FAIR TRANSMISSION ACCESS FOR WIND: A BRIEF DISCUSSION OF PRIORITY ISSUES

I. INTRODUCTION

Wind power has been the fastest growing energy technology in the world for the past decade. This reflects a growing recognition by policy makers, utility executives and consumers of the many benefits of wind power. Wind power relies upon a renewable, abundant and free fuel to produce clean energy. It has no harmful air emissions. It neither consumes nor pollutes water. It does not produce greenhouse gases that may contribute to global climate change. Moreover, the cost of wind generation has fallen dramatically. Due to technical breakthroughs and economies achieved over the past decade, the cost of wind-generated power has fallen almost 90% in the past two decades and is increasingly competitive with coal, nuclear and even gas-fired facilities. Wind also provides other economic benefits: 1) fuel diversity to mitigate price spikes in conventional fuels; 2) reduced reliance on vulnerable imported fuels to enhance national security; and 3) the ability to add generation incrementally to reduce load forecasting risks and "stranded" costs. Wind power can be developed in a wide range of sizes. Wind power has matured technologically, and is fully capable of complying with all applicable electric utility technical standards. The wind industry has been warmly embraced in many Great Plains states in part because it is seen as having substantial economic development benefits—new jobs, an expanded property tax base, and lucrative lease payments to rural landowners who provide the windy land for the turbines.

The United States is uniquely positioned to develop, market and use wind technology. While Germany is currently the world leader in the installation of wind power, Texas alone has a greater wind resource than Germany. In recognition of wind energy's huge potential and its emergence as a power technology of growing attractiveness to utilities, DOE Secretary Bill Richardson in 1999 announced the "Wind Powering America" initiative which set a goal of wind energy providing 5 percent of U.S. electric power by 2020—approximately 80,000 MW of new development. Most informed observers regard this goal as conservative and readily achievable given current trends in regard to both the economics of wind power and the growing concern in regard to the global environment.

Despite the enormous benefits of the technology and its potential in the United States,

most of the growth in new installations of wind power last year occurred in other nations. While wind continues to make progress in this country, other nations, notably in Europe, are seizing the wind opportunity more aggressively than the United States. There are several reasons this is the case, perhaps most notably that environmental concerns are driving energy policy more strongly in Europe than in the U.S. In addition, however, a number of European nations—Denmark, Germany and Spain in particular—seem to recognize that wind power will be a major 21st century energy industry, and they are moving aggressively and strategically to develop their own wind manufacturing industries through strong market incentives.

Although the U.S. is well positioned to become a global leader in wind energy, one of the greatest impediments to wind development in the United States could be transmission policy. Simply put, historically transmission systems have been built and transmission policies written to deliver power to customers from traditional utility resources. Now that generation is being opened to competition, it is important that transmission access rules and pricing be designed with new market entrants in mind, including wind energy. Like every power generation technology, wind has certain unique characteristics that affect its transmission needs. Unless transmission policies become sensitive to those needs, in the same way they are sensitive to the unique characteristics of more established technologies, then transmission policy will favor continued reliance on more polluting technologies and the promise of wind power will not be fully realized.

The purpose of this paper, then, is to identify the priority transmission problems faced by wind power in the United States and propose solutions for each of them. The goal of this paper is to present each of these issues in a manner which is succinct and accessible to a broad audience of policy makers and concerned citizens.

II. AN OVERVIEW: TRANSMISSION CAN UNIQUELY IMPACT WIND POWER

Transmission, the highway by which generators reach their customers, remains largely (and appropriately) a monopoly service. Denial of access or discrimination in rates fundamentally affects the competitiveness of any generation technology. Moreover, discrimination need not be explicit. Policies which are applied equally on their face can affect those subject to them very differently.[1] Thus, transmission policies must take into account the different circumstances of those entities that must meet them. While FERC has taken major steps to separate the transmission monopoly power from the interest of utilities as generation competitors, the legacy of a transmission system and related tariffs designed to serve traditional utility powerplants remains.

