



PIX 12586

Federal Wind Energy Assistance through NREL

The National Renewable Energy Laboratory (NREL) assists with wind resource assessment and development activities initiated by federal agencies to facilitate distributed renewable energy projects at federal agency sites. This brief outlines the process for requesting NREL assistance with federal wind energy projects.

Background: Renewable Energy Goals

The **Energy Policy Act of 2005 (EPAct 2005)** and **Executive Order 13423** direct federal agencies to implement renewable energy projects to reach renewable energy goals. **Section 203 of EPAct 2005** states that federal agencies cannot have less than 3% of their electricity consumption from renewable energy sources in FY2007–FY2009, not less than 5% in FY2010–FY2012, and not less than 7.5% in FY2013 and thereafter. Additionally, **federal agencies can receive double credit for renewable energy produced on-site** or produced on federal land and used at a federal facility.

NREL can assist federal agencies interested in using wind energy to meet these renewable energy requirements by conducting a Wind Resource Assessment and Economic Feasibility Study. These studies enable an agency to develop a Request for Proposal (RFP) for an on-site wind turbine project. The following sections outline how NREL can facilitate this process for federal agencies.

Meetings and Site Visits

Following a facility request, NREL team members will conduct a project kick-off meeting to bring together interested parties and stakeholders at your agency and inform them about wind technology, wind resource assessment, the wind development process, etc. This is followed by a site visit to determine the optimal location(s) for installing one or more anemometer (met) towers to assess the wind resource at your federal facility. Following the site visit, a letter report will inform the agency of the preferred met tower installation sites to enable the agency to obtain site-specific operations and environmental approval to install a met tower. If an airport or radar system is nearby, Federal Aviation Administration (FAA) approval may also be required, and NREL can assist in that process as well.

The agency will submit to NREL a completed U.S. Department of Energy (DOE)/NREL Environmental Checklist and submit its own

internal National Environmental Policy Act (NEPA) compliance document (Cat Ex, EA, or NEPA) in order for NREL to begin met tower installation activities.

Wind Resource Assessment

Upon completion of the required Environmental Checklist and NEPA compliance documentation, NREL will arrange for a qualified met tower installer to erect a 34-m, 40-m, or 50-m met tower at the designated site. Typical sensors installed for the wind resource assessment are shown in the table below. Relative humidity, atmospheric pressure, or insolation can be added to the met tower sensor package.

Typical Sensors in a 50-m Met Tower

Equipment to be Installed	Approximate Height
2 anemometers 1 wind vane	50 m
1 anemometer	40 m
1 anemometer 1 wind vane	30 m
1 temperature sensor 1 data logger	Base



A 60-m met tower was installed on the western ridge of a Navy installation on Guam. Credit: DNV Global Concepts Inc., PIX16289.

During met tower commissioning, agency personnel will be shown how to change data cards and download the data from the met tower. The agency will download the data monthly and e-mail it to NREL for analysis. NREL will perform quality control checks on monthly data and provide quarterly wind data summaries. Data collection activities will continue until 12 months of quality wind data have been amassed. NREL will complete a **Wind Resource Assessment Report** based on 12 months of recorded data correlated to available long-term wind data. This report shall be delivered within 2 months of the end of the data collection period.



As part of a wind resource assessment effort with the U.S. Coast Guard, NREL provided Cape May (in New Jersey) with anemometers and wind vanes installed at 30, 44, 74 and 97 meters on an existing 109-m tower. Credit: Richard Ker, PIX 15661.

3. NREL conducts a kick-off meeting and AGENCY site visit.
4. The AGENCY submits a met tower loan form to NREL.
5. NREL contracts the met tower installation.
6. The AGENCY commissions the met tower, conducts data downloads, and submits monthly downloads to NREL.
7. NREL reviews the data monthly and provides a quarterly data summary.
8. NREL performs a wind resource assessment after receiving and assessing 1 year of quality data.
9. The AGENCY removes the met tower and ships it back to NREL.
10. NREL performs an economic feasibility study.
11. NREL presents the results to the AGENCY.

NREL can also work with a federal agency to:

- Develop an RFP to enable bidding on the project
- Evaluate the submitted proposals
- Advise on paths forward or overcoming obstacles.

Wind Turbine Economic Feasibility Study

Using site electric load and cost data supplied by the agency, NREL will complete an economic feasibility study of available options for integrating wind power at the site. The study will include the wind resource, estimates of annual energy production, annual O&M costs, and a life-cycle cost analysis that includes first cost, energy savings, financial incentives, simple payback, and a savings-to-investment ratio.

The analysis will include technical and economic feasibility studies that compare the life-cycle operating costs of:

- **Business as usual:** continuing to purchase electricity from the existing utility
- **Purchase through appropriation/grant:** integrating wind turbine(s) into the existing electrical distribution system with an appropriation or other available funds
- **Energy Savings Performance Contract (ESPC) or Utility Energy Savings Contract (UESC):** integrating wind turbine(s) into the existing electrical distribution system under an ESPC or UESC, providing the utility or energy service company is willing to provide their cost estimates
- **Power Purchase Agreement (PPA):** leasing agency land to a third-party developer for turbine installation and while the agency purchases renewable electricity through a PPA.

The entire process usually takes 18 to 24 months, although occasionally delayed paperwork submissions, failed anemometry, or unforeseen events delay the subsequent steps. Both NREL and the AGENCY are responsible for handling required permits, forms, and approvals to ensure progress in a timely manner.

Here is a summary of the required steps:

1. The AGENCY enters into an Inter-Agency Agreement with DOE.
2. DOE assigns the task to NREL.

If you are interested in NREL assistance for a federal wind energy project and would like to begin a wind resource assessment, please contact:

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