

Wind in a Restructured Electric Industry

Many state legislatures and utility commissions are considering improvements in electric services in the United States by making policy changes to encourage development of a more market-based electric industry. The emergence of independent generators and new technologies over the past decade past shown that there are policies which rely on more competition and lead to attractive alternatives to traditional monopoly electric service. Moreover, some state policy makers believe that traditional regulation of the electric industry may no longer be providing the best results. Bringing greater competition into the electric industry may be an idea whose time has come.

Unfortunately, unless reforms in state policies and regulations lead to market structures designed for success, and unless the new policies result in markets that develop appropriately, these markets may not always work as well as intended. The success of wind energy under new market structures will depend to a large degree on how well these new markets work, how susceptible they are to cheating, and the degree to which commercial and residential customers who most support new technologies such as wind, are able to influence the composition of the technology selected in the marketplace. This paper summarizes some of the general problems that a technology like wind might face in a market-driven electric industry and suggests policy responses appropriate to help remedy potential market barriers to innovative clean, modular and intermittent technologies.

The success of wind under new market structures will depend upon:

- *How well the markets work.*
- *How susceptible they are to cheating*
- *The degree to which customers are able to influence technology choices.*

The market in transition

Over the last two decades, there has been a trend in state regulatory policy toward regulatory reforms and use of market mechanisms in many of this country's basic industries such as airlines, telephones and natural gas. Electricity is one of the last of the large, regulated monopoly industries to be "restructured." In some ways, it is also the most complex in that it has "commodity" characteristics like natural gas, but it also has "service" characteristics like telephones. Because it is highly capital intensive, a deregulated or lightly-regulated electric industry may tend toward consolidation, resulting in fewer market participants and vulnerability to anti-competitive actions by large players. Finally, the current technologies used for generation, transmission, and distribution of electric power have negative environmental consequences, when compared with natural gas, airlines or telephones. This feature makes environmental costs and resource efficiency a major public concern for policy makers considering changes in the electric industry. The overall result is a very complicated state public policy problem of how to reduce regulation and open the industry to greater competition and market forces while avoiding the many obstacles to success that will arise along the way.

One of the challenges facing state policy makers who are considering electric industry regulatory reforms is how to preserve the option for renewable resources, such as wind energy, to play a role in the future of the industry. Wind is an innovative, clean, modular and intermittent technology. It is capital intensive, but has low operating costs, since there is no fuel cost. Though wind power offers many possible benefits, it faces a number of potential barriers to full competitive participation in a restructured electric industry.' The type and severity of these barriers will depend upon the final design and implementation details of public policies and regulatory reforms for the new electric industry model chosen.

The strategies under consideration for electric industry restructuring fall into four principal categories: 1) increased competition in the wholesale electric market; 2) increased competition in the retail electric market; 3) hybrid models that contain aspects of both wholesale and retail competition; and 4) transition strategies for getting from here to there. in addition, most proposals substitute `market discipline" for formal regulation in competitive areas of the industry. In the future, monopoly services that are not open to competition or that include broad public interest responsibilities that require continued oversight may be guided by some type of "performance based regulation" (PBR).²

Public interest policies in a restructured industry

If markets worked perfectly there would be many buyers and many sellers and no significant barriers to market participation. The prices of products would accurately reflect all their costs and values compared to similar products. Customers would have sufficient information to allow them to choose intelligently among the products that best meet their needs. However, markets are imperfect if there are few sellers, few buyers, imperfect consumer information, barriers to market participation, and opportunities by some panics to play games with the system. The characteristics of the electricity industry and the potential for technologies such as wind power suggest that there may be justification for state policy makers to consider intervention to avoid market problems and ensure fair treatment of all participants. Since electricity is critical to the well being and commerce of society, there are funkier justifications for state policy makers to be concerned and to act to ensure that public interests are being served. The following table lists potential market failures and possible options for addressing them.

