# Response table to reviewers’ comments: SAJEMS special edition: Van Heerden *et al.*

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| **#** | **Reviewers’ comments** | **Authors’ responses** |
|  | Reviewer 1 |  |
|  | The authors set out to model the economy-wide impact of the proposed carbon tax/levy on coal, gas and petroleum fuels using a dynamic CGE model (i.e. the UPGEM). The paper is interesting and provides an authoritative discussion on the scenarios modelled and their resulting implications for the policy under review.  | Thank you for the positive comments.  |
|  | The model and database usedThe model discussion is quite comprehensive, yet the authors can rather bring in an abbreviated discussion of the model and adjusted database used instead. The diagrams in the Annexure can be dropped given that these are well documented elsewhere and can instead be referred to in the text, which should cut the length of the paper. This is, however, only a suggestion. | Thank you for the suggestion. We have removed the table which shows the database structure and are just referencing it from another paper. However, the flow chart picture of the model structure remains, since it is different from other models in that it contains a different electricity industry structure.  |
|  | The simulation shocksThe paper is original in its scenarios modelled, and the topic is quite relevant in the South African context, especially given that issues of “tax collection” and “efficiency” are often in the news and other media. | Thank you for the positive comments. |
|  | Explaining the resultsFinally, the results produced were adequately discussed, while only about one page of “conclusions and policy recommendations” were provided where an in-depth discussion was required. A stronger link can be made between the modelling results and the conclusions. Much more can be said about the potential policy implications than a mere paragraph. | We have expanded the conclusion section of the paper as requested.  |
|  | Reviewer 2 |  |
|  | 1. Is the research question clear and concise?

There is no research question in the introduction of the paper. The introduction presents a number of references to earlier studies, but does not discuss how the present study relates to these earlier papers, i.e. what is the novelty of the present paper? Also the paper does not discuss at any point how the paper’s results differ from those of the earlier studies. In the title, in the abstract and in the conclusions, reference is made to the effect of carbon taxes (and the recycling of the tax revenues) on the poor, but this is not substantiated by the analysis.  | We have re-written the introduction to incorporate all the suggestions by the reviewer.  |
|  | 2.     Is the research method appropriate to address the research question?As such the research method, a cge model, is appropriate for the analysis. I have two major concerns on the way that the cge model is used.First, the use of so-called effective tax rates. It seems that the authors have used the average tax per sector rate for their simulations. For all sectors the average tax rate (total tax/total emissions) is lower than the marginal tax rate (tax per unit of emissions at the margin). In the theory underlying the cge model, the profit maximizing firm will adjust its production plan based on the marginal tax rate, not on the average tax rate. The tax free threshold can basically be seen as a direct transfer to the owners (share-holders) of the industries. The modeling of this direct transfer is more difficult that the authors seem to realize.  | If we had used an average tax rate in the calculations, then the reviewers would indeed have been indeed correct, but we did not. The effective tax rate that we refer to is in fact a marginal rate: the rate the producer of emissions pays at the margin after taking all the exemptions into consideration. The stipulated tax rate, R120, does not changes, but the quantum of the emissions on which it is applied changes as a result of exemptions given by the government. So, the profit maximizing firm does indeed adjust its production plan based on the marginal tax rate in our model.  |
|  | Second, without explicitly modelling types of households (poor, wealthy) any references to the effect of the tax on poor households are not really substantiated.  | We agree with the referee and have removed the statement about the effect of broad based taxes on poor households. |
|  | 3.     Essentially, is this article suitable for publication in an ISI accredited journal? No I don’t think so, especially because of the use of average tax rates.  | As explained above, we are not using average tax rates.  |
|  | a.     If it is not suitable, are the necessary adjustments extensive or minor?  What are those adjustments?The necessary adjustments would be extensive. Adjustments are first of all necessary in the representation of a carbon tax with tax-free thresholds.  | In the light of the fact that we have not modelled average tax rates the only adjustments to the paper were an improvement of the introduction and an expansion of the conclusion, as requested. We have done both.  |
|  | b.     If so, do you have any suggestions for improvement or shortening?  What are those suggestions?In addition, the model would need a more detailed representation of households and the paper needs to include a more detailed discussion in which its results are compared to earlier studies.  | It would be a new paper if we split the household sector into various households so we are not going to do that for this paper. However, we have added a discussion on earlier studies.  |