, if it is now under this category), and in particular BECCS, in the figure panel b). If related to biomass energy/beccs, the co-benefit dominance of Bioenergy and BECCS seems not to be in line with some assertions in ch2, ch4 and this chapter. [Karlheinz ERB, Austria]	Rejected: this Section is focusing on systemic effects and groups of options. For individual options please see previous section of the Table in the annex.
50160	38	1	38	15	Figure 5.4 left hand panel is unreadable in its current form; the right hand panel is very clear and makes the point on where the biggest potential trade-offs with SD can be expected. That figure would do to illustrate the discussion I think. [Bert Metz, Netherlands]	Accepted: figure has been improved.
52376	38	1	38	1	Do these images have to be part of the same figure? If they could be broken out they'd be much easier to read. [Jason Donev, Canada]	Accepted: Figure has been improved for readability.
52378	38	1	38	1	eg should be e.g. [Jason Donev, Canada]	Accepted: text changed accordingly.
52380	38	1	38	1	The axes are unclear here. [Jason Donev, Canada]	Accepted: Figure has been improved for readability.
52382	38	1	38	1	The words in this graphic are a bit small, not as bad as future graphics, but be aware, they are hard to read. [Jason Donev, Canada]	Accepted: Figure has been improved for readability.
52384	38	1	38	1	There is no scale bar explanation on (b) [Jason Donev, Canada]	Accepted: Figure has been improved for readability.
52780	38	1	38	15	Figure 5.4 (particularly part b) is one of the best in the document, using this type of figure in more sections could be beneficial. [Iulain Florin VLADU, Germany]	Accepted: thanks!
55750	38	1	16		Figure 5.4. need to emphasise (1) that this is looking at only gross impacts of mitigation measures; and (2) using limited set of indicators that may not be representative of bigger picture. [David Cooper, Canada]	Accepted: Figure caption has been accepted to emphasise the point on gross impacts.
61632	38	1	38	15	Figure 5.4: The number scale in panel b is not defined in the caption. [United States of America]	Accepted: Caption has been extended to clarify the y-axis.
61634	38	1	38	15	Figure 5.4: The results in panel B do not appear to be consistent with panel A. For instance, panel A indicates both increases and decreases in food price index in the 1.5°C scenario compared to baseline, yet panel B shows only decreases. Perhaps the red diamond LED scenario is not included in panel B? This is not explained or justified. [United States of America]	Accepted: figure has been updated.
61636	38	1	38	15	Figures should serve to simplify information to make it easier for the reader to understand. This figure fails to do so. [United States of America]	Accepted: figure has been improved.
13722	38	14	38	15	Review bibliographic citations [Poot-Delgado Carlos, Mexico]	Accepted: Citations were changed.
12750	38	17	38	33	Not sure this summary is needed (it's generally clearly enough discussed in the sections above), so remove to save space. HOWEVER, the reference (Fujimori?) for the costs of dealing with the trade offs of energy access being modest should be discussed in the relevant section 5.4.3.3 (it wasn't). It should also be made more prominent. If actual the energy costs trade offs are not that significant, then this is a point of major policy significance and needs to be made much clearer. [United Kingdom (of Great Britain and Northern Ireland)]	Noted: Fujimori et al had to be removed, since the study was not published in time.
51502	38	17	38	33	This summary does not tally with the the arguments put forward in pages 35 to 37, describing series of negative and adverse impacts of negative emission technology and mitigation such as BECCS and Bioenergy and seems heavily biased in favour of negative emission technology and mitigation. It has been argued that without BECCS 1.5 degree pathway is possible. There is a need to a balanced argued summary in this regard. [Souparna Lahiri, India]	Accepted: we revised the text, and removed BECCS as a likely condition for 1.5C.
53468	38	17	38	19	I don't think that the sentence is an adequate reflection of chapter 2 discussion. Specifically, the "large-scale deployment of NETs ... will likely be required" phrase ignores that chapter 2 discusses several scenarios which can lead to 1.5°C with limited NET deployment (nor none altogether) [Christian Holz, Canada]	Accepted: text was modified to reflect the comment.

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57846	38	17	38	19	There are several pathways included in Chapter 2 which do not rely on BECCS. These pathways rely on increased energy mitigation (Grubler, A., Wilson, C., Bento, N., Boza-Kiss, B., Krey, V., McCollum, D. L., et al. (2017). A Global Scenario of Low Energy Demand for Sustainable Development below 1.5°C without Negative Emission Technologies. Nature Energy submitted), or alternative options to BECCS to achieve the scale of CDR required (Holz C et al (2017) Ratcheting Ambition to Limit Warming to 1.5°C –Trade-offs Between Emission Reductions and Carbon Dioxide Removal). Hence this sentence should be adjusted to reflect that a range of pathways for 12.5C are available, which rely on stringent near-term mitigation, and in some cases, a variety of options for CDR. [Kate Dooley, Australia]	Accepted: text was modified to reflect the comment.
62852	38	17	38	2	here "will likely be" does not seem to be the use of calibrated IPCC language. Please ensure coherency with the approaches of chapters 2, 3 and 4 related to BECCS. [Valérie Masson-Delmotte, France]	Accepted: text revised to avoid the use of likely term.
47016	38	19	38	19	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted: text has been removed.
3126	38	2	38	2	1.5°Care associated' should be '1.5°C are associated' [Robert Shapiro, United States of America]	Accepted: text corrected.
41238	38	2	38	2	add a space after 1.5°C [Maria Pia Carazo Ortiz, Germany]	Accepted: text corrected.
55898	38	2	38	2	Space between C and are [Debora Ley, Guatemala]	Accepted: text corrected.
33430	38	21	38	21	human, marine, and eco-toxicity [Sergio Aquino, Canada]	Accepted: text has been removed since the paper was not published in time.
31620	38	24	38	24	We would suggest to mention trade-offs with respect to mineral resources in more detail. [Japan]	Rejected: Unfortunately the underlying study was not published in time, hence the conclusion had to be removed.
50162	38	24	38	24	Mineral resource scarcity is mentioned here and shown (in figure 5.4) to be one of the most problematic issues in 1.5C strategies. However, a proper discussion of this issue is missing. This needs to be added, as it is not obvious that mineral resource scarcity is really a problem, as a recent paper from Amory Lovins (https://thebulletin.org/clean-energy-and-rare-earths-why-not-worry10785#.Wnl2VYlCgw0.twitter) argues. So add a proper discussion of the issue and do not assume upfront that mineral scarcity is a problem. [Bert Metz, Netherlands]	Accepted: text on mineral resources was removed, since the underlying study was not published in time.
4518	38	26	38	28	Cost for eradicating the trade-offs for eg food and energy access shold not be compared to cost of mitigation. Rather those two types of cost should be aded as cost to achieve sustainable 1.5 degree world. [Mitsutsune Yamaguchi, Japan]	Accepted: a new figure was added.
31622	38	26	38	28	This sentence is unclear. Comparison between associated costs for eradicating the trade-offs with cost of mitigation seems to be unclear. Those two types of cost should rather be added as a cost to achieve sustainable 1.5°C world. [Japan]	Accepted: we now refer to investments, and have also added a new figure.
44750	38	26	38	28	Yes, but what about the human rights issues? [Penny Urquhart, South Africa]	Noted: This section is on the pathways for 1.5C. General discussion on human rights issues are important, but will need to be discussed elsewhere (see Section 5.5.3).
43130	38	27	38	27	The phrase 'to be' is suggested to be changed to 'are'. [Muhammad Mohsin IQBAL, Pakistan]	Noted: doesn't seem to be relevant to the text.
18738	38	28	38	31	Fundamental transformation of demand, including efficiency and behavioural changes, can help to significantly reduce the reliance on risky technologies, such as BECCS, and thus reduce the risk of potential trade-offs between mitigation and other sustainable development dimensions. Two comments: (1) There is a sligh problem of consistency in the report when referring to BECCS. Here, it is presented as a "risky technology" (something on which we agree), but on the other hand it is almost presented as a condition in most 1.5°C scenarios. See previous comments on BECCS. It would be good to underline, since the very beginning, that BECCS imply risks - well defined when referring to carbon capture in the report. (2) This looks a relevant message that merits to be included in the SPM. [Andrea TILCHE, Belgium]	Accepted: We refer to the risks of trade-offs from BECCS in 5.4.
32692	38	28	38	37	Suggest to remove the word "risky". Otherwise, you need to explain why BECCS is risky or more risky than other CDR approaches. [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Rejected: The sentence clearly refers to risks of trade-offs. Earlier in the section we describe why BECCS has more risk for trade-offs than other options.
49666	38	3	38	31	BECSS in this section is labelled "high risk", and the caveats described legitimate this. But this is somehow in contrast to the fact that most 1.5° scenarios assume it the pathways to be come feasible, and the overall tone of the SR towards BECSS. I strongly suggest to include this more careful statement in the SPM and to reconcile (wording and content) of chapter 2 with this section. [Karlheinz ERB, Austria]	Accepted: SPM will be carefully worded.
13724	38	31	38	31	Missing points and commas [Poot-Delgado Carlos, Mexico]	Accepted. Text corrected.
35424	38	31			The citation (Grubler et al, 2015 and von Stechow et al., 2015) shall be corrected as (Grubler et al., 2015 ; von Stechow et al., 2015) [Regasa sagni, Ethiopia]	Noted: Reference style will be harmonized by typesetters.
12752	39	1	39	55	This section is really verbose and could easily be reduced in length. Please make it more concise [United Kingdom (of Great Britain and Northern Ireland)]	The content of this section has been synthesised to be more concise, and merged into a new section on enabling conditions (new 5.6).
51504	39	1	43	12	Integrating adaptation, mitigation and sustainable government needs bottom up policy and legislative approach globally by all countries, especially in the south. The governance system needs overhauling, with focus on the lower tiers of governance concerning communities. Policy and legislative provisions have to support community controlled and empowered governance, by the community and for the community, consultation and participation of communities at all levels, implementation of FPIC, participation of women and recognition and use of traditional knowledge, wisdom and systems of traditional governance. [Souparna Lahiri, India]	The role of communities and the need to integrate governance across scales are explicitly discussed in section 5.6.

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57458	39	1			This rather short and conceptual section does not give the impression of being a complete assessment. To be a proper basis for 5.6, the section needs a much more detailed explanation of participatory processes and institutional settings that could enable triple-wins. [Hans Poertner, Germany]	The content of this section has been moved to a new section coming after the discussion on pathways, as a contribution to a synthesis, rather than an introduction to the pathways discussion.
50164	39	1	65	2	Section 5.5 and 5.6 both discuss how mitigation and adaptation for 1.5C strategies can be combined with achieving SDGs. I find it unhelpful that the discussion is divided between two separate sections. It blurs the key messages that policy makers need on how to do this. Both sections discuss institutions, governance, local circumstances and creating equal opportunities, needed for this integration. So merging sections 5.5. and 5.6 would help to bring out the key lessons on how to successfully integrate much better. [Bert Metz, Netherlands]	Thank you. We have followed this suggestion by merging the content of this section into the discussion on pathways in a new section 5.5 on the one hand, and into a new section 5.6 discussing enabling conditions (which merges content from this section and the former 5.6.4).
61638	39	1	47	35	The discussion in this section is not specifically relevant to 1.5°C and is therefore outside the scope of the report. It should be largely removed (to be taken up later in the AR6 possibly) or revised to provide information that is directly relevant to the scope of the report. [United States of America]	This section has been removed as such, and the content that is relevant to this report has been included into the new section 5.6 discussing enabling conditions for 1.5C trajectories, as emerging from the other sections.
62854	39	1	39	55	Are there examples of "triple win"? [Valérie Masson-Delmotte, France]	We no longer use the 'triple wins' specifically, but we do discuss the integration of adaptation, mitigation and sustainable development in section 5.5.1. We primarily review literature detailing project-level case examples. The conditions of such integrated approaches are discussed in a dedicated section 5.6.
57460	39	6	39	6	"policy and community levels" is an unclear expression. [Hans Poertner, Germany]	Sentence has been deleted.
33184	39	1	39	11	additional useful references are Shine, T. (2017) Guides to support the Implementation of the Paris Agreement. Part Three: Integrating Climate Action into National Development Planning: Coherent Implementation of the Paris Agreement and Agenda 2030. Sida, Sweden. https://www.sida.se/contentassets/d69702947cb241d1ab77c414af6f9bcd/integrating_climate_action_into_national_development_planning_webb.pdf ; Shine T. and Campillo, G. (2016) The Role of Development Cooperation in Climate Action Post 2015. OECD Development Cooperation Working Paper December 2016. [Tara Shine, Ireland]	Thank you. Shine and Campillo (2016) has been included in section 5.6. Shine (2017) is included in section 5.5 regarding the examples of national attempts to align sustainable development and NDCs.
33232	39	1	39	11	additional useful references are Shine, T. (2017) Guides to support the Implementation of the Paris Agreement. Part Three: Integrating Climate Action into National Development Planning: Coherent Implementation of the Paris Agreement and Agenda 2030. Sida, Sweden. https://www.sida.se/contentassets/d69702947cb241d1ab77c414af6f9bcd/integrating_climate_action_into_national_development_planning_webb.pdf ; Shine T. and Campillo, G. (2016) The Role of Development Cooperation in Climate Action Post 2015. OECD Development Cooperation Working Paper December 2016. [Tara Shine, Ireland]	Thank you. Shine and Campillo (2016) has been included in section 5.6. Shine (2017) is included in section 5.5 regarding the examples of national attempts to align sustainable development and NDCs.
61640	39	15	39	19	The second and third sentences in this paragraph are stated in a policy-prescriptive way (e.g., "concrete decision-making requires an integrated vision" and an integrated approach "requires significant shifts in institutional approaches") and with a certitude that does not appear to be supported by the language that follows (e.g., the next paragraph states that the factors that can make the promises of climate policy integration work in practice are still not clearly defined; and the following paragraph states that "integration will not be necessary, suitable, or efficient for all situations"). In addition, the language is so general and vague that its value is for policymakers is limited. [United States of America]	The text has been edited and the discussion has now been merged into a specific section discussing enabling conditions, avoiding a policy-prescriptive approach and adopting rather a descriptive and analytical perspective.
33186	39	24	39	24	additional useful references are Shine, T. (2017) Guides to support the Implementation of the Paris Agreement. Part Three: Integrating Climate Action into National Development Planning: Coherent Implementation of the Paris Agreement and Agenda 2030. Sida, Sweden. https://www.sida.se/contentassets/d69702947cb241d1ab77c414af6f9bcd/integrating_climate_action_into_national_development_planning_webb.pdf ; Shine T. and Campillo, G. (2016) The Role of Development Cooperation in Climate Action Post 2015. OECD Development Cooperation Working Paper December 2016. [Tara Shine, Ireland]	Thank you. Shine and Campillo (2016) has been included in section 5.6. Shine (2017) is included in section 5.5 regarding the examples of national attempts to align sustainable development and NDCs.
33234	39	24	39	24	additional useful references are Shine, T. (2017) Guides to support the Implementation of the Paris Agreement. Part Three: Integrating Climate Action into National Development Planning: Coherent Implementation of the Paris Agreement and Agenda 2030. Sida, Sweden. https://www.sida.se/contentassets/d69702947cb241d1ab77c414af6f9bcd/integrating_climate_action_into_national_development_planning_webb.pdf ; Shine T. and Campillo, G. (2016) The Role of Development Cooperation in Climate Action Post 2015. OECD Development Cooperation Working Paper December 2016. [Tara Shine, Ireland]	Thank you. Shine and Campillo (2016) has been included in section 5.6. Shine (2017) is included in section 5.5 regarding the examples of national attempts to align sustainable development and NDCs.
31110	39	26	39	37	paper by Runhaar in press of interest here; "Mainstreaming climate adaptation: taking stock about "what works" from empirical research worldwide [James FORD, Canada]	Thank you. Reference added in section 5.6 when discussing integration of governance and stakeholder involvements.
57462	39	39	39	39	It should be critically assessed and explained how the term "development" is understood in this context. Economic development/growth, or other elements? [Hans Poertner, Germany]	We edited the text carefully to distinguish clearly when we talk about sustainable development in general and when we mean specifically economic growth.
52386	39	51	39	55	This is awkward phrasing, please re-write. This particular idea is really important. [Jason Donev, Canada]	CCD and CSA are now discussed in 5.5.1. The text has been edited.
29652	4	6	4	6	Please include after "the SDGs": (see Michaelowa et al. 2018 for a discussion about appropriateness of policies for a 1.5°C scenario)." Reference: Michaelowa, Axel; Allen, Myles; Fu Sha (2018): Policy instruments for limiting global temperature rise to 1.5°C – can humanity rise to the challenge?, in: Climate Policy, 18, p. 275-286 [Mareike Blum, Germany]	Thank you. Reference added in section 5.6.

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49682	4	6	4	6	Paragraph in need of references after "the SDGs" e.g. include: "(see Kalafatis 2017 for consideration of trade-offs and synergies for cities and Antwi-Agyei et al. 2017 for a sector-specific focus applied to Ghana)." References: Kalafatis, S.E. (2017): Identifying the Potential for Climate Compatible Development Efforts and the Missing Links. Sustainability, 9, 1642. Antwi-Agyei, P.; Dougill, A.J.; Stringer, L.C. Assessing Coherence between Sector Policies and Climate Compatible Development: Opportunities for Triple Wins. Sustainability 2017, 9, 2130. [Sabine Reinecke, Germany]	Thank you. The text has been significantly edited and restructured. But the references are considered in sections 5.5 and 5.6.
44752	4	9	42	16	Sections need links with 1.5. [Penny Urquhart, South Africa]	The content of these sections has been merged into a new 5.6, which synthesizes the conditions for following pathways compatible to 1.5C as discussed in previous sub-sections. This makes the analysis relevant to 1.5C.
55558	4	9	4	33	The following Brief summarizes well how climate compatible development requires a new collaboration between institutions. This is grey literature: Labriet M., C. Fiebig and M. Labrousse, 2015. Inside Story: Working towards a Smart Energy Path – Experience from Benin, Mali and Togo. Climate Development Knowledge Network, Inside Stories on climate compatible development. http://cdkn.org/resource/inside-story-working-towards-a-smart-energy-pathway/?locLang=en_gb [Maryse Labriet, Spain]	Thank you. Reference considered in section 5.6.
49998	4	11	4	33	Further discussion on the role of government, communities, private sectors, and other stakeholders, including their linkages will help. An example in a box may help. [Perdinan Perdinan, Indonesia]	The key role of these different actors and the need to link them is discussed in 5.6. Due to space constraints, a box on this specific topic could not be added.
56848	4	25	4	33	The role of agricultural research and extension services in generating and disseminating agricultural innovations for climate adaptation, and current constraints upon them, are relevant here. This is reviewed with research findings from four African countries in Morton, J. "Climate change and African agriculture: unlocking the potential of research and advisory services" in F. Nunan (ed.) Making Climate Compatible Development Happen, Routledge (2017) (declaration of interest: I am the author). [John Morton, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. Reference considered in section 5.6.
28888	4	31	4	33	The meaning of the sentence is not clear. Please re-phrase. [Germany]	This argument has not been retained for the final draft and the sentence deleted.
1326	4	35		52	This paragraph includes several generic, bold statements based on a single reference, which does not show a balanced assessment of the literature. For instance, it is not justified to claim that in general the CDM mechanism exacerbates existing inequalities and fail to fill the energy access gap in a number of LDCs, based on a single reference from Tanzania. With reference to the more comprehensive literature on the CDM's contribution to sustainable development (see comment 10), there is no consensus in the literature to make such a bold, generic statement about the CDM's influence on inequality. Likewise, the sentence (line 46-47) which states that lack of additionality and validation problems - the context of CDM is not mentioned - constrains the capacity of programs to deliver triple-wins, is another example of a bold, generic sentence, that is not justified and makes little sense. [Karen Olsen, Denmark]	Thank you. We have reviewed extensively the literature on the topic and provide a more balanced assessment in section 5.6.
7506	4	35	4	37	Replace "Conventional funding ... 2016b" by: "While in some countries like Tanzania the CDM has not mobilized projects to close the energy access gap (Wood et al. 2016b), in other African countries it has significantly mobilized decentralized renewable energy, especially recently through its programmatic approach (Kreibich et al. 2017)." Reference: Nicolas Kreibich, Lukas Hermwille, Carsten Warnecke, Christof Arens (2017): An update on the Clean Development Mechanism in Africa in times of market crisis, Climate and Development, 9:2, 178-190 [Axel Michaelowa, Switzerland]	Thank you. (Kreibich et al, 2017) has been added and a more in-depth discussion of funding schemes is provided in section 5.6.
13998	4	35	4	37	Conventional funding mechanisms like CDM are shown to exacerbate existing inequalities and hence fail to fill the energy access gap in a number of LDCs like Tanzania, demonstrating the need for innovative energy funding schemes. It seems bold to reject a UN mechanism based on only one study. Perhaps this is a meta study, and thus has more credence? or there are other papers, but somehow explaining the logic or reasoning why you believe just one study is sufficient is needed [Natalie MAHOWALD, United States of America]	Thank you. We have reviewed extensively the literature on the topic and provide a more balanced assessment in section 5.6.
28890	4	35	4	52	The key message of this paragraph is not entirely clear. The paragraph might need some re-structuring/re-formulation. [Germany]	Thank you. The section on finance has been completely rewritten.
18740	4	35		52	This paragraph includes several generic, bold statements based on a single reference, which does not show a balanced assessment of the literature. For instance, it is not justified to claim that in general the CDM mechanism exacerbates existing inequalities and fail to fill the energy access gap in a number of LDCs, based on a single reference from Tanzania. to our knowledge there is no clear/substantiated consensus in the literature to make such a bold, generic statement about the CDM's influence on inequality. Likewise, the sentence (line 46-47) which states that lack of additionality and validation problems - the context of CDM is not mentioned - constrains the capacity of programs to deliver triple-wins, is another example of a bold, generic sentence, that is well not justified and makes little sense. [Andrea TILCHE, Belgium]	Thank you. We have reviewed extensively the literature on the topic and provide a more balanced assessment in section 5.6.

