

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
11523	0	0	0	0	This chapter attempts to show how transition and transformation pathways are linked to climate actions. SR1.5 report also showed these relationships in the context of sustainable development (SD). Now it is time to show some examples of actions for implementing these pathways towards achieving climate change mitigation (and adaptation) and SD.	Accepted. We will include literature on actions if this is available	Rawshan Ara Beg	Universiti kebangsaan Malaysia (UKM)	Malaysia
12957	0	0	0	0	This is a very general chapter; nothing much to bite into. It should focus on avenues for acceleration, costs of acceleration and comparative analyses of adaptation and mitigation at different time scales.	Noted The chapter will be updated with more concrete cross-cutting results based on the other chapters	Prashant Goswan	Institute of Frontier Science and Application	India
22935	0	0	0	0	This whole chapter could do a lot better is discussing regional differences in impacts of climate change. Sub-Saharan Africa is likely going to be one of the regions most impacted by climate change and the last capable in combatting it for various reasons (weak institutions, lack of infrastructure, impoverished people). If they are to meet the SDGs or create real economic growth, must they be held to the same standards as richer more high emitting countries? Countries whose industrial revolutions happened decades ago without the same environmental restrictions? What about countries at risk or in debt distress for whom more extensive transitions are not possible?	Accepted We will expand our discussions about Just Transitions, and this will address many of the issues raised	Kelsey Ross	The Center for Global Development	United States of America
25499	0	0	0	0	Introduce quantitative findings on potential macro-economic implications and trade-offs in regards to achieving other SDGs (e.g. on poverty, economic growth, water scarcity, land use, etc.).	Accepted	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
25501	0	0	0	0	Analysis should elaborate further on issues related to equity, as mitigation policies could adversely affect the development aspirations of developing countries.	Accepted The equity issues will be addressed in more depth	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
13881	0	0			Indigenous knowledge, as well as the full implementation of UNDRIP, could be incorporated in this chapter. Indigenous people have thousands of years of experience in sustainable development, and sustainable food systems. There are also numerous contemporary examples of Indigenous governing bodies demonstrating leadership and developing 'differently' under their own authority and jurisdictions. Indigenous partnerships and free, prior and informed consent must be the new norm moving forward. Free, prior and informed consent will be required of sustainable development projects and climate mitigation solutions proposed on Indigenous territorial and/or ancestral lands and waters.	Accepted We will look for studies	Bridget Doyle	Tsleil-Waututh Nation	Canada
2271	0				The chapter should also incorporate the deployment of CDR techniques in the sustainable development context. See e.g. https://www.annualreviews.org/doi/full/10.1146/annurev-environ-101718-033129 and chapter 7	Noted We will coordinate with chapter 7 and see if there is a special perspective for us to cover	Sara Vicca	University of Antwerp	Belgium
3037	0				1- Executive summary is mitigation centric. SD necessarily requires addressing adaptation, finance, and access to technology. These dimensions are barely reflected. 2- What are the SD implications for differentiated responsibilities (CBDR) and national circumstances, loss and damage, and to the concept of "just transition" in the context of climate change and low-carbon transitions.	Partially accepted. We will refer to the main chapter considering this	Mustafa Babiker	Aramco	Saudi Arabia
3315	0				This chapter is somehow academic. It might become more relevant for the real world if the authors would use the regular annual edition of the report titled, 'Progressing National SDGs Implementation,' to inform this chapter. It might be useful to identify "champions" in integrating climate change policies with policies addressing the SDGs and provide examples, e.g. in boxes, to identify what has been successful.	Noted We will look for study results in the report	Klaus Radunsky	retired from Umweltbundesamt	Austria

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5247		0			The mainly reduction of pages would be among point 17.3 and 17.4 (go from page 17 to page 61). Mainly in point 17.3	Rejected Many new issues to be covered in Section 17.3 have been raised including just transitions. We also have to add more material from the other chapters	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
17871		0			"This chapter attempts to show how transition and transformation pathways are linked to climate actions. SR1.5 report also showed these relationships in the context of sustainable development (SD). Now it is time to show some examples of actions for implementing these pathways towards achieving climate change mitigation (and adaptation) and SD."	Accepted Actions will be included if they are addressed in studies. AR5 is not only about 1.5 degrees	Rawshan Ara Beg	Universiti kebangsaan Malaysia (UKM)	Malaysia
28225		0			In section 17.3.3.6. Transporttation it would be good to refer to the linkage between components of global roadmap for decarbonization of transport and the impacts on the SDGs. http://www.ppmc-transport.org/wp-content/uploads/2016/04/GMR2017.pdf . A peer reviewed -interactive process resulted in 23 Quick wins in the Transport Sector to address Climate Change and Sustainable Development : http://www.ppmc-transport.org/wp-content/uploads/2016/11/SLoCaT-Quick-Wins-Report-1.pdf	Accepted, we will take the study results into account	Cornie Huizenga	CESG	Germany
28527		0			Chapter 17 provides an overview on options to accelerate transition towards low-emissions and climate resilient sustainable development pathways. The chapter is well-structured and based on robust scientific data. However, authors can better engage with the scholarship on sustainability transitions in general and in agri-food systems in particular. Moreover, more attention can be paid to the role of civil society and social movements in transitions. For instance, see: El Bilali, H. (2019a). Research on agro-food sustainability transitions: A systematic review of research themes and an analysis of research gaps. <i>Journal of Cleaner Production</i> , 221, 353–364. https://doi.org/10.1016/j.jclepro.2019.02.232 ; European Environment Agency. (2016). <i>Sustainability Transitions: Now for the long term</i> . Copenhagen; Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., ... Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. <i>Environmental Innovation and Societal Transitions</i> , 31, 1–32. https://doi.org/10.1016/j.eist.2019.01.004 . In this respect, the 3D (Direction, Distribution, Diversity) approach suggested by the STEPS Centre (Innovation, Sustainability, Development: A New Manifesto - https://steps-centre.org/publication/innovation-sustainability-development-a-new-manifesto) can help better framing discussion on pathways towards climate-neutral sustainable development.	Accepted Thank you for suggesting studies on civil society and social movements	Hamid El Bilali	International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari)	Italy

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34565		0			The Exec Summary is interesting. I couldn't go in depth in the chapter, having focused mainly on other chapters, but offer some reflections. First and foremost – I had expected in some way that Chapter 17 would try and draw together some broad and cross-cutting insights from the body of the report. Obviously, the ability to do this in depth has been limited since the authors would only have had access to the Zero order drafts and subsequent drafts prior to final FOD, but the lack of reference to other chapters is striking. On a quick scan, the only pages of this chapter which appear contain any cross reference to other WGIII chapters are p.14 and 17 (to Chs. 3, 4, 6), p. 22 (refs Ch.6), and p.45 (referring to tables to be completed in the SOD). It may be that I had misunderstood the intent of this chapter, and that it is in fact intended to be substantially stand-alone, apart from the compilation tables to be compiled in the SOD; it would be useful to clarify this. But, inevitably, Chapters 1 and 17 will be seen as the “bookend” chapters of the report and it would be helpful if at least these two could perhaps draw some common themes and show some intellectual connection, which seems largely lacking at present.	Accepted It is our plan to include more cross references, but the ZOD had very limited material on the Chapter 17 issues	Michael Grubb	UCL - Institute of Sustainable Resources	United Kingdom (of Great Britain and Northern Ireland)
34567		0			For a chapter as broad in scope as this, diversity of authors, disciplines and perspectives will be important. The optics of having all three of the contributing authors from the same country as one of the CLAs (I don't know about disciplines) is not ideal.	Noted There is a mistake in the listing of contributing authors, there are only two, and they are both very relevant to the topics of the chapter	Michael Grubb	UCL - Institute of Sustainable Resources	United Kingdom (of Great Britain and Northern Ireland)
34569		0			The chapter rightly has significant sections on transitions. But there seem to be almost no reference to what in the field is known as the 'multi-level perspective', on which I am told more than 1000 papers have been published since its origins with work by Frank Geels (who is not cited). This is potentially a little awkward since the MLP framework is not only flagged in Chapter 1 as a potentially useful framework for analyzing transitions, but is significantly referred to in several other chapters for that reason. The MLP perspective clearly needs to be included as part of a credible review and assessment on transitions, and related to the insights in other chapters.	Accepted We cover the MLP and can add a reference to Frank Geels	Michael Grubb	UCL - Institute of Sustainable Resources	United Kingdom (of Great Britain and Northern Ireland)
34571		0			The chapter makes relatively little use of the economics literature. The IPCC has previously been criticized for being too dominated by mainstream economics, but I wonder if this Chapter 17 takes it too far in the opposite direction. I haven't done a count, but my impression is that in more than 20 pages of references, 'mainstream' economic journals – however broadly interpreted - appear barely a dozen times. In its limited discussions of economics, chapter should note various branches of economic theory - not in detail obviously, but at least recognizing that whilst neoclassical economics is one (important) branch, there are many others which have also been used to shed light on climate change and sustainable development. The section that focuses on economic theory (17.2.2.4 Economic theories) could benefit from reference to more than two or three economists. Note also (Table 17.1) that integrated assessment models do not in any way form evidence for economic theories, most rely on a fairly specific of them (far narrower than General Equilibrium theory itself).	Accepted We will add references to discussions of economic theory in other chapters, when it is directly relevant to studies in terms of major assumptions, structure, and the interpretation of results	Michael Grubb	UCL - Institute of Sustainable Resources	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
37729	0				<p>What happened to the wonderful analysis framework and findings of Special Report on 1.5°C and it's SPM.4 figure? That mapping of CC policies against SDGs was a major achievement and leap forward. AR6 cannot be complete without such a mapping, further developed, and including adaptation interventions. Missing this in chapter 17 is a major concern.</p> <p>Is Table 17.2 supposed to become a further developed version of SR1.5 SPM.4? If so, I have three major concerns:</p> <ol style="list-style-type: none"> 1. this work is fundamental and should therefore be properly reviewed by the expert reviewers. Since it is missing in FOD, it should be in SOD and no later. 2. the current layout of table 17.2 is risky in terms of it's 2°C and 1.5°C reference. What is meant by that? The authors of chapter 17 must be aware that the Paris Agreement refers to both "well below 2°C" and the 1.5°C limit as one goal, i.e. the goal of Art. 2 of the PA is to hold warming "well below 2°C" and simultaneously pursue the 1.5°C limit. The PA does therefore, legally, not have two temperature goals, or something. It has one single long-term goal related to temperature, with a reference to two temperature limits. 3. Chapter 17 authors must also be aware that in Chapter 3 there is an incorrect categorization of scenarios as "below 2°C" or "well below 2°C". This is essential to be aware of when compiling results from other chapter into chapter 17. To be specific: <ul style="list-style-type: none"> • Pre-Paris, the 2010 Cancun language was 'below 2°C'. In response to that, the IPCC AR5 presented the likely (66%) below 2°C category. This has in turn been taken up by the UNFCCC. Both the preambles of the Doha and Lima decisions (COP 19 and COP20) refer to pathways with 'a likely chance' and Paragraph 17 1/CP.21 explicitly mentions a 40 Gt limit in 2030 that is linked to 66% 2°C pathways. • The introduction of 'well below 2°C' in the Paris Agreement represents a 	Accepted We are working on a mapping jointly with other chapters	Michiel Schaeffer	Climate Analytics	Netherlands
37731	0				<p>(continued)</p> <p>This WG3 draft in chapter 3 is now shifting the goalpost on 2°C. A 50% 2°C pathway becomes 'below 2°C' (which is at odds with what is commonly understood by the word 'below') and a 66% chance of 2°C, which as always been linked to 'below' 2°C now suddenly becomes 'well below' 2°C (compare table 3.3). This is highly policy prescriptive and arguably in contradiction with the evidence available on how to interpret the PA goal. Rather than interpret the PA, the IPCC should provide different 2°C pathways and label this factually, not normative (in terms of -wrong- interpretations of PA language). The IPCC has calibrated likelihood language that can be deployed here.</p> <p>See also Schleussner, C.-F., Lissner, T. K., Rogelj, J., Fischer, E. M., Knutti, R., Licker, R., Levermann, A., Frieler, K., Schaeffer, M. and Hare, W. (2016) "Science and policy characteristics of the Paris Agreement temperature goal", Nature Climate Change 6, 827–835, doi:10.1038/nclimate3096.</p>	Noted We will leave the response to chapter 3	Michiel Schaeffer	Climate Analytics	Netherlands

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37733		0			<p>(continued)</p> <p>and the following fragment from Wachsmuth et al (2019) "The EU long-term strategy to reduce GHG emissions in light of the Paris Agreement and the IPCC Special Report on 1.5°C", Fraunhofer ISI Working Paper Sustainability and Innovation</p> <p>No. S 22/2018:</p> <p>"The core scientific basis for mitigation pathways that underpinned the Cancun Agreements and subsequent literature, and the work of the SED on the 2013-2015 Review of the adequacy of the long-term goal (all preceding the Paris Agreement) systematically characterized the Cancun "hold below 2°C" global goal using pathways that limited warming to below 2°C with a chance of at least 66%, or "likely" in IPCC terms [15]. The decision to strengthen the long-term goal therefore has to be seen with reference to this context, which frames the negotiations over the ambition elements of the Paris Agreement. The Paris Agreement LTTG strengthens the former Cancun temperature goal by referring to holding warming "well below 2°C" and, in this context, pursuing efforts to limit warming to 1.5°C. It therefore signals that warming needs to be held to a lower level than in the former (Cancun) goal, and hence increase both margin and likelihood by which warming is to be kept below 2°C compared to merely "hold below 2°C" [4]."</p>	See the comment above	Michiel Schaeffer	Climate Analytics	Netherlands
46685		0			<p>I encourage the authors to use the GSDR 2019 framework more thoroughly: it concluded the transformations needed to achieve the SDGs must use 4 levers across 6 entry points (including energy decarbonization and universal access). As a co-author of the GSDR 2019, I would be happy to contribute a few paragraphs along those lines. NB: the reference to GSDR 2019 is not correct in the bibliography.</p>	Accepted We will take a look at the report again and see if there are relevant results	Jean-Pascal van Y	Université catholique	Belgium
46759		0			<p>Please consider the findings regarding co-benefits presented in the major review Mikael Karlsson, Eva Alfredsson & Nils Westling (2020) Climate policy co-benefits: a review, Climate Policy, DOI: 10.1080/14693062.2020.1724070.</p>	Accepted	Mikael Karlsson	KTH Royal Institute of Technology	Sweden

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44139	1	1	59	15	In addition to not employing a one-size-fits-all approach to a highly complicated, complex, and individualized problem, I believe there's an important case to be made for reparations in the framing of the way forward. Dehistoricized sustainable development discourse views 'developing' countries as reliant upon the benevolence and good example of 'developed' countries. This discursive ranking not only reiterates colonial power dichotomies, but also grants "moral prestige to the neoliberal counter-attack on the struggle for post-colonial economic justice and thus [is], indeed, complicit in the dramatic deepening of inequality that has been its consequence" (Maldonado Torres 15). The otherization of the 'developing' countries frames sustainable development initiatives as benevolent aid and shifts the discourse away from a reparations discussion and towards blame on postcolonial governments who failed to liberalize their markets and therefore, squandered opportunities to 'develop'. Such failure by the unenlightened 'developing' countries enables neoliberals to argue for equality before global emission reduction demands and to stifle redistribution, foreign aid, and reparations. Embracing the notion of 'sustainable development' along market lines, neoliberal economists mobilized it "to curtail the range of feasible political options and to licence interventions into post-colonial societies [and] bolster their own agenda of imposing market discipline on former colonies ...The human rights discourse they developed aimed to provide an institutional and moral foundation for a competitive market economy and to shape entrepreneurial subjects."(Maldonado Torres 24). With the racialized ideological underpinnings ignored, "people of the global South become 'objects' of development for overwhelmingly white experts" (Kalpana Wilson 317) and the exploitative roots of free market enterprise grow into the human rights-centred sustainable development initiatives that climate proposals foreground. Dodging historical responsibility is counterintuitive to proposed solutions because "no market-	Noted	Emily Clark	Goldsmiths	United Kingdom (of Great Britain and Northern Ireland)
27775	1	1	59	22	The chapter is less self-contained as one might wish. In particular, one might want to include some introductory words on the basic problem. "The solution of many problems related to the interaction of our societies with nature, such as climate change and loss of biodiversity requires deep structural changes in key areas of human activity, including our transport, energy, agriculture, and other systems (STRN 2010). The field of sustainability transitions research has set out to understand how such deep structural change happens and how it can be steered (Rip & Kemp 1998; Grin et al. 2010)." Rip, A, Kemp, RPM & Kemp, R 1998, Technological change. in S Rayner & EL Malone (eds), Human choice and climate change. Vol. II, Resources and Technology. Battelle Press, Columbus, Ohio, pp. 327-399. Grin, John & Rotmans, Jan & Schot, Johan. (2010). Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change. Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change.	Accepted Will look at the suggested literature	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg

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27777	1	1	59	22	Likewise, it might be helpful to dedicate a few words to the equity problem with its spatial (individual) and intertemporal dimensions, as well as the usually suggested criteria of responsibility, capability, need. UNFCCC, 1992. United Nations Framework Convention on Climate Change. Banuri, T., Göran-Måler, K., Grubb, M., Jacobson, H.K., Yamin, F., 1996. Equity and social considerations. In: Bruce, J.P., Lee, H., Haites, E.F. (Eds.), Climate Change 1995—Economic and Social Dimensions of Climate Change. Contribution of Working Group III to the Second Assessment Report of the IPCC. Cambridge University Press, Cambridge, UK.	Accepted More studies on equity aspects will be added	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
27779	1	1	59	22	The chapter suffers of a lack of clear structure and purpose. In several sections, there are too many vague or contentless statements. Unrelated bits of information may be provided in the same paragraph, followed by seemingly unrelated assertions. Much of the presentation remains unduly vague, because of lacking context. Why not clearly differentiate between issues that are mostly relevant for developed countries respectively for developing ones? Why not classify opportunities with respect to the time horizon needed to become effective, the effort needed, their relative impact, the time profile of this impact – positive from the onset, negative or neutral before becoming positive, etc. etc.? This would very much help the reader to organize its thoughts and to create a more useful picture of what is possible.	Accepted, the concepts suggested are related to feasibility issues, and we will coordinate with the cross cutting issues on these issues	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
27781	1	2	59	22	Explanatory statements often appear too late in the text. E.g., there is much talk about equity at the beginning of the chapter, but equity is addressed in more detail only at the end. Some choices may appear unduly restrictive. Why not address halieutic sustainability and oceanic warming/acidification? Why remain silent on the promotion of small female holdings, which according to several studies might both contribute significantly to carbon capture and the SDGs? And so on	Noted	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
34843	1		59		The chapter is too wordy and devoid of current sustainable approach and data trend to show how sustainable development should be in the fore front of any nation. Authors should consider revising and modifying the chapter, and explain the sustainable development using: Geosystem, Climate Change, socio-economic policy	Noted	Onema Adojoh	Missouri University of Science and Technology, Rolla, USA	United States of America
47049	1	1	82	11	the terms transition and transformation seem to be used interchangeably. They should be more clearly defined and distinguished, drawing on AR5 WGII, Pelling 2011 and others who have defined these terms before.	Accepted	Siri Eriksen	norwegian University of Life Sciences	Norway
47051	1	1	82	11	There is a lot of excellent material in this chapter. I would like to see a key issue emerge more clearly: What does the evidence suggest regarding whether economic growth (a dominant current development model) is consistent with mitigation and de-carbonisation, or whether alternative development models are necessary (such as de-growth, substituting growth with well-being as development goal etc)	Accepted This is part of our discussion about development pathways, which are closely coordinated with other chapters	Siri Eriksen	norwegian University of Life Sciences	Norway

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46909	2	1	2	28	I have three general comments about the chapter as a whole. First, it's not about "accelerating" transitions as timescales are barely considered. I think the authors use "accelerating" as a synonym for "enabling", "facilitating" or "supporting" but these are not the same as "accelerating" which explicitly has a relative-to-a-slower-rate-of-change meaning. I would suggest renaming the chapter "Enabling the transition ... ". Second, the chapter has lots of interesting material, but there is no clear narrative or structure which holds it all together in a meaningful way. Third, large parts of the chapter are general, and quite theoretical expositions of key terms and literature. Surely the point of IPCC assessment is to review and synthesise the latest evidence (since AR5) which is relevant and useful for climate change mitigation. If so, this could be used as a criterion for reviewing the material in this chapter and deleting all the text which is overly theoretical, conceptual, or in general terms (rather than specific to climate change mitigation).	Accepted We will update with more studies. We can however not change the title of the chapter since this is approved by the IPCC Plenary	Charlie Wilson	Tyndall Centre for Climate Change Research	United Kingdom (of Great Britain and Northern Ireland)
24519	2	3	2	28	This is a critical chapter to inform policy, and kudos to the author team for the hard work that has gone into the draft. The single most useful thing for this chapter is to evolve the narrative and evidence provided so that it is not "merely" a set of suggested good practices aimed at contemporary notions of climate resilient development--all of that is broadly supported by AR5 and yet all of that is not sufficient to inform policy at this juncture. To make appropriate decisions about climate resilience in the future, it would be more useful to understand how to get on desirable pathways, what factors matter, what factors get in the way, how to sequence solutions, etc. Restructuring of information presented in this valuable chapter could be a way to evolve the narrative to answer such questions related to how to implement transformational mitigation and adaptation. It could look like 1. main message: this decade is THE opportunity window for accelerating the transition, 2. the challenges a) external: climate risks are growing rapidly and undermining hard-won development gains b) today's economic social and political systems largely favor carbon and unsustainable practices so transformational resources immediately face system obstacles c) the ethical and philosophical challenge that the solutions are generally understood enough to ask and in spite of that decision makers may not make the transition / may miss the opportunity window 3. turning point in the chapter expressing that it doesn't have to be that way and the scientific evidence points to numerous options and enablers of transition 4. present these along with evidence (a lot of 17.4 could go here) and 5. clear actions that need to be taken for transition (helpful would be lit that provides insights into timing, system changes that need to happen, "how", and 6. outcomes of effective transition to transformational mitigation and adaptation.	Accepted, and thank you for the good suggestions to our major conclusions	Koko Warner	UNFCCC	Germany
5355	2		2		Maybe of benefit include two points: Chapter overview and Chapter contain instead of part of the executive summary and the initial paragraph of Introduction, a Table with relations and aspects of Chapter 17 with other Chapters (like Table 12.1), and an Executive Summary, as in Chapter 12 with main points of the Chapter	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
34751	2	2	59	36	Please include a commentary on the following aspects to accelerate the transition in relevance to sustainable development	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada
34753	2	2	59	36	1. Measures for quality assurance and continuous improvement	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada

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34755	2	2	59	36	2. References to established standards of practice	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada
34757	2	2	59	36	3. Qualitative and quantitative measures of performance	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada
34759	2	2	59	36	4. Strategies to achieve goals	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada
34761	2	2	59	36	5. Productivity enhancements in existing practices	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada
34763	2	2	59	36	6. Impact of technological renainance and the fourth industrial revolution.	Noted	Rabiz Foda	Hydro One Networks Inc.	Canada
24605	2	1			The whole chapter is repetitive. It would help if you considered summarizing paragraphs through the chapter. You might express the same idea in 40 pages.	Noted	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
5249	3	1	3	23	The first three paragraphs begin by Sustainable development, please improve.	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
4209	3	4	3	4	"A deliberate approach to use sustainable development as a frame" should instead read: "A deliberate approach to use sustainability principles to guide development as a framework"...	Noted	Christine Callihod	Canadian Institute of Planners	Canada
30737	3	4	3	4	Please specifiy "its" in the second sentence as it is unclear to what it is referring to.	Accepted	Ulf Hahnel	University of Geneva	Switzerland
23959	3	6	3	6	As tade-offs between economic, social and environmental aspects often cannot be avoided it would be better to use the term "minimization" instead of "avoidance"	Rejected	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
47715	3	6	3	19	To reach these transdisciplinary and interdisciplinary constraints it is really mandatory to develop the training to integrative management -not to say systemic - methodologies that have proven their operational efficiency in both companies and administrations management. Most all ambitious programmes having to face complex challenges fail to reach their objectives because the actors are not trained to these methodologies which ar rarely teachd in schools and universities. Although rarely agreed, this is really an ESSENTIAL step to not underestimate.	Noted	Jacques de Gerlad	GreenFacts	Belgium
5251	3	8	3	8	Paris Agreement - This would act as a reference and add in the reference list	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5253	3	10	3	11	It is better realize the redaction in the following manner " Both climate change and sustainable development, and cross-cutting processes are complex "	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5255	3	11	3	13	Why? It is preferable to explain in short.	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba

