



ALTERNATE ENERGY SOLUTIONS INTEGRATED, INC.

“Helping clients understand wind resources to better hedge energy costs and lower carbon footprints.”

The Future Cost of Energy

We estimate the nation will need approximately 300,000 MW nationally by 2035 simply to match a 1% annual growth rate in electric energy demand. This is the approximate equivalent of forty 800 MW nuclear or clean coal power plant facilities.

For the past 50 years the cost of electrical energy has consistently grown at a rate of 2 ½ % to 3 ½% year after year until the past decade. The rate of increase has changed, from coast to coast regional utility rates hikes range from 4 ½ % to 6 ½ % annually. In our opinion, electrical energy costs will continue to increase for the foreseeable future.

According to economists specializing in the energy sector, the cost of designing and constructing a nuclear power plant began to increase significantly in 2006. At the turn of the decade, nuclear cost estimates were widely projected in the \$2,200/kW to \$2,800/kW range.

Four new reactor designs have been proposed by the U.S. electrical sector to the Nuclear Regulatory Commission. Most of the designs were never built or operated prior to their submission. Current cost estimates are being pegged at \$9,000/kW without factoring in the cost of finance, operation and maintenance.

It takes roughly 10 years to develop a nuclear facility and bring generation on-line. Due to the elevated economic risk with nuclear construction projects, development of many projects may be placed on hold until federal subsidies and loan guarantees are put in place by the government.

Clean coal technology is also expected to be rather expensive to implement. To date, no clear technology has emerged as a process standard. Experts project that the technology could be ready for commercial use by 2020.

Natural gas is plentiful and relatively inexpensive at the beginning of calendar 2010. Natural gas competes with the heating sector and may also become an intermediate fuel source for transportation while the development of hydrogen fueled vehicles proceeds.

As greater pressure is placed on mitigating the effects of anthropogenic climate change along with the growth of population and a strengthening economy, energy price inflation is likely to occur.

Our Perspective on Climate Change

Arctic air temperatures have increased ten times faster than the global-mean surface temperature. In the Russian Arctic, buildings are now collapsing because permafrost under their foundations has melted. The Greenland ice pack consists of 2,600,000 km³ of ice which is thinning. This ice pack has the potential to raise ocean levels by 6.4 m (21 ft.).

The permafrost region contains millions of tons of frozen plant life and, if allowed to thaw, has the potential of releasing an unprecedented amount of carbon into the atmosphere. The implications on the greenhouse effect would be tremendous.

In addition to carbon dioxide, black carbon is found to be the 2nd largest contributor to global warming. Black carbon primarily acts as a climate forcing agent that is emitted into the atmosphere by way of the incomplete combustion of fossil fuels.

Domestic and international pressure continues to weigh on Washington, D.C. to continue to address GHG emissions and to develop a national energy policy.

US Wind Market

Investment in new wind power capacity is expected to surpass \$16 billion (USD) during the year 2011, setting a new annual benchmark for generator production and installation. As of 2010, U.S. installed nameplate wind generating capacity stood at 35,000 MW and is expected to grow to more than 46,000 MW during the year 2011.

Wind power generation of electricity has moved far from being an environmental issue touted by activists to a mainstream generation option for electric utilities. More utilities are committing to long term Power Purchase Agreements (PPAs). State mandated Renewable Portfolio Standards (RPSs) require power suppliers to ensure a given percentage of the electricity being sold is generated by a renewable resource. RPS mandates exist in 32 states and the District of Columbia.

With the advances in wind energy measurement and low speed wind turbine technology, clients in lower speed wind regimes are now able to effectively use wind power to mitigate their carbon footprint and provide an energy cost hedge against raising energy prices.

Our Company

Alternate Energy Solutions Wind Resource, LLC., a wholly owned subsidiary of Alternate Energy Solutions Integrated, Inc., and provides renewable energy resource assessment for our clients. Our client base includes publicly owned municipal electric utilities, high school districts and intermediate school districts, colleges and universities, private development, and performance contract companies.

