

Review ESSD-2018-3

Excellent overall! Good description, good links to supplements and graphics, much needed step in the overall emissions quantification and validation process. Easy to access and use the source data files. Strong recommendation for publication in ESSD.

A few comments, mostly by way of suggestion:

Page 2 line 29 - Until this point the manuscript has carefully addressed only Annex I countries with a few explicit additions. Here, apparently, we switch to CRF data for "all" countries? Because most Annex II countries do not report CRF, this sentence must still refer only to Annex I? Worthy of clarification or, earlier in the text, emphasis that all subsequent discussion refers only to Annex I?

Page 3 line 6 - Here the reader confronts the short-hand acronym IPC4 which we understand if we have read the legend for Table 2 but otherwise we have not had explanation in the text?

Page 5 line 21 - Not until later in this paragraph do the authors clarify that the expert review occurs at the UNFCCC level. At the start of the paragraph a reader does not know whether expert review happens at the country level or the international level.

.csv tables work well, with clear organisation and good explanations. For some categories, e.g. the rarer HFCs, the table includes a strange mixture of formats, e.g. 0.000503 in one row but 1.2E-06 two rows below. Do these differences arise from the CFRs (because each type of format tends to occur consistently across a row) or from PRIMAP? Do we need a more consistent data formatting for these very small numbers? In terms of GWP, not worth the effort?

Kyoto bucket data (e.g. KYOTOGHGAR4) occur mixed in with the individual gas data? Although presentation of all data in one table with uniform formatting may prove necessary, the present organisation presents a substantial challenge to users (countries?) who might like to check specific PRIMAP outcomes e.g. where bucket total differs from sum of individual concentrations. Even if duplicative, should we have the bucket to individual components comparison as a separate table? Or the authors could build in a summary line before or after each bucket group, showing cumulative individual concentrations for comparison? We read about these discrepancies in the text e.g. in Section 3 but nowhere do we see a figure, which suggests to this reader that these discrepancies remain obscure except to the authors? Not worth the effort if the discrepancies remain minor but some countries will want to see?

In Figure 4, left panel LULUCF appears on rough estimate about cumulative sink of 20% or so. From global carbon budget also in ESSD, for decade 2007 to 2016, fossil fuel emission roughly 10 GtC with a net land impact (sink minus sources) of very roughly 2 GtC, so again roughly 20%. Thinking about validation, for which these authors address only the PRIMAP product vs the original CFRs. But they could perhaps validate their PRIMAP outcomes against carbon budget because the latter uses several sources in addition to the UNFCCC reports used here? Even a brief mention of validation in text would strengthen reader confidence in their PRIMAP outcomes?

Also in Figure 4, right hand panel about bunkers, we should interpret this more as who reports and who doesn't rather than as actual emission numbers?