[1] The French writer Anatole France aptly captured this principle in his famous sarcasm: "The law in its majestic equality forbids the rich as well as the poor from sleeping under bridges."

Every generation technology has unique characteristics that affect its interaction with the transmission system. For example, traditional coal, nuclear and gas-fired facilities have disparate ramp rates—physical limitations that affect how quickly these facilities can increase or decrease their power output. Transmission policies have long been fashioned to accommodate these ramp rates and many other characteristics of traditional technologies. Indeed, the electric system could not be operated reliably if these characteristics of traditional technologies were not considered. Accommodating ramp rates and similar limitations of traditional powerplants is done as a matter of course in transmission tariffs.

Wind power also has unique characteristics. Wind is a fuel that is plentiful and free. But nature decides where and when it is available. Thus, wind is an intermittent resource (i.e., its generation capability fluctuates with changes in wind speed). Yet many transmission policies assume that generators can control and predict their generation levels and penalize them when they do not. Plainly, these policies make no more sense for wind generators than would policies that penalize coal plant operators for their ramp rate limitations. Wind projects simply cannot control the wind in the same way a fossil or nuclear facility can control its fuel delivery. Nor can a wind generator predict the wind ahead of time as accurately as other technologies can predict their fuel supply.

A second key characteristic of wind projects is that they must be located at the site of the wind resource. Wind cannot be piped or sent by rail like coal, uranium or natural gas. Moreover, good wind sites are often located remotely from electric loads. This means that wind facilities are more dependent upon long-distance transmission and less able to avoid transmission problems than other technologies.

Finally, wind is a relatively new entrant to the generation marketplace. Thus, policies which favor (or "grandfather") existing generation can be a barrier to new market entrants such as wind power. AWEA is not suggesting abrogation of existing transmission contracts—contracts should be honored. AWEA's concern is focused upon policies or tariffs which seek to allocate access based on time of market entry or which demonstrate preferences for existing resources, regardless of whether they have any binding contractual right to the capacity.

These characteristics of wind power must be considered by policy makers in determining the fairness of transmission policies. Otherwise, even policies which are facially nondiscriminatory can have a discriminatory practical impact in the marketplace, and can frustrate the objective of fuller utilization of the nation's wind energy resource. From this background, then, we now turn to the five highest transmission policy priorities of the American Wind Energy Association: (1) the allocation of embedded costs of transmission facilities, (2) schedule deviation penalties in the creation of real-time balancing markets, (3) the elimination of rate pancaking, (4) the equitable allocation of congested capacity among competing users, and (5) the nondiscriminatory interconnection of new generation facilities.

III. THE ALLOCATION OF EMBEDDED COSTS OF TRANSMISSION FACILITIES

A. The Problem

The embedded costs of transmission facilities refers to the capital invested in the construction and operation of existing facilities.[2] These costs can be recovered through charges assessed to either users or generators of electricity, or to both. How these costs are recovered can substantially affect the development of emerging resources such as wind. When embedded costs are charged in whole or in part to generation, the charges have a disparate impact on wind projects due to their remote location as well as the intermittent nature of the wind resource.

For example, some utilities have historically charged generators different shares of system embedded costs depending upon the number of miles of transmission between the generator and a "load center."[3] This results in remote technologies paying a greater share of the embedded costs than those located nearer the "load center." Furthermore, some utilities have also charged generators based upon their maximum (or "peak") use of the transmission system within a given time period rather than their average use or the number of kilowatt-hours of use over that time period. Due to their intermittent nature, wind facilities are disproportionately affected by such policies because they have a greater disparity between their peak use and their average (or kilowatt-hour-based) use of the system. Worst of all, some utilities have used so-called "megawatt-mile" policies which combine peak use and mileage-based policies described above. These transmission policies hit wind projects doubly hard.

The practical effect of these transmission policies is to charge remote, intermittent technologies such as wind a substantially greater share of the embedded costs of the transmission system than the technologies against which wind facilities compete. These policies are a barrier to entry for new wind facilities.