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4211	3	13	3	13	Add 'natural capital' (natural assets) to the Annex A Glossary as this term is not widely familiar and is a substantive inclusion. See page 4 of the The Natural Capital Declaration: https://www.unepfi.org/fileadmin/documents/ncd_booklet.pdf	Accepted	Christine Callihod	Canadian Institute of Planners	Canada
18229	3	13	3	13	There is mentioning of "energy production".(and four times further in this chapter). Since Einstein we know that energy is conserved (fundamental conservation law in physics). It is therefore not possible to produce energy. It is only possible to transform energy. Please modify the language "energy transformation".	Accepted	Manfred Treber	Germanwatch	Germany
5257	3	13	3	15	Why? Please explain in short	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
25453	3	13	3	15	Delete "Energy production and consumption, ... sustainable development (high confidence).", as this statement singles out one of the sectors and does not consider other potential mitigation actions.	Rejected We will add more details see the previous suggestion	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
5259	3	15	3	15	I suggest:balanced and integrated actions...	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
37737	3	16	3	17	Sentence very unclear. Co-benefits alone are not enough to cover the costs of adaptation? What the underlying rationale that mitigation co-benefits need to be directly compared to adaptation costs? Mitigation co-benefits moreover often include e.g. avoided deaths from air pol (avoided costs), and not necessarily direct benefits.	Accepted an explanation will be added. From a socioeconomic perspectives all costs and benefits are relevant	Michiel Schaeffer	Climate Analytics	Netherlands
30739	3	16	3	19	This sentence seems to be illogical "as enhanced sustainable adoption can lead to effective emission reduction benefits" does not seem to be a cause for non-effective co-benefits. Please clarify.	Accepted	Ulf Hahnel	University of Geneva	Switzerland
47053	3	16	3	19	These sentences describing the relationship between mitigation and adaptation are unclear. It would seem obvious that the co-benefits of mitigation is insufficient to achieve adaptation, since mitigation is not aimed at adaptation, and may in some cases undermine adaptation. Is how sustainable adaptation may contribute to emissions reduction well explained in this chapter? Virtuous collaboration between adaptation and mitigation is an unusual term, and seems to suggest mitigation and adaptation can be all positive and benign, while underplaying the potential trade-offs. All measures always also have negative impacts on some groups, and calling them virtuous may be misleading.	Accepted	Siri Eriksen	norwegian University of Life Sciences	Norway
37739	3	17	3	17	Sentence again very unclear. Explain how (and why) enhanced adaptation can lead to emission reduction benefits.	Accepted	Michiel Schaeffer	Climate Analytics	Netherlands
36127	3	18	3	18	Change the word 'collaboration' to 'interaction'	Accepted	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
37741	3	18	3	18	Reformulate. 'Virtuous' does not seem to be appropriate word and it is unclear what is meant with this.	Accepted	Michiel Schaeffer	Climate Analytics	Netherlands
4213	3	19	3	19	"...collaboration between adaptation and mitigation are explored" Suggest "...collaboration between adaptation and mitigation are employed"	Noted See other comments	Christine Callihod	Canadian Institute of Planners	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
36129	3	20	3	21	Delete the terms 'disruptive technological'	Noted Will be edited	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
42185	3	20	3	23	basically sets out requirements of SD but without refs / confidence etc - given such a strong statement would be good if it carried on through the chapter - almost as the story chapter but does not	Accepted, we will make sure that this is consolidated by literature in the chapter	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
17111	3	21	3	21	Replace "technological" by "technologies"	Rejected, it refers to changes so it is more general than technologies	Théo Milliez	Alterna	Switzerland
5261	3	24	3	25	Why?Please explain more	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
30741	3	24	3	25	Why has the statement only (medium confidence). That a sustainable transition cannot be reduced to a single action is an assumption with very high confidence.	Noted We will re-consider the basis	Ulf Hahnel	University of Geneva	Switzerland
47055	3	24	3	25	Important point	Noted	Siri Eriksen	norwegian University of Life Sciences	Norway
47057	3	25	3	27	Does the literature show that using climate change as a main conduit can indeed accelerate the transition to sustainable development? What else is needed in addition to climate change action? The rest of the chapter seems also to suggest that (various forms of social and technological?) transformation is required, in addition to policy coherence and breaking down silos?	Accepted We will further consider whether climate change as a main conduit can accelerate transition	Siri Eriksen	norwegian University of Life Sciences	Norway
45123	3	26	3	27	The emphasis on "synergies across sectors and policy coherence across scales" is very well stated that also relates to the opportunities that are targeted to be presented in Chapter 8 on "Urban Systems and Other Settlements."	Noted	Siir Killis	The Scientific and Technological Research Council of Turkey	Turkey
4215	3	27	3	27	"...synergies across sectors are exploited and policy coherence across scales is sought" Suggest "...synergies across sectors are employed and policy coherence across scales is achieved"	Editorial	Christine Callihod	Canadian Institute of Planners	Canada
36131	3	27	3	27	Change the word 'exploited' to 'created'	Noted see other comments	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
23961	3	28	3	31	While this diagnosis applies to many subjects the relevant question is which conclusions can be drawn for the alignment of both climate policies and sustainable development.	Accepted We will treat this more specifically in relation to studies	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
3311	3	32	3	32	It is suggested to insert "pathways" after "Reducing emissions down to 2oC or 1.5oC"	Accepted	Klaus Radunsky	retired from Umweltbundesamt	Austria
4217	3	32	3	32	"Reducing emissions down to 2oC or 1.5oC will necessitate a radical shift to transformational" Suggest "Reducing global emissions to restrict changes to no more than 2oC or 1.5oC will necessitate a radical shift to in transformational"	Noted, the language will be coordinated across the full report	Christine Callihod	Canadian Institute of Planners	Canada
47059	3	32	3	33	this is an important sentence, please add a definition of transformational pathway (different from transition and transformation?)	Rejected We will simplify our use of the tranformation, transition concepts	Siri Eriksen	norwegian University of Life Sciences	Norway
4219	3	36	3	36	"...to support climate-proofed infrastructure ..." Suggest "...to support climate-proofed resilient infrastructure ..."	Accepted	Christine Callihod	Canadian Institute of Planners	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
37743	3	38	3	38	Factoring in in what? It's not clear what is "equity" here and why it is "important" - to achieve what exactly? Further, while "distributional effects" is clear enough, "equity" is a very broad concept with many philosophical, normative, and quantitative perspectives. Please replace by component concepts or indicators that are more precise and mean something in the context of this chapter. Also, exactly how are the authors proposing to "factor in" equity? Factor this in how in which processes? In UNFCCC negotiations? In national processes? Internationally, equity has been quite toxic where countries use any equity principle or concept they can put their hands on to argue their own (and only their own) actions are "equitable". While everyone likes equity, once one drills into what it actually means, it never means the same between any two people let alone nations.	Accepted We will consider equity in a more concrete way in other parts of the chapter	Michiel Schaeffer	Climate Analytics	Netherlands
4221	3	39	3	39	include full term with acronym - Nationally determined contributions (NDCs)	Accepted	Christine Callihod	Canadian Institute of Planners	Canada
37745	3	39	3	42	Sentence unclear. Please clarify	Accepted	Michiel Schaeffer	Climate Analytics	Netherlands
4225	3	42	3	42	"... policy integration with SDGs... [add] with adaptation in mind."	Rejected Is is not particularly on adaptation	Christine Callihod	Canadian Institute of Planners	Canada
5263	3	44	3	44	I suggest the following change:and associated redirection of investments and production and consumption patterns in accordance with low-carbon societies.	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
4223	3	45	3	45	Add 'low-carbon societies' to the Annex A Glossary	Accepted	Christine Callihod	Canadian Institute of Planners	Canada
3313	3	2	4	35	It is strongly recommended to include the precise reference to the main body of the text in order to trace the findings included in the Executive Summary.	Accepted	Klaus Radunsky	retired from Umweltbundesamt	Austria
37747	3	2	4	35	Whole Executive Summary (ES) contains many very vague and unclear statements and very little (new) more concrete insights. Please summarize key insights on e.g. in which areas the largest opportunities and trade-offs lie for the areas listed in Ch 17.3, respectively. Include statements summarizing findings from the listed key enabling factors and barriers in Ch17.4, respectively. Also, the link of the ES to the Conclusions chapter 17.5 seems very weak.	Accepted	Michiel Schaeffer	Climate Analytics	Netherlands
37749	3	2	4	35	language needs to be improved in whole Executive summary. It is very hard to read and follow what the authors want to say.	accepted	Michiel Schaeffer	Climate Analytics	Netherlands
11187	3	3	4	2	I find the the first half of the Executive summary to be a little vague. I think the summary would benefit if it has more concrete conclusions.	Accepted	Snorre Kverndokk	Frisch Centre	Norway
23963	3	3	4	35	The summary could benefit from a structural and contentual revision. For example, theoretical foundations are addressed in p. 3 lines 28 ff. and then again at p. 4 lines 13-19, without any link between both paragraphs. Sometimes, sudden changes from normative to descriptive passages occur without obvious reasons (e.g., page 3-4 lines 43-2). Furthermore, it would be helpful to include more precise recommendations on key trade-offs and synergies together with reasons why these are the key aspects and others not.	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
25451	3	3	4	35	Executive Summary to have key messages presented as in other chapters.	Accepted	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
30743	3	3	4	35	The evaluation of the statements in terms of low to high confidence seems to be very unsystematic across the Executive Summary . For instance, why is paragraph page 3, line 32 to 37 not evaluated regarding confidence? The same is true for paragraph page 4, line 13 to 19.	Accepted Confidence will be added	Ulf Hahnel	University of Geneva	Switzerland
37905	3	1	5	1	The executive summary is missing reference to where in the chapter the statements are drawn from.	Accepted	margot Hurlbert	University of Regina	Canada
3071	3	6		7	I suggest to remind the three pillars of the sustainable development at the beginning of the chapter and modify the sentence on page 3. It might be rewritten in a more clear way: "The interconnections between the three dimensions (economic, social and environmental) of the sustainable development, require the pursuit of synergies and the avoidance of trade-offs in order to provide pathways that accelerate progress towards ambitious climate change mitigation goals (Paris Agreement)".	Partly accepted, but the executive summary is not the right place for this. The suggestion will be considered included in section 1	Manuela Milli	Government official	Italy
42183	3	10			need to clarify long term stable policy environments - I cannot really find in the chapter and needs to link with chapter 13	Accepted	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
36313	3	12			Can we achieve at all sustainable development? If yes how and when? It seems to me that SD is an aspiration and development should move towards a more sustainable future	Accepted We will add language on moving to a more sustainable future	Youba Sokona	South Centre	Switzerland
33817	3	15		16	What linkages are going to be made to WGII's "climate resilient development" (pathways) which also talks to the relationship between sustainable development, adaptation and mitigation? SEE Ch18 WGII.	Accepted, we will add WG II links	Debra Roberts	EThekweni Municipality	South Africa
1707	3	15			SPACE after a full stop: development (high confidence).Sustainable? development needs balanced actions in relation to impacts	Noted	Johannes Solar O	University of Dar es Salaam	United Republic of Tanzania
36315	3	32			We are not yet at 2°C or even 1.5°C and the issue is not to reduce emissions down to.....	Accepted, we will refer to the Paris agreement	Youba Sokona	South Centre	Switzerland
1927	3				Suggest improving traceability of the ES by providing a reference to an underlying section for each Executive Summary statement.	Accepted	Haroon Khesghi	ExxonMobil Research and Engineering Company	United States of America
42181	3				this is a general comment - this FOD is considerably better than the ZOD. My really big issue about this chapter is that I do not get the link between SD and acceleration. The structure of the chapter should enable that - 17.2 on theories; 17.3 on case studies; 17.4 on barriers and enablers but somehow it does not really make that practical. I think if 17.3 was improved then maybe this would come across better. 17.4 has to be about how to accelerate whilst maintaining SD - the book end to Chapter 1 - but it does not yet get there.	Noted	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
5265	4	3	4	4	I propose the following redaction: Renewable energy can be among critical technologies for accelerating the transition process and redirecting low-carbon trajectories, if it is well utilized and selected". Deployment of renewables,.....	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
25455	4	3	4	5	Delete "Renewable energy will be critical ... in recent decades", as this statement singles out one mitigation options and does not refer to energy efficiency improvement, technological advancement, etc.	Noted We will mention other options	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
38651	4	6	4	12	this paragraph could have a level of confidence: medium to high confident	Noted	Eveline Maria Vas	COPPE_UFRJ	Brazil

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25457	4	7	4	10	Delete "Nonetheless, the deployment of renewable energy ... with the fossil-fuel industry.", as this is a subjective argument that does not consider socio-economic impacts and national circumstances and capabilities in developing countries.	Noted Will be related to the literature	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
4227	4	10	4	10	"There is poor understanding of how governance at multiple" Suggest "There is poor understanding of how governments at multiple" Governance is the guide/ the overall framework whereas it is at the government level that serves as the vehicle to employ governance - which is where things break down - the human propensity to distort the intent of the governance framework which is where failure then occurs.	Noted, but I do not understand the response	Christine Callihod	Canadian Institute of Planners	Canada
30745	4	10	4	12	Please specify last part of the sentence ("thus constituting a limiting factor."). Limiting factor for what?	Accepted	Ulf Hahnel	University of Geneva	Switzerland
44051	4	10	4	12	Governance is mentioned in this section and comes up repeatedly in this chapter. I think it would be useful to talk about some of the common governance issues between different levels and governance failures related to regulatory structures, who controls decisions (top down, bottom up, how close they are to citizens/grassroots), financial constraints (e.g. community access to government finance when finance decisions may be made at very different levels, to name a few.	Noted, this will be considered in subsection 4 on enabling	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
5267	4	17	4	19	I suggest: "Transitions are not uniform but depend on, inter alia, development pathways and the environment situation, the speed of action and a myriad of contextual factors, not least political economy dynamics.	Rejected, the sentence already includes language with a reference to a myriad of factors	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5269	4	21	4	22	Please include:beliefs and actions, natural capital, social cohesion....	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
4229	4	27	4	27	"...the world also imply large-scale investments ..." Suggest "...the world also require large-scale investments ..."	Accepted	Christine Callihod	Canadian Institute of Planners	Canada
5271	4	27	4	28	Improve the redaction: "Sustainable development in many parts of the world will also imply large-scale investments in new infrastructure and substitution of obsolete technologies"	Noted, but what is obsolete technologies?	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
32673	4	33	4	35	Sobriety should be mentioned in general here as it is a way to reduce our consumption of goods, energy and so on at low cost in an efficient manner.	Noted, studies on this are part of the discussions in Section 2	Tahina Lehmann	Alterna SA	Switzerland
30747	4	36	4	36	A summary paragraph for the Executive Summary would be very helpful for the reader as the section now just ends quite abruptly.	Accepted, the ES will be updated	Ulf Hahnel	University of Geneva	Switzerland
42187	4	3			general comment for chapter - renewable energy is mentioned a lot but energy efficiency and the reduction in demand which chapter 5 sets out a very good argument for being incredibly important for reaching mitigation goals is more or less ignored in this chapter - that should be rectified.	Noted, we are not covering the energy section in general, but we can add a reference to other chapters on energy efficiency and demand	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
3069	4	24		26	The sentence on page 4 lines 25-26 seems to me unclear (...avoiding maladaptation and mitigation??) and inconsistent with the sentence on page 3 lines 18-19.	Accepted, will be updated	Manuela Milli	Government official	Italy

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5273	5	2	5	2	Please include: " This chapter looks at how climate policies are related to sustainable development policies".....	Accepted- text revised	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5227	5	2	5	14	- What is the difference between transition and transformation? These two terms are used interchangeably in this report. Specify the meaning of the terms respectively.	Accepted- transition is the process and transformation is the outcome. Usage has been according to the definition of the IPCC glossary and this will be harmonised throughout the report.	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
23965	5	3	5	4	What is meant by "inter-dependence, interrelativity, connectivity.. of interaction". What are the differences and why are these aspects / nuances important to this section?	Accepted-This is fine as this chapter will talk about how the various complex elements are connected and affect each other during a transition process. This sentence stays as a thesis statement to give a sense of what is to be followed in the rest of the chapter which is why it is stated as so.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
11189	5	3	5	5	This is a very complicated sentence. I would advice to make this simpler.	Partially accepted- Sentence might look longer as its trying to catch and summarize many complexities. This is a simple way of summarizing of what will be looked at the rest of the chapter	Snorre Kverndokk	Frisch Centre	Norway
5275	5	12	5	12	Include: Finally, the chapter synthesizes the findings and conclusions, and identifies.....	Accepted- text revised	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5277	5	32	5	32	Although climate change has traditionally been portrayed principally as an environmental problem - WHO and WHEN – need fundament and references because is a strong affirmation	Accepted- reference added	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
11191	5	34	5	37	The sentence starting with "It is a well-rehearsed notion" should have a reference to back the conclusion.	Noted- a new text will be used to replace this initial statement	Snorre Kverndokk	Frisch Centre	Norway
23969	5	34	5	43	The paragraph reads as if the SDGs are a reaction to the complexity of causes of climate change ("... is the result of many unsustainable practices... To address these concerns, countries have embraced the concept of SD"). Instead of sorting causes the SDGs are rather helpful in sorting goals or consequences of policies	Rejected-The paragraph does not say that SD is a reaction to the causes of climate change. Rather it says that SD has been considered as a means to solve and reduce the unsustainable practices which led to climate change and other issues.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
23967	5	36	5	37	"policies" are a subcategory of "governance". What does "policies within/across disciplines" mean?	Accepted- will be changed in the revision as "unreliable policy considerations within and across many disciplines	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24555	5	38	5	38	What mean "Countries"? Are we talking about governments?	Accepted-Countries is correct as countries are represented by government	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
12719	5	1	7	33	There is a lot of text on the history of SD. In my view this can be condensed and focussed more on the empirical questions of what kind of transitions works where and why. Also because this overlaps with chapter 1	Accepted-more condensed version will be used	Robbert Biesbroek	Wageningen University	Netherlands
1463	5	16	7	33	In order to address sustainability challenges, knowledge generation needs to move rapidly from a disciplinary linear 'tree' model to an interdisciplinary 'web' model. There is also a need to use knowledge generated into action for sustainable development. This requires a deep involvement of stakeholders in the generation process of knowledge (co-production). More detailed discussion pls find in Liu J., Bawa K. S., Seager T. P., Mao G., Ding D., Lee J. S. H., Swim J. K., 2019. On knowledge generation and use for sustainability, Nature Sustainability 2: 80-82.	Accepted- a new text will be used to complement the initial statements	JUNGUO LIU	Southern University of Science and Technology	China
11195	5	16	7	33	You should refer to other chapters where SDGs are discussed.	Accepted- a link with question 12719 will be made	Snorre Kverndokk	Frisch Centre	Norway
23973	5	16	7	33	The section loosely refers to AR5 and then goes on to cover the aspect equity without making clear why exactly this aspect is important here. It would be helpful to provide the reader with a systematic review / summary of AR5 and then to specify which new research / literature / aspects are added and why.	Accepted-But reasonable summary is found in Ch 1 and therefore it is not made here to avoid duplication	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
47061	5	17	7	33	it would be helpful if the chapter would be clearer on when it is talking about sustainable development as a development process, and when it is talking of sustainable development as policy measures. Perhaps define this more clearly in this section. And how does socio-environmental change interact with climate action and sustainable development actions? it is important to convey that sustainable development does not exist in a societal vacuum, achieved as long as the right policies are implemented. We may be on unsustainable development trajectories (created by decisions made by a range of actors across scales) that climate actions alone cannot easily shift.	Accepted- revised text with references considering the links SD as policy and SD as development	Siri Eriksen	norwegian University of Life Sciences	Norway
33821	5		7		Repeats a lot of the same kind of SD/SDG/Paris Agreement messaging as Chapter 1.	Accepted-To keep the continuity and for each of readers to follow, some of the flavour found in Ch 1 might be found as its in evitable, although they are not repeated exactly the same.	Debra Roberts	EThekweni Municipality	South Africa
20255	5		9		There is only one sub-section 17.1.1. under Section 17.1 . Should it be another sub-section under 17.1?	Accepted-will be fixed in SOD. This is a numbering issue.	Thi Lan Huong Huynh	Viet Nam Institute of Meteorology, Hydrology and Climate change	Vietnam
11185	5	1	57	34	I find this to be a well written chapter, but I lack coordination with other chapters and references to where the different topics are analysed/assessed in these.	Accepted-will be fixed in SOD. This is a numbering issue.	Snorre Kverndokk	Frisch Centre	Norway
36317	5	7			Development as a key component and on which countries are engaged is missing here and I wonder why?	Accepted-The relevant cross chapter coordination will be done	Youba Sokona	South Centre	Switzerland
24521	5	38			What mean "Countries"? Are we talking about governments?	Accepted-Countries is correct as countries are represented by governments	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico

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5279	6	4	6	5	This affirmation would be funded, because this process is new and has short time to established - " showed that NDCs are falling short of delivering the Paris goals".	Accepted- text revised	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
25459	6	7	6	7	The Paris Agreement states well below 2°C.	Accepted- text revised	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
36133	6	7	6	7	Change 'below 1.5° C' to 'well below 2° C as per the text of the Paris Agreement	Accepted- text revised	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
36135	6	9	6	9	Add ' with ambitious targets in every iteration of NDC' after 'living documents'	increasing ambition/not sliding back	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
5281	6	9	6	10	Inside of reasonable limits according the country and if it is Annex I or not, main emitter of GHG or not - "as countries are free to choose their targets".....	Rejected- this is an interpretation of the actual text	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
44463	6	17	6	17	It should read climate extremes, as in IPCC literature, or climate and weather-related disasters	Accepted-will be changed accordingly	Urbano Fra Paleo	University of Extremadura	Spain
24523	6	18	6	28	In these lines, you are describing the importance of Paris agreement in 2015. However, The AR6 will be published in late 2021. Could you give examples of concrete actions taken during the last five years?	Accepted- additional text and references added in this regard	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
5283	6	23	6	28	This paragraph would be placed before paragraph that begin with " After the SDGs....."	Accepted- but initial text was finally deleted	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
11193	6	23	6	28	I think this paragraph should be moved to page 5 where you start describing the Paris Agreement and the SDGs, for instance before line 44 on p. 5.	Accepted- but initial text was finally deleted	Snorre Kverndokk	Frisch Centre	Norway
24525	6	36	6	37	Could you specify which systems? And are there any actions or suggestions to take corrective actions?	Accepted- new text with references will be added	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
24527	6	43	6	44	You mentioned that 150 countries had developed national urban plans, So it means that 50 countries are doing nothing about it, 75 are delayed. Do we have questions: (1) why it happened? (2) Do the governments have to submit their commitment? (3) There is no importance on this topic? Could you explain these thoughts? In addition, you can make a reference from chapter 8.	Partially accepted- 150 countries who has developed does not mean that the rest is doing nothing. Possibly they must be in the phase of formulation/preparation/review etc, where the formal endorsement has not been made yet. This reference is taken from sustainable development goals report, which means those countries who completed the process is counted while there could be countries who are in process and yet to submit.	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico

Ali You could just say, that it is uncertain what happens with the ones without plans and that we will refer to chapter 8

