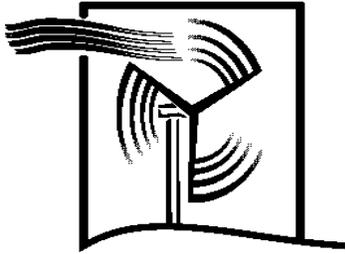


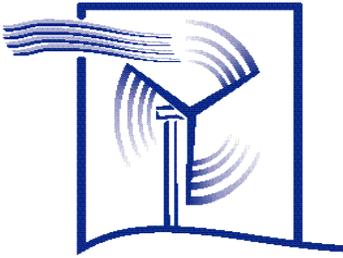
National Wind Coordinating Committee



Wind Power Transmission Case Studies Project

National Wind Coordinating Committee

September 2000



Wind Power Transmission Case Studies Project

National Wind Coordinating Committee

September 2000

Contents:

Transmission Case Studies Conclusions Summary

- Appendix 1: Case One: Transmission Policy and Pricing in Texas
- Appendix 2: Case Two: Virtual Wheeling
- Appendix 3: Case Three: Transmission System Improvements
- Appendix 4: Regional Transmission Organization Principles document

About These Documents

The NWCC Transmission Case Studies Conclusions Summary includes brief summaries of three NWCC Wind Transmission Case Studies and their conclusions, along with discussions of the opportunities for progress to be made on issues raised in the case studies within Regional Transmission Organization (RTO) development processes. The conclusions summary was formally approved as a *Consensus Document* of the NWCC. Consensus is defined as “all can live with.” The NWCC RTO Principles document is a consensus document of the NWCC.

The full Wind Transmission Case Studies are *Resource Documents* of the NWCC. The cases were prepared and reviewed by members of the NWCC. Changes were made to accommodate views of different members. The final cases were not formally submitted to the NWCC for consensus review and are being released as educational resource documents.

All documents are available on the NWCC website at www.nationalwind.org

The NWCC Transmission Case Studies Conclusions Summary: Opportunities for Wind in RTO Development Processes

Prepared by the National Wind Coordinating Committee.
Revised by Steve Wiese and Terry Allison

In the spring of 1999, the Utility Wind Interest Group (UWIG), with the cooperation of the National Wind Coordinating Committee (NWCC)¹, conducted a forum on transmission issues associated with the production of energy from wind. As a result of this forum, a number of issues were identified which, if successfully resolved, could help reduce barriers to the future expansion of wind power. The NWCC, being a multi-stakeholder group, was in an ideal position to conduct follow-up activities among a cross-section of the interested parties. The follow-up activities took the form of three case studies in the areas of interest identified by forum participants:

- Transmission policy and pricing;
- “Virtual wheeling” arrangements; and,
- Transmission system improvements

The case studies provide an interesting snapshot in time dealing with a range of issues associated with scheduled or planned regulatory and restructuring proceedings related to energy transmission. The NWCC Transmission Subcommittee and the UWIG reviewed early drafts of the case studies in November 1999.

The case studies were conducted through a questionnaire and interview process with interested parties. In writing each case study, NWCC staff attempted to identify all stakeholder groups with an interest in each topic and solicit their input. While all parties do not agree on every issue presented, a serious effort has been made to present all views in an unbiased fashion. At the end of each case study, relevant conclusions are drawn and recommendations for next steps are provided where appropriate.

The original intent in creating these case studies was twofold:

- To inform the NWCC’s broad membership on complex and important issues associated with the changing transmission situation in the deregulated environment, along with potential impacts on wind power expansion; and,
- To offer the experience developed in the case studies to the regions and the people dealing with these issues, in the hope of providing information and insights that might be useful in resolving outstanding transmission issues related to increased utilization of wind power.

¹ The NWCC is a consensus-based collaborative endeavor formed in 1994 that includes representatives from electric utilities and their support organizations, state legislatures, state utility commissions, consumer advocacy offices, wind equipment suppliers and developers, green power marketers, environmental organizations, and local, state, tribal, regional, and federal agencies. The NWCC identifies issues that affect the use of wind power, establishes dialogue among key stakeholders, and catalyzes activities to support the development of an environmentally, economically, and politically sustainable commercial market for wind power. More than 2,500 individuals from diverse sectors and wind resource areas across the country have participated in the NWCC's collaborative efforts.

The case studies take on more significance in the light of a recently issued federal order favoring independent regional governance of electric power transmission systems. In December 1999, the Federal Energy Regulatory Commission (FERC) issued Order 2000, which requires all public utilities that own, operate or control interstate electric transmission to file a proposal addressing the utility's participation in a Regional Transmission Organization (RTO). Public utilities already in a FERC-approved RTO must file with FERC how the RTO does or does not comply with Order 2000, and offer any amendments or changes to comply with Order 2000. Under Order 2000, RTOs must have the four minimum characteristics and perform the eight functions listed in Box A.. FERC has said well-designed RTOs could improve transmission grid management; improve grid reliability; eliminate discriminatory transmission practices; improve market performance; and help provide for light-handed regulation.