Barriers to Effective Participation in a Restructured, More Market-Driven System	
Barriers	<u>Summary of Options for Addressing Potential Market Problems</u>
Few Sellers of Power	1) Limit maximum size of generation for any single owner or management unit at time generation is separated from other utility functions. Ensure rules of participation do not exclude small size and intermittent resources.
Few Buyers of Power	1) Offer all customers a choice of electric suppliers (include option' for aggregating service to smaller customers); or 2) offer smaller customers, served by existing retail utility; resource portfolio option (Include: a) requiring competitive bidding for-long-term supply; b) prohibiting "contracts for differences" between a utility and its affiliates; and c) separate, in some way, generation from other utility functions).
Inaccurate or Incomplete Price Signals	<u>For environmental costs:</u> 1) Use of a pollution tax; 2) some type of "feebate" system or environmental dispatch; 3) institute more widespread use of emission permits; 4) require renewables be included as a percentage of total

	<p>state supply portfolio; and/or 5) through mandated environmental performance goals.</p> <p><u>For risk allocation/diversity benefits:</u> 1) eliminate balancing accounts; 2) include environmental performance as PBR criteria; 2 3)-maintain IRP principles for utility resource planning for captive customers; 4) include environmental and resource risk comparisons in state and regional siting and permitting decisions.</p>
Barriers to Entry by New Products	1) Energy RD&D tax credits; 2) performance based tax credits for demonstration and commercialization projects; 3) an energy surcharge; 4) a private/public RD&D consortium; and 5) green pricing support for technology demonstrations.
Unfair Competitive Practices	1) Ensure <u>structures</u> which encourage broad competition and provide good market information to all consumers; 2) <u>consumer protection</u> -- provide simple mechanism for resolving consumer complaints; 3) <u>enforcement</u> -- license merchants who sell electricity to smaller customers.
Poor Customer Information	Require full disclosure by all electricity merchants of the risks and mitigation aspects of the supply portfolio they are offering (enforce through licensing provisions).
Transition Issues	1) Support existing programs until new policies are available to replace old; 2) establish criteria for new structures to meet public interest needs; 3) evaluate restructuring proposals using these criteria; and 4) ensure meaningful choices for small customers from the onset of new structures.

The types of market problems listed above are examples of "market which suggest that state policy makers respond either to prevent these situations from occurring or to correct problems should they occur. Any of these situations would undermine the ability of technologies such as wind to fairly compete in-a more market driven system.

Appropriate state public policy responses to any of these market problems should: 1) be fair and apply equally to all similar market participants; 2) where possible, use structures and rules of conduct that prevent the situation from occurring in the first place; 3) where oversight is required, involve the minimum regulation necessary to deal appropriately with the-issue; 4) not result in the inappropriate transfer of costs among customers-or other parties; and 5) be practical -- involve minimal costs, be politically feasible and be reasonably expected to work.

Market problems and policy responses

Although wind plants are capital intensive, they have low operating costs. Few sellers of power

In the past, electric utilities owned the generation facilities as well as the transmission and distribution lines required to deliver power to 'end-use customers.:' Generally, only one electric seller served the entire market. New technologies and new competitors have now proved that they can provide lower cost power than the utilities. Effective competition in a market-driven system requires many sellers.

The Problem. A market structure with few sellers of power can cause a number of problems for emerging technologies such as wind: 1) a few large sellers can dominate the market and prevent entry by new companies with new technologies; 2) they can dominate financial markets, making capital difficult to obtain and expensive for smaller competitors; 3) they can influence rules of participation in power markets and power pools to block entry by other competitors; and 4) to the extent large owners reflect traditional technology preferences, they may not want to build or own facilities using non-traditional technologies such as wind.

The problem of few sellers in a restructured electric market can arise in two ways: 1) by retaining the large blocks of generation under a single owner (even if the owner is not a utility); or 2) by consolidation of the ownership of generation assets after the industry has been restructured.

Policy Responses. In the first instance the preferred response would be to avoid the situation from the beginning. This means that, when generation assets are separated from the utility's other functions, it would be preferable if they were broken into smaller ownership or management units appropriate to the size of the market in which they will be competing. If an open generation market results in reconsolidation and a lack of competition rather than increased competition, the market will not provide competitive benefits. To avoid barriers to participation in power markets, state legislators and utility regulators can ensure that rules of participation do not include unreasonable size limitations or exclude participation by intermittent resources.

Few Buyers of Power

Under traditional electric utility regulation, for any geographic market area there has been only one buyer of power, the franchise utility. Until recently, there was no significant competitive supply market.

Effective competition in a market-driven system requires many sellers. The Problem.