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18742	4	35		52	This paragraph includes several generic, bold statements based on a single reference, which does not show a balanced assessment of the literature. For instance, it is not justified to claim that in general the CDM mechanism exacerbates existing inequalities and fail to fill the energy access gap in a number of LDCs, based on a single reference from Tanzania. With reference to the more comprehensive literature on the CDM's contribution to sustainable development (see comment 10), there is no consensus in the literature to make such a bold, generic statement about the CDM's influence on inequality. Likewise, the sentence (line 46-47) which states that lack of additionality and validation problems - the context of CDM is not mentioned - constrains the capacity of programs to deliver triple-wins, is another example of a bold, generic sentence, that is not justified and makes little sense. [Andrea TILCHE, Belgium]	Thank you. We have reviewed extensively the literature on the topic and provide a more balanced assessment in section 5.6.
36686	4	35	4	37	The sentence is too general and as such simply wrong! CDM activities are as well shown to provide multiple benefits as there are several examples where CDM projects have supported rights enhancement for marginalised or very poor social groups. These too general too extreme sentences do not help and shouldn't be part of the report. A more balanced analysis showing under which conditions CDM has been useful or less useful for different social groups is required (and there is plenty of literature on it!!) [Carmenza Robledo Abad, Switzerland]	Thank you. We have reviewed extensively the literature on the topic and provide a more balanced assessment in section 5.6.
61642	4	35	4	37	This sentence is not clear and appears potentially overbroad. First, what is a "conventional funding mechanism", and is it obvious that the CDM is a conventional funding mechanism (given that the CDM is part of a relatively complex offset scheme under the KP)? Second, even if the CDM is a conventional funding mechanism, have studies shown that all "conventional funding mechanisms" exacerbate existing inequalities? Third, even if true, what is the basis for concluding that new funding schemes are needed – as opposed to, for example, existing funding schemes taking into account certain additional factors, and/or policy or other reforms in implementing countries? [United States of America]	The text has been edited to be more specific and we provide a more in-depth and balanced discussion of funding approaches in section 5.6.
28892	4	36	4	36	Please specify what is meant by "energy access gap". [Germany]	This term has been deleted as it was a specific point related to a given example. We now conduct a more cross-cutting analysis.
47242	4	36	4	36	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Noted. Policy prescriptive language has been removed from the final chapter.
33432	4	37	4	37	extra space - schemes (Wood [Sergio Aquino, Canada])	Editorial to be completed before final submission.
52388	4	37	4	39	An awkward phrasing, please re-work. [Jason Donev, Canada]	The section on finance has been completely rewritten.
3128	4	38	4	38	but it can effective' should be 'but it can be effective' [Robert Shapiro, United States of America]	Thank you. This whole paragraph has been completely reworked.
41242	4	38	4	38	but it can be effective (add be) [Maria Pia Carazo Ortiz, Germany]	Thank you. This whole paragraph has been completely reworked.
12754	4	4	4	4	What about this? Give details [United Kingdom (of Great Britain and Northern Ireland)]	This reference is discussed in section 5.6, where the purpose is not to enter into details of specific analyses but rather to derive messages of higher validity beyond the specific examples.
41244	4	42	4	42	by international donors (add by) [Maria Pia Carazo Ortiz, Germany]	Thank you. This whole paragraph has been completely reworked.
41246	4	44	4	44	add 'and' before 'by the nature' [Maria Pia Carazo Ortiz, Germany]	Thank you. This whole paragraph has been completely reworked.
36688	4	5	4	52	Right, but this creates a risk as well because this money will be missed somewhere else. Indeed one of the biggest potential trade-offs for other SDGs is that as countries have to decide on already very short budgets prioritising climate policies can reduce national budgets for other sectors e.g. education with a clear trade-off on SDG 4 [Carmenza Robledo Abad, Switzerland]	The risks of trade-offs under constrained national budget is acknowledged and pointed to as one of the justifications for the need for enhanced access to climate funding.
12756	41	1	51	41	This section is possibly overly political and prescriptive as well as being beyond the scope of the chapter, particularly lines 12 - 24. Please consider rewording. Additionally, this section, particularly the opening paragraph, is very verbose and jargon heavy. It could be rewritten both to be both more concise and to improve clarity. [United Kingdom (of Great Britain and Northern Ireland)]	This section has been deleted as such and most of its content is not used in the new section 5.6, which discusses some conditions emerging from the analysis in a non-prescriptive manner. This reorganization and rewriting aims to provide a more synthetic view.
33188	41	1	41	41	Add the literature on the right to participation e.g. Mary Robinson Foundation – Climate Justice (2015c) Women's participation: An enabler of Climate Justice. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Womens-Participation-An-Enabler-of-Climate-Justice_2015.pdf . Also on procedural rights Procedural Rights as a Crucial Tool to Combat Climate Change Georgia Journal of International and Comparative Law, Vol. 38, No. 3, Spring 2010 Svitlana Kravchenko Advancing Climate Justice and the Right to Health Through Procedural Rights Margaux J. Hall Health and Human Rights 2014, 16/1 [Tara Shine, Ireland]	Thank you. We have included the majority of the suggested references in our assessment.
33190	41	1	41	41	Also the work and reports of the UN Human Rights Council on the right to participation - available here: http://www.ohchr.org/EN/Issues/Pages/EqualParticipation.aspx [Tara Shine, Ireland]	The main conclusions regarding the right to participation and the need for processes that allow actors to exert this right is a key point discussed in 5.6.

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31978	41	1	41	41	The critical side of the participatory approach or methodologies should be reviewed again. The community participation programmes are need to deal with the power within the community or the large context of the project is operating. Due to the diversity in a community, the powerful social agencies or the individual has more voice to represent the totality. But do these few really represent the majority of the community? After the program has been ended, then other people realize that their opinions are manipulated (Arnstein, 1969). In that situation, subaltern groups (Spivak, 2000) are underrepresented because of social hierarchies and the application of such a society-based program may create a emergence of a dysfunctional rural society (Withanachchi et al., 2013). Citations Arnstein, S. R. (1969). A ladder of citizen participation. Journal of the American Institute of planners, 35(4), 216-224. Withanachchi, S. S., Köpke, S., Frettsome, D. (2013): Building Non-Hegemonic Political Culture for Sustainable Rural Development. In: Albrecht, S., Braun, R., Heuschkel, Z., Mari, F. & Pippig, J. (Eds.): Future of Food State of the Art, Challenges and Options for Action. Oekom, München, pp. 231-242 Spivak, Gayatri Chakravorty.,2000. The New Subaltern History: A Silent Interview. In Vinayak Chaturvedi., (Eds.), Mapping Subaltern Studies and the Postcolonial, London, Verso, pp.324-340 [Sisira S. Withanachchi, Germany]	The need to manage uneven power structures and complex interactions within the communities to address these potential difficulties of participatory processes is acknowledged explicitly in section 5.5.3 and 5.6.
36690	41	1	41	41	Participatory approaches are quite good and certainly support ownership and empowerment. However participatory processes are cost and time intensive. The section doesn't recognise the constraints of promoting participatory processes at all levels and in all cases when discussing climate change activities. This is a gap that shall be improved for the third order draft. [Carmenza Robledo Abad, Switzerland]	Participatory governance is now mentioned as one of the characteristics of CRDPs in section 5.5.3.2, together with social equity and social inclusion. Section 5.6 presents inclusive processes as an important enabling condition for aligning sustainable development and 1.5C-consistent pathways, but the normative statements about participatory processes as a way to achieve these have been deleted
50000	41	1	41	41	Again, participation of children and/or youth is still missing from the discussion as they are the agent of change, a consideration should be made. [Perdinan Perdinan, Indonesia]	Youth are explicitly mentioned as one of the key actors to be invoked in participatory processes.
50166	41	1	41	41	This section is on participatory processes as a way to make integration of mitigation, adaptation and SD easier, in particular to cope with exiting differences in power between different stakeholders. However, it is not convincingly demonstrated that participatory processes do indeed change the power relations. More effort should be made to evaluate the effectiveness of participatory processes. [Bert Metz, Netherlands]	Participatory processes are now discussed as a stand-alone condition separately from issues related to power, which are indeed different points although connected (see section 5.6.3).
28894	41	3	41	4	Please add the level of confidence of the statement of the first sentence of this subsection, and what methodologies are involved (empirical or theoretical)? Are there any field studies available? [Germany]	This sentence has been removed, because we now deal with the different dimensions of multi-level governance, attention to power and participatory processes in distinct sub-sections (recognising upfront their close connections). See section 5.6.
28896	41	9	41	12	1) Please define the concept of justice in relation to equity (as the term mainly used in the previous sections; 2) Is this statement taken seriously in the entire chapter?; 3) Is it (always) possible to negotiate "justice" between affected interests (with the expectation of more or less desirable outcomes)?; 4) To which extent does this mean that procedural aspects of justice/equity should have priority from an universal perspective? [Germany]	The text has been significantly edited in the new section 5.6 to avoid confusion and make the discussion more concrete. We acknowledge the existence of more or less desirable outcomes for different groups triggering different interests, which calls for specific processes to manage these in an equitable manner.
3130	41	11	41	11	'be negotiate between' should be 'be negotiated between' [Robert Shapiro, United States of America]	Thank you. This whole paragraph has been completely reworked and the necessary editorials addressed.
61644	41	12	41	12	In addition to the vulnerabilities of local peoples, worth mentioning the vulnerabilities of Indigenous peoples in particular and the need to hear their voices. [United States of America]	This whole section has been reformulated and merged into section 5.6.3. A more general formulation is adopted to include all vulnerable populations ("those negatively affected by change")
47252	41	14	41	14	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Thank you. Policy prescriptive language has been removed from the assessment.
28898	41	19	41	22	Do these individual examples allow for general statements on the achievement of triple wins? Please revise the text providing an assessment of measures mentioned in literature leading to the achievement of triple wins including information on your confidence of this assessment. [Germany]	Integration of adaptation, mitigation and sustainable development is discussed in section 5.5.1 but the discussion on conditions which is now conducted in the new 5.6 takes a broader perspective about integrated pathways. The text has been edited to focus less on the specificities of each individual example but rather to point the cross-cutting messages emerging from these specific studies. Also the list of references has been expanded significantly.
3132	41	32	41	32	stakeholders though participatory' should be 'stakeholders through participatory' [Robert Shapiro, United States of America]	Thank you. This whole paragraph has been completely reworked.
54330	41	36	41	36	Replace "contestations" with "contests" [Christopher Bataille, Canada]	Thank you. This example has been deleted.
61646	41	38	41	41	This seems like an overly broad statement that implies a broad conclusion – i.e., that "top-down" approaches result in tradeoffs that are not present when there are participatory processes. Is it not the case that, even when there is stakeholder engagement, there are necessarily tradeoffs that will need to be made, given different needs of different communities and different groups within communities? Even if stakeholder engagement is important and can contribute to positive outcomes, does this section overstate (either explicitly or by implication) what participatory processes achieve? [United States of America]	Thank you. The language has been edited and the structure of the arguments has been rearranged in the new section 5.6 to capture more accurately that participatory processes are not sufficient conditions to address the multiple trade-offs. Participatory processes contribute to this effort by improving ownership and grounding the analysis in the reality of the context, but dedicated approaches to uneven power structures and deliberation are also needed.
58258	41	4	41	41	Suggest to add India and reference to IEA India Energy Outlook 2015. [Andrew Prag, France]	Thank you. Reference added on the new section 5.6.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12758	41	41	41	41	How? Examples are not useful without further detail [United Kingdom (of Great Britain and Northern Ireland)]	In the new section 5.6, which serves as a synthesis, the objective is not to enter into the details of specific examples, but rather to use converging examples to illustrate similar cross-cutting points. Specific examples are therefore not singled out.
29776	41	41	41	41	The point made here about participatory approaches as a means of overcoming inherent differences in values and interests importantly also apply to the production and dissemination of scientific knowledge for policy-making. This calls for a reflexive approach to producing and communicating knowledge from the climate change research community, highlighting rather than downplaying value choices and distributive implications (Lahn 2017, https://doi.org/10.1007/s10784-017-9375-8) [Bård Lahn, Norway]	Thank you. Reference added (see Section 5.6.3).
33192	41	44	41	55	More attention needs to be paid in this section to gender as a factor in local circumstances and to the value of women's participation in climate decision making. Mary Robinson Foundation – Climate Justice (2015c) Women's participation: An enabler of Climate Justice. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-_Womens-Participation-An-Enabler-of-Climate-Justice_2015.pdf UN Women & the Mary Robinson Foundation – Climate Justice (2016a). The Full View second edition. Ensuring a comprehensive approach to achieve the goal of gender balance in the UNFCCC process. Available online at https://www.mrfcj.org/wp-content/uploads/2016/11/MRFCJ-Full-View-Second-Edition.pdf [Tara Shine, Ireland]	Thank you. References have been included in our assessment.
57464	41	44			This section should be merged with the previous one. [Hans Poertner, Germany]	The whole section has been completely reorganised.
12760	41	46	42	16	Again, this can be significantly shortened. Essentially this section is saying a) be holistic and aware of local circumstances and b) some areas are more vulnerable than others. You don't need so much text to make this point, especially as point b) has been made repeatedly elsewhere. [United Kingdom (of Great Britain and Northern Ireland)]	The whole discussion on enabling conditions in 5.6 has been reworked to avoid repetitions.
33434	41	48	41	48	Low-emission and climate-resilient [Sergio Aquino, Canada]	Thank you. All editorials will be addressed before final submission.
50002	42	4	42	5	Add information on vulnerable groups, are they women, elderly people, children, low-income people? [Perdinan Perdinan, Indonesia]	We do not discuss anymore vulnerable groups specifically in the new section 5.6 where most of the content of this section now lies. This level of detail is rather provided in sections 5.2 and 5.3.
50168	42	4	42	16	This paragraph seems to draw on literature that describes expected climate change impacts for warming that far exceeds 1.5oC. That is misleading, as we are talking here about strategies to keep it below 1.5. Of course there are significant climate impacts even at 1.5C, but then the literature used here should indeed be relevant for such a situation. The other problem with this paragraph is that it only discusse the problems of certain groups not being able to take part in the transition process and ending up as losers. It would help a lot if a discussion is added on how to avoid or counter this risk. In fact, this is to some extent done in the subsequent section 5.5.4 [Bert Metz, Netherlands]	Thank you. This discussion was indeed not specifically relevant to 1.5C and has been dropped in the revision.
33194	42	9	42	12	additional references to support this point : Mary Robinson Foundation – Climate Justice (2015c) Women's participation: An enabler of Climate Justice. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-_Womens-Participation-An-Enabler-of-Climate-Justice_2015.pdf UN Women & the Mary Robinson Foundation – Climate Justice (2016a). The Full View second edition. Ensuring a comprehensive approach to achieve the goal of gender balance in the UNFCCC process. Available online at https://www.mrfcj.org/wp-content/uploads/2016/11/MRFCJ-Full-View-Second-Edition.pdf [Tara Shine, Ireland]	Thank you. References have been included in out assessment.
33436	42	11	42	11	particular - may [Sergio Aquino, Canada]	Thank you. All editorials will be addressed before final submission.
3134	42	13	42	13	concerns.Indigenous' should be 'concerns. Indigenous' [Robert Shapiro, United States of America]	Thank you. All editorials will be addressed before final submission.
32992	42	13	42	13	Indigenous and traditional populations are disproportionately exposed to climate change impacts impacts, which may cause an adaptation-mitigation disconnect hindering the benefits of integrated strategies for transformational changes when indigenous and traditional knowledge and adaptive capacities are ignored in adaptation planning . [Brazil]	This discussion was indeed not specifically relevant to 1.5C, which instead aim to reduce the climate change impacts. This point has been dropped in the revision.
52390	42	13	42	13	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Thank you. All editorials will be addressed before final submission.
57466	42	13	42	13	Are they really more "exposed", or rather more "vulnerable"? [Hans Poertner, Germany]	This discussion was not specifically relevant to 1.5C. This point has been dropped in the revision.
50170	42	19	43	11	The title of this section suggests a discussion on a "Systemic and Dynamic Approach to Integration". However, the section does not do that. It continues the discussion on the limitation of local circumstances and unequal opportunities that is covered in the previous section 5.5.3. And it even discusses (in page 42, lines 47-55) some of the measures that can be taken to avoid or counter these problems. In my opinion it is therefore more logical to merge sections 5.5.3 and 5.5.4. The paragraph on page 43, lines 1-11 pretends it is about " a more dynamic view of the interlinkages ...". I don't see anything in that text that is about the dynamics however. Better to leave that suggestion out. [Bert Metz, Netherlands]	Thank you. The whole set of enabling conditions is indeed relevant to addressing systemic and dynamic effects. We have therefore reverted the order of the arguments by putting this discussion on enabling conditions in a stand-alone section 5.6, after the systemic and dynamic effects are discussed at length in the "pathways" section 5.5. This is explicitly acknowledged in the short introduction to 5.6.
12762	42	21	43	11	Is this section really necessary? It's very long and doesn't really say anything that can't be very succinctly described elsewhere in the chapter. E.g. some would be appropriate in 5.5.1. [United Kingdom (of Great Britain and Northern Ireland)]	The content and organisation of the whole section has been reworked to provide a more synthetic discussion of conditions avoiding repetitions.
33196	42	23	42	28	see also on this point : Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. [Tara Shine, Ireland]	Thank you. Reference included in our assessment.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33198	42	3	42	31	erdding capacities yes, but als eroding human rights. ohchR (2009), Report of the Office of the United Nations High Commissioner for Human Rights on the relationship between climate change and human rights available at: http://bit.ly/1KisvYs ; Mary Robinson Foundation – Climate Justice (2015a) Rights for Action: Putting People at the Centre of Action on Climate Change. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Rights-for-Action-edition-2.pdf ; UNEP (2015) Human Rights and Climate Change [Tara Shine, Ireland]	Human rights are now discussed in the new section 5.6.
12764	42	38	42	42	Requires evidence/citation [United Kingdom (of Great Britain and Northern Ireland)]	Poverty traps and lock ins are now discussed in section 5.5.3 with corresponding literature.
28900	42	38	42	4	Do these individual examples allow for a more general assessment of measures that help to overcome these traps and lock-ins or could inform on enabling conditions? Please revise the text providing an assessment including information on your confidence in this assessment. [Germany]	Poverty traps and lock-ins are now discussed in section 5.5.3 with corresponding literature. These path dependencies are a cross-cutting, overarching challenge and, as stated in the introduction to the new section 5.6, the whole set of enabling conditions discussed in 5.6 is relevant to addressing them.
28902	42	38	42	45	Please provide evidence if concepts of governance in areas of limited statehood could be seen as an helpful approach in this context and worth mentioning here (see for example http://www.sfb-governance.de/publikationen/sfb-700-working_papers/wp71/SFB-Governance-Working-Paper-71.pdf or http://www.sfb-governance.de/publikationen/sfb-700-working_papers/wp67/SFB-Governance-Working-Paper-67.pdf) [Germany]	Thank you. This reference could not be added because it does not discuss the question of climate change or sustainable development.
47018	42	39	42	39	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Thank you. Policy prescriptive language has been removed throughout the text. This was indeed an inaccurate use of uncertainty language.
62856	42	42	42	42	I am surprised by this statement ("the tropics are emerging as a region prone..."). This seems quite a generic statement. Coherency with outcomes of other chapters (especially chapter 3) is needed. [Valérie Masson-Delmotte, France]	This statement was indeed not relevant and has been deleted.
33438	42	51	42	51	but prevent long-term projects [Sergio Aquino, Canada]	Thank you. All editorials will be addressed before final submission.
12766	42	52	42	55	This doesn't make sense - can your rephrase for clarity [United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been deleted.
3136	42	53	42	53	policy might be more' should be 'policy which might be more' [Robert Shapiro, United States of America]	Thank you. All editorials will be addressed before final submission.
47020	42	53	42	53	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Thank you. Policy prescriptive language has been removed throughout the text. This was indeed an inaccurate use of uncertainty language.
44754	43	2	43	4	What are the implications for policy makers? How could this be made clearer for them? [Penny Urquhart, South Africa]	This statement provides the framing of the problem rather than discussing direct implications for policymakers. The new structure of the argument in the new section 5.6 puts these dynamic and systemic aspects first, as a synthesis of the analysis in the section on pathways (see section 5.5), and then derive implications for decision makers to address this challenge, in the form of enabling condition.
62858	43	2	43	1	Repetition with earlier statements. [Valérie Masson-Delmotte, France]	The text has been significantly reorganized and edited to avoid such repetitions
33440	43	1	43	1	substitute pathways for scenarios [Sergio Aquino, Canada]	Rejected. Climate-resilient development pathways are a plenary approved bullet point for our chapters
62860	43	13	43	38	The section 5.6 appears disconnected from insights on what a changing climate might look like in the coming decades (outcomes of chapter 3) and what a 1.5°C warmer world will imply in terms of risks and changing living conditions (e.g. in the 2040s). [Valérie Masson-Delmotte, France]	This section assesses literature on sustainable development pathways toward a 1.5C warmer world. The focus is on development pathways in a changing climate. We have now improved this section by a) including more specific literature on SSPs and SDGs (recently published) to indicate which SSPs, if any, are able to meet all SDGs (the literature suggests none); and b) by incorporating very recent literature that addresses how to address and potentially overcome inequalities and power differentials in decision-making processes in which possible solutions in specific contexts are deliberated and negotiated. This important and growing body of literature typically does not discuss locally specific realities of a 1.5C warmer world and associated risks. Rather, it discusses uneven development trajectories and associated equity dimensions, at different scales, that need to be addressed in efforts to meet both development goals and pursue mitigation and/or adaptation actions to limit warming to 1.5C and reduce risks for the most disadvantaged. We are bound by what the literature has to say at this point.
1328	43	14			Section 5.6 points out that SD pathways to remain within the 1.5 degree target require urgent, unprecedented scale of emission reductions and transformational changes to overcome unsustainable trajectories. An emerging literature on sustainability transitions in developed and developing countries is relevant to the focus of the section, however, this literature is not captured in the review. E.g. Markard, J., Raven, R. & Truffer, B., 2012. Sustainability transitions: An emerging field of research and its prospects. Research Policy, 41(6), pp.955–967; Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions, 1(1), pp.24–40.; Loorbach, D., 2010. Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. Governance, 23(1), pp.161–183.) [Karen Olsen, Denmark]	Thank you very much for your suggestion. Unfortunately we are unable to accept your suggested literature due to our mandate to focus predominately literature published after the AR5.