Box A.

Regional Transmission Organizations (RTOs)
Minimum Characteristics

1. Independence from market participants;
2. Appropriate scope and regional configuration;
3. Possession of operational authority for all transmission facilities under the RTO's control; and,
4. Exclusive authority to maintain short-term reliability.

Required Functions

1. Tariff administration and design;
2. Congestion management;
3. Parallel path flow;
4. Ancillary services;
5. OASIS and total transmission capability (TTC) and available transmission capacity (ATC);
6. Market monitoring;
7. Planning and expansion; and,
8. Interregional coordination.

Source: FERC Order 2000.

Prior to Order 2000, FERC had required in Order 888² that interstate transmission owners, typically utility companies that also owned generation, provide open access to their transmission facilities to other generation owners. Order 888 was intended to promote competition in the generation sector, and although utilities developed open access policies (tariffs, interconnection rules, etc.) that satisfied the requirements of Order 888, many independent generators still viewed these policies as being insufficient to promote competition. In particular, critics objected to the fact that utilities still exercised full control over the governance and operation of their transmission systems. In addition, distributed and intermittent resources would have difficulty taking advantage of open access transmission tariffs because of various terms and conditions designed more for larger-scale generation resources. Critics also objected to the fractured governance and operation of the transmission system that continued after Order 888, and to the existence of utility-by-utility tariffs that required independent generators to pay multiple transmission fees to multiple transmission owners in order to transport power through or within a small region. In response to this criticism, FERC issued Order 2000 to regionalize transmission governance and operation and to functionally separate it from transmission ownership.

² Issued April, 1996.

Many wind energy advocates believe that RTOs can become a forum in which they have increased opportunities to participate in the development of transmission system policies alongside traditional players such as electric utilities. RTO development processes are important to wind stakeholders generally, and to the wind stakeholders discussed in the transmission case studies in particular. As they are formed, RTOs will be responsible for developing ground rules on many issues important to wind development, including the issues of RTO governance, transmission pricing policies, system planning, and interconnection requirements for generators, among others. FERC has also stated that Independent System Operators (ISOs) are an acceptable form of RTO. ISOs are already established in Texas, California, New England, and other regions, and are currently under development in the Midwest, the Pacific Northwest, the Desert Southwest and the Mountain West.

Following are brief summaries of the case studies and their conclusions, along with discussions of the opportunities for progress to be made on issues raised in the case studies within RTO development processes. Current working drafts of the case studies are attached.

Case 1. Transmission Policy and Pricing in Texas

The NWCC has identified transmission planning and pricing issues as being of critical importance to wind development. Some areas of the country have established ISOs to handle planning and pricing issues. The ERCOT-ISO governs the transmission system that serves most of Texas and provides a unique example of solutions to transmission planning and pricing issues.

The ERCOT-ISO is one of only five fully operational RTOs in the U.S.³ As such, it is ahead of many regions in developing a regional, independent agency to control transmission. The efforts that went into developing the ERCOT-ISO transmission policies can provide a model for other regions needing to set up their own RTOs. Case 1 draws the following conclusions about how the wind community can position itself in RTO development processes to encourage favorable, or at least equitable, outcomes for wind:

1. Have a strong presence, seek a level playing field, and work for inclusive and transparent processes in RTO governance proceedings;
2. Do not seek special treatment for wind;
3. Find common interests with other participants and build alliances on broad issues to be more effective;
4. Promote a view of the transmission system as a common carrier operating in the public interest;
5. Use simplicity as a guiding principle to reduce the adversarial aspects of transmission issues; e.g., simplify the transmission reservation process.

³ The others, as of May 2000, are the California ISO, ISO New England, New York ISO, and the PJM Interconnection.

Since RTOs are required to be independent of market participants, wind interests and their allies have a new opportunity to participate in transmission decision-making proceedings alongside utilities, and to expect equitable treatment in these proceedings by a neutral authority. Wind interests may best be served by advocating for equitable, rather than special, treatment under new transmission rules during RTO development proceedings. To make the case for equitable treatment, wind interests will need to develop alliances with other interests, such as others seeking open competitive markets for transmission services.

To date, the ERCOT-ISO rules have not discouraged wind development in Texas; ERCOT-ISO has received over 20 interconnection requests representing over 1,600 MW of proposed new renewable (primarily wind) generation since the rules went into place.⁴ However, the driver for many, if not most, of these proposed projects is a Texas legislative mandate requiring development of 2000 MW of new renewable generation by 2009. Also, these proposed projects face serious transmission constraints that still need to be resolved. For regions in the formative stages of RTO development, it may be valuable to monitor how these forthcoming issues are resolved within ERCOT-ISO.

