

# Wind Power: Opportunity or Albatross?

*An exclusive report for E SOURCE members*

*Paul Komor*

## Summary

One hundred megawatts (MW) here, 300 MW there . . . all these new wind farms are adding up to some serious capacity. Why are U.S. energy service providers (ESPs) investing in wind power? Their motivations vary, but our interviews with ESP decision-makers reveal that wind is being used to meet a variety of strategic goals, including—but certainly not limited to—making a profit. Wind also hedges political and fuel price risk, meets consumer needs, and taps an often overlooked resource.

Our analyses show three distinct roles for wind power: to meet regulatory-driven demand, to meet premium “green” demand, and as a cost-competitive option in wholesale power markets. The wind industry is maturing rapidly. Innovative start-up companies are staking out positions on the wind value chain, making it possible for an ESP to pick a specific niche and outsource the rest. Yes, there are significant uncertainties—notably natural gas prices and transmission pricing rules—but overall, we’re bullish on wind power. MidAmerican Energy’s March 2003 announcement of a new \$323 million wind farm in Iowa suggests that we’re not the only ones who see real possibilities in wind.

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# Wind Power: Opportunity or Albatross?

Paul Komor

*“What is a cynic? A man who knows the price of everything, and the value of nothing.”*

—Oscar Wilde<sup>1</sup>

Wind power in the U.S. is in the midst of a remarkable transition, going from a technical curiosity, heavily dependent on subsidies for research and development, to an innovative and occasionally even profitable mix of generation source, retail product, and political statement. A growing number of energy service providers (ESPs), competitive electricity marketers, new-generation investors and developers, and even nonprofits are getting into the wind power business. For example, in March 2003, MidAmerican Energy announced plans for a 310-megawatt (MW), \$323 million wind farm in Iowa. However, the vast majority of ESPs are doing little or nothing with wind.

Is wind power just the latest in a string of technologies driven by regulations and politics that make little sense in an increasingly market- and price-driven electricity system? Or is it a potential profit center and a shrewd investment for the innovative ESP? As we'll show through case studies, wind power's many strengths—notably relatively low costs, high political and consumer appeal, and its value as a hedging tool against fuel price and political risks—give it an edge that ESPs can't afford to ignore. We encourage ESPs to develop a useful strategy for wind—one that will leave them positioned for success in the rapidly changing electricity market.

## Outdated Beliefs, Current Realities, and Future Opportunities

Where is the market for wind power going, and where might ESPs find opportunities? We've drawn on recent E SOURCE market assessments and case studies to find answers.

### Where's Wind Going?

As a blanket term, “renewables” is increasingly outdated—for one thing, renewable power sources vary widely in terms of costs, intermittency, and perceived greenness.<sup>2</sup> Wind is close to being cost-competitive with fossil fuels, but it is subject to intermittency; geothermal can be used for baseload power, but these resources are geographically limited; photovoltaics are prohibitively expensive for all but niche applications; and so on. Because wind power is the most promising option in the short term, we're going to focus on it for this report. Please bear in mind that the strategies we'll be outlining here wouldn't be appropriate for hydropower, for example, any more than a coal strategy would apply to natural gas.

Costs for wind power are down, technical reliability is up, and recent explosive growth means that the infrastructure necessary to support the resource (a network of developers, installers, operators, and others vital to the wind power supply chain) is in place. We expect to see continued growth for wind power, in response to (1) regulatory-driven demand, notably from state renewable portfolio standards (RPSs), which require electricity

**“We believe wind generation is here for good and will become more of a mainstream technology with each passing year.”**

**—Jeff Anthony  
We Energies**

providers to have a minimum amount of renewables in their generation mix; (2) increasing end-user demand for premium “green” electricity; and (3) demand within regional wholesale power markets where wind is cost-competitive.

The maturing of the wind power business is reflected in increased specialization in the power industry.<sup>3</sup> Today, some firms invest in wind power generating capacity but don’t operate it. Others are intermediaries that facilitate wholesale wind power purchases between buyers and sellers. Still others operate as retail marketers or re-marketers, with no ownership, operating, or financial stake in the wind power generating source.

The wind industry faces many uncertainties. Between now and 2005, three critical unknowns could boost or greatly damage this sector—natural gas prices, the fate of the U.S. wind energy Production Tax Credit (PTC), and the market value of green tags (also known as tradable renewable credits). If natural gas prices are low during the next several years, wind will be uncompetitive, and if the PTC expires as scheduled on December 31, 2003, wind power would be dealt a major blow. However, if green tags gain acceptance, they could drive huge growth in wind power.

In the longer term (through 2010), a few more critical uncertainties will further shape the fate of wind power. First, new rules for transmission access and pricing now under consideration at the federal level could sharply reduce costs of intermittent (wind and solar) renewable generation. Second, 16 states now have RPSs, and if more states choose to adopt them, that will greatly increase the demand for wind power. Third, many nations, some U.S. states, and several large companies are trading carbon or setting carbon regulations. If this trend continues, it will certainly have a strong positive impact on the U.S. wind power industry.

## **What ESPs Could Be Doing with Wind Power**

Too many utility planners are still wedded to outdated concepts about wind power, particularly

when it comes to the cost-effectiveness or reliability of this unique generation resource. Don’t let outdated arguments blind you to the very real opportunities afforded by this expanding industry.

On the supply side, the myths are that wind costs too much, it’s too hard to site, it doesn’t work, and so on. As our case studies show, wind *can* compete with natural gas generation, there are plenty of sites still available, and the technologies do work. Wind power should be evaluated on its merits, not on outdated stereotypes. Noted Jeff Anthony, manager of alternative energy programs for We Energies, “A number of utilities are still resistant to renewable energy. They assume that renewable energy can’t make economic sense and will automatically raise costs to customers. But wind generation isn’t something utilities and policy-makers should rule out as a ‘fringe’ technology. We believe wind generation is here for good and will become more of a mainstream technology with each passing year.”<sup>4</sup>

Wind power can also be a retail product (through, for example, a green pricing program), a wholesale product (via green tags), or part of a brand identity (as it is for Green Mountain Energy). ESPs often make the mistake of evaluating wind only as a resource. Decisions about generation investment are essentially *financial* and *technical*, a matter of determining which resource can supply the needed electricity at the lowest cost. But wind power can also have a *strategic* component that should not be underestimated. That is, wind power can tie in to higher-level goals such as fuel diversity, maintaining good relationships with customers and regulators, or hedging political risks.

