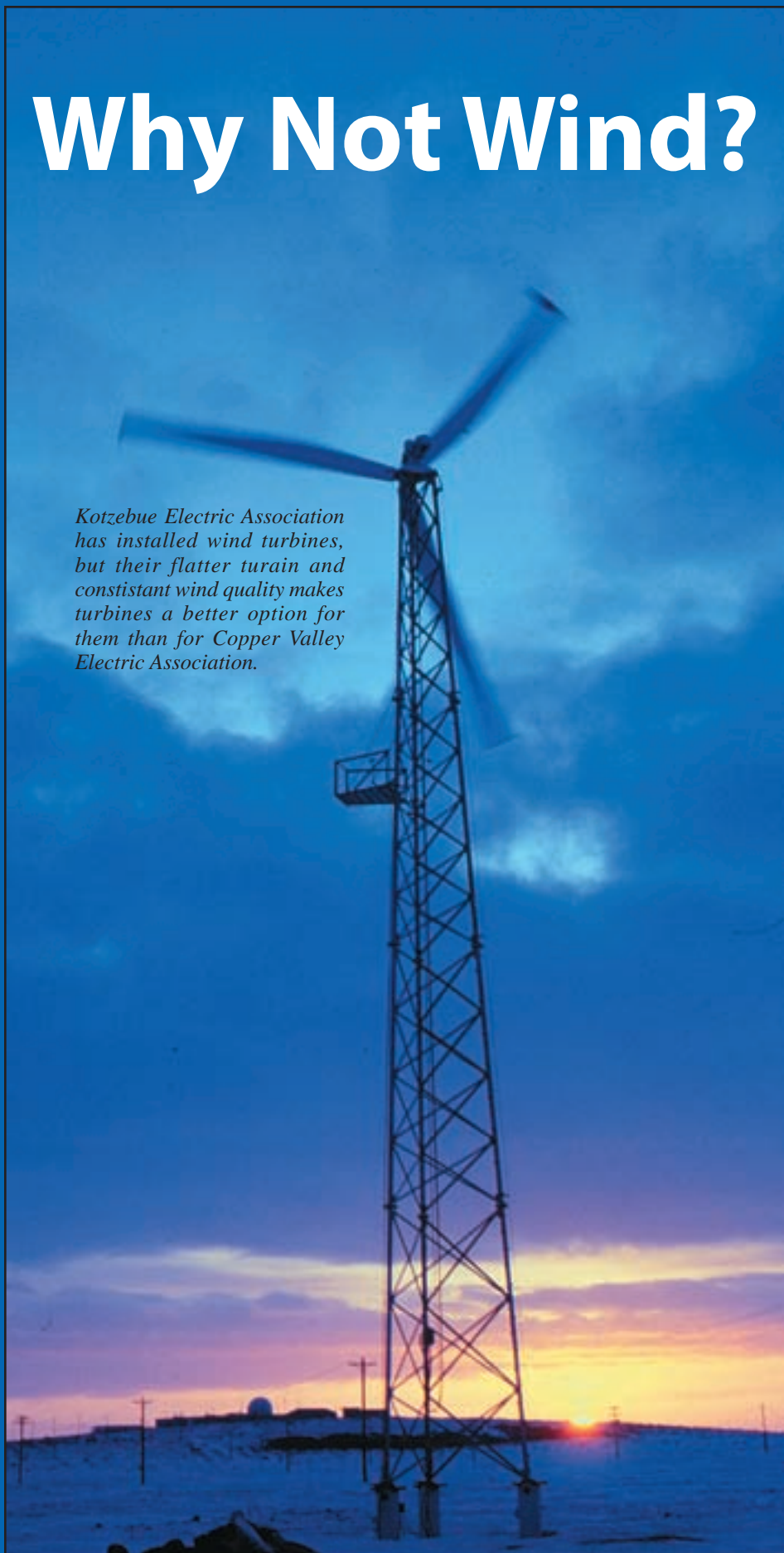


Why Not Wind?

Kotzebue Electric Association has installed wind turbines, but their flatter terrain and constant wind quality makes turbines a better option for them than for Copper Valley Electric Association.



Easily the most prevalent of “green” resources being considered nationally, wind energy has garnered attention in the Copper Valley Electric Association (CVEA) service territory as well.