Case 2. Virtual Wheeling

It is often difficult to match the availability of wind energy with customer demand because of the distance, the lack of available transmission capacity between the generation and load, or because of differences in timing between when the energy is available and when it is needed. This problem can be addressed in several ways. At the local level, wind energy can be accommodated by backing off fossil generation when the wind energy is available and replacing the displaced energy at a later time. This concept can also include storage. At a regional level, this concept can be extended to include delivery of the energy at another place and time by the same entity that purchases the energy, or by another entity through the purchase of a green energy credit. At the national level, one can imagine a purely financial transaction in which green energy credits are bought and sold. The concept can be extended globally. Three examples of virtual wheeling are examined in this case study. The specific conclusions are that:

1. As states enact regulatory requirements for renewable energy, financial transactions can enable wind development to occur in the best wind resource areas while giving utilities flexible options to meet requirements in least-cost ways.
2. Opportunities for green marketing programs to utilize virtual wheeling face public perception challenges, as many customers are reluctant to pay a premium for green power while receiving energy delivered from local fossil generation.

⁴ *Transmission Constraints, West Texas Renewable*; presentation by Kenneth A. Donohoo, Senior Transmission System Engineer, ERCOT-ISO, available at <http://www.puc.state.tx.us/rules/rulemake/22200/westtex.ppt>, May 25, 2000.

3. Power exchanges involving fossil-based replacement power, particularly coal, can raise some issues of concern and can lead to misunderstandings if the nature of the transaction and net results are not clearly communicated.
4. “Virtual wheeling” transactions are not a panacea for wind energy nor do they obviate the need for new transmission.

The examples in Case 2 offer illustrations of creative power transactions that enable wind projects to be developed in contexts where they might otherwise have been unsuccessful or less cost-effective. As new RTOs are formed in response to FERC Order 2000, they will need to be flexible enough to allow these types of transactions to occur.

The RTO function of tariff administration and design will play an important role in determining whether virtual wheeling transactions are facilitated both within and between regions. This primarily involves determining whether wheeled energy will pay a flat rate for delivery within the region (the postage stamp model) or a variable charge that reflects the distance between generation and load. To the extent that virtual wheeling arrangements are proposed between regions, the RTO function of interregional coordination will play an important role as well.

Even where technical and economic challenges to virtual wheeling are overcome, there is still the challenge of convincing energy consumers that abstract financial transactions deliver real value. Critics of such transactions point to the need for fossil backup of intermittent resources and distant environmental benefits as serious obstacles to widespread consumer acceptance of green power. RTOs, being independent of market participants, are in a unique position to speak with credibility on these issues and to create policies that may contribute to consumer confidence in green power products.

Case 3. Transmission System Improvements

Electrical transmission facilities connecting windy areas and load centers are sometimes non-existent or minimal. Even in cases where a good wind resource has nearby transmission, that transmission often has limited capacity to transport additional energy. In fact, transmission facilities throughout much of the country are strained, and this problem is acute at specific points of congestion. The expansion of wind power is hampered by this situation, but the associated problem is not confined to wind. Instead it is a general problem of concern to many in the electric power sector. Transmission system improvements have been proposed, are being considered, or have been carried out in several regions of the country.

The experience with transmission planning issues in the Upper Midwest and Great Plains contains lessons that could prove instrumental in dealing with transmission needs associated with wind power expansion nationally. The stakeholder responses documented in this case study suggest several conclusions that address the transmission issues covered. They are:

1. Stakeholder groups have different perspectives that lead to conflicting conclusions on the need for new transmission. Additional education and dialogue on transmission issues would be beneficial to fostering common understanding

among diverse interests about both the impacts of the transmission infrastructure to society and its benefits. Utility respondents feel strongly that greater public understanding of functions provided by the transmission system is needed, as well as of the system's changing use after open access policies were mandated by FERC.

2. Current transmission planning processes are insufficient for bringing new transmission projects to fruition. A broader consensus is needed on energy policy objectives, environmental impacts, and economic benefits to help resolve the standoff on the need for improvements to the transmission system. An improved regional approach to resolving transmission planning disputes ultimately must be found.
3. Transmission system improvements that are needed in the Upper Midwest and Great Plains to serve the needs of wind development and other generation interests seem unlikely to occur without facing continued opposition from environmental and community advocate interests. A new approach that provides assurances that proposed transmission system improvements will produce renewable energy and environmental benefits, and will provide compensation for those along the transmission rights-of-way, may be required.

Each of the conclusions presented in Case 3 highlights the potential benefits to transmission system planning processes that a regional, independent, multi-stakeholder forum could provide. It is possible that the evolving Midwest ISO could emerge as the forum needed in the Upper Midwest and Great Plains. RTO development proceedings in other regions also present promising opportunities to develop regional consensus-building alliances in support of needed transmission system improvements, and should be closely monitored.

National Wind Coordinating Committee c/o RESOLVE
1255 23rd Street, NW, Suite 275
Washington, DC 20037
888.764.9463
nwcc@resolv.org
www.nationalwind.org