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18744	43	14			Section 5.6 points out that SD pathways to remain within the 1.5 degree target require urgent, unprecedented scale of emission reductions and transformational changes to overcome unsustainable trajectories. An emerging literature on sustainability transitions in developed and developing countries is relevant to the focus of the section, however, this literature is not captured in the review. E.g. Markard, J., Raven, R. & Truffer, B., 2012. Sustainability transitions: An emerging field of research and its prospects. Research Policy, 41(6), pp.955–967; Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions, 1(1), pp.24–40.; Loorbach, D., 2010. Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. Governance, 23(1), pp.161–183.) [Andrea TILCHE, Belgium]	Thank you very much for your suggestion. Unfortunately we are unable to accept your suggested literature due to our mandate to focus predominately literature published after the AR5.
33204	43	14	46	35	there is a critical need in this section on sustainable developmnet pathways to refer to the need to integrate human rights into SD pathways - Human rights underpin the the SDGs and climate action (see the preamble of the Paris Agreement). Without attention to Human Rights climate actions risks undermining the full range of human rights. ohchR (2009), Report of the Office of the United Nations High Commissioner for Human Rights on the relationship between climate change and human rights available at: http://bit.ly/1KisvYs ; Mary Robinson Foundation – Climate Justice (2015a) Rights for Action: Putting People at the Centre of Action on Climate Change. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Rights-for-Action-edition-2.pdf ; UNEP (2015) Human Rights and Climate Change [Tara Shine, Ireland]	We are happy to include publications on human rights in the context of sustainable development and 1.5C compatible pathways. Included: Robinson and Shine 2018, Nature Climate Change.
50172	43	14	65	2	As suggested for section 5.5. (see comments above) it would be much better to integrate section 5.5. and 5.6, because they both discuss the integration of adaptation, mitigation and sustainable development, albeit from two different strands of literature. Merging would bring out the key conclusions for policy makers muc more clearly. [Bert Metz, Netherlands]	Accepted: Sections have been integrated.
28904	43	2	43	21	The delineation between pathways "as temporal evolution of a set of scenario futures" and "as solution-orientated trajectories and decision-making processes" is not entirely clear. Please be more explicit [Germany]	This formulation has been revised.
50174	43	26	43	29	This statement would fit very well in the Exec Summamry and the SPM. [Bert Metz, Netherlands]	Thank you. It is reflected, in parts, in the ES and to a certain extent in the SPM, given space constraints and negotiations across chapter authors.
63306	43	26	43	32	Limiting global warming to 1.5°C above pre-industrial times and ensuring well-being among human populations and ecosystems in a 1.5°C warmer world require ambitious and well-integrated adaptation-mitigation-development pathways that deviate fundamentally from high-carbon, business-as-usual futures (Arts, 2017; Gupta and Arts, 2017a; Okereke and Coventry, 2016; Sealey-Huggins, 2017). Is this even possible? How about "Limiting global warming to 1.5°C above pre-industrial times while not impacting the well-being among human populations and ecosystems in a 1.5°C warmer world requires ambitious and well-integrated adaptation-mitigation-development pathways that deviate fundamentally from high-carbon, business-as-usual futures. If well-being for all is to be at the core of an ecologically safe and socially just space for humanity, is must start with a stable climate." [Greg Rau, United States of America]	Thanks you for the proposition but our original sentence is more suited. Ensuring is better than not impacting. The core argument of this chapter is that reducing inequalities and stabilizing the climate mist go hand in hand.
57468	43	27	43	27	Ecosystems have largely been neglected in this chapter... [Hans Poertner, Germany]	We understand SD as covering ecosystems. There is no specific literature on equity and inequalities re systems in the context of climate change.
12768	43	29	43	3	Would it not be better and potentially more neutrally phraseology to talk in terms of the SDGs here, rather than social justice (which is more likely to be a contested term than the accepted SDGs)? [United Kingdom (of Great Britain and Northern Ireland)]	Our task is to assess the relevant literature, and the work by Raworth and colleagues cannot be ignored. Raworth's 2012 article that includes justice has been cited >450 times, and there is important literature that builds on it. We now also include a follow-up sentence that links this body of work to the Agenda 2030 and the UNRISD 2016 work on transformative social development, all of which are important to understand the notion of well-being.
12770	43	31	43	32	What does this mean? I doubt more than a handful of readers will understand what "relational and subjective dimensions of being and social interactions" actually means. [United Kingdom (of Great Britain and Northern Ireland)]	This part of the sentence has been removed.
57848	43	31	43	31	Suggest to add an extra reference here: Raworth, K. (2012). A safe and just space for humanity: can we live within the doughnut? Nature 461, 1–26.doi:10.5822/978-1-61091-458-1. [Kate Dooley, Australia]	It is already included.
13282	43	34	43	35	Delete the text "the transformational undesirable lock-in patterns". [Eleni Kaditi, Austria]	This sentence has been modified and the term 'lock-in' removed. Please note however, that the term is in the plenary approved outline for Chapter 4.
47244	43	34	43	34	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	This language has been replaced.
33200	43	35	43	36	and the human rights dimensions identified in this chapter and in chapter 1 [Tara Shine, Ireland]	We mention the human rights dimensions in other parts of the chapter, where supported in the literature and in the context of pathways to a 1.5C warmer future.
33442	43	37	43	37	collective and value-driven [Sergio Aquino, Canada]	Term removed.
32894	43	38	48	27	• Note that the reference Tàbara et al., 2017a (p. 43) and Tàbara et al., 20 17b (p48) is the same reference. [J. David Tabara, Spain]	Editorial - copyedit to be completed before submission of final government draft.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28906	43	41	46	35	We appreciate the detailed information within subsection 5.6.1. However, it could be significantly shortened by 1) not repeating but referring to information provided in other sections; 2) only stating results and findings rather than listing of studies existing on a topic; 3) moving the discussion of literature gaps to the dedicated section in chapter 5.7. 4) The purpose of some sections could be made clearer. For example, the section in p43 i43-45 is not entirely clear to us. [Germany]	The section has been significantly revised and shortened. It now focuses more concretely upon quantitative assessments of integrated climate-sustainable development pathways towards stringent climate targets.
44756	43	41	46	35	Very useful and fluidly-written section. Needs key messages to be developed / more clearly signposted. [Penny Urquhart, South Africa]	Noted: Thank you Penny.
45450	43	41	43	41	This conceptual material - e.g. the CRDPs is coming very late - shouldn't the entire conceptual framework be set up at the beginning of the chapter (or even in Ch 1)? [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Yes, we agree! We have updated the section on CRDPs in 5.1, and are introducing the figure there too.
63308	43	47	43	49	It is not possible to stabilize warming to 1.5degC without trade-offs. The goal is to determine actions that maximize climate and SDG benefits while minimizing negatives, and it is the net benefits that are important here = benefits - (costs+negative effects). [Greg Rau, United States of America]	Rejected: The literature shows that with complementary measures you can address trade-offs.
13726	44	2	44	2	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: Johnsen et al removed from the reference list.
28908	44	4	44	11	We are missing SDG12 in the list of interactions between climate and SDGs. Sustainable consumption is very relevant in the context of low demand and sustainable development pathways and should be considered here and throughout the entire chapter. If these issues cannot be addressed in the SR1.5 due the lack of the scientific evidence this should please be clearly stated. [Germany]	Accepted: Thank you for catching the omission!
45448	44	4	44	11	Haven't I read this earlier in the chapter [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	Noted. We checked that this is not duplicated elsewhere.
4252	44	6	44	6	As an example, the following paper discusses 'The importance of an integrating framework for achieving the Sustainable Development Goals: the example of health and well-being' http://gh.bmj.com/content/1/3/e000068 [Ana Raquel Nunes, United Kingdom (of Great Britain and Northern Ireland)]	Rejected: Thank you for providing this reference. Unfortunately, however, it doesn't fit into this section, which focuses rather on pathways than overarching frameworks to represent certain SDG dimensions.
28910	44	7	44	8	SDG14 and 15 are not about the "sustainable use" of land and ocean, but "life on land" and "life under water". Please revise. [Germany]	Removed.
13728	44	9	44	9	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: All references that are not published before the May 15th cut-off date were excluded.
28912	44	26	45	6	Please consider if the climate-resource-nexus could be seen as an helpful approach addressing multiple goals in this context and should be mentioned additionally. The climate-resource-nexus considers interdependencies of the policy fields climate and resource protection in a systemic way and is essential in order to find policy approaches to sustainable transformation pathways tackling the challenges of both policy fields. See for example https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/171220_uba_fachbrosch_rtd_bf_engl.pdf [Germany]	Accepted partially: text has been edited to make the resource nexus clearer: "policies that improve the resource use efficiency of land, energy, or water systems can maximize synergies for SD, benefiting from resource connections across these sectors".
52392	44	29	44	3	This definition of nexus was needed earlier, in chapter 4. [Jason Donev, Canada]	Now defined in section 5.5.2
57824	44	3	44	31	The claim that emission trading can reduce the mitigation cost by 80% should be removed unless it can be supported by a citation. In addition, a sentence could be added here saying that emission trading is not the most appropriate mitigation policy for all sectors (in particular sectors such as transport, housing and agriculture, where emissions are dispersed and difficult to measure), and that carbon pricing more generally needs to be explored to provide a variety of cost-effective mitigation tools beyond emissions trading. Such a statement would link to and support the statement made on page 5-31, line 38-39. This statement can be supported by the following references: Pearce and Böhm (2014) Ten reasons why carbon markets will not bring about radical emissions reduction, Carbon Management; Stiglitz and Stern (2017) Report of the High-level Commission on Carbon Prices, Carbon Pricing leadership Coalition. [Kate Dooley, Australia]	Rejected: text does not refer to emissions trading.
13730	44	31	44	32	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
28914	44	31	44	32	A list of literature does not help the understanding of the world "nexus". Please provide a description and an assessment on this topic than rather only a list of literature. [Germany]	Accepted: we have shortened the text and focus on the findings from the nexus studies.
55904	44	31			Incomplete sentence [Deborá Ley, Guatemala]	Accepted: text revised.
50176	44	32	44	39	Too much jargon . Simplify language and better explain the terms used. [Bert Metz, Netherlands]	Editorial - copyedit to be completed before submission of final government draft.
13732	44	39	44	39	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
57850	44	43	44	44	Suggest the networked governance sentence can be supported by adding the point that look at how regional and national forms of orchestration can better engage local responses to climate change, creating horizontal linkages in climate governance. Reference Chan, Ellinger and Widerberg (2018). Exploring national and regional orchestration of nonstate action for a < 1.5 C world. Int Environ Agreements (2018) 18:135–152. [Kate Dooley, Australia]	Thank you for the suggested reference. Unfortunately, due to space limitations, we could not include the suggested reference in the assessment.
33444	44	44	44	44	2017). However [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
44120	44	44	44	44	needs space between "2017). However" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed before submission of final government draft.
52394	44	44	44	44	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed before submission of final government draft.

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63310	44	44	44	45	However a reductive focus on specific SDGs in isolation may undermine the long-term achievement of sustainable climate change mitigation (Holden et al., 2016). How true, yet this has not deterred the climate+SDGs or nothing mantra in this report. [Greg Rau, United States of America]	Rejected: many sections throughout the report deal with SDG interactions and trade-offs that need to be addressed.
28916	44	5	44	53	It would be very helpful to add results of the study by PBL and provide the mayor statements. [Germany]	Rejected: Text was deleted due to space limitations.
31624	44	5	44	53	Suggest to include a paper as one of early pioneer studies in the context of nexus assessments which consistently analyze relationships between sustainable development and climate change mitigation (Akimoto et al., 2012). Akimoto, K., Sano, F., Hayashi, A., Homma, T., Oda, J., Wada, K., Nagashima, M., Tokushige, K., Tomoda, T. (2012). Consistent assessments of pathways toward sustainable development and climate stabilization. Natural Resources Forum 36, 231-244. doi:10.1111/j.1477-8947.2012.01460.x [Japan]	Rejected: Due to space limitations this section is focusing on literature since AR5. See also response to comment 1146.
62862	44	5	44	5	this is written like a review and not an assessment [Valérie Masson-Delmotte, France]	Accepted: see response to comment 1142.
58264	44	53	44	55	Suggest adding reference to forthcoming WEO 2018 Sustainable Development Scenario which will look at the intersections of SDGs (3, 6, 7, 11, 13). [Andrew Prag, France]	Rejected: We can only include published literature. WEO doesn't seem to be published yet.
13734	44	54	44	54	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: Non-published references were removed from the assessment.
33446	45	3	45	3	2009). Despite [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
44122	45	3	45	3	needs space between "2009). Despite" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed before submission of final government draft.
52396	45	3	45	3	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed before submission of final government draft.
55906	45	3	45	3	Space between period and despite [Deborah Ley, Guatemala]	Editorial - copyedit to be completed before submission of final government draft.
3138	45	4	45	4	Foremost,policies' should be 'Foremost, policies' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed before submission of final government draft.
44124	45	4	45	4	needs space between "Formost, policies" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed before submission of final government draft.
55908	45	4	45	4	Space between comma and policies [Deborah Ley, Guatemala]	Editorial - copyedit to be completed before submission of final government draft.
48210	45	6	45	6	Please check to see whether 'Bartos and Chester, 2014' is in the reference list. [Sarah Connors, France]	Thank you. It is now in the reference list.
50178	45	8	45	22	This paragraph totally overlaps with material in section 5.5. Delete and make reference to section 5.5 (or , if 5.5 and 5.6 are merged, move it to the appropriate place). [Bert Metz, Netherlands]	Accepted: sections were merged.
57852	45	8	45	1	An additional reference should be included here in this emerging body of literature that explores the effect of mitigation pathways on SDGs. The key findings of this paper is that, in terms of land-based CDR, some options have greater synergies with SDGs than others, with forest restoration delivering significant CDR potential as well as co-benefits with SDGs 2 and 15: Dooley K and Kartha S (2017) Land-based negative emissions: risks for climate mitigation and impacts on sustainable development. Inter. Environ. Agreements, 18(1):79-98, https://doi.org/10.1007/s10784-017-9382-9 [Kate Dooley, Australia]	Thank you for the suggested reference. Unfortunately, due to space limitations, we could not include the suggested reference in the assessment.
13736	45	9	45	1	Missing years [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
33448	45	9	45	1	citations missing year and consolidation in one parenthesis [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
36206	45	1	45	1	Add- publication years and delete extra parenthesis [India]	Editorial - copyedit to be completed before submission of final government draft.
28918	45	11	45	14	Please revise the following sentence where purpose and instruments are confused: "[...] and show how choices of mitigation technologies can help in designing mitigation portfolios that would [...]" [Germany]	Sentence removed.
35426	45	11			The citation (Bertram et al. submitted) shall be corrected as Bertram et al.,(submitted) [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before submission of final government draft.
43132	45	11	45	11	(Bertram et al. submitted) is suggested to be written as Bertram et al. (submitted). Similarly, (Krey et al. submitted) as Krey et al. (submitted) in line 14. [Muhammad Mohsin IQBAL, Pakistan]	Editorial - copyedit to be completed before submission of final government draft.
63312	45	13	45	19	Fine, synergies between climate and SD goals exist, but at the end of the day are these alone sufficient to achieve the 1.5 climate goal? The SD goals? And if not do we quit, or do we acknowledge that trade-offs are required, that there are no perfect solutions to either goal? [Greg Rau, United States of America]	Rejected: The literature shows that trade-offs can be avoided.
13738	45	14	45	14	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted: all unpublished references were removed.
35428	45	14			The citation (Krey et al. submitted) shall be corrected as Krey et al.,(submitted) . [Regasa sagni, Ethiopia]	Removed
41248	45	14	45	14	Krey et al. (submitted) - change the position of the parenthesis [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
3140	45	17	45	17	keyconclusion' should be 'key conclusion' [Robert Shapiro, United States of America]	Corrected.
33202	45	17	45	19	supporting reference - Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Rejected: sentence was removed since Krey et al. was not published in time for the report.
41250	45	17	45	17	add a space after key and before conclusion [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
41252	45	18	45	18	eliminate 'where' [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
10186	45	19	45	2	Need more evidence and it is a policy prescriptive and out of mandate of IPCC [Saudi Arabia]	Rejected: statement is not policy prescriptive, since different instruments have been compared in a scientific manner and pros and cons with respect to SD have been identified. This is well within the mandate of the IPCC, which should explore our understanding of policy relevant science.
41254	45	21	45	21	Should read: "Such combined policies also generally lead to..." [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.

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13740	45	22	45	22	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted. References unaccepted before the literature cut-off date have been removed from the assessment.
50180	45	24	46	35	This discussion on the value and use of SSP's is not breining out one of the most important points, i.e. The fact that delivering on 1.5C strategies requires a number of SD conditions to be fulfilled. This is illustrated by the sentence on page 45, lines 49-51, but that is only one way to discuss this issue. A much more elaborate dicussion is needed on other SD conditions (low population , education, approach to security etc.) for being able to deliver 1.5C, as those consitions require specific attention of governments and specific policies to make them happen. SSPs are thus much more than sceario variations. They contain important policy messages. Important statement on this can be found in chapter 2, section 2.3.2.1. [Bert Metz, Netherlands]	Accepted: We have changed the focus of this section to highlight the insights rather than the framework.
31112	45	36	45	37	for example, participatory scenario planning [James FORD, Canada]	Rejected: Sentence was removed, participatory scenarios have been emphasized elsewhere.
41256	45	36	45	36	like (Shukla and Chaturvedi - this reads strange / should be redrafted somehow [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
13742	45	41	45	41	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted. References unaccepted before the literature cut-off date have been removed from the assessment.
13744	45	43	45	44	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted. References unaccepted before the literature cut-off date have been removed from the assessment.
13746	45	43	45	46	Missing points and commas [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
12772	45	47	45	53	This seems like an important point, please draw this out further [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: statement was elevated to the ES, and also elaborated further.
13748	45	51	45	51	Missing points and commas [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
13750	46	5	45	6	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted. References unaccepted before the literature cut-off date have been removed from the assessment.
41258	46	6	46	7	assessments of the impacts of local vulnerabilities instead of "assessments of local vulnerabilities impacts" [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
10188	46	1	46	14	Decoupling energy from income growth needs more evidence, needs more details from the reference [Saudi Arabia]	Accepted: text revised/amended.
63314	46	1	16	14	In other words, no climate solution until everyone is equally living at a 3rd world energy consumption level? What happened to "From each according to his ability, to each according to his needs"? K. Marx [Greg Rau, United States of America]	Rejected: this is not what the text says.
13752	46	11	46	12	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Accepted. References unaccepted before the literature cut-off date have been removed from the assessment.
62864	46	17	46	35	This whole paragraph is about work in the pipeline and is not an assessment so it should be removed. Web sites are not acceptable references. [Valérie Masson-Delmotte, France]	Accepted: The paragraph has been reduced significantly and the issues are highlighted as a knowledge gap.
18746	46	38	46	38	The concept of Climate-resilient development pathways merits to be mentioned in the SPM. It is a sort of summary of the main development thesis defended in the report. [Andrea TILCHE, Belgium]	We agree. The concepts included in the SPM.
45452	46	39	46	39	I'm afraid at this point I'd forgotten what the first notion of pathways was. Sholudn't the whol conceptual framework be set up front? [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	This has been reformulated and a stronger intro provided at the beginning of the section.
31626	46	41	46	41	CDRPs should be "CRDPs". [Japan]	Text has been corrected.
43134	46	41	46	41	(CDRP) needs to be changed to (CRDP). [Muhammad Mohsin IQBAL, Pakistan]	Done.
46316	46	41	46	41	change 'CDRPs' to 'CRDPs' [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Text has been corrected.
61648	46	41	46	43	The statement in this paragraph is misleading because this report does not introduce CDRPs. WGII AR5 Chapter 20 introduced climate resilient development pathways as "a continuing process for managing changes in the climate and other driving forces affecting development, combining flexibility, innovativeness, and participative problem solving with effectiveness in mitigating and adapting to climate change." WGII AR5 Chapter 20 does indeed explain that ideas about equity and values play a role in sustainable development and how policymakers perceive tradeoffs in aims to improve human well-being. [United States of America]	Correct. CRDPs were already introduced in the AR5, but in Ch13 (not Ch 20). This is now corrected in 5.1 and referred to here.
61650	46	41	46	41	Typo: Should be (CRDPs). [United States of America]	Text has been corrected.
63316	46	47	46	47	tripple wins are wonderful, but where is the evidence that they are sufficient with regard to the 1.5degC warming target, the supposed subject of this report? Shouldn't we instead be focussing on the (difficult) choices/trade-offs that will need to be made to fully achieve the 1.5degC target, which is also critical to achieving SDGs? [Greg Rau, United States of America]	This sentence has been removed here.
381	47	1	47	9	The representation chosen that makes a dichotomy between "climate resilient worlds" and "undesirable futures" somewhere between 1.5 and 2.0 is too strong to be supported by current knowledge. [Céline Guivarch, France]	This has been corrected.
382	47	1	47	9	The concept of "net zero" emissions is fuzzy and requires to be defined and connected to chapter 2. [Céline Guivarch, France]	Yes, this is defined in Ch2 and also in the SPM.
383	47	1	47	9	The figure gives the overall picture that achieving all SDGs and 1.5 or even 1.0 is (i) possible and (ii) in synergy. This may be over rosy, and not conveying the different trade-offs underlined in the chapter. Moreover, the connection with chapter 2, and the characterization of "1.5" and "1.0" (what probability? overshoot?) is still to be made. [Céline Guivarch, France]	This is a conceptual figure, hence no probabilities. Overshoot is mentioned in the figure caption but would complicate the figure beyond need. The trade-offs are now more prominent in the updated figure.

