Reply on CC3

Timothy J. Garrett et al.

Richard Rosen suggests " 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.... 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. "

The statistical premise required for taking an average is that the quantities in question are independent. Transportation, buildings, and industry are not independent, because, for example, people drive to work. In the limiting case that transportation were subtracted entirely from the system, it would clearly have a non-zero impact on both value and energy consumption everywhere else in the economy.

Calculating non-linearities associated with inter-sectoral interactions, those that prevent simple averaging, would be nearly impossible to do with any fidelity. This is why, for this submission, the human system is considered only as a whole. Taking this approach reveals a nearly fixed relationship beween energy consumption and historically cumulative production.