

Interactive comment on “EDGAR v4.3.2 Global Atlas of the three major Greenhouse Gas Emissions for the period 1970–2012” by Greet Janssens-Maenhout et al.

Anonymous Referee #1

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Review of ESSD-2017-79 EDGAR v4.3.2 Global Atlas of the three major Greenhouse Gas Emissions for the period 1970-2012 Author(s): Greet Janssens-Maenhout et al.

: <https://www.earth-syst-sci-data-discuss.net/essd-2017-79/#discussion>.

1. General comments

The Emissions Database for Global Atmospheric Research (EDGAR) with its global geo-coverage and continuous time-series is an extremely important dataset underpinning many (global) modelling studies. It is also often used as a benchmark for regional / national emission inventories. Moreover the EDGAR grids are frequently used to distribute or scale results from other studies. Publication of the latest release in ESSD with

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an extensive documentation and clarification of its features is highly appropriate and valuable. It will provide the many users of the data with a clear and reliable reference as well as a direct link to find the data. The readability of the overall MS is somewhat hampered by the repetition in the sections for CO₂, CH₄ and N₂O but in my opinion this is unavoidable as the documentation also has to cater for users that only want to use one of the three gases. So, completeness is more important here than a good “story line”. This reviewer recommends publication after taking into account a number of corrections / suggestions as outlined in more detail below. I look forward to seeing the corrected version appear in ESSD.

2. Specific comments abstract: p1 line 20: best-available emission factors – what is a best-available EF? Moreover in line 25 it is stated “(using) mainly default emission factors”, so are these then the best-available? Please clarify and/or harmonize. Personally I think “best-available” is an unnecessary addition but maybe the authors mean something different?

Introduction

P4 Line 2 “These global etc. – “ This may be true but seems out of scope for the paper, I don’t see its value for the paper - please remove this commentary.

P4 line 16 “as a consequence uncertainties in particular in the inventories of Annex I countries can be assumed to have declined” “- Very evasive – do you know it or only assume? If only the latter than you might as well not mention it.

P4 line 27 “In 2023 a global stocktake is foreseen to track the progress of the collective efforts to reduce the emissions as promised under the NDCs. Comprehensive information on global emissions, consistently compiled for all world countries 30 available from EDGAR v4.3.2 can help to assess and build trust in the effectiveness of the NDCs. Moreover the country estimates of EDGAR v4.3.2 can also help countries with less developed statistical infrastructures to compile their inventories.” This seems to me more a paragraph for outlook than introduction. Reconsider its location.

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methods

P 5 line 4-10 – this is most repetition of parts also mentioned elsewhere and under methods. I suggest to remove, simply to reduce length. Line 29-30 – same

P6 line 16 – the “also” seems misplaced. CH₄ does not depend on carbon content of the fuel combustion

P9 line 13 – what do you mean by “seem”? Is there a reference?

P9 line 15-16. Here % are presented but to make sense of this, one has to look up the other sources. What does 60% really mean? Why is it important that one country is 60% and the other 2%? I would prefer the absolute emissions in tons of CH₄.

P15 line 33-end of section. This paragraph with correlations and lengths is cryptic. First it is stated that it is outside of scope and then some lose information is dropped in a few sentences. Either clarify better and tell why or remove.

Resulting trends

The publication in ESSD is to support the scientific community, it is not aimed at policy makers. I dislike the use of the CO₂eq as a unit. I would much prefer to stick with the individual species and leave the GWPs and their changes out of the discussion. It does not change your inventory. I don't think there are modellers or gridded inventory compilers who actually use CO₂eq as the unit of choice, this always is a final “post processing” for comparisons but it's a moving target and in my mind not very useful here.. Likewise with figure 4 and the discussion on top of page 18. I would prefer 3 figures (a, b, c) for the 3 GHGs instead of CO₂eq. Yes, a bit more figures but at least one can interpret it and the tons/yr remain “true” while the CO₂ eq may change again, making the figure incomparable to future figures because disentangling in the figure is not possible. If too many figures are seen as a problem one or more can be moved to the SI.

P21 l6 and further + Fig6; This is not clear to me does Non-metallic now include ce-

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ment? Also in Figure 6a? If so, I would rather see non-metallic without cement in the same figure with cement instead of trying to subtract it “in your head” to understand the independent trends.

P21 l 24-26. I am uncomfortable with saying that the 6% is within the uncertainty range. It is true, but the use of the non-oxidation factor is a choice not an uncertainty, although the factor may be uncertain. So, this mixes real uncertainties with choices which are then “solved” by saying they are within the uncertainty. I am more inclined to say that it shows that this needs to be clearly documented and is important to reconcile in the future.

P22 l28-29 Somehow I can't believe that the global modelling inversions are so accurate that they prove that the 2% difference between v43.2. and 4.2 is correct. My expectation is that this would still be within uncertainty of these studies? (but I may be wrong here and did not check in detail)

Resulting grid maps

P23 l18-28 Can be removed – simply start with In this section etc. See comment on figure 11 later

P27 l3-13 – Here it would be good to mention that the models also struggle with accuracy of the natural emissions and that this influences their current capacity to evaluate anthropogenic emissions.

Future perspectives P27, l27 First sentence is cryptic, I would suggest to remove and start with To analyse etc. . . .

P27 l33 remove everything after “further evaluation”

Figures and tables

Table 2b – I don't understand this table. There is a header row, that is repeated and different numbers in the columns. I suspect something is missing but really cannot

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interpret it. However, in line with my general comment on the CO2eq approach I think it would be more useful to have this table2a for each of the 3 gases instead of a pooled total GHG table and a cryptic Table 2b. Alternatively the CH4 and/or N2O table could be in the SI.

Fig 11 – why include AWB in this figure? It is not buildings or transport. Why not make a figure w/o short cycle carbon? (excluding biofuel, AWB, etc.).

3. Technical corrections

p2 line 25 “There are” - do you mean “These are”?

p4 line 14 emissions estimates – not 2 times plural; this is also in p7 Line 12. emissions sources However, it may also be my lack of English knowledge. I a native speaker says it is good to use double plurals - I rest my case.

P15 line 10 – remove “of”

P19 l7 “and increases from 1989 onwards” - here should be 1998?

P19 l39 : in (or from) Brazil

P21 l6 examines the

P22 l4-5 sentence is wrong or words are missing

P 25 l34 please change 1/3.5 - that is a very strange amount. It increases or decreases with a factor 3.5 but not 1/3.5

P27, l37 remove local

Finally the acknowledgement is strange. While I understand the comment on “the last 4 authors” – basically saying the contribution was not done at their current affiliation – the other part is strange: the first 5 authors are not all at JRC (see author 3), so which are the 5 that is referred to and moreover, as the last 4 and the first 5 are specified it makes one wonder what the others did. My suggestion would be to only specify the

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contribution of the last 4 authors by saying it was done during previous jobs at JRC as it is now – this has a purpose because the work is not associated to their current affiliation - but give no further ranking or split. If the authors feel it is better to specify more, it has to be complete.

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