

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2022-125

Anonymous Referee #2

Referee comment on "GCAM-CDR v1.0: enhancing the representation of carbon dioxide removal technologies and policies in an integrated assessment model" by David R. Morrow et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-125-RC2>, 2022

This manuscript introduces a modified version of the GCAM integrated assessment model which adds several new pathways for carbon dioxide removal, which are not yet available in the extant public release of the model (GCAM 5.4). It also allows users flexibility for representing policy options to induce CDR deployment beyond removal subsidies equal to a carbon price as in the extant GCAM 5.4. Both are welcome and policy-relevant developments which will advance the knowledge and modeling capability of the IAM community. The manuscript is well-written, but I have several important details that should be addressed before publication in Geoscientific Model Development.

I agree with the first referee that reporting of the numerical costs and performance in the main body of the manuscript would be useful. While I see this is done in the Supplementary Information, it would be helpful to have in the main manuscript and reported in units that are more intuitive (e.g., GJ/tCO₂), and include the levelized non-fuel cost assumptions as well (e.g., 2020 USD/tCO₂) as the model results are highly sensitive to both parameters.

- 4 L-121. GCAM 5.4 represents a sorbent-based DAC process wherein the low-temperature heat is assumed to be supplied by an electric heat pump with an assumed coefficient of performance and thus does not require any natural gas input. The model also includes representation of a high-temperature DAC process which again uses only electricity to provide the high-temperature heat requirement. This sentence should be clarified to avoid implying only the natural gas-based process is represented in the

