

Interactive comment on “Combining temperature rate and level perspectives in emission metrics” by Borgar Aamaas et al.

Anonymous Referee #2

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This paper proposes a new emission metric that combines rate and level targets. The rate of change perspective is important, and the conceptual framework is relatively well presented in the beginning. I have however two main issues with this work.

Firstly, I am not convinced on the value of this new metric in applications. While a rate metric is conceptually interesting and useful to be explored theoretically, the paper left an impression that overextends the applicability of the proposed new metric. This manuscript starts with Article 2 of the UNFCCC, however the interpretation is somewhat subjective, especially on the need for a metric compatible with the rate target. While previous literature suggested there might be some maximum acceptable temperature rate, right now it is not supported by as much evidence as the temperature level. Such trend could certainly be critical for plants and animals if lasting for several decades, but the exact critical duration is also not clear, and additionally there is

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natural climate variability which is not considered in the conceptual framework of this study. Some important assumptions are also made without much support (e.g., the baseline scenario). As such, the paper left with an impression that some groundwork has to be completed first for a robust rate metric to be applicable. At least the key assumptions in this paper should be clearly listed and better defended. The authors also admitted that the political feasibility might be low.

Secondly, as a pure conceptual work, the framework is not described clearly in this paper, especially for ESD's diverse readership. While figure 1 and 2 are still relatively easy to follow without explaining each symbol, the major part of the writing contains numerous distracting jargons that cumulatively impede understanding of the work. Section 2 starts with Alternative rate metrics without specifying alternative to what (to GTP?). If the focus is on improvement to GTP metric, then the GTP metric itself should at least be introduced and highlight the modifications in this new metric. The paper also tries to combine the rate aspect and the CO₂-eq aspect, which also dilutes the focus.

In summary, my recommendations for the authors are: 1) frame this paper differently without overextending too much on the applicability; 2) Either making the symbols and paper organization clear to follow, or submitting to a more specific journal. As the suggestions require a complete rework, unfortunately I cannot recommend publication of the paper in ESD.

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