Reports from other countries on the economics of Wind Power

Denmark

The Danish Center for Politiske Studier (CEPOS) published a report on the economics of wind energy in September 2009.
The following is a summary and a web link to the report is given at the end:

- Denmark has roughly 5500 wind turbines with an installed capacity of 3160 MW (end 2008 figures).
- Capacity factor (what is actually generated) varies from 20% in a low wind year (e.g. 2006) to 25% in a high wind year (e.g. 2007).
- Despite this, the electricity supply system remains overwhelming dependent on centralised conventional power plants for system stabilisation
- Although Denmark **generates** about 19% of its energy from wind, the contribution to energy **demand** is somewhat different. Over the last 5 years the average has been 9.7%, with 5% as a minimum.
- There is no way of storing energy generated by wind. Denmark can only balance supply and demand through exporting energy at times of high production. Over the past 7 years, 57% of the wind power generated in West Denmark has been exported and 42% from East Denmark
- Power can only be exported because Denmark has large inter-connectors with neighbouring countries and they have ways of using this power (Sweden use it to pump water up to lakes for hydro storage).
- Spot prices for exported power are often very low, sometimes zero, as the generators have no option as to what they do with this power. (In 2007 there were almost 100 hours when the spot price was zero.) Conversely, when Denmark has to import power (e.g. at times of low wind) the spot prices are very high.
- Wind power that is exported saves neither fossil fuels nor CO_2 emissions. Exported wind power also carries away with it the subsidies that went into its generation.
- Once the capital costs of manufacture, installation and grid connection have been made, operating costs are marginal. However, useful life of wind turbines is only 10 – 15 years compared with 40-60 years for conventional power plants. **Also note** that nuclear power generation costs are marginal once the capital has been paid off.
- A significant percentage of the charges paid by consumers goes to making it attractive for companies to invest in wind power. “The main subsidy process is transfer from mainly private consumers to the wind turbine owners and then on to the wind industry.”

On further expansion of wind turbines:

- **“Unless there is a revolution in the way energy is supplied and used within Denmark, it seems certain that the electricity supply industry will be forced to re-engineer the whole system or export even more power.”**
- **“Denmark needs a proper debate and a thorough reappraisal of the technologies that need to be invented, developed and costed before forcing the country into a venture that shows a high risk of turning into an economic black hole.”**

On employment:

- There would be no Danish wind industry if it had to compete on market terms.

- The industry only exists because of massive subsidies to wind turbine companies.
- In terms of value added per employee, the sector underperformed the industrial sector average by up to 13% between 1999 and 2006.
- Recently manufacturers of wind turbines have been forced to concentrate on export markets as subsidies outside Denmark are becoming higher.

Other

- Although Danes accepted the first generation of wind turbines, they are now resistant to the giant turbines which have recently been developed

Reference: http://www.cepos.dk/fileadmin/user_upload/Arkiv/PDF/Wind_energy_-_the_case_of_Denmark.pdf

Germany

The Rheinisch-Westfälisches Institut für Wirtschaftsforschung (rwi) published a report on the economic impact of renewable energies in October 2009.
The following is a summary and a web link to the report is given at the end:

- Germany's installed wind power capacity at the end of 2008 was almost 24000MW, about 17% of its total.
- Installed capacity is not the same as energy production - by 2008 the estimated share of wind power in Germany's electricity production was 6.3%.
- Wind power does not improve energy security, as back up systems that use fossil fuels must be in place. In Germany this is principally gas that must be imported to meet domestic demand.
- Utilities are required to accept the delivery of power from independent producers of renewable electricity into their own grid, paying technology-specific feed-in tariffs far above their production cost of 2 to 7 Euro-cents per kilowatt hour (kWh).
- Feed-in tariffs grew nearly 6-fold between 2001 and 2008.
- On-shore wind, widely regarded as a mature technology, requires feed-in tariffs that exceed the per-kWh cost of conventional electricity by up to 300% to remain competitive.
- Estimates of the wind power subsidies may total 20.5 Bn € for wind turbines installed between 2000 and 2010.
- Subsidy accounts for about 7.5% of average household electricity prices.
- **Renewable energies are among the most expensive Greenhouse Gas reduction measures and wind energy is by no means a cost-effective way of CO_2 abatement.**
- **The cost from emission reductions as determined by the market is about 4 times cheaper than using wind power.**

On employment:

- It is most likely that whatever jobs are created by renewable energy promotion would vanish as soon as government support is terminated.
- There is a negative economic impact through job losses from:
    - the drain on economic activity precipitated by higher electricity prices
    - private consumers' overall loss of purchasing power due to higher electricity prices, and
    - diverting funds from other, possibly more beneficial investment.

On Renewable Obligation Certificates:

- As a result of the establishment of the European Trading Scheme (ETS) in 2005, the true effect of Germany's Renewable Energy Sources Act (EEG) is merely a shift, rather than a reduction, in the volume of emissions. Germany's electricity production from renewable technologies mitigates the need for emission reductions in other countries that participate in the ETS regime.

Other

- **The commonly advanced argument that renewables confer a double dividend or "win-win solution" in the form of environmental stewardship and economic prosperity is disingenuous.**
- **Germany's experience is a cautionary tale of massively expensive environmental and energy policy that is devoid of economic and environmental benefits.**
- **Germany's principal mechanism of supporting renewable technologies through feed-in tariffs imposes high costs without any of the alleged positive impacts on emissions reductions, employment, energy security, or technological innovation. Policymakers *(in other countries)* should thus scrutinize the logic of supporting energy sources that cannot compete on the market in the absence of government assistance.**

Reference: http://www.instituteforenergyresearch.org/germany/Germany_Study_-_FINAL.pdf

Summarised by Derek Partington – 21 January 2010.