

## Report #1

**Suggestions for revision or reasons for rejection (will be published if the paper is accepted for final publication)**

**The readability of the manuscript has been substantially improved after the revision; now it is much more focused and is clearly structured. I recommend that it is published after some technical corrections. I suggest the authors perform a thorough proof-reading of the manuscript, especially paying attention to the units of CH<sub>4</sub> RFs in figures and tables. I list some issues below.**

Thanks to the reviewer for a second round of very helpful and detailed comments. We have addressed the specific comments below, and made some additional minor changes as part of the suggested proof-reading.

**P3, line -9 “H that is under investigation” – can you explain what “H” means here? You should change it to italic font and put a “,” after if it symbolizes “the time horizon”.**

Agreed – Updated in text.

**P5, line 2 missing “)”**

Updated in text.

**P7, line -5 “These lifetimes include loss terms such as those due to soil processes;” – they should also include stratospheric loss (Fiore et al. 2009).**

Agreed-Updated in text.

**P10, line 3 “For the Fry-method subset, the metrics must be constructed more carefully.” – relative to what? This sentence is a bit empty and it is not clear to me how it connects to the following text.**

This sentence has been re-ordered and now reads:

*The GWP and GTP are both the sum of a short-lived ozone component, which depends only on the ozone RF, and a long-lived component, which depends on the methane and long-lived ozone RF, and the change in the methane lifetime.*

*For the Fry-method subset, the ensemble-mean GWP and GTP are first calculated, and then a separate standard deviation due to each of these four variables is calculated.*

**In figure 3:**

- 1) The wrong unit of RF in the figure – should be “W m<sup>-2</sup>”. This should also be corrected in the caption.**

Updated in text and Figure

**2) In caption, it reads like the CH<sub>4</sub> RF is also normalised which I take it is not. So it needs some rephrasing.**

Updated in text

**P13, line 10, I suggest it would be more appropriate to say “anti-correlation”.**

Agreed - Updated in text

**In section 4 “Radiative forcing” there is only one subsection 4.1. Maybe you could turn the first part into a subsection to keep the structure in balance.**

Updated in text

**In section 4, the unit of CH<sub>4</sub> RF was first mentioned in W m<sup>-2</sup> (also shown in Figure 3) but subsequently you cite these numbers in units of mW m<sup>-2</sup> from the literature. It is really minor but it would be good practice to be consistent. I suggest to use mW m<sup>-2</sup> throughout which is in line with the units used in other work.**

Updated in text

**Figure 4, the units of RF CH<sub>4</sub> are not consistent in the figure (W m<sup>-2</sup>) and in the caption (mW m<sup>-2</sup>). Please correct. Why don't you use mW m<sup>-2</sup> throughout?**

Agreed - Updated in text

**Table 3, no units specified for RF CH<sub>4</sub> in the table caption.**

Updated in caption.