B. The Solution

AWEA's preferred solution to this problem is to adopt the policies approved by the FERC for the California Independent System Operator (ISO). This policy allocates the embedded costs of transmission to end-use customers rather than generators. This, of course, allows generators to compete more equally. While generators may still incur transmission costs which differ by location due to losses and congestion charges (discussed further below), there is no longer an "embedded cost thumb" on the scales. Even where embedded cost charges are allocated to generators (or "transmission customers"—those scheduling the transaction), FERC can avoid

[2] The costs associated with building new facilities is a separate issue.
[3] Loads are, of course, often dispersed throughout a utility's service area and the concept of "load center" can be highly arbitrary.

unduly penalizing wind facilities by basing charges on the point of delivery, such as is the policy approved by the FERC for the Pennsylvania-Jersey-Maryland (PJM) Interconnection.

Moreover, this policy makes sense for several additional reasons. First, end-use customers will ultimately pay 100% of the embedded costs of the transmission system, directly or indirectly, under any policy. This is because any portion of embedded costs allocated to generators is passed on to end-use customers indirectly in their electric power charges. This burying of transmission investment charges in commodity power costs disguises the real cost of competing generation technologies. Second, this policy also recognizes that, by definition, embedded costs have already been incurred. Thus, the operation of generation has no effect on these costs.[4] Third, this policy recognizes that generators are already paying for their individual impacts on the transmission system in the form of congestion costs and transmission loss adjustments.[5] For all these reasons, AWEA strongly believes that it makes sense that end-use customers should be allocated 100% of the embedded costs of the transmission system.

Moreover, it also important that these costs not be recovered from end-use customers in a manner which discriminates against remote resources. Even where generators do not pay these costs, in states with retail access generators are affected if customers face different embedded cost charges based upon the location of their generation. AWEA supports "postage stamp" or "license plate" rates and opposes policies that attempt to assign these costs based on false assumptions that the electric grid is divisible into pieces that are used separately. In fact, the electric power grid is a fully interconnected and interactive system. Customers interconnect to and rely upon all of it. Thus, FERC should enforce the policy it has approved with respect to the California Independent System Operator and others: that embedded costs are charged to end-use customers, or at least based upon the point of delivery, without segmentation of the grid.[6]

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[4] Of course, as lines become congested, transmission upgrades may be required for which new embedded costs will be incurred. However, in emerging transmission pricing policies such as those of the California ISO, generators pay congestion costs separately from embedded costs and receive appropriate price signals in that fashion. AWEA discusses congestion policies as a separate issue in this paper.

[5] Congestion costs are the costs imposed on generators and customers to reflect the economic consequences of "bottlenecks" in the transmission system. Transmission losses reflect the economic consequences of the physical loss of energy (in the form of heat) when it is transmitted long distances. Remote facilities incur greater loss charges than facilities located near loads.

[6] FERC has approved different embedded cost responsibility among customers in different transmission service territories within an ISO to avoid cost-shifting when multiple owners place their systems in the hands of a single operator. Given AWEA's strong support for RTO's as discussed later, it supports such policies as a necessary, practical step in their formation. Such policies are distinguishable, however, from policies which seek to "subfunctionalize" the grid based on assertions as to usage.

To the extent generators are charged for embedded costs, it is critical that these charges be fairly applied as between competing generation technologies. This means that the costs should be charged based upon average or kilowatt-hour use of the transmission system and not peak demand. (Again, in emerging transmission pricing schemes, congestion is charged separately from embedded costs of transmission. Thus, the impact of a facility's "peak" demand on congestion is a separate issue.) Moreover, as noted above, such costs should not be allocated on a mileage or "subfunctionalized" basis which falsely suggests that generators only use portions of the grid. Just as with customers, generators interconnect to the entire grid and should share its embedded costs on an equal basis, if at all.

