Earth System Dynamics Discussions

Earth Syst. Dynam. Discuss., community comment CC3
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Reply on RC1

Richard Rosen

Community comment on "Lotka's wheel and the long arm of history: how does the distant past determine today's global rate of energy consumption?" by Timothy J. Garrett et al., Earth Syst. Dynam. Discuss., https://doi.org/10.5194/esd-2021-21-CC3, 2021

While I agree with the basic substance of Peter Haff's review, I still think it does not focus quite enough on the physical energy consuming technologies that are still functioning today, compared with those that were invested in during the past and are no longer being used. Thus, it would be interesting to extend this article under review to a sector by sector analysis, for the main energy consuming sectors, namely transportation, buildings, and industry. Obviously, there are still many buildings that were built by components of long past GDP expenditures that having boilers and furnaces still in operation for 50 years, the time period analyzed. In constrast, there would be basically no significant number of vehicles comprising the transportation sector still operating after 50 years. Since the data for the energy consumption of each of these sectors exists (at least approximately in the US), it would be even more interesting to see how the ratio the authors highlight between current year energy consumption and cumulative GDP evolve for each of these three major sectors separately yielding the weighted average ratio for the entire economy. Again, while this trend line has (unfortunately) been amazingly constant in the past, as I said in my first comment, government policy could slowly but surely force this ratio to decline somewhat faster if the introduction of new more efficient energy consuming technologies (like electric vehicles and renovating old buildings with more insulation) were accelerated relative to those trends in the past. The paper would be more interesting if some analysis were done as I suggest for each major energy consuming sector separately. We would surely find a different trend line for each.