

WIND DISCUSSION
FARM FOUNDATION FORUM
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NRECA resolution process supports a long range national energy policy for diversity of fuel, which includes renewables such as wind and solar.

Wind is a free fuel, produces zero CO₂ emissions and is a competitive form of energy available to most utilities and their customers. Notice that I said energy – not capacity. Wind turbines are frequently not available when needed – i.e., on hot summer days when everyone has their air conditioners cranked up and there is no wind. But I will discuss that later.

I am a wind advocate and sit on the board of the Utility Wind Integration Group (a wind-users organization). Due to time limitations, I will not discuss problems such as bird/bat mortality, net metering, noise, visibility concerns, etc. and will direct my talk towards large installations, not individual units, but I will list some of the problems being encountered with wind additions as utilities and developers attempt to add more wind capacity – and some of the steps being taken to overcome these barriers.

Economics – Wind energy is frequently more expensive than grid energy. Federal legislation has addressed this in the form of a Production Tax Credit (currently 2.1 cents/kwh) that lowers the cost of wind (and other renewables) energy. One problem with this is that cooperatives and municipals, being non-profit

organizations, can't use tax credits. A Clean Renewable Energy Bond (CREB – zero interest) is available for cooperatives/municipals. A major barrier with these fixes is that legislation supporting renewables is usually only in effect for a year or two at a time, and frequently allowed to lapse. During this lapsed period, very few new units are started.

Transmission – Wind resources are frequently located in remote, rural areas with limited transmission access. Transmission is both difficult and lengthy to site and construct. Economics are poor if building a line just for renewables and that line is only lightly loaded. The Energy Policy Act of 2005 provides for renewable transmission corridors, but it's now 2009 and the program has yet to produce any results.

A subset of transmission problems is the access queue. Most transmission grids operate on first in, first out for applicants. With so many applying for interconnection permits, the system has a long backlog that is overwhelming the system. For example, California's Independent System Operator has 265 projects for 77,600 MW in the queue (183 are renewables). The process takes time in order to do studies of cost, feasibility, reliability, system connections, cost of connecting, facilities involved, safety, etc. FERC has ordered the various grids to seek ways to improve the current process, and this is underway.

Dispatchability – Depending on the location of the wind farm, turbines have annual capacity factors varying between 25 and 40 percent. Wind turbines often produce a lot of energy during the windy spring and fall, and during the night but not during peak energy use such as day time summer application. Generation is most valuable when it's available as needed. Some studies have shown wind to be available about 6% of the time during peaking periods. Wind can be backed up using gas turbines, but that causes

problems of continuous ramping up and shutting down of these units.

These problems and their resolution are being continuously studied by NREL, UWIG and others. UWIG, by its name, is seeking to successfully integrate wind into the grid. Better weather forecasting has also improved the use and reliability of wind energy.

Current financial crisis – This downturn in the economy is being reflected in future wind units as developers are experiencing difficulties in financing future units or selling of the tax credits. This is hopefully a limited time period. Renewable Portfolio Standards (both state and possible future federal) require utilities to include renewable resources in their generation mix. Wind generation is the cheapest, most available renewable and so will continue to be used by utilities to meet this requirement (even without the Production Tax Credit). Future legislation limiting CO2 emissions should also result in additional renewable wind applications.

SUMMARY

Wind has limitations (as do all generation forms) but has a bright future. It is renewable, clean, and preferred by the public. It does have problems of economics, dispatchability, and grid integration, as described but the industry is busily working to resolve these barriers and I expect to see many new wind applications in the future.