IV. SCHEDULE DEVIATION POLICIES

A. The Problem

To facilitate reliable operation of the transmission system, transmission users are often required to schedule in advance some or all of their use of the transmission system. In real time, electric power demand and generation typically deviate from these schedules. The primary reason for such deviations are deliberate changes in generation to accommodate real-time changes in customer demand for power. (These are sometimes referred to as "instructed deviations".) In addition, however, generation sometimes deviates from schedules without being instructed to do so by the system operator (i.e., "uninstructed deviations"). Of course, for intermittent technologies such as wind, real-time generation is "instructed" by nature and schedule deviations are often unavoidable.

Historic transmission policies have often imposed severe penalties on uninstructed deviations outside a certain amount. These penalties are based on two assumptions: (1) that such uninstructed deviations are always harmful; and (2) that generators can control such uninstructed deviations if properly motivated to do so by a penalty. The first assumption is often incorrect as applied to any generator. This is because uninstructed deviations can be beneficial as often as they are harmful, depending on system conditions at the time. Deviations can benefit the system when they compensate for opposite schedule deviations in customer demand or supply from other generators.[7]

[7] For example, consider a company operating two 10-megawatt generators at the same or similar locations. Assume that this company schedules 8 megawatts of generation from each facility in a particular hour. However, it actually delivers 10 megawatts from one generator and 6 from the other. Although the company delivered precisely the amount of energy scheduled, it would be penalized twice, once for each facility's deviation. Another example is the situation where a company operating a single generator exceeds its scheduled amount at a time when the system operator is seeking more generation due to increased customer demand. In that circumstance, a deviation benefits the system operator and helps keep the system in balance. Similarly, a company which delivers less than its schedule at a time when the system operator is seeking to reduce generation also benefits the system. Nonetheless, in each of these cases, the generator would be penalized under these policies.

As discussed above, the second assumption is always incorrect as applied to wind projects. Wind generators cannot control the wind no matter how great the penalty—they simply have to incur the penalties (or the cost of an avoidance strategy) as a cost of doing business, thereby making them less competitive.

B. The Solution

There are two solutions to this problem. The first is the creation of a real-time balancing market and the elimination of penalties. The second is to allow generators (or at least intermittent generators) to schedule as close as possible to real time.

Real-time balancing markets charge for, or credit, deviations based upon the value of energy at the time of the deviation. Thus, if a system needs more energy, a positive deviation is rewarded: the company receives the real-time balancing price for its excess output. A negative deviation at that same moment would be charged the real-time balancing price for its shortfall. Such a system promotes economic efficiency by correctly pricing the value or cost of deviations. An additional benefit of these policies is that they mitigate to some degree the scheduling problem faced by intermittent technologies. In its historic "millennium order" of last year promoting formation of regional transmission organizations ("RTOs"), the FERC recognized the importance of real-time balancing markets:

> "As we proposed in the NOPR, we conclude that an RTO must ensure that its transmission customers have access to a real-time balancing market that is developed and operated by either the RTO itself or another entity that is not affiliated with any market participant. We have determined that real-time balancing markets are necessary to ensure non-discriminatory access to the grid and to support emerging competitive energy markets. *Furthermore, we believe that such markets will become extremely important as states move to broad-based retail access, and as generation markets move toward non-traditional resources, such as wind and solar energy, that may operate only intermittently*." Order 2000, at p. 423, emphasis added.

Even with real-time balancing markets and elimination of inappropriate penalties, intermittent technologies still face schedule deviation costs greater than their competitors. This difference is reduced, however, to the extent that intermittent technologies are permitted to adjust schedules as close to the delivery hour as possible.[8] The ability of wind projects to predict their

[8] In California, AWEA and the Independent Energy Producers Association are discussing with the California ISO policies to address the scheduling penalties issues. In particular, we are discussing the ability of wind facilities to deliver supplementary energy without scheduling penalties. The California ISO staff have suggested that this can be accomplished under their new "10-minute" scheduling proposal. In the future, AWEA would also like to develop a pilot program to demonstrate near-time or even real-time scheduling for intermittent resources. Since these resources comprise a very small portion of the overall system generation, and since the California ISO

output increases dramatically in the hour preceding the delivery hour. Given that these adjustments by intermittent generators would represent negligible changes in overall system conditions in any U.S. market, allowing last hour adjustments for these technologies should not be difficult. To the extent intermittent generators are allowed to make such adjustments, much of the scheduling problem they face would be solved.