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
4231	6	48	6	48	"... 2017, 2016) and regional plans..." Suggest: "... 2017, 2016), and regional plans, and local plans ..." As has been stated by the UN and numerous other international and national bodies, it is at the local government level that climate resiliency is to be realized - including local government plans (Official Community Plans, Local Area Plans, etc).	Noted- some additional references to provide a more thorough approach and a more direct conclusion will be formulated	Christine Callihoo	Canadian Institute of Planners	Canada
36319	6	3			what are those principles of SD?	Accepted - will be fixed in next OD	Youba Sokona	South Centre	Switzerland
5285	7	10	7	10	Lack a comma after social.	Accepted- text revised	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24529	7	10	7	12	You are talking about the participation of the population. Could you explain what actions they can do? Maybe you can put a chart with examples of personal or group involvement.	Noted - Could not find this in the chapter	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
9643	7	10	7	28	Inequality should also be considered, when setting the environmental target. Economic analysis have shown, that for most goods and services from nature a more equal distribution of income increases the economic value society attaches to nature (Drupp 2018, Baumgärtner et al. 2017). References: Drupp, M.A., Meya, J.N., Baumgärtner, S., Quaas, M.F. (2018): Economic inequality and the value of nature. Ecological Economics, 150: 340-345.; Baumgärtner, S., Drupp, M.A., Meya, J.N., Munz, J.M., Quaas, M.F. (2017): Income inequality and willingness to pay for public environmental goods. Journal of Environmental Economics and Management, 85: 35–61.	Partly accepted We will add more literature on equity in different sections of the chapter	Jasper Meya	German Centre for Integrative Biodiversity Research	Germany
36137	7	10	7	28	Check logical flow and sequencing of sentences	Noted	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
37955	7	10	7	28	Equity is crucial for effective climate policies not just for ethical and development reasons but because this reinforces effective climate action. Ch. 5 discusses this in more detail.	Accepted - Cross reference with chapter 5 will be done	Patricia Perkins	York University	Canada
23943	7	14	7	15	The sentence: "In the context of sustainable development and climate change, equity has been seen as a multi-dimensional challenge." there is some examples of multi-dimensionality missing. Also some kind of literature source would be supportive	Accepted- new text with references will be added	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
23971	7	21	7	22	Whether equity (which facet?) is an obligation is at least debatable but no matter of fact as stated here. The relevance of equity results from its potential function as a barrier for policies if neglected.	Accepted- new text with references will be added	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5229	7	29	7	33	- What is the purpose of showing the example of non-UN led initiatives? Explain the implication of the example and if possible add more cases from other organization such as OECD.	Noted- new more rounded text and explanations will be added	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
5287	7	30	7	31	Have had any results ?	Rejected- this is not the concept more important to be identified here	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
36139	7	42	7	42	Introduce 'SD as abbreviation of Sustainable Development' at the first of the chapter not starting at this page	Accepted - this will be harmonized throughout the chapter	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
23945	7	42	7	46	in this context the influence of the "rebound effect" would be suitable. As the rebound effect might even overcompensate efficiency improvements.	Accepted- this chapter looks more at how the adaptation and mitigation is related to SD with with positive and negative synergies and how they should be taken onboard in a balanced manner. Therefore indirectly the rebound effect is looked at.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
37751	7	43	7	45	explain why (and how) enhanced sustainable adaption can lead to effective emission reduction benefits. Give more concrete examples. Unclear how this statement is related to half-sentence before co-benefits not being enough to lead to adaptation, the connection with "as" implies causal relationship which is very unclear. Explain this statement as well.	Accepted-References to adaptation co-benefits could be provided	Michiel Schaeffer	Climate Analytics	Netherlands
23975	7	44	7	45	Please check for arbitrary adjectives or adverbs like "enhanced", "effective" and "virtuous". They add no relevant information and sometimes confuse the reader (e.g., is there a difference between "usual" and "enhanced" sustainable adaptation? If so, please explain).	Noted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
37753	7	46	7	47	"(Fuso Nerini et al. 2019) show that climate change can both undermine and reinforce efforts in the direction of sustainable development." Explain how, give examples. Stays very vague for main text.	Accepted- examples extracted from the references	Michiel Schaeffer	Climate Analytics	Netherlands
23979	7	35	8	18	The section repeats its message that SD and climate policies are linked several times without adding much substance to this claim. It would be helpful to name key trade-offs and synergies and provide respective empirical evidence	Accepted- The examples of the linkages are there in the paragraph. However the repetitions could be revisited to streamline the text.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
42087	7	35	8	18	There are many links between mitigation and adaptation: particular uses of renewables (pumping for irrigation, for water supply, desalination ...) , improvements to HVAC, alternative materials for construction, efficient agricultural measures, food production, preservation and storage).	Accepted- examples extracted from the references	Francisco Javier Hurtado Albir	European Patent Office	Germany
47063	7	35	8	18	this may be the section where reference to WGII chapter 18 on climate resilient development pathways can be made. In general, there is a lot of material in chapter 17 that links well with WGII ch 18.	Accepted- it will be checked with chapter 18 in WGII	Siri Eriksen	norwegian University of Life Sciences	Norway
42189	7	12			old refs	Noted - Still relevant reference	Catherine Mitchell	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
36321	7	22			Equity is certainly important or very important for wellbieng but not an obligation	Accepted - Textual editions will be made to address this.	Youba Sokona	South Centre	Switzerland
23977	8	6	8	11	Why are cities key subnational actors in comparison to, e.g., counties, states etc.? Please provide references with empirical evidence. Does this apply to all nations irrespective of the degree of centralization?	Accepted- text revised to expand actors	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
36141	8	6	8	11	The para starts with 'At the subnational level...' without talking about national level issues in preceding chapters. If multi-layer issues are discussed, sequenceing is necessary.	Accepted- text revised to organize layers of information	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
5289	8	10	8	10	Include letter "a" in the following manner: " However, a thorough integration among these strategies.....*"	Editorial	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44071	8	12	8	18	It seems as though this discussion needs to be far more substantive. There is only one reference, but it seems that we need a larger discussion and more research conclusions related to development of response capacities. What are the most important response capacities? How do they rely on strong institutions, financial resources, other enabling factors, etc.?	Accepted-more references and additional evidence included	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
5291	8	17	8	17	ADD... on its ability to draw on strong and integrated policies, institutions...	Accepted-text revised	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5293	8	20	8	43	Point 17.1.1.2 Transition processes - Would be included in point 17.2	Rejected-concepts covered are different	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
23987	8	20	8	43	The added value of this section in regard to the main topic (relationship climate protection and SDGs) is unclear. The section is about social aspects (unlike the title suggests) but is limited to equity / distributional issues. Why not include other social aspects like norms, values, attitudes and habits?	Rejected-concepts commented are covered in other sections of the chapter	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
4233	8	24	8	29	".... Highlighted ten nine (9) essential elements needed for transition:" Suggest numbering each of the entries for greater clarity ... i.e. ".... elements needed for transition: 1) consideration of shocks and stresses;"	Accepted-will be revise	Christine Callihoo	Canadian Institute of Planners	Canada
23981	8	30	8	31	instead of "climate decarbonisation" (i.e., geoengineering) I guess it should read decarbonisation of the economy / society	Noted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
23983	8	32	8	35	It is not clear what the reference cited means with "practical, political and personal needs" - please specify and explain the relevance of these concepts for the covered subject	Accepted-additional text added	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
47067	8	32	8	35	An explanation of leverage points for transformation should be expanded. Including shifting mindsets and development goals (goal of the system) as key to leveraging transformation.	Noted-concepts commented are covered in sections 17.2 and 17.4 of this chapter	Siri Eriksen	norwegian University of Life Sciences	Norway
47065	8	38	8	39	Knowledge is also a key component of power relations, and the contestation of dominant knowledges is key to the shifting of inequitable power relations. Plural ways of knowing are also key to reimagining sustainable development and climate action. See Nightingale, A. J., et al. (2019). Beyond Technical Fixes: climate solutions and the great derangement. Climate and Development 0(0) 1-10. Hulme, M. (2018). "Gaps" in Climate Change Knowledge: Do They Exist? Can They Be Filled? Environmental Humanities 10(1) 330-337.	Accepted-additional text and references added	Siri Eriksen	norwegian University of Life Sciences	Norway
23985	8	38	8	40	The role of knowledge mentioned here feels obvious / arbitrary. The same goes for the next aspects "transforming the urban community" and "accelerative and transformative potential of interventions" (innovations?). These are examples for many statements in the chapter that lack precision and substance. Taking the example of urban communities, first, it is unclear what exactly is meant by "urban community" and why the statement does not refer to "cities" or other communities instead. Second, if it simply refers to urban contexts, it is self evident that climate or SD policies need changes at this level as a substantial fraction of people live in cities. In other words the added value of such statements is unclear.	Accepted-additional text added	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5231	8	20	9	35	- "transition to sustainable development", "sustainable transition", "transition to decarbonization", "transition to low carbon society" are found in the report. What is main focusing transition dealing in this report?	Noted- literature provides different angles to the transition concept and applications. These are developed further mostly in sections 17.2 and 17.4 of this document	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
36323	8	20		43	This paragraph mixes different issues such as transition, equity, decarbonization, etc. without a clear linkage between them. It seems to me that you should discuss the achievement of SDGs in lieu et place of SD transition unless you clearly define the later	Accepted-will be revisited	Yuba Sokona	South Centre	Switzerland
1719	8	38			Citation and sentence commencement: (Hjerpe et al. 2017) stress that knowledge could act as	Accepted - References will be fixed	Johannes Solar Obeto	University of Dar es Salaam	United Republic of Tanzania
44075	9	32	8	33	What does need to be done at various levels of government? What does this say about appropriate roles for different levels of governance and what is better established at the local level, federal level, or other?	Accepted: Additional elaboration will be placed on the roles of different governments	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
44073	9	1	9	1	Title makes reference to three different timeframes, which are then never mentioned below. How do we think about the actions that need to be prioritized in the short term and in the long-term? How do we develop effective timelines for change and consider what is needed in different stages for a long-term, effective response?	Accepted: The timeframes will be removed from the title	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
5295	9	1	9	2	Point 17.1.1.3 - Don't have the materials nor references about this, but to my modest knowledge this point isn't developed according the title, for different intervals of time. If we don't have answers for this is better modify the title or delete. Maybe written: Relevant policy issues, opportunities and obstacles	Accepted: The timeframes will be removed from the title	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
11197	9	1	9	2	You refer to the years 2025,2030 and 2050 in the heading, but these years are not mentioned in the text.	Accepted: The timeframes will be removed from the title	Snorre Kverndokk	Frisch Centre	Norway
23989	9	1	9	15	While the section title refers to "policy", the first paragraph covers governments, which are actors / structures and thus not covered by the policy-term (usually referring to political content and instruments). It is furthermore unclear why only governments are addressed here while throughout the chapter references are made to governance (which includes governments, but is not limited to these). Furthermore, the link to the overarching topic (relationship between climate protection and SDGs) is unclear (again).	Accepted: The title will be changed; the role of other stakeholders will be highlighted; and the link to SDGs will be made clearer	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
34053	9	9	9	12	Although I refer here to a particular page and sentence which uses the term "diffusion", this comment could equally apply elsewhere in the text e.g. in relation to page 4 lines 13-14. Although the chapter refers to the temporal aspects of transitions, radical disruptive innovations and the diffusion of technologies, for example, it misses out on a substantive framework through which such issues can be discussed: that of the emergence, diffusion and impact of (in this case) low-carbon innovations. Such a structured (although not necessarily step-wise) account could prove very profitable for understanding sustainability transitions, I think. Therefore, the authors might wish to engage with this idea and this paper that substantiates it: https://www.sciencedirect.com/science/article/pii/S2214629617303900	Accepted: Will review and draw upon literature on sociotechnical transitions based on "Reducing energy demand through low carbon innovation: A sociotechnical transitions perspective and thirteen research debates" and similar studies	Kirsten Jenkins	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
24531	9	12	9	14	This is a crucial point to achieve SDG. For some governments, it can be an opportunity; however, for others, they may see climate change as an issue. How can we change to a positive vision of the decision-makers? We need to change the mind to change for a real transition.	Accepted: This point is covered in section 17.1 of the FOD but will be reiterated here as well	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47073	9	13	9	15	important points, more literature about creativity and innovation could be added. There is also a link here with WGII ch 18 regarding multiple arenas of engagement with climate action.	Accepted: will aim to highlight creativity and innovation as well as links to these themes in ch 18 in WG II	Siri Eriksen	norwegian University of Life Sciences	Norway
23991	9	16	9	18	The statement is very general and thus questionable (do all mentioned aspects apply to all developing countries? If so, please provide references). Why does the statement highlight state-driven technological development and what exactly does "state-driven" refer to? Public research subsidies? Direct technology subsidies? Public research or development?	Accepted: This statement will be qualified and "state-driven" will be removed	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
47071	9	16	9	18	It could be mentioned that many developing countries may be using more sustainable technologies and production forms (such as in smallscale agriculture, but also in energy and consumption levels) than the global north. The challenge may be to ensure that global trade and national subsidy policies, plus international investments, do not undermine existing sustainable production systems by shifting them into unsustainable production forms (e.g. high emission, inequitable forms of production and consumption)	Accepted: This point is well taken: it can be discussed in the section on equity	Siri Eriksen	norwegian University of Life Sciences	Norway
23993	9	18	9	21	Please make this statement clearer. The link between type/TRL of a certain technology and a market failure (which one?) due to information asymmetries and cost barriers should be explained in more detail and its relevance for this section should be explained. If the issue is relevant indeed, please provide more substantial references. Usually technologies do not play a key role in market failures and information asymmetries are to be expected rather in cases of mature technologies.	Partly accepted. This is not an issue for section 1, but can be partially included in section 2 on innovation	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
23995	9	22	9	28	Please explain why the use of multiple policy instruments is useful in this specific context. Furthermore, the statement should be qualified as the use of multiple policy instruments is not per se positive (e.g., http://dx.doi.org/10.1561/101.00000005 or https://doi.org/10.1142/S2010007810000169)	References will be made that qualify claims about multiple instruments based on Nils Axel Braathen (2007), "Instrument Mixes for Environmental Policy: How Many Stones Should be Used to Kill a Bird?", International Review of Environmental and Resource Economics: Vol. 1: No. 2, pp 185-235. http://dx.doi.org/10.1561/101.00000005 SAMUEL FANKHAUSER, CAMERON HEPBURN and JISUNG PARK, COMBINING MULTIPLE CLIMATE POLICY INSTRUMENTS: HOW NOT TO DO IT: Climate Change Economics Vol. 01, No. 03, pp. 209-225 (2010)	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
36325	9	3		4	This is a good way of approaching the issue but need to clearly define the linkage between Development and making development more sustainable	Accepted: Will review and revise	Youba Sokona	South Centre	Switzerland
1705	9	16			Developing countries face the additional policy implementation challenges BECAUSE? of their more limited	Accepted: Will add in because	Johannes Solar Obeto	University of Dar es Salaam	United Republic of Tanzania
1713	9	27		28	GOOD CITATION HERE: needed for social and technological change (Edmondson, Kern, & Rogge, 2018; Köhler et al., 2019; Rogge & Johnstone, 2017).	Accepted: Will add in this citation	Johannes Solar Obeto	University of Dar es Salaam	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22927	10	3	10	4	Figure 17.1 Overview of Relevant Theories and Enablers of Transitions Elaboration, of Chapter 17 is confusing. I am not sure what "Current Unsustainable" means. Do you mean current instability? If so, I'm not sure what each of the pictures is meant to represent? Also not sure what "Future Sustainable" means? Is this what a sustainable future would look like? If so, again I do not think the pictorial representations are themselves explanatory enough. Maybe label each icon?	Accepted: This figure will be removed	Kelsey Ross	The Center for Global Development	United States of America
30749	10	3	10	4	It would make it easier for the reader to better align the figure 17.1 with the text, for instance by adapting the order of the theories to its appearance in the text.	This figure will be removed	Ulf Hahnel	University of Geneva	Switzerland
30751	10	3	10	4	Consider changing the wording from "current unsustainable" to "unsustainable present" and from "future sustainable" to "sustainable future"	This figure will be removed	Ulf Hahnel	University of Geneva	Switzerland
39553	10	3	10	4	Figure 17.1 could probably contain much clearer messages. Although what it aims to say about economic, innovation and psychology is somehow fairly understandable, for governance, the icon of a greek-column building does not mean anything. Also, I would say it is not exactly fair to put all different economic theories in the same bucket like that. Perhaps you mean financial logic/rationale instead of economic theory? Models are tools, how are they either drivers or enablers? Or do you mean something else by "models" e.g. regimes? Also, innovation theory is at times part of economic theory itself, and so is behaviour. Besides, social innovation involves mindset changes and movements as well. Thus, it does not make much sense to constrain those to psychology. However, social and technical innovation appear in the figure as drivers/enablers of innovation. But they are themselves types of innovation, aren't they? And the figure only reflect specific technological change in it. So, the boundaries between theories, drivers and enablers do not seem quite clear.	Accepted: This figure will be removed	Lilia Caiado Coelho Beltrao Couto	University College London	United Kingdom (of Great Britain and Northern Ireland)
39159	10	14	10	14	The reference of (Morin, 2018) is missing in the bibliography.	Accepted: will be included	Bertrand Hespel	University of Namur	Belgium
30755	10	18	10	21	"while more communal values appear to be losing favour in modern individualistic societies..." this claim is too broad and not supported. Either a source should be added or the claim should be attenuated.	Accepted: The claim will be attenuated	Ulf Hahnel	University of Geneva	Switzerland
5297	10	18	10	24	The utilized literature is old in this paragraph - For SOD I suggest to seek new literature	We added new literature to the classical one	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
30757	10	18	11	12	In this paragraph, many terms and worldviews such as "engaged Buddhism" or "practical spirituality" are listed but these concepts rather cover a very small minority of individuals and it remains unclear for the reader why the concepts should be of interest. This part should be either omitted or better introduced.	Partly accepted. The content will be changed and the different approaches will be introduced based on literature, where they are related to climate change	Ulf Hahnel	University of Geneva	Switzerland
30753	10	8	12	5	The selection of the chosen theories is quite unclear and none of the theories can be actually considered as being "psychological". Overall it seems like a non-systematic selection of different approaches while it is unclear why theory XY has been chosen for the section.	Partly accepted. The content will be changed and the different approaches will be introduced based on literature, where they are related to climate change	Ulf Hahnel	University of Geneva	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47075	10	10	12	5	A lot of good material in this section. A link could be made to knowledge, worldviews, understandings of human-nature relations as the 'personal sphere of transformation' spelling out the leverage points of transformation in this sphere. The link between worldviews, interconnectedness, and social innovation to politics in terms of shifting power relations could also be made (i.e. interactions with the political sphere of transformation).	Partly accepted: Several links are already included on these issues	Siri Eriksen	norwegian University of Life Sciences	Norway
29049	10	8	15	4	Please see how much of this section is policy relevant and addresses climate change mitigation. Overall, the chapter can consider how much theory is relevant and how best to package the different theories in the chapter, perhaps with useful examples. Existing examples of taxation, abatement costs, behavioural choices are useful	Accepted: Will aim to make more policy relevant by highlighting the implications of this theory for policy and practice related to climate change	Priyadarshi Shukla	Ahmedabad University	India
23947	10	8	15	30	as the approach is to show "central claims and underlying assumptions" there is missing some investigations and theories about the education systems and its roles. As education has many links to governance, innovation and psychology, this section should demonstrate the crucial role a transformation of the the educational systems play regarding climate change mitigation and adaptation.	Partly accepted Education will be included in the enabling section. We are not including an extensive discussion of economic theories, this will be included in Chapter 1	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
11199	10	8	17	1	The framework for transition and transformation is outlined in chapter 1 (1.5.4). You need to coordinate with chapter 1 so that the report is consistent.	Accepted: Will check and align	Snorre Kverndokk	Frisch Centre	Norway
37055	10	8	17	1	Following reference can be useful to highlight north-south divide in approaches . Hayward, B., and J. Roy, 2019: Sustainable Living: Bridging the North-South Divide in Lifestyles and Consumption Debates. Annu. Rev. Environ. Resour., https://doi.org/10.1146/annurev-environ-101718 .	Issues of regional equity will be covered elsewhere in the chapter	Joyashree Roy	Asian Institute of Technology, Thailand. Jadavpur University, India	Thailand
22929	10	10	17	1	I would order the theories and approaches in section 17.2.2 in the same order as the table for continuity.	Accepted: This table will be removed	Kelsey Ross	The Center for Global Development	United States of America
2377	10		17		Given the "Accelerating" nature of the topic, I find there is missing information in the section 17.2.2 and its Figure 17.1 about complex systems (see the Complex System Society for a definition e.g. at https://cssociety.org/about-us/what-are-cs , and at https://complexityexplained.github.io) as a theoretical framework to tackle the issue, specific applications on accelerating transitions based in complex systems can be found in the literature: Milkoreit, M., Hodobd, J., Baggio, J., Benessaiah, K., Calderón-Contreras, R., Donges, J. F., ... & Werners, S. E. (2018). Defining tipping points for social-ecological systems scholarship—an interdisciplinary literature review. Environmental Research Letters, 13(3), 033005.; Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., ... & Lenferna, A. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354-2365. ; Scheffer, M. (2009). Critical transitions in nature and society (Vol. 16). Princeton University Press.	Partly accepted. We will expand the discussion on complex systems, but the figures will be excluded	Roger Cremades	GERICS	Germany
33823	10	10			Ensure there is always a clear link between the material presented in the section and climate change.	Accepted, and we will make more clear how environmental psychology is linked to climate change	Debra Roberts	EThekweni Municipality	South Africa
24533	11	1	11	12	These activities and lifestyle are essential to achieve SDG. However, we need to focus on change mobility to reduce fossil fuel consumption. One of the main challenges is to reduce oil consumption.	Partly accepted: We will expand the discussion on complex systems, but the figures will be excluded	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17117	11	6	11	7	Remove "Thus, the House of One in Berlin is an example of an effort to remake urban areas as a focal point of spiritual and religious practice". While interesting, this example has little to no link with CC or SD in the context of this chapter.	Accepted: will aim to underline how this relates to CC and SD	Théo Milliez	Alterna	Switzerland
23949	11	8	11	12	besides post-development and degrowth there are other theories as well as "post-growth", which display a whole set of multi-scale effects and theory. An example is the german publication: Ökonomie der Genügsamkeit. Impulse für eine Gesellschaft ohne Wachstum ", Herrenalber Forum, Karlsruhe 2019 (mit C. Rauch und A. U. Engelmann) by Nico Paech.	Rejected, discussions of economic theories will be included in Chapter 1	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
30759	11	13	11	22	I recommend to restructure this paragraph by starting with the outer transition that is the more intuitive form of transition and then turn to the concept of the inner transition.	Partly accepted: we will restructure some of the text to make the narrative easier to follow. The reason for starting with the inner transition is that the unit of analysis (the individual) is smaller in scale and then leads to the larger outer transition which is more closely related to some of the other factors policies, governance, technologies that facilitate transitions	Ulf Hahnel	University of Geneva	Switzerland
4235	11	33	11	33	Curious term to use: "...low-temperature goals" Consider changing to be more meaningful vs glib "acceptable temperature goals" Low-temperature is not the goal ... Mitigating for temperature increases is	Accepted: Will change to reflect this point	Christine Callihoo	Canadian Institute of Planners	Canada
30761	11	34	11	37	Do the authors want to refer to adolescents instead of "adults"?	Accepted: will change	Ulf Hahnel	University of Geneva	Switzerland
30763	11	38	11	42	The term "bottom-up" in contrast to classic "top-down" initiatives could help to better structure the sentence and to better introduce the concept of grassroots innovations.	Partly accepted: It should be noted that social movements can also "affect" the top-down" process. Moreover, in systemic approaches, there is no separation between top-down and bottom-up. We will nonetheless work to make it more clear.	Ulf Hahnel	University of Geneva	Switzerland
30765	11	42	11	43	It's unclear why social innovations should dampen rebound effects. Please explain better.	Accepted: yes, we will improve this	Ulf Hahnel	University of Geneva	Switzerland
5299	11	42	11	45	This idea isn't clear, may you improve it ?	Accepted: yes, we will improve this	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
30767	11	44	11	45	What does "increased use those very technologies" mean? Word missing?	Accepted: will review and revise	Ulf Hahnel	University of Geneva	Switzerland
15105	11	24			after "O'Brien, 2018)" it is suggested to add "or even genuinely interdependent, when perceived in a multiparadigmatic world view (Ahamer, 2019)." -- The reference is: Ahamer, G. (2019), Mapping Global Dynamics - Geographic Perspectives from Local Pollution to Global Evolution. Springer, Dordrecht. (ISBN 978-3-319-51702-5, 426 pp., relevant chapters are 14, 15 and 25.2 to 25.5; see https://www.springer.com/de/book/9783319517025)	it is included in the corrected SOD	Gilbert Ahamer	Environment Agency Austria	Austria
1715	11				CITATION INCONSISTENCY this problem is seen in many sections and pages throughout this chapter for example: economics (Lawhon and Murphy 2012); Loorbach et al. 2017a). Outer transitions involve external	Accepted: will review and revise	Johannes Solar Obeto	University of Dar es Salaam	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
40059	12	28	12	28	Add after "... Berry JM 2017)": "However, Michaelowa and Michaelowa (2017) conclude from an empirical assessment of over 100 transnational climate governance initiatives that they cannot be expected to fill the "mitigation gap" due to an absence of incentives and MRV systems." Michaelowa, Katharina; Michaelowa, Axel (2017): Transnational Climate Governance Initiatives: Designed for Effective Climate Change Mitigation?, in: International Interactions, 43, p. 129-155	Accepted: This counterpoint will be reflected in the section	Axel Michaelowa	University of Zurich	Switzerland
43539	12	28	12	28	Add However, recent studies are more critical of the effectiveness of such initiatives lacking transparency and quantification of outcomes and find that they cannot be relied upon to fill the "mitigation gap" add references to: Michaelowa, Katharina; Michaelowa, Axel (2017): Transnational Climate Governance Initiatives: Designed for Effective Climate Change Mitigation?, in: International Interactions, 43, p. 129-155 and Chan, Sander, Idil Boran, Harro van Asselt, Gabriela Iacobuta, Navam Niles, Katharine Rietig, Michelle Scobie et al. "Promises and risks of nonstate action in climate and sustainability governance." Wiley Interdisciplinary Reviews: Climate Change 10, no. 3 (2019): e572.	Accepted: This counterpoint will be reflected in the section	Matthias Honegger	Perspectives Climate Research gGmbH	Germany
40061	12	31	12	31	Add after "... Zhao et al. 2013):" In the past, the action of interest groups has led to distortions of mitigation policy instruments that reduced their effectiveness. Under favourable lobbying constellations strong subsidy schemes for mitigation can emerge. Renewable feed-in tariffs in Europe persisted for over two decades and were crucial for the breakthrough of wind and solar power technologies. But once competition from China led to the demise of European technology providers and the European population started to feel the pinch from the surcharges on their electricity bills, feed-in tariffs were abolished. Historically, rapid transformations of the nature required to reach 1.5°C built on either lavish public investment into the underlying infrastructure or a general notion of national emergency (Michaelowa et al. 2018)". 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	Accepted: This is a useful citation: will aim to show that when trade-offs become more apparent enabling policies may be reformed	Axel Michaelowa	University of Zurich	Switzerland
24535	12	7	13	7	In this section, you can integrate a list of key action governments should take. For example: Develop schools and research institutions whit the commitment to develop new technologies to mitigate climate change and propose social and economic actions to achieve SDG.	Will further specify the roles of different levels of government	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
47077	12	7	13	7	Important section. It could be mentioned that not only do governance arrangements influence which actors possess power, some have argued that power relations constitute governance, with power relations at multiple levels reproduced and contested by multiple actors over climate policies. Climate policies and governance arrangements are nested in existing power relations and conflicts. Nightingale, A. J. (2017). Power and politics in climate change adaptation efforts: Struggles over authority and recognition in the context of political instability. Geoforum 84 11-20.	Accepted: This is a good point and will be reflected in the revisions	Siri Eriksen	norwegian University of Life Sciences	Norway
1717	12	20			CITATION INCONSISTENCY: this problem is seen in many sections and pages throughout this chapter for example: lead (Rabe 2007; Koehn 2008; Doll and de Oliveira 2017).	Accepted: This will be corrected	Johannes Solar Obeto	University of Dar es Salaam	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47779	13	15	13	15	see also multifractal transition that generate heavy tailed probability distributions (Schertzer, D., Lovejoy, S. and Lavallée, D. (1993) 'Generic Multifractal phase transitions and self-organized criticality', in Perang, J. M. and Lejeune, A. (eds) Fractals 93. World Scientific, pp. 216–227.)	Accepted	Daniel Schertzer	Ecole des Ponts ParisTech,	France
23997	13	29	13	43	As Loorbach et al. 2017 state the socio-technical transition theory is by far the dominant paradigm. It should therefore be mentioned first and classified accordingly.	Partly accepted: will underline the role of socio-technical transitions but the ordering may stay the same as the socio-technical theories	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24537	13	29	13	43	The main topic is to reduce fossil fuel consumption. We need to be conscious about the physical and technical limits of the natural sources. New technologies are essential to replace oil for renewables. Maybe you can refer to Chapter 10.	Accepted: Will cross reference	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
47079	13	32	13	34	Path dependencies and lock-ins are critical to understanding the barriers to sustainable development outcomes. In this chapter, I would like to see a little clearer explanation (beyond stranded assets explained later) of how path dependencies come about, what reinforces them, and what evidence exists regarding how such path dependencies can be overcome.	Accepted: Will aim to incorporate lock ins toward the end of this section	Siri Eriksen	norwegian University of Life Sciences	Norway
9737	13	46	13	46	What economic theories?	Noted: A broader coverage of economic theories will be included in Chapter 1. We will revise and relate the discussion more directly to studies	Nathalie Hilmi	Centre Scientifique de Monaco	France
23999	13	46	13	47	This statement is not specific for economics. The condition "when framed..." is also misleading as economic theories claim to deliver on the goals mentioned without usually referring to the SDGs (rather to overall welfare which includes all SDGs and their trade-offs). A meaningful introductory statement for economics would be that economic theories highlight the role of economic aspects compared to political, social or cultural ones.	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24607	13	9	15	4	(1)We suggest you incorporate exergy and the second law point of view: It is essential to distinguish between exergy and energy. Energy is conserved in any process, whereas. Exergy, although similar in some respects, is different. "exergy" to express; the amount of available energy; its ability to be converted into other kinds of energy; and especially the capacity for doing work that we can utilize with a given system of energy carriers in our normal environment on the earth (Sato, 2004) Exergy represents the maximum work we can hope to harvest from energy (Bejan, 1996, 2002; Dincer & Rosen, 2013; Jørgensen, 2008; Rodriguez, 1980; Sussman, 1980; Szargut, 2005; Tsatsaronis, 2008). It is possible to determine the extent to which the system destroys exergy. The destroyed exergy is proportional to the generated entropy.	Rejected This is not relevant to the theories addressed	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
24609	13	9	15	4	(2)The amount of energy is always preserved during a process (first law), but the exergy in a process is linked to the decrease in the quality of energy (second law). This decrease in quality is accompanied by an increase in entropy and destruction in the exergy. The destroyed exergy represents the potential for lost work and is also called wasted work or lost work. The energy is preserved, but the exergy does not. Once the exergy is wasted, it never recovers.	Rejected This is not relevant to the theories addressed	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24611	13	9	15	4	(3)Exergy also has links to environmental issues and impacts that permit exergy methods to be useful tools in efforts to reduce or mitigate environmental impacts. Some have proposed that exergy methods be used to determine the taxes and financial penalties applied to polluters because the exergy of emissions correlates with the theoretical work required to undo the environmental damage (or clean up). Other methods for linking exergy and the environment that could be useful in formulating government policy exist (Bonati et al., 2019). Although work in this area has led to many successes, there appears to be much more opportunity for benefits that will unfold in the future through further research (Rosen, 2002).	Rejected This is not relevant to the theories addressed	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
24613	13	9	15	4	(4)Exergy is what we value because it, not energy, consistently represents the potential to drive processes and devices that deliver services or products. It seems that exergy conservation is what laypeople mean when they say energy conservation.	Rejected This is not relevant to the theories addressed	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
24615	13	9	15	4	(5) Bejan, A. (1996). Advanced engineering thermodynamics. John Wiley & Sons. Bejan, A. (2002). Fundamentals of exergy analysis, entropy generation minimization, and the generation of flow architecture. International Journal of Energy Research, 26(7), 0–43. https://doi.org/10.1002/er.804 Bonati, A., De Luca, G., Fabozzi, S., Massarotti, N., & Vanoli, L. (2019). The integration of exergy criterion in energy planning analysis for 100% renewable system. Energy, 174, 749–767. https://doi.org/10.1016/j.energy.2019.02.089 Dincer, I., & Rosen, M. A. (2013). Exergy and Energy Analyses. In Exergy (pp. 21–30). https://doi.org/10.1016/b978-0-08-097089-9.00002-4 Jørgensen, S. E. (2008). Exergy. In Encyclopedia of Ecology (pp. 1498–1509). https://doi.org/10.1016/B978-008045405-4.00689-3 Rodriguez, L. (1980). Calculation of Available-Energy Quantities. ACS Symposium Series, 39–59. https://doi.org/10.1021/bk-1980-0122.ch003 Rosen, M. A. (2002). Exergy and government policy: Is there a link? Exergy, An International Journal, 2(4), 224–226. https://doi.org/10.1016/s1164-0235(02)00088-2 Sato, N. (2004). Chapter 10: Exergy. In Chemical Energy and Exergy. https://doi.org/10.1016/b978-0-444-51645-9.x5000-6 Sussman, M. V. (1980). Standard Chemical Availability. Chemical Engineering Progress, 76(1), 37–39. Szargut, J. (2005). Exergy method: technical and ecological applications. International Series on Developments in Heat Transfer, 18, 164. Tsatsaronis, G. (2008). Recent developments in exergy analysis and exergoeconomics. International Journal of Exergy, 5(5–6), 489–499. https://doi.org/10.1504/IJEX.2008.020822	Rejected This is not relevant to the theories addressed	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24015	13	45	15	4	The section exhibits several difficulties: 1) it presents only one economic paradigm, which is neoclassical theory. 2) this is no transition theory (unlike, e.g., socio-technical transition theory presented above) as most of the models used (and mentioned here) are static - i.e. they show conditions of a certain desired state (e.g. 1.5 degree world) but do not explain how to get there (i.e., how to persuade governments to apply effective and efficient policy instruments). Closest to an economic transition theory is the change-oriented branch of New Institutional Economics (North 1990), which usually does not use the models discussed here. 3) Other relevant contributions that could be reflected here come from ecological economics and behavioral economics. Relevant topics are post-growth (Daly, Jackson), happiness research (Easterlin), nudging (Kahneman, Thaler), dealing with commons (Ostrom) and merit goods (Musgrave).	Rejected This is not relevant to the theories addressed	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
27783	13	45	15	14	Section 17.2.2.4. is unclear, poorly constructed, poorly argued, mixes apples and oranges, in short, it is more confusing then enlightening. It is very biased towards neo-classical models (energy-economy models and Integrated Assessment Models) as these models have a dominating position in IPCC related research. However, these models have been much criticized, with good reasons. This most relevant critic is barely addressed in the section, thus depriving the reader of important insights. The section likewise neglects the increasingly important and recognized contributions from evolutionary economics, complex systems models, computational simulations using agent-based models and economic-ecological systems models. Even if these advances are not the subject matter of other chapters in the report, they should not be overlooked. It would be ironic if a report that stresses the complexity of transitions restricted itself, in in its "economic modelling" section, to the very class of models that negate this complexity. In the following I suggest an amended text, broken down in subsequent paragraphs by //.	Rejected A more general discussion of the theories will be included in section 1, and we will only focus on applications in models	Christophe Deissenberg	Institute for non-linear dynamic inference	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27785	13	45	15	14	The dominating economic paradigm, the neo-classical theory, considers a very aggregated world with nice mathematical properties (convexity, continuity, differentiability ...) which translate into smooth substitutability between and among technologies, resources, and goods. In this world, that is inhabited by one or a few “representative consumers” and “representative firms”. Despite considerable methodological caveats, the neo-classical approach assumes that the welfare of a society can be univocally measured as a function of the goods consumed by the representative consumer and thus, that one can assign a monetary value to environmental changes./The substitutability properties imply that it is e.g. always possible to substitute natural resources with capital without affecting social welfare. In other words, standard economic theory focusses on “weak sustainability” principles. These stand in stark contrast to the “strong sustainability” or “integrated sustainability” principles found in ecology-based approaches (Rockström et al., 2009) that suggest limited substitutability. The standard economic paradigm also stands in stark contrast to non-linear approaches as it largely precludes any abrupt change of regime or catastrophe and concentrates on unique stable equilibria. As it is based on representative consumers representations, it is poorly equipped to address questions of intra-generational equity./A well-known example of results obtained in the neo-classical framework is the Hartwick’s rule, that requires to Invest all profits or rents from exhaustible resources in reproducible capital such as machines. Following this rule insures, in a fairly wide class of neo-classical models, the existence of a development path that is both efficient (it is impossible to increase social welfare at some point of time without decreasing it at another point) and equalitarian (the welfare is the same at any point of time)./Neoclassical environmental economics recognize that free markets will not reach sustainability objectives if left to their own devices. A market economy, e.g., will not spontaneously follow the Hartwick’s rule. Taxes,	Rejected A more general discussion of the theories will be included in section 1, and we will only focus on applications in models	Christophe Deissenberg	Institute for non-linear dynamic inference	Luxembourg
27787	13	45	15	14	In the same vein, I regret that Input-Output models are not mentioned in the section as they are a main tool to quantify at a disaggregated level the total material and financial requirements of mitigation and adaptation, to assign the responsibility for emissions embodied in internationally traded products, etc. etc. J. Guilhoto (2020), Vercauteren et al. (2019) for theoretical considerations. In addition, there is a very long list of applications. J. Guilhoto, Input-Output Models Applied to Environmental Analysis, Oxford Research Encyclopedia of Environmental Sciences, 2020 Vercauteren, An & Christis, Maarten & Geerken, Theo & Linden, Ann. (2019). Policy needs (to be) covered by static environmentally extended input–output analyses. Economic Systems Research. 32. 1-24. 10.1080/09535314.2019.1644994.		Christophe Deissenberg	Institute for non-linear dynamic inference	Luxembourg
27789	13	45	15	14	Based on the previous comments I suggest including a box or a section explaining the shortcomings of the standard neoclassical models and giving an overview of alternative systemic, granular, agent based, input-output, ... approaches.	Rejected A more general discussion of the theories will be included in section 1, and we will only focus on applications in models	Christophe Deissenberg	Institute for non-linear dynamic inference	Luxembourg
40063	13	45			Include the new political economy (“public choice”) theory in the discussion in Section 17.2.2.4. See e.g. 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, for an application of this theory.	Rejected A more general discussion of the theories will be included in section 1, and we will only focus on applications in models	Axel Michaelowa	University of Zurich	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43541	13	45			New political economy ("public choice") theory contributes; should be included in Section 17.2.2.4. esp. pertaining to the extreme transformations for 1.5°C e.g. 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.	Rejected A more general discussion of the theories will be included in section 1, and we will only focus on applications in models	Matthias Honegger	Perspectives Climate Research gGmbH	Germany
9739	14	1	14	1	Any reference for "these theories"?	Noted It is a very general discussion and we will leave this to chapter 1	Nathalie Hilmi	Centre Scientifique de Monaco	France
23951	14	1	14	4	Environmental costs all together are widely externalised. Internalisation of GHGs and pollutants is only part of this this. Also costs of damaging biodiversity have to be integrated in the economic theories.	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5301	14	1	14	7	In addition to this reference that have many years(43 years, the World changed very much), we need more references that put on the floor this affirmation	Rejected A more general discussion of the theories will be included in section 1, and we will only focus on applications in models	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
18793	14	1	14	21	In the context of opposing perspectives such as the "economic" perspective and the "planetaries boundaries" perspective it can be worth pointing to analyses that show what kind of policy making is really necessary to deal with planetary boundaries in the Anthropocene. It turns out that one of the foremost is to be tough and consistent with a broad array of conventional policy instruments such as carbon taxes. See Sterner, T., Barbier, E.B., Bateman, I., van den Bijgaart, I., Crépin, A.S., Edenhofer, O., Fischer, C., Habla, W., Hassler, J., Johansson-Stenman, O., Lange, A., Polasky S., Rockström, J., Smith, H.G., Steffen, W., Wagner G., Wilen. J.E., Alpizar, F., Azar C., Carless, D., Chávez, C., Coria, J., Engström, G., Jagers, S.C., Köhlin, G., Löfgren, Å., Pleijel, H. and Robinson, A. (2019). Policy design for the Anthropocene. Nature Sustainability 2(1), 14-21 Jan 10th. DOI: 10.1038/s41893-018-0194-x.	Noted We will leave the discussion to chapter 13 on policies	thomas Sterner	Univ of Gothenburg	Sweden
24001	14	3	14	3	instead of "internalize GHG and other pollutants" only the respective costs can be internalized	Rejected We will leave this discussion to Chapter 13 on policies	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24003	14	3	14	3	Relevant references regarding the internalisation / limitation of environmental externalities are Pigou, A. C. (1932): The economics of welfare, London, and Baumol, W. J.; Oates, W. E. (1988): The Theory of Environmental Policy. 2. Ed., Cambridge	Rejected We will leave this discussion to Chapter 13 on policies	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
23953	14	4	14	5	"Substitution of exhaustive resources" does not fulfill the necessity to meet the needs of future societies. The economic development should shift more to circular economy and benefit from the cross-cutting effects it is generating: See for example: A Circular Economy Model of Economic Growth by George et al. 2015.	We will leave this discussion to Chapter 1	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
25461	14	6	14	7	Delete "Hartwick's rule, which calls for ... , illustrates this targeting."	Rejected It is a very central point on exhaustible resources	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
4237	14	7	14	7	"Economic theory is therefore based on"	Accepted	Christine Callihoo	Canadian Institute of Planners	Canada
17119	14	7	14	7	Replace "based" by "based on"	Accepted	Théo Milliez	Alterna	Switzerland
24005	14	7	14	7	This applies to neoclassical theory only, not to, for example, ecological economics.	Accepted; will be added.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
9741	14	7	14	11	Any reference to support this?	Partly accepted, but references are already included	Nathalie Hilmi	Centre Scientifique de Monaco	France
9743	14	12	14	14	Too vague. Please precise what theories and models?	Accepted, will be revised.	Nathalie Hilmi	Centre Scientifique de Monaco	France
24007	14	15	14	18	If limitations of theories are mentioned like at this point this should apply to all theories presented and not only to economic ones	Rejected This is a section on economics	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
14387	14	22	14	26	Thank you for citing IEA results. Nonetheless, please note that more recent publications from IEA also prove the importance of energy with refined analysis, that could be better to cite here : in IEA WEO 2019, Chapter 2, figure 2.16 shows that efficiency, Renewables, and CCUS could allow respectively for 37%, 32% and 9% of emissions reduction required by 2050 between our baseline scenario (Stated Policies Scenario) and our Sustainable Development Scenario compliant with Paris Agreement target of holding temperature increase to well below 2°C.	Accepted in general. But the sentence will be moved to Section 17.3.	Arthur Contejean	International Energy Agency	France
24009	14	22	14	28	The specific purpose of economic models like general or partial equilibrium models is not simply to find suitable technologies but rather to find efficient technologies that minimize costs of implementing certain goals	Noted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
27791	14	22	14	28	I fail to see how this relates to economics economic theories, the subject matter of the section. These are mostly technical/empirical results, of interest for economists as input for further analyses but outside from their field of research.	Accepted, some of the sentences will be moved to Section 17.3.	Christophe Deissenberg	Institute for non-linear dynamic inference	Luxembourg
23955	14	31	14	38	The energy consumption of the IoT, AI and big data is growing rapidly and efficiency measures are necessary there. See: Hintemann, R. & Hinterholzer, S. (2019). Energy Consumption of Data Centers Worldwide – How will the Internet become Green? Presented at ICT4S, Lappeenranta, Finland.	Noted; will be added in section 17.3.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5303	14	39	14	42	What is the relation between technological innovation and marginal abatement costs? Please explain more clear in this paragraphs	Noted; some explanations will be added.	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
27793	14	39	14	48	This fragment is confused and arguably erroneous at places. If I understand properly, the intended message is: "The sustainability of a policy cannot be accurately evaluated by looking at its first order impacts only. It is necessary to consider also at all its induced effects. In economic parlance, one needs to carry out a general equilibrium analysis, by contrast to a partial equilibrium one. But general equilibrium models are very difficult to quantify precisely, and the associated margin of error is very large. Moreover, these models do not incorporate yet many climate-related damages, of which there is a growing list.". The fragment might advantageously be placed earlier in the sub-section –what I did in my suggested reformulation.	Rejected A broader coverage of economic theories and model applications will be included in Chapter 1. We will revise and relate the discussion more directly to studies	Christophe Deissenberg	Institute for non-linear dynamic inference	Luxembourg
24011	14	39	14	49	I would not say that a certain technology is per se sustainable or not. Usually its contribution to sustainability depends on the circumstances	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
9745	14	40	14	40	Which models?	Partly accepted, we will move particular modelling results to section 17.3	Nathalie Hilmi	Centre Scientifique de Monaco	France
24013	14	44	14	45	it would be more precise to say that economic models (not the theory) do not cover all damage aspects. Please provide references for damages that are typically not included in the models referred to in this section	Noted A broader coverage of economic modelling results in Chapter 3.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
26629	14	39	15	4	According to the conventional view, mitigation policies are costly since they divert resources from productive use: environmental regulation potentially hurt firms' competitiveness. The "Porter hypothesis" challenges, however, this conventional view. Strict but flexible environmental regulations modify relative prices and eventually generate innovations that lead to environmental benefits and productivity gains. There would, therefore, be a complementarity between environmental and industrial or competition policies (Porter M.E. and Van Der Linde C., 1995, Toward a new conception of the environment-competitiveness relationship, Journal of Economic Perspectives, 9, 97- 118). However, this hypothesis is hotly debated both theoretically and empirically (see for a literature review: Brännlund R. and T. Lundgren, 2009, Environmental Policy without Costs? A Review of the Porter Hypothesis, International Review of Environmental and Resource Economics, 3(2), 75-117).	Partly accepted We will add this discussion briefly	Jean-Louis Combes	University of Clermont Auvergne; center for studies and research on development economics (CERDI); France	France
24539	14	47	15	4	This is an excellent idea. Do you have information that support these thoughts? Or some papers?	Accepted We will look for literature	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
26631	15	4	15	4	Economic theories also address the link between macroeconomic policies and the environment. Thus the trade-off between environmental constraints and the performance of fiscal and monetary policies is treated in a Keynesian framework by Heyes (Heyes A. (2000), Proposal for the greening of textbook macro: "IS-LM-EE.", Ecological Economics, 32 (1), 1-7).	Noted A broader coverage of economic theories will be included in Chapter 1. We will revise and relate the discussion more directly to studies	Jean-Louis Combes	University of Clermont Auvergne; center for studies and research on development economics (CERDI); France	France
30769	15	11	15	16	The conclusion that "psychological theories provided evidence to understand changes in attitudes at the individual and community level" has not been discussed before. The theories should be introduced in the respective section in order to better link the main text with the conclusion section.	Accepted: This will be included in the main text; and the table will not be included.	Ulf Hahnel	University of Geneva	Switzerland
30771	15	30	15	30	Many different terms are used: values, attitudes, beliefs across the main text and the tables. Often these terms are not introduced or discussed without being integrated into the literature review (see previous comment). The terms should be consistently used and introduced.	Accepted: Tab. 1 will be revised	Ulf Hahnel	University of Geneva	Switzerland
30773	15	30	15	30	The concepts discussed in the line "drivers of change" and row "psychological, community-based, and social movements" are not introduced in the main text and seem to be quite unconventional (e.g., "inner peace"). What about concepts such as values, political identity/ideology, emotions, moral foundations that have been quite intensively discussed in the psychological literature within the CC context.	Accepted: Tab. 1 will be revised	Ulf Hahnel	University of Geneva	Switzerland
30775	15	30	15	30	Line "breakthroughs" and row "psychological, community-based, and social movements". In line with my previous comment, it is unclear where the concepts come from. "Self-enlightenment" has not been sufficiently introduced before.	Tab. 1 will be removed	Ulf Hahnel	University of Geneva	Switzerland
30777	15	30	15	30	Line "Inertia" and row ""psychological, community-based, and social movements": The concepts of loss aversion and status quo bias seem to be very relevant concepts here. See for instance: Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler. 1991. "Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias." Journal of Economic Perspectives, 5 (1): 193-206.	Tab. 1 will be removed	Ulf Hahnel	University of Geneva	Switzerland

