

Interactive comment on “ESD Ideas: Global climate response scenarios for IPCC AR6” by Rowan T. Sutton and Ed Hawkins

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We thank the referee for their positive comments on our article. We fully agree that the ability of models to simulate historical trends is a critical issue in assessing their credibility and relevance for projections. However, because of the importance of aerosol forcing for past changes, the relationship between historical trends and future warming is not simple. In broad terms, model simulated trends may disagree with observed trends either because the simulated radiative forcing (especially the aerosol component) is incorrect, or because their sensitivity is incorrect, or both. Furthermore, simulated trends may agree well with observed trends but for the wrong reasons (i.e. compensating errors). Consequently, our view is that it is appropriate for IPCC WGI to assess climate sensitivity (ECS and TCR) drawing on multiple lines of evidence in-

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cluding historical trends, and then use this assessment to generate climate response scenarios, as in our paper. This procedure does not rely on specific models and would be more robust than past practice such as using the 5-95% CMIP range as the likely range for future projections.

Thank you for pointing out the typo, which we have corrected.

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