

Dear Editor,

In a previous upload, we detailed our response to the referees' comments as well as explained our responses to you. Please find here our response to your concerns about the GCP budget, which you would like us to revise.

Table 3 of Saunio et al (2020) quotes emissions for three periods, (i) 2000—2009, (ii) 2008—2017, and (iii) 2017. The first period, 2000—2009, is directly comparable to our inversions and we have computed 2000—2009 means from our inversions and reported those in the newly added §4.2. However, our inversions end in 2016. Therefore, we constructed the 2008—2016 means of GCP emissions from periods (ii) and (iii) reported by Saunio et al (2020). These are the GCP numbers quoted in §4.2. Finally, we used the GCP spreadsheet at <https://doi.org/10.18160/GCP-CH4-2019> instead of the numbers in Table 3 of Saunio et al (2020) to calculate means, which resulted in small differences due to rounding. For example, the 2000—2009 mean bottom-up fossil fuel emissions computes to 110.51 Tg/yr from the spreadsheet, which is rounded (incorrectly, in our opinion) to 110 Tg/yr in the paper. We round it to 111 Tg/yr when we quote the GCP budget. This possibility of small differences due to rounding is acknowledged in Table 3 of Saunio et al (2020) as well.

We submit that the small inconsistencies and differences the editor has noticed are due to these two factors, namely (i) using the GCP spreadsheet instead of the rounded numbers quoted in the paper, and (ii) calculating and using the 2008—2016 GCP means, which are not reported directly in Saunio et al (2020). We realize that at first glance our GCP numbers and the numbers quoted in Saunio et al (2020) may seem inconsistent. We have therefore added lines 515—520 in §4.2 of the revised manuscript for explanation. We hope this will address the editor's concerns.

Kind regards,

Sourish Basu  
(on behalf of all co-authors)

#### References

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