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24017	15		15		Table 17.1 column 5 row 2 lists integrated assessment models as (key) economic method. However, IAM are no specific economic method but rather models that contain economic (sub-)models	Noted. The table will not be included	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5305	15	30	17		Table 17.1 - Why not is included the environmental factor? In the System Theories for Drivers of Change	Noted. The table will not be included	CRISTOBAL FELIX DIAZ MOREJON	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24541	15		17		Table 17.1 comparing theories This table is not clear and waste space.	Noted. The table will not be included	Daniel Alejandro Pacheco Rojas	National Autonomous University of Mexico (UNAM)	Mexico
24019	16		16		Table 17.1 row "uncertainties and tensions". I do not know whether this row is helpful. Both terms are rather vague (there are, e.g., different types of uncertainty, e.g. DOI 10.1007/978-94-007-5455-3_2). Futhermore, as the columns cover a broad range of different theories it is rather difficult to say that they generally (don't) cover aspects like uncertainty.	Noted. The table will not be included	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
18857	17		5		Sustainable development as a global policy framework is a pragmatic measure in achieving climate change mitigation	This suggestion will be dealt with in Section 1	Michael Ugom	University of Nigeria, Nsukka	Nigeria
47081	17	9	17	10	this is key. It would be useful if the section more explicitly mentions evidence of the negative effects of climate actions (as with sustainable development actions) on some people and groups, and how it is decided which negative effects are acceptable or not, and how they may impact on sustainable development /SDGs. AR5 WGII ch 13 (Olsson et al) found that climate measures to some extent undermined poverty alleviation, for example, because they seldom have poverty alleviation as their primary objective. There is literature on this e.g. REDD+, Khatri, D.B., Marquardt, K., Pain, A., and Ojha, H. 2018. Shifting regimes of management and uses of forests: What might REDD+ implementation mean for community forestry? Evidence from Nepal. Forest Policy and Economics, 92:1-10. Benjaminsen, G. 2017. The bricolage of REDD+ in Zanzibar: From global environmental policy framework to community forest management, Journal of Eastern African Studies, 11(3):506-525, https://doi.org/10.1080/17531055.2017.1357103 Bergius, M., Benjaminsen, T.A., and Widgren, M. 2018. Green economy, Scandinavian investments and agricultural modernization in Tanzania, The Journal of Peasant Studies, 45(4):825-852, DOI: 10.1080/03066150.2016.1260554	Accepted	Siri Eriksen	norwegian University of Life Sciences	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
37057	17	16	17	21	most of the chapters have discussed mitigation options within SDG framework showing synergies and trade offs which is near term conclusions and can be finally summarised here taking from sectora chapters. But what is the message for the long term path dependency that is emerging from AR6 within long term sustainable development paradigm can be a unifying theme which can be added in this chapter based on assessment from other chapter findings. This is will be different than ch 3 and chapter 4 conclusions cobmined with chapter 5 and ch 12. As long term visions can emerge from these chapters as well as from sector chapters combined with policy chapter enablers. So two tables one for 2030 and another for long term SD dimensions compatible options /pathway can be presented. So that will definitely be narrower than ch 3 and 4 , compatible with Ch 1 figure 1.2 on sustainable development corridor with regional variations with more empirical support. In SR 1.5 the synergies and trade offs were indicative so if this chapter can consier more concrete examples from sector chapters in AR6 that will advance the knowledge. Also, a hanshake with WGII by expanding the synergies-trade offs with Adaptation and mitigation implication and vice versa can also be useful advancement of IPCC knowledge. Current place holder table 17.2 /17.3 can be improved towards this . Section 17.3.5.1 can be a good section to summarise options, portfolios of actions and pathways without committing to more lock in.	We will consider tradeoffs in more detail and include more studies on local issues	Joyashree Roy	Asian Institute of Technology, Thailand. Jadavpur University, India	Thailand
31607	17	25	17	28	Exploring synergies between climate change adaptation, mitigation and other sustainability priorities (such as biodiversity and social equity, for instance) (Beg et al. 2002; Burch et al. 2014; Shaw et al. 2014; Van der Voorn et al. 2020) may help to yield these transformative outcomes and the associated strategies, though data regarding the specific nature of these synergies is emerging only now.	Accepted	Tom van der Voo	Institute for Environmental Systems Research	Netherlands
24021	17		17		Table 17.1 row "shortcomings" 2nd column: as stated above in the table the (social) theories cover several institutions such as organisations, cultural aspects or social movements. If these do not fall under the definition of institutions used here this should be made explicit and justified	Accepted: this table will be removed	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24023	17		17		Table 17.1 row "shortcomings" 5th column: the key shortcoming of (neoclassical) economic theory is certainly not the utility maximization assumption, which, moreover, has long been revised. If at all the maximization assumption is a shortcoming of models (method, not theory) but even then the key problem is rather the highly stylized modelling in gernal, assuming away relevant aspects of reality in order to keep the model operationable (e.g. Reiss, J. (2013): Philosophy of economics, 1. ed., pp. 119 ff.)	Noted The table will not be included	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
42191	17	2	45	27	in principle I really like the idea of using case studies for really illuminating the issues about SD and acceleration - in practice, a s yet, this section does not work.	Accepted	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
5307	17	2	50	2	Point 17.3 - Exists a mix between study cases, effects of climate change over water, energy, food production nexus , and other items that would be ordinated	Accepted. We will work more on the case studies and also link the information more directly to other chapters	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
36327	17	18			Could you please made clearly distinction between: low carbon society, decarbonization, deep decarbonization?	Accepted	Youba Sokona	South Centre	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
36143	18	3	18	3	Add 'increasingly important role' instead of 'increasing role'	Accepted	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
5309	18	3	18	6	It was analyzed in the beginning of the Chapter page 5	Accepted We will cross reference	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24543	18	3	18	16	The main idea of this paragraph is already in the text. It would help if you considered eliminate this paragraph. Waste of space.	Noted We will coordinate with Section 1	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
5233	18	3	18	48	It is very important to link the policy related to NDC and SDG as described in the report. But the process of linking the two is quite long journey and hard to accomplish. It also depends on each country's governance, institution and system, etc. I recommend that the report mentions that we need consider each country's condition and environment to link, and try to cooperate for improvement.	Accepted	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
24659	18	5	18	6	There is "et al." twice in the reference (Pelling et al.et al., 2015)	Accepted	Juergen Weichsel	HWR Berlin	Germany
24661	18	5	18	6	More recent literature and detailed evidence regarding this statement should be added. For instance, a good overview is provided by: Weichselgartner J. & Arheimer B. (2019): Evolving climate services into knowledge-action systems. Weather, Climate, and Society 11 (2): 385-399.	Noted Most of the discussion about sustainable development paradigms, however will be in Chapter 1	Juergen Weichsel	HWR Berlin	Germany
4239	18	27	18	27	Suggest adding to ".... For the mitigation actions"... and for any mitigation impacts.	Accepted	Christine Callihod	Canadian Institute of Planners	Canada
4241	18	36	18	36	"... mitigation costs, rather but also strategically include policy integration"	Rejected We think that this is not only a strategic issue	Christine Callihod	Canadian Institute of Planners	Canada
24545	18	37	18	48	The main idea of this paragraph is already in the text. It would be best if you considered eliminating this paragraph—waste of space.	Rejected. The text includes new information based on a study	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
28451	18	37	18	48	It may be worthwhile discussing the potential of marine renewables here in the UN sustainability goal SDG14 ("life below water"). Given the high LCOE and low TRLs of marine renewables (waves, tides), development of these sectors has stagnated - however the potential is create when considering future technological developments (Lewis et al. 2015) or the apprent geographic bias in design (Fairley et al. 2020) which if addressed could have a significant installed capacity globally, due to the catalyst of offshore aquaculture, etc, therefore creating high uncertainty in the future contributions from the marine renewables industries. Fairley, I., Lewis, M., Robertson, B., Hemer, M., Masters, I., Horrillo-Caraballo, J., Karunarathna, H. and Reeve, D.E., 2020. A classification system for global wave energy resources based on multivariate clustering. Applied Energy, 262, p.114515. and Lewis, M., Neill, S.P., Robins, P.E. and Hashemi, M.R., 2015. Resource assessment for future generations of tidal-stream energy arrays. Energy, 83, pp.403-415.	Rejected These areas would be more relevant in relation to sectoral chapters	Matt Lewis	Bangor University	United Kingdom (of Great Britain and Northern Ireland)
38653	18	46	18	46	food, energy and water security. Furthermore, water coonservation	Rejected Our formulation is better	Eveline Maria Vas	COPPE_UFRJ	Brazil

