

Declining renewables output

Posted on **January 09,2019** by **admin**

Something I have been thinking about for a while is declining renewables output. I said last year that I thought my solar PV output was declining in a previous blog. I read an article in the Guardians' weatherwatch in which the author said his PV output was declining in passing although he did not allude to any reasons why. The other week the same weatherwatch feature also said the planet is becoming less windy. This latter fact is surprising. Climate change was expected to make it stormier. Of course the two are not mutually exclusive. Average wind speeds could drop with much more violent winds at times. The wind drop is global. The Guardian article put forward some theories. One was that vegetation cover was increasing as are built up areas. Both tend to slow wind down. If vegetation cover is increasing then this is good news I thought it was decreasing. In any case these are not the explanation. Wind speeds are decreasing in Saudi Arabia which has little of either. The wind speed decreases are taking place at ground level and its unknown as to whether they will affect wind turbine output. It does seem likely however. My solar PV drop does not seem as bad when plotted out (below) or analysed statistically*. The data is shown for my oldest system. The newer one shows the same trend but there is less data and not enough to do stats on (and the number of years is odd). The red line shows the linear trend and the equation at the bottom the trendline equation and the R^2 value a measure of how significant the linear regression is. The answer is not very and the paired test bears this out. The drop is not statistically significant. [solar PV output](http://www.thetimes.co.uk/world/news/uk/2019/04/solar-pv-output-200x150) This surprised me. The question is if wind and solar output are declining why is it and what can we do about it? There are several possible solutions to declining renewables output . We could add more wind and solar capacity to compensate. We could add better technology. This is happening anyway with solar cell efficiency hitting 50% rather than that of my cells which is around 20%. And we can add different technology. Tidal for the UK seems the obvious answer. (Wave tends to follow wind output). In other countries it could be completely different. Its pretty obvious we should be overly reliant on one form of renewables anyway. Happy new year Neil *For those interested you can divide a dataset in 2 and do a paired test. I need an even number to do it. My new system is an odd number of years. To remove one year could introduce bias, also for the new system there are too few years to do a normality test first. The data for the old system was divided in 2 and each half was tested for normality. One set was normal the other was not. This means you use a non-parametric (non normal) test. I used Wilcoxon matched pairs in PSPP. This is an open source version of SPSS which I have used in the past and found to give the same answers as SPSS.

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