There are numerous roles a company can play in the wind power arena, each of which offers its own set of opportunities. A company might choose to serve as anything from an investor to a retail marketer (**Figure 1**). The roles that make sense for any given company will depend on several factors—most notably the firm’s strategic goals and comparative strengths in the energy marketplace.

**Strategic goals.** What is your company trying to achieve? If, for example, you see wind power as a

way to improve customer relations and establish a green brand identity, then you'll want to get involved at the retail end of the business. But if you're interested in hedging against fuel price risk, you need to be either an owner of wind capacity or a holder of a firm long-term power purchase agreement (PPA). (See **Table 1**, page 4.)

**Comparative strengths.** What is your company good at? For example, "many utilities excel at technology and project management," noted Eric Blank, executive vice president of Community Energy Inc., and wind projects could definitely benefit from such expertise. Similarly, capital is currently very tight in the power market, which suggests opportunities for an ESP looking for investment opportunities (**Figure 2**, page 4).

Outsourcing options are rampant in the wind power arena. Innovative products and companies with narrow and specific expertise have popped up, making it possible for ESPs to be very selective in just what tasks and risks they choose to take on. For example, if you want to offer your customers a premium green product, it's possible to outsource all the marketing to a third party, while still branding the product as your own. Similarly, an ESP that needs to purchase wind energy—for example, to meet an RPS requirement or to supply a green program—without having to get involved in the supply end of the business can often simply buy green tags. (**Figure 3**, page 4).

If an ESP decides to market wind energy to retail customers, we recommend bringing the product to life through experiential marketing (see sidebar, page 10). The narrow, cost-focused approach that works

in an ESP's engineering or rates department doesn't translate well into the marketing department.

## How Did We Get Here?

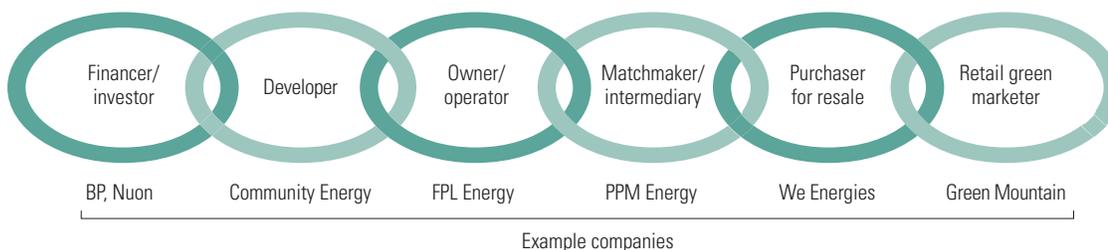
In the late 1990s, as restructuring steamed ahead, some analysts thought the emerging competitive market would mean the death of wind power. They believed that electricity would become a commodity, with price as the only differentiating factor, which in turn would mean that higher-priced generation, such as wind power, would disappear. That may have been the theory, but in practice, the market has done just the opposite. Aggressive policies such as RPSs, technology advances, and—oddly enough—restructuring itself have caused interest in wind power to accelerate rather than fade away.

## The Technologies Work

Wind turbines have gone from temperamental, one-of-a-kind mechanical oddities to dependable, mass-produced, high-performing electricity generators. Unusual turbine designs, such as vertical-axis models, have largely gone away. Turbine design has coalesced around a standard model: upwind units with a 1- to 2-MW peak capacity. Some 6.9 gigawatts (GW) of wind capacity were installed worldwide in 2002 alone, bringing global installed capacity to 31 GW.<sup>5</sup> Wind power industry sales for 2002 came to \$7.3 billion, and the necessary infrastructure of manufacturers, installers, operations and maintenance

Figure 1: The wind industry value chain

There are many roles a company could play in the wind industry, ranging from large-scale investor to retail marketer of green energy.



Source: Platts

**Table 1: Matching strategic goals and market roles**

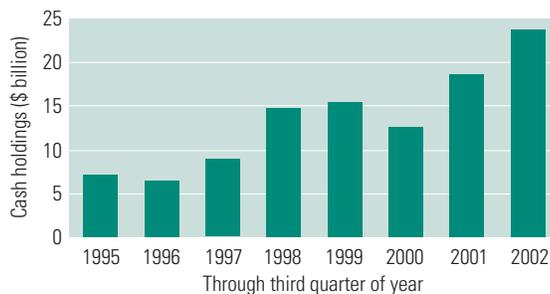
Once you've defined your strategic goal, you can zero in on the specific role you want to pursue in the wind market.

Strategic goal	What you need to be doing
"Green" the brand	Offer a green pricing program; own or purchase new wind capacity
Hedge fuel-price risk	Own wind capacity or have firm long-term power purchase agreement in hand
Meet state renewable portfolio standards requirements with minimal effort	Buy green tags (if state rules allow)
Promote local or regional economic development	Buy or build local new wind capacity

Source: Platts

**Figure 2: Utility cash holdings keep climbing**

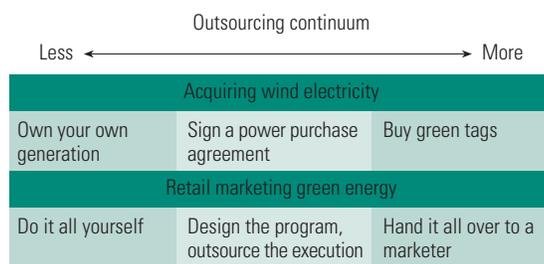
Many utilities are sitting on cash, looking for smart investment opportunities. Some promising wind projects are on hold due to tight availability of capital. This suggests an opportunity for a utility thinking about playing a role in the wind industry.



Source: Platts POWERdat

**Figure 3: The wind power outsourcing continuum**

Small start-up companies are grabbing niches in the energy market, giving energy service providers the latitude to outsource as much—or as little—as they want of their wind energy activities. Our figure shows just two of the many goals an ESP might have, along with examples of outsourcing some or all of the activities required to meet that goal.



Source: Platts

experts, and other support groups is in place. This market maturity means that the technology risk for wind power—that is, the risk that the technology will not perform as intended—has dropped considerably. In fact, it's now approaching the same level as for traditional, fossil fuel-based generating technologies.

## Costs Are Down

As the technology has matured, costs have steadily decreased. It's usually the case that wind generation comes at a price premium relative to fossil fuel-based electricity generation. But because the premium is now relatively small and is shrinking rapidly, it can easily be offset by a public subsidy, consumer preferences, or other factors. In addition, in some cases, wind energy has been found to be less expensive than natural gas-fueled generation (see sidebar, page 5), and that's likely to become increasingly common.