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24025	19	1	19	4	Please specify what is meant by "lack of finance" and provide references. In general this seems questionable as never before in history has there been so much financial wealth both in private and public hands. The financial crisis 2008/09 has demonstrated how much public money can be mobilized on short notice. The relevant barrier, rather, is how to mobilize / channel these resources for the sake of SDGs / climate protection. Furthermore, as with many other aspects listed in the chapter, the choice of this particular barrier feels arbitrary. There should be at least a reference to the theoretic approach that makes this claim.	Rejected We think it is better to keep water security and conservation in the same sentence	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5235	19	2	19	2	- What does "SDG transformations" mean?	Accepted All these concepts will be reviewed and standardized	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
47083	19	2	19	4	Equally challenging may be to ensure that the finance targets the poorest people in practice within the poor countries, and that elite capture is avoided.	Accepted	Siri Eriksen	norwegian University of Life Sciences	Norway
44077	19	5	19	6	It would be useful to better understand the potential (realistic) role of the private sector instead of talking in generalities. Can more be said here?	Accepted	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
23957	19	22	19	24	According to a new report Germany will miss its emission targets even with the full application of all measurements of its climate programm. (See: Treibhausgasmindierungswirkung des Klimaschutzprogramms 2030, Harthan, R. et al, 2020). So this is not really a good example of longer term planning.	Noted We will develop the text on these issues based on submissions by other countries	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24027	19	24	19	24	the correct term would be security of investment (instead of investment certainties)	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
37907	19	30	19	47	This paragraph lacks references and confidence statement. While the content is interesting it is not an assessment of the literature.	Noted We will develop the text, include more references and studies, and cross reference to chapters 3 and 4	margot Hurlbert	University of Regina	Canada
9747	19	33	19	33	What long and short terms studies?	Accepted See previous comment	Nathalie Hilmi	Centre Scientifique de Monaco	France
9749	19	33	19	35	any reference to support this sentence?	Accepted More studies and references will be added	Nathalie Hilmi	Centre Scientifique de Monaco	France
5311	19	42	19	42	Don't put abbreviations	Noted, it is the acronym of the project, we will use a bracket	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24029	19	46	20	2	I am not sure whether non-economists can make sense out of this sentence	Accepted We will add explanation	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24037	19	30	21	45	<p>it should be made clearer what this section tries to convey: unlike suggested in the title there are no references to "development pathways" as the study results presented are purely static in nature. Rather a key topic appears to be co-benefits of climate change mitigation for SDGs.</p> <p>It is also unclear why this section is filed under section 17.3.2 which refers to short and long term transitions.</p> <p>The results also relate to different analytical levels, making the section incoherent: Bataille et al and Markandya et al refer to co-benefits, while Kainuma et al refer to implications of such benefits (seemingly for optimal GHG-price and thus policy formulation)</p> <p>The section considers only co-benefits, no trade-offs, which are possibly more relevant for policy making</p>	Accepted We will make the reference to methodologies and studies more clear and add material on tradeoffs	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
14391	19	30	21	46	<p>In this part (17.3.2.1 Economy wide analysis: low-carbon development pathways), IEA's Sustainable Development Scenario (SDS) should be mentioned, given that the results are used throughout the chapter and that it would be a perfect citation of a model looking at both climate targets and certain SDGs related to energy. We would be happy to provide you with a one paragraph description that could fit here. I also added some info below on what is done in SDS.</p> <p>It is a normative scenario, which describes an integrated least-cost pathway for the world's energy system to deliver on energy-related SDGs: to ensure universal access to affordable, reliable, sustainable, and modern energy services by 2030 (SDG 7); to substantially reduce the air pollution which causes deaths and illness (SDG target 3.9); and to take effective action to combat climate change (SDG 13). This scenario starts with the SDG outcomes and then works back to set out what would be needed to deliver these goals in a realistic and cost-effective way.</p> <p>Interest of this scenario is to observe what measures and technology improvements can bring in terms of emissions reductions. As a result, it appears that there is no single or simple solution to reach sustainable development goals. And reaching sustainable development goals would require a host of other technologies and policies, with renewables and efficiency at the forefront (accounting in our scenario for around 70% of the energy-related CO2 emissions reductions needed to realise the Paris Agreement compared to our baseline scenario, the Stated Policies Scenario).</p> <p>It is also interesting as it looks at how achieving energy access and pollution goal can be interlinked with climate goal. One important and interesting outcome is that according to our analysis, in our SDS scenario universal access to electricity and clean cooking facilities is achieved by 2030 with net reductions in greenhouse gas emissions, as increased CO2 emissions from the</p>	Accepted We will refer to the WEO and coordinate this with Chapters 3 and 6	Arthur Contejean	International Energy Agency	France
1709	19	22			FOR or FROM: In the spirit of the Paris Agreement, the plan for? Germany emphasizes that	Noted	Johannes Solar O	University of Dar es Salaam	United Republic of Tanzania
24547	20	2	20	4	<p>•Do you have evidence that supports that? Could you make a reference?</p> <p>•This idea could be valid for countries that do not base their economy on fossil fuels. Nevertheless, it would help if you considered the differences between countries.</p> <p>•You may seek feedback from Working Group II.</p>	Accepted We will look for more studies and it will also be considered as part of discussion about Just Transitions	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
13501	20	5	20	13	Reference is missing	Accepted	Sophie Szopa	Commissariat à l'Energie Atomique et aux Energies Alternatives	France
24551	20	5	20	13	<ul style="list-style-type: none"> •These results are really attractive. What did they do? Could you explain this? •You miss references. Do you have it? 	Accepted More details can be added	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24031	20	6	20	9	please specify whether these results relate to actual (historic) or hypothetical (scenario) events	Accepted They are future scenarios	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5313	20	10	20	10	The word improve is repeated	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24549	20	10	20	10	"improve improve"	Accepted	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
25463	20	10	20	10	Delete "improve".	Accepted	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
11201	20	31	20	33	How can the carbon price be lower if co-benefits are included? With a lower carbon price, the benefits will not be realized.	Accepted We will reconsider the study, carbon price can here be used as a measure of mitigation costs	Snorre Kverndokk	Frisch Centre	Norway
24033	20	31	20	33	the phrase "the carbon price would be lower" is not clear. It could either read "the carbon price should be lower" (normative wording) or "the optimal / cost effective carbon price would be lower" (descriptive wording)	Accepted We will reconsider the study, carbon price can here be used as a measure of mitigation costs	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24035	20	40	20	47	how are these methodological aspects relevant to the section?	Accepted The idea was to include more aspects about policy dialogues and enabling included in a study. We will explain this in the text	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
5315	20	46	20	46	Change om by on	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
1711	20	19			Consider a COMMA: In India, the co-health benefits were USD3-28	Accepted	Johannes Solar O	University of Dar es Salaam	United Republic of Tanzania
47085	21	1	21	7	How are effects (and co-benefits) socially differentiated? How can one ensure that inequity is not exacerbated and that the most vulnerable are not negatively affected (critical aspects of sustainable development 'leave no one behind').	Accepted We will look for literature	Siri Eriksen	norwegian University of Life Sciences	Norway
47087	21	13	21	21	Important points made here, link with climate resilient development /WGII ch 18?	Accepted	Siri Eriksen	norwegian University of Life Sciences	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24553	21	15	21	15	Could you provide some examples of lifestyle changes and localized solutions?	Accepted The integration will depend on how these issues have been addressed in the IAM's	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
38655	21	19	21	39	In fact, it is a challenge for IAMs to cover local synergies or trade-off about different aspects of the modelling. For example, modelling energy projection does not consider important aspects such as water availability and withdrawals from non-energy users. Also, current IAM consider land-use modelling, increasing the level of detail for analysis. This kind of modelling faces with the compatibility of the spatial scale of water (hydrographic regions) and IAM regionalization systems. For that reason, national or regional IAMs is necessary. Also, the addition of a water cost to the integrated energy system induces the choice of technologies with a minimal total cost and / or the option for processes that have less water intensive use. This leads to changes in the energy mix and land use expansion of the system and a reallocation of technologies to other hydrographic areas. COPPE institute, Rio de Janeiro Federal University - Brazil, is challenging this effort by the incorporation of a new water tool in the national energy and land use IAM model BLUES (http://www.ppe.ufrj.br/images/publica%20A7%20C3%B5es/doutorado/Eveline_Mar%20ADa_V%20C3%A1squez_Arroyo.pdf). The integrated optimization model is used to explore possible impacts on the Brazilian energy system and land use under restriction by the water resources use. BLUES model also has an interaction with the global IAM COFFEE model and the global TEA model (computational general equilibrium model). (http://www.globalchange.umd.edu/iamc/wp-content/uploads/2019/02/30.schaeffer.pdf) References: Arroyo, 2018. INCLUSION OF THE WATER-ENERGY NEXUS IN THE BRAZILIAN ENERGY EXPANSION SYSTEM OPTIMIZATION MODEL.	Accepted We will consider the suggested references and also see if they can be better addressed in the sub-section on water	Eveline Maria Vas	COPPE_UFRJ	Brazil
47089	21	40	21	45	Another barrier would be the power relations inherent in any governance arrangement, these relations being vested in the status quo, development as usual rather than transformation, and elite capture rather than shifting inequitable relations in favour of the vulnerable? See Pelling 2011, Taylor, M. (2014). The political ecology of climate change adaptation: Livelihoods, agrarian change and the conflicts of development: Routledge. Taylor, M. (2019). Hybrid Realities: making a new Green Revolution for rice in south India. The Journal of Peasant Studies 1-20.	Noted The text is focussing on IAM's, so it is may be not the best place for the suggested literature. We will consider it and see it it fits better in other parts of Chapter 17	Siri Eriksen	norwegian University of Life Sciences	Norway
42193	22	2	22	4	this intro to 17.3.3 needs to be much longer and really say what the chapter is trying to illuminate and probably what issues come out - referred to the case study. At the moment, what should be a really good section just gets lost in this long set of case studies	Accepted	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
9751	22	6	22	44	This section is missing: references and renewable energy from the ocean	Partly accepted but we are not exhaustive on all renewable energy options	Nathalie Hilmi	Centre Scientifique de Monaco	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
14393	22	16	22	18	WEO 2019 also provided an analysis on offshore wind that could be interesting in this context: https://www.iea.org/reports/offshore-wind-outlook-2019 Renewables market report 2019 had a focus on solar PV : https://www.iea.org/reports/renewables-2019	Noted, we will here refer to chapter 6, which go more into details about renewable energy options	Arthur Contejean	International Energy Agency	France
30779	22	17	22	18	"electric vehicles" do not match here as this technology is, in contrast to PV and wind, not a competitor with fossil fuels	Accepted	Ulf Hahnel	University of Geneva	Switzerland
30781	22	27	22	27	Here, a link with the coal box as an example would be helpful for the reader	Accepted	Ulf Hahnel	University of Geneva	Switzerland
14395	22	30	22	37	Please see comments on page 23 where I mention WEO 2019 analyses on the legacy of existing infrastructure.	Noted.	Arthur Contejean	International Energy Agency	France
24557	22	30	22	37	In the last years, this idea gets attention, and they disperse. They become popular. However, we know that "The challenge is thus to manage a transition" How to handle it? Do you have any recommendations or suggestions?	Noted. We recognize that this is an important point, and this is considered in more depth in the JT section of section 17.3.	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
37909	22	30	22	37	This is an interesting paragraph but there are no references and there isn't an assessment of the literature. Without these it comes across as a very normative statement and outside the mandate of the IPCC.	Accepted. We will revise by following the comment.	margot Hurlbert	University of Regina	Canada
24043	22	6	24	42	I feel that this section could be more condensed without reliance on specific numbers for certain metals from country XYZ. The key aspect should be that fossil substitution by renewables leads to increased demand for other non-renewable (instead of "non-fossil") resources. While this poses new chances for economic development environmental risks are simply shifted to another area an interesting aspect in regard to regional effects of climate change protection and SDGs would be whether and how benefits from energy resource extraction (now coal, then renewables) reallocate profits and thus development chances between regions / nations. There is, for example, the argument that the increased use of biomass for energy or other post-fossil applications will provide significant chances for many developing countries as global biomass is far more evenly distributed than fossil resources (e.g. Foust et al. 2015 p. 74 in http://bioenfapesp.org/scopebioenergy/images/chapters/bioenscope_introducao.pdf). Other aspects that should be covered are wind and solar energy (land use, income opportunities) and hydropower (ecological implications of mega dams)	Partly accepted, we will add references, but will refer to the industry chapter for a more detailed discussion.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
25465	22	6	24	42	Sub-section 17.3.3.1 should be substantially revised, making no reference to "fossil-fuel phase out", as this analysis does neither consider technological options such as CCS, nor matters related to national circumstances and capabilities, as well as adverse impacts of mitigation response measures. Energy access should be considered along with issues related to affordability and reliability.	Rejected The sub section aims at addressing fossil fuel phase out together with other issues	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
47069	22	1	39	19	It would be useful to see a discussion of evidence of leverage points for transformation in all these sectors.	Noted. We will leave this to other chapters since this is also going to be coordinated with policies and feasibility	Siri Eriksen	Norwegian University of Life Sciences	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24039	22	1	45	27	<p>the section's analytical depth regarding the initial question should be improved. For example, the subsection on WEFN discusses the topic without a clear reference to both sustainable development and decarbonization; there are no systematic reflections regarding possible synergies or trade-offs. The descriptions mostly rely on examples / anecdotal evidences that feel arbitrary. Systematic empirical results could greatly improve the section. Some subsections lack complexity, e.g. the one regarding digitalisation that fails to acknowledge decarbonisation risks posed by the high energy consumption of digital applications</p> <p>Overall, it would be more informative to discuss case studies that show how (historic) development has improved while leaving GHG emissions at least constant or even reducing those. For example, the deployment of renewable energies is often positively correlated to economic growth (https://doi.org/10.1016/j.inteco.2017.02.001). It would be helpful to collect, illustrate and analyse such examples of synergies between decarbonization and development</p>	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
16433	22	6			<p>In Section 17.3.3.1 Renewable energy penetration and fossil-fuel phase-out, consider adding a description related to hot dry rock geothermal energy and the potential of oil and gas companies to transition to the geothermal industry, thereby leading a transition in the energy sector. Drilling technology from oil and gas can be used for geothermal. Plant cost is mostly upfront, and funding provided by developed countries might be used to install geothermal power generation in developing countries to help decarbonize their energy sectors, while at the same time facilitating oil and gas companies to transition their assets to increase drilling capacity for hot dry rock geothermal. International mechanisms to enable this process would increase the rate of transition, and could be covered in this chapter.</p>	Noted. However, there are limited potentials of geothermal power in many countries. We will consider it within the limitations in pages.	Daniel Helman	College of Micronesia-FSM	Micronesia, Federated States of

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14397	23	2	23	4	<p>In WEO 2019, IEA did a substantial analysis on the coal legacy, and more generally, on legacy of existing energy systems, that could be added here. I copied below two paragraphs from WEO 2019 executive summary ; we would be delighted to provide more substance on this analysis if needed.</p> <p>"If the world is to turn today's emissions trend around, it will need to focus not only on new infrastructure but also on the emissions that are "locked in" to existing systems. That means addressing emissions from existing power plants, factories, cargo ships and other capital-intensive infrastructure already in use. Despite rapid changes in the power sector, there is no decline in annual power-related CO2 emissions in the Stated Policies Scenario. A key reason is the longevity of the existing stock of coal-fired power plants that account for 30% of all energy-related emissions today.</p> <p>Over the past 20 years, Asia has accounted for 90% of all coal-fired capacity built worldwide, and these plants have potentially long operational lifetimes ahead of them. In developing economies in Asia, existing coal-fired plants are just 12 years old on average. We consider three options to bring down emissions from the existing stock of plants: to retrofit them with carbon capture, utilisation and storage (CCUS) or biomass co-firing equipment; to repurpose them to focus on providing system adequacy and flexibility while reducing operations; or to retire them early. In the Sustainable Development Scenario, most of the 2 080 GW of existing coal-fired capacity would be affected by one of these three options."</p>	Noted.	Arthur Contejean	International Energy Agency	France
37755	23	2	23	4	<p>need to refer to need for phase out of coal for power generation (IPCC: 2050, but more precisely by 2040, and earlier in many regions see https://climateanalytics.org/media/report_coal_phase_out_2019.pdf, and very fast reduction of emissions from coal for power generation by 2030.</p>	Accepted.	Michiel Schaeffer	Climate Analytics	Netherlands

