

Earth Syst. Sci. Data Discuss., community comment CC1
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Comment on **essd-2022-327**

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Community comment on "An investigation of the global uptake of CO₂ by lime from 1930 to 2020" by Longfei Bing et al., Earth Syst. Sci. Data Discuss.,
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Thank you for your interesting work. I do not have time for a full review, but would like to just comment on your estimation of historical lime production in China.

It seems to me that the use of a principal-component approach is unnecessary and a standard multilinear regression would be simpler, more appropriate, easier to understand by the readers, and also less open to human error. The reason I comment on this is because the results appear to me not make sense. The earliest data point you have for lime production in China is 2002. You estimate the growth of lime production between 1963 and 2002 at a very low 30%, despite growth rates of over 500% for calcium carbide, over 2000% for steel, 800% for completed floor areas, and over 7000% for alumina, the four variables you use in your regression model. It is very difficult to see how lime production could only grow by 30% when all four explanatory variables grow by substantially more than this. Is this reasonable? It implies that even if the uses of lime are extremely low, the production of lime will still be very high, which is illogical. If the growth rate of lime production is greatly underestimated, then the amount of lime produced in the earlier part of the time series here is greatly overestimated, leading to an overestimation of the carbonation uptake. I encourage the authors to look into this again.

I would point also to the report by Andrew and Peters on the Global Carbon Project's fossil CO₂ dataset, where we try to estimate historical lime production in China. You might disagree with the results, but consider the arguments used anyway. Link to the PDF of this report: <https://zenodo.org/record/7215364>