## Aggressive Policies Are in Place

Explicit government programs that support wind get much of the credit for the recent boom in wind power. A long list of state and federal policies now affect or promote the use of wind.<sup>6</sup> However, three policies stand out as being particularly influential.

**The federal Production Tax Credit.** This credit, currently 1.8 cents per kilowatt-hour (kWh), is available to qualifying wind energy producers in the U.S. The PTC, which applies to all new generation installed by December 31, 2003, provides 10 years of tax credits, proportional to actual output. The credit is currently set to expire at the end of 2003, unless Congress decides to extend it.

**Renewable portfolio standards.** As noted earlier, 16 states currently have RPSs in effect, requiring electricity providers to have a minimum amount of renewables in their generation mix.<sup>7</sup> Other states are considering implementing such standards. (Similar requirements are in place in Austria, The Netherlands, the United Kingdom, Italy, and other countries.) The details vary by state, but RPSs typically require an electricity retailer to obtain a set percentage of its electricity from renewable

## Colorado PUC Finds Wind to Be the Least-Expensive New Generation

As part of its 1999 integrated resource planning process for Colorado, Xcel Energy issued requests for proposals (RFPs) seeking bids from power plant developers. After receiving several responses, Xcel selected what it considered to be the lowest-cost options, all of which were based on natural gas. At hearings held in early 2001 by the Colorado Public Utilities Commission (PUC) to review Xcel's bid selection, a number of intervenors argued that Xcel should have accepted some wind power bids instead.

The PUC sided with the intervenors and directed Xcel to accept a bid for a 162-MW wind farm in eastern Colorado. What was

significant about that directive was the reasoning behind it. The PUC said, "We find that adding [the 162-MW wind farm] . . . is in the public interest. . . . This determination is based solely on our finding that the acquisition . . . will likely lower the cost of electricity for Colorado's ratepayers. After a careful analysis of the economics of the wind bid, we find it is justified on purely economic grounds, without weighing other benefits of wind generation." In other words, the PUC found wind to be less expensive than natural gas, on a strict electricity cost basis.<sup>8</sup>

generators, and that percentage increases over time. In Texas, for example, the requirement for new renewable capacity started at 400 MW by 2003 and will rise to 2,000 MW by 2009. Each retailer is allocated a share of the mandate in proportion to its share of total in-state electricity sales. Most RPSs allow for certificate trading.

**Public benefits funds.** Also known as system benefits charges, these funds are essentially taxes on electricity consumption. The revenue is used to support various energy-related public goals including energy efficiency, providing energy to low-income residents, research and development, and expanding the use of renewables. Oregon, for example, provides \$9 million annually to support the use of renewables through its public benefits fund. So far, 15 states have established public benefits funds.<sup>9</sup>

## Restructuring Has Provided a Boost

What does restructuring mean for wind power? Probably the most significant connection between the two is that most state RPSs and public benefit funds came about as part of restructuring legislation. More important from a strategic perspective, however, are the opportunities that have been created for competitive providers by restructuring. In open electricity markets, providers must find a way to distinguish themselves from their competitors, and a number of providers have used wind power to give themselves a market advantage.

About 20 companies now offer retail renewable electricity products in competitive states. The demand created by these products is estimated to have resulted in the construction of over 680 MW of new wind capacity. One example is Community Energy's New Wind Energy, which is sold in several Northeast states. For utilities in regulated markets, these efforts take the form of "green pricing" programs. The customer pays a premium, typically 2.5 cents/kWh, for electricity produced from renewable sources. There are over 100 such programs operating in the U.S., and it is estimated that these utility programs have resulted in the construction of more than 220 MW of new wind capacity.<sup>10</sup>

## Wind Strategies at Work

Today, companies cite a rich continuum of reasons—including fuel diversity and hedging, political calculations, business investment, environmental stewardship, resource abundance, localized infrastructure bottlenecks, market differentiation, and the retail customer experience—for their involvement in the wind power business. Although relatively few utilities have gotten involved in any significant way, the providers that have taken the plunge are finding that investing in wind is not a risky bet on an uncertain future market. Rather, it is the logical response to a particular business environment. And, because the companies we interviewed faced very different business environments, it isn't surprising that they used disparate criteria to determine whether, why,

when, and how they would become participants in the wind power business.

## We Energies

We Energies, which serves about 1 million electric customers in Wisconsin and Michigan, has committed to an ambitious goal of getting 5 percent of its electricity from renewable energy sources by 2011 (far above the states' RPS requirements). In December 2002, the company issued an RFP for 200 MW of wind power and is planning to develop other new renewable energy sources as well. Why the aggressive stance? In addition to traditional drivers, such as a committed CEO and a history of strong environmental concern, We Energies is motivated by what could be called "fuel diversity"—but in the regulatory/political sense rather than the technical resource sense of the term.

A bit of background will clarify. We Energies is facing electricity demand growth of 2.5 to 3.0 percent annually. In response, the company has put together a comprehensive plan for meeting that demand. Introduced in September 2000, "Power the Future" calls for some \$7 billion to be invested in new generation and transmission. Central to the plan is 1,800 MW of new coal-fired power plants. Because We Energies realizes that getting these plants approved will be challenging, the company has been making a concerted effort to communicate its view to the public. Its public-relations activities include community forums, business seminars, a door-to-door campaign, a special Web site ([www.powerthefuture.net](http://www.powerthefuture.net)), and radio and TV advertising to be done in cooperation with labor unions (which support the plan because it is expected to create 1,200 union construction jobs).

A plan containing only new fossil-fuel generation would be unlikely to find much regulatory or public support. Therefore, We Energies has taken the strategy of including new wind capacity along with new coal and natural gas-fired generating plants to create a more balanced and politically acceptable plan. "We're packaging our Power the

Future plan as technology- and fuel-diverse," noted We Energies' Jeff Anthony.<sup>11</sup>

As We Energies sees it, wind also hedges national as well as state-level political risks. According to Anthony, "We have added flexibility not only for fuel price stability but also as a hedge against the day a federal RPS might come down the pike. If that should happen, we'll be ahead of the game."

This isn't to say that the wind power is there only for show. Adding 200 MW of wind is a substantial investment, even relative to 1,800 MW of new coal. We Energies is counting on wind to provide some very real fuel diversity. "Recent volatility in natural gas prices has solidified our view that it makes sense to have a diverse fuel mix," commented Anthony.

We Energies' experience nicely illustrates using wind power's public and political appeal to further a utility's goals—in this case, gaining approval for new fossil-fired generation. No apologies necessary here: Wind power provides a political edge, and there's no reason not to take advantage of it.