As reported in the September 2006 Strategic Issues Discussion Paper and briefly addressed in the last edition of Ruralite magazine, CVEA has looked at the potential of a wind energy project that might displace fossil fuel generation. In addition to a field reconnaissance trip with two leading Alaskan wind energy consultants, CVEA retained an independent review of what generation options, including wind turbines, might provide lower costs to CVEA members. This article will delve further into what information was gathered during our investigation of wind energy.

Will the Wind Blow?

The most important requirement for a successful wind energy project is a quality wind resource, because no amount of capital can counter a poor site selection.

One or more years of wind monitoring is typically performed at potential sites prior to installing a turbine. From this data, energy from the wind resource can be evaluated while taking into account detailed wind speed data and periods when units are shut down due to too much or too little wind.

Such detailed monitoring has not been performed at potential sites in the CVEA system. Some historical data is available from federal weather stations, but this data is site specific and may be some distance from the desired location of the turbine. Furthermore, the data is typically somewhat limited in detail and will not provide necessary information on wind characteristics, such as turbulence.

Location, Location, Location

Another key factor is the accessibility to the site for construction/maintenance and cost to connect a potential wind energy project into the distribution or transmission sys-

tem. For the field reconnaissance trip, CVEA used the Alaska Energy Authority's (AEA) wind resource map to identify sites with Class 4, or better, ratings and sites suggested by consumers: Thompson Pass, Willow Mountain in the Copper Basin, a bluff northeast of Gakona, and the Lowe River outlet area of the Keystone Canyon.

While the consultants agreed with our identification of potential sites from the wind resource maps, their feedback during the field visit was that each of the sites has technical challenges and accessibility issues such that they do not fall into the category of low cost or easy to develop.

Mountainous terrains, such as that found in much of the CVEA area, tend to produce gusty winds, and direction can quickly change 180 degrees—factors that significantly reduce power production.

Although the average wind speed in these areas may appear to be favorable, it is not uncommon for wind gusts to reach speeds where turbines will go into a "brake" mode and shut down operations.

Icing on turbine blades is an issue in many areas. Snow in Thompson Pass and other potential areas can reach depths that require tower heights that increase project costs. Areas on ridges where wind direction and speed and snow depths may be more favorable are located some distance from CVEA's existing infrastructure, and the capital costs associated with the required transmission interconnection would further erode project economics.

Cost Versus Benefit

While evaluating alternative energy resources, it is important to look at the net benefit to the consumer. As described earlier, wind generation is site specific. Without identifying a particular site, corresponding estimates of the expected annual energy cannot be made. A range of energy production is therefore provided based on the upper threshold of what might be found in the CVEA area.



In the case of CVEA, consumers receive the bulk of their energy requirements from the Solomon Gulch hydro project for approximately five months of the year (May-September). This means if we had a wind turbine it would not be used during the summer months.

Based on an application for only seven months of the year and the cost per kilowatt-hour of wind turbines, our estimates indicate wind generation—not including the cost to tie the wind units into the transmission or distribution system—is greater than the cost of diesel fuel for diesel generation.

While wind energy has gained increasing popularity in the Lower 48, these projects are dominated by large-scale installations with total installed capacities of up to 200 megawatts with numerous turbines. The norms for installation costs in larger projects is approximately one-third of the equipment costs; whereas in Alaska, installation costs can equal or even exceed equipment costs.

Even with the large installations in the Lower 48, officials cite the continued need for tax credits and other financial incentives for the industry to grow.

In Alaska, a number of small-scale turbines have been installed, but federal grant funds have financed most of these costs, and true economics are difficult to obtain.

Kotzebue Electric Association, Alaska Village Electric Cooperative (AVEC), and TDX Power have all installed wind turbines. Costs are as high as \$6,000 per kilowatt due to the small size of turbines being placed and high installation costs.

The installations of these three utilities are all located in western Alaska in coastal areas with very little vertical relief. Winds in these areas are typically steady and from a single, general direction—both factors that favor energy production—unlike what is found in the CVEA service territory.

The Search Continues

The subject of wind energy and other alternatives has been discussed at length by the CVEA Board. CVEA continues to look for alternative energy solutions that will provide long-term benefits to the membership. While it may be possible to reduce CVEA's dependence on fossil fuels, that does not necessarily mean that the monthly bill will be reduced.

At this point it is not cost effective to develop or further explore wind resources. However, CVEA will continue to monitor the development of wind technology and to investigate other options and opportunities that might lower members' costs and provide more reliable electrical service. ■