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« [The dramatic decline in available wind power](#)

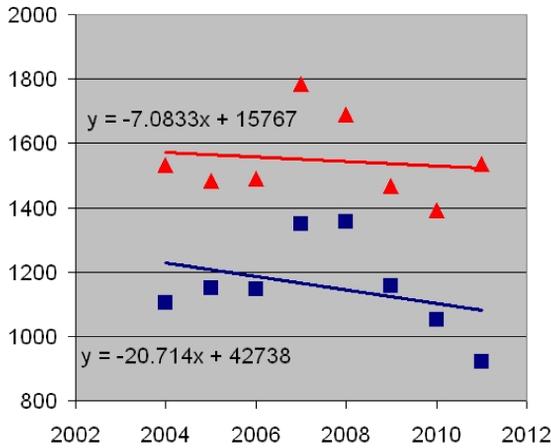
[German subsidies: EEG 17 billion, research/education 13.7 billion ! »](#)

## Decline in wind power: the slump in capacity factors.

In the [preceeding comment](#) I showed using the IWES report that the decadal decline in potential wind power was about 14% per decade during the 1992-2012 time period in Germany (coastal and land locations). Such an important decline of the available wind resource should be show up in the electricity produced by the wind turbines. The easiest metric to use is the capacity factor (CF) or the equivalent parameter "Volllaststunden". (VLh) preferred in German reports. The relation between both parameters is  $CF = VLh/8760$ .

### 1. The ThinkAero data

It is not easy to find reliable data,so I will start with the data found at the [ThinkAero](#) blog. Here we have a table which gives the average VLh of all German wind turbines and also those located in the Land Baden-Württemberg.

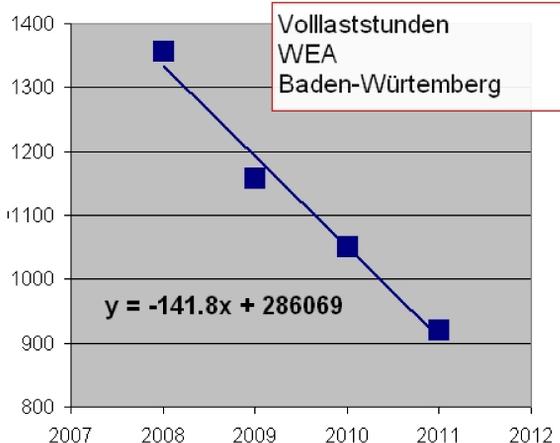


The upper red data points represent the German average, the lower blue squares the numbers for in-land Baden-Württemberg. Trend lines have been computed with Excel. Clearly both groups show declining VLh's (or CF's).

As in the previous comment, we clearly find that the year 2007 was an exceptional good one, both for the whole country as well as for Baden-Württemberg.

For the whole country, the decline given by the trend line would be 62.5 hours per decade, or about **-4%/decade** (percentages calculated w.r. to the trend line). The same calculation made for Baden-Württemberg gives -181 hours per decade or **-14.8%/decade**.

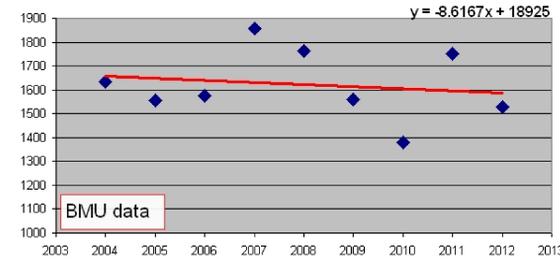
The situation in Baden-Württemberg becomes dramatic during the last 4 years 2008 to 2011:



Here we see a decline of **-32%** during that short period. Needless to say that such a slump will make all economic predictions a laughing-stock!

### 2. The BMU data

The website of the BMU (Bundesministerium f. Umwelt...) has a data table with values from 2000 to 2012. To be able to compare to the ThinkAero data let us just use the results from 2004 to 2012:

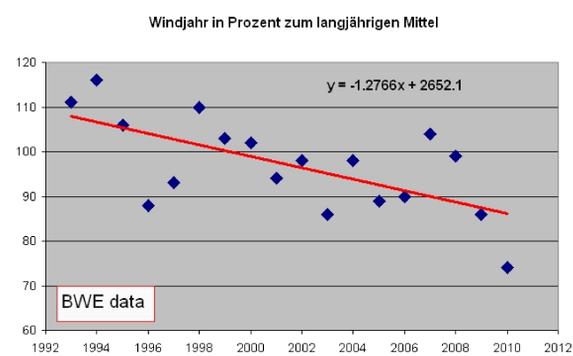


The trend line gives a decadal decline of **-4.6%**.

If we use the ThinkAero data and add the BMU value of 1530 for the year 2012, the same calculation gives a decadal decline of **-3.5%**, close to the BMU result.

### 3. The BWE data

The [Bundesverband WindEnergie](#) gives a table with the "Windjahr" percents (actually these are anomalies of probably the wind resource (not the produced wind electricity) over an unspecified period, probably a decade):



Here again we find a decline of **-12.2% per decade** (computed from the trend line), a number close to those found in the preceding comment. And as is the case for Baden-Württemberg, the last 4 years are especially worrying.

### 3. Conclusions

1. Both the wind resource data and the capacity factor (or Volllaststunden) data show a (long-term) decline

The 2 series we have studied give the following decadal declines in percent for the period 2004 to 2012:

ThinkAero (Volllaststunden): - 3.5%

BMU (Volllaststunden) : - 4.5%

The declines in wind resource given by the IWES report ([preceeding comment](#)) and by the BWE are comparable (-14% and -12.2%)

2. Especially instructive is the comment given in "[Energiewirtschaftliche Tagesfragen](#)" from September 2013: "**Bisher ist ein Trend zu steigenden VLS trotz stetiger technischer Weiterentwicklung durch Serienproduktion und rapide gestiegene Anlagenkapazitäten und Nabenhöhen nicht erkennbar.**"

Approximate translation: "Up until now a rising trend in CF's can not be detected, despite technical progress and fast rising power capacities and wind turbine heights".

**It would be more correct to acknowledge that an uncomfortable declining trend is clearly detectable!**

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