V. ELIMINATION OF RATE PANCAKING

A. The Problem

When a generator seeks to deliver energy to a distant load, it may have to use the transmission systems of multiple owners/operators. In such cases, the access charges of each owner/operator accumulate to a collective access charge which can far exceed an equitable access rate. This is not merely a function of using more transmission and therefore having to pay for more—it is a function of crossing ownership lines and having to pay multiple access rates that were each developed assuming only a single rate applies. (In other words, the access price for the same transaction using the same pricing policies but assuming a single owner/operator will be substantially lower). This phenomenon is referred to as rate "pancaking." Since wind facilities are often remotely located, access rate pancaking has been a significant impediment to the wind industry.

In addition to unfairly penalizing wind and other remote, site-constrained generators, access rate "pancaking" segments markets. Such segmentation decreases economic efficiency, reduces competition, increases the market power of local utilities and generators, and ultimately raises prices to consumers.

B. The Solution

The solution to access rate pancaking is to eliminate it, either by consolidation of tariffs under an RTO and/or by creating access "waiver" agreements between multiple owner/operators. The elimination of rate pancaking is a fundamental goal of the FERC in its historic Order 2000:

> "As described in the NOPR, the elimination of rate pancaking for large regions is a central goal of the Commission's RTO policy, and has been a feature of all five ISOs the Commission had approved." Order 2000 at p. 513.

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already provides scheduling up to 20 minutes before the delivery hour under certain existing contracts, AWEA is confident that this type of remedy is feasible for system operators.

The creation of RTOs should consolidate operation and eliminate pancaking within the boundaries of the RTOs.[9] Thus, AWEA applauds the FERC for Order 2000 and strongly supports the creation of RTOs that truly reduce or eliminate access rate pancaking across significant regions. The creation of RTOs will promote economic efficiency, reliability and help remove barriers to market entry for new technologies such as wind.

As RTOs are being discussed throughout the nation in response to Order 2000, AWEA will be encouraging their formation provided that they meet the FERC's minimum criteria. Chief among the FERC's criteria, and AWEA's criteria for support, will be the elimination of pancaked rates across regions significant to the wind industry. Ultimately, AWEA would like to see unified access charges across entire interconnections or at least across significant markets. However, as a transitional step to overcoming cost-shifting barriers to RTO formation, AWEA supports FERC's policy of permitting "license plate" access charges within RTOs.

While AWEA supports the direction FERC is taking on this issue, it is concerned about the pace and scope of RTO formation. As RTO proposals come before FERC in response to Order 2000, AWEA will be urging the FERC not to dilute its Order by approving "sham" RTOs that fail to fully meet its minimum criteria. AWEA will also not support RTOs which lack the regional scope inherent in the concept. Nor will AWEA support significant delays in the formation and implementation of RTOs. The industry is changing rapidly and neither the U.S. market nor the world market will tolerate "deliberate speed" in addressing the problems FERC identified in Order 2000. AWEA will be urging FERC to continue to use its authority to bring about significant and timely reform.

VI. THE EQUITABLE ALLOCATION OF CONGESTED CAPACITY AMONG COMPETING USERS

A. The Problem

Transmission congestion occurs when the demand for a transmission path exceeds its reliable capacity. In such circumstances, the system operator must protect the system by curtailing and redispatching generation. In other words, the operator must allocate the available capacity among competing users. Due to lack of site flexibility and generally remote location from load, wind facilities are less often able to avoid congested transmission facilities.