Today, however, there is cheap power available in the spot market in many areas. In addition, a variety of new generation technologies offers a choice of power options not previously available. Electricity from new, clean, modular facilities like wind may be particularly attractive to residential and commercial customers for whom the short-term direct costs of electricity may be important rather than the long-term indirect costs, such as environmental costs. These customers may also wish to hedge against the price volatility and regulatory risks associated with fossil fuel technologies. Different customers have different power needs and preferences. These differences increase opportunities for the provision of new types of energy services using emerging technologies that are sold at prices which reflect the value to customers. Offering customers meaningful choices in the electricity market could increase the efficiency and benefits for everyone.

However, reaching these potential buyers can be difficult if 1) they do not have direct access to the market themselves; or 2) the utility that builds and purchases power on their behalf does not design its resource mix to reflect all the preferences of smaller customers. Moreover, to the extent that the utility which buys on behalf of small customers also receives financial benefits from buying from the non-wind generation it owns, an additional barrier is introduced.

Policy Response. State legislatures and utility regulators should consider at least two main policy responses to this problem. One is to offer all customers the choice of what electric services will be purchased and from whom. This is called "direct access" or "retail wheeling." In theory, it might provide customers with the greatest choice and improve competition by increasing the number of buyers. In practice, this policy option could result in new problems. Markets for customer choice may not be competitive due to poor customer information and unscrupulous sellers (see below). Policy makers also need to consider the loss of benefits associated with traditional utility service (including beneficial programs such as utility sponsored demand side management and energy efficiency investments), transitional and logistical problems of achieving customer choice, added costs of retail wheeling, and the costs and "hassle" of exercise of choices many customers may not want which are associated with implementing a direct access program.

In order for direct access to be successful and equitable for smaller customers, a mechanism should operate to aggregate the purchases of many small customers to reduce their transaction costs. Options include "competitive franchises,"⁴ "customer service districts,"⁵ and "municipal joint power agencies."⁶ The details of program implementation are especially critical.

A second state policy option to be considered would be to provide more customer choices within the existing utility structure. The utility might offer alternative resource portfolios designed to meet the needs of a specific customer groups. For example, power from wind generation might be included in a portfolio with other "clean" resources and offered at a rate that is held stable (or with limited price increases) over some specified period of time. This type of portfolio might be attractive to customers on fixed incomes, owners of rental or commercial property, and others who prefer stable to volatile electric rates as well as those who want to reduce the environmental impacts of their electricity use. Different combinations and variations of these two options are also possible.

Policy options to avoid undue utility preference for purchases from facilities from which the utility receives a financial benefit include: 1) requiring competitive bidding to fill the power needs of retail utility customers; 2) prohibiting unregulated utility affiliate companies from competing unfairly to meet utility customers' power needs; and 3) requiring the utility's generation to be separated from other utility functions.

Offering customers meaningful choices in the electricity market could increase efficiency and benefit everyone. Inaccurate or incomplete price signals

Until recently, electric utilities relied on various "boiler" technologies which burn fossil fuel to heat water into steam, which is used to power an electric generator. All the boiler technologies had similar environmental consequences and similar risk profiles. Comparing the costs of the various boiler technologies was fairly straight forward since they had the same primary characteristics. Diversifying the technologies used to produce electricity to reduce risk often required only building generating plants with alternative fuel capabilities. The vertically integrated utility supplied much of its own power on a long-term basis. In more recent years; technology choices have diversified, energy efficiency has been recognized as a resource choice, and external costs of power produced from boiler technologies have been recognized. Most states have used integrated resource planning (IRP) as the mechanism to compare the costs of different types of resources and resource mixes. Tradeable emission permits have also been introduced for one air pollutant, SO_x, and have been suggested for others.

The Problem. If the electric industry becomes more disaggregated and competitive, who carries the burden of making sure that generation is available to meet loads, and that resource planning fairly considers all the public policy interests inherent in expansion of the electric system? Since emission standards have been adopted for only a few air pollutants' to internalize environmental costs in electricity prices, decisions among resources which differ in their environmental costs will be greatly influenced by short-term prices. This poses a particular problem for technologies such as wind which have environmental and other characteristics that provide long-term benefits. Short-term prices which do not reflect long-term environmental costs and other risks such as vulnerability to fuel price spikes will tend to change dramatically as environmental regulations and fuel prices change, resulting in price shocks and price volatility. Resources like wind power with high fixed but low variable costs can provide price stability and a good hedge against the risk of fuel price fluctuations associated with fuel-based technologies. To the extent that electricity prices do not reflect these benefits or do cause future risks to be inappropriately transferred to panics who either do not control the risk nor take such costs into account in making resource decisions, inappropriate resource choices will be made.

