

## ***Interactive comment on* “Can Limits to Growth in the Renewable Energy Sector be Inferred by Curve Fitting to Historical Data?” by Kristoffer Rypdal**

**Anonymous Referee #1**

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The paper by Rypdal presents an important test of recent claims of limits to growth in renewable energy sector that are relevant for mapping out the option space for mitigating greenhouse gas emissions and, hence, future trajectories of the Earth system in the Anthropocene. The presented research shows that based on current data on renewable energy capacity or consumption, logistic growth cannot be distinguished from exponential growth and points out critical methodological flaws in earlier works on the topic.

Since the journal Earth System Dynamics is not focussing on energy science alone, a broader framing and discussion of the problem addressed and the results obtained in the context of Earth system dynamics would be desirable, particularly referring to the topic of the Special Issue "Social dynamics and planetary boundaries in Earth system

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modelling". The pedagogical structure and appeal of the paper is useful, even though it is up to debate whether this is an appropriate style for a research article in Earth System Dynamics.

Major issues:

\* Sections 3.2 and 3.3: The presentation would be more consistent and convincing if a detailed model uncertainty analysis would be presented for these cases as well as it is done in Section 3.1.

Section 4, p.13, line 27 ff: The statement "The data exhibit strong dependence on the inter-annual scale, and when the number of independent data points are used ( $n=4$ ), rather than the 19 points in the series, the null hypothesis is not rejected, and the trend does not appear as statistically significant." needs further explanation. How is the number of independent data points computed here?

\* Reference should be made to standard literature on model selection where appropriate in the paper to help interested readers finding more in-depth information.

\* Please make the data analysis code available as Supplementary Information to ESD.

Minor issues:

\* I would find the figures easier to read if time were indicated in years AD (e.g., 1980 to 2015) instead of years from the beginning of the series (e.g., 0 to 35)

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