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8400	47	1	47	9	Figure 5.5 is logically unclear. Based on the indicators and pathways given here, the 1.5°C warming will be a necessary condition for achieving sustainable development with a prejudice that global warming will not exceed 1.5°C to achieve a climate resilient world. At the same time, time scales of mitigation, adaptation and sustainable development are inconsistent. It is necessary to maximize synergies and optimize trade-offs under the goal of sustainable development, that is, to consider the costs of both mitigation and adaptation in order to choose the optimal pathway for sustainable development. It is suggested to redraw this figure. [China]	The figure has been improved.
13754	47	1	47	1	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. Consistent with IPCC style guide.
28920	47	1	47	9	We strongly encourage the author team to consider to integrate Figure 5.5 in the SPM. Rationale: Figure shows that achieving a climate resilient world depends on mitigation and adaptation policies and measures as well as on achieving SDGs. Growing literature shows that societal transformation against the background of climate change and achieving SDGs is an enabling factor and precondition for decarbonisation and adaptation pathways (e. g.: Feola, G. 2015. Societal transformation in response to global environmental change: A review of emerging concepts. Ambio 44: 376-390, doi 10.1007/s13280-014-0582-z; Mapfumo, P. et al. 2015. Pathways to transformational change in the face of climate change: an analytical framework. Climate and Development, doi 10.1080/17565529.2015.1040365; Termeer C.J.A.M. et al. 2017. Transformational change: governance interventions for climate change adaptation from a continuous change perspective. Journal of Environmental Planning and Management 60 (4): 558-576, doi 10.1080/09640568.2016.1168288). Furthermore this figure builds on figure SPM.9 of IPCC AR5 WGI and shows the further development of the idea of climate resilient pathways in the context of sustainable development. However, a better description what message this figure seeks to provide could be helpful to facilitate understanding. [Germany]	Thank you! We have tried very hard to get the figure included in the SPM but did not succeed. We have improved the figure caption for the chapter.
30786	47	1	47	9	Figure 5.5: The representation chosen that makes a dichotomy between "climate resilient worlds" and "undesirable futures" somewhere between 1.5 and 2.0 is too strong to be supported by current knowledge. [France]	The figure has been improved.
30788	47	1	47	9	Figure 5.5: The concept of "net zero" emissions is fuzzy and requires to be defined and connected to chapter 2. [France]	Yes, this is defined in Ch2 and also in the SPM.
31980	47	1	1	47	Figure 5.5: I recommend also to add the "policy transformation". Because societal transformation represents only the social actions, and public engagements, not the long-term strategical policy transformation. [Sisira S. Withanachchi, Germany]	Societal (not social) transformation includes policy transformation. The figure now includes 'systems' in addition to societal transformation.
52766	47	1	47	9	This figure shows that what is different about 1.5 degrees is the sustainability aspect. This figure could be brought right up to the front of the section. [Julain Florin VLADU, Germany]	Thank you! Now in section 5.1.
30792	47	1	47	9	Figure 5.5: The figure gives the overall picture that achieving all SDGs and 1.5 or even 1.0 is (i) possible and (ii) in synergy. This may be over rosy, and not conveying the different trade-offs underlined in the chapter. Moreover, the connection with chapter 2, and the characterization of "1.5" and "1.0" (what probability? overshoot?) is still to be made. [France]	This is a conceptual figure, hence no probabilities. Overshoot is mentioned in the figure caption but would complicate the figure beyond need. The trade-offs are now more prominent in the updated figure.
31628	47	1	47	11	The column D in Figure 5.5 contains the word "undesirable". This word includes some value judgement and is inappropriate in view of the not-policy-prescriptive principle of IPCC. The phrase "Undesirable future" should be replaced with something like "Warmer world" or "Extended business-as-usual world". Besides, the current "Undesirable future" box should be shrunk and an explicit box labeled "somewhere in between" should be added, in order to consistent with the caption. [Japan]	The figure has been improved.
44758	47	2	47	9	Solid green arrow does not reflect the need for CRDPs to embody iterative processes with multiple decieweked to sion points, as idnetified in the assessment. Suggest this is tweaked to show a more fluidly evolving process. [Penny Urquhart, South Africa]	This is a conceptual figure that should stay as simple as possible, upon recommendations from the graphic designers. Nuances such as iterative processes are captured in the underlying text.
62866	47	2	47	8	Figure 5.5. I am puzzled by the vertical temperature axis. We are already at 1°C. The notion of "undesirable future" implies a value judgment; would not "unsustainable" be more relevant? [Valérie Masson-Delmotte, France]	The figure has been improved.
55338	47	3	47	9	Figure 5.5. Rearrange the limits of section D and/or explain accordingly. "Climate Resilient Worlds" are also in D. [ELISA BERDALET, Spain]	Figure adjusted to include 'future worlds'.
57146	47	3	47	9	What is the reference temperature level ? If it is pre-industrial (and it should be for clarity), then it is odd to indicate that CRDPs would lead to 1.0°C, which is the current level of global warming. The scale could have the green arrow at 1.5°C. But even that raise questions as to the meaning of CRDPs, and what failing to follow such pathways implies: any global warming is to some extent "undesirable", so can we say that there is a boundary between what is resilient and was is undesirable, and if so, what is the evidence for it? Or should we rather conclude that the SDB + Net-zero + 1.0 - 1.5°C combination is "the most resilient we can possibly hope to achieve", and anything departing from that is increasingly undesirable? [Philippe Marbaix, Belgium]	The figure has been improved.
28922	47	12	51	34	We have strong reservations about prejudging the meaning of terms and concepts central to equity considerations under the UNFCCC in the context of this report. We urge the authors to refrain from any form of analysis or interpretation that may be perceived as policy-prescriptive, as for example the treatment of "CBDR" or the introduction and unbalanced discussion of concepts and indicators such as "fair share" or "spill-over score" in Sections 5.6.2.1 and 5.6.2.2, and in Figure 5.6. Please revise these sections, and replace Figure 5.6. [Germany]	Removed from this section. Figure 5.6 has also been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33206	47	12	48	4	Well being and equity require that human right are intergarted into all climate action. e.g. Cameron, E. Shine, T and Bevins, W. (2013) Climate justice: Equity and justice informing a new climate agreement. WRI working paper [Tara Shine, Ireland]	Thanks you for the reference but we are asked to include new literature after the AR5.
62868	47	13	47	35	do not quote Millar et al here but the outcomes of chapters 2 and 4 to ensure coherency across chapters. [Valérie Masson-Delmotte, France]	We now cite Ch2 and Ch4, as well as the Millar et al. paper. It is part if the literature that we assess.
61652	47	14	47	16	References to CBDR should be removed from this chapter and elsewhere. The statement that development pathways, including low-carbon trajectories, be in alignment with the UNFCCC premise of "common but differential responsibilities and respective capacities" (CBDR/RC) is policy-prescriptive and lacks clarity. Referring to the UNFCCC is unnecessarily specific and limits its relevance. Moreover, CBDR/RC is a concept that lacks fixed meaning, and different states have significantly different views about what CBDR/RC means or how the concept is applied. It is a loaded term politically and its inclusion will undermine an effort to enhance understanding and threaten the ability for this report to be approved. [United States of America]	We have removed references to CBDR if not warranted but assess the scientific literature on it that is relevant to this section.
45098	47	15	47	15	...the UNFCCC premise... should be "...the UNFCCC principle..." [ARI Izzet, Turkey]	This part of the sentence has been removed.
31630	47	16	47	16	We suggest the modification of "differential" to "differentiated" to be consistent with the UNFCCC text. [Japan]	The reference to CBDR/RC has been removed.
57854	47	16	47	2	A suggested addition to this group of references is: Winkler et al (2017). Countries start to explain how their climate contributions are fair: more rigour needed. Int Environ Agreements (2018) 18:99–115 [Kate Dooley, Australia]	We have included this reference in this sub-section, later.
57856	47	16	47	16	The correct term is 'differentiated', not 'differential' [Kate Dooley, Australia]	The reference to CBDR/RC has been removed.
45694	47	19	47	19	A reference to Robiou du Pont et al. 2016 and Pan et al. 2017 would be useful here. These references specifically address burden sharing under the 1.5°C objective. Additionally, there is currently a reference to grey literature that is not peer reviewed and is therefore not valid: CSO Review 2015 [Yann Robiou du Pont, France]	We reference both later in the sub-section, under effort sharing.
13284	47	24	47	24	Delete the text "and behavioural carbon lock-in". [Eleni Kaditi, Austria]	Deleted.
13756	47	29	47	29	Space [Poot-Delgado Carlos, Mexico]	Editorial to be completed before submission of final report.
24422	47	29	47	29	Well-being for all(Dearing et al", adjacency [Nazan AN, Turkey]	Editorial to be completed before submission of final report.
33450	47	29	47	29	all (Dearing [Sergio Aquino, Canada]	Editorial to be completed before submission of final report.
55340	47	29	47	29	add space: "all (Dearing" [ELISA BERDALET, Spain]	Editorial to be completed before submission of final report.
33208	47	3	47	32	these social boundaries also include human rights [Tara Shine, Ireland]	Due to space constraints, the list has been shortened. Human rights are not listed here but addressed elsewhere in the chapter.
33236	47	3	47	32	these social boundaries also include human rights [Tara Shine, Ireland]	Due to space constraints, the list has been shortened. Human rights are not listed here but addressed elsewhere in the chapter.
44760	47	32	47	35	Very important point, not sure it comes through clearly enough in the Executive Summary. [Penny Urquhart, South Africa]	We are limited to 2 pages of ES, with line of sight to this section.
61654	47	32	47	32	Doughnut? This need more of an explanation. [United States of America]	We have removed the term doughnut, although it is well known in the literature.
61656	47	39	47	4	Not appropriate to use CBDR in this context. The authors should not take a term from a treaty – particularly one that is the subject of such debate as CBDR – and seek to frame a conclusion around it. [United States of America]	Removed from this section.
3142	48	2	48	2	production patters' should be 'production patterns' [Robert Shapiro, United States of America]	Thank you. Corrected.
33452	48	3	48	4	moving towards economic development rather than simply growth [Sergio Aquino, Canada]	The literature talks about development as well-being rather than economic development or economic growth. The end of the sentence now reads "...rather than mere economic growth".
33210	48	6	48	8	other references to support this section on climate justice that are recent are in this special edition - Volume 18, Issue 1, February 2018 Special Issue: Achieving 1.5 °C and Climate Justice. International Environmental Agreements: Politics, Law and Economics. https://link.springer.com/journal/10784/18/1/page/1 ; and Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. Mary Robinson Foundation – Climate Justice (2015a) Rights for Action: Putting People at the Centre of Action on Climate Change. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Rights-for-Action-edition-2.pdf Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Thank you! We have included publications where relevant, given the page limits.
44762	48	6	48	6	How is this distinct from wellbeing? - the above paragraph notes that wellbeing includes equity, addressing inequalities etc [Penny Urquhart, South Africa]	Equality and equity are not the same. Equity, fairness, and justice have a distinct meaning in the climate change literature.
61658	48	6	48	6	Reference to "climate justice" should be deleted. That is a controversial term that has no fixed meaning. In addition, language stating that these considerations are "the other essential yardstick" is policy-prescriptive; what is the scientific basis for asserting that these are the "essential" yardsticks? [United States of America]	In the literature, all three terms are used. In fact, there is a large body on literature on climate justice. Ch13 in the AR5 WGII, in the context of climate-resilient development pathways' drew attention to justice. We have removed 'essential yardstick".
61660	48	6	48	8	The framing of any topic as an essential yardstick is policy-prescriptive and should not be used. Equity, fairness, and justice have different meanings depending upon the perspective of the actor. The inclusion of such statements is problematic from both a scope and a substantive basis. [United States of America]	In the literature, all three terms are used. In fact, there is a large body on literature on climate justice. Ch13 in the AR5 WGII, in the context of climate-resilient development pathways' drew attention to justice. We have removed 'essential yardstick".

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
46320	48	8	48	8	change 'Shue, 2014a' to 'Shue, 2014' in line with previous comment [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed before submission of final government draft.
57770	48	9	48	1	on the importance of decarbonization which does not exacerbate social injustices see Simon Caney. 2005. "Cosmopolitan Justice, Responsibility, and Global Climate Change", Leiden Journal of International Law, vol.18 no.4 (2005), 747-775. [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. We are mandated to assess literature published predominately after the AR5.
33454	48	19	48	19	2017) (medium evidence [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
45696	48	19	48	19	Currently in the text, the two references refer to the same research project and a single model of equity (as too often this SR15 report's draft). This IPCC report should provide an overview of the literature and refer to at least other modelling and qualifications from other teams, under the 1.5°C threshold. Again, Robiou du Pont et al. 2016 and Pan et al. 2017 (from institutions developing and developed countries: in Australia and China) which are specifically addressing burden sharing under the 1.5°C objective. There may be additional literature to account for. [Yann Robiou du Pont, France]	We have included Pan et al here. Both refs come then in the sub-section of burden sharing.
32892	48	21	48	32	• Section 5.6.2.1. p. 48 , lines 21-32: on the role of visions as the main and original driver for generating situated transformations and 'positive tipping points' in the context of accelerated climate change the authors may consider this reference which constitute a synthesis of the EU project IMPRESSIONS (www.impressions-project.eu, http://highendclimateresearch.eu/) on transformative solutions to high-end climate change: Tabara, J.D., Frantzeskaki, N., Hölscher, K., Pedde, S. Lamperti, F. Kok, K., Christensen, J.H., Jäger, J., and P. Berry. 2018. Positive tipping points for a rapidly warming world. Current Opinion in Environmental Sustainability. Special Issue on Sustainability Governance and Transformation, 31. doi: 10.1016/j.cosust.2018.01.012 [J. David Tabara, Spain]	Yes, fantastic suggestion, thank you! Now incorporated.
44764	48	21	48	23	Make the link with the UNFCCC and Paris Agreement here, to avoid overly normative phrasing. [Penny Urquhart, South Africa]	This sentence refers to the underlying scientific literature assessed in this section, not the UNFCCC.
63318	48	21	48	32	Great! What happens when the only way to achieve 1.5 is not equitable, inclusive, and/or socially acceptable? Do we abandon the effort??? [Greg Rau, United States of America]	We are not allowed to policy prescriptive. Our task is to assess the literature on possible pathways. Some would reach 1.5C in ways that meet none or few of the SDGs and are socially not desirable (also captured in an updated figure). We highlight likely equity concerns and potential losses. It is up the countries and communities to decide whether to follow such pathways.
61662	48	22	48	22	Essential endeavor is similarly overly prescriptive for an IPCC report. [United States of America]	We have modified the language. It is, nonetheless, as important endeavour, for all countries and communities.
33212	48	27	48	27	Add a reference Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Thank you. We have made efforts to include Mary Robinson Foundation - Climate Justice references where appropriate throughout this and other sections.
33238	48	27	48	27	Add a reference Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Thank you. We have made efforts to include Mary Robinson Foundation - Climate Justice references where appropriate throughout this and other sections.
13758	48	31	48	32	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial to be completed before submission of final report.
31632	48	35	51	8	The messages of subsection 5.6.2.2 that cite the UNFCCC premise of "Common but Differentiated Responsibilities and Respective Capacities" (CBDR-RC) and some literatures can be understood to be an encouragement of dividing roles in pursuing Climate-resilient development pathways (CRDPs) among developed (wealthier) and developing (poorer) countries. It is important to acknowledge that the potential for CRDPs differs between richer and poorer nations and regions given different levels of development, but the key messages of this chapter and Special Report should be that "all countries, independent of their income level or development status, as well as non-state actors, will need to strengthen their contributions" as pointed out in subsection 5.6.2.1(from page 47 line 16 to page 47 line 20). For the same reason, (CBDR) is not a principle of "justice and ethic " at Chapter 4, page 8 line 18 to page 8 line 21. [Japan]	Yes, we do acknowledge that the potential differs between richer and poorer nations. Yes, we do say that all have to strengthen their efforts.
36208	48	35	51	8	Literature reviewed here does not include papers which have used approaches such as cumulative emissions, historical responsibility and carbon budgets. These approaches should also be included in the review. Few references for the same include: 1. Kanitkar, Tejal. What Should the Climate Goal Be, 1.5°C or 2°C? Review of Agrarian Studies vol. 5, no. 2 July–December, 2015 http://ras.org.in/68a4448bb404ca365b879b604ae8c64 2. Kanitkar, T., Jayaraman, T., D'souza, M., & Purkayastha, P. (2013, May 10). Carbon budgets for climate change mitigation – a GAMS-based emissions model. Current Science Vol 104 3. Harald Winkler, Thapelo Letete & Andrew Marquard, Equitable access to sustainable development: operationalizing key criteria, Climate Policy, Vol. 13, Iss. 4, 2013 4. BASIC experts, 2011. Equitable access to sustainable development: Contribution to the body of Scientific Knowledge. BASIC expert group: Beijing, Brasilia, Cape Town and Mumbai. These approaches have been cited in the literature in AR5 in WGIII and their omission here is unconscionable. [India]	We are asked to only include relevant literature after the AR5 (from 2014 onwards).

