IEAGHG Information Paper; 2012-IP9: Renewable Energy Issues

Background: Several Recent On-Line Articles

A recent article in Power-Technology.com (28th June 2012) indicates that whilst there is considerable activity in building new wind farms globally the lack of grid reinforcement works is holding up their application. The following points can be noted in the article:

- A report by the China Renewable Energy Society revealed ten billion kilowatt hours of power were wasted in 2011 (just over half the electricity generated), resulting in unrealised revenue of $793m because of insufficient grid connections.
- Installed capacity of wind power in the US was more than 40,000MW in 2010, but electricity generation there is growing four times faster than transmission, making it almost impossible for energy companies to distribute total power production to their customers.
- Meanwhile, in Germany, 150GW-hours of wind generated electricity was lost in 2010, an increase of up to 69% during the course of a year, because of turbines were being taken off the grid to stabilise power supply, according to statistics from the German Wind Energy Association (BWE).

Problems seem to stem from the fact that it quicker and easier to build a wind farm than it is to build a transmission line.

The full article can be found at:www.power-technology.com/features/featurewasted-wind-energy-grid-connections-turbines/?WT.mc_id=WN_Feat

Germany which is pressing ahead with an expanded renewables programme as it phases out its nuclear plant has recognised this as a problem. To meet the Governments renewable targets, the CEO of power grid firm TenneT TSO, the German arm of the TenneT group, said Germany needed to build 2,100 kilometres of direct current lines and 1,700 km of alternating current, while 4,000 km of existing power lines needed modernising. €5.5 bn has already been committed by TenneT but it is expected to rise to €20bn with a further €12bn expected to be required to connect new offshore wind farms.

See article at Energy News:
www.energymarketprice.com/SitePage.asp?Command=NewsLetter&ID=9224&trydf=john.gale@ieaghg.org) 02 July 2012

In addition to the direct subsidies that wind farm operators receive in Germany already this amounts to a considerable indirect subsidy for wind energy.

On a related point, a recent MIT Report in the USA indicates the need to change the current regulatory environment in the USA to allow the uptake of renewable energy. Currently when new transmission lines cross state boundaries each state is involved and federal agency if federal lands are crossed. Each body has the power to say no, so the need for a centralised transmission line authority is recommended. Until a central authority is established it is felt that new national transmission lines are inconceivable in the USA.

The full report entitled “The Future of the Electric Grid” can be found at:
http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml

The grid connection issue is not restricted to wind energy only. There have been recently a number of announcements regarding large PV projects in Chile. But similarly an article in RECHARGE casts doubt on Chile's ability to connect these to the grid. The PV projects announced to date in northern Chile, lead to a 4.8GW pipeline — more than twice the peak demand of the regional grid.

See article: http://www.rechargenews.com/energy/solar/article317096.ece

Taken together the articles suggest that whilst Government targets for renewable energy lead to the construction of new facilities in line with policy commitments, the real issue is the capacity of the grid to take up the intermittent energy these facilities generate. To do so require substantial financial investment and regulatory development and new transmission lines may be a publicly sensitive issue as well. All in all meeting renewable energy targets is but one challenge getting it to the market is the biggest challenge of all.

One the cost side, renewable advocates often talk about a level playing field, however it seems to be increasingly apparent that wind power in particular attracts subsidies to make it viable. In most regions we see the costs of wind power on and offshore are higher than CCS. If you factor in the indirect subsidies like the huge grid reinforcement costs quoted for Germany then I think the costs for CCS will look extremely favourable.

John Gale, 9/7/12