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Interactive comment on "Global CO_2 Emissions from Cement Production" *by* Robbie M. Andrew

Anonymous Referee #2

Received and published: 4 October 2018

Dear editor,

Thank you for giving me the opportunity to review this manuscript.

This manuscript is an update to an important work that estimated global process CO2 emissions from cement production by including latest production statistics as well as revisiting assumptions on e.g. clinker-to-cement ratio values assumed in earlier studies.

While I enjoyed reading the manuscript and going through the datasets, it was not always clear the 'identify' of this manuscript provides compared to the earlier version https://doi.org/10.5194/essd-10-195-2018 as the two have identical titles. This manuscript also does not refer to the earlier article when a comparison of results is expected (in particular, cumulative emissions that changed substantially). Of course, this might be entirely my misunderstanding as I am not familiar with the practices of

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the ESSD journal, the objectives of which are somewhat different from other academic journals.

Nevertheless, my assessment is that the manuscript needs revision before it can be accepted for publication. My comments are provided below:

General If I understood correctly this manuscript is an updated version of the article also published in ESSD https://doi.org/10.5194/essd-10-195-2018 – why does this current manuscript have exactly the same title as the already-published one? The conventions for ESSD might be different from those in other journals due to the focus of the journal, but from how the Global Carbon Budget updates are titled and that this manuscript covers one more data year (2017), shouldn't this manuscript have an original name if it is to be published as a new paper (and not a replacement of the aforementioned article)?

In relation to the above, I found it very strange that this manuscript does not cite the earlier article (essd-10-195-2018) at all. Even if this manuscript is an annual data update, it is recommended that the author clearly communicates the main changes on the methodology and the results (and main reasons for the changes).

The track change version (supplementary file) compared to the earlier article was very useful. Nevertheless, to make this manuscript more transparent without a track change file, it would be nice to have the main changes (or their summary) presented in a tabular format, e.g. two columns with 'before' and 'after'.

This manuscript presents both cumulative emissions and annual emissions. To avoid confusion, it is advisable to add "/year" for annual emission figures throughout the manuscript. A dataset that is currently not uploaded but would be very useful for the energy and climate policy/technology researchers would be country-level clinker ratio time series. Is possible to have this dataset on public domain?

On the references to Appendices: not all Appendices are referenced in the main text,

and the ones that are referenced do not appear in an alphabetical order (first Appendix A, then Appendix D, followed by Appendix C). Please re-organise.

Abstract "The required data for estimating emissions from global cement production are poor, and [. . .]" : it was not fully clear whether the data availability was poor or data quality was poor (or something else). Please clarify. "Cumulative emissions from 1928 to 2017 were 36.9±2.3 Gt CO2, 70% of which have occurred since 1990. Emissions in 2016 were 28% lower than those recently reported by the Global Carbon Project." Where in the main text is this substantiated?

Main text P4 l4: "Anonymous 2010" : Is the author PBL (as an organization) ? P6 l9: On "Process emissions from cement production reached a new peak in 2017 of 1.48±0.20 GtCO2", does the author mean a new historical high? When looking at the data file, 2017 emissions are 1.477095 GtCO2 whereas 2014 emissions are still a tiny bit higher at 1.478259 GtCO2. Please clarify. P6 l12: "Cumulative emissions over 1928–2017 were 36.9±2.3 GtCO2" – The value has reduced significantly from the previous version even after including 2017 data (39.3 GtCO2 for 1928-2016), but there is no clear explanation on what caused this change. Please elaborate. P6l 15: Since the China paragraph comes right after the global results, readers would expect to learn whether China is the main contributor to the 'new peak' in 2017 but this is unfortunately not entirely clear. It would be good to elaborate. P6 l27: "Uncertainty jumps" does not sound like a scientific expression. Suggest rewording. P10 l2: "It is intended that the database will be used in the Global Carbon Budget and updated annually, with both data updates and methodological improvements." – the author maintains the same sentence as in the earlier article (essd-10-195-2018), but the repetition of this makes the readers wonder why the dataset is still not used in the Global Carbon Budget project. If there are particular challenges or limitations regarding the dataset's inclusion in the Global Carbon Budget, please clearly describe them. P10 (conclusions): it would be important to mention that this is a 'living document/data' and will be updated annually.

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