

Interactive comment on “Accounting for the climate-carbon feedback in emission metrics” by Thomas Gasser et al.

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In addition to the changes made to respond to the referee and short comments, we made two other changes to the paper.

First, we now refer to a very recent paper by Sterner and Johansson (2017) which is a model-based investigation of the impact of the climate-carbon feedback on emission metrics. Their conclusions are qualitatively the same as ours.

Second, with the aim of proposing the most up-to-date metrics, in addition to the update of the climate IRF, we now also include an update of the radiative efficiencies of CO₂, CH₄ and N₂O (Etminan et al., 2016). Therefore, we have added a new row in table 2 and some new text:

C1

"In table 2 (fifth row), we provide another set of relative metrics, similar to the previous one in that it includes the feedback response calibrated on OSCAR and the updated climate IRF, but it also includes an update of the radiative efficiencies of CO₂, CH₄ and N₂O (Etminan et al., 2016). The new radiative efficiency of CO₂ differs by +2%, that of CH₄ by +14%, and that of N₂O by -3%. These changes logically impact the GWPs and the GTPs, since both metrics are function of the φ^x parameters. The change is substantial for CH₄: in most cases more so than the update of the climate IRF. Notably, the update of the radiative efficiency of CO₂ – being the reference gas in relative metrics – implies a change in the metrics' values of all species, even those whose own radiative efficiency are not changed. These results show that the first-order processes (here, the radiative forcing) may have more impact on the metrics than second-order processes such as the climate-carbon feedback."

The proposed revised manuscript – with track changes – is in attachment.

Please also note the supplement to this comment:

<http://www.earth-syst-dynam-discuss.net/esd-2016-55/esd-2016-55-AC5-supplement.pdf>

Interactive comment on Earth Syst. Dynam. Discuss., doi:10.5194/esd-2016-55, 2016.

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