[9] For example, the creation of the California ISO eliminated rate pancaking as between the systems of Pacific Gas and Electric Company ("PG&E"), Southern California Edison Company ("SCE") and San Diego Gas and Electric Company ("SDG&E"). In this example, a customer located in San Diego and paying an access rate based upon the embedded cost of SDG&E's system obtains a "license plate" right of access to the entire ISO-controlled grid, including the systems of all three utilities. Such a customer could therefor contract to purchase wind power from generators located in PG&E's service territory without paying an additional embedded cost-based rate. Prior to the creation of the ISO, however, this transaction would have required paying the pancaked rates of all three utilities.

Accordingly, wind technologies are very much affected by congestion policies. They are also very much affected by policies regarding the upgrade of transmission systems to eliminate congestion.

Historic transmission congestion policies have strongly favored existing technologies over new market entrants. This is because these policies have tended to allocate constrained capacity on a "first come, first served" basis. In other words, utilities have historically solved congestion by curtailing more recent market entrants (often their competitors) first. This has had the effect of ensuring greater transmission access for older, less efficient traditional resources over newer technologies such as wind.

These policies, in turn, have tended to make utilities relatively immune from congestion compared to potential competitors. (Traditional facilities also face less congestion in the first place because transmission facilities were originally built with these facilities in mind). This fact, together with the increasing cost and uncertainty associated with transmission planning, may reduce utility willingness to make upgrades to reduce or eliminate the congestion. For these and other reasons, there has been a dramatic decline in utility proposals to make significant transmission upgrades that increase bulk transmission capability. As a result, transmission congestion is an ever-increasing problem.

B. The Solution

Congested transmission capacity should be allocated without regard to time of entry in the market. "Grandfathering" or "first come, first served" allocation schemes are an inherent barrier to entry for any new market participant, not just wind facilities. However, they have a particularly egregious impact on wind facilities due to these facilities' greater vulnerability to congestion. Instead, congested transmission capacity should be allocated based upon the societal value of the transactions involved.[10] At a minimum, this means that transmission users should be able to bid for congested capacity on an equal-footing. This will ensure that such capacity is allocated to those who value it most. FERC is plainly moving in this direction in Order 2000 and the approval orders for the five ISOs already in existence.

These bidding systems, which would include both zonal or nodal location-based marginal cost pricing schemes, are an improvement over many traditional curtailment schemes for wind developers. But congestion remains a serious impediment to wind development even under such

[10] To the extent environmental and other externalities are not reflected in the economics of transactions, a transmission user's willingness to pay for transmission capacity does not fully reflect the full societal value of that user's transaction. Arguably, the public interest is not served whenever congestion policies force the curtailment of a resource whose fuel is free, renewable and nonpolluting in favor of the use of fossil or nuclear fuels. This case is strengthened by the recognition that the "price signal" of congestion bidding schemes cannot affect the location of site-constrained resources such as wind. Thus, a case could be made that wind resources should have a congestion priority, let alone the "equal footing" advocated by AWEA here.

proposals due to the remote and intermittent nature of wind power. The intermittent nature of the resource makes it difficult for wind facilities to bid for constrained capacity, since they do not know with certainty how much capacity they will require for a given hour. Moreover, the mechanism relied upon in many of these models to provide financing and access certainty—transmission congestion contracts or fixed transmission rights—does not work well for intermittent resources. That is because these mechanisms require predictable transmission capacity needs to function efficiently. Finally, these models also are often based on economic theories that presume all electrons are fungible (i.e. that a developer is indifferent to the generation source and can readily hedge or avoid congestion by purchasing power on the other side of constraints). However, for wind and other facilities seeking to meet consumer demand for "green" power, substituting a non-green resource for wind power to mitigate congestion may violate contracts with "green" power customers.

Thus, while an improvement, these bidding systems do not address all the needs of the wind industry. To truly address the congestion problem facing wind developers, the FERC needs to take additional action. AWEA has identified three possible additional types of solutions which separately or in combination can help address this problem: 1) eliminating congestion through upgrades; 2) allowing wind to bid for congested capacity closer to the operating hour; and 3) to allocate capacity reserved for "N-1" reliability to intermittent resources on a "non-firm" basis subject to curtailment when needed to maintain system reliability.