The company has serviced clients from Alaska and Montana, through the Midwest and Great Lakes region. The parent company, its subsidiaries and our strategic partners have the technical and construction expertise to deliver turn-key systems that are stand-alone or grid-connected.

The company and its technical staff work across many engineering disciplines to provide "best of technology" design tailored to each client's unique location, needs and requirements. We are a vendor neutral developer.

We facilitate all aspects of a project's development inclusive of Conceptual Design Reports (CDRs), feasibility studies, engineering, construction, plant economics and pro-forma projections.

The company has established a network of investment banking, municipal financing, and independent power producers for equity and debt funding of projects. Project location and development may be domestic or international.

Furthermore, the company endeavors to return a portion of its success to academic institutions in the regions where we do business.

Management

A good management team is perhaps one of the most critical components of a corporation because it is responsible for administrating the affairs of the company, which, in turn, affects client satisfaction and ultimately corporate earnings.

Alternate Energy Solutions Integrated, Inc. has assembled a management team that is well focused and works with stakeholders interested in wind resource investigation and development. We augmented our personal experiences and talents with those of other professionals as well.

Board of Directors

Melvin W. Bredemeier
Director

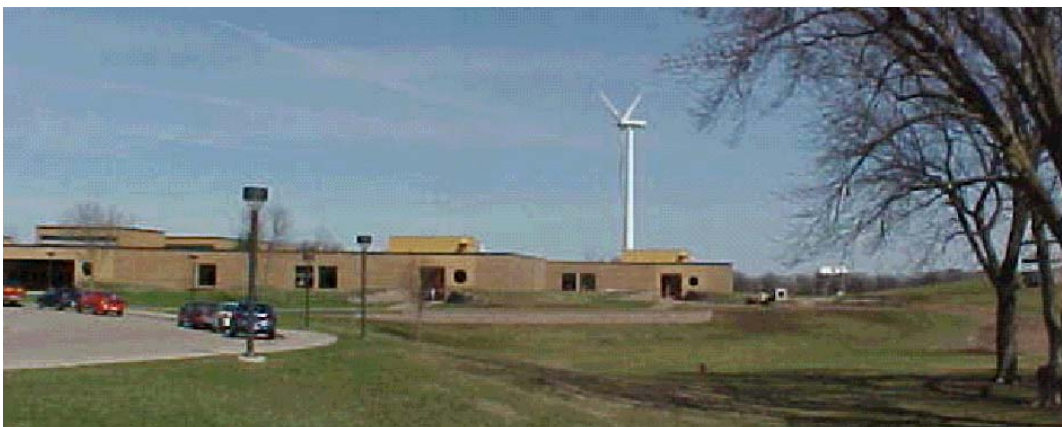
Robert J. Byarski
Director and Chief Financial Officer

Russell R. Lockhart
Director and Vice President

Sally G. McLellan
Director and Secretary

Thomas S. Palermo
Director and Project Manager

John D. Wolar
President and CEO



Nordex N43 600kW wind turbine adjacent to a school building in the town of Forest City, Iowa.

The turbine is connected to the grid of the local municipal utility. School is credited for electric energy generated.

Engineering and Infrastructure

Alternate Energy Solutions Wind Resources, LLC. has positioned itself as a development company having the capability to conduct physical wind monitoring, resource and feasibility studies, project planning and engineering coordination, site excavation and foundation work, negotiation of wind turbine supply and warranty service maintenance agreements, power and REC purchase agreements, wind turbine construction and commissioning.

We are not opposed to looking at a project that would be considered a special situation. For example, the company has performed wind turbine survival studies of a utility client where wind velocities would demand the installation of IEC Class S turbines. The company then negotiated with manufacturers, on behalf of the client, for design change to permit unit installation in the most demanding of wind environments.

Generally, we focus on projects that have up to a 20MW nameplate rating. Larger projects are handled as a coordinated effort between ourselves and extremely well established construction firms. These entities have unprecedented access to the appropriate heavy construction equipment and skilled manpower for the build-out of large infrastructure requirements necessitated while developing robust wind regimes. This includes high-voltage special circuit transmission lines.

