

Interactive comment on “Modeling framework for exploring emission impacts of alternative future scenarios” by D. H. Loughlin et al.

Anonymous Referee #1

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General comments

In my view, this work should probably be published somewhere, but it is well outside the scope of Geoscientific Model Development. Put simply, the submission does not describe the development of a geoscientific model. If it did, the computer code would be included with the submission, but I do not think there is any substantive new code here. Furthermore, the existing codes that are used are not really what I would call geoscientific models, but rather socio-economic and market models.

What the submission does is describe a new methodology, and it does this very well. The contribution in itself is interesting and valid, but I think the people who will be most impacted by it are probably not readers of Geoscientific Model Development. More appropriate journals would be Int J Energy Res, J Air Waste Manage, or B Am Meteorol

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I therefore regret to recommend rejection, but encourage the authors to re-submit to one of the above journals, where the readership will be better aligned with the content.

Specific comments

I should prefix these comments with a note that the core content of the paper is outside my main expertise.

Why do you apply the methodology only to the United States? (This restriction should be mentioned in the title of the paper, by the way, which currently promises more than the content of the paper delivers.) My understanding is that the MARKAL and SMOKE models are not specific to the USA, but could be run more generally for any nation, or even the entire globe. If this could be done, I think a much more influential paper would result.

Why do you run the analysis only until the year 2050? If the emissions inventories calculated in the paper are intended to be used by climate modellers, for example, then extending them out to the year 2100 would make them more useful.

As the authors themselves admit, the scenarios considered represent only two of a large number of potential futures. Since the models run so quickly, why not include a more diverse portfolio of scenarios, to give a better representation of uncertainty?

Technical corrections

The computational time is going to depend upon not only the options and resolution of MARKAL, but also on the processing speed of the computer (p 2025). This speed should be specified.

Interactive comment on Geosci. Model Dev. Discuss., 3, 2021, 2010.

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