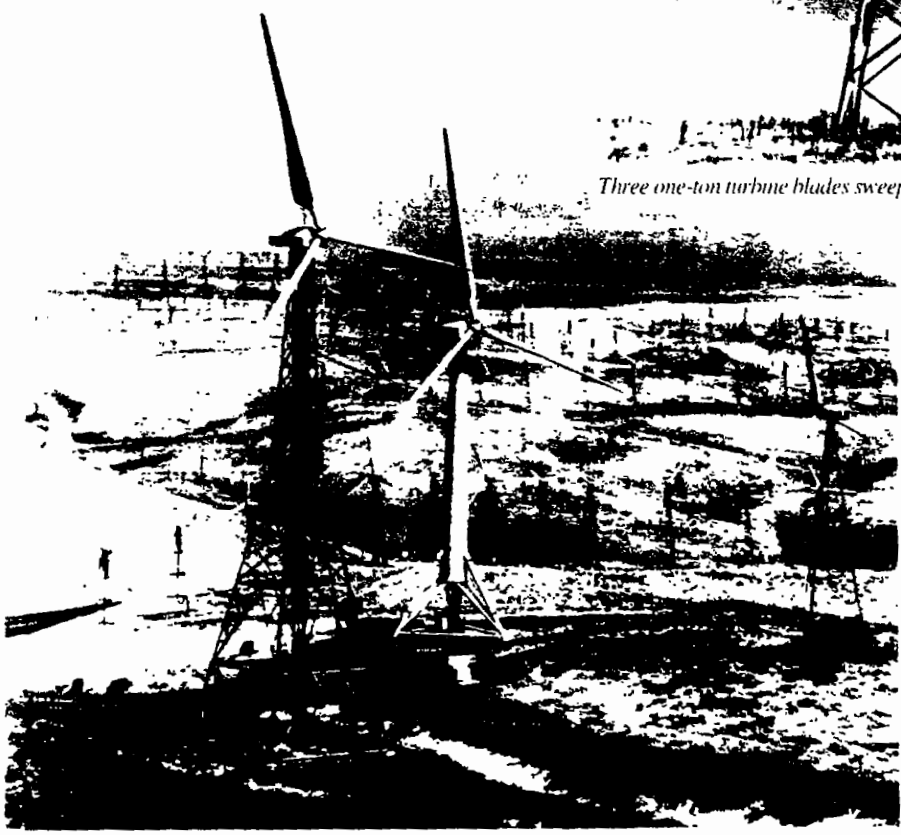
Power Blowin' In The Wind

Each laminated fiberglass blade weighs a ton. The pitch of the blades can be varied, much like the trailing edge of an airplane wing. This, combined with an advanced electronic converter allows the rotor and generators to operate with variable wind speeds while maintaining constant frequency power. Turning wind into electrical energy is the wind turbine KVS-33 from KENETECH Corporation, San Francisco. They are the world leader in the manufacture of wind turbines and the developer of Windplant™ generating systems for utilities. KENETECH has development projects across Canada, Europe, South America, and the United States, including this northern California Windplant producing 420MW.

The KENETECH KVS-33 provides four times the energy of its earlier constant speed wind turbines at only two-and-one-half times the cost. Power is produced at about five cents per kilowatt hour—competitive with new fossil-fuel plants. The advanced electronics, aerodynamics, and wind turbine design allows the KVS-33 to capture significantly more energy than constant speed wind turbines. The turbines cut-in at nine-mph wind speed and cut-out at 65-mph.

Three one-ton turbine blades sweep through a 108' diameter circle.



KENETECH Corporation developed Windplant™ of hundreds of wind turbines connected to a utility power grid.

Linking Up

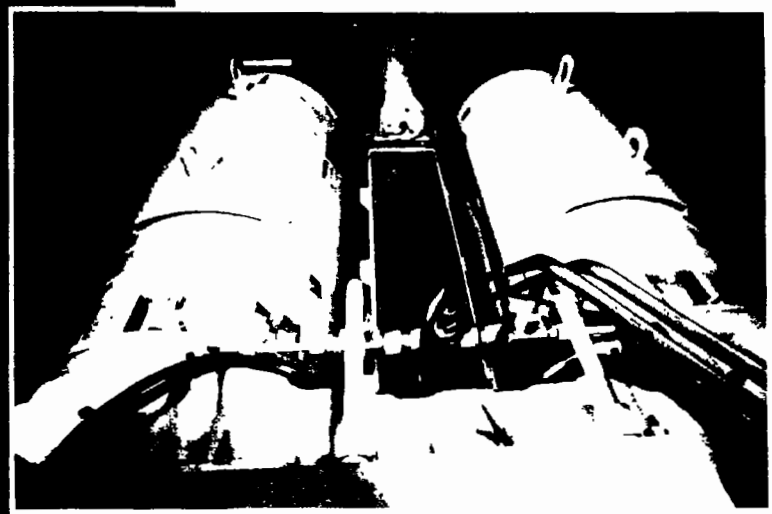
The linking of wind turbines into a network to produce power for a utility has several advantages. Wind is an emission-free, inflation-free fuel source. The ability to predict a reliable wind resource, durable turbines, modular setup, and relatively short construction time, give utility planners flexibility in meeting capacity and energy requirements. With permits obtained, a Windplant can be expanded in a matter of months, from 5MW to 50MW, or more. Site selection is scientifically determined to ensure the most constant wind levels.

The northern California, Altamont Pass site, has one of the most consistent wind patterns worldwide.

High frequency switching by the turbine converters creates the AC current waveform that is delivered to the grid. From a single work station, Windplant operators can control the performance of several thousand turbines simultaneously while scanning data on individual turbines. Anemometers on top of the turbine housings are linked to onboard computers which control each machine. Individual turbines are linked to the central control station via satellite or fiber-optic communications systems.

Generators

Lincoln Electric motor division has recently begun supplying generators for KENETECH wind turbines. Working with KENETECH, Lincoln design and engineering groups and technical sales representatives met a unique need, providing the most efficient generators at a competitive price. Generator life is expected to be seven years or more. Lincoln has dedicated a $44 million building to the design, development, and production of motors. The motor group has been especially organized to custom engineer motors to exacting customer specifications. And to do so quickly with the quality and durability famous in all Lincoln Electric products.



Lincoln Electric generators ready for final hookup in a KENETECH wind turbine

Turbine towers range in height from 80' to 120'