**Call to re-classify wind power as non-renewable.** From Revolt news 184, amended 16.5.05.

Reason: wind power needs a high level of back-up generation which is usually fossil-fuel based, because of wind power's intermittence and high variability (power output varies as the cube of wind speed). It's a tip-of-the-iceberg problem: UK data for 2004 show that only 24.1% of capacity was delivered by UK wind farms, because of intermittence and variability. Most (but not all) of the remaining 75.9% has to come from back-up generators. This 25-75 mix is implicit in UK wind power on any large scale, rendering it in effect as a non-renewable energy source.

In news178.4 I gave a summary equation for effective wind power, generously allowing that only 50% out of the 75% would be needed as back-up. Here it is, tidied up a bit:

1 unit wind + 2 units back-up + X = 3 units in-feed to grid + X waste

= (3 - Y) usable units from grid + (X + Y) waste.

Greenhouse gas emissions come from the 2 units of back-up as well as from the waste. The X is needed for volatility, rapid start-up and related off-design inefficiencies, and can be highly polluting from fossil-fuel back-up systems. The Y represents additional waste in the system, for example in excessive long-distance transmission, which can be considerable (e.g. 20%).

The net effect of the mix can even be to cause increased greenhouse gas emissions, as indicated in experience in Denmark (news171.7 and 176.2). It depends on what the mix displaces and how it is used (news174.5 and Bass and Wilmot, UK Power, issue 2, 2004). In addition large-scale wind power needs excessive infra-structural development (roads, foundations, etc.; plus billions of pounds' worth of powerline developments) which all add further to greenhouse gas emissions.

While re-classification would be right and proper, it would be reasonable to define and except Good Quality Wind Power (GQWP). That would reflect the way Good Quality CHP (Combined Heat and Power) has been defined in association with government CHP targets. Examples are small-scale wind projects which are used locally, or projects including renewable back-up. Another example, in the Shetlands, uses wind power to produce hydrogen, itself a clean fuel, which is then used for back-up.

Qualification for GQWP should depend centrally on the provision for clean back-up, not the sort of virtual generation used in green trading but actual physical clean back-up available locally to respond to the variations of the particular wind farm's output. Wind generators small enough to be absorbed within a local demand point, or embedded wind power not exporting large variable output to the grid, should qualify. Examples might include wind turbines serving a school or factory. A general maximum size for such systems might be set, say at 1 MW. Any multi-megawatt wind farm should be excluded unless it has its own on-site clean back-up generators.

Additional (not alternative) criteria for GQWP might include the location not requiring long-distance transmission nor extensive infrastructure such as foundations and service roads. Further conditions of landscape and residential impact might be added. But most wind farms, especially large scale wind power stations in remote areas, should not count as GQWP. They should not receive the (large) government subsidies and should not be tradable as carbon-free generation.

MJOC amended 16.5.05