Construction insurance and bonding will be provided for all projects.



Rotor blade arriving on transport.

Professional Services

Our staff will work with you step-by-step to evaluate and explain which technical options make the most sense, give reasonable projections for cost savings, provide the necessary reports and representation for system financing, use uniform project pricing standards for feasibility studies and construction, oversee and ensure your system project is built and functioning correctly.

Specific services we provide include:

- Meteorological Tower Installation and Maintenance
- Wind Measurement, Analysis and Mapping
- Economic Feasibility Studies
- Turbine Specification Development

Project Funding

There are a number of wind farm ownership models being used throughout the US. We work with an established law firm, experienced in both the municipal and electrical energy industry sectors, to assist clients with the various ownership models given below:

- Municipal
- Educational
- Electric Cooperative
- Sole Investor as Owner
- Local Investors as Owners
- Limited Liability and C-Corporation Joint Owners
- Projects with Public and Private Ownership

Wind Data and Evaluation of Resource

Clients interested in developing a wind generating facility should have a minimum of one year's wind data at an elevation of 50m (164ft.) with supporting data from other meteorological stations within the immediate region being proposed for turbine placement. In the absence of supporting data, the standard engineering requirement for resource evaluation is two years of data.

The accurate measurement and interpretation of wind data for a site under consideration is one of the most important aspects of the wind renewable industry. To acquire wind data, it is necessary to install wind measurement towers on the property being investigated. Generally, the installation of one measurement tower will provide the necessary wind data when evaluating large areas of flat open land. Two or more measurement towers give more meaningful data as the topology of the land becomes more complex, e.g., ridges, buttes, valleys and hills.

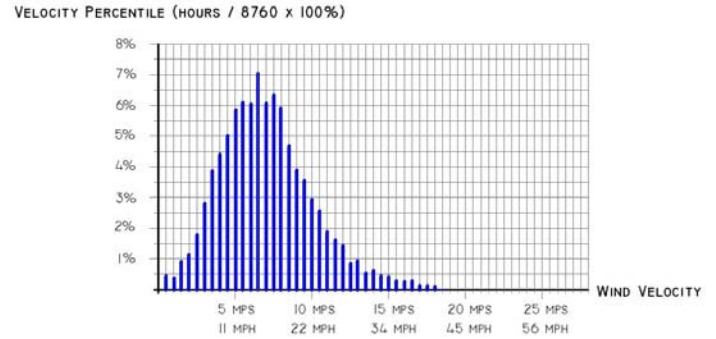
There are several companies that manufacture wind velocity measuring instruments, towers and data recorders. Management has reviewed the cost of equipment and found that amounts range from \$18,000 to \$45,000 depending upon manufacturer, the type of measuring instrument, sophistication of the data recorder and the height of the tower. The time to properly install the typical tower would be in the order of 86 to 110 man-hours on unencumbered land.

The Company has a high degree of technical competence to provide our clients with important advice on the merits of a territory's wind resource.

The evaluation and analysis of wind data uses what is known as *Weibull statistical analyses* with focus on two important parameters, the shape factor of the wind speed frequency distribution curve and the scale parameters. Although there are wind sites that have exceptionally high wind velocities, these sites are generally not suitable for wind turbines because the wind turbines are programmed to stall at high wind speeds, to protect the rotor and tower structure. Turbine rotors are stalled when excessive wind speed is present. This is accomplished by turning the blade pitch into the wind at cut-out speed.

When evaluating wind data, simply knowing that a site has a high average wind speed is not sufficient information to warrant the investment in a wind turbine facility. The pattern for the distribution of wind speed and frequency are equally important factors.