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38586	48	35	49	28	A recent commentary (peer reviewed) by Otto et al in Nature Climate Chaneg is potentially relevant for this section: Assigning historic responsibility for extreme weather events. Nature Climate Change 7, 757–759 (2017)DOI:10.1038/nclimate3419. [Jan Fuglestedt, Norway]	Thank you. Now included.
44766	48	35	49	28	It would be refreshing to see at least a mention here that rich countries could learn from the poor ones about CRDPs - speak to Saleem ul Huq for references. [Penny Urquhart, South Africa]	We have included more relevant literature.
50182	48	35	49	28	The message on (international) equity is too vague: What should have been said is that ensuring equitable 1.5C strategies will require a different implementation of the CBDR principle. Current implementation is that developing countries consider it fair to reduce emissions less and later than developed countries (see for instance page 5-49, lines 6-12). However, in 1.5C pathways the room for such differentiation is much smaller than in 2C pathways ("everything needs to be done everywhere"; this is illustrated by the fact that under SSP-3 conditions, with "late accession" of developing countries, 1.5C limits cannot be reached, see chapter 2.5.1); and that means equity should be sought much more in rich countries paying for part of the mitigation efforts of developing countries and assisting them in creating the right institutional and governance arrangements to enable them to strengthen their mitigation efforts and to assist them in strengthening their resilience against climate change. This notion seems to be included in the text on page 49, lines 14-20, but needs to be brought out much more clearly. see http://climateactiontracker.org/assets/publications/briefing_papers/Potentials_Briefing/CAT_AirPollutionCoBenefits_Dec15.pdf for the notion that developing countries can be expected at minimum to pay for all mitigation that has no net costs after taking into account the co-benefits and that rich countries could pay for the net costs of poor countries. [Bert Metz, Netherlands]	This is an important point and we have tried to make the language more precise to get this point across.
63118	48	35	51	34	Figure 5.6 uses 1980 and 1990 as the historical start dates to assess burden sharing. The "high equity ambition" fair share score is calculated using 1980 as the historical start date, and the "low equity ambition" fair share score is calculated using 1990 as the historical start date. The Climate Equity Reference Calculator website allows for the equity settings for cumulative emissions to date back since 1850. We are not clear why was this not used as the historical start dates, and the years 1980 and 1990 were used instead. The use of variable timeframes is not consistent with Chapter 1 framing of the Anthropocene era, which the report acknowledges is still subject to debate. [Singapore]	This figure has been removed.
31982	48	36	53		Section 5.6.2.2 Development Trajectories, Responsibilities, and Capacities - It would be good to mention about the people perception of the climate change. Some of reaseach found that there are some differences how people/individual graphs the average temperature increasing compare to the rainfall or snow. People are more aware or worry or know about the long term changes in precipitation compare to the temperature increasing. Reading Marlon, J. R., van der Linden, S., Howe, P. D., Leiserowitz, A., Woo, S. L., & Broad, K. (2018). Detecting local environmental change: the role of experience in shaping risk judgments about global warming. Journal of Risk Research, 1-15. [Sisira S. Withanachchi, Germany]	This is interesting but beyond the scope of this chapter.
61664	48	37	48	39	Reference to CBDR/RC should be deleted. CBDR/RC is not a defined term in the UNFCCC. [United States of America]	Removed.
45100	48	39	48	39	...as defined in the UNFCCC. should be "...as acknowledged in the UNFCCC." [ARI Izzet, Turkey]	Good suggestion. Thank you. We have changed the text accordingly, and moved it where it fits better in the sub-section.
57772	48	39	48	4	on "a growing literature on various effort- or burden- sharing approaches" see Caney 2010. 'Climate Change and the Duties of the Advantaged', Critical Review of International Social and Political Philosophy, vol.13 no.1 (2010), 203-228. [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. We are mandated to assess literature published predominately after the AR5.
13760	48	41	48	41	Space [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
13762	48	41	48	42	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
45102	48	41	48	42	As Authours emphasized, there is a growing literature on burden sharing approaches. I suggest two studies on this subject: DOI: 10.1016/j.esr.2017.09.016 and DOI: 10.1080/23311843.2017.1420365 [ARI Izzet, Turkey]	We have expanded our relevant literature on this topic.
45678	48	41	48	42	The reference "du Pont et al. 2017" should be corrected to "Robiou du Pont et al." (published online in 2016, printed in 2017 DOI: 10.1038/nclimate3186). A reference to Pan et al. 2017 could be relevant (DOI: 10.1016/j.envsci.2017.04.020). [Yann Robiou du Pont, France]	Thank you. This has been updated.
45682	48	41	48	42	A reference to Pan et al. 2017 could be relevant (DOI: 10.1016/j.envsci.2017.04.020). [Yann Robiou du Pont, France]	Done.
53460	48	41	48	42	It is odd that the CSO Review 2015 and Holz et al 2017 references that are used elsewhere are missing from this list [Christian Holz, Canada]	Corrected. Thank you.
13764	48	42	48	42	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Yes, all articles included in the final draft have to be accepted for publication.
38582	48	42	48	43	I think it is important to distinguish between contribution and responsibilities. See references in Skeie et al. [Jan Fuglestedt, Norway]	Yes, thank you. Done.
38584	48	42	48	43	I suggest adding "calculated contributions" before "responsibilities. [Jan Fuglestedt, Norway]	Done.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
45680	48	43	48	45	This sentence implies that several studies are systematically biased against poorer country. However, the reference "Karthar et al. Fourthcoming" refers to a critique of a single paper. The critique also tackles the IPCC AR5 categorisation of equity and states: "Third, the 'IPCC equity categories' referenced by Robiou du Pont et al cannot be taken as an authoritative and ethically-robust taxonomy of equity approaches in any sense". As a result, the current sentence should be modified to either specifically refer to the bias of a single study (but the IPCC report should rather describe a body of literature rather than a single analysis), or refer specifically to the critique of the IPCC AR5 equity categorisation system. [Yann Robiou du Pont, France]	We are now referencing the Hoehne et al. 2014 study.
13766	48	44	48	45	It is suggested to change for published articles [Poot-Delgado Carlos, Mexico]	Yes, all articles included in the final draft have to be accepted for publication.
61666	48	49	48	53	The language on human rights and the Paris Agreement are inaccurate and should be deleted (i.e., the sentence should end after "green economies"). Neither the SDGs nor the Paris Agreement are human rights instruments or define human rights obligations. [United States of America]	This sentence has been removed.
61668	48	51	48	51	The SDGs and the Paris agreement do not outline obligations on human rights. This sentence should be deleted after 'green economies.' [United States of America]	This sentence has been removed.
45676	48	55	49	1	The reference "du Pont et al. 2017" should be corrected to "Robiou du Pont et al." (published online in 2016, printed in 2017 DOI: 10.1038/nclimate3186). A reference to Pan et al. 2017 could be relevant (DOI: 10.1016/j.envsci.2017.04.020). [Yann Robiou du Pont, France]	Thank you. This has been updated.
45684	48	55	49	1	A reference to Pan et al. 2017 could be relevant (DOI: 10.1016/j.envsci.2017.04.020). Additionally, there is currently a reference to grey literature that is not peer reviewed and is therefore not valid: CSO Review 2015 [Yann Robiou du Pont, France]	We have included Pan et al. 2017. Grey literature is relevant and part of the body of knowledge assessed in this SR, as also previously in the AR5, WGII.
54566	48	55	49	12	add reference to Cross Chapter Box 4.1 on NDCs which discuss equity issues in relation to the ambitiousness of current NDCs [Paolo BERTOLDI, Italy]	Done.
61670	48	55	51	8	While noting the differing of methods and perspectives on how to allocate future emissions reductions "fairly", the authors proceed to choose a single perspective to present in this report. This endorsement is unacceptable. The IPCC should not be endorsing a specific perspective over others. The authors may wish to discuss the diversity of views in a balanced and comprehensive manner. [United States of America]	This figure has been removed. More relevant references are now in the text.
62870	49	1	49	1	for equity and mitigation, please also check chapters 2 and 4 for coherency. Work of Yann Robiou du Pont could also be quoted (Nature Climate Change, 2016, Equitable mitigation to achieve the Paris Agreement goals). For the whole section, I was looking for insights related to 1.5°C or 2°C pathways and did not find such information. [Valérie Masson-Delmotte, France]	We have du Pont included and refer to the x-chapter box on NDCs. References to Ch2 are made where applicable, especially in 5.5.2. Pathways below the global level do not focus on a global warming level (they are place- and context specific), although we have more literature now that assesses pathways in the context of 1.5C.
57774	49	4	49	5	on "fair share debates on responsibility, capability, and right to development in climate policy" see Caney. 2018. 'Climate Change and Distributive Justice' in The Oxford Handbook of Distributive Justice (Oxford: Oxford University Press), edited by S. Olsaretti, pp.664-688. [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	We could not access the final version (only text available was "forthcoming").
57858	49	5	49	6	Additional references to support the point on fair share debates on responsibility, capability, and right to development in climate policy: Lahn (2017). In the light of equity and science: scientific expertise and climate justice after Paris. Int Environ Agreements (2018) 18:29–43. https://doi.org/10.1007/s10784-017-9375-8 ; and Gupta and Arts (2017). Achieving the 1.5 C objective: just implementation through a right to (sustainable) development approach. Int Environ Agreements (2018) 18:11–28. https://doi.org/10.1007/s10784-017-9376-7 [Kate Dooley, Australia]	We have expanded our references in the fair share section, focusing on those most relevant. We cite Gupta and Arts 2017 elsewhere in the section where it fits better.
57470	49	7	49	7	This probably refers to "SIDS", i.e. "Small Island Developing States" [Hans Poertner, Germany]	We have now ensured correct use of terminology throughout the Chapter text.
45686	49	12	49	12	The reference to Kartha et al refers to a document that does not provide an assessment framework as it is a critique and not an article introducing material. A reference to Klinsky et al. 2017 (DOI: 10.1016/j.gloenvcha.2016.08.002) is much more relevant to support this sentence. A reference to Mace 2016 (10.1163/18786561-00601002) may also be helpful. [Yann Robiou du Pont, France]	We now have both Klinsky et al. and Mace included.
12774	49	14	49	28	Paragraph is overly political and based on value-judgements that aren't necessarily backed up by the evidence [United Kingdom (of Great Britain and Northern Ireland)]	This section has been substantially revised to capture the very relevant literature on this debate without coming across as policy-prescriptive.
33216	49	14	49	17	additional supporting references : Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Thank you! We have included both references where appropriate throughout the section. Much appreciated!
33242	49	14	49	17	additional supporting references : Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Thank you! We have included both references where appropriate throughout the section. Much appreciated!
13768	49	15	49	15	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. Consistent with IPCC style guide.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10190	49	23	49	29	As high income may depend on one commodity accordingly considered vulnerable to climate change, more evidence needed on the contribution to the NDCs (spill-overs) by referring the low income contributing to NDCs [Saudi Arabia]	We have removed the reference to spill-overs.
33456	49	23	49	23	scheme that is summarized [Sergio Aquino, Canada]	Wording has been removed.
384	5	1	51	8	This figure, with many spikes, is difficult to read and understand. [Céline Guivarch, France]	This figure has been removed.
385	5	1	51	8	The concepts of "fair share" need to be explained, and connected to the literature on the different underlying concepts (see Table 6.5 Clarke, L. et al. in Climate Change 2014: Mitigation of Climate Change (eds Edenhofer, O. et al.) 456–462 (IPCC, Cambridge Univ. Press, 2014) [Céline Guivarch, France]	We now better explain fair shares, based on more relevant literature.
386	5	1	51	8	some recent references seem to be missing on this topic, eg: Robiou du Pont, Yann, M. Louise Jeffery, Johannes Gütschow, Joeri Rogelj, Peter Christoff, et Malte Meinshausen. « Equitable Mitigation to Achieve the Paris Agreement Goals ». Nature Climate Change advance online publication (19 décembre 2016). https://doi.org/10.1038/nclimate3186 ; Meinshausen, Malte, Louise Jeffery, Johannes Gütschow, Yann Robiou du Pont, Joeri Rogelj, Michiel Schaeffer, Niklas Höhne, Michel den Elzen, Sebastian Oberthür, et Nicolai Meinshausen. « National post-2020 greenhouse gas targets and diversity-aware leadership ». Nature Climate Change, 2015. ; Pan, Xunzhang, Michel den Elzen, Niklas Höhne, Fei Teng, et Lining Wang. « Exploring Fair and Ambitious Mitigation Contributions under the Paris Agreement Goals ». Environmental Science & Policy 74 (août 2017): 49756. https://doi.org/10.1016/j.envsci.2017.04.020 . [Céline Guivarch, France]	Thank you. We have included more literature, i.e. Pan and du Pont.
13770	5	1	5	1	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. Consistent with IPCC style guide.
30798	5	1	51	8	Figure 5.6: This figure, with many spikes, is difficult to read and understand. In the second figure, for the sake of readability, would it be possible to sort countries within each group, let's say in a decreasing order of NDC pledge ? (or fair share) [France]	Figure has been removed.
30800	5	1	51	8	Figure 5.6: The concepts of "fair share" need to be explained, and connected to the literature on the different underlying concepts (see Table 6.5 Clarke, L. et al. in Climate Change 2014: Mitigation of Climate Change (eds Edenhofer, O. et al.) 456–462 (IPCC, Cambridge Univ. Press, 2014) [France]	This figure has been removed.
45454	5	1	5	1	Getting this approved will be fun! [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	This figure has been removed.
45692	5	1	5	21	The horizontal axis of Figure 5.6 is not specified. It seems that countries are organised by income, and can therefore be identified. The figure should be clearer et name the countries. [Yann Robiou du Pont, France]	This figure has been removed.
47038	5	1	5	21	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	This figure has been removed.
50184	5	1	5	2	Figure 5.6 is very unclear. Even the lengthy caption does not make me understand it. [Bert Metz, Netherlands]	This figure has been removed.
8402	5	1	5	21	In Figure 5.7, CBDR is an important principle of the Convention. It originates from the different historical responsibility of developed and developing countries on climate change, which has nothing to do with the income level. It is also open to discussion that 1980 and 1990 are taken as a starting year for calculating the historical responsibility. Instead, the cumulative historical emissions in the whole process since the Industrial Revolution should be calculated as a basis for measuring responsibility. It is suggested that the income-based grouping be replaced by developed and developing countries, with 1850 taken as a starting year for calculating responsibility, or be deleted directly. References: Civil Society Organizations. Fair shares: a civil society equity review of INDCs[OL/R]. 2015. [China]	This figure has been removed.
30804	5	1	51	8	Figure 5.6: Some recent references seem to be missing on this topic, eg: Robiou du Pont, Yann, M. Louise Jeffery, Johannes Gütschow, Joeri Rogelj, Peter Christoff, et Malte Meinshausen. « Equitable Mitigation to Achieve the Paris Agreement Goals ». Nature Climate Change advance online publication (19 décembre 2016). https://doi.org/10.1038/nclimate3186 . Meinshausen, Malte, Louise Jeffery, Johannes Gütschow, Yann Robiou du Pont, Joeri Rogelj, Michiel Schaeffer, Niklas Höhne, Michel den Elzen, Sebastian Oberthür, et Nicolai Meinshausen. « National post-2020 greenhouse gas targets and diversity-aware leadership ». Nature Climate Change, 2015. Pan, Xunzhang, Michel den Elzen, Niklas Höhne, Fei Teng, et Lining Wang. « Exploring Fair and Ambitious Mitigation Contributions under the Paris Agreement Goals ». Environmental Science & Policy 74 (août 2017): 49756. https://doi.org/10.1016/j.envsci.2017.04.020 . [France]	This figure has been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
45688	5	1	5	21	While being informative, this whole paragraph relies on a single study using a single model to quantify a single vision of equity. This is problematic as this section should reflect the research of the literature on equity in the context of the 1.5°C threshold. The text on page 49 seems to be strongly promoting this model, and provides more information than necessary. For example, it is not necessary to have a sentence on the evolution of the research project naming from the Greenhouse Development Rights (subjectively referred to as "well know") to the new name of "Climate Equity Reference Framework". The report seems to be disproportionately lean towards this single approach when other literature is available and models the multiple categories of equity and burden sharing threshold introduced in the IPCC AR5 such as Robiou du Pont et al. 2016 (the first peer-reviewed study on burden sharing under the 1.5°C threshold, published in Nature Climate Change) and Pan et al. 2017 (from an institution in a developing country, China). Both these studies are specifically addressing burden sharing under the 1.5°C objective. Both these studies model multiple effort sharing approaches, including the GDR approach that is currently put forward, and therefore convey a broader range of interpretation of equity reflecting more countries' positions. [Yann Robiou du Pont, France]	This figure has been removed. The text now includes more relevant literature.
45690	5	1	5	21	Figure 5.6 also relies on a single concept of equity and on a single study even though the IPCC AR5 had presented several categories (in IPCC AR5 WGIII table 6.5 and figure 6.28). As it stands, it seems that the report on based on a single study, and on a single concept of equity despite existing literature that models the categories of burden sharing introduced in the IPCC AR5, applied under a 1.5°C threshold. Again, Robiou du Pont et al. 2016 and Pan et al. 2017 (from institutions developing and developed countries: in Australia and China) which are specifically addressing burden sharing under the 1.5°C objective. I suggest using figures from Robiou du Pont et al. 2016 and Pan et al. 2017 in order to include national mitigation allocations, or Robiou du Pont et al. 2016 (Figure 1.g to 1.k DOI: 10.1038/nclimate3186) to include information at the regional level and thereby update the Figure 6.28 from the IPCC AR5 WGIII with the new 1.5°C threshold. Both these studies model multiple effort sharing approaches, including the GDR approach that is currently put forward, and therefore convey a broader range of interpretation of equity reflecting more countries' positions. [Yann Robiou du Pont, France]	This figure has been removed.
61672	5	1	5	2	This figure is overly complex, poorly described, and unrelated to the underlying chapter, as such it should be deleted. It relies on a single model framework and is not a comprehensive assessment of the literature. Not enough information is given of what assumptions are made in developing the "fair share scores" and the sensitivity of the scores to those assumptions. Displaying results as per capita implies an equity arrangement in the assessment of NDCs that has been repeatedly rejected. Moreover, it presents a false picture as to the ability to assess what emission reductions developing countries have committed to (given the conditionality and poorly defined baselines in many NDCs). See Chapter 4. Finally, it is unclear to the reader how to interpret the various spikes in the figures. Is this due to population disparities or are they due to other changes in the underlying economic indicator data from the model framework? Ultimately, this figure generates more questions than it answers. [United States of America]	This figure has been removed.
61674	5	1	5	21	This figure is overly complex and lacks a clear focused message. Figures should make understanding a topic easier, not more difficult. Its use of multiple disparate datasets with poor documentation and explanation limits its ability to impact the reader. [United States of America]	This figure has been removed.
62872	5	1	5	21	What is the literature source for the Climate Equity reference calculator beyond the web site? I could not find the related reference. Does the figure include the impacts of consumption or is it just related to country emissions without consumption? This is an important point to consider. [Valérie Masson-Delmotte, France]	This figure has been removed.
61676	5	4	51	8	This figure should not be titled using the term CBDR/RC. It is not appropriate to use that undefined, political, UNFCCC term and seek to attach a depiction to it. [United States of America]	This figure has been removed.
53462	5	16	5	16	The blue and red dotted lines -- in the chart, the lines are solid, not dotted. [Christian Holz, Canada]	Figure has been removed.
53458	5	2	5	2	According to the CERC website (https://climateequityreference.org/calculator-about/#how-to-cite) the preferred reference is not CERC 2017 but Kemp-Benedict et al 2017 [Kemp-Benedict, Eric, Christian Holz, Paul Baer, Tom Athanaisou, and Sivan Kartha (2017) The Climate Equity Reference Calculator, Berkeley and Somerville: Climate Equity Reference Project (EcoEquity and Stockholm Environment Institute), [Online]. https://calculator.climateequityreference.org] [Christian Holz, Canada]	Figure has been removed.
53464	5	21	5	21	for the "high equity" benchmark in Holz et al, the start date is 1850 not 1980 [Christian Holz, Canada]	This figure has been removed.
1330	51		62		Section 5.6.3 on Emerging Country and Community Experiences with Climate- Resilient Development Pathways contains five boxes with case studies in one sub-section. This represents five out of six boxes in the chapter and appears as an unbalanced distribution of examples/case studies across sections and sub-sections of the chapter. Furthermore, Box. 5.1 is 3½ pages long, too long for a box. It reads as if there was little overall editing and not appropriate consideration of the level of detail needed. Five detailed, long case studies in one sub-section is too much to illustrate an overall issue. [Karen Olsen, Denmark]	Yes, we agree. We have moved 2 case study boxes to other sections, and removed 1. The 5th one is a cross-chapter box. Hence 2 boxes remaining in this section. All box text has been shortened.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
18748	51		62		Section 5.6.3 on Emerging Country and Community Experiences with Climate- Resilient Development Pathways contains five boxes with case studies in one sub-section. This represents five out of six boxes in the chapter and appears as an unbalanced distribution of examples/case studies across sections and sub-sections of the chapter. Furthermore, Box. 5.1 is 3½ pages long, too long for a box. It reads as if there was little overall editing and not appropriate consideration of the level of detail needed. Five detailed, long case studies in one sub-section is too much to illustrate an overall issue. [Andrea TILCHE, Belgium]	Yes, we agree. We have moved 2 case study boxes to other sections, and removed 1. The 5th one is a cross-chapter box. Hence 2 boxes remaining in this section. All box text has been shortened.
53500	51	1	51	1	In Fig 5.6, bottom panel, I suggest removing the two outliers in the UMICs group where the green line peaks to ~40 and ~70 t/cap mitigation. The two countries in question (Belize and Guyana) have communicated a substantial net negative 2030 target, which causes these very large per capita mitigation figures. It is unclear from their NDCs whether this large sink activity refers to only anthropogenic removals or their overall terrestrial sink. (I am one of the authors of the cited piece and was the person primarily responsible for the quantification) [Christian Holz, Canada]	This figure has been removed.
53466	51	2	51	4	the "low equity" benchmark in Holz et al, actually uses a \$2,500 development threshold, not \$0 as indicated in the SOD [Christian Holz, Canada]	This figure has been removed.
53498	51	2	51	4	a 50:50 ratio between ... (lines 2 and 4) is a perhaps a confusing phrase. I recommend "equal weighting for ..." instead, which is the phrase that the cited publication uses. [Christian Holz, Canada]	This figure has been removed.
45104	51	28	51	38	Literaturedepicting should be "Literature depicting" [ARI Izzet, Turkey]	Thank you. Resolved.
61678	51	28	51	3	Language on human rights and CBDR-RC should be removed. [United States of America]	We have removed language and references to CBDR-RC. We refer to section 5.6 on values and rights, given recent literature on human rights and climate justice in 1.5C pathways (see Robinson and Shine 2018).
57776	51	31	51	32	on interpreting CBDR-RC in terms of capabilities see Caney 2016b. [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	Reference to CBDR-RC has been removed.
52800	51	32	51	34	Mention that the reason is because it limits/reduces vulnerability. [Iulain Florin VLADU, Germany]	It is not clear why this would fit here. Rejected.
61680	51	37	65	2	The discussion in these sections and case study boxes is not specifically relevant to 1.5°C and is therefore outside the scope of the report. It should be largely removed (to be taken up later in the AR6 possibly) or revised significantly to provide information that is directly relevant to the scope of the report. [United States of America]	We have revised the most relevant case studies to highlight how they are relevant to a 1.5C warmer world, showing which trade-offs are made, how, and why. Less relevant case-studies have been moved to other sections in the chapter where they fit better.
3144	51	38	51	38	Literaturedepicting different' should be 'Literature depicting different' [Robert Shapiro, United States of America]	Thank you. Resolved.
33458	51	38	51	38	Literature depicting [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
28924	51	38	59	8	We strongly recommend to change the current selection of case studies and examples in order to include a representative number of case studies for integrated planning and transformative adaptation/climate-resilient development pathways building on existent literature illustrating the synergies in implementing the Agenda 2030, the Paris Agreement and the Sendai Framework (the mentioned mixed of options, reducing potential negative trade-offs) considering inter alia the following aspects: strategies including financial instruments, economic diversification, livelihoods, food security, cities, ecosystems, technologies. [Germany]	Accepted. We have indeed changed this section considerably to present the most representative case studies while other case studies now appear in other sections of the chapter where they ensure a better fit. Section 5.6 summarises the literature on enabling conditions.
41260	51	38	51	39	sentence incomplete, not clear. [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
43136	51	38	51	39	The sentence "Literature depicting - - - global warming" needs rechecking as it seems to be incomplete. [Muhammad Mohsin IQBAL, Pakistan]	This sentence has been modified and is now grammatically correct.
52398	51	38	51	38	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed before submission of final government draft.
52782	51	38	62	2	This is a long section, on country and community experiences. It might be better to draw on this part in other sections, rather than having it as stand-alone. The case studies might be more helpful if integrated in the text. A landscape/map graph might be a better way to show case studies via an infographic. [Iulain Florin VLADU, Germany]	Accepted. We have indeed changed this section considerably to present the most representative case studies while other case studies now appear in other sections of the chapter where they ensure a better fit. We did not attempt an info graphic given that we only present 2 case studies here (incl. the Cross-chapter box). Section 5.6 summarises the literature on enabling conditions.
54332	51	38	51	38	Separate "literaturedepicting" [Christopher Bataille, Canada]	Editorial - copyedit to be completed before submission of final government draft.
55914	51	38	51	38	Space between literature and depicting [Debora Ley, Guatemala]	Editorial - copyedit to be completed before submission of final government draft.
55916	51	38	51	39	Sentence not coherent [Debora Ley, Guatemala]	This sentence has been modified and is now grammatically correct.
3146	51	39	51	39	above, degrees of global warming.' this clause makes no sense. [Robert Shapiro, United States of America]	This sentence has been modified and is now grammatically correct.
44768	51	41	51	41	Need to couch your requirement for CRDPs to embody 'stringent emission reductions' within the CBDR language [Penny Urquhart, South Africa]	rejected. Several countries argued strongly against the CBDR language.
52400	51	41	51	42	This would be easier to read as a numbered list (bullet points rather than paragraph form) [Jason Donev, Canada]	Section has been heavily edited and the numbering removed.
33460	51	43	51	43	regional, national, community-level [Sergio Aquino, Canada]	Sentence has been revised.
44770	51	46	51	47	This is a highly debatable interpretation of the literature and practice. Many processes do indeed include win-win situations along the way, and are not just constant processes of trade-offs. Suggest the author team revisits the literature to provide a more nuanced assessment of it. [Penny Urquhart, South Africa]	This sentence has been removed. We rely on the available literature where no cases show clear win-win situations. See also 5.5.1.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
52402	51	46	51	48	Wait a second, this point is buried and probably true, but at odds with the way the report is presented. As I've stated elsewhere, we need a consistent, clear thesis statement for this entire report. If the lack of win-win or triple win for these pathways is the conclusion of this report, and I think that it probably is (especially if nuclear power is taken off the table as this report seems to be trying to do, but not here specifically), then that needs to be clear from the outset and stated clearly throughout. [Jason Donev, Canada]	This sentence has been removed. The conclusion that there aren't any easy win-wins is now made more compellingly. See also 5.5.1, and 5.6 on enabling conditions.
52404	51	49	51	5	An awkward phrasing, please re-work. [Jason Donev, Canada]	The text has been substantially revised and reduced in length.
13264	52		53		Section 5.6.3.1 delete expressions such as "green economy", "green growth" and "green states". [Eleni Kaditi, Austria]	Rejected. Green growth and green economy are important concepts covered in the literature and relevant here.
44772	52	1	52	49	Make the link with 1.5 here. [Penny Urquhart, South Africa]	This section has been considerably shortened and now includes available literature specific to 1.5C.
3148	52	4	52	4	developem't should be 'development' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed before submission of final government draft.
41262	52	4	52	4	specific - not specifc [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
41264	52	4	52	4	development - not developem't [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
12776	52	17	52	26	Again, overly political - makes policy judgements based on values ("overly reliant on market mechanisms") not on the evidence [United Kingdom (of Great Britain and Northern Ireland)]	This section has been considerably shortened and all language cross-checked to avoid policy-prescriptive statements.
52406	52	17	52	2	I can't figure out what this means, what are the implications? What are you trying to say? [Jason Donev, Canada]	The section has been heavily edited and the sentence removed.
57152	52	19	52	2	I do not understand that sentence. What is 'best suited', as compared to what? What is the meaning of "to integrate green economy pathways with sustainable development" - isn't the green economy supposed to include sustainable development in itself (so that sentence would speak about integrating something with a part of itself) ? [Philippe Marbaix, Belgium]	This statement has been removed.
13772	52	28	52	29	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
10192	52	29	52	3	More clarification is needed on the issue of spill-over [Saudi Arabia]	The statement referring to spill-over has been removed.
12778	52	3	52	34	Very tehcnical language and hard to understand what you are trying to say - can you rephrase into language suitable for non-experts? [United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been modified to simplify language.
57154	52	3	52	3	Is "out-sourcing emissions" the topic of Holz et al 2017 ? I do not have that impression. Please check and adapt de reference (and/or sentence if needed). [Philippe Marbaix, Belgium]	The statement referring to spill-over has been removed.
52408	52	36	52	51	China and India are in the northern hemisphere, refering to them as part of the Global South is problematic. Later these countries are refered to as non-OECD. Is that better? [Jason Donev, Canada]	Now referred to as 'non-OECD'.
35430	52	37			The citation (Death 2014; Death 2015) shall be corrected as (Death, 2014; Death, 2015) [Regasa sagni, Ethiopia]	Editorial - copyedit to be completed before submission of final government draft.
3150	52	39	52	39	instance,has' should be 'instance, has' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed before submission of final government draft.
52410	52	46	52	48	I would stronly caution against throwing Brazil's hydropower under the bus here. Criticizing it is fine, but it is very low emission and provides power for a country that is extracting itself from poverty. [Jason Donev, Canada]	The example on Brazil has been shortened and reference to hydropower removed, given space constraints to provide a more nuanced assessment.
57156	52	46	52	49	This sentence is unclear and very long. While citing specific countries and situations is certainly useful to avoid being too vague, it should be made clear to what extent there are specific concerns in the cited country (here Brazil) or if it is only an example of broader issues. [Philippe Marbaix, Belgium]	This sentence has been modified to simplify language.
3152	52	48	52	48	country's Brazil's growing' should be 'country's growing' [Robert Shapiro, United States of America]	The section has been heavily edited and the sentence removed.
43138	52	48	52	48	Brazil's' seems to be redundant, may be deleted. [Muhammad Mohsin IQBAL, Pakistan]	Deleted.
53502	52	48	52	48	in the country's Brazil's -- delete either "the country's" or "Brazil's" [Christian Holz, Canada]	The section has been heavily edited and the sentence removed.
41266	52	55	52	55	add comma before 'to China's" [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
52412	53	4	53	4	An awkward phrasing, please re-work. [Jason Donev, Canada]	The section has been heavily edited and the sentence removed.
62874	53	4	53	4	Several chapters (2, 4, 5) have small items on stranded assets where they all stress their importance but give only a minor place to this issue. Would a cross chapter box be relevant? [Valérie Masson-Delmotte, France]	Given the space constraints of the chapter and the entire report, no additional cross-chapter box was possible. However, this case study has been moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in the GCC region. There is also a cross-chapter box on economics.
13774	53	9	53	9	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. Consistent with IPCC style guide.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28926	53	11	54	11	<p>Please revise Box 5.2 including its title. If reasonable shorten the box text it or delete it partly.</p> <p>1) Box 5.2 is currently titled "Low-Carbon Pathways in Oil-Producing Countries", however it only discusses the (important) example of transition challenges in the Gulf Cooperative Council (GCC) region. It may be helpful to include such a box in the chapter to illustrate challenges in resource dependent economies, but we would recommend to adjust the title in order to clarify that the Box is limited to the example of the GCC region. It would also be helpful to have some context whether the situation of these states can be considered typical or is very different from other oil-producing and exporting developing nations.</p> <p>2) The projected costs stated in box 5.2 are based on studies that might be too old to provide current figures of transformation costs. Please add current literature.</p> <p>3) It is not clear, when the development/construction of Masdar will be finished. Furthermore, we wonder what conclusions could be drawn from the Masdar project and used for other green city projects. The information provided seem to lack of relevance regarding the transfer of knowledge.</p> <p>4) For a more balanced account, consider to briefly highlight also more critical voices complementing Masdar's views. [Germany]</p>	The case study has been significantly revised and moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in the GCC region.
52414	53	11	53	42	The countries mentioned here are developing nuclear power as a way of reducing their GHG emissions and improving their energy security in a carbon constrained world. This should be discussed. Once again, I understand that looking at nuclear power is emotionally difficult, it was very hard for me to accept that nuclear power is such an important part of fighting climate change. We need to overcome our discomfort and recognize that nuclear power has provided more GHG-free electricity than all of wind, solar, geothermal and tidal power combined for the past 50 years. These countries recognize that and are pursuing nuclear power as part of their electricity mix for the coming decades. [Jason Donev, Canada]	Nuclear energy is discussed in 5.4.1.2.
57472	53	11			The description of the case studies here could be more balanced, i.e. with more specific assessment of the feasibility, challenges and problems associated with projects such as Masdar, and how far they can be realistic models for a 1.5C world. [Hans Poertner, Germany]	The case study has been moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in oil-producing countries.
3154	53	13	53	13	low costal lands' should be 'low coastal lands' [Robert Shapiro, United States of America]	The box has been revised and shortened, including needed editorial changes, It is now in 5.4.2.
50186	53	21	53	25	The cost numbers are for mitigation costs only. Co-benefits and avoided climate damage is not included. This is a one-sided and misleading way to portry costs. [Bert Metz, Netherlands]	The case study has been significantly revised and moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in the GCC region.
3156	53	32	53	32	in valuable' should be 'into valuable' [Robert Shapiro, United States of America]	The box has been revised and shortened, including needed editorial changes, It is now in 5.4.2.
13266	53	32	53	32	Delete the text "energy price reforms". [Eleni Kaditi, Austria]	The case study has been significantly revised and moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in the GCC region.
7508	53	34	53	34	Insert after "Griffiths, 2017b)": "Michaelowa et al. (2014) identified a significant potential and willingness for use of the market mechanisms of international climate policy in the GCC region". Reference: Michaelowa, Axel; Honegger, Matthias; Eschmann, Michael; Dransfeld, Björn; Krey, Matthias (2014): The role of CDM and NAMAs to promote greenhouse gas reductions in the GCC, in: Ferroukhi, Rabia; Luciani, Giacomo (eds.): Political Economy of Energy Reform: the Clean Energy-Fossil Fuel Balance in the Gulf States, Gerlach Press, Berlin & London, p. 143-182 [Axel Michaelowa, Switzerland]	The case study has been significantly revised, shortened and moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in GCC region. Due to space constraints, the suggested reference could not be included.
3158	53	36	53	36	and costal zones' should be 'and coastal zones' [Robert Shapiro, United States of America]	The box has been revised and shortened, including needed editorial changes, It is now in 5.4.2.
43140	53	4	53	4	in' may be replaced with 'is'. [Muhammad Mohsin IQBAL, Pakistan]	The box has been revised and shortened, including needed editorial changes, It is now in 5.4.2.
45418	53	44	54	9	The tone of the description of Masdar is wildly at odds with the characterisation in the cited article by Cugurullo which unflatteringly describes the city as a sandcastle and in a later uncited article as Frankenstein urbanism. IPCC needs to draw on all strands of literature and highlight disagreements. This might be a place. [Skea Jim, United Kingdom (of Great Britain and Northern Ireland)]	The case study has been significantly revised and moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in the GCC region. The discussion of Masdar has been removed.
52416	53	44	53	45	How are MENA and GCC different? [Jason Donev, Canada]	MENA includes all countries in North Africa, e.g. Morocco, but Morocco is not part of GCC.
62876	53	44	54	1	The last paragraphs of box 5.2 look like publicity rather than an assessment. What is the social dimension of the Masdar project? [Valérie Masson-Delmotte, France]	The case study has been significantly revised and moved to section 5.4 (see Box 5.2) where it has a better fit - mitigation options in the GCC region. The discussion of Masdar has been removed.
13776	54	12	54	12	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. Consistent with IPCC style guide.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12950	54	15			This section provides information on the Pacific States for regional and state-level planning and partnership efforts. The same can be reference for other small island developing states in particular the Caribbean islands and recommendation for reference to the publications "Regional organisations and climate change adaptation in small island states" -Robinson, Giffillan (2017), "Regional Framework for Achieving Development Framework for Climate Change" prepared by the Caribbean Community Climate Change Centre (5C's) and "Climate Change Adaptation trends in SIDS,- Robinson (2017) [Saint Kitts and Nevis]	Thank you. The reference has been recommended for inclusion in the cross chapter box on Caribbean SIDS.
32150	54	15	54	5	What is the relation between this case study of Pacific SIDS and SIDS in other regions? There should be some connections between this regional example and other SIDS. This is particularly important given that box 5.3 also focuses on a Pacific SID. Attention to other regions of SIDS needs to be reflected as they face similar challenges [Jamaica]	This case study focuses specifically on Pacific SIDS but cross-references others SIDS case studies (boxes) as described in Ch3 and Ch4.
32206	54	15			This section provides information on the Pacific States for regional and state-level planning and partnership efforts. The same can be referenced for other small island developing states in particular the Caribbean islands and recommendation for reference to the publications "Regional organisations and climate change adaptation in small island states" -Robinson, Giffillan (2017), "Regional Framework for Achieving Development Framework for Climate Change" prepared by the Caribbean Community Climate Change Centre (5C's) and "Climate Change Adaptation trends in SIDS,- Robinson (2017) [Jamaica]	Thank you. The reference has been recommended for inclusion in the cross chapter box on Caribbean SIDS.
36590	54	15	54	5	What is the relation between this case study of Pacific SIDS and SIDS in other regions? There should be some connections between this regional example and other SIDS. This is particularly important given that box 5.3 also focuses on a Pacific SID. Attention to other regions of SIDS needs to be reflected as they face similar challenges [Snialah Mahal, Saint Lucia]	This case study focuses specifically on Pacific SIDS but cross-references others SIDS case studies (boxes) as described in Ch3 and Ch4.
36596	54	15			This section provides information on the Pacific States for regional and state-level planning and partnership efforts. The same can be referenced for other small island developing states in particular the Caribbean islands and recommendation for reference to the publications "Regional organisations and climate change adaptation in small island states" -Robinson, Giffillan (2017), "Regional Framework for Achieving Development Framework for Climate Change" prepared by the Caribbean Community Climate Change Centre (5C's) and "Climate Change Adaptation trends in SIDS,- Robinson (2017) [Snialah Mahal, Saint Lucia]	Thank you. The reference has been recommended for inclusion in the cross chapter box on Caribbean SIDS.
38442	54	15	54	5	What is the relation between this case study of Pacific SIDS and SIDS in other regions? There should be some connections between this regional example and other SIDS. This is particularly important given that box 5.3 also focuses on a Pacific SID. Attention to other regions of SIDS needs to be reflected as they face similar challenges [Grenada]	This case study focuses specifically on Pacific SIDS but cross-references others SIDS case studies (boxes) as described in Ch3 and Ch4.
44038	54	15	54	5	What is the relation between this case study of Pacific SIDS and SIDS in other regions? There should be some connections between this regional example and other SIDS. This is particularly important given that box 5.3 also focuses on a Pacific SID. Attention to other regions of SIDS needs to be reflected as they face similar challenges [Carl-Friedrich Schleussner, Germany]	This case study focuses specifically on Pacific SIDS but cross-references others SIDS case studies (boxes) as described in Ch3 and Ch4.
45972	54	15	54	21	This section focuses on PSIDS and the way that they have led adaptation efforts. It should be mentioned that the Pacific region is the first region to produce a truly integrated regional strategy that addresses mitigation, adaptation, disaster risk reduction, low carbon development: Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management (FRDP) http://gsd.spc.int/frdp/ . The framework is now used only as a reference but should be mentioned by name, with an accompaying sentence explaining its significance. [Johanna Nalau, Australia]	Agreed, emphasis added.
58628	54	15			This section provides information on the Pacific States for regional and state-level planning and partnership efforts. The same can be reference for other small island developing states in particular the Caribbean islands and recommendation for reference to the publications "Regional organisations and climate change adaptation in small island states" -Robinson, Giffillan (2017), "Regional Framework for Achieving Development Framework for Climate Change" prepared by the Caribbean Community Climate Change Centre (5C's) and "Climate Change Adaptation trends in SIDS,- Robinson (2017) [Donovan CAMPBELL, Jamaica]	Thank you. The reference has been recommended for inclusion in the cross chapter box on Caribbean SIDS.
62878	54	15	54	5	too many acronyms (e.g; PSIDS, PRRP). Not needed. [Valérie Masson-Delmotte, France]	Deleted PRRP retained PSIDS an international term.
41268	54	43	54	43	add comma after 'however' [Maria Pia Carazo Ortiz, Germany]	Editorial - copyedit to be completed before submission of final government draft.
52418	54	43	54	43	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed before submission of final government draft.
24424	54	5	54	5	(MCCA, 2016)(see Box 5.3)", adjacency [Nazan AN, Turkey]	Editorial - copyedit to be completed before submission of final government draft.
13778	55	1	55	1	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
62880	55	1	56	2	There is potentially overlap with other boxes on risk management where examples from small islands are also developed. [Valérie Masson-Delmotte, France]	Now cross referenced to boxes 3.5 and 4.3. However this discussion here highlights the first integrated adaptation, mitigation and inclusive low carbon national plan that has been developed in Vanuatu as a leading example.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
45974	55	3	56	3	This box has been greatly improved from FOD and now will provide a better understanding of Vanuatu's adaptive capacity and situation. What is still missing from this explanation is also the role of Traditional Indigenous Knowledge: for example, during TC Pam, the traditional cyclone houses still saved many lives on the island of Tanna (worst hit by the cyclone). See eg Nalau, J., Handmer, J., & Dalesa, M. (2017). The role and capacity of government in a climate crisis: Cyclone Pam in Vanuatu, pp. 151-161. In W. Leal Filho (Ed.), Climate Change Adaptation in Pacific Countries: Fostering Resilience and Improving the Quality of Life.: Springer, Berlin. Traditional Knowledge and the traditional governance systems in particular in Vanuatu function outside the official climate adaptation policies and initiatives, and hence in the end have a much broader impact on people's lives than formal government adaptation projects and policies. This box should dwell a bit more into the details of adaptation governance as the majority of people in Vanuatu live in remote rural areas, and as such their development pathways look very different than those that are living closer to Port Vila and other emerging urban centres. This ties in with food security and for example GIZ has funded many initiatives that include considerations of climate resilient crops and livestock in such areas. The Sovacool et al. 2017 percentage of people living in rural areas should be double-checked: the percentage since 2012 has been 70-80%, and recently as low as 60%. Cyclone Pam damage assessment reports would have more recent figure unless that is what Sovacool is referring to. [Johanna Nalau, Australia]	Agreed, thank you we appreciate that you feel the box is improved - unfortunately severe space constraints prevent more emphasis in the 1.5 context, and a fuller discussion of the value of local knowledge will be carried over to the AR6 assessment. Reference noted.
44774	55	5	55	1	Would be useful to briefly spell out differences between 1.5 and 2 here. [Penny Urquhart, South Africa]	Agreed, cross referenced to Chapter 3 where differences between 1.5C and 2C are discussed.
52420	55	8	55	8	How are 'food' and 'food security' different? Isn't this just 'food'? [Jason Donev, Canada]	Correct term is food security.
57474	55	9	55	1	Is the degradation of coral reefs attributable to climate change or human action ? [Hans Poertner, Germany]	Cross reference to Chapter 3 where impacts on coral reefs are discussed.
57476	55	12	55	12	Why is the adaptive capacity "severely constrained" ? [Hans Poertner, Germany]	As De Le (2018) and colleagues note Vanuatu is highly exposed to tropical cyclones, tsunamis, volcanic eruptions, earthquakes and floods Vanuatu is "the worst affected country by the consequences of climate change as share of gross domestic product in the Pacific region "While Vanuatu shares similar vulnerabilities with many other SIDS, such as lack of infrastructure, weak governance, limited social security system, high levels of relative poverty and colonial history (Connell 2013). Vulnerabilities also include remoteness, lack of financial and technical capacities, dependence on imported goods and international aid, rapid rural-urban migration and loss of culture and knowledge through migration ". Although Vanuatu can call on 3000 years of significant local resources including "kinship networks, high sense of identity and community, unique cultural heritage, highly diversified livelihoods, strong local knowledge, remittances sent by relatives and extensive experience" The impact of Cyclone Pam 2015 impacting 70% of the population and subsequent impact on GDP highlights the severely constrained the capacity this nation faces compared for example to affluent and larger states with broader sources of income and less proximity to risk
52422	55	17	55	17	I regret to admit that I have no idea what Ni-Vanuatu means. [Jason Donev, Canada]	Ni-Vanuatu refers to citizens of Vanuatu like Canadians are citizens of Canada. We regret this sentence and this significant t term had to be removed because of space constraints.
57478	55	18	55	23	Adaptation plans and strategies are very common in SIDS. The real problem, however, is rather the implementation, enforcement, and monitoring of adaptation measures, laws and regulations. [Hans Poertner, Germany]	This is noted but there are other reasons in addition including difficulty in ensuring local priorities and voices are heard and adequate resourcing (Barnett and Waters 2017 Rethinking the Vulnerability of small states)
57480	55	37	55	37	Is is not clear why limiting NGO influence is desirable. [Hans Poertner, Germany]	See De Le 2018 for a discussion o the way external NGO priorities can subvert the needs and concerns of local populations and lead to duplication of effort However this section has been removed for length
57482	55	41	55	42	Above you state that adaptive capacity is "severely constrained"? This is now contradicted. Please clarify or correct one of the statements. [Hans Poertner, Germany]	There is no contradiction, traditional capacity is high but it is severely constrained given the increase in extreme events, but we thank the reviewers for pointing out the need to indicate this clearly and highlight multiple lines of evidence.
45976	55	42	55	42	barriers of knowledge is mentioned but in the context of Western science vs Traditional Knowledge, what kind of knowledge is referred to here? [Johanna Nalau, Australia]	Western science is not a term we use. Text clarified to indicate the knowledge recognised here includes local knowledge, women and youth insights.
45978	55	55	56	3	The serious damage of Cyclone Pam 2015 highlights the benefits and limits of resilient development effort by individual SPIDS (Ensor; Handmer and Iveson, 2017). TC Pam was a major defining disaster for Vanuatu: it fuelled international media attention never seen before in the country, set back the whole country's development pathway, etc. Therefore, this last sentence here would need to really highlight the extent of the disaster, and also raise the question for all SIDS: if development pathways are distructed by more extreme storms, how do you change the pathway? This is not relevant only for PSIDS but for example current examples in Puerto Rico and Barbuda. [Johanna Nalau, Australia]	Agreed. Cross referenced to Adaption cross chapter box in Ch4 and new reference Makay et al 2018 inserted to give emphasis to the point made.
57484	56	2	56	2	Use consistent acronym : SPIDS or PSIDS, etc. [Hans Poertner, Germany]	We have standardised the use of language for small island developing states and SIDS - see glossary.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
13780	56	5	56	5	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
36210	56	8			This section can benefit from a more critical approach to community-led and bottom-up approaches by pointing out and presenting evidence that it is essential to examine how these approaches perform especially from the perspective of the more disadvantaged, and whether they perpetuate caste, class and gender discrimination (Pieterse 2000; Cornwall 2003; Williams 2004). In a review of some 400 studies of community-based development and local decentralization programs, (Mansuri and Rao 2012) in a World Bank Policy Research Report find limited evidence that such programs reduce poverty or increase accountability and civic capacity. Such a critical approach could be helpful in analyzing what underlies such exclusionary outcomes in climate-resilient development pathways and how outcomes can be improved. Cornwall, Andrea. 2003. "Whose Voices? Whose Choices? Reflections on Gender and Participatory Development." World Development 31 (8): 1325–42. https://doi.org/10.1016/S0305-750X(03)00086-X . Mansuri, Ghazala, and Vijayendra Rao. 2012. Localizing Development: Does Participation Work? World Bank Publications. Pieterse, Jan Nederveen. 2000. "After Post-Development." Third World Quarterly 21 (2): 175–91. Williams, Glyn. 2004. "Evaluating Participatory Development: Tyranny, Power and (Re)Politicisation." Third World Quarterly 25 (3): 557–78. https://doi.org/10.1080/0143659042000191438 . [India]	We acknowledge this issue and AR6 will develop the arguments, given space constraints we note power imbalances can be embedded in development (box 5.3) but we are limited to citations of literature after AR5, in this report.
57486	56	9	56	9	The terms "communities of practice and place-specific communities" should be explained. [Hans Poertner, Germany]	These terms have been deleted.
13782	56	18	56	18	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
4400	56	22	56	27	It seems highly relevant to highlight that not all social movements are against market-based mechanisms for climate change mitigation. Examples of these movements, with particular focus on indigenous groups, are discussed for instance in "West TAP, 2016, Indigenous community benefits from a de-centralized approach to REDD+ in Brazil. Climate Policy 16, 924-939" and in "Shankland A and Hasenclever L, 2011, Indigenous peoples and the regulation of REDD+ in Brazil: Beyond the War of the Worlds? IDS Bulletin, 42(3), 80–88." [Thales A. P. West, Brazil]	Due to space constraints, this box on alternative development pathways and transnational movements had to be removed.
32896	56	22	56	32	the arguments put forward here seem to oppose climate justice (movements) with other alternative options such as REED+, climate-smart agriculture, Blue Carbon and green growth and bluntly state that these options perpetuate rather than reduce injustice. These are statements that may need a more qualified argumentation. This is the view of some of the authors cited in this box and perhaps it is actually true; but perhaps it would be advisable to explain or prove in a social scientifically way where the evidence of that lies or if this occurs in all cases. [J. David Tabara, Spain]	Due to space constraints, this box on alternative development pathways and transnational movements had to be removed.
52424	56	25	56	25	What does 'carbon complex' mean? [Jason Donev, Canada]	Phrase removed.
13268	56	26	56	26	Delete the text "green growth". [Eleni Kaditi, Austria]	Due to space constraints, this box on alternative development pathways and transnational movements had to be removed.
32694	56	48	56	51	I already commented on this section in the FOD review (Original comment: This part should be rephrased, especially the terms in "... The way it is it reads very subjective, even if the words are in "...). I still think it should be defused, as it appears that the perception of BECCS and carbon trading as a "false solution" is backed up by references and is common agreement. [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Due to space constraints, this box on alternative development pathways and transnational movements had to be removed. Only a very short, non-controversial mentioning of Buen Vivir is retained in FAQ2.
52426	56	48	56	52	The framing of the concerns about BECCS, carbon trading and so forth as a 'false solution' is problematic. I agree that BECCS and market based solutions are problematic, but this box needs to be consistent with the overall statement of the report. [Jason Donev, Canada]	This box has been removed.
13270	56	55	56	55	Delete the text "green growth". [Eleni Kaditi, Austria]	Due to space constraints, this box on alternative development pathways and transnational movements had to be removed.
13784	57	7	57	7	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
62882	57	1	58	6	too many acronyms introduced here (MERET, SLMP, FMNR)... [Valérie Masson-Delmotte, France]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. Acronyms have been retained when meaningful to the particular regional and project context.
33464	57	17	57	17	extra space - hotspots. Examples [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
28928	57	19	57	22	Please provide more information on "appropriate policy support" as well as "enabling conditions". Are there assessments available in the literature? [Germany]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit.
33218	57	25	57	26	additional references to add to the point on giving voice to women : Mary Robinson Foundation – Climate Justice (2015c) Women's participation: An enabler of Climate Justice. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ- Women-Participation-An-Enabler-of-Climate-Justice_2015.pdf UN Women & the Mary Robinson Foundation – Climate Justice (2016a). The Full View second edition. Ensuring a comprehensive approach to achieve the goal of gender balance in the UNFCCC process. Available online at https://www.mrfcj.org/wp-content/uploads/2016/11/MRFCJ-Full-View-Second-Edition.pdf [Tara Shine, Ireland]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. This particular reference could not be included.
28930	57	32	58	12	Please revise the three paragraphs and compare their content with box 5.5, please shorten or delete accordingly. [Germany]	This box has been significantly revised and shortened, and now sits in section 5.3, with a better fit.

