

ESSD-2023-166

Suggestions and comments in attached .pdf will emerge as well during copy-editing. You will need to compile and compare lists of mandated changes vs optional suggestions. Lists might provide head-start.

References contain many strange sequences of characters. I marked only a few. These likely arise from use of multiple bioblimetric systems. Please check carefully to resolve. Particularly check that all references to IPCC AR6 chapters include valid DOI. Format slightly different supplement vs. main text? Authors will want to make their own checks of supplement references.

Check acronyms. I marked a few. Authors need to either: a) define all at first use (as often done but not yet for e.g. DAMIP); or b) include a table of acronym definitions. Authors to decide.

Small but possibly useful change: convert names and labels of figures and tables in supplement to better link to main text and to clarify associations with relevant sections. Find details in attached list.

Overall: good idea, excellent execution, thank you for using ESSD.

Page 1, line 5: Bradley Hall affiliation superscript should read as '23', not '22'. Otherwise line 38, NOAA GML, exists as an orphan.

Page 1, line 28: this institution, even if private, probably needs a country. Or, state and country?

Page 1, line 37: Need more info about this institution?

Page 1, line 42: DKRZ needs city (Hamburg) and country (Germany). DKRZ also hosts WDCC; relevant?

Page 2, line 1: need a country?

Page 2, line 54: Affiliation #36 should have identical format to #16. One at NOAA NCEI Silver Spring, other at NOAA NCEI Asheville?

Page 2, line 58: Affiliation #40 (CIRES) not used by any author?

Page 2, line 68: "... update ... to produce updated ...". Need better wording here?

Page 3, lines 80-82: redundant text here

Page 3, line 82-82: "... continued series of these annual updates over this critical decade ...". Good, but which decade exactly. The most recent decade? The most recent decade for which you have data? The upcoming decade? This reader knows, but many will not; need clarity and specificity. Discussed (more than adequately) in Conclusions section, but first hinted at here?

Page 3, line 103 " ... global surface air temperature?

Page 3, line 107: about FAIR: findable, accessible, reusable - yes. Interoperable: doubtful.

Page 5, line 151-154: Good paragraph! Could serve not only as introductory, as here, but also for summary! Make it more prominent?

Page 11, line 306: Authors have previously referred to generic climate models but have not yet used, nor defined, the CMIP acronym. Because you will use the acronym multiple times, it needs definition?

Page 13, line 349: Here authors use term “AR6 Working Group I” while in many other locations authors refer to WGI. Quick search and replace should ensure better consistency?

Page 14, line 363: ‘AGAGE’ acronym used often in this section but never defined?

Page 14, line 383: N2O uncertainty, in version I see, appears as italicized?

Page 20, line 504: Do readers need quantitative interpretation of IPCC ‘*very likely*’ here?

Page 22, line 531-532: some confusion introduced here? IPCC ‘high confidence’ for EEI means but only ‘very likely’ for ranges? Or, high confidence for earlier time period (1976-2006) but only very likely for 2006-2018?

Pages 24, 25: Figure 4a and 4b referenced before Table 5, but Table 5 presented before Figure 4. Need a change of order, or, did I miss something? Figure 4b called out in text but Figure 4 generally or Figure 4a never? Fig 4a comes from von Schuckmann? Fig 4b might prove more informative if sorted by starting year?

Page 27, line 652-653: parenthesis missing in here somewhere?

Page 32, line 744: “also known as the carbon budget” Eliminate this phrase from this sentence, to reduce confusion with following definition?

Page 32, line 754: need altered punctuation here? E.g. replace comma with semicolon? “... systematic annual update; the decade-long period ...”

Page 32, line 756: ‘up-to-date’?

Page 33, Table 7, two questions: a) under 1.5C, 3rd row (‘as above with AR6 update’), why do these values prove identical to those in row above? Shouldn’t these values appear slightly lower than those above? b) under 2.0C, 3rd row (‘as above with AR6 WGIII scenario update’), why does this text differ from equivalent rows above under 1.5 and 1.7. From line 774, doesn’t reader conclude that authors applied AR6 WGIII scenario updates in all cases?

Page 34, lines 803-804: “50% RCB is expected to be exhausted a few years before the 1.5C global warming level is reached”, does this occur because formal exceedence of 1.5C requires decadal averaging of GMST or because of some other systematic lag? On page 40, authors remark about need to also understand non-CO2 warming. Does that reason apply here?

Page 35, line 807: depends on reader’s viewpoint. Better to claim ‘among’ rather than ‘to’?

Page 38, line 871: link works for me, thanks for including.

Page 45, line 954: Table 1 shows emissions. Reader needs to interpolate and average to estimate that rates of increases might have slowed. Perhaps to temper this conclusion

somewhat? Data would allow such an interpretation? Such a statement would better support your earlier conclusion about need to continue monitoring and metadata records?

Page 57, line 1346: redundant issue number (23) in Purkey and Johnson J. Climate article. Supplement

Page 1, Table 1: Good to move to supplement. Clear orderly presentation. Do we need a reference, e.g. so that reader can follow to find details of e.g. HCFC-22? Perhaps original IPCC chapter?

Section 4 = okay.

Section 5 = okay.

Section 7 = okay. Suggest possible improvements: Figure numbers could perhaps change to S7.1, S7.2, etc. to better reflect inclusion in supplement and place in Section S7?

Section 8 = clarifications needed, as follows:

Page 15, line 343: "provided in Supplementary Table 1". Supplement Table 1 does not show non-CO2 reductions. Text instead refers to supplement Table 2? Another reason (see Section 7 comment above) for assigning table and figure numbers to specific sections. E.g. in this case one would refer to Figure S8.1. Earlier table would, by these numbering methods, register as Table S3.1? If, eventually, one might choose to refer to supplement tables or figures in main text, this enumeration system could provide good clarity?

Section 9 = okay but suggest change of figure label to Figure S9.1.

Page 22, line 519: This Smith et al. reference to the WGI report should have a DOI? E.g. as in the Szopa reference following soon after?

Page 23, line 544: Something strange here?