

solar PV growth

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[DSC_4304](#) We need some encouragement as pessimism at the current climate talks makes the news. So when I found an article on solar PV growth via [Make Wealth History](#) saying it would be the dominant form of electricity generation I was very pleased. Then I had a think about it and a look at the BP data from their annual Review of World Energy. Several of the assertions made in the the blogs are entirely correct. The IEA and others have completely underestimated global growth of renewables generally as well as cost reductions. Could they be currently be doing this with batteries and electric vehicles? Is this really because they don't understand the exponential growth curve?! Its also true that a 41% increase in installation every year doubles capacity every two years (its actually 98% but near enough). The growth is clearly exponential in nature. I plotted the capacity data in Libreoffice calc as an exponential fit. The R^2 value was over 0.99. Its also true that the growth between 2006-2016 was 48% a year on average (installed capacity) according to BP. However are the claims about PV's dominance correct (or at least by 2022)? There is a difference between capacity and output. Solar PV has quite a low capacity factor (of about 20% if memory serves me correct). That is output is at max about 20% of the time. This is obvious since its dark on average 50% of the year anywhere in the world. At the moment (2017) according to BP total global electricity production is 25551 TWh/year and of that 442 TWh/year was supplied by solar PV. This is just over 1.7%. Electricity use is increasing by about 2.7%/year (far from exponential). So the good news is that PV is closing on other forms of production. Additional good news, if PV is the dominant new power form (which it is) and increases at its current rate then by 2022 then PV will produce about 55% of global electricity. This assumes no major growth in other forms of capacity and assumes 2.7% growth in electricity demand. However a closer look at BP's data show this would overstate the case. PV is doubling in terms of power *output* every 3 to 4 years. This means that sadly PV will not be the dominant power source by 2022 on current growth trends it will be responsible for up to about 4% of global electricity production. I've plotted the data for PV electricity production and capacity out in the graph below.

[PV solar growth](#) We will know if we are on track next June when this years BP data comes out. With exponential output at the same rate as capacity electricity production by PV should be about 3.5% of the total for 2018. This seems unlikely since installation slowed in 2017. For what its worth I think will be the dominant global power source - unfortunately we are some way short of this. Neil

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