## Xcel Energy

Xcel Energy is emerging as a leader in U.S. wind power, with about 800 MW of wind in place, and it plans to add more. Although much of Xcel's wind investments in the past were "involuntary"—that is, driven by regulation rather than by the utility itself—the company now believes that "with the wind production tax credit, the resource is down to market price," according to Fred Stoffel, vice president for policy development at Xcel Energy.<sup>12</sup>

Xcel's recent involvement with renewables goes back to the 1994 Prairie Island agreement, in which the Minnesota legislature allowed Northern States Power (which later became Xcel Energy) to store more spent nuclear fuel assemblies on-site in return for significant increases in funding for renewable generation. For each cask of spent fuel, Xcel was required to spend \$500,000 annually on the development of renewable power sources. As of 2002, Xcel had 17 such casks and was spending \$8.5 million annually on new renewables. In

*Wind power provides a political edge, and there's no reason not to take advantage of it.*

2001, Xcel Energy was ordered by the Colorado Public Utilities Commission to build 160 MW of wind generation, even though Xcel argued that doing so would not be cost-effective because wind was a more expensive resource than natural gas-fired generation. (See sidebar, page 5.) In both cases, new renewables were largely forced on the utility by regulators.

But that was the old Xcel. In 2002, Xcel's renewables strategy began to change. After a bruising and unpleasant fight in the 2002 Colorado legislature, in which Xcel helped defeat RPS legislation, the company began to question its "just say no" approach. A number of factors, including significant cost reductions for wind turbines, volatile natural gas prices, and continuing concerns over fossil plant emissions, meant that developing new wind capacity might make sense for Xcel, even without regulatory pressure. Xcel's popular green pricing program, Windsource™, also built confidence within the company that wind would work. This new view was hinted at in Xcel's 2002 Resource Plan, which stated, "We believe that renewable energy will continue to play a role in cost-effectively meeting our customers' needs."<sup>13</sup>

In 2003, Stoffel says, Xcel has come to believe that wind "serves as a hedge against fossil fuel prices" and—depending on natural gas prices—can be cost-competitive as well. The proof is in the lobbying. When it became clear that the Colorado RPS bill would be reintroduced in 2003, "We looked at what we would need from a bill, instead of just saying no," Stoffel reported. This time around, Xcel testified in favor of the bill. As Stoffel explained, it was clear that the issue of renewables wasn't going away and Xcel decided that it would much prefer the certainty (and reduced risk) of an RPS over periodic battles with renewables advocates and regulators.

As was the case with We Energies, Xcel's new strategy reflects a political reality: wind is here to stay, and it's better for the company to work with wind power advocates than against them. We think it's likely that other ESPs will come to appreciate this viewpoint as well.

## Nebraska Public Power District

Nebraska Public Power District (NPPD) currently obtains its electricity from the Cooper nuclear plant, several large coal plants, nine hydro facilities, and a number of smaller natural gas and oil plants. NPPD is seriously considering adding a 30- to 50-MW wind farm to its generation mix.

The primary drivers behind NPPD's plans for wind generation are economics and customer interest. Frank Thompson, renewable energy manager at NPPD, told us that since 1995, surveys have shown strong customer interest in renewables.<sup>14</sup> And as a public entity, NPPD believes that part of its mission is to deliver what its customers want.

Pinning down and interpreting customer preferences can be tricky, though. NPPD's surveys have revealed some inconsistencies. For example, although NPPD's customers have expressed interest in renewables over time, sign-up levels for Prairie Power, its green energy product, lag far behind customers' stated level of interest. (This is commonly the case across the U.S.; actual sign-ups are typically far lower than willingness-to-pay surveys would lead one to expect.) NPPD is convinced that a better assessment of customer interests is needed, and it is considering using Deliberative Polling™ (see page 11) to better quantify what its customers want and are willing to pay for.

Why wind? Wind resources in Nebraska are excellent. And it just so happens that one of NPPD's transmission lines runs right past an excellent wind site. That means the cost of developing a wind farm would be relatively low, making wind a "competitive resource," according to Thompson. NPPD is also looking into the burgeoning green tag market as a possible new revenue stream that could further improve the economics of a wind farm.

Unlike most utilities, NPPD is planning to do much of the work itself, from site selection to substation design and negotiations with landowners. "That's just the way we do projects," Thompson asserts. Which is a polite way of saying that the company has the necessary

***Xcel Energy preferred the certainty of an RPS over periodic battles with advocates and regulators.***

expertise in-house and sees no need to outsource. As a large, stable public utility, NPPD also has access to some of the cheapest capital around, making in-house projects even more cost-effective.

How will wind fit into the utility's generation mix? NPPD sees wind as increasing the diversity of its generation mix and providing improved protection from fossil-fuel price fluctuations and a possible hedge for increased emissions regulations in the future. Says Thompson, "The resource mix is like a fruit salad. You've got some apples and oranges in there, and wind is like adding a little peach to the mix. We're considering renewable energy resources that are cost-competitive on an energy basis and meet consumer needs."

In our view, NPPD's approach of putting customer needs first is an inspiring one. We believe that ESPs got themselves into financial or strategic difficulties in recent years because their leaders often tried to satisfy the demands of institutional shareholders at the expense of other critical stakeholders, including retail customers, retail shareholders, employees, and their communities. A utility business model that elevates the importance of these other interests is more likely to produce acceptable levels of profits as a by-product.<sup>15</sup>

## Long Island Power Authority

Offshore wind farms take advantage of stronger offshore winds while avoiding some of the land-use conflicts that can make siting onshore wind farms difficult or impossible. But they present some new challenges as well. Access for maintenance and repair is more difficult, the installations must withstand high waves and corrosive sea water, and there can be conflicts with the shipping and fishing industries. So why would a utility decide to build a 100-MW offshore wind farm in the busy Long Island Sound, no less?

According to Dan Zaweski, a manager at Long Island Power Authority (LIPA), the company's interest in clean technologies can be traced back to the LILCO takeover.<sup>16</sup> LIPA was created in 1986 to take over the Shoreham nuclear power plant.

From 1995 to 1998, LIPA took over many of LILCO's assets and began serving Long Island retail electric customers in 1998. At that time, LIPA established a strategy to bring clean power sources to Long Island, and it has been reviewing and assessing clean energy technologies ever since.

