

Interactive comment on “Power Plant Fuel Switching and Air Quality in a Tropical Forested Environment” by Adan S. S. Medeiros et al.

Anonymous Referee #1

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The manuscript ‘Power plant fuel switching and air quality in a tropical forested environment’ presented three sensitivity simulations to demonstrate that switching from fuel oil/diesel to natural gas as power energy can reduce maximum afternoon ozone in Manaus, Brazil. The idea, approach, and analysis are not novel, as the paper lacks sufficient new science to contribute what we know about ozone chemistry in a forested environment. Normally I would not recommend its publication in ACP. However I do see the potential interests of such a study for Manaus, a fast growing city surrounded by tropical forests. The shifting in power energy matrix is very exciting and is expected to have substantial impact on air quality, particularly in Amazonia region. Should it be published in ACP, a major revision is suggested to provide more science for ozone chemistry and/or anthropogenic emissions in tropical forested environment. A few suggestions but not limited as follow could really improve the quality of the paper:

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– Validation of ozone and its precursors. We need to have at least some confidence on the model performance in this region. Given the paper was submitted to the GoAmazon2014/5 Special Issue, including some field campaign data for model evaluation would give the model credibility. A full evaluation of the model probably would be out of scope of the paper, but again, we need to at least know if the model does a fine job.

– There is some effort involved in development the emission inventory for this region, but again it is unclear to me how realistic the inventory would be. I would give the paper enough credit for just developing and presenting a realistic emission inventory for the region, given that widely used global inventories may do a terrible job here. This could be very useful for others doing research for this region too. According to the Table 4, basically NO_x emissions are predominately contributed by power plants, with vehicles only contributing to 0.3%-3%. This is the fundamental to justify the ozone sensitivity simulations, and would need to be assessed.

– The discussion and analysis can be improved. One suggestion would be to demonstrate how ozone production efficiency changes among sensitivity simulations.

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