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57488	57	34	57	35	Need to specify "iterative co-learning cycle of action research". [Hans Poertner, Germany]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. This particular expression has been removed.
33466	57	45	57	45	case of MERET [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
44776	57	55	58	12	Could place this paragraph after Box 5.5 [Penny Urquhart, South Africa]	Taken into account. The text has been substantially revised and reduced in length.
13786	58	14	58	14	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
44778	58	16	58	16	Suggest the box title include the notion that these are practices at scale, and that they are proposed as the basis for evolving CRDPs, to differentiate them from what a box in Chapter 4 might illustrate. E.g. 'Drylands ecosystem- and community-based practices at scale for evolution into CRDPs', or something along those lines. [Penny Urquhart, South Africa]	Taken into account. The box is now housed in Section 5.3 (see Box 5.1) and focuses predominately upon adaptation and mitigation strategies.
62884	58	17	59	8	an assessment of the adaptation potential is relevant here as well (not just the mitigation benefits). [Valérie Masson-Delmotte, France]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit.
28932	58	18	58	26	Please add information on the major enabling conditions of MERET. Why did MERET work so well? [Germany]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. It was not possible to provide a more in-depth assessment of MERET.
52428	58	18	58	2	This is neat-o, could a graphic be included somehow? [Jason Donev, Canada]	Thank you! Unfortunately we could not address your recommendation given tight space constraints.
10644	58	28	58	38	Recent literature from India on watershed development (WSD) questions seeing watershed development as a panacea. It's implications for adaptation are still to be tested. One empirical example that says WSD in India focusses on hard adaptation (check dams, fodder banks) but lesser on soft adaptation strategies (behavioural change, institution building etc.). See Singh C (2018) Is Participatory Watershed Development Building Local Adaptive Capacity? Findings from a case study in Rajasthan, India Environment and Development, DOI: 10.1016/j.envdev.2017.11.004 [Chandni Singh, Myanmar]	Thank you. We have included this useful reference in 5.3.3.
28934	58	28	58	31	Do the numbers refer to one year? [Germany]	Numbers refer to period 2012-2015.
36212	58	36	58	38	Increase in yield by 200%. More citations required to substantiate this. [India]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. The yield number has been removed.
40872	58	36	58	38	Increase in yield by 200% is overstatement.....must have occurred in one or two very low yielding farms and this can not be used as a generalized statement...please check the original paper or consider deleting this. [NARESH KUMAR SOORA, India]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. The yield number has been removed.
40870	58	38	58	38	adoption of heat stress tolerant varieties, adjusting sowing time, improved management led to improvement of yield by about 28-35% in rice, 20% in wheat, 28-41% in maize, 8-11% in mustard, 25% in chickpea, 22-40% in soybean in about 2200 farms in 24 villages of Mewat and Dhar districts of India (Naresh Kumar et al., 2014). ref: Naresh Kumar S., S.K. Bandyopadhyay, R.N. Padaria, A.K. Singh, Md. Rashid, Md. Wasim, Anuja, Ranjeet Kaur, D.N Swaroopa Rani, B.B. Panda, L.M. Garnayak, Suresh Prasad, M. Khanna, R.N. Sahoo and V.V. Singh 2014. Climatic Risks and Strategizing Agricultural Adaptation in Climatically Challenged Regions. IARI, New Delhi Publication. TB-ICN: 136/2014, P 106. download at http://www.iari.res.in/files/ClimaticRisks.pdf [NARESH KUMAR SOORA, India]	Due to space constraints, this entire section and the subsequent box have been significantly modified, shortened, and moved to section 5.3.2 as a supportive case study for ecosystem- and community-based adaptation, providing a better fit. The yield number has been removed.
13788	59	1	59	12	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
34608	59	22	59	22	It's suggested to change "vast major" to "vast majority" [Mexico]	Noted. The text has been substantially revised and editorials addressed.
43142	59	22	59	22	Please see if the word 'major' needs to be changed to 'majority'. [Muhammad Mohsin IQBAL, Pakistan]	Noted. The text has been substantially revised and editorials addressed.
5654	59	26	58	3	Appreciate that this chapter shows the nuances of communities, belief systems, narrative frameworks etc. Again, why only one example of an indigenous culture. Why not bring a longer paragraph here on religious communities, whose ways of engaging can look different and requires different narrative approach and pedagogies. One example is Katherine Hayhoe, who has ably functioned as a scientist speaking to evangelicals in ways they will be able to hear and engage in. climate pedagogy in terms of religious, ethnic and ethical frameworks is absolutely key. Again, please consider further strengthening treatment of the role of religious narratives and pedagogies in similar way as is done in these lines. Good job! [Marion Grau, Norway]	Thank you for the comment. We have tried to incorporate more examples on indigenous knowledge, including from the US, but could not secure the right CA within the short time frame.
41270	59	37	59	37	add space between 'urbanisation' and '(Dos Santos)' [Maria Pia Carazo Ortiz, Germany]	Reference removed.
44126	59	37	59	37	needs space between 'urbanisation (Dos Santos et' [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Reference removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
52430	59	37	39	37	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed before submission of final government draft.
6846	6		73		insert additional bibliography relating to suggestions made above: Heyd, T. and Gutberlet, J. in press: Waste governance and resilient communities. Resilient Cities: Re-thinking Urban Transformation, Tollin, N., Montasser, W., Grafakos, S., and Betancourth, C., Eds, Springer Book Series. King, M.F. and Gutberlet, J. 2013: Contribution of cooperative sector recycling to greenhouse gas emissions reduction: A case study of Ribeirão Pires, Brazil. Waste Management 33, 2771–2780. Tremblay, C., Gutberlet, J. and Peredo, A.M. 2010: United We Can: Resource recovery, place and social enterprise. Resources, Conservation and Recycling 54.7, 422-428. [Thomas Heyd, Canada]	Thank you for the references, but our task is to assess the post-AR5 literature (2014 and newer).
28936	6	1	6	6	The key message of "urbanisation-focused systems..." is not clear. Please revise or consider deleting. [Germany]	Text has been revised.
62886	6	1	61	55	I was looking for insights on energy insecurity in cities (poverty and heating of housing) here but did not find it. The box does not cover adaptation and is not explicit enough on the links with 1.5°C or 2°C warming (which imply ambitious mitigation). [Valérie Masson-Delmotte, France]	The text for this cross-chapter box has been significantly revised. There is now a more detailed discussion of transformation in the context of informality. Poverty and housing conditions are discussed. Adaptation occurs in local contexts, not in connections with global temperature averages. The box highlights opportunities and challenges for 1.5C compatible pathways and the needed urban transformations, and their ingredients, rather than discrete adaptation actions.
28938	6	9	6	1	The sentence is not clear. Please specify "urban metabolism". [Germany]	This sentence, including the term, has been removed.
54918	6	23	6	32	The first sentence is an interpretation therefore in order to avoid any misunderstanding it is would be advisable to refer the exact wording in the preamble no.15 of the Paris Agreement "recognition of the importance of engagement of all levels of governments". Throughout the paragraph, there are numerous attributions to the role of the networks of local and regional governments but it would be important to underline that they engage in the UNFCCC process officially through the "Local Governments and Municipal Authorities Constituency (LGMA) since 1995. [Yunus Arian, Germany]	The text for this cross-chapter box has been significantly revised. We no longer refer to the UN in the opening paragraph.
34612	6	25	6	32	It might provide a more clear idea if an example of multi-lateral agreements between cities could be mentioned. I would broaden the understanding of the potential implications (mitigation and sustainable development wise) and results of such alliances [Mexico]	The text for this cross-chapter box has been significantly revised. Due to space constraints, no discussion on multi-lateral agreements was possible. However, re reference Ch4, section 4.3.3. for additional discussions on cities.
34610	6	28	6	28	It's suggested to change "cities increasingly are connected" to "cities are increasingly connected" [Mexico]	Text has been removed.
28940	6	39	6	42	The section how climate change and cities interact could be further elaborated: Urbanizations means greater concentration of people and assets. Much of the urbanization takes places in hazard-prone areas (e.g. rivers and coastlines) and through informal settlements. This makes the impact of disasters in terms of human and economic losses particular devastating. Consider to insert 1-2 sentences that make this link more explicit. [Germany]	The text for this cross-chapter box has been significantly revised. Due to space constraints, no discussion on multi-lateral agreements was possible. However, re reference Ch4, section 4.3.3. for additional discussions on cities.
27	6	53	6	54	I would question the unambiguous assertion that electric vehicles represent some sort of absolute adaptation. The opportunity costs association with road development relative to alternative investments in mass transit represents a serious long-term maladaptation. I would request the appropriate qualification. [Jesse Keenan, United States of America]	This part has been removed.
55048	61	5	61	55	It is nice to see a dedicated box for one initiative "Transition Towns" But it would also be fair at least to refer to some other efforts. For example, carbonn Climate Registry, is a voluntary global reporting platform which captures information of more than 100 local and regional governments worldwide. Their voluntarily reported information is presented to the UNFCCC every year and this practice, along with many other inputs by LGMA constituency played a key role in the change of the mindset of the national governments towards a positive understanding in the potential and contributions of local and regional governments. It would be advisable to refer some of the data compiled in this report, such as their aggregate GHG reduction commitment reaching to 5GT by 2020 or availability of hundreds of GHG inventories and thousands of mitigation and adaptation actions. [Yunus Arian, Germany]	Thank you. However, due to space constraints, we were obligated to focus on one example from high-income contexts and one example from development/informality context.
3160	61	9	61	9	although mostlyin' should be 'although mostly in' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed before submission of final government draft.
44128	61	9	61	9	needs space between "mostly in" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed before submission of final government draft.
13272	61	12	61	12	Delete the text ", peak oil". [Eleni Kaditi, Austria]	Peak oil is a term very much at the centre of the Transition Town movement and hence it is retained here.
28942	61	16	61	17	Please revise: "energy efficiency through renewables". Energy efficiency and renewables are not interlinked as the text suggests. [Germany]	Corrected.
13790	61	22	61	22	Missing n dash [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
13792	61	22	61	22	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial to be completed before submission of final report.
35568	61	27	61	27	You could also cite the following for small scale rural experimental initiatives on democratic participatory governance and management of natural resources: Pathak, Neema, and Vivek Gour-Broome. "Tribal Self-Rule and Natural Resource Management: Community Based Conservation at Mendha-Lekha." Maharashtra, India, Kalpavriksh: Pune/Delhi and International Institute of Environment and Development (IIED) (2001). [Ashok Sreenivas, India]	Thank you for the references, but our task is to assess the post-AR5 literature (2014 and newer).
52432	61	3	61	3	What's a 'post-political trap'? [Jason Donev, Canada]	This part has been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
13794	61	35	61	36	Missing n dash [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
13796	61	46	61	46	Missing points [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
54108	62	1	85	1	comments made in 1st review have not been followed. Please stop using IPCC reports for anti-nuclear advocacy and start being serious about +1.5°C scenarios which include nuclear power, such as scenario "Efficiency-N" (IJGEI V40 N3/4 2017). Climate change cannot wait. Here is my comment from FOD: "The IPCC needs to reassess the impact potential of nuclear power for global warming mitigation. Neither the World Health Organization reports on the health consequences of Chernobyl and Fukushima, nor UNSCEAR studies, nor IAEA scenarios have been acknowledged in this chapter. Field research by Robert Baker et al. (http://www.nslr.ttu.edu/about/Outreach/Chernobyl%20Exhibit.pdf) shows that the effect of the catastrophe on wild life are not a reduction of biodiversity, but a greater number of individuals than is present in non radioactive sites beyond the 30 km zone. In fact, human impacts are more detrimental to wildlife than the world's worst nuclear power plant disaster. A quick comparison between the GHG intensity of France and Germany should help the IPCC realize that nuclear fission is an essential tool for mitigating global warming. The data is available online: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=FR-DE&page=6 " [Stephan Savarese, France]	It is not clear to which sub-section this comment pertains. Nuclear options are discussed in a short and revised paragraph in 5.4.1.2.
54564	62	5	63	28	Add reference to section 4.4.1 on Multilevel Governance [Paolo BERTOLDI, Italy]	Multi-level governance is now discussed in 5.6, with an abundance of relevant references.
28944	62	6	62	11	Are the SDGs mentioned and discussed in this paragraph the ones that are relevant or the ones for which literature is available? Please clarify and add a discussion of further SDGs if possible. [Germany]	This part has been removed from the cross-chapter box.
13798	62	21	62	21	Delete text [Poot-Delgado Carlos, Mexico]	Rejected. This is part of the TSU's formatting guidelines.
36214	62	24			Section 5.6.4 identifies four enabling conditions for sustainable and climate-resilient development pathways which includes inclusive governance; social learning; equity, rights and justice and monitoring and evaluation. An important enabling condition left out of discussion is climate finance to be made available by developed countries to developing countries. In so far as access to external funding is discussed, it is as a part of coherent and integrated institutions and governance, where the discussion revolves around engagement and alignment between international aid agencies and governance structures. UNFCCC mechanisms for finance such as Green Climate Fund is left undiscussed. Information on climate finance as an enabling condition for sustainable and climate-resilient pathways may be added. [India]	Thank you. Climate finance is now discussed in 5.6.1
14116	62	27	62	37	It might be useful to review this reference to add evidence: O'Neill, D. W., Fanning, A. L., Lamb, W. F., & Steinberger, J. K. (2018). A good life for all within planetary boundaries. Nature Sustainability. https://doi.org/10.1038/s41893-018-0021-4 [Meimailin Moreno, Venezuela]	Thank you for the reference. We use it in section 5.5 and 5.6.5.
52434	62	27	62	31	This is hard to read, could it be put into a list format as opposed to a paragraph format? Bullet points would make this easier to read. [Jason Donev, Canada]	Taken into account. The text has been revised to reduce length and improve readability.
52802	62	37	62	37	Citation needed here [Iulain Florin VLADU, Germany]	Section removed.
47022	62	4	62	4	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	All confidence language has been updated.
61682	62	44	62	46	Include sources and confidence rating for this statement as these are four rather disparate elements. [United States of America]	Confidence statements have been included for all sub-sections in the new 5.6 (enabling conditions).
28946	62	52	62	55	The growing role.... This is arguably too all-encompassing and contains value judgement. It appears that the role of all actors (from governments over citizens businesses and NGOs etc.) has grown. This raises the question whose role has diminished. Please reconsider and/or specify. [Germany]	This sentence has been modified. Non-state actors are now discussed in 5.6.2.
50004	62	52	62	55	What is the role of each stakeholders? A collaboration can be made if they can have an agreement on their role and responsibility. [Perdinan Perdinan, Indonesia]	This sentence has been modified. Non-state actors are now discussed in 5.6.2.
47246	62	55	62	55	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Done.
52436	63	22	63	24	The phrase 'right-based policies' is problematic. Is there another way to frame this? Human rights or 'correct'? The term right, in Europe, the US and Canada has another meaning on politics. I don't know how to re-phrase this though. [Jason Donev, Canada]	This sentence has been revised. Rights are addressed under reconsidering values in 5.6.5.
33220	63	25	63	28	add also references to human rights and gender equality [Tara Shine, Ireland]	Human rights are addressed under reconsidering values in 5.6.5. No literature that explicitly addresses gender equality in a 1.5C warmer world has been found, not counting the SDG on gender equality.
62888	63	31	63	55	Issues related to education, training, social learning, knowledge co production and sharing are also discussed in chapter 4 but are not prominent in key findings from chapters, while there are key for transformation and for 1.5°C pathways. A cross chapter discussion may be relevant. [Valérie Masson-Delmotte, France]	We cross-reference Ch4, section 4.3.5.5. and Box 4.3 regarding knowledge, in a revised paragraph under inclusive processes, 5.6.3.
52438	63	35	63	38	An awkward phrasing, please re-work. [Jason Donev, Canada]	Text has been substantially revised to reduce length and improve readability.
3162	63	38	62	38	of knowledges' should be 'of knowledge' [Robert Shapiro, United States of America]	Knowledges' has been removed from Chapter 5 in the final government draft.
9602	63	39		43	Very happy to see this point on knowledge co-production in climate resilience planning! [Joanna Petrasek MacDonald, Canada]	Thank you. Learning is now discussed under inclusive processes in 5.6.3.
13800	63	43	63	45	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial to be completed before submission of final report.