But why offshore wind, and why now? Several factors drove the decision to jump in:

- LIPA expects to see load growth that will necessitate developing an additional 100 MW per year through 2011.<sup>17</sup> As a result, the utility needs to be open-minded and imaginative when it comes to securing new generation.
- LIPA serves a largely urban, developed area, which makes siting new power plants extremely difficult.
- Because the utility buys much of its electricity from natural gas-fired generating facilities, it is exposed to considerable natural gas price risk. The extent of that risk was made clear when natural gas prices spiked in 2000 and again in 2003.
- LIPA's preliminary analysis found that "wind power is one of the lowest-cost renewable technologies . . . [and] Long Island's energy costs . . . are somewhat higher than the national average."<sup>18</sup>
- Long Island has no onshore sites appropriate for large-scale wind development. But the offshore wind resource is very good. In fact, wind resource analyses found a technical resource potential of 5,200 MW.<sup>19</sup>

But what will it cost to develop that wind capacity? Answers will have to wait until the RFPs come in, in mid 2003. But LIPA's expectation, according to Zaweski, is that "near-term (wind) prices will probably be at a premium, relative to a combined-cycle natural gas unit. But life-cycle costs? That's still up in the air."

So, what might initially appear to be a bold adoption of a new technology is in fact the logical outcome of LIPA's planning process. The company needs new (and preferably clean) generation, it needs to hedge against natural gas price risk, and it

has access to an impressive offshore wind resource—so why not seize the opportunity to make use of that local resource?

## Community Energy

Community Energy Inc. (CEI) is a privately held company that occupies two distinct yet related niches in the wind power business. It is best known for its premium green products, which are offered in partnerships with utilities in states with retail competition.<sup>20</sup> For example, electricity users in Washington, D.C., can buy CEI's New Wind Energy™ through Washington Gas Energy Services. In addition, Community Energy acts as a developer to get new wind turbines in place to supply renewable electricity for its retail green products. CEI brought its first wind farm on-line in 1999, and as of early 2003, it had 20,000 residential customers, 500 business customers, and several dozen government entities buying its green energy products.

How and why CEI chose to operate as both a marketing partner and a developer reveals a great deal about how the wind industry is evolving. CEI was founded and is still headed by individuals with a strong social conscience. Committed to ensuring that new wind power will be built, they constructed their business model around that goal. CEI's analysis of the economics of wind, however, made it clear that the market for wind could be expanded through a "green premium." In other words, the additional revenue stream from a green electricity product, such as one based 100 percent on wind, could vastly improve the resource's financial viability.

A simple example can illuminate this point. In the eastern U.S., according to Eric Blank, executive vice president of CEI, a wind farm built today could produce electricity at a levelized cost of \$35 to \$45 per megawatt-hour (MWh), including the PTC.<sup>21</sup> The cost for western U.S. wind farms is typically somewhat lower, around \$32/MWh. Power pool prices, however, usually run around \$30/MWh. So in the eastern U.S., wind is generally not financially viable. If, however, the wind energy can be sold at a net

premium of \$15/MWh or more, it becomes an attractive investment.<sup>22</sup>

CEI soon learned a lesson that is familiar to other competitive providers: It is extremely costly to acquire new customers. So CEI hit upon the elegant strategy of partnering with incumbent utilities to sell premium green products to those companies' existing customers. Those utilities already have name recognition and low-cost access to customers via bill-stuffers, which sharply reduces the cost of acquiring those customers. As of early 2003, CEI is emerging as a major "outsourcer," partnering with utilities such as New York State Electric and Gas, Niagara Mohawk, Washington Gas Energy Services, and Commonwealth Edison.

Although CEI is privately held and thus doesn't disclose financial details, Blank told us "CEI's partners are making money." CEI's success has several lessons for utilities in search of a wind strategy:

- It is possible to make money in wind.
- Innovative start-up companies will emerge to meet customer demands.
- By jettisoning the "build-it-yourself" approach and partnering with firms that specialize in providing wind power, ESPs can lower the cost and shorten the response time for providing "greener" electricity to their customers.<sup>23</sup>

## FPL Energy LLC

FPL Energy is an independent power producer. Its business model is simple and appealing: build new generation and sell the electricity. (The company is related to Florida Power & Light, the regulated utility, through its parent company FPL Group.) FPL Energy currently has 7.2 GW of installed electric capacity, with an additional 4.1 GW planned or under construction.<sup>24</sup> About one-fourth of the installed capacity is renewable—mostly wind power (**Table 2**, page 11).

Although the details vary by project, in most cases FPL Energy owns (or co-owns) and operates the generation and sells the output to a utility or other

*It is possible to make money in wind.*

retailer. For example, FPL Energy owns and operates the 300-MW Stateline Wind Energy Center along the Oregon/Washington border and sells the output to PPM Energy.

In 2002, FPL Energy made the surprising announcement that it would no longer develop fossil-fuel plants. Instead, it would exclusively build and acquire wind capacity. According to Michael O'Sullivan, senior vice president for development at FPL Energy, this change in strategy was driven by simple finances: demand for wind power is strong, clients are willing to sign long-term power purchase agreements for wind,

and earnings for wind projects are very attractive.<sup>25</sup> A number of secondary drivers all tilt toward wind as well: wind farms can be brought to market in six to eight months rather than the two to three years gas projects typically take; wind is politically popular and thus less subject to political and regulatory risk; and there are plenty of high-quality unclaimed wind sites still available.

FPL is emerging as the unregulated monopoly—the Microsoft—of the large-scale wind farm construction and operation business. But in this growing market, there's clearly room for a smart competitor. Who's it going to be?

## Experiential Marketing: Connecting Emotionally with Customers

Marketing professionals in competitive industries have taken a fresh approach to the way they practice marketing, deploying new concepts, tools, and metrics over the past decade. Marketing at category leaders like Coca-Cola, MasterCard, and Apple is now conducted according to a new mantra: Design and deliver memorable emotional experiences for customers.<sup>26</sup> These category leaders are using experiential marketing to build durable emotional bridges to customers, activating unconscious preferences and deeply held values.

Among ESPs, Green Mountain Energy Co. (GMEC) is one of a select few practitioners of experiential marketing. The company, which has almost 600,000 retail customers in seven states, is built around satisfying customers' desires to use their purchasing power to make a difference. GMEC's marketing material shows wind turbines spinning against a bright blue sky with the exhortation "Help clean the air we breathe."

