

Interactive comment on “Energetic regimes of the global economy – past, present and future” by Andrew Jarvis and Carey King

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R1 - "the research topic of the manuscript poses very stimulating questions"

Response - Thank you, but it would be good to hear why R1 thinks this specifically and hence why the work as presented does not address these questions to R1's satisfaction, specifically.

R1 - "just imagine how confusing could it be, that low quality manuscripts providing intellectual support to ideas like "there is no meaning on transitioning beyond oil and coal" and "there is no need to implement low-carbon energy" remain having the format and logo of ESD/EGU."

Response – 1. To be clear, these quotes do not appear in our manuscript and are not

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a part of any argument in the manuscript, or our words uttered elsewhere. Indeed, we are concerned as to why R1 is arguing against our paper by using statements that are not part of the paper.

2. We suggest that, to hold any genuine concern on this issue, R1 would have to believe our findings are, to some extent, credible. Otherwise they could simply reject them using specific scientific arguments and have no concern. For example, independent of our analysis and interpretation of the observed long-run relationship between PEU and GWP shown in Figure 1, R1 must know now that this is what is observed. As they elude to in their first post, this alone raises some important questions about the evolutionary path of the global economy. We offer what we believe to be a physically tenable interpretation of those observations. Until that interpretation is refuted using specific scientific evidence and arguments, it stands.

3. We believe the paper attempts to do precisely the opposite to what R1 asserts here. We explicitly identify how and why the energy efficiency promises within the NDC's are at risk (L458-476), drawing directly from our analysis. In doing this we believe the paper reinforces and is consistent with the extensive and important literature on rebound effects and Jevons paradox. Although contentious, that literature is seldom perceived to undermine efforts to address climate risks, but rather as a check on often naive assumptions over the independence of efficiency improvements and growth, for example as assumed in the IAMs used to generate the SSPs. We are similarly motivated in this paper, albeit as a result of our analysis of Figures 1 & 3, rather than through pre-assuming any normative stance on this issue.

4. When set against the dynamics we attempt to describe, we believe R1's concern that the paper is attempting to either advocate, or support, a laissez-faire approach to the economy and climate change again raises the thorny issue of human agency. Our analysis would suggest the SSPs assume relatively heroic levels of agency in relation to energy efficiency, energy use and economic growth. We believe that it is irresponsible, or even dangerous, to ignore the possibility society could be in a low

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agency setting over the ability to independently manipulate these factors, especially at the global scale, even if that conclusion doesn't align with the current collective world view. Through attempting to address this critically important issue we believe the paper presents a responsible and proactive contribution to managing climate risk. However, we would be happy to add further clarification on this, for example as follows:

"We also believe that through alerting society to the possibility of thermodynamic imperatives on energy efficiency, and the associated risks this presents to the implementation of the NDCs, the current paper attempts to raise collective self-awareness and hence open up the possibility for us to rest back agency when attempting to manipulate carbon emissions through efficiency improvements."

R1 - "I would like to offer praise to the clarity of the second reviewer, even if it might be undesirable to be so direct at times, it is a good way to reprimand non-professional behaviour in academia."

Response – We have no further comment to add to that of the Handling Editor (on November 20th) who has responded to this type of reviewer comment.

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