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32661	23	22	23	34	China has also recognized the need to control non-CO2 greenhouse gases at the national level in its five-year planning document and related policies. For example, non-CO2 greenhouse gas controls are briefly mentioned in China's 13th Five-Year Plan covering 2016-2020. 13th Five-Year Plan for National Economic and Social Development 《十三五规划纲要》(2016). In particular, because SLCPs are co-emitted with CO2 in energy production, transportation, and industry, CO2 mitigation measures will also reduce some co-emitted non-CO2 climate forcings. CO2-targeted policies can mitigate 70% of methane emissions and 30% of black carbon emissions. SLCP-targeted measures—like reducing methane from the agricultural sector and HFCs from cooling needs—are necessary for maximum benefit. Allen M., et al. (2018) TECHNICAL SUMMARY, in IPCC (2018) GLOBAL WARMING OF 1.5 °C, 33–34; Shoemaker J. K., et al. (2013) What Role for Short-Lived Climate Pollutants in Mitigation Policy?, SCIENCE 342:1323–1324; and Rogelj J., et al. (2018) CHAPTER 2: MITIGATION PATHWAYS COMPATIBLE WITH 1.5 °C IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT, in IPCC (2018) GLOBAL WARMING OF 1.5 °C, 96; Xu Y. & Ramanathan V. (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, PROC. NAT'L. ACAD. SCI. 114(39):10315–10323 (“A fraction of CH4 (about 70%) and BC (about 30%) emissions can be mitigated through CO2-dedicated measures.”). In addition, China has also recognized the co-benefits of and been promoting the collaborative control of air pollutants and greenhouse gases in its national legislation and policies. The coal transition should keep in line with these national laws and policies as well. Standing Committee of the National People's Congress, Air Pollution Prevention and Control Law 《大气污染防治法》(2018) (“对颗粒物、二氧化硫、氮氧化物、挥发性有机物、氨等大气污染物和温室气体实施协同控制”); and State Council, Three-Year Action Plan to Win the	Noted. We recognize the co-benefits of existing measures. Meanwhile, we will write the texts from the viewpoint of "acceleration".	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America
32663	23	22	23	34	Last but not least, coal transition should also be complemented by energy efficiency improvement efforts, which significantly reduce the needs for power generation and ease the pressure on coal consumption. For example, Lawrence Berkeley National Laboratory researchers calculate that the savings from improved air conditioner efficiency in peak demand could be equal to 500–1200 gigawatts of electricity, which would avoid (or free up for other uses), an amount of electricity equal to the production from between 1,000 and 2,500 medium-sized (500 MW) peak-load power plants by 2050. For the China market alone, transition of the room air conditioner industry to production of super-efficient and low-GWP air conditioners by 2030 could provide greenhouse gas savings of 850 MT CO2-eq annually, equivalent to over 8 Three Gorges dams. 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.	Partly accepted. We will add to the coal discussion in particular	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32861	23	22	23	34	Because SLCPs are co-emitted with CO2 in energy production, transportation, and industry, CO2 mitigation measures will also reduce co-emitted non-CO2 climate forcers. CO2-targeted policies can mitigate 70% of methane emissions and 30% of black carbon emissions. SLCP-targeted measures—like reducing methane from the agricultural sector and HFCs from cooling needs—are necessary for maximum benefit. Allen M., et al. (2018) TECHNICAL SUMMARY, in IPCC (2018) GLOBAL WARMING OF 1.5 °C, 33–34; Shoemaker J. K., et al. (2013) What Role for Short-Lived Climate Pollutants in Mitigation Policy?, SCIENCE 342:1323–1324; and Rogelj J., et al. (2018) CHAPTER 2: MITIGATION PATHWAYS COMPATIBLE WITH 1.5 °C IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT, in IPCC (2018) GLOBAL WARMING OF 1.5 °C, 96; Xu Y. & Ramanathan V. (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, PROC. NAT'L. ACAD. SCI. 114(39):10315–10323.	Accepted: will aim to include section on SLCPs; but important to note that many sources of black carbon are not major contributors to CO2 such as cookstoves, brick kilms, and diesel vehicles	Kristin Campbell	Institute for Governance & Sustainable Development	United States of America
30783	23	42	23	42	The source "Parra et al., 2018) is not in the reference list.	Accepted. Thanks.	Ulf Hahnel	University of Geneva	Switzerland
38657	23	1	24	6	This box should mention CCS technology for coal-fired power plants, as China has many studies about this alternative. This is important because thermoelectric power plants with a Rankine cycle, as coal-fired power plants, have an important trade-off with SDG 6 and SDG 14.	Accepted.	Eveline Maria Vas	COPPE_UFRJ	Brazil
38665	23	1	24	6	This box should mention CCS technology for coal-fired power plants, as China has many studies about this alternative. This is important because thermoelectric power plants with a Rankine cycle, as coal-fired power plants, have an important trade-off with SDG 6 and SDG 14	Accepted. (the same comment as #30783)	Eveline Maria Vas	COPPE_UFRJ	Brazil
37735	23	40	24	6	A core finding from Parra et al 2018 (which should be "Yanguas-Parra et al") was *not* that coal power plants play a crucial role in balancing fluctuations in electricity production. This is a mis-quote. The report found that lowering emissions from coal is crucial for meeting 2020 and 2030 emissions targets, and that Germany would need to phase out coal by 2030 in order to comply with the Paris Agreement 1.5 degree warming limit. This section is also out-dated with respect to the conclusions of the coal commission and the subsequent actions taken by the German government, and should be updated. Another misrepresentation is reference to economic problems fom increasing renewable energy.	Accepted.	Michiel Schaeffer	Climate Analytics	Netherlands
24559	23		24		Box 17.1 Do you have some alternative for carbon use, in case China achieved the 1.5 goals?	Noted.	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24041	24	1	24	6	please update: the commission has published its final report on 26.1.2020 another good example would be Poland, which dependency on coal is far higher, leading to an important laggard role in EU climate policy (e.g. doi 10.1080/09644016.2018.1429046)	Noted. Thanks.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
30785	24	8	24	8	This claim has been made multiple times before and is redundant.	Noted.	Ulf Hahnel	University of Geneva	Switzerland
30787	24	12	24	14	The concept of flexibility is extremely relevant for the renewable energy transition. I understand that the concept cannot be explained in detail in this section, but reference could be made to the relevant chapter of the report (e.g., Chapter 6).	Accepted, will include it within the scope of this chapter.	Ulf Hahnel	University of Geneva	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
11203	24	15	24	37	You should make a reference to chapter 10 here. Also, you should be more explicit on the social problems with mining in maye developing countries such as Congo, and recycling of the materials. An interesting new study that may be considered when it comes to recycling of Lihium is: Rosendahl, K. E., and D. R. Rubiano, 2019: How Effective is Lithium Recycling as a Remedy for Resource Scarcity? Environ. Resour. Econ., 74, 985–1010, https://doi.org/10.1007/s10640-019-00356-5 .	Accepted, will include the recycling of Lithium into the article. Social issue also will be elaborated in details.	Snorre Kverndokk	Frisch Centre	Norway
22931	24	15	24	42	This section lacks a discussion of the negative impacts of being a natural resource risk country and cludes as if it might be positive for lithium mining to replace the economic value of oil and coal extraction in resource-rich countries with no thought given to the potential non-inclusive nature of this switch and who will benefit.	Will review the narrative on lithium a bit more comprehensively	Kelsey Ross	The Center for Global Development	United States of America
5317	24	26	24	26	I propose Include Bolivia	Rejected, not supported by the peer-reviewed published literature	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
47091	24	28	24	37	Evidence of exploitative working conditions and child labour in resource extraction? Relevant to several SDGs.	OK. Point Accepted	Siri Eriksen	norwegian University of Life Sciences	Norway
47093	24	44	25	48	What is the role of agri-business, land rights/land grabbing, modernisation of agriculture in development models, and the extent to which they are consistent with sustainable development? Also mention that many behaviours and production systems in Africa and Asia are sustainable from many social and environmental respects, but are perhaps not economically viable in current economic structures? More explicit discussion of food systems and how these may or may not be sustainable would be useful (such as food systems based on exports, high emissions, monoculture, loss of land rights, loss of biodiversity, poor labour rights for farm workers etc etc. Is there evidence of particular types of investment in agriculture as a poverty alleviation measure?	Rejected - outside the scope of the chapter. More details on the climate change mitigation in agriculture sector has been elaborated in details in Chapter 7. The food systems supply chain within supplier till consumers are provided in detail in Chapter 12 section 12.4 Food Systems.	Siri Eriksen	norwegian University of Life Sciences	Norway
24051	24	44	27	4	The whole section 17.3.3.2 is devoid of policy instruments except for diffuse references to "various governance issues" that are not spelled out. This is irritating as the section 17.3.3 is introduced as providing a picture on the link between sustainable development and "decarbonisation policies". The section should also highlight the important role of forests and swamps and the related trade-offs to agricultural land use for food	Rejected. The IPBES Report and the IPCC Report that used as reference are endorsed by policy makers of IPBES and IPCC countries member. It should be aligned with their ownrspective polices. The study case on oil palm reflect the trade off between forest and food.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
42089	24	14			The fully operational and optimized integration of renewables in the power networks is only possible with smart grids. They are instrumental in electrical power generation, transmission or distribution, in the management and operation of prosumers local renewable generation, also in the interaction of electric and hybrid vehicles with the electric power system (vehicle to grid arrangements, cooperative charging and interoperability) amplifying the positive effects of renewables.	Accepted. Agreed with the statement, which also has been mentioned on Chapter 6 on Energy. This section was focused on the mineral extraction for electric vehicle purpose in association with sustainable development goals (social benefits, income equality, and economic development)	Francisco Javier H	European Patent Office	Germany
42091	24	37			A strong penetration of Lithium-ion batteries would entail geopolitical impact. The three countries accumulating the biggest reserves of lithium are Argentina, Bolivia and Chile.	Accepted, the largest Lithium mining is located in DRC while the largest deposit of Lithium reserves are Argentine, Bolivia and Chile.	Francisco Javier H	European Patent Office	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
36329	24	45		46	What low stabilization target for agriculture means?	Accepted. We will change the sentence to talk about GHG emission reductions	Youba Sokona	South Centre	Switzerland
24561	25	1	25	10	The main idea of this paragraph is to change lifestyle. This thought is already in the text. It would help if you considered eliminating this paragraph—waste of space.	Noted, we will add more literature on lifestyle changes	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
4243	25	9	25	10	"... or aid programmes in the short term. However, it should be noted that the financial viability of long term subsidies is not in keeping with SDG #8 and #12.	Rejected - not supported by the peer-reviewed published literature	Christine Callihoo	Canadian Institute of Planners	Canada
4245	25	10	25	10	"... In terms of lifestyle changes with specific reference to the human propensity to resist change.	Rejected - this is too specific for this section, reference to Chapter 5 is added	Christine Callihoo	Canadian Institute of Planners	Canada
24045	25	20	25	23	to my knowledge the debate on the relation between food security and food prices has concluded that rising food prices tend to increase food security rather than to decrease it. See for example https://doi.org/10.1016/j.gfs.2017.12.001	Partly accepted, we will briefly refer the discussion	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24047	25	23	25	26	See previous comment: rising food prices tend to increase food security. However, locally negative impacts on food security can occur (especially for poor urban residents who do not profit from higher food prices as they are no food producers). As this is a crucial aspect regarding the relationship between climate protection and SDGs this complex aspect should be reflected here in more detail with respective references	Partly accepted, we will briefly refer the discussion	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
4247	25	31	25	31	"forest restoration and avoided deforestation".	Partly accepted We will reflect the argument	Christine Callihoo	Canadian Institute of Planners	Canada
35361	25	33	25		As an example of "large benefits" suggested by Griggs and Smith (2013), it would be a good idea to add our global analysis (Iizumi and Wagai, 2019) which showed how increasing soil carbon in agricultural lands (mitigation) can contribute to the increase farmer's income in drought years through increasing drought tolerance of crops (adaptation) in drier regions. This is critical for sustainable development because (i) most agricultural lands are cultivated by small farmers who are susceptible to poverty, (ii) drought is one of the most severe natural disaster and drought risk reduction is crucial to achieve the food security goal by 2030, and (iii) soil carbon increase enhances ecosystem functioning and biodiversity. Ref: Iizumi, T., Wagai, R. Leveraging drought risk reduction for sustainable food, soil and climate via soil organic carbon sequestration. Sci Rep 9, 19744 (2019). https://doi.org/10.1038/s41598-019-55835-y	Rejected - outside the scope of the chapter. The details on the climate stabilization GHG emissions of agriculture is mentioned in Chapter 7.	Rota Wagai	National Agriculture and Food Research Organization, Institute for Agro-Environmental Sciences, Division of Climate Change	Japan
32055	25	37	25	37	The IPCC Special Report is titled 'Special Report on Climate Change and Land' not on Land Use.	Accepted-text revised	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
37911	25	37	25	43	Reference to the Special Report on land needs to be properly named and also the specific chapter and page of the quote given.	Accepted	margot Hurlbert	University of Regina	Canada
11205	26	4	26	32	Oil palm or palm oil?	Oil palm refer to the tree which produce palm oil	Snorre Kverndokk	Frisch Centre	Norway
17341	26	12	26	12	What is meant by "mineral forest"? In relation to peat swamp forest, should this read "forests on mineral soils" as opposed to the organic soils in peat swamps?	Accepted- text revised.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
30789	26	17	26	17	"...which might be lost to the environment..." unclear what this means in this context. Please clarify.	Accepted- the words 'lost to environment' revised to be 'negative impact to the environment'	Ulf Hahnel	University of Geneva	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
30791	26	23	26	27	"Smallholders need particular attention..." SM need attention from whom? Please specify.	Accepted-text revised	Ulf Hahnel	University of Geneva	Switzerland
24049	26	43	27	4	please reconsider the wording. These aspects are not policies (as introduced before in line 44).	Accepted- "the range of policies" revised as " the range of actions"	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
4249	27	4	27	4	"...and phosphorus, while also addressing maladaptation that ill-suited agricultural subsidies can influence."	Rejected - outside the scope of the chapter	Christine Callihod	Canadian Institute of Planners	Canada
1455	27	6	27	27	Food waste has become an important social and political issue in China to both government officials and the public. In early, 2013, China's government called for rigorous measures to stop the waste of resources. All mainstream media in China immediately followed and reported on the issue of food waste and the antiwaste campaigns have flourished online. Eight days after this initiative call was broadcast on national television, more than 550 000 microblogs had been posted on the topic of antiwaste with a search on Sina Weibo (http://www.theatlantic.com/international/archive/2013/02/xi-jinpings-sudden-concern-for-wasting-food/272853/). The effect of the government's and the public campaign against food waste has been immediate and impressive, and now the topic has quickly become a priority for both government and civil society. Please see more details in Liu J., Lundqvist J., Weinberg J., Gustafsson J., 2013. Food losses and waste in China and their implication for water and land. Environmental Science & Technology 47(18): 10137- 10144.	Rejected - the study case focus on the social movement to reduce food waste and loss	JUNGUO LIU	Southern University of Science and Technology	China
30793	27	8	27	8	Please change title to "Food waste reduction" to be more specific.	Accepted- the text " food waste" revised to " food waste reduction.	Ulf Hahnel	University of Geneva	Switzerland
24563	27	28	27	42	You should consider incorporating "Capturing and storing rainwater, personal and industrial level."	Rejected. This is too far away from the case study focus	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
36145	27	30	27	31	Give citation for ' Subsidized fertilizers, energy and crops can drive unsustainable levels of water usage and pollution in agriculture'	Accepted	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
32053	27	42	27	42	You refer to Box 17.5 as discussing Kenya and India. This isn't the case.	Accepted-text revised	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
24053	27	28	29	2	what is the link of this section to climate change?	The climate change will impact to the drought and the irrigation is required in the intensive to produce adequate yields for agriculture sector. Irrigation will required energy to pump the water which needs energy that mostly from fossil fuel in developing countries. The water conservation technology will reduce the irrigation demand and lead to electricity decline for pumping .	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
33825	27	28			Ensure there is always a clear link between the material presented in the section and climate change.	Will review for greater links with climate change	Debra Roberts	EThekwini Municipality	South Africa
36331	27	29		30	What low stabilization target for water sector means?	Accepted. We will refer to GHG emission reductions in the sector	Youba Sokona	South Centre	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
42093	27	41			After "management" I propose to add "Water resources protection or enhancement by means of river restoration, saltwater intrusion barriers, aquifer recharge, draining and infiltration of impermeable surfaces for groundwater enrichment and water saving techniques at user level are important aspects to consider"	Accepted	Francisco Javier H	European Patent Office	Germany
29053	28	1	28	34	What's the key message in the case study	The study case has been removed since not direct related with the climate change mitigation	Priyadarshi Shukla	Ahmedabad University	India
44053	28	1	28	34	All of the research presented is speculative. What results have actually been demonstrated from the project? Do the expected results materialize in reality? If there are no demonstrated results yet (I can't find any), then we need to be carefully caveating these case studies to put potential results in perspective.	The study case has been removed since not direct related with the climate change mitigation	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
47095	28	1	28	34	Evidence of on the ground impacts on people? Socially differentiated effects?	The study case has been removed since not direct related with the climate change mitigation	Siri Eriksen	Norwegian University of Life Sciences	Norway
27803	29	16	29	42	Unnecessary repetition on the climatic and in particular hydrologic impact of climate change	Accepted - we will make sure to further implement this point and add references accordingly	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
38659	29	33	29	42	Here must be consider the nexus analysis of synergies and trade-offs about climate change impact on crops (ex. sugar-cane and soybeans) to produce biofuels (ethanol and biodiesel) and their impacts on water availability and water security. Brazil is an good example that mitigation policies implementation will face with effects of climate change on Brazil's sugarcane agroecological zoning and water availability and security. Some references Vasquez-Arroyo et al 2018. Water implications by mitigation scenarios for the Brazilian energy sector. http://www.globalchange.umd.edu/iamc/wp-content/uploads/2019/02/30.schaeffer.pdf ZULLO; J.; PEREIRA; V.R. AND KOGA-VICENTE; A., 2018. Sugar-energy sector vulnerability under CMIP5 projections in the Brazilian central-southern macro-region. <i>Climatic change</i> , 149(3-4), pp.489-502.	Noted - this is more relevant to the chapter on agriculture	Eveline Maria Vas	COPPE_UFRJ	Brazil
1457	29	5	31	30	Concerns about the water–energy–food (WEF) nexus have motivated many discussions regarding new approaches for managing water, energy and food resources. Despite the progress in recent years, there remain many challenges in scientific research on the WEF nexus, while implementation as a management tool is just beginning. The scientific challenges are primarily related to data, information and knowledge gaps in our understanding of the WEF inter-linkages. Our ability to untangle the WEF nexus is also limited by the lack of systematic tools that could address all the trade-offs involved in the nexus. Future research needs to strengthen the pool of information. It is also important to develop integrated software platforms and tools for systematic analysis of the WEF nexus. Detailed description pls see the publications below. Liu J., Yang H., Cudennec C., Gain A.K., Hoff H., Lawford R., Qi J., de Strasser L., Yillia P.T., Zheng C., 2017. Panta Rhei Opinions: Challenges in operationalizing the water- energy-food nexus. <i>Hydrological Sciences Journal</i> 62 (11): 1714-1720; Liu J., Mao G., Hoekstra A.J., Wang H., Wang J., Zheng C., van Vliet M.T.H., Wu M., Ruddell B., Yan J., 2018. Managing the energy-water-food nexus for sustainable development. <i>Applied Energy</i> 210: 377-381.	Partly accepted. We will refer to the discussion	JUNGUO LIU	Southern University of Science and Technology	China