"We are offering a clearly differentiated product. There's a real societal benefit for signing up with us—people help to clean the air that we breathe. We have a simple differentiating factor and we promote it heavily," Mark Hammer, director of advertising and marketing for GMEC, told us. "Our proprietary segmentation research tells us what our customers look like demographically and psychographically—their income, what they do in their spare time, and so on. Because we know what's important to them, we can better locate them and position our product for them."<sup>27</sup>

At one time, GMEC used concert sponsorship to identify prospective customers, position its product, and create favorable associations with supporters. In the late 1990s, the company brought folk rockers Loggins & Messina to Pennsylvania to kick off

the firm's presence there. Last year it sponsored a concert tour by Bonny Raitt, a Texas native with a strong following in the Lone Star State. As part of GMEC's sponsorship, the company purchased wind electricity to offset the impact of the tour's electricity usage. Sole sponsorship for events proved to be too costly, and the company has switched channels.<sup>28</sup> Today, GMEC's marketing channels include select storefronts, such as natural foods retailers and recreational stores, as well as regularly scheduled events, such as art festivals or county fairs, that take place in its target markets.

"These venues offer a better opportunity for us to interact with customers and prospects," explained Hammer. "It's difficult, and very expensive, to touch an emotional or experiential chord at mass events like concerts. We want to reach customers where they live and open a dialogue about how they can make a difference."

GMEC is one of the largest, and best-known, renewable energy marketers.<sup>29</sup> Its goals are clear, if a bit daunting: To "change the way electricity is made," and specifically to build, or cause to be built, 1,000 MW of new renewables by 2010. The company began by competing directly for customers in areas that permitted retail competition, such as Pennsylvania and California. When direct access was postponed or eliminated in some U.S. states after the California debacle, GMEC developed a second strategy of partnering with other utilities to offer co-branded premium green electricity. For example, GMEC has joined forces with Pacific Power and Portland General Electric to offer co-branded green power products, somewhat similar to the strategic partnering strategy position staked out by Community Energy. The company's third strategy is to acquire customers through aggregations, as it has already done in northeastern Ohio.

Table 2: FPL Energy's generation holdings

About one-fourth of FPL's current generation holdings are in wind. That will shift in the future, however, as FPL moves toward building only new wind capacity.

Fuel type	Total owned capacity as of January 2002 (net megawatts)
Gas	3,194
Wind	1,745
Nuclear	1,024
Oil	755
Hydro	373
Solar	80
Waste	43
Coal	36
<b>Total</b>	<b>7,250</b>

Source: Platts; data from FPL Energy [24]

## A Hard Look at Wind's Pros and Cons

Our look at case studies helps explain why utilities and players are investing in wind power. But as we all know, the road to business failure is littered with good intentions. Are the reasons behind these companies' actions valid? Do they hold up under the cold glare of unimpassioned analysis? Let's examine the evidence.

## There Is a Strong Public Preference for Renewables

People like renewables. Numerous public polls have shown consistent public support for renewable energy. For example, according to one market assessment, "Trends in public opinions polls have also shown long-standing preferences for renewables and efficiency over other energy sources. . . . The pattern of preferences for using renewables to supply energy has been consistent in the poll data for 20 years. This is one of the strongest patterns identified in all of the [U.S.] national poll data on energy and the environment."<sup>30</sup>

However, public opinion polls have been criticized for raising unrealistic expectations. Some have argued that if consumers better understood the costs and other trade-offs involved in energy

supply, their support for renewables would fade away. But recent research conducted in the state of Texas suggests that public support for renewables is remarkably robust. For this project, the researchers used Deliberative Polling<sup>TM</sup>—an approach that reduces the influence of poor information on public preferences.<sup>31</sup>

Electric utility customers throughout Texas were questioned about their preferences on a variety of energy topics, including renewables. These customers then received in-depth training on energy issues. They were given written material that had been carefully screened for bias, they had time to deliberate the trade-offs in electric generation technologies, and they discussed the issues with advocates of all positions and with each other. The training included information on the costs of renewables and other generation options. They were then asked about their preferences for renewables a second time.

In the first (uninformed) polling, more than 50 percent of interviewees favored renewables as the generation resource that should be pursued first. After the training, their preference for renewables dropped to around the same level as their preference for energy efficiency, but it remained higher than for fossil-fuel plants. In other words, consumers still preferred renewables, even when well-informed about the added costs.<sup>32</sup> This suggests that, at least in Texas, the often-stated public preference for renewables is based not on ignorance of the actual costs but on a deep-seated belief that renewables are inherently better. (As we mentioned earlier, that preference doesn't necessarily translate into customers willingly paying more for renewables.)

We think more ESPs should use the Deliberative Polling method, or a similar approach, to increase the quality of their interactions with customers. We see two types of benefits resulting from using this tool. For the near term, the tactical benefits would include gathering informed customer opinion about the relative costs and benefits of different resource options. But an ESP that uses this tool would also send its customers a strong signal about the way it does business. Customers would see that the ESP wanted to work cooperatively with them to address issues of mutual

*If customers choose higher-cost solutions as part of their desired resource mix, the ESP shouldn't substitute its judgment for that of its customers.*

concern. And if customers choose higher-cost solutions as part of their desired resource mix, the ESP shouldn't substitute its judgment for that of its customers. Tailoring resource decisions to match customers' preferences would provide customers with a new and positive experience that would extend well beyond the monthly bill or the call center's automated voice response system.

## The PR Bounce: How High?

The simple fact that consumers like renewables has implications other than their willingness to pay more for green electrons. There's also a public-relations (PR) angle—one that doesn't exist (or is negative) for other electricity supply technologies. The (as yet unproven) theory is that the public's warm, fuzzy feelings about renewables are transferred to a company that supports renewables. The benefits reaped by the provider could be as diverse as they are diffuse, including political support, as needed; more (and more loyal) customers; and so on.

But are these imagined benefits real? The evidence so far is mixed.<sup>33</sup> Interviews with utilities that have green power offerings indicate that these programs didn't have a significant effect on overall customer satisfaction. Program participants were satisfied, but other customers seemed to be nonplussed. This may have been due in part to low customer awareness of their utility's green power programs. However, the utilities did see marked improvement in their relationships with environmental groups, historically a nemesis.

Municipal utilities benefited from improved relations with city councils, but investor-owned utilities didn't see a clear change in their relationships with regulators as a result of offering green power programs. It would appear that although renewables do have some PR benefits, the direct results are tough to quantify.

## But Will They Pay for It?

Some electricity users are willing to pay more for wind power just because they think it's the right thing to do. It's hard to imagine similar support

for coal, natural gas, or other electricity supply technologies. But how many will actually buy, and how much are they willing to pay?

Utility-run voluntary green pricing programs, in which consumers can choose to pay more for renewables, typically charge a premium of 2.5 cents/kWh for wind energy. These programs have so far achieved market penetrations ranging from 1 to 6 percent. It's important to recognize, however, that this less-than-impressive result sometimes reflects wind supply constraints, limited (and, in some cases, inept) marketing, a lack of senior management support, and other institutional constraints.