AWEA's preferred solution for congestion is that it be eliminated through transmission upgrades. Policies which ensure rational planning and timely installation of upgrades to relieve congestion will have the ancillary benefit of supporting the introduction of additional wind generation. Furthermore, such policies will increase electric competition by reducing the segmentation of markets caused by congestion. Accordingly, AWEA urges FERC to adopt policies which strongly encourage transmission congestion relief.

This paper has already discussed the value of allowing intermittent technologies to schedule nearer to the operating hour in the context of schedule deviations. This solution also can greatly assist wind projects in overcoming risks associated with bidding for capacity on congested paths. To the extent wind projects can bid for such capacity nearer to the operating hour, the risk associated with unnecessarily incurring congestion costs is reduced.

Finally, FERC should also investigate whether capacity which is not available on a "firm" basis due to "N-1" outage contingencies can be made available to wind and other intermittent technologies on a long-term, but "non-firm" basis. It may be that the intermittent nature of the wind resource might match well with the intermittent nature of this transmission capacity, in the sense that wind developers would be willing to accept the risk of reliability-based curtailments in return for a long-term assurance of capacity in most hours.

AWEA intends to work with the FERC and the various RTOs around the country to explore these and other solutions to the congestion problem.

VII. NONDISCRIMINATORY INTERCONNECTION OF WIND GENERATION FACILITIES

A. The Problem

Interconnection to the transmission grid is a prerequisite to market access for any technology. Even where transmission operation has been made independent of utility generation interests, interconnection policies often remain controlled by vertically integrated utilities with incentives to discourage market entry by competitors. Wind is especially affected by interconnection policies because it is a relatively new market entrant. Moreover, because wind facilities are installed in increments rather than large blocks, interconnection can pose special problems for the development of this resource. Finally, the intermittent nature of wind means that interconnection costs based on peak output must be recovered across relatively fewer kilowatt hours of sales.

Historically, wind energy developers seeking interconnection to deliver power under contracts mandated by the Public Utility Regulatory Policy Act ("PURPA") often suffered substantial delays and faced large and questionable interconnection costs. Faced with contract, tax or other development deadlines, developers have often had no time to appeal interconnection costs which they feel are not reasonable. Instead, they have been forced to pay these costs. Alternatively, in some cases, the costs required by utilities for interconnection have been of such magnitude that wind projects were forced to construct their own long-distance transmission lines that bypass the utility system. [11]

As wind projects seek market entry as merchant facilities, these interconnection issues remain an obstacle. Ironically, some utilities are now again using interconnection issues to frustrate market entry by existing facilities who are prepared to give up PURPA contracts or whose contracts are expiring. For new wind projects, obtaining timely interconnection at reasonable cost continues to be critical. Indeed, the financing, permitting, tax and other development deadlines imposed on such facilities today make lengthy litigation of interconnection issues an even less viable option than was the case for PURPA facilities. The FERC needs to craft a pro-active solution which ensures that market entrants are not forced to suffer long delays in order to obtain fair resolution of interconnection disputes.

When dealing with transmission utilities unfamiliar with wind power, developers can face extended technical review and design processes. For one AWEA member, the design and construction of interconnection facilities will take longer than is required for the permitting and

[11] For example, wind developers were required to build the Sagebrush Transmission Line in California.

construction of the wind project itself. As competitive power projects of all technologies and all sizes become more common, it is appropriate and necessary for RTOs to establish more standardized interconnection procedures, particularly for small facilities, whose impacts on the transmission system will be less significant. The 3-tiered structure instituted in New York, for example, establishes different interconnection procedures for small, medium and large-sized projects.

