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Geoscientific Model Development Discussions

Interactive comment on "Global emissions pathways under different socioeconomic scenarios for use in CMIP6: a dataset of harmonized emissions trajectories through the end of the century" *by* Matthew J. Gidden et al.

Anonymous Referee #2

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This manuscript presents a new generation of emission scenarios for their use in CMIP6. This is a very important manuscript for the ESM modeling community because it sets the basis for common model drivers on emission trajectories. The manuscript is very well written. I only have a few minor issues:

- Page 7, lines 10-13. This makes sense only if there's no trend in the data. Did you check whether there are increases or decreases in land burning? Please clarify.

- Eq. 3. If $\dot{I}_c$ is the growth rate, shouldn't the rhs be a sum rather than a multiplication? Please check whether this equation is correct.
- Eq. 5. Please define c'. I have problems understanding this equation.
- Section 3.4. The manuscript does a good job describing the methodology for harmonizing the datasets, but it does not describe with the same level of detail the methodology for obtaining the spatial distribution of emissions. I think it's important to add more detail on this methodology to better understand the results presented in section 3.4. In particular, the section describes different values of emissions for the different scenarios in different countries. Since population and GDP change drastically over time and across scenarios, it is very difficult to make sense of sentences such as "...SSP1-2.6, emissions across countries decline dramatically such that by the end of the century, total emissions in China, for example, are equal to that of the USA today". It'd be great if you help the reader by pointing out whether the results in emissions are driven mostly by changes in population, GDP or the other SSP drivers.
- Conclusions. This section is relatively long and reads more like a summary. It can be improved by shortening it, focusing only on the main take home messages of the manuscript, and not summarizing it.

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