Recent E SOURCE market research, in which thousands of buyers and nonbuyers were surveyed, revealed that "6 percent of U.S. households will participate in a green energy program within three years if green energy is effectively marketed."<sup>34</sup> Our research also uncovered the tactics, including market segmentation, strategic partnerships, targeting, and self-efficacy messages, that can be used to reach that level of participation.<sup>35</sup>

Utilities are beginning to use more-sophisticated marketing techniques with good results. Avista Utilities, for example, used the PRIZM market segmentation tool to better target potential green energy buyers, and the response rate for bill inserts tripled. The Sacramento Metropolitan Utility District (SMUD) cut its customer acquisition costs to \$30 per customer—less than half the industry average—through carefully targeted mailings.<sup>36</sup>

But the reality of green pricing is that 6 percent is about the best that anyone in the U.S. has achieved to date. This stands in direct contrast to the clear and consistent results from public surveys and Deliberative Polling, which document a much higher percentage of consumers stating that they prefer wind. We see no clear answer to this apparent paradox.

## Wind Costs More—Or Does It?

Wind energy contracts signed today are typically in the range of 3.5 to 6.0 cents/kWh. As is the case for all forms of electric generation, it isn't possible

to quote a single number to represent the cost of a kilowatt-hour for all energy generated from wind. The levelized costs for wind are site- and project-specific, influenced by the cost of capital, operations and maintenance, financing terms project ownership, the quality of the wind resource, proximity to existing transmission infrastructure, project size, and federal and state renewable energy policies. But levelized cost per kilowatt-hour is just one way to measure the overall cost picture. Wind differs from fossil-fuel power in several other cost-related ways, including fuel price volatility and escalation risk, intermittency, and system integration costs.

**Fuel price risk.** New wind generation typically competes with new natural gas as “marginal capacity”—that is, capacity intended to meet shorter-term demand. As wind’s costs have come down, the issue of fuel price risk has become more prominent.

The prices electric utilities paid for natural gas fluctuated from about \$2.00 to \$3.00 per 1,000 cubic feet in the late 1980s and 1990s. In 2000, however, prices climbed to over \$9.00 in December 2000. By September 2001 they had fallen back under \$3.00 (Figure 4).<sup>37</sup> Fluctuations like these are likely to happen in the future as well,

but of course no one knows just when or by how much. Therefore, electricity systems that depend on natural gas are exposed to a large fuel price risk. Wind power can help offset that risk.

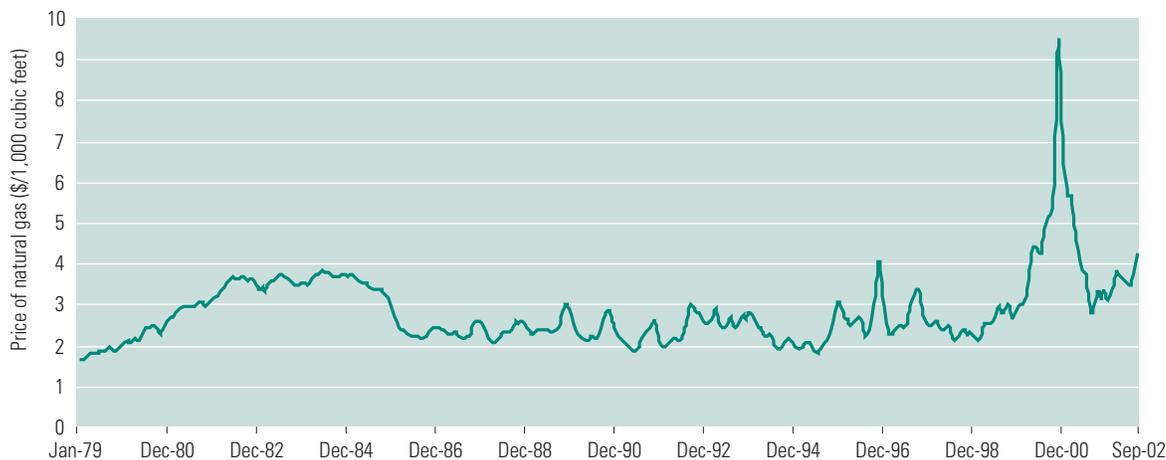
But what’s the value of this fuel diversity? That’s a difficult figure to pin down, but recent research has estimated that gas-fired power plants pay, on average, 0.52 cents/kWh to guarantee gas delivery, eliminate price volatility, and remove gas price escalation.<sup>38</sup>

**Intermittency.** One of wind power’s major challenges is its dependence on a fluctuating resource. Unlike fossil-fueled or geothermal power plants, wind power cannot be turned up to meet short-term electricity demand needs. This issue is usually quantified in terms of “capacity credit”—a measure of the degree to which wind power can be counted on to be available when needed. The capacity credit awarded to wind generation varies depending in large part on the wind resource: An area with strong and consistent winds can provide more consistent output than one with fluctuating winds.

Recent advances in short-term wind forecasting tools have improved wind’s ability to contribute to capacity needs. For example, a detailed analysis concluded that a proposed wind farm in Colorado could be given a capacity credit of 30 percent.<sup>39</sup>

Figure 4: U.S. natural gas prices, January 1979 to September 2002

This chart plots the average prices paid for natural gas by U.S. electric generating plants of 50 megawatts or more in capacity. The recent extreme volatility of natural gas prices adds to the cost of natural gas-fired electricity generation.



Source: Platts; data from U.S. Department of Energy [37]

**The cost of wind's intermittency is a contentious and largely unresolved issue.**

Even so, the cost of wind's intermittency is a contentious and largely unresolved issue.

**Integration.** When wind power accounted for well under 1 percent of total generation, it had little effect on the transmission system. In fact, one wind developer told us that the utility classified his wind farm as “negative load” for system planning purposes. With the use of wind power growing, questions are being raised as to how to best integrate it into the transmission system. What are the effects of an intermittent resource like wind on the system? How should transmission system costs be allocated? Recent research suggests that “nominal amounts of wind power could be safely integrated without disrupting bulk power systems.”<sup>40</sup> The Federal Energy Regulatory Commission's proposed standard market design (SMD) provides guidance on how to charge for wind's use of the transmission system. So far, SMD has been getting a mixed reception, and it's not yet clear how transmission systems will ultimately allocate such costs.<sup>41</sup>

## Does Wind Power Create Jobs?

Pragmatic nuts-and-bolts issues such as employment and tax revenue impacts often drive state-level policy decisions about wind power. Sluggish U.S. economic growth and a relatively high rate of unemployment suggests that state lawmakers might be particularly receptive to the “job creation” argument sometimes used to drive policy decisions regarding wind power installations. But is this a valid argument?