In the Energy Policy Act of 1992, Congress recognized the importance of interconnection along with transmission access. It empowered the FERC to provide remedies in both of these important areas equally in sections 210 and 211 of that Act. However, FERC has been relatively more aggressive in addressing the inherent conflict of interest of the vertically integrated utility with respect to transmission operation as compared with interconnection. That is the right priority for enhancing market-wide competition. However, for new market entrants such as wind power, it is important that FERC not lose sight of the importance of interconnection policies.

B. The Solution

For the same reason it is important to have transmission access provided by an entity independent of generation interests, it is equally important that interconnection policies be set and administered by such an independent and objective entity. While appeals to FERC under section 210 remain a critical element to ensuring fair interconnection, the cost and time required for such complaints is problematic. Thus, AWEA endorses the FERC's decision to make RTOs the sole authority regarding requests for new interconnections:

> "We note the strong support for this standard in the comments and we adopt the NOPR's requirement that the RTO be the sole provider of transmission service and sole administrator of its own open access tariff. Included in this is the requirement that the RTO have the sole authority for the evaluation and approval of all requests for transmission service *including requests for new interconnections."* Order 2000 at p. 330, emphasis added.

AWEA urges the FERC to enforce this policy strictly as it reviews new RTO proposals. In addition, however, there are other policies which the FERC should consider to facilitate timely and fair interconnection, whether by RTOs or traditional utility owners. First, the FERC should make clear that existing facilities already delivering power to the grid should not face any new "interconnection" costs upon expiration or surrender of existing power sales contracts. A facility which is already interconnected and delivering power, and which is not changing or adding generation capability, should never be treated as a "new interconnection" simply because of a power sales contract change.

Second, the FERC should consider creating a mechanism to publish the costs a utility will impose upon new interconnections in advance. Such as system, similar to though not as variable

as the OASIS system, would mandate advance publication of the interconnection costs that would be imposed at the various likely interconnection points on an RTO's or utility's system.[12] This proposal has three important benefits. First, it provides more timely notice to the market of interconnection costs, thereby eliminating the delays and costs of studying these impacts only after a developer requests the information. Second, and more importantly, such advance publication allows market participants to have greater confidence that consistent assumptions and study methods are being used for all interconnection requests. Finally, this proposal allows greater time for market participants to review and challenge proposed interconnect costs that they find unreasonable. In this way, such a system makes appeal of unreasonable interconnection costs a more viable option which, in turn, is likely to promote more reasonable interconnection cost proposals from the outset.

Third, FERC should support differentiating interconnection requirements based upon the size of the incremental generation addition. Relatively small capacity additions with little potential for large system impacts, as is typical of wind projects, should not be held to the procedural and technical interconnection requirements necessary to address very large projects that might add hundreds or even thousands of megawatts to the grid. Creating a hierarchy of interconnection procedures, studies and time frames based upon different project sizes makes sense and will help reduce the interconnection barriers faced by wind development.

VIII. CONCLUSION

Whether the benefits of wind power will be fully realized in the United States depends in large measure on solving the transmission problems identified in this paper. While other issues, including other transmission issues, are also important, AWEA has determined that solving these five transmission issues is a critical priority for the wind industry in this country. In several cases, the FERC has already taken important steps toward the solutions recommended here. AWEA applauds these efforts, notably the policies of Order 2000.

However, the pace and extent to which these policies will be implemented remains uncertain. For the reasons briefly summarized in this paper, AWEA urges policy-makers to move quickly toward making the solutions outlined here reality. These policies are not only important to the wind industry, but will produce widespread benefits to the industry as a whole and, ultimately, to electric consumers nationwide.

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[12]This proposal is similar to the interconnection "phone books" mandated by the California Public Utilities Commission and published by PG&E, SCE and SDG&E for use in California's aborted Biennial Resource Plan Update auction. These "phone books" provided developers with advance notice of the costs of interconnecting various amounts of new generation at all significant points on the utility grid. The concept would have enabled developers to better incorporate transmission interconnection costs into their business planning and it also enabled them to review and, if necessary, challenge utility costs without risking their development or permitting schedules.