Will Wind Work for CVEA?

The CVEA MET tower is located in the center of a clearing 200 feet in radius. It stands 167 feet in the air and is supported by 12 anchors and 20 guy wires.

Photo by Tom Kelly, CVEA Line Superintendent

Is there wind in Valdez that can be used to generate electricity? With the growing interest in renewable energy alternatives, this is a question that Copper Valley Electric has been asked repeatedly over the last several years. Robert Wilkinson, CVEA CEO, responds to that question by saying, "we don't know, but we're going to find out".

So, why wind…why now? In 2010, CVEA adopted a vision to reduce or eliminate the Cooperative's dependence on fossil fuel and to stabilize the cost of generation with regional, sustainable resources. To accomplish this task, a substantial amount of the Co-op's time and resources are spent looking at alternative ways to generate electricity. Additionally, CVEA has participated on the Valdez Mayor's Energy Task Force, where a wind study became a top priority in 2010.

It is apparent to everyone that there is a lot of wind in Valdez. Wind alone, however, isn't good enough. It must be 'good wind' to support a wind generation project. What do we mean by 'good wind'? Good wind for a wind energy project is all about consistency; it can't be too mild or too strong and it can't come from all directions.

The power curve for wind turbines are very specific for each model, but to illustrate an example; a GE 1.5 megawatt turbine does not begin to turn until the wind speed is at 6.7 mph and it produces 200 kilowatts of power at 10 mph. At 18.5 mph, this turbine hits 1 megawatt (1,000 kilowatts) and it peaks at 1.5 megawatts at 25 mph. At only 45 mph, the turbine will shut itself down as a protection mechanism. As this demonstrates, high wind speeds are not optimal for wind generation.

So, the first step of a wind study is to find out whether or not a location has 'good wind'. To do this, one must collect and analyze data with a Meteorological (MET) Tower. MET towers collect wind and temperature data. The wind data is gathered using anemometers and vanes. The anemometers register the speed of the wind and the vanes register the direction of the wind. Additionally, vertical anemometers determine if there are vertical components, called shear forces, of the wind that would not be beneficial to a wind generation project.

The anemometers produce an output signal with a frequency value proportional to the speed of the wind. The temperature sensor produces an output signal with a voltage value proportional to the ambient temperature. All of these signals are collected by a data logger.

In 2010, $100,000 was included in the State of Alaska capital budget to fund wind resource evaluations in CVEA's service territory. This funding was used to purchase two MET Tower systems that include a 50 meter tower with anchors and all of the instruments necessary for collecting wind data. Project costs

include installation, monitoring data collection and evaluation of the data.

With funding for the project in hand, the next important step was to determine the best location for the tower. CVEA conducted preliminary analysis at multiple locations and reviewed regulatory requirements in order to narrow down prospective sites. In 2010, CVEA gave a presentation to the Energy Task Force, providing them with the two most promising locations. After a group discussion, the higher ranked option was removed from consideration due to potential scenic view shed issues. The task force requested CVEA focus on a project in the 10-Mile area.

CVEA ranked the 10-Mile area as the second most promising location. The area is well known, by locals and visitors alike, for having high winds. This is due to the area's proximity to high rock canyons that act as wind funnels. The area also functions as a channel for winds coming off the Port of Valdez and back into the canyons. Additionally, the location ranked high regarding public safety, public acceptance, lack of Avian issues, and road access.

CVEA worked with the State of Alaska and the City of Valdez to obtain permits and access to the current location, which was chosen due to existing road accessibility and its proximity to the following: the middle of the Lowe River Valley, a protective dike, and existing power infrastructure.

The tower is a temporary structure that will remain at the current location for a minimum of one year while the Cooperative gathers data on wind speed, direction, and temperature. Once the data is collected, it will be analyzed and validated by a meteorologist and wind power expert to determine the energy potential of the site. If the data indicates that the site is a viable location, CVEA will begin evaluating geotechnical data, wind turbine options, and interconnection possibilities, while continuing to collect data.

If it turns out the location has 'good wind', the next step will be to determine what wind energy project might provide the most economic benefit. The exact location of a turbine will also need to be determined as it is unlikely it would reside in the exact location as the tower. A geotechnical review would be conducted to determine if the ground in the area is capable of supporting the type of turbine that might fit CVEA's energy potential.

CVEA also has plans to install a second tower that is currently being evaluated for installation in the Copper Basin.

CVEA would like to remind everyone to keep a safe distance from the MET tower at all times. The support wires can be very hazardous to pedestrians and motorists that enter the cleared area.

CVEA advises that no one get closer than the levy road. Tampering with or causing damage to the support wires or structure may result in serious injury or death.

For additional information on this or any CVEA project, contact Sharon Crisp at 822-5506, 835-7005, or email crisp@cvea.org. ■

Top, KB Energy, LLC President Keith Broyles (left) and lead installer Terry Broyles (right) assisting CVEA during the installation of the MET tower.

Above, CVEA lineman, Garrette Francis, operating an excavator during the installation of the support anchors.

Photos by Tom Kelly