Review of: "Revisiting the challenges of ozone depletion from a prospective LCA perspective"

Jianhui Bai[1]

1 Institute of Atmospheric Physics

This work presents a review of recent studies regarding current O3 layer trends, O3 depleting substance (ODS) life cycle modeling, and characterization factors to define strategies for assessing the ODP in prospective LCA studies. The phase-out of ODS is currently not well represented in background databases, resulting in large overestimations. These overestimations will be more important for prospective studies. Anthropogenic N2O emissions are the most important contribution to O3 depletion. The current standard characterization models have not yet covered these emissions. Several interlinkages with climate change were reported. Recommendations are given to improve the quality of inventory modelling and ODP impact assessment.

The comments and suggestions are provided for the revisions and improvement.

Abstract, prospective LCA, please explain LCA. The abstract can be shortened a little.

1. Introduction, it is suggested to introduce the current states and their changes of O3 holes/layer, regionally and globally, are there any effects from after the adoption of the Montreal Protocol since 1987? Apart from O3, GHGs (CO2, N2O, CH4), which other chemical components should be controlled and considered to slow down climate warming in the future?

2. Methodology, "the United Nations Environment Programme (UN Environment)" is suggested to be replaced by "the United Nations Environment Programme (UNEP)". It is also suggested to cite the latest scientific assessment reports of ozone depletion by WMO and UNEP in this section and the main text.

3.1, please change "For example, [20] found" to "For example, *Roibás* et al. [20] found". Also, please revise other similar expressions. "These overestimations will be more important for prospective studies", more examples are suggested to show these overestimations.

3.3, please give some examples for "more divergent" and how divergent, and explain LIME.

3.4, "Another link is related to CO2 and CH4 emissions, which increase climate change" should be changed to "… which cause climate warming". Talking about the interlinkages, it may be beneficial to introduce and discuss the roles of gross primary productivity, net ecosystem exchange, as well as BVOCs (biogenic volatile organic compounds), SOA (secondary organic aerosols) production form BVOCs oxidation, SOA contribution to clouds formation, all of their contributions to/interactions with climate and climate change through different mechanisms. Additionally, carbon peak and carbon

neutrality goals and relations with climate change are also suggested.