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3164	63	46	63	46	explore tools for, monitoring of and the' should be 'explore tools for monitoring of the' [Robert Shapiro, United States of America]	Text has been substantially revised to reduce length and improve readability.
32728	64	1			The expression "Justice" should be clarified and expanded beyond "procedural and distributive justice". There is abundant literature on environmental justice generally, and climate justice specifically, that could be referenced. See: Shue, Henry, Climate Justice: Vulnerability and Protection, 1st edition ed (Oxford: Oxford University Press, 2014). [Christopher Campbell-Durufé, Canada]	The term justice and associated sub-definitions are provided in the glossary. Relevant literature, incl. Shue and others, is assessed in the chapter, esp. in 5.5.3.
32726	64	1			The expression "rights, including rights to development" should be clarified and expanded beyond the notion of development, given the richness of existing legal sources and that apply to sustainable development. On the one hand, it is clear that international human rights form a core element of a CRDP. Most definitions, instruments and declarations on sustainable development include a reference to human rights. See for instance: Stockholm Declaration, Principle 1, and ILA New Delhi Declaration of Principles of International Law Relating to Sustainable Development, 2 April 2002, Principle 7 "The principle of integration and interrelationship, in particular in relation to human rights and social, economic and environmental objectives". SDG 16.B also refers to the substantive right to equality: "Promote and enforce non-discriminatory laws and policies for sustainable development". Furthermore, the institutional and procedural dimensions of the notion of rights (includin the notion of rule of law) are essential elements of a CRDP and should also be referenced. SDG 16.3 reads: "Promote the rule of law at the national and international levels and ensure equal access to justice for all". Likewise, New Delhi Principle 5 reads: "The principle of public participation and access to information and justice." [Christopher Campbell-Durufé, Canada]	Due to space constraints, we were not able to engage with this discussion in any detail. WE refer to rights, justice, and development as well-being where relevant in the chapter.
33222	64	1	64	4	additional referencesRobinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. Mary Robinson Foundation – Climate Justice (2015a) Rights for Action: Putting People at the Centre of Action on Climate Change. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Rights-for-Action-edition-2.pdf Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf [Tara Shine, Ireland]	Thank you. We cite Robinson and Shine 2018 in 5.6.5.
36216	64	1			Equity, rights and justice is identified as one of four enabling conditions for sustainable and climate-resilient development pathways. However, this section and the chapter 5 in general addresses the issue of power, justice, equity, equality and fairness at only the intra-country level, and at the level of community, household and individuals. The discussion on these issues may also take into account international equity, rights and justice and North-South relations. [India]	Thank you. Please refer to 5.5.3.2 for such international dimensions of equity. See 5.6.3 for rights and obligations between nations.
54176	64	2	64	16	No Mention of Legislative efforts (Eg see: http://www.climatelawgovernance.org/wp-content/uploads/2017/10/1-LWP-C-Schwarte-Legislation.pdf) or Climate Litigation (http://columbiacclimatelaw.com/files/2017/05/Burger-Gundlach-2017-05-UN-Envt-CC-Litigation.pdf) ? [Ayman Bel Hassan Cherkaoui, Morocco]	This would be beyond the scope of this section. Litigation is very briefly mentioned in the cross-chapter box on limits to adaptation and loss and damage.
61684	64	2	64	3	Language on "rights to development" should be removed; not all states recognize or have taken on obligations with respect to such a right. More generally, it is unclear what it means that these different things are "core elements" of CRDPs. [United States of America]	This sentence has been removed.
13802	64	3	64	4	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial to be completed before submission of final report.
13804	64	9	64	1	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial to be completed before submission of final report.
13806	64	15	64	16	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
57490	64	19			Need to be clearer about limitations for monitoring and evaluating climate resilient development, and implications of these limitations. [Hans Poertner, Germany]	Due to space constraints, this sub-section has been removed. Limitations regarding monitoring and evaluation are briefly discussed under knowledge gaps (5.7).
57908	64	19	64	55	The fourth level heading of "Indicators, Monitoring, and Evaluation" following the Cross-Chapter Box 5.1 on "Cities and Urban Transformation" can establish the expectation that benchmarking of cities will be addressed in the chapter. This is a valid approach that can support the "science for cities" theme. Additional information can be included to emphasize the use of composite indicators to provide benchmarking guidance for cities. The available references include 1) Tapia, C., Abajo, B., Feliu, E., Mendizabal, M., Martínez, J., Fernández, J., Laburu, T., Lejarazu, A., Profiling urban vulnerabilities to climate change: An indicator-based vulnerability assessment for European cities, Ecological Indicators, Vol. 78, pp. 142-155, 2017; 2) K?lk?s, S., Sustainable development of energy, water and environment systems index for Southeast European cities, Journal of Cleaner Production, Vol. 130, 222-234, 2016. [Sir KILKIS, Turkey]	Due to space constraints, this sub-section had to be removed. However, Ch4 discusses implementation of responses for cities.
28948	64	2	64	4	The section could be more explicit on existing M&E approaches and their shortcomings; in particular it could highlight more explicitly general methodological problems (e.g. attribution problem when it comes to monitoring adaptation progress or indicator development). Please refer to the following publications and references cited therein, available at: http://www.adaptationcommunity.net/monitoring-evaluation/ . [Germany]	Due to space constraints, this sub-section has been removed. Limitations regarding monitoring and evaluation are briefly discussed under knowledge gaps (5.7).
52440	64	23	64	23	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed before submission of final government draft.

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7510	64	25	64	25	Insert after "Mukute et al. 2017": "For example, Stadelmann et al. (2014) propose a set of two indicators "saved wealth and saved health" to assess adaptation activities." Reference: Stadelmann, Martin; Michaelowa, Axel; Butzengeiger-Geyer, Sonja; Köhler, Michel (2014): Universal Metrics to Compare the Effectiveness of Climate Change Adaptation Projects, in: Leal Filho, Walter (ed.): Handbook of climate change adaptation, Springer, Berlin, doi: 10.1007/978-3-642-40455-9_128-1 [Axel Michaelowa, Switzerland]	Due to space constraints, this sub-section has been removed. Limitations regarding monitoring and evaluation are briefly discussed under knowledge gaps (5.7).
13808	64	34	64	36	Review the order of bibliographic citations [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
3166	64	44	64	44	agency and capacity' should be 'and capacity' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed before submission of final government draft.
33468	64	44	53	44	2017) agency [Sergio Aquino, Canada]	Editorial to be completed before submission of final report.
13810	64	52	64	52	Missing n dash [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed before submission of final government draft.
33470	64	53	64	53	context and gender sensitive [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
52442	64	55	64	55	Please define M&E. [Jason Donev, Canada]	Text removed.
31636	65		66		Although supplementary policies for sustainable development and climate change mitigation in order to reduce adverse impacts are stressed in the overall synthesis, there is little evidence and argument about why it should be the 1.5°C target. This subsection mentions that the impact of climate change is larger in 2°C than 1.5°C, however, there is almost no statement with respect to relative difference of rapid and drastic transition between 2°C scenarios and 1.5°C scenarios. It is hard to understand the relationships between overall transition for sustainable development and 1.5°C pathways from this synthesis. [Japan]	The analysis of transitions in 1.5C and how it differs from 2C is conducted in Chapters 2 and Chapter 4. Chapter 5 builds on them to highlight the sustainable development dimensions of these transformations.
54508	65		65		This is generally an excellent summary, but it omits any significant discussion of an important point brought up earlier regarding the pace of changes and how SDGs and pace needed to meet 1.5C target might be difficult to synergise, and if they are synergised may hold other trade-offs. [Thomas Thornton, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This point on the articulation of paces of changes between SDGs and 1.5C has been added.
33472	65	1	65	1	2017). This is an important... [Sergio Aquino, Canada]	Editorial - copyedit to be completed before submission of final government draft.
54334	65	5	66	47	The executive summary needs to be rewritten to the clarity of the concluding synthesis, section 5.7, which is very good [Christopher Bataille, Canada]	Thank you. We have heavily revised the ES.
57492	65	5			This section lacks references to other sections and chapters in the report, which could be helpful for the reader. [Hans Poertner, Germany]	Sections of this chapter are explicitly cross-referenced in the synthesis.
57494	65	5			Too much stress on gaps. Highlight more what we do know, and where CRDPs can be considered as being on track and role models. [Hans Poertner, Germany]	This section is focused on knowledge gaps on purpose. It has a short synthesis upfront but given space constraints, it was not possible to repeat in-depth everything we learn from the chapter.
61686	65	5	66	47	This synthesis and research gaps section has no relationship to the rest of the chapter. It would serve the authors well to integrate what is not known back into the main chapter text. In particular the finding that there is no literature supporting the global level conclusion that adaptation will be lower in a 1.5°C world because higher levels of mitigation have been achieved is a very significant finding and deserves a thorough discussion in the main text. [United States of America]	The link between the synthesis and corresponding sections in the report is made explicit. The sections discuss the evidence found in the literature and not the information missing, which is instead only discussed in this section 5.7.
57910	65	7	66	47	The research gaps may emphasize the necessity for additional research to integrate sectors in cities based on cross-sectoral approaches. Related references include "Martos, A., Pacheco-Torres, R., Ordóñez, J., Jadraque-Gago, E., Towards successful environmental performance of sustainable cities: Intervening sectors. A review, Renewable and Sustainable Energy Reviews, Vol. 57, pp 479-495, 2016." [Siir KILKIS, Turkey]	The research gaps points to the pathways at different scales, including at the urban scale.
62890	65	7	66	44	This is not expected to be the conclusion of the report. I suggest to focus only on the knowledge gaps (not the research pathways that you recommend). [Valérie Masson-Delmotte, France]	The text has been reformulated in terms of knowledge gaps without normative statements about research pathways.
43144	65	16	65	16	Please see if the word 'arc' needs to be replaced with 'as'. [Muhammad Mohsin IQBAL, Pakistan]	Editorial has been addressed.
31634	65	18	65	2	There could be an analysis from another perspective that changing mindset of people is difficult and some reaction could occur when that failed (e.g. democratization) . [Japan]	The synthesis points explicitly that there is a set of conditions to be met in order to make the transformations possible.
44780	65	18	65	26	refer to UNFCCC and Paris Agreement to better ground this assessment and avoid overly normative language. [Penny Urquhart, South Africa]	The part of this section that synthesizes main findings of the chapter has been significantly reworked to avoid normative statements.
61688	65	18	65	2	The reference to "an ethical imperative" seems out of place in this report. [United States of America]	This expression has been deleted.
61690	65	18	65	2	It is not the responsibility of climate policies to solve multi-dimensional complex issues that are often unrelated to climate change. The authors should not call this an ethical imperative and should revise this section and the entire chapter significantly. [United States of America]	The mandate of this chapter is actually to analyse the multidimensional complex interplay between climate change and multiple dimensions connected to sustainable development, eradication of poverty and reducing inequalities. The "moral imperative" has been deleted.
61692	65	22	65	22	Is it necessarily the case that these objectives "are" mutually reinforcing? Aren't there situations in which pursuing development could undermine efforts towards 1.5°? Recommend moderating this statement, e.g., by saying that they "can be" mutually reinforcing in some circumstances. [United States of America]	The part of this section that synthesizes main findings of the chapter has been significantly reworked to avoid normative statements.

