



2007: record year for US wind industry

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This is impressive news:

Shattering all its previous records, the U.S. wind energy industry installed 5,244 megawatts (MW) in 2007, expanding the nation's total wind power generating capacity by 45% in a single calendar year and injecting an investment of over \$9 billion into the economy, the American Wind Energy Association (AWEA) [announced \[Thursday\]](#).

*Disclosure: I am working for the wind industry - I finance wind projects in Europe. **update:** A first estimate of global numbers puts total new capacity built in 2007 at [20 GW](#)*

This was widely expected to be an excellent year, after an already [good year in 2006](#), when more than 2,500MW were installed in the US. hopes were that 3,000, or even 3,500MW would be installed in 2007. With more than 5,000 MW built and connected to the grid, the record for any country is shattered (the previous one was Germany with 3244 MW in 2002). And 2008 is looking good too.

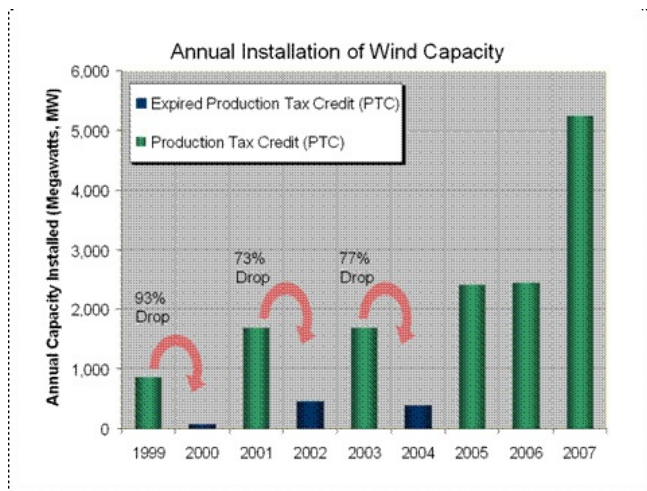
As the AWEA notes, wind power has several advantages:

- Helps protect consumers from increases in electricity costs due to volatile fuel prices and supply disruptions: by reducing the use of natural gas and other fuels used for electricity generation, and lowering the pressure on their price, wind can save consumers money, even in regions with low or no wind resources.

Wind power prices are quite simple: there is no fuel cost, just a little bit of maintenance, so each additional kWh of power provided when wind blows is almost free once the turbines are installed. Which means that the only cost is the amortization (or financing) of the initial construction. And the good news is that this cost is set in stone from the start, and will not change for the next 20 years: you know how much interest and principal you need to pay, and that's it. Compared to gas-fired plants or even coal-fired plants, whose main cost is that of the fuel, it's becoming a huge advantage, and an incredibly safe bet.

Even better, as the AWEA notes, each time wind blows, power with zero marginal cost is sent into the network; with electricity market prices set at the highest marginal cost needed to satisfy demand at any given moment, the more ultra cheap power you have, the lower that market price will be, as there is less need to tap the more expensive producers (like diesel plants or gas peaking plants). That reduces the price of electricity for *everybody*. The [Economist](#) noted that studies in Denmark have shown that the savings to electricity consumers thanks to that effect are now larger in that country than the cost of subsidizing wind power production - which means that this is exactly the kind of things that governments should do, ie bear an expense that creates a larger gain for the overall population.

Today, wind power, while still more expensive than existing coal and nuclear plants, is cheaper than gas-fired power and, thus, most of the time, cheaper than market prices which are driven by gas prices. The trouble is that investors are not yet convinced that this will be true for the full next 15 years, and are still reluctant to some extent to support wind construction without some form of support. In the US, that support takes the form of the PTC, or production tax credit, which allows investors to deduct, for ten years, an amount equal to 2cents/kWh from their tax bills, which can thus be added to their income coming from the wind project.



The PTC is pretty low compared to European support mechanisms, but given that the US has a generally better wind resource, it's been more than enough to support the industry. The problem is that it is a temporary mechanism which is only extended for a year or two by Congress each time it lapses, causing huge uncertainty. In fact, several times in the past few years, it was not renewed in time and killed the industry for that year, creating havoc for the industry worldwide (some manufacturers almost went bankrupt).

Oddly enough, the problem with PTC is not that it's unpopular in Congress, but the opposite: that it's hugely popular. That means that any law that includes it is likely to be supported by a strong majority, and then gets larded with more disputable - and disputed - items, which are then opposed. The PTC gets taken hostage, effectively... Crazy, but true.

- Reduces global warming emissions: To generate the same amount of electricity using the average U.S. power plant fuel mix would cause over 28 million tons of carbon dioxide (CO₂) to be emitted annually.

This is pretty obvious too. Each kWh of wind is carbon-free, and reduces the need for the same kWh to be generated by a hydrocarbon-burning plant. Some contest that effect by saying that wind power is intermittent, and thus unreliable, and requires fuel-burning plants as back-up for times when there is demand for power but no wind. What is true is that wind power cannot eliminate the need for coal-fired and gas-fired plants, but it does eliminate the need for these plants to actually burn fuel: having these plants around, but functioning at a lower capacity is a

net plus for carbon emissions. A lot of gas-fired plants are designed not to be used for permanent use (gas peaking plants can be profitable even though they function less than 5% of the time), so this is technically feasible and imposes minor costs - and it DOES reduce emissions (for a discussion of a more detailed study, see this diary: [No technical limitation to wind power penetration](#)).

