Some Common Misconceptions about Wind Power

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1. **Wind plants are controlled by nature and not by utility operators. Hence they can't be relied on; 100% backup from dispatchable generation is required.**

   Responses:

   - True, wind plants are not dispatchable in the conventional sense. However, electricity demand is also not controlled by utility operators. The utility system is designed to accommodate fluctuating loads, and additional incremental variability imposed by adding amounts of wind up to at least 10% to 15% of system generating capacity is small and has not been costly – as discussed further in the next item.

   - No power plant is 100% reliable. During an outage, backup is provided by the entire interconnected utility system. The system operating strategy strives to make best use of all elements of the overall system, taking into account the operating characteristics of each generating unit and planning for contingencies such as plant or transmission line outages. Wind's need for support of this type from the rest of the system will differ *in degree* from that required by conventional plants, but not *in kind*. Wind simply needs to be integrated into the overall system operating strategy.

   - Wind's ability to support growth in utility loads will in general be less as a percentage of nameplate rating than that of conventional dispatchable plants. All power plants can be characterized by an effective load carrying capability that is a fraction of the rated power output. Its magnitude depends on a statistical evaluation of contributions made by the plant to overall system needs during the entire year. Contributions during periods of high system load are most important. In general, the fraction for typical fossil-fueled plants ranges from about 70% to about 90%. For a wind plant, the range is typically 20% to 40%. Hence a wind plant generally can't be relied on to serve as much load growth as a conventional plant of the same rating, but its effective load carrying capability is not negligible. Historically the Mid-Continent Area Power Pool and recently The PJM RTO have recognized this in their system reliability calculations and rules by incorporating a simplified, historic-performance-based calculation to assign reliability ratings to wind power plants.

- Many wind plants are being installed to reduce fuel consumption by and emissions from conventional power plants. In fact, this is the primary value of wind power today. When the wind blows, the conventional plants can be turned down, thus reducing fuel combustion and emissions. In these cases, wind is only providing energy, so the issue of load carrying capability is moot. The existing conventional plants provide system reliability, and there is no cost associated with additional backup for system reliability. The only incremental costs are those associated with minute-to-minute and day-to-day operation, generally referred to as ancillary services costs.

2. Since wind is not dispatchable, the ancillary services required to accommodate its variability will make wind energy uneconomical.

Responses:

- Wind's variability does increase the day-to-day and minute-to-minute operating costs of a utility system because the wind variations do affect the operation of other plants. But investigations by utility engineers show these costs to be relatively small – less than about 2 mills/kWh at penetrations under 5%, and possibly rising to 5 mills at 20% penetration.

- The biggest "reserve" in the integrated utility system is called first contingency or n-1 reserve. The grid is designed to withstand the loss of the single largest element (big generator or transmission line tripping off). Until a single wind plant approaches the level of the first contingency loss, incremental operating costs are likely to increase only slowly as wind penetration increases.

3. If wind energy displaces energy from existing coal plants, then rates will go up.

Responses:

- Rates for electricity from wind plants being installed today are comparable to wholesale electric power prices of 2.0 to 3.0¢/kWh. Estimates for energy from a new wind plant slated for North Dakota are below 2.5¢/kWh. The incremental cost of wind power, if any, will be negligible when distributed among all customers. Several studies looking at the rate impacts of wind have considered the costs of various renewable portfolio standard percentages from 5% to 10%, and average residential bill impacts are predicted at 5-25¢/month. In fact, some studies predict the accompanying decrease in demand for conventional fuels will reduce fuel prices enough to fully compensate for slightly higher costs for renewables. Many of these studies are several years old, and wind plants continue to be installed at lower and lower prices, so any price increment derived by assuming low (and stable) conventional fuel prices is shrinking.

4. **Yes, but wind needs a production tax credit (PTC) of 1.8¢/kWh over 10 years (about a penny over 30 years) to achieve these economics.**

   Responses:

   - That's true, but the tax credit for wind only compensates for subsidies provided for conventional energy technologies that are paid in our tax and health-care bills – not in our energy bills. These hidden costs have been estimated at levels comparable to the value of the PTC.

   - Examples: public-health costs for treatment of respiratory diseases; nuclear accident liability limitation; nuclear waste management; oil and gas depletion allowances; maintenance of oil access by the USDOD.

5. **New natural gas power plants will provide cheaper energy than wind plants.**

   Responses:

   - This is not likely at today's gas prices, and these prices are rising with time. At $3/MBTU, the fuel cost alone is 2.5 to 3¢/kWh, and capital and O&M costs add a comparable amount. And gas prices have spiked to over $10/MBTU in the past three years. Betting on low gas prices over the foreseeable future is highly risky, while energy costs from wind plants will be relatively stable over time.

   - Gas price volatility is not going away. Planned power plant construction countrywide is nearly 100% gas fired and the success of these plans is heavily dependent on natural gas production meeting growing demand. The economics of these plants are based on low gas prices into the future. Witness the CA power crisis and the impact of price volatility on the general health of our economy.

6. **The production tax credit and accelerated depreciation are helpful only to big, out-of-state developers. The economic benefits aren't local, and rural electric cooperatives and municipal utilities can't receive the same benefits.**

   Responses:

   - It's true that only entities that pay federal taxes can use the tax credits to reduce their tax liability. But those tax credits result in lower wind energy costs for the benefit of all electricity customers. However, if local entities assume equity positions in wind plants, then they can receive the tax-credit benefits. Whether or not the wind-plant equity is locally held, wind plants result in jobs for the local community and the need for local services—both during construction and during operation. And to the extent debt financing comes from local sources, debt-service payments stay within the local community.

