

# Wind Resource Study Fact Sheet

***“We need a different mindset or mental model.”***

## **- Excerpt from U.S. General Services Administration’s Expanding Our Approach to Sustainable Design**

The General Services Administration, Greater Southwest Region is currently beginning a design/build project for a new land Port of Entry border facility near McAllen Texas on the US/Mexico border. This is the Anzalduas project. The agency has been faced with mounting electric power costs for its buildings and facilities. GSA has examined various alternatives for supplying power to this location. These include hooking up to the grid in the traditional manner, use of solar, wind, on-site micro-turbines, diesel generators, and other such technologies. Currently, wind appears to have the most favorable economics and life cycle costs of all the available distributed generation systems considered. Wind is an intermittent resource and may not be able to supply the entire needs of this facility by itself. Grid connection will still be required. Nevertheless, the use of wind power to supplement and replace the use of grid power will greatly enhance the economics and utility of this facility. It will still be necessary to connect this facility to the electric utility grid, but the use of wind power can lower the amounts of power required from the grid and provide some measure of alternate or backup power.

The present design for this facility calls for an electric power load of approximately one megawatt, in order to operate the facility. It is likely that at some future time this facility will have northbound commercial lanes and inspection lanes added, which will increase this electricity demand load.

Numerous site visits by the project manager have indicated that strong prevailing winds exist at this location. An investment grade wind resource study is required to establish the quality, reliability, and value of this wind resource. GSA would like to consider the feasibility of using onsite distributed generation system in the form of one or more “wind turbines” to generate some or all of the power required for use at this facility. Having this power available would accomplish the following:

- Reduce the peak use and demand load for the facility thus obtaining lower power prices.
- Provide a measure of ability for this site to operate independently of the grid, for at least some of its electricity requirements, in the event of an emergency, or disruption of power.
- Provide GSA with experience with installation and use of wind power for its facilities, and information on the possible replication of this method of powering other facilities elsewhere along the border.

- Help to avoid or minimize the construction of expensive power transmission lines, or the upgrading of these lines (which is also expensive) where the use of wind generation can contribute to the facilities cost effective operation.
- Help to determine if the use of distributed wind power is practical and economical.
- Help agency goals of increasing use of renewable energy and the improvement of air quality.
- Help the agency meet the Leadership in Environmental and Energy Design (LEED) goals established for new projects.
- Help to meet the increased power loads caused by the increasing numbers of pieces of new security equipment being required and being installed at these facilities. These pieces of equipment include license plate readers, various databases and computer systems, increased lighting, radiation scanners, and other inspection and contraband scanning devices. At some locations Cargo X-ray scanning machines capable of scanning an 18 wheel tractor trailer are being placed into operation. This type of equipment draws considerable power and places demands on the existing electrical infrastructure.
- Help to establish GSA as a leader in the use of renewable energy to power the buildings in our inventory.
- Help to further the goals of the GSA Public Building Service and the Executive and Legislative branches of the U.S. Government in promoting the use of renewable energy.

GSA has visited with the Department of Energy's National Renewable Energy Lab (NREL) and been advised that they could conduct a wind resource evaluation, at this site, for approximately \$75,000.00. NREL has the meteorological towers and anemometers that are required to conduct a study of this magnitude. NREL also has the expertise in capturing data from the towers to analyze the value of this wind resource. Normally, this involves the erection onsite of an eighty (80) to one-hundred sixty (160) foot tall meteorological tower. This tower would have multiple anemometers at various heights along its structure to measure wind velocity.

Data is captured from these devices and is typically evaluated over a 12 to 24 month period of time to determine the quality of the wind resource. For this project since it is design/build, it is recommended that the data collection period be twelve (12) months. A survey that captures all four seasons of the year is needed as the wind varies during different seasons. The wind in micro-climates can vary significantly, and can vary at differing heights above the ground level, and in different locations in the same general area. The Wind Resource Study is needed to support investment decisions on installation of wind turbines at the location.

Once the wind regime data is gathered and analyzed, an economic analysis will be done to ascertain the following:

1. Payback time for an initial capital investment in wind turbine equipment.
2. Identification of sources of potential funding to support the capital investment required to install wind turbines at this site.
3. The potential for expansion of the wind generation equipment installed and for connection to the utility grid of this equipment so that excess power generated may be sold into the grid to offset the facilities' power costs.
4. The potential to sell or make use of the renewable energy credits or "green" attributes of energy generated by the project.

If the Wind Resource Study is favorable, GSA would expect to obtain and install one or more wind turbines capable of generation of electricity that would be used to support the new facility. The Wind Resource Study is a requisite part of being able to reach an investment decision into the application of wind technology to this site.

If this proposal is deemed acceptable and funding is approved, the Wind Resource Study can begin immediately since GSA owns the property on which any meteorological tower(s) would be placed.