TYPICAL WIND SPEED FREQUENCY DISTRIBUTION CURVE



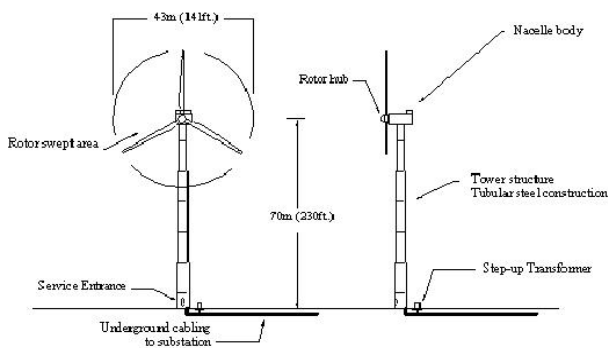
The distribution curve is evaluated for its shape factor (k) which is representative of how much power can be captured from the wind. Shape factors are typically assigned values of 1.50 to 3.00. Most wind sites have shape factors in the range of 1.85 to 2.40. The lower the shape factor, the better the site and the capacity factor for the wind generator. Therefore, knowing just the average speed for a given location is not a good engineering metric for determining the merits of installing wind generation.

The type of ground cover in the region tends to offer a certain degree of resistance to the movement of wind as ground level is approached. The opposition to wind can be given a value, or friction coefficient, that may be used in calculating wind speed at higher altitudes when the speed of the wind is known at a certain height above ground level.

Wind Turbine Technology

Wind turbines come in a variety of designs having varied power or nameplate ratings. One of the more basic design distinctions is made between vertical and horizontal axis wind turbines. The following section of this prospectus will focus on horizontal axis machines.

Horizontal Axis Wind Turbine (3-Blade Design)



As wind energy flows across the blades of a wind turbine, a portion of the wind's energy is removed by the turbine rotor blades. The amount of energy removed from the wind is a function of the efficiency of the rotor. The rotor converts the wind energy into rotary mechanical energy for delivery to an electric generator by way of a mechanical shaft and transmission gear-box. An electric generator receives the twisting force, or torque, from the drive shaft and produces electrical energy based on the velocity of the wind. Conductors bring the electrical energy down the tower to a step-up voltage transformer at the base of the turbine for more efficient power transmission to the electrical grid or substation.

Turbine Sub-System Components

The following discussion of turbine sub-systems is intended to give the prospective investor a general overview of the components making up a typical wind turbine.

Major Turbine Sub-Systems

- 1) Rotor Configuration and Construction
- 2) Rotor Power Control
- 3) Rotor Braking System
- 4) Drive Train and Nacelle Support Structure
- 5) Electrical System
- 6) Yaw System
- 7) Tower

Rotor Configuration and Construction

The purpose of the rotor is to convert a portion of the energy within the wind stream into mechanical energy in the rotor shaft. Rotors having three blades are the Danish industry standard.

Rotor blades may be constructed from wood epoxy, glass-polyester, glass-epoxy, carbon-epoxy, glass fiber epoxy and polyester. The primary considerations here are flexibility, weight, structural integrity, and resonant frequencies.

Rotor Power Control

There is a tendency for short duration, destructive torque to occur when high wind gust conditions are present. Development of high drive train power and torque must be avoided in wind turbine design. The management of drive train power and torque is accomplished by the rotor power control system. As a general rule, the limiting of rotor power may be accomplished by blade pitch, active stall control, or active yawing.

Rotor Braking System

The purpose for a rotor braking system is to stop the rotor and to be able to park the rotor under normal operating conditions. Additionally, braking is part of overall turbine system safety from the point of view that the machine can be brought to a safe position when potentially dangerous conditions exist.

Aerodynamic braking in the form of rotor blade tip-brakes is considered one of the best methods for reducing rotor speed. In utilizing aerodynamic braking, the mechanical power of the wind is removed at the source, thus, the drive shaft does not need to have undue stress placed upon it to stop the rotation of the blades. Mechanical disc brakes are also installed as part of the braking system.

Drive Train and Nacelle Support Structure

The drive train and nacelle support structure serve two functions in the wind turbine machine. Rotational speed of the rotor is slow in comparison to the rotational speed of the generator. Thus, the drive train must couple the rotor shaft to a gear-box that will increase the rotational speed of the shaft to the generator. Also, the drive train support structure transfers the mechanical load, both active and passive, of the rotor to the tower.

