

Our responses are in bold. We very much thank the reviewer for taking another extremely careful look through our manuscript. We agreed with almost all their comments. Please let us know if you have any further questions.

The manuscript reads much better now. However, I still had at some places some problems to follow and would like to ask the authors for a further revision. These are however only minor issues and should be easily be implemented.

Specific comments:

P1, L11 and L12: What is the difference between "Use in emissive applications" and "exist in application and equipment". Isn't that essentially the same?

We have altered the second sentence of the abstract to make it clear that we are referring to the same applications mentioned in the first sentence.

P1, L21 and L22: What is an "easily accessible bank" and what is the "total bank"?

We changed "easily accessible bank" to "easily recoverable portion of the bank" to provide clarity. We hope this also helps with the "total bank" question. We contemplated changing "total" to "entire" but it's not obvious that it would help.

P2, L44 and L46: Is the abbreviation R/AC really useful? Wouldn't it be better to just omit it and write "refrigeration and air conditioning" a second time?

We agree since it is never used elsewhere in the manuscript. We have changed it as suggested.

P3, L83: Instead of just "bottom-up methods" I would suggest to directly write "bottom-up modelling methods".

We made this change. We also switch the use of "approaches" and "methods". For some reason this sounds better to us.

P3, L89: Also here I would suggest to write instead of just "methods" rather "modelling methods".

We made this change (with it now saying "modeling approaches").

P3, L95: This is why I had the two previous comments, because here you suddenly call it models and not methods.

This is a good point. Thank you.

P4, L109: What do you mean with "significantly banked"? Not clear, please rephrase this sentence. Did you mean "mainly" banked?

We have changed this sentence to read "... unlike datasets for many other ODSs that have significant quantities residing in banks."

P4, L113: What is the difference between "emissions" and "banks"? Looking at Figure 1 it becomes clearer, thus I would suggest that you already in this paragraph refer to Figure 1.

In addition to referring to Figure 1 here, we change "calculates banks in" to "calculates the sizes of banks in..."

P5, L136: Figure should be abbreviated as Fig. and Sections as Sect. unless it appears at the begin of the sentence (Copernicus style). Please correct this throughout the manuscript.

We have made these changes.

P7, L160: What is meant with "Parties to the Montreal Protocol"? Parties that participated in or agreed on the Montreal Protocol? Please rephrase sentence to be more precise.

This sentence now reads "The Montreal Protocol requires that all ratifying countries, which includes all countries in the world, annually report to the Ozone Secretariat the amount of domestic chemical production as well as the amount imported from and exported to other countries for all controlled ODSs.

P7, L160: report to where? And "imported and exported" quantities not clear in this context. Please rephrase.

Please also see response to previous statement. In this statement, it states that the reporting is to the Ozone Secretariat. They are the ones that keep all this data.

P11, Table 2: Units are missing for the lifetime and Weibull scale factor.

We have added that "s" is unitless and "τ" has units of "yr".

P17, L401: Which figure? Please be more precise.

We now explicitly refer to it as Fig. 6.

P18, L421 and figures: Gg/yr should be Gg yr-1 (Copernicus style).

We made the change here and in line 469.

P18, L438 and L443: Instead of writing Wang et al. (2015) parameters, I would suggest to write "parameters provided by" or "parameters provided in".

We have made these changes.

P23, L533: Add the reference or table where these are listed.

We have added references for reported production and published market information and we refer to Tables 1 and 2 for the emissions factors.

P26, Table A1: What is meant with "but not in the tables"?

We have changed the 2 instances to "Used in TEAP(2019), but not listed in tables" to hopefully clarify.

While these values are used in the modeling of that report, the values were not given in the text of the report.

P28, Table A2, Last row and in general: Please give also the numbers or value ranges.

Since these are the references for the numbers used in Table 2, we would prefer to leave it as it is. Note that the description and range are given in Table 2 in the last row; leaving it as it is is more consistent with the 3 previous rows, too, although we do provide the central value of the emission factor for the inactive bank.

Note: Currently where is a supplement, but also the same supplement is included in the manuscript. Please take care that in the end not the same figures are published twice.

Thank you. We will indeed remove this from the main text.

Technical corrections:

P1, L19: Add "calculated" so that reads "our calculated emission".

Done.

P2, L31: lead to large further climate benefits -> lead to further large climate benefits (?)

Done.

P4, L102: Add "modelling" before "approaches".

Done.

P4, L120: write "are found" or "are summarized".

We now say "are provided"

P5, L130: I would suggest to rather use plural here, thus is -> are and emission -> emissions

We agree that this sounds better.

P5, L133: add "the" so that reads "where the consumption".

Done.

P7, L162: Add "Ozone" before "Secretariat".

Done.

P8, L178 and P9, L226: Figure should not be written in bold text. Use normal text font and abbreviate it a Fig. (Copernicus style).

Done.

P9, L205 and L206: UNEP should be written in upright font.

Done.

P14, Figure 4 caption, first line: ".....and (3) and....." one "and" is obsolete. Last line repetition of "here".

We removed the "and" after the "(3)". We have also replaced the second "here" with "in this figure". We feel like if we do not do this, it is unclear whether the statement refers to Figure 1 or Figure 4.

P15, L341-342: Repetition of "CFC-11"?

We prefer to retain both "CFC-11" instances to make it clear neither of these references were calculating HCFC-141b.

P15, L386: Delete "in" and put Sect. 3 in parentheses

We think the reviewer means line 368 (just transposed the "6" and the "8"). We have made this change.

P21, Figure 8 caption, L479: Figure 6 should be written in normal text font and abbreviated as Fig. 6.

Done.

P21, Figure 8 caption, L480. Panel -> panel

We made this change in line 479.

P23, Figure 9 caption, L526: is in same in both panels -> is the same in both panels

Done.

P24, L536: Add "bottom-up" so that it reads "The bottom-up model".

Done.

We have made a few additional changes for minor correction, clarity, etc. All changes can be seen in the version submitted with changes tracked. Some of these are described below:

In responding to the current set of comments, our abstract has grown to 252 words. We have thus removed "for the period" since it doesn't detract from the point of the sentence and brings us below the 250-word limit.

In response to previous reviewer suggestions, we missed two values what should have been updated:

Our total bank value for 2030 in line 508 was altered from 1750 Gg to 1700 Gg.

Our refrigeration bank in 2030 was altered from 50 Gg to 60 Gg.

We have added an additional sentence to the acknowledgements thanking Dr. Velders and the two anonymous reviewers for their helpful comments and suggestions in the process.

We have corrected a typo of "or" to "of" and dropped "production" in line 43 of the new Word version just for smoother readability

Line 161 of previous version: changed "reported as being aggregated" to "reported in aggregate".

L. 179: Since we never discuss individual countries, nor do we show that data, we have removed the example countries in this sentence.

L. 246: We change "assume" to "assign" since "assume" has been used multiple times in close proximity.

L. 247: we move the statement about emitting installation emissions in the year of production up 2 sentences since it goes better with that thought.

Table 2 caption: removed "assumed to be".

L 306: We simplified the 2nd term in equation 9.

L 342: replaced "for values described by our" to "when considering our".

L 343: we added "through the present time" at the end of this sentence for clarification.

L 371: wording slightly altered for clarity.