We thank the reviewer for taking the time to explore the manuscript, and for their points raised. While overall we disagree with the reviewer's framing of the manuscript and the wider literature, we appreciate the engagement and hope we have provided suitable responses to each point - including additional text to the manuscript - which we address in turn below.

"Estimates of the total impact of climate change often attempt to measure or model the overall impact on global Gross Domestic Product." The typical impact is a Hicksian Equivalent Variation, rather than an income or output effect.

We appreciate the reference to the broader context, but note that we are here referring to existing literature, and therefore prefer to frame this in the terms used therein, which overwhelmingly utilises GDP effects. We use a process-based approach to climate damages, rather than a top-down GDP one, and therefore consider it unwarranted to explore this noted distinction in this manuscript.

You can't cite Burke without also citing the by now many papers that make mince meat of that paper.

While we understand the critiques of the top-down economic damages approaches used by e.g. Burke et al., 2015 - and indeed adopt a bottom-up process-based representation of climate impacts partly on this basis - our assessment of the overall literature is not the one presented here. We didn't see it necessary to present in further detail the pros and cons of a methodology which we haven't used in our modelling approach.

The set of included impacts is haphazard. Most impacts are based on a single study, ignoring most of the literature. Some impacts are based on primary research, of hair-raising quality.

In the manuscript, we set out in detail the process by which we arrived on the set of climate impact channels modelled in FRIDAv2.1. As part of this discussion (Sections 3.1 and 3.2), we fully acknowledge that this set is an initial formulation of the damages under climate change, constrained by existing literature and data. However, and especially in the context of existing modelling frameworks which exclude climate impacts by design, we must insist that the goal should be the incorporation of as wide a set of climate impact channels as reasonably possible, in order to better simulate the fully coupled system.

The sections on indirect economic effects and government spending would make an undergraduate blush.

The previous review comments, while abrupt, focus on points of substance within the manuscript, and we have therefore responded to their substance. We feel however that this comment doesn't engage with any specific substantive issue with the manuscript, and as such we are unable to comment or suggest modifications to the paper on this basis.

All impacts ignore Schelling (1984). Why on Earth would impacts be a function of climate change and climate change only? What happened to human agency, technological progress, institutional change?

We fully agree that the effects of climate impacts are not purely a function of physical drivers, with the overall effect dependent on the underlying context. Indeed, part of the motivation for using a coupled System Dynamics model like FRIDA is that variations in the response to feedbacks can occur based on the properties of other system components. Within FRIDA, this occurs in several domains - via e.g. costs of adaptation, variation in the

behavioural response, and energy source diversity. In addition, agency and institutional change are best incorporated via external scenarios.

However, it is a definite limitation of the modelling framework, constrained as it is by the existing climate impacts literature, that the effects of socioeconomic factors are underrepresented. We feel strongly that, due to the uncertainties at hand, this context-dependent nature of climate impacts should for now be explored as part of the uncertainty ensemble, coupled with external scenario imposition, in bespoke experiments. On this basis, we have added the following text to the manuscript at L790:

It should be noted that the climate impact functions in FRIDAv2.1 are driven by purely climate variables, whereas their overall effect can be expected to depend on the broader socioeconomic context, such as the level and form of technological development, and shifts in institutions and societal perspectives. Within the current FRIDA framework, these effects are best explored downstream of the damage functions, with some aspects of socioeconomic effects (e.g. technological change) suitable for analysis within the parameter uncertainty framework (see Schoenberg et al., 2025), and other, more qualitative aspects (e.g. institutional and decision-making changes) best studied using exogenous policy impositions. Future development of FRIDA can seek, where possible, to endogenise these effects into the internal damage functions.

We appreciate the highlighting of this oversight in the original manuscript, and feel the paper is better orientated as a result.