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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Perfluorocarbons in the global atmosphere: tetrafluoromethane, hexafluoroethane, and octafluoropropane" *by* J. Mühle et al.

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Please note that we provide our replies in bold after each comment.

The Australian Aluminium Council (AAC) welcomes the opportunity to provide comment on this paper, which demonstrates a clear improvement in the measurement of key perfluorocarbons (PFCs) in the atmosphere. The presentation of atmospheric baseline growth rates from the 1970s across both hemispheres, along with pre-industrial background values for the three key PFCs serves to add to our understanding of global emissions trends for these important gases.

We thank the commentator for the positive assessment of our analytical and modeling work.

Whilst the data and methodology presented in the paper demonstrate an improvement and the measurement data appear robust, it is clear from the commentary throughout the paper that there is still some way to go before we arrive at a comprehensive understanding of the relative contributions from the acknowledged PFC sources. It is, therefore, concerning that some of the author's statements regarding emission sources appear to be conjectural and hence detract from what should be the main focus of the paper: an improved understanding of the trends of global PFC emissions. Rather than guessing at possible reasons for the reported gap between emissions as measured in this study and those reported by industry, it would be more useful if the paper placed more emphasis on the need to improve our understanding of emissions from all emitting industries. A first step would be to call for a greatly improved understanding of emissions from the semiconductor/electronics manufacturing sector – at least up to the level of reporting currently achieved by the global aluminium industry. Only then can a meaningful analysis be made regarding the reasons behind any observed differences between measured and reported emissions.
The AAC recommends that the authors review their discussion to eliminate conjecture and present a more balanced view, one that recognises the disparity that exists between emissions reporting amongst the recognised PFC emitting industries.

We understand the sensitive nature of source apportioning of global perfluorocarbon (PFC) emissions and are aware of the continuing, long-term effort of the International Aluminium Institute (IAI) to identity and reduce PFC emissions. We now also point out that the report of the World Semiconductor Council (WSC) on the perfluorocompound emission reduction program of the semiconductor

industry contains only very limited information. We also stress that the EDGAR database does not provide all details necessary to understand how the PFC emission estimates are calculated or apportioned. We conclude that it would be highly desirable if IAI, WSC, global PFC suppliers, and EDGAR were to work together on improving estimates of CF_4 and C_2F_6 emissions. The discussions in the manuscript are valuable as they discuss the shortcomings of the various inventories and demonstrate that the sum of available PFC bottom-up emission estimates from the aluminum and semiconductor/electronics industries is significantly lower than global emissions inferred from our atmospheric measurements, and that this emission gap has been increasing. We discuss that the missing CF_4 emissions likely stem from the primary aluminum and/or the semiconductor/electronics industry. We have made changes to the revised manuscript to avoid any bias.

P 6507 Line 19: Typographical error – PFTB should read PFPB.

We have corrected the typographical error.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 6485, 2010.