« Has climate alarm peak been crossed?

Energiewende: a lesson in numbers (Part2) »

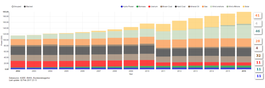
Energiewende: a lesson in numbers (Part 1)

A new **report** from McKinsey on Germany's Energiewende (= energy transition policy) has been published in the series "Energiewende-Index". This very transparent and non-emotional report makes for a good reading: the main lesson is that the costs of the Energiewende (which has driven German household electricity prices 47.3% higher than the EU average) will continue to rise, and that the political deciders seem to ignore the future financial burden.

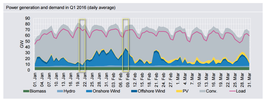
In this blog, I will comment using only numbers from well-known institutions (as the Dutch PBL report "Trends in global CO2 emissions 2016", Fraunhofer ISE, Agora Energiewende etc.), and let these numbers speak. Let me just give my personal position on renewable energies: In my opinion, every country should diversify as much as possible its energy sources, and that means that wind and solar should not be brushed aside. But the importance of having reliable and affordable **continuous** electricity available can not be ignored: intermittent sources as solar and wind should not be presented as the sole environmentally acceptable providers, as clearly the last dozen years have shown that this intermittency and the absence of realistic electricity storage are at the root of many tough problems. The German green Zeitgeist (which seems to drive many EU regulations) clearly is blind on both eyes concerning these problems; condemning nuclear energy under all its actual and upcoming forms as unacceptable increases dramatically the problems.

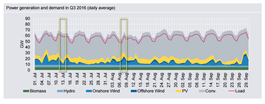
1. **The avoidance of CO2 emissions**

The Energiewende was first positioned as a measure to avoid and diminish CO2 emissions caused by producing electricity from fossil fuels, transportation and industrial manufacture. After the Fukushima tsunami (March 2011), the "Atomausstieg" (nuclear exit) was added to this political foundation. Heavy subsidies have been poured on solar PV and wind energy facilities, pushing up the **installed** capacities of these 2 providers to 91 GW for a total installed generation capacity of 196 GW (numbers rounded commercially) as shown in this edited plot from Fraunhofer ISE:



Intermittent sources thus represent 91/196*10 = 46% of the **installed** capacity in 2016.; in January they delivered 23%, in August 25% of the total installed generating capacity. So we can conclude that when **summing** the intermittent sources, we find that these subsidized sources which have a feed-in priority contribute at about half of their installed capacity. The problem lies in the word "summing": under the aspect of emissions, the sum might be a useful metric, but in real life it is the instantaneous available power that counts. The two following graphs from the Agora Energiewende report 2016 show the situation during the first and third quarters: I highlight the days with minimum and maximum (solar+wind) contribution with yellow rectangles.

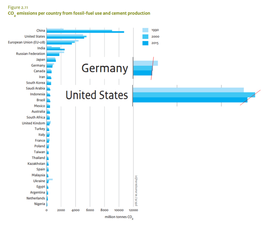




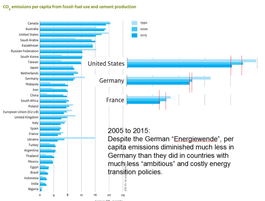
Without the base load of CO2 emitters like biomass and coal, the lights would have been out many times!

Let us now look at the CO2 (or better the equivalent CO2 (CO2eq)) balance for the last years, compare several countries with Germany, and see if the Energiewende has been a successful CO2 lowering policy.

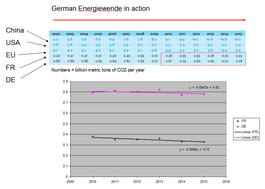
Our next graph shows how the CO2 emissions varied from 1990 to 2015 (I added zoomed inside pictures):



The most interesting conclusion from this graph is that Germany's total CO2 output diminishes not much between 2005 and 2015 (the Energiewende started in 2001), in contrary to the USA which had not a comparable policy. The same picture shows up in the "per capita" emissions:

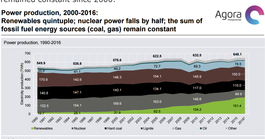


Compared to the non-"Energiewende" countries of France and the USA, Germany again fares very poorly. The next graph highlights in a more precise manner the trends between 2002 and 2015:



I computed the trend-lines for Germany (magenta) and France (black): the equation show that France is two-times more successful than Germany in lowering its CO2 emissions, without any comparable and extremely costly Energiewende policy. Agora concedes this in its report writing that " … *Germany's total greenhouse emissions haven risen once again*"!

And the following graph shows that the part of fossil fuel has remained constant since 2000:



Conclusion: The Energiewende has not achieved its primary goal in greatly lowering CO2 emissions!

(to be followed by part 2)

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