Electrical System

The electrical system is where the mechanical energy from the rotor is converted into electrical energy that is sent to the power grid. The generator is the primary component of the electrical system. There are two types of generating systems, induction and synchronous. The induction generator has been the preferred generating component for use in wind turbines having fixed speed rotors. Synchronous generators are used with variable speed turbine operation. Variable speed machines are able to capture more energy from the wind but tend to produce more noise from the rotor as it sweeps the wind.

The entire system is monitored by a programmable logic controller (PLC) to ensure proper operation of the turbine unit.

Yaw System

The yaw system is used to turn the plane of the rotor perpendicular to the direction of prevailing wind on a continuous basis. Modern wind turbines have sensing devices that feed prevailing wind telemetry to the on-board computer system. The processor interprets the data with the current position of the rotor plane and implements the necessary adjustment.

Towers

There are two materials of choice for wind turbine tower construction, steel and concrete. Steel has the economic advantage over concrete and is considered to be the de facto standard for tower construction. Wind turbine towers constructed of steel are of the shell type and the lattice type. Tower heights are available from 65 m (213 ft.) to 112 m (367 ft.) depending on manufacturer. It is important to consider that a higher tower will cost more, but typically improves energy capture and shortens system payback.

Equipment Availability

Manufacturer specifications express equipment availability ratings of 97% and better. Manufacturers typically recommend that each machine is taken off-line annually, for a maximum of two weeks to perform scheduled preventative maintenance. Scheduled maintenance estimates account for 1.8% down-time and non-scheduled equipment maintenance for up to 1.2% of down-time. A number of manufacturers offer a two-year equipment warranty for their wind turbines.

The following is a simplified preventative maintenance schedule for wind turbine equipment that may be specified by a given equipment manufacturer.

6 Month Interval

Minor maintenance

Inspection of blades and electrical components

Lubrication of bearings

Replacement of worn components, e.g., brake pads, oil filters, etc.

12 Month Interval

Inspection of gearboxes, generator, and blades.

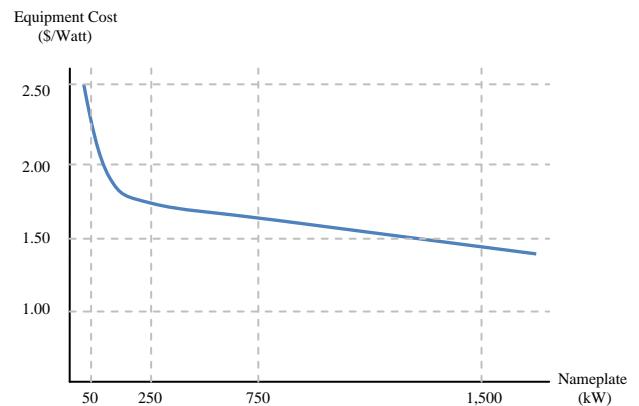
60 Month Interval

Major maintenance overhaul of gearboxes, generator, and blades.

Turbine Cost and Availability

The installed cost of a large wind turbine can vary from \$2,080/kW to \$2,35/kW (\$2.08 to \$2.35 per watt). Economies of scale are generally realized with the larger machines. The cost will also depend on whether the turbines are manufactured in the US or in Europe. Additional consideration must be given to currency exchange rates and the strength of the U.S. Dollar.

Approximate Wind Turbine Equipment Cost per Watt



Generally, availability of equipment varies with each particular manufacturer, prevailing market economic (both foreign and domestic) and tax incentives.

Our company has cultivated working relationships with manufacturers of turbine nameplates ranging from 750 kW to 3,200 kW. Please check with us for availability status and pricing.

Company Contact Information

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A Wholly Owned Subsidiary of
Alternate Energy Solutions Integrated, Inc.



AESI's tower team in eastern Montana setting up two meteorological towers to evaluate wind resources for a company owned project. Tower cables are being fenced-in so ranch cattle don't interfere.



Placement of wind turbine tower sections
Photo Courtesy of D. Pierson, Forest City, IA



Photo of a crane lifting a three blade rotor hub up to nacelle for mounting to the generator drive.