Policy Responses. One policy option is to include these other costs and benefits in market prices. Environmental costs can be included by expanding the use of "pollution permits" or by including environmental costs in the dispatch and pricing of resources. This can be done: 1) by adding specified environmental- costs to the price of power appropriate to the generation technology (i.e. a pollution tax which is applied at either the wholesale-or retail level); 2) through a revenue neutral "feebate" system

which would adjust the price paid to various suppliers according to their relative "cleanliness;"^{8 3)} through more widespread use of emission permits covering types of pollution not presently covered by such permits; 4) through the use of a portfolio mandate requiring a specified percentage of all power sold to be from "clean resources;" and 5) through the use of mandated performance goals (e.g. emission caps and old source reviews).

Accounting for and internalizing diversity benefits (quantifying and allocating risks associated with technologies, fuels, changes in environmental or other regulations) can be accomplished by: 1) eliminating pass through and balancing accounts for technology, fuel and regulatory risks for utilities continuing to serve retail customers; 2) including environmental performance as one of the categories for evaluating a utility's performance; 3) requiring comprehensive resource planning for retail utilities continuing to serve end-use customers; and/or 4) including environmental and resource risk assessment comparisons in resource siting and permitting decisions for both generation facilities and transmission line expansions (at either the state or regional levels).

Barrier to entry by new products

The demonstration and commercialization of new technologies have generally been accomplished through direct financial arrangements between utilities and equipment vendors. More recently they have been funded by RD&D accounts, contributions to EPRI, joint ventures with a consortium of utilities and vendors, and participation in group purchases. In an electric industry increasingly focused on short-term market prices, RD&D expenditures are being reduced or eliminated.

Most states have used IRP to compare costs of different types of resources and resource mixes. The Problem. For new, clean, modular technologies where the only market for the technology is the electric industry, the reduction or elimination of RD&D programs is a particular problem in that a technology's usefulness can be demonstrated only through its performance in connection with the electric system. Moreover, the reduction of costs of modular technologies requires economies of mass production which cannot be achieved unless there are sufficient equipment orders to achieve commercial scale manufacturing.

New technologies such as wind may have many public good characteristics. They may be environmentally cleaner and have the potential to play a role in state and region-wide economic development. These technologies can have the most difficulty becoming commercialized under a more market-driven system. A market driven system will tend to invest in RD&D for technologies with benefits that accrue more to the investors rather than in technologies with benefits to society as a whole.¹⁰

Policy Responses. There are a number of possible policy options to address this problem depending upon the technology of interest, and the market sector. These include: 1) energy RD&D tax credits; 2) performance based tax credits for demonstration and commercialization projects; 3) an energy surcharge (on transmission and distribution services) to pay for demonstration and commercialization programs; 4) a private and public RD&D consortium; and 5) green pricing support for technology demonstrations."

Unfair competitive practices

Under a tightly regulated franchise utility system, dishonest behavior by utilities in providing electric services to smaller customers has generally not been a problem. In a more market driven system, unfair competition could become an issue.

In preparation for competition, the electric industry is reducing RD&D expenditures. The Problem. In a more market-driven electric industry with *reduced levels* of regulation *and a greater* number of players, dishonest competitors can be a problem especially for customers who may have inadequate information-and knowledge to protect themselves. This could be a particular problem for new clean technologies like wind where- smaller customers are a primary market. False claims and unfair market practices would reduce consumer confidence in purchasing from new technologies and from smaller-companies.

Policy Response. There are three areas for policy responses: 1) *Structure* -- ensuring the basic market structures encourage broad competition and make good market information available to all consumers; 2) *Consumer protection* -- providing a simple public mechanism for resolving electric service problems and consumer complaints; and 3) *Enforcement -licensing all marketers and brokers who sell to smaller customers* (so if problems arise a *state mechanism removes unscrupulous players from the market*).

Poor customer information

In the traditional electric industry, where everyone receives similar products from the *same* distribution company, *customer information is not essential*. Under a restructured electric industry, where there may be many sellers offering all kinds of goods and services using different *mixes* of technologies and fuels, customer information becomes mandatory for consumers to make informed choices.

