Hand-out by Hans Schreuder, Harbertonford, 7 November 2011

http://www.clepair.net/windSchiphol.html

A 300 MW nameplate wind project near Schiphol on August 28, 2011, a normal windy day, during 21,5 h would have increased the amount of natural gas needed for the electricity production of 500 MW with 47150 m^3 gas. This would have caused an extra emission of 117,9 ton CO_2 into the atmosphere.

The wind comes free, the turbines do not pollute and there is no need to burn fossil fuel. However, this simple notion defended by staunch supporters of wind turbines, has been criticized by several critical analysts, e.g. refs: 4, 5, 6, 8, 10, 11, 12.

Wind does not blow according to the demand of electricity users. Sometimes there is no wind or too little wind, or too much. It would be no problem if there was an economic and practical way to store electricity and to use it from that storage whenever needed. Unfortunately we currently do not have such a storage option. Batteries have little capacity and they are **much** too expensive. There are other possibilities but none of them comes near to anything that is economically feasible. There is hydro power, (i.e. lakes in mountains) that can be pumped full if there is an electricity surplus and emptied when the power is needed. But this adds more cost to an already high-cost option. (**With hydro storage, one loses a quarter to one third of the energy input.**) For geographic reasons, most wind development locations don't have this option anyway. This is certainly the case in the Netherlands.

So the current practice is to have wind developments operate in connection to conventional powerplants. These generators step in when the wind fails and they can be switched off, or their output is reduced, if the wind blows. Thus, when considering wind power, one must factor in an augmenting conventional system (typically gas). A handicap complicating the selection of options is the absence in the public domain of factual data about the different producing units. So the arguments are mostly based on model computations, but there are exceptions. In the USA a BENTEK study used real emission data of power plants in Texas and Colorado. They became available due to the Freedom of Information Act. Its conclusion was: ***wind has no visible influence on fuel consumption for electricity production and the emission of CO_2 in the atmosphere is not reduced***[13].

This shocking result did not convince decision makers yet. The negative result was attributed to a difference in fuel mix. Coal-, oil-, gas- and nuclear heated generators behave differently. So what might be true in that study, does not mean that it holds true for all of us.

In August 2011 Fred Udo analyzed the data put on the internet by EirGrid, the grid operator in Ireland. His web page article was termed by colleagues abroad *'The smoking gun of the windmill fraud'*. He showed that a substantial wind contribution in the Irish Republic caused such a small saving of fuel (and of CO_2 emissions), that it shattered a major tenet of the wind policy. **He also was able to show that more wind penetration caused an *increase* of CO_2 emission**[8]**.**

The real situation, however, is even worse. The way EirGrid derives its data on CO_2 emission does not correlate with what is actually happening in fossil fuel power plants. Moreover the Irish data does not include some other serious factors that further undermine the desired fuel savings. There is evidence that the overall CO_2 emission in Ireland can be ~20% higher than the emission calculated in the EirGrid tables, as Udo showed. (His source: ref. 14. A difference of 3% might be due to the importing of electricity. Transport losses have been accounted for.)

We believe even Udo's figures to be conservative. On the basis of existing data plus new information on the behavior of conventional generators when they are cycling (i.e. ramping up and down in order to compensate for the variations in wind power) we shall show how much worse the influence of adding wind electricity to the grid really is.