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32730	65	28			UNEP's Emission Gap Report 2017 suggests that the expression "business as usual" has fallen out of favour. Should a less fatalistic alternative be used throughout the IPCC's report ? UNEP, EGR 2017, Glossary, p. vii: "The term 'baseline scenario' is used interchangeably with 'reference scenario' and 'no policy scenario'. In much of the literature the term is also synonymous with the term 'business as usual' (BAU) scenario', although the term has fallen out of favour because the idea of 'business as usual' in century-long socioeconomic projections is hard to fathom." [Christopher Campbell-Durufé, Canada]	Thank you. The revised text does not use the expression "business-as-usual", which was indeed not appropriate.
63320	65	28	65	29	The findings underscore the numerous ethical dilemmas emerging from business-as-usual approaches and an entrenched binary logic that pits climate-first against development-first solutions. This report needs to be about achieving climate goals without endangering SDGs. Instead the thrust seems to be climate + SDGs or nothing - we are going to hold climate goals hostage to SDGs. The risk is failure to achieve either. How about a discussion of this possibility? [Greg Rau, United States of America]	This sentence has been deleted. The chapter identifies conditions for achieving jointly climate goal and sustainable development objectives, but also acknowledges the challenge. Notably, the lack of pathways in the literature achieving all objectives is pointed as a key research gap.
43146	65	3	65	3	Please see if the word 'warming' needs to be added after 1.5C. [Muhammad Mohsin IQBAL, Pakistan]	This section has been significantly edited and editorials addressed.
52444	65	34	65	4	The framing here is inconsistent with what's stated in page 51 lines 46-48. At the bare minimum, some mention of trade-offs is required here. The overall report does all boil down to the question of 'can we keep warming to 1.5C'. It is essential that the report provide a consistent, nuanced statement. Uncertainties are fine, but, ultimately, we can't be wishy-washy in any way. This report must clearly state what we can and can't do, what we do and don't know. [Jason Donev, Canada]	The statement has been reworked to reflect the evidence regarding trade-offs in sustainable and climate-resilient development pathways.
32732	65	36			Insert space after "come." [Christopher Campbell-Durufé, Canada]	Taken into account. The text for this section has changed significantly, so the comment is no longer relevant. Nonetheless, all spaces after periods were checked throughout.
44130	65	36	65	36	needs space between "come. Emerging" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text for this section has changed significantly, so the comment is no longer relevant. Nonetheless, all spaces after periods were checked throughout.
46322	65	37	65	37	delete "both" [Three, not two, items are then listed] [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text for this section has changed significantly, so the comment is no longer relevant.
61694	65	39	65	4	The 2030 Agenda is not a binding instrument and does not create a "mandate"; more accurate to refer to this, e.g., as an "aim". [United States of America]	Thank you. We refer only to it as an agenda.
50006	65	42	66	47	Money is the government needs for measuring the climate change responses. Although, CRDP and the triple win are complex, information on fundamental criteria for development of Money indicators that can be used by a country with respect to their NDC will help. This discussion can be supplied in a box. [Perdinan Perdinan, Indonesia]	Due to space constraints, a box on this specific topic could not be included. The challenge posed by measurement is explicitly acknowledged.
32734	65	43			The Paris Agreement and other texts use "response measures" instead of "response options". See among others Article 4(15). It may be appropriate to mirror this choice of language. [Christopher Campbell-Durufé, Canada]	Response measures and "response options" have a distinct meaning. The latter refers to individual, specific solutions that can be used to mitigate or adapt. The former has a broader meaning, understood as the ensemble of decisions made to reorient the pathways. We use both terms in the chapter, and in section 5.7, we indeed refer to "measures".
33224	65	46	65	51	there is also limited evidence of the impacts on human rights of 1.5 [Tara Shine, Ireland]	Human rights are now acknowledged.
38588	65	46	65	46	Sounds strange: "...evidence... that examines...". I guess you mean "studies" or "literature"? [Jan Fuglestad, Norway]	Thank you. Text edited accordingly.
61696	65	46	66	47	The section on knowledge gaps points to the challenge understanding the broad synergies and tradeoffs among adaptation, mitigation, and sustainable development through a global lens when the details of such tradeoffs and synergies are born out in very localized contexts. This section very usefully identifies some common needs across those local contexts such as the need for indicators of key outcomes and inclusive governance processes. An additional gap across many local contexts is the need for decision support capabilities that enable policymakers and other actors to anticipate the outcome of decisions on the indicators of importance as well as the uncertainties associated with those outcomes. [United States of America]	The need to anticipate the outcome of decisions on indicators is acknowledged.
33474	65	47	65	47	equality reduction [Sergio Aquino, Canada]	Noted. The text has been deleted. We use the term 'reducing inequalities' as per the plenary approved outline of the Special Report.
61698	65	48	65	5	The sentence is broadly applicable and the phrase "particularly those who are already disadvantaged" should be deleted, as done for the subsequent sentence. [United States of America]	Accepted.
61700	65	52	65	53	Rather than stating that the same research gaps exist for the 2°C scenario and stopping, it would be helpful to summarize those. [United States of America]	We have merged the first two gaps and provide more concrete details on what is missing.
12780	65	53	66	3	Just one of many sentences where the language is just much too convoluted [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been substantially edited and revised to improve clarity and to better reflect the underlying assessment.
38592	66	1	66	47	Several times on this page the authors write what is needed ("More studies are needed", "More literature is needed...", "More research is needed..."). In my view such statements should be avoided. Instead the authors can point to limited literature and lack of scientific basis, knowledge gaps. This could be coordinate across chapters [Jan Fuglestad, Norway]	The text has been edited to avoid such normative statements and only point to the knowledge gaps.
38590	66	4	66	4	You may consider replacing "locating" with "identifying". [Jan Fuglestad, Norway]	The text of this section has been significantly edited.

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14000	66	22	66	3	The question of sustainable development and 1.5°C climate goal poses an issue of multi-scale articulation. The implementation challenges of sustainable development, adaptation and mitigation measures are often more precisely understood at the local scale but the 1.5°C goal and several key enabling conditions of change (e.g., finance, technology) require a global-scale perspective. These two scales of analyses are largely investigated in disconnected bodies of literature. More structured literature is needed, that investigate the specificities of each local, regional, national context, to be directly policy relevant at these scales of decision, but that allows also to build a global trajectory emerging as a composite of these local visions. 30 ? Emerging literature suggests key ingredients This paragraphs includes technical lagnuage that makesee it hard to undesatnd for a non-specialist: 'structured', 'articulation', 'local visions'. please rewrite in simpler english. [Natalie MAHOWALD, United States of America]	Taken into account. The text has been substantially edited and revised to improve clarity and to better reflect the underlying assessment.
44782	66	22	66	25	Important contextual point, could appear earlier in the assessment. [Penny Urquhart, South Africa]	The multi-scale nature of the interactions and the need for appropriate governance structures connecting these scales is central in the discussion of enabling conditions in 5.6.
32736	66	22	66	42	A more explicit link could be made between current research gaps and the UNFCCC, the Kyoto Protocol, and the Paris Agreement, since they form an important part of the governance structure for a CRDP. The multiplicity of existing international law mechanisms (MRV, Transparency Framework, Global Stocktake, Compliance Committee, etc.) should be studied from the perspective of their contribution to development and justice priorities in the context of global decarbonization, especially inasmuch the actors involved with many of them will have the chance to learn iteratively as they take off the ground, and their procedures and guidelines may be developed experimentally on the basis of future research (e.g. Paris Rulebook). [Christopher Campbell-Durufié, Canada]	The need to connect governance structures at different scales is discussed in section 5.6. But defining how the Paris rulebook should specifically be designed goes beyond the mandate of this report.
63322	66	35	66	36	you mean?: "..... pathway choices and path dependencies along the spectrum of socially desirable to socially challenging climate solutions that are otherwise technically and economically feasible." [Greg Rau, United States of America]	Taken into account. The text for this section has changed significantly, so the comment is no longer relevant.
39072	66	43	66	47	There will always be more literature needed to capture the value of iterative learning in any field, but unfortunately in terms of global warming we lack the time to generate more literature hence with the current weight of evidence actions must be taken to ensure triple wins of adaptation, mitigation and sustainable development [Anish Paul Antony, United States of America]	This point has been deleted.
28950	67	1	69	47	The FAQ section is quite long. Instead of explaining only two or three broad question per chapter, we suggest to explain rather more than two or three questions that are more narrow. Please see also our comment on the FAQs on the entire report. [Germany]	FAQ1 has been shortened.
61702	67	7	67	8	The first sentence should be removed. The SDGs aren't the entirety of sustainable development policy, as this structure seems to imply. [United States of America]	Taken into account. The text has been revised in accordance with the comment.
50680	67	8	67	9	Sustainable development is closely linked with climate change, [ADD] and this is in line with SDG13, which is climate action. [Jasmin Irisha Jim Ilham, Malaysia]	Taken into account. The text has been revised in accordance with the comment.
33476	67	26	67	26	eliminate to - extreme poverty elimination [Sergio Aquino, Canada]	Text has been modified.
33478	67	26	67	26	areas (refer [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication.
18750	67	31	67	31	We suggest to use the "wedding cake" figure to illustrate the SDGs (i.e. the one with biosphere on the bottom, society in the middle and economy on the top). It represents pretty well that nature is the basis of economy and society and that economy should benefit society. [Andrea TILCHE, Belgium]	Thank you for your suggestion. However, we have decided to include a graphic that shows clearly the 17 SDGs without further grouping/disaggregation.
50682	67	37	67	39	...but that also cover policy design, implementation and behavioural changes. [ADD] Besides that, they need capacity building, and most importantly, financial aid. [Jasmin Irisha Jim Ilham, Malaysia]	This sentence has been deleted and the entire FAQ1 substantially modified, following suggestions from the TSU.
4406	67	43	67	43	Well-managed and protected forests can prevent emissions from deforestation and from forest degradation as well. References to support this claim can be found in "West TAP, Vidal E, Putz, FE. 2014. Forest biomass recovery after conventional and reduced-impact logging in Amazonian Brazil. Forest Ecology and Management 314, 59-63" and in the meta-analysis "Putz FE et al. 2012. Sustaining conservation values in selectively logged tropical forests: the attained and the attainable. Conservation Letters 5(4) 296-303. See "Barreto P et al., 1998. Costs and benefits of forest management for timber production in eastern Amazonia. For. Ecol. Manage. 108, 9-26" for a reference on costs of sustainable forest management based on reduced-impact logging compared to conventional/unsustainable logging in tropical native forests. [Thales A. P. West, Brazil]	The example on forestry management has been modified. Thank you for the references but the FAQs are meant to convey insights for a broad audience, without referencing specific literature.
28952	68	4	68	11	We appreciate the discussion about SDGs in the light of climate change. However, only few SDG are mentioned directly (SDG7, SDG16 and SDG17), others are mentioned indirectly (SDG1, SDG2, SDG3, SDG5, SDG6, SDG15). We suggest to include other SDGs as well in this discussion, in particular SDG10 (the reduction of inequalities was discussed in Chapter 5 extensively), sustainable economic development, infrastructure and cities and responsible consumption and production (SDG8, SDG9, SDG11, SDG12), education (SDG4), and also biodiversity on land (SDG15). Otherwise, please clarify if these SDG are not mentioned because they are not relevant or due to the lack of literature. [Germany]	More SDGs are now explicitly mentioned in FAQ1. Inequality is addressed in FAQ2.
47024	68	5	68	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Policy prescriptive language has been removed.

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61704	68	1	68	11	The statement "These are all supported explicitly within SDG 13, which targets climate action consistent with the Paris Agreement" is inaccurate because SDG 13 does not specify that the action be "consistent with the Paris Agreement". Suggest ending the sentence at SDG 13. Alternatively, replacing "consistent with" with the phrasing "which builds on the momentum of the Paris Agreement" would result in a correct formulation. [United States of America]	This sentence has been removed.
10194	68	13	68	18	More evidence required that SDGs priority can undermine climate adaptation and mitigation [Saudi Arabia]	This paragraph has been modified. FAQs are supposed to provide background information without repeating the evidence that the chapter sections assess.
44784	68	13	68	18	Would suggest that the chapter avoid giving the impression that CRD and SD are dichotomies, here and elsewhere in the chapter. The only way that SD can be approached in the world we now live in is through CRD. Making 'development' the priority would undermine adaptation and mitigation. But making sustainable development the priority necessitates CRD. [Penny Urquhart, South Africa]	This paragraph has been modified. FAQ1 does not address climate-resilient development (see FAQ2).
52770	68	13	68	18	The topic of equity needs more clarification throughout the chapter, and one way could be by moving this part from the FAQs forward. There is a need to refer to literature that says why equity is important. [Iulain Florin VLADU, Germany]	This paragraph in FAQ1 did not address equity. Equity is addressed in FAQ2, defined in the glossary and explained in Ch1.
52446	68	13	68	18	This framing is problematic. If we're going to hit the SDGs we need energy, but we need energy without the GHG emissions. Providing energy for people reduces poverty, reduces family size (and thereby reduces population growth). The goal is to prevent catastrophic climate change, but we must also keep in mind that if we do that at the cost of society then it will be for naught. This report is all about how we mitigate and reduce our impact. Doing so by reducing energy use beyond a certain point will hurt people. Please understand that like all Canadians, I use more than I need to maintain my quality of life, efficiency could provide tremendous benefits to Canada's energy intensity. Rapidly developing economies will wind up generating huge inefficiencies in their energy sector and leaving people in poverty because we don't want them using energy misses the whole point. We must find ways of keeping their carbon intensity strong while their energy intensity fluctuates wildly with rapid economic development. [Jason Donev, Canada]	This paragraph has been modified to avoid such problematic framing.
28954	68	14	68	15	The statement that "people escaping from poverty and hunger might consume more energy and land" is not supported by the evidence provided in Ch 5. We therefore suggest to revise the text in the FAQ or delete it. Please see also our comment on the FAQs on the entire report. [Germany]	This sentence has been removed.
62892	68	14	68	14	I suggest to rewrite this sentence to : "if the increased consumption of people escaping poverty and hunger leads to increased greenhouse gas emissions" ... "drive increase fossil fuel use and associated greenhouse gas emissions". [Valérie Masson-Delmotte, France]	This paragraph has been modified and the link to consumption removed.
13274	68	15	68	15	Delete the text ", or goals for economic growth and industrialization drive increased fossil fuel consumption". [Eleni Kaditi, Austria]	This sentence has been modified and now refers to a switch from fossil fuels.
47026	68	21	68	21	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Policy prescriptive language has been removed.
22782	68	26	69	47	Very few are mentioned on the difference between 2 and 1.5 degree from the SDGs' point of view. It is too lengthy only for description on the relation between climate change and SDGs. [Shuzo Nishioka, Japan]	The FAQs are meant to be accessible to a wide audience and not repeat the assessment of the chapter sections. We were asked to avoid assessments in the FAQs.
61706	68	26	69	47	The usefulness of this question is limited and the alternative suggestion is worse. Terms such as equity, justice, and fairness have no commonly agreed upon definition. The IPCC should not assume that a common decision exists or impose its own definition. [United States of America]	The original title for this FAQ was maintained (not the alternative). Definitions relevant to this Special Report are provided in the glossary, including equity, justice, and fairness.
62894	68	3	69	47	The penultimate paragraph is only referring to low carbon future and does not include adaptation or risk management. The last paragraph does not refer to adaptation but only low carbon. [Valérie Masson-Delmotte, France]	FAQ 5.2 Fig1 includes adaptation in the sub-heading. Indeed, adaptation and risk management are not explicitly mentioned in the examples, however, they show development pathways that are equitable and contribute to reducing inequalities, given the title of the FAQ. Very few, if any examples, address all possible angles of CRDPs.
33226	68	32	68	55	Important to include in this FAQ a reference to human rights and gender equality (as aspects of equity and justice) - and in line with the Paris Agreement (preamble) 'Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity' [Tara Shine, Ireland]	The text for the FAQs has been revised and simplified, based on suggestions of the TSU, to avoid repeating findings from the chapter. The UNFCCC preamble is beyond the scope of a FAQ.
47248	68	38	68	38	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Corrected.
28956	68	39	68	41	We appreciate the clarity of the statement, that "1.5°C-compatible development pathways generate more benefits than those that reach 2°C warming or higher." We suggest to highlight this statement within chapter 5 supported by scientific evidence. Furthermore, we suggest to be more specific on the "benefits" that are generated. Are benefits considered as they are considered throughout chapter 5 (benefits with SDGs)? (c.f. p. 69 li. 32-34). If the statement cannot be supported by scientific evidence in Ch 5, please consider revising or deletion in the FAQ. Please see also our comment on the FAQs on the entire report. [Germany]	This sentence has been removed.

IPCC WGI SR15 Second Order Draft Review Comments And Responses - Chapter 5

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9594	69	3		6	Indigenous communities in the Arctic are identified several times throughout the report as among those with the highest vulnerability. It would be useful to include a profile of some Arctic communities where immense change and impacts have been experienced and there are examples of truly innovative adaptation action. Furthermore, it is disappointing that knowledge holders from these communities were not engaged in the development of this report. [Joanna Petrasek MacDonald, Canada]	Ch4 covers adaptation action among Arctic communities, including a case study in Cross-Chapter Box 9. Such specific descriptions would go beyond the scope of a FAQ. Authors have been nominated by individual countries and selected by the IPCC Bureau.
13812	69	17	69	17	Space [Poot-Delgado Carlos, Mexico]	Editorial - copyedit to be completed prior to publication.
52448	69	17	69	17	This line (or lines) is missing a space (or more than one). There seems to have been some sort of problem in converting this document to pdf. [Jason Donev, Canada]	Editorial - copyedit to be completed prior to publication.
47250	69	2	69	22	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Corrected.
13276	69	39	69	39	Delete the text "creating green jobs and". [Eleni Kaditi, Austria]	Replaced with 'environmentally friendly jobs'.
57778	76	47	76	47	The reference is incomplete. It should be 'Simon Caney 2016a. 'Climate Change, Equity, and Stranded Assets' (Oxfam America: Research Backgrounder). This is available at: https://www.oxfamamerica.org/static/media/files/climate_change_equity_and_stranded_assets_backgrounder.pdf [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. Details updated.
53456	77	17	77	17	According to the CERC website (https://climateequityreference.org/calculator-about/#how-to-cite) the preferred reference is: Kemp-Benedict, Eric, Christian Holz, Paul Baer, Tom Athanaisou, and Sivan Kartha (2017) The Climate Equity Reference Calculator. Berkeley and Somerville: Climate Equity Reference Project (EcoEquity and Stockholm Environment Institute), [Online]. https://calculator.climateequityreference.org [Christian Holz, Canada]	Thank you. Details updated.
45698	79	25	79	25	This reference is grey literature that is not peer reviewed and is therefore not valid: CSO Review 2015. Please remove. [Yann Robiou du Pont, France]	Rejected. As per IPCC guidelines, we can include grey literature in our assessment where appropriate.
53454	79	25	79	26	The reference can be enhanced by quoting the DOI of the report: 10.6084/m9.figshare.5917399 [Christian Holz, Canada]	Thank you. Details updated.
46324	94	7	94	11	delete 'a' after 2016 in line 7 and delete 'b' after 2016 in line 11 because J.-Y. Liu and W. Liu are different people [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Editorial: to be completed before final submission.
46328	95	37	95	37	mark one 2015 as 2015a and the other 2015 as 2015b [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. The text have been substantially revised and shortened. Unfortunately, as a consequence, these references were removed.
30810	95	52	95	57	This article is referenced twice [France]	Editorial: to be completed before final submission.
46318	15	15	15	16	2014a and 2014b are the same - collapse into a single 2014 [Henry Shue, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Thank you.
30814	114	1			Table 5.1 : A definition of what this Nilsson score is and how it is calculated is missing. [France]	Accepted: The name of Nilsson Score has been changed into SDG Interaction Score and is explained in the Glossary.
10610	114	3	132	1	The texts in the tables are not readable. [Hong Yang, Switzerland]	Accepted: we expect revised version is readable.
46000	232	48	232	48	Submitted paper should be confirmed before the final draft and available for discussion of final assessment. [Hiroyuki ENOMOTO, Japan]	Accepted: all papers that were not published in time were removed.