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24057	29	5	31	30	The section could be more relevant for this chapter 17 if it addresses how water (and related SDGs) is (are) affected by climate protection (instead of climate change).	Accepted - the numbers are updated	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
47097	29	5	31	30	this seems to be a good example of how development models create particular types of sustainability problems: Increasing consumption of water for industry, irrigation and domestic uses, interact with the impacts of climate change (warming, drying, variability) to create scarcity.	Noted - Primary energy supply and electricity are different things, but the sentences have been elaborated	Siri Eriksen	norwegian University of Life Sciences	Norway
44055	30	19	30	20	Three types of energy are presented but only two percentages of current supply. It is not clear which forms of energy the 2.5% and 1.8% numbers refer to.	Accepted - the sentence have been elaborated	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
11207	30	19	30	21	You mention that hydropower counts for 2.5% of global primary energy supply, but on page 29 line 39, you write that hydropower accounts for 17% of electricity generation. This seems a bit confusing and may need some more explanation.	Noted - it will be considered	Snorre Kverndokk	Frisch Centre	Norway
30911	30	30	30	34	CCS systems do not necessarily have to increase water usage, see IEAGHG report 2010/05 "Evaluation and Analysis of Water Usage of Power Plants with CO2 Capture" and Magneschi et al. "The Impact of CO2 Capture on Water Requirements of Power Plants", GHGT-13, Energy Procedia 114 (2017) 6333-6347.	Noted - we mention it, but it is more related to energy systems as such as opposed to water-energy linkages	Jasmin Kemper	IEA Greenhouse Gas R&D Programme (IEAGHG)	United Kingdom (of Great Britain and Northern Ireland)
38661	30	30	30	34	There is a Brazilian case study about how could be the economic and water security impact if all existing Brazilian coal-fired power plants decide to implement CCS technology with MEA. (http://dx.doi.org/10.1016/j.ijggc.2012.12.019) As the evaluation of water scarcity must make in a local scale, the authors use a water scarcity indicator to show that possible impact of CCS technology with MEA in specific watersheds. In this, new mitigation policies in the thermoelectrical power sector can create a trade-off with water security policies (SDG6).	Accepted - climate change aspect has been added to the points in this paragraph	Eveline Maria Vas	COPPE_UFRJ	Brazil
11209	30	33	30	34	CCS has barely been mention in this chapter. Does it mean that CCS does not play any role in the transition process, and how does this look like in the other chapters?	Noted - we will consider these references	Snorre Kverndokk	Frisch Centre	Norway
24055	30	39	30	48	what is the link to climate change?	Accepted - climate change aspect has been added to the points in this paragraph	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38663	31	15	31	29	<p>In fact, it is a challenge for IAMs to cover local synergies or trade-off about different aspects of the modelling. For example, modelling energy projection does not consider important aspects such as water availability and withdrawals from non-energy users. Also, current IAM consider land-use modelling, increasing the level of detail for analysis. This kind of modelling faces with the compatibility of the spatial scale of water (hydrographic regions) and IAM regionalization systems. For that reason, national or regional IAMs is necessary. Also, the addition of a water cost to the integrated energy system induces the choice of technologies with a minimal total cost and / or the option for processes that have less water intensive use. This leads to changes in the energy mix and land use expansion of the system and a reallocation of technologies to other hydrographic areas.</p> <p>COPPE institute, Rio de Janeiro Federal University - Brazil, is challenging this effort by the incorporation of a new water tool in the national energy and land use IAM model BLUES (http://www.ppe.ufrj.br/images/publica%20A7%20B5es/doutorado/Eveline_Mar%20ADa_V%20A1squez_Arroyo.pdf).</p> <p>The integrated optimization model is used to explore possible impacts on the Brazilian energy system and land use under restriction by the water resources use.</p> <p>BLUES model also has an interaction with the global IAM COFFEE model and the global TEA model (computational general equilibrium model). (http://www.globalchange.umd.edu/iamc/wp-content/uploads/2019/02/30.schaeffer.pdf)</p> <p>References: Arroyo, 2018. INCLUSION OF THE WATER-ENERGY NEXUS IN THE BRAZILIAN ENERGY EXPANSION SYSTEM OPTIMIZATION MODEL.</p>	Noted - we will consider these references	Eveline Maria Vas	COPPE_UFRJ	Brazil
36147	31	44	31	44	Add 'climate induced disaster such as' before 'heatwaves and flooding events'	Accepted: will add	Jony Mainaly	Vidhigya Legal Services and Research Center	Nepal
47781	31	45	31	45	Lovejoy, S. and Schertzer, D. (2013) The weather and climate: Emergent laws and multifractal cascades, The Weather and Climate: Emergent Laws and Multifractal Cascades. doi: 10.1017/CBO9781139093811.	Accepted: will consider adding	Daniel Schertzer	Ecole des Ponts ParisTech,	France
45125	31	32	34	27	An additional cross-chapter box may be included under the section "Cities: Urbanization, city planning, low-carbon cities" in collaboration with Chapter 8 based on opportunities for synergies across sectors with a systems approach.	Partly accepted: will aim to bring in these synergy issues but not a full box	Siir Kilkis	The Scientific and Technological Research Council of Turkey	Turkey
42095	31	32			With regard to section 17.3.3.5., an appropriate effort of planning and developing urban green infrastructure offers the possibility of integrating district energy or distributed or on-site energy generation (combined heat and power generation or solar energy) in city layout or reducing heat island effects (by minimizing paved surfaces or by planting trees).	Accepted: will try to underline these synergies	Francisco Javier H	European Patent Office	Germany
33831	31	33			Check the figure as chapter 8 says "68 percent of the world population will live in urban areas by 2050".	Accepted: will reference	Debra Roberts	EThekwini Municipality	South Africa
27805	32	8	32	14	First and last sentence are unnecessarily repetitive	Accepted: will revise sentences to reduce repetition	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24565	32	15	32	20	This is a good idea. You can link with chapter 8 and chapter 10.	Accepted: will cross-reference	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
22933	33	1	33	1	Figure 17.2 is completely blurry and unreadable.	Accepted: will locate a new figure	Kelsey Ross	The Center for Global Development	United States of America
28453	33	1	33	1	Fig 17.2 - check quality	Accepted: will locate a new figure	Matt Lewis	Bangor University	United Kingdom (of Great Britain and Northern Ireland)
39161	33	1	33	1	Figure 17.2 cannot be read because of blurring.	Accepted: will locate a new figure	Bertrand Hespel	University of Namur	Belgium
1459	33	1	33	5	pls improve the quality of this figure.	Accepted: will locate a new figure	JUNGUO LIU	Southern University of Science and Technology	China
5319	33	2	33	5	Figure 17.2 - It is necessary to improve this Figure because is impossible to read	Accepted: will locate a new figure	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24567	33	7	33	12	You write twice: "The space for sustainable and climate compatible management of cities according to WBSD, 2019 I includes the four categories: Building and transforming; Improving biocapacity and managing ecosystems; helping change happen."	Accepted; will edit	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
47773	33	7	33	12	Please see that 2 § are identical	Accepted: will locate a new figure	Daniel Schertzer	Ecole des Ponts ParisTech,	France
25467	33	10	33	12	Delete "The space for the sustainable ... and helping change happen.", as this is a repetition.	Accepted: will locate a new figure	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
24569	34	4	34	11	It can be useful to point out the economic cost of these projects.	Partly accepted: will see if it is feasible to locate cost data	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24571	34	29	34	29	We suggest underlining the transport emissions and the importance of the reduction. And the implications of the replace fossil fuel transport to non-fossil fuel transportation schemes.	Accepted: will highlight this point	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
30795	34	38	34	41	Consider integrating paragraph into previous one to avoid "stand-alone sentences"	Accepted: will revise	Ulf Hahnel	University of Geneva	Switzerland
1461	34	29	35	32	I expect there are more speculation on green infrastructure for mitigating climate change. Palmer et al. (2015) concluded that green infrastructure may play similar roles to traditional human-made infrastructure, but generally green infrastrucutre has low costs, multiple benefifits and ecologically friedly. In future, integrating gray with green infrastructure is a good way for climate mitigation. Palmer M.A., Liu J., Mattews J.H., Mumba M., D'Odorlco P., 2015. Manage water in a green way. Science 349 (6248): 584-585.	Accepted, we will add on costs	JUNGUO LIU	Southern University of Science and Technology	China
11211	34	29	35	32	You should give some examples of important infrastructure in the transition process.	Accepted	Snorre Kverndokk	Frisch Centre	Norway
47099	35	6	35	13	Is there also evidence of the effect of people (and goods) simply travelling less, as is currently happening due to the covid-19 pandemic?	Accepted: will see if this can be identified	Siri Eriksen	norwegian University of Life Sciences	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44057	35	9	35	13	I am unclear how this discussion of the ASI approach is supposed to summarize or duplicate the much more extensive discussion in Chapter 5. There isn't even a reference to Chapter 5 to indicate that these tradeoffs are discussed more in depth in another section of the report. Shouldn't Chapter 5 be at a minimum referenced and an effort undertaken to ensure that appropriate links with other areas of the report are referenced and/or summarized appropriately?	Accepted: will strengthen cross references to chapter 5 and distinguish how the ASI fits within the context of transitions and sustainable development	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
14399	35	25	35	27	On the sentence "Electric vehicles also deliver significant reductions in greenhouse gases (GHGs) and air pollution if the electricity needed to operate the cars comes from renewable resources." ; our 'Future is Electric' scenario in the WEO 2018 has also investigated that and proved it. We would be delighted to provide more information on this, please do not hesitate to reach out to me.	Noted.	Arthur Contejean	International Energy Agency	France
14401	35	31	35	32	Sentence "Additional advances in battery technology and engine performance appear primed to accelerate the transition to electrification in the decades to come", we would add that recharging infrastructure investments to important factors to make this transition happening. Please make sure that the (IEA,2019) source listed in the references is the World Energy Outlook 2019.	Noted	Arthur Contejean	International Energy Agency	France
5321	36	6	36	6	Add in the title: Hawassa Industrial Park in Ethiopia	Will review and consider	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
27807	36	25	36	26	Please update	Noted	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
44059	36	6	37	15	I think that it's VERY important to state that these are expected results but have not been independently verified. From my work in Africa, I recognize that many of these projects do not end up delivering the expected results, and so there needs to be a strong caveat about expectations vs. actual results if those results have not yet materialized and/or been independently verified. These are still important case studies to present for the ambition and promise -- it's just that the caveat is warranted to properly place them.	Noted	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
5323	36	19	39	19	Put a title: Morocco accelerating development of Renewable Energy	Noted - will do -	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
47101	36	6	40	19	Very useful to have these case studies. But include more balanced references, some of the references are in danger of being a little 'self-congratulatory'.	Noted Most of the discussion about sustainable development paradigms, however will be in Chapter 1	Siri Eriksen	norwegian University of Life Sciences	Norway
5325	37	39	37	39	Box 17.8 -Which is the EU maximum capacity of recycling facilities for plastic wastes?	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5327	38	20	38	20	It is better to write: smart agriculture	Noted Most of the discussion about sustainable development paradigms, however will be in Chapter 1	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
11213	38	30	38	31	Earlier in this report you refer to the number 80% when you mention how many will live in urban areas in 2050. The numbers should be consistent. Also how many people live in urban areas today?	Will review	Snorre Kverndokk	Frisch Centre	Norway
5329	38	40	38	43	¿¿and 3D??	unclear comment	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
11215	38	18	39	6	More digitalization may also give higher emissions in some sectors, e.g. more streaming of films and music. Digitalization is also mentioned elsewhere in the report, for instance chapter 1 (1.4.3) and references should be made.	Will review	Snorre Kverndokk	Frisch Centre	Norway
14403	38	18	40	20	Please note that the Africa Energy Outlook 2019 (chapter 3 --> box 3.2 and part 3.4.2) can also provide a good evidence on the role that digital-based technologies (in particular mini-grids, solar home systems, mainly renewables based), could/should play in expanding access in a low-carbon way. The report is available here : https://www.iea.org/reports/africa-energy-outlook-2019	Will review	Arthur Contejean	International Energy Agency	France
33835	38	18			Ensure there is always a clear link between the material presented in the section and climate change.	Will do	Debra Roberts	EThekwini Municipality	South Africa
33833	38	31			Check the figure as ch 8 says "68 percent of the world population will live in urban areas by 2050" and pg 31 of this chapter says 90%.	Will check this figure against figures elsewhere in the chapter	Debra Roberts	EThekwini Municipality	South Africa
27809	39	8	40	17	The presentation of Society 5.0 sounds more like advertising or religious sect hype than an objective description of the Japanese program. This is particularly true of Figure 1 (there is an alternative but equally bombastic one in last year's Davos proceedings) and of the reference to the Imagination Society and harmony of man and nature.	Partly accepted, we will add more examples and add more critical aspects	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
42097	39	4			I would replace "smart energy systems" with "smart grids". Or add "smart grids" within brackets after "smart grids".	Noted	Francisco Javier	European Patent Office	Germany
42099	39	4			The efforts in energy efficient computing (so-called green computing) and techniques for reducing energy consumption in wired or wireless communication networks should be mentioned here.	Noted	Francisco Javier	European Patent Office	Germany
5331	40	27	40	33	The part from 27 to 33 - PLEASE ADD REFERENCES BECAUSE WRITE ASPECTS VERY IMPORTANT OF CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5333	40	34	40	38	Please add references indorsing the text	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24573	40	38	40	38	"actions can me aligned"	Noted	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
42195	40	21	45	27	it seems the mit -adap section does not really fit in 17.3.3 - may be give it its own sub-section. Also - the financial sector and just transitions is a bit odd as well - probably would read better if in its own sectiona and the chapter could have more headings relevant to the sub-section title	A seperate section will be added	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
6003	40	21			We have recently published a study that for the first time in the literature assesses in a comprehenisve way the economy-wide effects from coastal flooding due to sea-level rise (at a global and country level), specifically considering the interaction between climate change mitigation, adaptation, residual impacts and climate-resilient development. Schinko, T., Drouet, L., Vrontisi, Z., Hof, A.F., Hinkel, J., Mochizuki, J., Bosetti, V., Fragkiadakis, K., et al. (2020). Economy-wide effects of coastal flooding due to sea level rise: A multi-model simultaneous treatment of mitigation, adaptation, and residual impacts. Environmental Research Communications 2 (1): e015002. DOI:10.1088/2515-7620/ab6368.	Noted	Thomas Schinko	International Institute for Applied Systems Analysis (IIASA)	Austria
11217	41	22	41	22	Why is hydro power dams a low cost mitigation option?	More explanation added	Snorre Kverndokk	Frisch Centre	Norway
5335	42	13	42	26	Need references	Accepted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24575	42	28	42	28	You might link with chapter 15 and give some examples.	Accepted	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
9753	42	47	42	47	For the glossary: definitions of green, climate, sustainable finance	Accepted	Nathalie Hilmi	Centre Scientifique de Monaco	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
26633	42	30	43	18	In developing countries, money creation by central banks may have been an important source of income for states (seigniorage). This situation is especially true when both access to international credit and tax revenues mobilization are constrained. Some authors have shown both theoretically and empirically the existence of a substitution effect between seigniorage and deforestation revenues. A tight monetary policy to fight against inflation encourages the government to increase deforestation and, therefore, GHG emissions from land-use change (J.-L. Combes, P. Combes Motel, A. Minea, P. Villieu, 2015, Deforestation and seigniorage in developing countries: A tradeoff?, Ecological Economics, 116, 220-230). To put it differently, inflation targeting can hamper the efficiency of environmental policies when it encourages the government to find additional revenues while increasing the pressure on natural resources. However, international transfers, defining inflation-contingent rewards for "avoided deforestation", can be a way for implementing a "win-win strategy" by removing the temptation for Governments to promote deforestation. This institutional design is similar to "debt for nature swaps" (Hansen S., 1989 Debt for nature swaps — overview and discussion of key issues, Ecological Economics, 1(1), 77-83; Kahn, J.R., McDonald, J.A., 1995, Third-world debt and tropical deforestation, Ecological Economics, 12, 107–123). This institutional design could have similarities with the REDD+ device designed under the auspices of the UNFCCC and more generally with several advances about the implementation of "rewards" for countries combating climate change (Combes Motel P., R. Pirard, J.L. Combes, 2009, A methodology to estimate impacts of domestic policies on deforestation: compensated successful efforts for "avoided deforestation" (REDD), Ecological Economics, 68 (3), pp. 680-691.	Partly accepted. The issues will briefly be included	Jean-Louis Combes	University of Clermont Auvergne; center for studies and research on development economics (CERDI); France	France
35007	42		58		Please write a section on mitigation options reducing key risks	Will review	Pramod K Singh	Institute of Rural Management Anand	India
27811	43	3	43	7	The first and last sentence may seem contradictory. I know Stefano's work well but cannot identify the conclusion it is referred to here.	Will review	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
25469	43	5	43	7	Delete "Energy-intensive industries ... in the financial sector."	Will review	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
47103	43	8	43	18	Is there evidence of how successful these funds/mechanisms have been in addressing social equity and avoiding elite capture?	Will review and provide examples -	Siri Eriksen	Norwegian University of Life Sciences	Norway
30797	43	20	43	20	Consider specifying title, as "just transitions" can be read as "only transitions" for the non-specialized reader --> Socially just transitions	Will consider	Ulf Hahnel	University of Geneva	Switzerland
25471	43	23	43	26	Delete "The term "just transition" has become ... gender-based discrimination and inequalities.", as this definition is not aligned with the definition used under UNFCCC, in terms of just work.	Section will be revised the section will be reviewed in its entirety - the definition of just transition is quite layered	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
30799	43	26	43	26	A source is needed to support the claim.	Noted - Accepted	Ulf Hahnel	University of Geneva	Switzerland
37951	43	26	43	26	"Inequities" would probably be more accurate here than "inequalities".	Noted -	Patricia Perkins	York University	Canada
30801	43	27	43	28	Consider integrating paragraph into previous one to avoid "stand-alone sentences"	Noted -	Ulf Hahnel	University of Geneva	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
26635	43	30	43	30	The relationship between public debt and what might be termed environmental debt as measured by cumulative greenhouse gas emissions has been overlooked so far. Fodha and Seegmuller (Fodha, M., Seegmuller, T., 2014, Environmental Quality, Public Debt and Economic Development Environmental and Resource Economics, 57, 487–504) have shown that there can be a conflict between public debt-financed environmental policies and capital accumulation Boly et al. emphasize two complementary effects (Boly, M., J-L. Combes, P. Combes Motel, M. Menuet, A. Minea, 2019, Public debt versus Environmental debt: What are the relevant Tradeoffs?, working papers CERDI, hal-02165453). On the one hand, an increase in public debt can allow increasing public spending dedicated to mitigating greenhouse gas emissions. On the other hand, public debt generates unproductive public spending (interest payments) that crowds out environmental expenditure. The authors show that in the long run, this second effect prevails. In other words, public debt and environmental debt are complementary. Consequently stricter climate policies can both generate environmental benefits and better macroeconomic performance, as measured by debt stabilization.	Will review	Jean-Louis Combes	University of Clermont Auvergne; center for studies and research on development economics (CERDI); France	France
30803	43	33	43	33	Please specify "this" as it is unclear to what it is referring to	Will consider	Ulf Hahnel	University of Geneva	Switzerland
25473	43	36	43	42	Delete "Stranding resource wealth as a result ... land restoration and renewal efforts.", as this is a subjective statement.	Will consider	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
27813	43	38	43	38	Please check the use of "by tapping into" – it may be inappropriate	Will consider	Christophe Deiss	Institute for non-linear dynamic inference	Luxembourg
27815	43	41	43	42	Please check the last sentence – it may be formulated in a misleading way.	Will do	Christophe Deiss	Institute for non-linear dynamic inference	Luxembourg
24577	43	43	44	7	This paragraph is not clear.	Will review	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
47105	43	22	45	27	There could be more literature assessed on climate justice, beyond stranded assets.	Accepted - section will be reviewed	Siri Eriksen	Norwegian University of Life Sciences	Norway
37957	43	29	45	5	"Deciding not to extract fossil fuels" is a better term than "stranding assets" -- it conveys that these political decisions are made including a range of political, economic, social, and other factors in the context of climate decision-making.	Rejected - stranded assets suffers from definitional clarity - but it is common place to refer to assets that may lose their economic viability as stranded.	Patricia Perkins	York University	Canada
25475	44	3	44	9	Delete "as a result, the transition ... high carbon industries." as this is a subjective argument, including policy prescriptive statements.	Will consider	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
11219	44	8	44	16	Disinvestment from fossil fuels or mining may also has some positive effects. One is health effects. Another one that I think we see in developed countries (I do not have any references) is that when a town/region gets less dependent of a large industry, the general education level increases. I think this is what we have seen in Norway in certain regions. If everybody gets a job in the mine, the incentive to take an education is low.	Rejected - it depends on your contextual realities - in many developing and African countries disinvestment is seen as a net loss given the emphasis places on such commodities as a revenue earner.	Snorre Kverndokk	Frisch Centre	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25477	44	17	44	30	Delete "Nonetheless, a policy of deliberately leaving ... (WB, 2017; McGlade and Ekins, 2015).", as this is subjective analysis using policy prescriptive arguments.	Will review - but subjective is also a relative term	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
30807	44	28	44	28	The reference to climate change as largest market failure is unclear. Please specify.	Noted, We will exclude this statement since it is very general	Ulf Hahnel	University of Geneva	Switzerland
5337	44	31	44	33	Which are the base emissions? How much would be reduced?	Noted We will refer to chapter 3 conclusions	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
25479	44	34	44	45	Delete "In addition, if mineral resources are stranded ... (The Guardian, 2018).", as this incorporates policy prescriptive statements.	will review	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
44061	44	39	44	40	Is it possible to quantify this global divestment more thoroughly?	Accepted We will look for numbers	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
30805	44	41	44	45	There is the more recent and more relevant example of Blackrock that banned investments in non-clean investments.	Accepted We will look for numbers	Ulf Hahnel	University of Geneva	Switzerland
37959	44	46	45	10	Demand is for services provided by energy, not for specific sources of energy (as discussed in Ch. 5). For policy relevance these two paragraphs would be more effective if they outlined sustainable, equitable and cost-efficient transition pathways, including options for reinforcing global equity, rather than the "carbon depletion cycle".	Accepted The Just transition section will be given a wider perspective	Patricia Perkins	York University	Canada
27817	45	5	45	10	This paragraph largely duplicates an earlier one	Will review	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
25481	45	5	45	27	Delete "In addition, accelerating the transition and treating ... unable to exploit their resources.", as this analysis incorporates policy prescriptive statements, and does not consider mitigation options such as technological advances and use of CCS.	Will review	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
5339	45	11	45	22	I suggest, if it is possible, to seek references of developing countries authors, that give us the criteria and the ideas from developing countries	Will review	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
44063	45	23	45	24	I am concerned that references to compensation imply a policy objective that not all countries will support. Is there a way to say something similar while avoiding sounding as though a specific policy recommendation is being advocated? Perhaps saying that it could raise expectations about compensation, rather than implying that compensation will be required?	Will review	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
27819	45	36	45	36	Table 17.2 I fail to understand what will be achieved with the arrows	Accepted New figures will be developed	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
5341	45		46		Table 17.2 - Not is better to change or include water availability? And food availability?	Accepted New figures will be developed	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
43871	45	36			Table 17.2: it might be useful to distinguish between marine and terrestrial/freshwater biodiversity losses	Accepted New figures will be developed	Hans Poertner and	Alfred-Wegener-Institut	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43873	45	36			Table 17.2: it is not clear at the moment what is envisaged for ecotoxicity and human toxicity - are these pollution or impacts on ecosystem functioning and human health concerns?	Accepted New figures will be developed	Hans Poertner an	Alfred-Wegener-Institut	Germany
30809	47	3	47	5	"Implies a different set of policy options than in studies". Please specify "studies" and provide more information on the different set of policy options.	Accepted New figures will be developed	Ulf Hahnel	University of Geneva	Switzerland
30913	47		47		Although this table is still empty, I would like to question why the energy sector does not have Gas with CCS included and why the industry sector does not have CCS included at all. CCU is also not included at anywhere.	Accepted	Jasmin Kemper	IEA Greenhouse Gas R&D Programme (IEAGHG)	United Kingdom (of Great Britain and Northern Ireland)
5343	48	1	48	2	SUGGEST NOT INCLUDE BIOENERGY USE, BECAUSE IT IS RELATED WITH LAND USE , FOOD, AND WASTE DISPOSAL CONFLICTS	Rejected This will be considered in the section on Nexus	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5237	48	5	48	5	"climate prices" looks to be a typo.	Noted	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
44065	48	8	48	12	This point warrants being highlighted more within this section and within this chapter.	Accepted	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
5345	48	17	48	17	Write have been	Noted	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
24579	48	17	48	17	"have bene identified"	Noted	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24581	48	17	48	17	we suggest changing "manoeuverability"	Unclear comment	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24059	48	18	48	19	The chapter mainly collected examples for trade-offs and less opportunities for acceleration. "Industry" and "infrastructure" as such are no "opportunities" as stated by this sentence. "Deep carbonization" is part of the transition and not an independent variable	Accepted	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24061	48	19	48	19	that the transition is "non-linear" is stated throughout chapter 17 without explaining the meaning or implications anywhere	Accepted will be further explained	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24583	48	20	48	20	we suggest changing "maladaptation"	Maladaptation is real problem and has to be taken into account as part of the tradeoffs .	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24585	48	21	48	21	we suggest changing "mal-mitigation"	Mal-mitigation is real problem and has to be taken into account as part of the tradeoffs .	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24587	48	25	48	29	You miss the reference. Do you have some? (2) We think that fossil fuel is finite, and their scarcity will express in their price. This change will be able to search and develop new technologies and behaviors.	Will review	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
5347	48	28	48	28	manoeuverability - What is the meaning of this?	Will review and replace with a synonym	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
44067	48	38	48	38	There is a reference to key indicators for transformational change but no additional information here on what would be considered key indicators. Can this section be expanded and referenced?	Will review	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
5239	48	44	49	2	I agree that "policy" is a key enabler in making the low carbon transition happen. However, in order for policy to work in proper way, we need set a corresponding governance system. The governance system will control and coordinate among different groups and policies.	Will review	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea
24063	48	44	49	2	please check the paragraph for substance and consistency. For example, the 2nd sentence criticises the lack of climate action by governments while the next sentence ascribes a key role to policy. What does "putting in place" mean? Why are only macroeconomic models / tools relevant? What is meant by "framework model"?	Will review	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24589	48	44	49	2	The main idea of this paragraph is already in the text. It would help if you considered eliminating this paragraph—waste of space.	Will review	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
24065	49	32	49	32	what does "limited studies" mean? For several aspects listed below there are many more studies than the sporadic references used in the sections above. A simple search shows that there is, e.g., a wealth of literature on urban sustainability	Will review	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
45127	49	37	49	38	It may be clarified whether findings from Chapter 8 may be integrated with the statement "urban sustainability, including climate change adaptation and mitigation plans and related implementation issues, have not been comprehensively reviewed in the literature." Published studies in the literature include Reckien et al. (2018) in which about 890 cities in the Urban Audit database were compared based on the presence of plans for mitigation or adaptation as well as any joint climate plans < https://doi.org/10.1016/J.JCLEPRO.2018.03.220 > as also discussed in other publications, including " https://doi.org/10.1016/j.rser.2018.11.006 " that had focused on benchmarking and a cross-sectoral scenario.	Will consider	Siir Kilkis	The Scientific and Technological Research Council of Turkey	Turkey
30811	49	39	49	40	There is no reference to relevant literature which would help the reader better understand to what the sentence is referring to. It is also unclear to what "development trends" and "experiences" are referring to here.	Will review	Ulf Hahnel	University of Geneva	Switzerland
24075	49	4	57	34	Section 17.4. could greatly improve by linking it closer to the previous sections. While the link to section 17.2 is often unclear the lack of coherence in section 17.3 is itself a barrier for a systematic review of sustainability barriers and enablers. The section furthermore lacks reference to the overarching topic, i.e. the link between climate change and sustainable development. It could greatly benefit from being structured along the theoretical foundations laid down in section 17.2 (i.e., psychological barriers, social barriers, economic barriers, governance barriers)	Partially Accepted; Closer links made in section 17.4 to previous sections. Will be structured along the categories of enablers presented in the 1.5 degree report.	Stefan Majer	German Biomass Research Centre - DBFZ	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24067	50	1	50	2	If a strategy is understood as combination of (policy) instruments and goals there is also a wealth of literature on this subject. If something else is referred to, please specify	Accepted Will be edited	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
27801	50	4	59	16	Section 17.4 is arguably more a depository of facts and affirmations that perhaps could have been presented earlier than a synthesis. Similarly, the conclusions cannot always be related straightforwardly to the earlier discourse.	Noted - will ensure that 17.4 makes a new contribution to the chapter, but a synthesis that draws together the specific enablers is nonetheless a crucial component of the chapter. Links between conclusion and earlier sections have been added	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
16435	50	4			In Section 17.4 Key barriers and enablers of the transition: synthesizing results, consider adding a subsection dealing with schools and education. Schooling can have an immense impact on shaping meaning, and including a subsection on schooling, including sustainability education, which is a nascent field, will add to the comprehensiveness of the section. Education for sustainability (sustainability education) has some robust findings that would make this section stronger.	Taken into account - further reference to education has been added to section that explores individual and collective behaviour change.	Daniel Helman	College of Micronesia-FSM	Micronesia, Federated States of
42197	50	36			this chapter uses the term enabling factors. Most chapters seems to use a vraince on eabling environment / condistions / factors - there needs to be some link. Chapter 4 sets out some; Chapter 13 tries to bring the value of enabling conditions together etc	Taken into account - "factors" changed to "conditions" to be consistent with other chapters	Catherine Mitche	University of Exeter	United Kingdom (of Great Britain and Northern Ireland)
40065	50				Somewhere in Section 17.4 it should be discussed how international market mechanisms could increase mitigation ambition and thus contribute to transition.	Taken into account - reference to this added in new section 17.4.3 "financial systems and economic instruments"	Axel Michaelowa	University of Zurich	Switzerland
43543	50				Need to address international cooperation via market mechanisms regarding efficiency gains, thereby enhancing ambition and contribute to transition.	Taken into account - reference to this added in new section 17.4.3 "financial systems and economic instruments"	Matthias Honegg	Perspectives Climate Research gGmbH	Germany
24069	51	1	51	9	how are frames and narratives related to the topic of individual and collective action? Why are renewable energies highlighted? In a barrier/enabler analysis with the title "individual and collective action" one would expect reference to the difference between both, i.e. aggregated but uncoordinated individual vs. coordinated collective action, such as analysed by Ostrom (tragedy of the commons). In general, this key aspect (barrier) for sustainability should have a prominent role in the chapter, but it is nowhere to be found	Accepted - specific reference to renewable energy removed, to broaden the message. Text added to distinguish between individual and collective action	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
24591	51	1	51	10	The main idea of this paragraph is already in the text. It would help if you considered eliminating this paragraph—waste of space.	Partially addressed - paragraph retained in order to provide a short introduction to the section (which is now 'behavioural and lifestyle changes' and includes both individual and collective actions elements).	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
17121	51	4	51	4	Individual action is at the same time necessary and insufficient for a low carbon future. It must be coupled with collective action (Dugast, Soyeux et al. 2019). [Source: https://www.carbone4.com/wp-content/uploads/2019/06/Publication-Carbone-4-Faire-sa-part-pouvoir-responsabilite-climat.pdf ; Faire sa part ? Pouvoir et responsabilité des individus, des entreprises et de l'Etat face à l'urgence climatique]	Addressed - distinction and relationship between individual collection added to introductory text in 17.4.1, now called "behavioural and lifestyle changes"	Théo Milliez	Alterna	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44069	51	8	51	9	What research links the integration of local values into success of various actions, even if it does not come from the climate change space? If there isn't good research in this area, please reference the gap and state that this is theory, rather than making unsupported statements.	Accepted - references added	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
18045	51	11	51	18	Could mention the 3.5% heuristic of social change https://cup.columbia.edu/book/why-civil-resistance-works/9780231156820	Rejected - interesting reference but not strictly related to climate change or sustainability transitions	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
15809	51	30	51	31	Two valuable experiential learning tools: Climate Interactive and Sloan MIT have developed the a) World Climate Simulation based on the C ROADS simulator and b) the Climate Action Simulation role playing games. Both games are available on Climate Interactive's website. These two experiential learning role play games show positive results in intent to climate action after each game / simulation. The following article by the Climate Interactive staff "Combining role-play with interactive simulation to motivate informed climate action: Evidence from the World Climate simulation" J. N. Rooney-Varga, J. D. Sterman, et al, Published: August 30, 2018 https://doi.org/10.1371/journal.pone.0202877 states that: "We find statistically significant gains in three areas: (i) knowledge of climate change causes, dynamics and impacts; (ii) affective engagement including greater feelings of urgency and hope; and (iii) a desire to learn and do more about climate change. Contrary to the deficit model, gains in urgency were associated with gains in participants' desire to learn more and intent to act, while gains in climate knowledge were not. Gains were just as strong among American participants who oppose government regulation of free markets—a political ideology that has been linked to climate change denial in the US—suggesting the simulation's potential to reach across political divides. The results indicate that World Climate offers a climate change communication tool that enables people to learn and feel for themselves, which together have the potential to motivate action informed by science." And here is a link to their latest article on the EN ROADS simulator and the Climate Action Simulation role playing game: Rooney-Varga, J. N., Kapmeier, F., Sterman, J. D., Jones, A. P., Putko, M., Rath, K., The Climate Action Simulator, Simulation & Gaming, https://journals.sagepub.com/doi/full/10.1177/1046878119890643 A word of caution: this EN ROADS simulator is not an IAM, it is just an easy to use simulator for general public use in order to foster and to create more	Accepted - reference to these tools added to section on social movements and education	EDUARDO PEDRO	ITBA Instituto Tecnológico de Buenos Aires	Argentina
24455	51	40	51	43	The work of educational institutions such as universities is very important. In countries like Argentina where civil society still does not understand the effects of climate change. Or where people do not have resources, the link between university extension programs and low-income sectors can accelerate a better transition to low emissions.	Noted; text makes reference to educational institutions	Luis Tuninetti	Universidad Nacional de Villa María	Argentina
5241	51	1	53	26	17.4.1 displays the conflict and issues related to the individual and collective action conceptually. By the way, 17.4.4 illustrates how the conflict and issues are resolved with the help of innovation and private-public cooperation practically. Therefore, I suggest to merge two parts (17.4.1 and 17.4.4) into one section that exhibits how innovation and collaboration contribute to resolving the individual and collective action's problem.	Partially accepted - sections have not been merged, so as to follow established categories of enabling conditions, but text added to make the link between the two.	HWANIL PARK	Science and Technology Policy Institution	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24593	52	11	52	11	Are there some cultural, theater, music, art related to climate change?	Rejected - reference to art, storytelling etc are already present in this section.	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
17113	52	12	52	12	Insert "Sobriety [or find a more appropriate translation for sobriété in french] is an essential part of the transition to a low carbon future. Not only at an individual level but also at a collective scale. Societal actors (companies, public entities, individuals...) must function with as little as possible and as much as needed. Collective sobriety increases its chances to have a large effect if it shows a positive narrative that shows an attractive climate compatible future. This narrative is appearing and must be rapidly developed and widespread by various medias."	Rejected - claims not (yet) supported by the literature	Théo Milliez	Alterna	Switzerland
17115	52	12	52	12	Taking into account the psychology of change when implementing climate policies has been shown to increase their efficiency (Evans et al. 2017). [Source : https://www.researchgate.net/publication/318394998_Green_Nudging_A_discussion_and_preliminary_evaluation_of_nudging_as_an_environmental_policy_instrument]	Accepted - will include this reference	Théo Milliez	Alterna	Switzerland
15107	52	5			After "Wamsler et al., 2018).", it is suggested to add: "An especially effective and relevant approach to learning is game-based learning which already accounts for a vast offer in web-based collaborative learning approaches that was analysed recently by Eisenack & Reckien (2013) and Hallinger et al. (2020), including the negotiation game "Surfing Global Change" (Ahamer, 2013; 2019)" - - The references are: Eisenack, K., & Reckien, D. (2013). Climate change and Simulation/Gaming. <i>Simulation and Gaming</i> , 44(2-3), 245-252. doi:10.1177/1046878113490568 Hallinger, P., Wang, R., Chatpinyakoo, C., Nguyen, V. -, & Nguyen, U. -. (2020). A bibliometric review of research on simulations and serious games used in educating for sustainability, 1997–2019. <i>Journal of Cleaner Production</i> , 256 doi:10.1016/j.jclepro.2020.120358 Ahamer, G. (2013), Game, not fight: change climate change! <i>Simulation and Gaming – An International Journal</i> , 44(2-3), Volume 44, Issue 2, 268 – 297, DOI: 10.1177/1046878112470541. Ahamer, G. (2019), <i>Mapping Global Dynamics - Geographic Perspectives from Local Pollution to Global Evolution</i> . Springer, Dordrecht. (ISBN 978-3-319-51702-5, 426 pp., relevant chapters are 9 and 24; see https://www.springer.com/de/book/9783319517025)	Partially accepted - will include gaming references relevant text	Gilbert Ahamer	Environment Agency Austria	Austria
24595	52	39			the whole section 17.4.4 it is repetitive. It would help if you considered eliminating these paragraphs—waste of space.	Partially accept - this section has been revised to cover "technological and social innovation" which includes leadership, but redundancies with previous sections have been removed as per reviewers request	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
24071	53	32	53	34	Please specify. Carbon pricing is itself a reaction to market failure, addressing (among others) the lack of low-carbon investments. Another aspect is that (Pareto-)optimal carbon pricing is difficult due to additional market failures such as technological externalities or market power. There are several difficulties related to optimal carbon pricing though, and it is not clear, why (additional) market failures are mentioned here and other obstacles not (e.g., information asymmetries, transaction costs). Furthermore, market failures usually impede only carbon pricing aiming at optimality, while in practice the goal of carbon pricing such as the EU-ETS is cost-effectiveness. Furthermore I would not list carbon pricing as a "financial, technical and material" measure, but rather as policy or regulation.	Noted. Subsection is now renamed "financial systems and economic instruments."	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
27795	53	33	53	34	Please consider making explicit that the market failures noted by Campliglio refer to the unwillingness of banks to grant credits. A good example of high political costs is the Gilets Jaunes movement in France, which was ignited by the will of the government to impose a more ecological taxation of automotive fuels.	Accepted; including this aspect of the market failure. Chapter does not have the scope to mention the Gilets Jaunes movement, however.	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
24515	53	35	53	46	The para beginning "many forms of transformational change...are not possible when financial systems still...". This is a very important point and the chapter should retain it, strengthen it with evidence, and coordinate with Chapter 15 about what a financial system would need to look like to facilitate transformational resources towards mitigation and adaptation. Evidence could draw on TCFD, G20 central banks which are changing incentives, efforts to make stranded assets more clear and lay out how public and private sector can manage and shift away from stranded assets.	Noted. Will support this claim with additional evidence and ensure coordination with Chapter 15	Koko Warner	UNFCCC	Germany
24517	53	35	53	46	consider broadening to also consider barriers in contemporary financial system for adaptation investment (framed as zero profit, short termism, incentives of some MFIs towards debt over reducing risk, political economy literature.	Rejected - outside the scope of Chapter 17	Koko Warner	UNFCCC	Germany
27797	53	36	53	37	The sentence "To a significant degree, the root cause of the failure of traditional financial systems is the undervaluation of both human and natural capital." This is certainly true for the natural capital. But human capital? This may require an explanatory sentence.	Noted - adding explanatory sentence to clarify.	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
24073	53	37	53	39	Please reconsider the formulation. Rents are related to the use of (scarce) resources, not to "scarcities" per se or "externalities". Rather, scarcity is a precondition for rents to exist and externalities can alter or redistribute rents	Accepted - will reformulate as per suggestion	Stefan Majer	German Biomass Research Centre - DBFZ	Germany
27799	53	40	53	42	Do you mean perhaps "But even smaller scale low-carbon energy and infrastructure projects can fail to get off the ground if uncertainty and investment risk discourage project planning and bank-lending programmes"?	Accepted - will revised accordingly	Christophe Deisse	Institute for non-linear dynamic inference	Luxembourg
24597	53	27			It would help if you considered integrating section 17.4.5 to the "Financial sector" on page 42	Rejected - This section has been renamed "financial systems and economic instruments" to align with a new categorization of barriers and enablers	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
25483	54	10	54	15	Reference to all energy-related technologies (e.g. CCUS) should be made, and not only on renewables.	Accepted - will include	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
25485	54	22	54	27	The example provided in Argentina should be deleted, as it does not take into account matters related to affordability and reliability.	Rejected - example will be retained but caveats as mentioned will be added	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5349	54	30	54	30	?? and not in the private sector??	Rejected - it does place high demands on the private sector, but this section is focused on governance and institutions	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
5351	54	45	54	45	I propose include Environmental too	Rejected - this sentence is about power relations, not all external constraints	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
44665	54	29	55	38	This section might profit from including some issues around "institutional capacity" to steer transitions at the speed necessary to reach global/national targets, e.g. the electoral market orientation of politicians (see https://journals.sagepub.com/doi/10.1177/0038026117731658), the status quo orientation of senior public officials (see https://onlinelibrary.wiley.com/doi/abs/10.1002/wcc.305), path dependencies created by 'instrument constituencies' (see https://onlinelibrary.wiley.com/doi/abs/10.1111/gove.12179), or the benefits of deliberate inconsistencies between talk, decisions and actions in climate policy (see https://onlinelibrary.wiley.com/doi/abs/10.1002/wcc.305)	Accepted - thank you; will cite	Oliver Geden	German Institute for International and Security Affairs	Germany
5353	55	30	55	30	The word incrementalism isn't very usual, please if you can change it. I can seek in many dictionaries.	Rejected - this word is quite common in transitions theory, climate policy etc.	CRISTOBAL FELIX	Environmental Directorate/Ministry of Science, Technology and the Environment	Cuba
9641	55	41	55	41	I do not see why "energy justice" should include affordability. From a sustainability and efficiency perspective energy prices should reflect their true social cost (including damages on local and global scale). If these optimal prices are difficult to afford for some households, poor households could be compensated (e.g. by carbon tax revenue recycling) or the income distribution in the society should be changed (e.g. via some social policy or changes in the income tax system). However, one should not reduce energy prices. This will just lead to an inefficient high level of energy consumption.	Noted	Jasper Meya	German Centre for Integrative Biodiversity Research	Germany
25487	55	41	55	46	Analysis on energy justice to also consider matters related to reliability and national circumstances, as well as the core principles of the Convention - i.e. common but differentiated responsibilities and respective capabilities, equity and historical responsibility.	Taken into account - have deepened the examination of the various dimensions of the just transition	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44667	55	40	56	22	It's probably worthwhile to include considerations on equity in the context of very tight remaining global carbon budgets (see, for the Pre-Paris constellation https://iopscience.iop.org/article/10.1088/1748-9326/10/10/105004). In the context of the growing importance of net negative pathways one might think that this simply means that industrialized countries have to go net negative first, creating space for emerging economies and developing countries (see https://link.springer.com/article/10.1007/s10584-019-02368-y). But neither are industrialized countries talking about this, nor is this well reflected in IAMs which often deploy CDR in regions with the highest afforestation and biomass potential, like Latin America (see https://www.nature.com/articles/nclimate3369). There is a little bit of a discussion in ch 3.6.1.2, which hopefully will be expanded	Accepted - have expanded this discussed and added citations	Oliver Geden	German Institute for International and Security Affairs	Germany
9967	56	1	56	1	Energy justice, although increasingly emphasised (Pellegrini-Masini et al., 2020), has been under-represented... - Pellegrini-Masini, G., Pirni, A., & Maran, S. (2020). Energy justice revisited: A critical review on the philosophical and political origins of equality. <i>Energy Research & Social Science</i> , 59, 101310.	Accepted - will cite	Haris Doukas	School of Electrical and Computer Engineering, National Technical University of Athens	Greece
14405	56	7	56	16	Similarly, please note that the Africa Energy Outlook 2019 (in particular chapter 3 --> part 3.4.2) can also provide interesting insights on how renewables can play a role in improving access to electricity and overcome the many barriers existing for sustainable development in poor and remote areas.	Noted	Arthur Contejean	International Energy Agency	France
25489	56	7	56	16	Analysis on renewable energy transition should consider national circumstances and capabilities, the special needs to developing countries and the requested support (finance, technology transfer, capacity building) from developed countries, as well as the important role other energy sources could play (e.g. fossil fuels with CCUS).	Taken into account - discussion of the just transition has been expanded to account for these dimensions	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
37953	56	8	56	8	"Inequities" would probably be more accurate here than "inequalities".	Accepted - changed to inequalities	Patricia Perkins	York University	Canada
25491	56	17	56	22	The arguments presented on hidden costs of resource extraction should be also considered as hidden costs for specific renewable energy sources. Extensive literature exists on similar arguments but for renewables and it should be explicitly stated, if this text remains in the chapter.	Accepted - will add reference to hidden costs of renewable energy as well	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
2373	56		57		The use of nexus approaches for cross-sectoral coordination in water-scarce drought-prone areas could add value here. See e.g. J. Halbe, C. Pahl-Wostl, A. Lange, M., C. Velonis Governance of transitions towards sustainable development—the water–energy–food nexus in Cyprus <i>Water Int.</i> , 40 (5–6) (2015), pp. 877-894	Accepted - will cite	Roger Cremades	GERICS	Germany
2375	56		57		A formal and clear definition of the nexus has been provided: the nexus is a multi-layer network (Cremades, R., Mitter, H., Tudose, N. C., Sanchez-Plaza, A., Graves, A., Broekman, A., ... & Cheval, S. (2019). Ten principles to integrate the water-energy-land nexus with climate services for co-producing local and regional integrated assessments. <i>Science of the Total Environment</i> , 693, 133662.)	Accepted - will add and cite	Roger Cremades	GERICS	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25493	57	14	57	23	Analysis should consider the importance of developed countries supporting developing countries through finance, technology transfer and capacity building. A more careful examination of economic diversification options is needed, as well as analysis on whether these approaches would be sufficient to eliminate the adverse impacts of climate response measures.	Taken into account - will add reference to economic diversification and role of support from developed countries	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
47775	57	30	57	30	An original approach to reduce the uncertainty across scales was proposed by (Royer, J.-F. et al. (2008) 'Multifractal analysis of the evolution of simulated precipitation over France in a climate scenario', Comptes Rendus - Geoscience, 340(7). doi: 10.1016/j.crte.2008.05.002.)	Rejected - not needed to strengthen this sentence.	Daniel Schertzer	Ecole des Ponts ParisTech,	France
24599	57	41	57	43	It would be best if you considered pointing out concrete actions and specific environmental regulations to accelerate the transition.	Rejected This is an issue for Chapter 13	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
5009	57	37	59	36	I think there are many studies and theories that guide the implementation of actions to mitigate the effects of CC. The approach should be broad and not only directed at carbon emissions.	Party accepted We will take this into consideration in another part of the conclusions	MARIA DEL VALLE	UNIVERSITY	Argentina
1929	57				Suggest deleting conclusion section and raising any key conclusions to the Executive Summary.	Noted This will be coordinated with other chapters	Haroon Kheshgi	ExxonMobil Research and Engineering Company	United States of America
24601	58	6	58	7	You should include specific actions to involve and regulate the companies, especially those industries that pollute more.	Rejected This is too specific for the conclusions	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
25495	58	25	58	34	Analysis should also consider energy efficiency improvement and technological options such as CCUS, stressing the critical role of means of implementation for developing countries.	Rejected This is too specific for the conclusions	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
44141	58	25	58	34	Within the dehistoricized Anthropocene framework, existing capitalist mechanisms can be packaged as solutions to the climate crisis. Considering the historical and foundational ideology of extractivism, though, one can understand how 'green industrial development' proposals are recycled mechanisms touting profitable opportunities in crisis. Thomas Wanner argues, "the green economy/growth discourse, in short, can be seen as an extension of the dominant sustainable development discourse and a new form of 'passive revolution' to save capitalist hegemony and its attendant interests" (Wanner). The proven co-optation of sustainable development discourses that enable a new capitalist colonialism under the guise of 'development' and 'empowerment' thus prove the perfect precursor for similar co-optation of the climate discourse which, on a global scale, is measured in terms established by sustainable discourse.	Rejected. This is not a conclusion of our chapter	Emily Clark	Goldsmiths	United Kingdom (of Great Britain and Northern Ireland)
18535	58	36	59	15	This text is a bit one-sided, focusing only on social groups supporting IPCC-conform climate policies. Compare this to Chapter 1, where the impact of the gilets jaunes and other movements critical of current path-dependent climate policies is acknowledged. Please make sure the report is consistent from beginning to end, preferably by adapting the text in Ch 17 to Ch 1 (rather than the other way around).	Partly accepted. We will cross reference to Chapter 1	Marcel Wissenbu	Radboud University, Nijmegen, The Netherlands	Netherlands
1721	58	9			CONSISTENCY: advance other shifts in thinking and behaviour that are consistent with the 1.5 degree (Celsius) goal.	Noted	Johannes Solar O	University of Dar es Salaam	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25497	59	9	59	12	Delete "and allow for growing social pressures ... governance and policy", and refer to energy efficiency improvement, and use of technological options such as CCUS.	Noted On social movements, we will edit the text and relate it to previous discussion. On the technical options rejected as a reflection of our chapter content	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
24603	59	16	59	16	We suggest incorporating a key message with concrete action we can make or implement. And the consequence of do not. These points will act as a guide to help to take action by policy-makers.	Rejected This is not the aim of our chapter	Daniel Alejandro	National Autonomous University of Mexico (UNAM)	Mexico
1931	59				I very much like the idea of an FAQ on transition Vs transformation. I suggest that this might be useful also in the context of section 1.5.4 either as a box or FAQ since it is not defined there.	Noted	Haroon Kheshgi	ExxonMobil Research and Engineering Company	United States of America
18537	60	1	60	1	A general observation about the literature used in this report: in spite of the promise in Ch 1 to pay ample attention to ethics and political philosophy, I have seen very, very few works from the field of environmental political philosophy used - Patterson and Gardiner in Ch 1, that's it; none of the other great names. Particularly surprising is the total absence of ecomodernism. I'm quite disappointed that the promise to pay appropriate attention to ethics and political philosophy is not realized in the remainder of the report.	Noted See feedback to specific suggestions for section 17.2	Marcel Wissenbu	Radboud University, Nijmegen, The Netherlands	Netherlands
14407	65	35	65	35	Error in the way the IEA is cited. It is written : "EIA, 2019: Data & Statistics. tps://www.iea.org/data-and-statistics.", while it should be "IEA, 2019: Data & Statistics. https://www.iea.org/data-and-statistics."	Will be updated	Arthur Contejean	International Energy Agency	France
14409	70	8	70	8	The IEA 2019 World Energy Outlook 2019 should be cited instead of WEO 2017. Thank you !	Will be updated	Arthur Contejean	International Energy Agency	France
46687	79	31	79	34	The GSDR 2019 reference should be corrected: Independent Group of Scientists appointed by the Secretary-General, 2019, etc.	Will be updated	Jean-Pascal van Y	Université catholique de Louvain	Belgium
5027					There are important agreements through which countries promised to reduce the effects of CC. Only the corresponding public policies must be complied with. Punish those who do not implement the agreements.	Will be updated	MARIA DEL VALLE	UNIVERSITY	Argentina
9433					ok chapter 17	Unclear comment	ANNA LAURA PIS	DEPARTMENT OF ENGINEERING - UNIVERSITY OF PERUGIA, ITALY	Italy
11517					This chapter attempts to show how transition and transformation pathways are linked to climate actions. SR1.5 report also showed these relationships in the context of sustainable development (SD). Now it is time to show some examples of actions for implementing these pathways towards achieving climate change mitigation (and adaptation) and SD.	Will provide examples	Rawshan Ara Beg	Universiti kebangsaan Malaysia (UKM)	Malaysia
12693					Please note that there are inherent trade-offs between the various dimensions of transformation. Pursuing deep, large scale and quick transformations, for example, is generally perceived not to be possible, See for more details: Termeer et al (2017) Transformational change: governance interventions for climate change adaptation from a continuous change perspective, Journal of Environmental Planning and Management 60(4), 558-567	Noted. Will review and consider.	Robbert Biesbroe	Wageningen University	Netherlands