The short answer is that wind power is somewhat more labor-intensive than fossil fuels, if one looks at the entire process—that is, from the mine (for coal), or blade and turbine construction (for wind), all the way through to power plant construction and operation. The latest estimates indicate that wind power installations create about 40 percent more jobs per dollar invested in new generation than do new coal-fired plants: Wind provides 5.7 person-years of employment per \$1 million in cost, whereas coal provides 4.0 jobs.<sup>42</sup>

These numbers can be misleading. First, *where* the jobs are located is as important as how many jobs

are created. For wind power, the bulk of the jobs are associated with blade, tower, and gearbox manufacturing. If the blades are manufactured in Denmark, for example, there will be no direct job benefits for any U.S. state or region.

Second, can one fairly claim that wind power will create more jobs locally or regionally? The question is “more jobs than what?” Constructing and operating a wind farm, for example, clearly creates some jobs—about five person-years of employment per megawatt.<sup>43</sup> But this new type of electric generation will obviously be displacing some other type of generation somewhere else, so the net job gain will depend on how many other jobs are being displaced and in what locations.

Then there's the “economic development” argument that new wind capacity creates or stimulates the local and regional economy. That's certainly an appealing idea right now, as most states are suffering from budget deficits and would welcome new tax revenue. But is it true? The short answer is yes. There are usually economic benefits to be had from *any* new industrial activity, including wind power construction. Landowners are typically paid about \$2,000 per year per turbine sited on their land. Property tax revenues depend on local tax rates, but according to the American Wind Energy Association, local taxing jurisdictions could reap up to \$10,000 annually per MW of new wind generating capacity sited in their areas.<sup>44</sup>

## What's Next for Wind?

What's the future of wind power? Keeping in mind Nobel-prize winning mathematician Niels Bohr's shrewd observation, “it is difficult to predict—especially the future,” here are some informed guesses about where the wind market is likely to go, and where the key uncertainties are.

## What to Watch For

The first set of factors likely to determine what happens to wind through 2005 are natural gas

prices, the extension of the PTC, and wider acceptance of green tags.

**Natural gas prices.** Over 90 percent of the new electric capacity that will be built between now and 2005 will probably be natural gas-fired.<sup>45</sup> New wind generation competes directly with new natural gas-fired generation, and if natural gas prices are low, wind will not be cost-competitive. So far, there is little consensus on the short-term future of natural gas prices.

**Extending the PTC.** The production tax credit, which is currently set at 1.8 cents/kWh is scheduled to expire on December 31, 2003. Eric Blank of Community Energy noted that the PTC is “one through five on the list of the five most important policies supporting wind.” If it isn’t extended, new wind installations will drop sharply.

**Acceptance of green tags.** Green tags are a novel idea, and if they achieve widespread acceptance, they could transform the wind industry. As of early 2003, many of the 16 state-level RPS-like requirements contained language indicating that some sort of credit trading system would be established, but so far only Texas and New England have an active and robust system in place for trading renewable energy credits. A handful of small companies and organizations are selling and trading certificates, but the idea hasn’t yet gained widespread acceptance.

Looking further out, through 2010, we need to include a few more factors in the wind power equation: transmission access and pricing rules, the growth of RPSs, and the possibility of carbon regulations.

**Transmission access and pricing rules.** The U.S. Federal Energy Regulatory Commission’s proposed standard market design will determine, among other things, how much intermittent resources like wind would pay for transmission access. The final form of these rules will strongly influence the cost-effectiveness of wind power.

**RPS growth.** Currently, about 16 states have renewable portfolio standards in place. Although these requirements differ hugely in the amount of

new renewables they mandate, if more states pass RPSs, the wind market will grow in response.

**Carbon markets.** Electricity generation is responsible for 39 percent of U.S. greenhouse gas net emissions.<sup>46</sup> There are no federal carbon control regulations currently in place in the U.S. and none are likely until at least 2005—and probably not even then. But we see several drivers that would encourage the development of a U.S. carbon market, even without explicit national regulations.

- The Kyoto Protocol is gaining ground. Both Canada and Japan have ratified it, and a global market for carbon dioxide emissions may become a reality within the next few years.
- The Chicago Climate Exchange is a voluntary carbon trading system, in which a number of companies (including American Electric Power and Manitoba Hydro) have committed to explicit carbon-reduction goals.
- Several investor groups, including some state pension funds, are pressuring large carbon emitters to reduce their emissions.
- Some states are pushing carbon reduction. For example, both New York and California are pursuing automobile carbon emissions reductions.

## The Answer, My Friend, Is . . .

We have shown how the wind power business in North America has expanded and matured, as reflected in the existence of specialist firms operating at different points along the value chain. For those inclined to view the glass as half-full rather than half-empty, there are widespread and significant benefits—in the areas of operations and marketing as well as political, environmental, social, and financial advantages—to be gained by participating in the wind power market.

Wind technologies are still on the steep side of the technology curve, but significant cost reductions are expected to result from economies of scale in production and in turbine/blade sizing

*Eric Blank of Community Energy noted that the Production Tax Credit is “one through five on the list of the five most important policies supporting wind.”*

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in the next few years. In the western U.S., wind is close to cost-competitive with natural gas, and it is likely to cross that line in the next five years. The March 2003 announcement by MidAmerican Energy, a firm controlled by Warren Buffett, that it will build a 310-MW wind farm in Iowa suggests that wind may already have crossed that line. We've heard unconfirmed rumors that wind energy can now be generated at prices well below that of natural gas generation, but wind developers don't want that known, because it would weaken their contract negotiating position and threaten efforts to extend the production tax credit.

We advise ESPs to think *now* about what role they will want to play in this burgeoning market. They need to carefully consider both the limits and the

market potential of wind power. It will not replace coal as the base-load fuel of choice for much of North America, and it must still clear regulatory and financial hurdles. And although wind power will provide exciting opportunities for some energy businesses, others will find it to be a distraction—or worse.

We urge our member companies to avoid repeating the industry's recent mistake of pouring all available capital into this business, as many did with the merchant power generation market in the late 1990s. Although wind power is no longer a niche market, neither does it afford an unlimited market opportunity with profits for all comers. Pick your spot carefully today, and you'll be less likely to have a tomorrow filled with regrets or recriminations.

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## About the Author

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