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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The impact of a future H_2-based road transportation sector on the composition and chemistry of the atmosphere – Part 2: Stratospheric ozone" *by* D. Wang et al.

Anonymous Referee #2

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1 General comments

The second paper on the impact of the change from fossil fuel to hydrogen in road transportation focuses on changes of stratospheric ozone. This paper is much too long with respect to the minor and often not significant effects (typically much less than 1%). The used model is state of the art but it should be sufficient to summarize the results as an additional section with 1 or 2 figures (maybe Figs. 3 and 8) in the first paper of the series, also since most of the effects are related to NOx changes in the troposphere and the small and uncertain contribution from transport across the tropopause. The merging also avoids the repetition of the lengthy scenario description. Figures 6 and

11 might go to a supplement after improvement. For Figure 1 a reference to WMO (2011) is sufficient. The other figures can be summarized in the text. The project report with more details should be included in the reference list.

2 Specific comments

Page 19429: Do changes in SO_2 and sulfate aerosol interact with the PSC-chemistry? How are the discontinuities in meteorology at the end of a year handled when repeating the year?

Page 19432 and Fig. 5: Is most of the additional HOx from H_2+O(^{1}D)? Surprisingly only secondary reactions are discussed here.

Page 19435: The ozone increase in the lower stratosphere of high southern latitudes and the difference between FC and ICE need more explanation. Is it related to heterogeneous chemistry?

3 Technical corrections

The different kinds of blue in the figures are difficult to distinguish, please improve color scheme. Include mean tropopause in latitude/altitude plots.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 19423, 2012.