The Problem. Though a *seller* might supply good information about its own products, customers need reliable information about both long- and short-term benefits of all the competing products. Short-term price savings can mask the costs of long-term price volatility, as well as fuel and environmental risks. Larger customers may have in-house experts who can obtain the information they require. Smaller customers frequently lack the knowledge to make informed choices about electric services with complex characteristics.

Policy Responses. One of the most effective policy responses is for the retail electric utility to set the information standard by providing full disclosure" of the sources of power included in their supply portfolio(s). In addition, non-utility electricity brokers selling directly to end-use customers could be required to provide the same information. If these sellers are licensed, disclosure could be a condition of their license.

Transition issues

The issues identified above are an even greater concern during a transition period between the existing system and the move to a new one. This is because concern about competition and the risk of doing business in a highly competitive environment is causing utilities to stop signing long-term contracts, especially for alternative technologies, and to drop public interest programs such as those encouraging renewable resource use. A short-term, price-only focus is gripping the industry.

Unfair market practices could make consumers lose confidence in new technologies or smaller companies. *The Problem.* Without the ability to access the market, the momentum for renewable technologies will stop. Without the discipline of a fully competitive market, the problems of few sellers, few buyers, inaccurate price signals, lack of RD&D programs, unfair competition and poor customer information will be even worse.

Policy Response. State regulators and legislators must quickly develop a framework for the support of public goods (such as renewables) lest the damage to existing projects and programs becomes irreversible. Options include: 1) support existing projects and programs until full competition and new policies are available to replace the old; 2) establish criteria for new market driven structures to meet public interest needs; 3) evaluate proposals for a restructured electric industry in light of these criteria; and 4) ensure that any new industry structure includes meaningful market choices for smaller customers from the outset.

Conclusions

The type and severity of barriers to wind depend upon the final design and implementation "details of the new industry model which is ultimately adopted. Where one or more barriers might exist, public policy intervention is justified to either prevent the situation from occurring or to correct and offset such problems should they occur.

Notes

1. Any innovative, clean, modular, and intermittent technologies would face similar problems.
2. Such services might include transmission and-distribution services, power services to end-use customers, and customer services during any transition period.
3. Such as universal service, lifeline rates and special low-income programs.
4. As suggested in Sen. Montigney's bill in Massachusetts.
5. Suggested by some consumer advocate-groups.
6. Being discussed by some California local government officials.
7. There are no requirements for greenhouse gases, and increased regulation of other emissions such as mercury and particulates are seldom included in resource choice analysis.
8. This can be implemented through-a wholesale power pool.
9. Regional level activities could be uncler, taken through Regional Transmission Groups (RTGs) and through regional compacts between state agencies and/or governors' offices. FERC's RTG guidelines require an RTG to develop a regional transmission plan. Such a transmission-plan can be undertaken only if there are some assumptions or criteria for the generation Facilities to be accommodated by any new transmission. This opens the door to some type of regional generation resource planning and siting. Though there is interest in some type of regional environmental planning, there are few enforcement mechanisms for regional agreements except by individual state actions or by a federal agency such as the FERC (if required to do so by Congress).
10. *Energy Development: Volume 1,-Part 11. RD&D and Electric Industry Restructuring*, RD&D Committee of the California Energy Commission, Draft, June 1995.
11. Because of "free rider" problems, this is not recommended as a stand-alone solution but one done in conjunction with other listed options. For a more complete discussion of this problem and possible policy options, see the draft report, *ibid.* (CEC).
12. Similar to the full disclosure information required to be provided by mutual funds. For example, a listing of any long-term risks to supply or price and the resources included in the portfolio to mitigate those risks

Without access to the market, the momentum for renewable technologies will stop.

National Wind Coordinating Committee

The content and form of the papers in this series have been reviewed and approved by the National Wind Coordinating Committee. Committee members include representatives from investor-owned utilities, public utilities, state legislatures, state utility commissions, state land commissions, consumer advocacy offices, state energy offices and environmental organizations. The purpose of the National Wind Coordinating Committee is to ensure the responsible use of wind power in the United States. The committee identifies issues that affect the use of wind power, established dialogue among key stakeholders and catalyzes appropriate activities.

The Wind Energy Series is a product of the National Wind Coordinating Committee (NWCC). The NWCC is a collaborative endeavor that includes representatives from electric utilities and support organizations, state legislatures, state utility commissions,

consumer advocacy offices, wind equipment suppliers and developers, green power marketers, environmental organizations, and state and federal agencies.

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