The problem today is certainly not that of too much wind in the system, it is that, despite recent growth, wind investment is still dwarfed by investment in the traditional power sector, as this table from the US Energy Information Agency [shows](#):

Planned Nameplate Capacity Additions from New Generators, by Energy Source

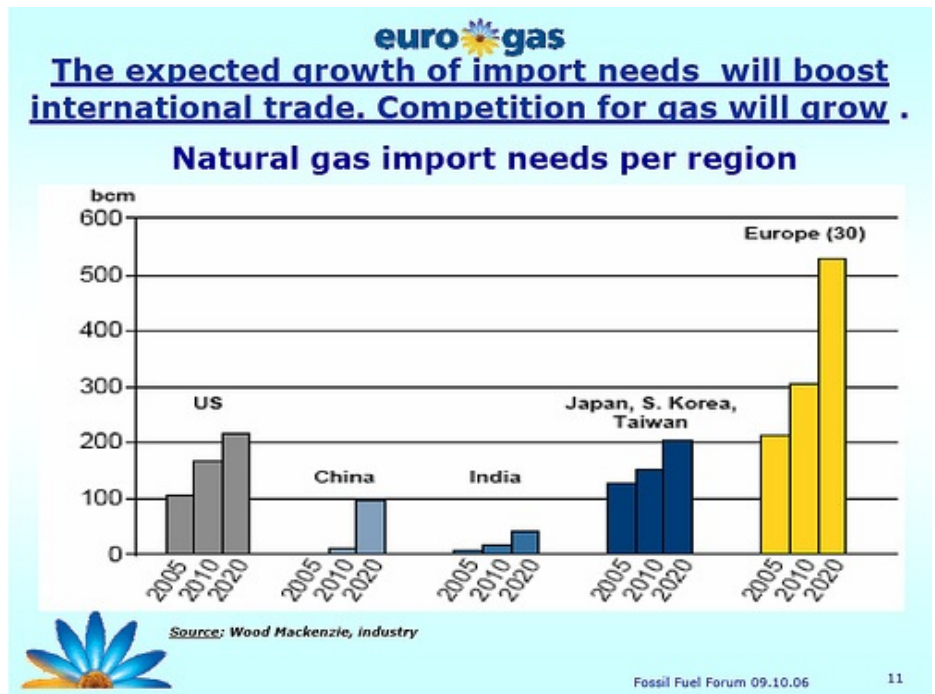
Electric Power Annual with data for 2006
Report Released: October 22, 2007
Next Release Date: October 2008

Table 2.4. Planned Nameplate Capacity Additions from New Generators, by Energy Source, 2007 through 2011 (Megawatts)

Energy Source	2007	2008	2009	2010	2011
Coal ^[1]	1,679	920	12,611	6,839	7,649
Petroleum ^[2]	255	1	835	50	-
Natural Gas	9,891	12,896	11,050	7,569	4,622
Other Gases ^[3]	-	580	771	-	340
Nuclear	-	-	-	-	-
Hydroelectric Conventional	13	3	1	-	-
Other Renewables ^[4]	5,714	2,032	350	217	56
Pumped Storage	-	-	-	-	-
Other ^[5]	-	-	-	-	165
Total	17,552	16,432	25,617	14,675	12,833

Just under double the capacity in gas-fired plants was built than in wind. And, with wind power's lower capacity factor (30% for wind, which means that a wind power will produce, on average over the year, only 30% of its maximum potential capacity, as opposed to 70-90% for gas) that means that capacity additions in 2007 still translate in 5 times more kWh coming from gas than from wind *just for the new capacity*.

The problem is that gas is no longer plentiful: production in North America (ie US and Canada) is declining, which means increasing LNG imports - a sector where there is heavy competition from other markets:



Even if there is enough gas, the massive requirement to invest in the LNG infrastructure, and likely bidding wars with European buyers, are going to keep gas prices high - and thus power prices.

- Conserves precious water resources: Wind farms don't need water for steam or for cooling, a benefit that is increasingly valuable in arid areas and in times of drought.

This is a less obvious argument, but a vital one in many areas, as steam-based power plants (which also includes nuclear ones, in that instance) require access to plenty of water to function.

So, some may ask, why subsidize wind power if it's so great and so damn economic already? As I noted above, its competitiveness in the short term has not yet convinced investors that this will be the case over the next 15 years, the usual duration to finance the investments. The good part of having fixed production costs is that they cannot go up; but the downside, of course, is that they cannot go down which means that, should there be any period of lower gas prices, wind power plants would not be able to repay their debt during that period - and banks absolutely hate payment defaults, even temporary. The risk is low, but enough to give cold feet to lenders without some additional revenue source, and the lack of financing makes projects much less attractive for investors.

Also, wind is almost competitive despite the massive subsidies received by its competitors (all the tax breaks received by the oil&gas industry, no accounting for pollution and carbon emissions, etc...), and the PTC only levels the playing field to some extent.

But there are other reasons why more support for the industry would be worthwhile, even given prevailing price conditions:

- wind power creates a lot more jobs per kWh produced than all other technologies. Good manufacturing jobs, good construction jobs, and long term maintenance jobs. Even better, apart from the manufacturing ones, these jobs are not offshoreable, and are usually located in the communities near the wind farms, often providing a much needed boost to areas with otherwise few prospects;
- wind power does not require the control of the Persian Gulf by US Navy aircraft carriers nor grunts in Iraq;
- wind power is local, is plentiful, and will not be depleted;

Some will say that wind farms are ugly. I don't have an argument against that, but would suggest that there is enough space for wind power projects without needing to put them in the most spectacular spots.

And as a final note about my partiality here: as a financier for the industry, I have to make sure that we do not take inappropriate risks. In particular, that means making sure that performance claims are not inflated, that costs are as announced and, a very important thing, that each project is well accepted by the local community and that there is no hostility (as this can lead to judicial procedures, delays, and bad publicity, all things which cost money and can compromise debt repayment). So bankers - when they do their job - have to remain clear-eyed about the industries they work with...



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