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
12711					the authors use transition and transformation interchangeably. I dont think this is correct. For transitions you have a clear goal and more-or-less clear path of achieving that goal through all sorts of planned actions. For transformations there is often not a clear goal, nor a clear pathway forward. I am aware that there are multiple definitions floating around, but I would propose to use it very strictly in this chapter. please link this discussion to WG2 (chapter 1 and 16,17,18) where this is also discussed.	Will review and fix	Robbert Biesbroe	Wageningen University	Netherlands
12713					table 17.1 really needs referencing. I am not necessarily convinced a) by the value of this table; b) by the accuracy of the content	Noted The table will not be included	Robbert Biesbroe	Wageningen University	Netherlands
12715					the chapter would benefit from a more systematic regional assessment of: a) already observed transitions; b) systems in need of transitions in the region; 3) region specific enables/barriers to accelerate the transition. As the authors note, there is no 'one size fits all', but maybe a regional split might be more informative to readers. The information might come from previous chapters (in WG2 the regional chapters received several requests to provide empirical information to feed into the synthesis chapters	Good point - noted, with review and provide examples where necessary	Robbert Biesbroe	Wageningen University	Netherlands
20307					The two comments made on Chapter15 Investment and Finance above could also provide rationale for transition in Chapter 17.	Noted.	Paul Dumble	Paul's Environmt Lentd	United Kingdom (of Great Britain and Northern Ireland)
22373					The message of chapter 17 seems to have too much focus on the equity issue or community-based approach. They seem a bit distant from the messages of Chapters 1 and 17 which stress the importance of market instruments to mitigate GHG efficiently.	Different policy instruments are discussed - but equity is an important part of the narrative of how the transition can be accelerated.	Arimura Toshi	Waseda University	Japan
25545					Please take care not to use value-judgement terms such as 'important', 'significant' and also prescriptive terms such as 'need' and 'must'. Some readers will interpret these statements as policy prescriptive.	Noted. Will review	Sarah Connors	IPCC WGI TSU	France
25579					As a reader who isnt familiar with all the topics being discussed in your chapter, it might help many Executive Summaries to include subheadings to cluster the statements by topic or overarching chapter themes.	Will consider	Sarah Connors	IPCC WGI TSU	France
28825					Some discussion of how climate-altering technologies might interplay with the achievement of the Sustainable Development Goals would be welcome – e.g., food, land and water tensions see for example https://www.c2g2.net/wp-content/uploads/C2G2-Geoeng-SDGs_20180521.pdf	Noted - will review	Paul Rouse	Carnegie Climate Governance Initiative	United Kingdom (of Great Britain and Northern Ireland)
29047					How does the chapter differentiate the concepts of transition and transformation? Is this aligned with the framing in Ch 1 and glossary	Will review definition	Priyadarshi Shukl	Ahmedabad University	India
29051					Prescriptive language at few instances. Check for sentences mentioning 'governments should'	Will review	Priyadarshi Shukl	Ahmedabad University	India
29055					Case studies in boxes have some good examples. Important to frame these in light of the chapter narrative and explicitly state the mitigation-SD linkage	Well noted - will review.	Priyadarshi Shukl	Ahmedabad University	India
33837					Ch 17 is restating many of the important points being raised in other chapters, but it is not yet clear what unique assessment/value add/identity this chapter is bringing to the report.	Will review in terms of value add.	Debra Roberts	EThekwini Municipality	South Africa
36311					Could you define "In the context of Sustainable Development" means? Why in this important chapter you overlook "Development"? Is it because it is not important issue?	Will review - development issues are important dimensions of the chapter - will provide examples where necessary	Youba Sokona	South Centre	Switzerland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
36333					The chapter contains a lot of information and sometimes in the same section not really connected. It is a bit hard to read as it lacks a clear flow of issues addressed. It seems to me that a confusion exists between "Development" and Sustainable Development" or linkages are not at all addressed and discussed. Also it seems a confusion between low carbon and deep decarbonization seen as transition. The transition is not clearly defined and poorly addressed	Will review and fix - will provide clear definitional boundaries boundary between transition and transformation	Youba Sokona	South Centre	Switzerland
40307					This is an overall comment: This chapter should better align with Chapter 1 which explores the issue of the 'just transition' which features strongly in Chapter 1. In terms of the acceleration needed there is a super article in Nature which highlights this issue: Figueres, C. et al. (2017). Three Years to Safeguard our Climate. Nature. 546 (7660), 593-595.	This is an overall comment: This chapter should better align with Chapter 1 which explores the issue of the 'just transition' which features strongly in Chapter 1. In terms of the acceleration needed there is a super article in Nature which highlights this issue: Figueres, C. et al. (2017). Three Years to Safeguard our Climate. Nature. 546 (7660), 593-595.	Raphael Heffron	Centre for Energy, Petroleum, Mineral Law & Policy	United Kingdom (of Great Britain and Northern Ireland)
40309					This is an overall comment: This chapter should also reflect the need for more convergence in scholarship in terms of climate, energy and environmental researchers to bring about a just transition: see - Heffron R. J. and McCauley, D. (2018). What is the 'Just Transition?', Geoforum, (88), 74	The Just Transition section will be reviewed and expanded where necessary	Raphael Heffron	Centre for Energy, Petroleum, Mineral Law & Policy	United Kingdom (of Great Britain and Northern Ireland)
43609					The focus on transitions in chapter 17 is well chosen. 17.4 is similar to 5.4. Both chapters would profit from crossreferencing and learning from each other. The equity point in the executive summary is strong but would benefit from better substantiation in 17.4. Some concrete examples would be nice. The renewable energy angle in the Executive Summary is also well emphasized and could have more substance in the chapter.	Noted. Will review -	Felix Creutzig	MCC Berlin	Germany
43989					Coordination with WGII chapters such as 18 as well as development of a Cross Working Group Box on Climate Resilient Development should be investigated.	Noted We are in contact with Chapter 18 on this	Hans Poertner and	Alfred-Wegener-Institut	Germany
44049					Overall, I found this chapter very useful. However, I think it's important to recognize that the concept of SDGs are heavily used in certain parts of the world and barely in people's vocabulary in other parts of the world (the U.S. chief among them). The formulation around SDGs may be offputting for some. I think the executive summary is already fairly user-friendly, and the conclusion (lessons learned) section is relevant for anyone, but it may also be useful in Section 17.1 to try to generalize beyond the SDGs (while perhaps also providing a text box with some background on SDGs for people who may not track that discussion).	Noted - will review	Tegan Blaine	Blue Cairn Climate Consulting	United States of America
44079					Other chapters conclude with a section outlining key research areas that need more attention. I would suggest that such a section would be very valuable to this chapter as well, as many of these areas are not traditional scientific areas, and many of the references are rather old (some in 1990s, many in early 2000s). It is critical that this area get more attention for research, as it is so important to successfully achieving the necessary transitions in both mitigation and adaptation.	Noted.	Tegan Blaine	Blue Cairn Climate Consulting	United States of America

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48097					The chapter ES has a style which differs from usual IPCC report ES (lack of use of calibrated language to report confidence in findings; very prescriptive tone). What is differs in this assessment from SR15 and why? There seems to be much overlap with other chapters. In the assessment of education aspects, there could be a link with WGI on issues related to climate change literacy and storylines related to regional information. I could not find in the ES or outline references to gender dimensions of mitigation potential, limits and specificities, despite availability of literature on this aspect.	Will review and integrate calibrated language	Valérie Masson-D	CEA, IPSL/LSCE	France