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Interactive comment on "Nitrous oxide (N_2O) production in axenic *Chlorella vulgaris* cultures: evidence, putative pathways, and potential environmental impacts" *by* B. Guieysse et al.

Anonymous Referee #2

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The study by Guieysse et al. addresses a rather under-researched topic known for almost 3 decades now: Nitrous oxide production by microalgal and cyanobacterial cultures. Studies in this area of research are urgently needed of interest to many researchers. Although the basic finding that Chlorella vulgaris is capable of N2O production is confirmatory, the authors speculate on N2O formation pathways in Chlorella vulgaris based on experiments with nitrate reductase inhibitors, which is positive to guide future research. Further findings of the study included that nitrite rather than nitrate stimulate N2O production. N2O emissions of bioreactors with nitrate as N-source were significant due to accumulation of nitrite in the lower mM range. What is the significance of N2O emissions by photo-bioreactors (% of global N2O emissions per

year)? If yes, would it be feasible to operate bioreactors with ammonium as N-source rather than nitrate? Might there be other strategies to mitigate N2O emissions? Such questions need to be addressed to clarify the relevance of the study. P9742 L17 Pleas give x g rather than rpm P9744 L8-14 Was nitrate reductase activity shown and the effect of the inhibitor verified? P9745 L25 Please give reference for IC method.

Interactive comment on Biogeosciences Discuss., 10, 9739, 2013.

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Interactive Discussion

Discussion Paper