- In some cases, a number of farmers have joined together in a cooperative arrangement to build and own a wind plant. In aggregate, they can have enough tax liability to make full use of the tax credits.

- In other cases, an external entity with a tax appetite can hold majority ownership – even as much as 99% – for 10 years while the tax credits apply, with the remainder of ownership vested in the cooperative. After the initial 10-year period, the ownership portions can be shifted so that the cooperative becomes the majority owner. In this way, the cooperative is the major owner in the long run, the external entity gets its return on investment over 10 years with the aid of the tax credits, and the overall cost of energy from the plant over its operating lifetime is lower than it would have been if the cooperative were the sole owner.

7. In many rural areas, local load growth is small, so export of wind energy is the only option. But often no transmission capacity is available.

Responses:

- It's true that transmission availability is often the major factor limiting wind development. However, a community wishing to do so could provide a substantial portion of its local energy needs from wind and then cut back on imports from the transmission and distribution grid. In some cases, this would violate terms of the contract with the wholesale supplier, but in other cases it would not.

- The transmission problem is often driven by historic methods of evaluating and allocating the power-carrying capability of the wires. Historic use rights are often fully committed in an administrative sense. Electrically, there is often actual capability that goes unused much of the year. Changes in evaluation and allocation rules associated with transmission reform are expected to allow further generation expansion without requiring additional wires.

8. Large, utility-grade wind turbines can't be installed on the distribution grid without expensive upgrades and power-quality issues.

Response:

- In situations with weak distribution grids (long lines with thin wires and few customers—maybe even single-phase), this is often true. However, in many cases, wind generation can be connected to the distribution system in amounts up to about the rating of the nearest substation transformer. One study of a rural mid-western county estimated that several tens of MW of turbines could be installed on the local distribution grid with a minimum of upgrade expense and minimal power-quality impacts.

9. All-source requirements imposed by the regional G&T wholesaler preclude wind installations by distribution co-ops.

Responses:

- In some cases, this is true without modification of current contracts. Sometimes an exception can be granted, and G&T's can be responsive to the distribution co-op's desires. After all, the distribution co-ops are their customers and often part owners as well.

- Some G&T's (e.g., Tri-State and BPA) allow distribution co-ops to generate a portion of their electricity locally from renewables without penalty. However, rules for backup energy in the event the local generator doesn't deliver may need to be modified to avoid substantial demand charges.

- In most cases, the major barrier to wind plant additions by a distribution co-op is the absence of experience with generation of any kind.

10. Small projects that might be suitable for co-ops or small municipal utilities are uneconomic.

Responses:

- Small projects generally have a higher cost per MW than larger wind plants. However, the incremental costs on customers' bills are likely to be small. The energy premium for a small project is unlikely to exceed 50%. If the project provides a small portion of the community's needs—say 2%—then the premium is reduced to about 1% if distributed among all customers. Most folks don't lose sleep over a 1% impact.

- The real value of small projects stems from utilities and communities obtaining experience with and learning about the technology and its positive environmental and economic impacts.

- Some communities have succeeded in covering the premiums for energy from a small project by offering a green-priced product to their ratepayers or green tags to a broader customer base.

11. Wind turbines kill birds and thus have serious environmental impacts.

Responses:

- Bird kills have caused serious concern at only one location in the U.S.: Altamont Pass in California. This is one of the first areas in the country to see significant wind development. Over the past decade, the wind community has learned a great deal about siting wind plants in ways that avoid locations that might pose problems for birds. Modern wind installations are simply not raising avian concerns.

- One to two bird kills per turbine per year is at the high end of the range observed in U.S. wind installations. The majority of deaths are common species. Compared to bird deaths resulting from other manmade structures, highway traffic, and housecats, bird kills by wind plants are numerically insignificant and are not expected to impact bird populations. Of course, deaths of endangered species are of greater concern, but again the only location with a suggestion of this problem is Altamont. And even in that case, experts disagree on the severity of the problem.

- Environmental impacts are relative. All energy technologies have some negative environmental impacts. Society makes tradeoffs when making power plant choices. Wind plants may result in some bird fatalities or other unwanted impacts on wildlife and their habitats. Coal plants cause premature human deaths from respiratory problems. Maintaining open channels for free flow of oil causes military deaths. Society needs to choose from these alternatives, and it cannot assess a single energy technology in isolation.

12. Many people say they'd be willing to pay more for clean, renewable energy, but when the time comes to sign up for a green product, only a few actually do this.

Responses:

- Green pricing is a relatively new thing, and early customer percentages are not out of line with new offerings of other products. Successful green-pricing programs demonstrate concrete actions—not just vague promises—and seek a minimal premium. If folks are asked to pay too much—say, a premium of 50% or 100%—then unless they are fanatical supporters of clean energy, they shy away because they know that the clean energy benefits will be shared by all—even the free riders. Also, people in general need multiple exposures to something new before they decide to buy.

- Willingness to pay doesn't necessarily mean costs should be covered through a green-priced product offering. If most people in a community say they'd be willing to pay a premium for clean energy, then the justification exists for a rate-based project whose premium, if any, would be shared by all. In most cases, the premium would be truly negligible. In this case, there is no need to conduct the effort or incur the marketing costs associated with a green pricing program.