Response to Reviewer 2 (in bold)

The authors are to be again greatly complimented for their work, for the outstanding number of data sources used, performed analysis, as well as for the continuous inclusion of new products. I was again a bit overwhelmed with the length of the paper, however, it looks like it shortened a little compared to previous versions. I find the Executive summary and the highlighted key messages of great use. I would only suggest consistency between the information provided in each paragraph, as highlighted below, in the line by line suggestions.
Thank you for the very positive overall comments.

Abstract: great to see the inclusion of the ESMs and CDRs estimates as well as inversion systems using both satellites and surface observations (OCO-2 and GOSAT).
Thank you.

L846: Please add the value for deforestation in 2022 compared to 2019 similarly done for the CO2 fossil?
We give the 2019 estimate for fossil fuel as fossil fuel emissions decreased significantly in 2020 because of the COVID pandemic and 2023 is the first year where fossil fuel emissions are above the pre-pandemic level. There is no equivalent for land use change emissions,

L789 and L858: the increased concentration of CO2 is 51%, could be mentioned as well on line 789 instead of saying more than 50%
Done, thank you.

In general I agree with RC1 about comparing estimates for the pre-, post- and pandemic years, if authors want to exclude pandemic years as being atypical, then only 2022 compared to 2019 is enough, with a clear sentence of projection (2023) in the end.
Unclear what the reviewer is asking here. We certainly do not want to exclude the pandemic years. Reviewer 1 comment was about potential rounding error between 2022 and 2023 estimates.

L1197: because 2023 is a projection, I would think of using 2022 instead, to compare it with 2019.
Unclear what the comment refers to. Line 1197 describes the methodology and its changes over the successive global carbon budget publications (from 2019 to 2023 in Table 3 and before 2019 in Table S8).

L1533: first time RECCAP is mentioned, please add the weblink
There isn't a dedicated website for RECCAP-2 (apart from the generic global carbon project website). It seems more appropriate to give the reference to Ciais et al. 2020). We now also refer to Poulter et al., 2022 which also describes the RECCAP-2 activity.

L1638,1641,1704 etc.: consistent use of wording for the numbers throughout the manuscript is needed, now it's a mix of words and numbers.
Thank you, we will double check.

L2063: regarding the following paragraph "...relatively constant over the 1960-1999 period. Since the 1990s they have shown a slight decrease of about 0.1 GtC per decade, reaching 1.3 ± 0.7 GtC yr-1 for the 2013-2022 period (Table 7)" . What happened between 2000-2013?
Unclear what the reviewers asks. 2000-2013 is part of "Since the 1990s". ELUC emissions are declining by about 0.1 GtC per decade since the 1990s until now.

L2297: Perhaps add the projection value of Powis et al., 2023 for blue carbon CDR?
Powis et al does not explicitly quantify blue carbon CDR. their estimate of 0.01 MtCO2yr−1, includes DACCs, mineralization, aquatic biomass growth, and others. Hence, we added "less than 0.003MtC yr-1" in the text.

L2341 NGHGI already explained at L1333, L1047 and Tables...keep please the first and the rest NGHGI
Thank you. NGHGI is now defined only once at the first occurrence in the main text.

L2341 and paragraphs after: the authors discuss the subtractions between DGVMs and bookkeeping models to match the NGHGIs estimates, I would suggest they mention that NGHGIs apply only to Annex I Parties while FAOSTAT is used for the non-Annex I. Also, FAOSTAT has global coverage, do they use a mix of the two? I would understand that the GCB estimates which match very closely the NGHGIs refer only to Annex I.
In our study "NGHGI" refers to both Annex-I and non-Annex I. We use the same methodology as described Grassi et al. 2023 (the NGHGI dataset upon which the NGHGI data in the GCB 2023 is based): "This database builds on a detailed analysis of a range of country submissions to the UNFCCC and is complemented by information on managed and unmanaged forest areas. Specifically, for Annex-I countries, data are from annual GHG inventories (including a complete time series from 1990 to 2020). For non-Annex I countries, the most recent and complete information was compiled from different sources, including national communications (NCs), biennial update reports (BURs), submissions to the framework REDD+ (Reducing Emissions from Deforestation and Forest Degradation) and NDCs" The Grassi et al. 2023 dataset is available at https://essd.copernicus.org/articles/15/1093/2023/

L3594: Interesting inclusion of the RECCAP2 regions paragraph given that not all regions submitted their papers, I assume authors received the agreement of the chapter-lead authors to generate this preview of RECCAP2 results. I would suggest a sentence to clearly mention this.
We only show the ELUC, SLAND and SOCEAN estimates from this Global Carbon Budget paper over the RECCAP regions. We do not report any of the estimates from the RECCAP individual papers. This is clarified in the text now.

L4049: "emission declines in the USA and the EU27 are primarily driven by slightly weaker economic growth" needs a reference ?
This statement is our analysis of Figure 16, the Kaya identity figure, which shows with lower per capita GDP in EU and US over this past decade than over the 1990s.

Table 9: please explain to which countries you refer to for the NGHGIs
As explained above, NGHGI refers to both Annex-I and non-Annex I.

Figure 2: please add a sentence to explain what the uncertainties represent
Thank you, sentence added: "Fluxes estimates and their 1 standard deviation uncertainty are as reported in Table 7"

Figure 16: I would add what positive/negative values mean
Thank you. Text added to clarify.