On-Site Wind Energy Project Feasibility Checklist

This feasibility checklist provides federal agency staff with a series of questions to answer when considering an on-site wind energy generation project. The checklist is applicable to wind turbines of all sizes used as distributed energy resources (regardless of implementation method). The checklist is divided into two parts. The first part has yes/no questions. If you answer no to any of these critical questions, it is recommended that your agency consider a different location for on-site wind energy. If you can answer yes to all the questions in the first part, proceed to the second part of the feasibility checklist which presents best practices for your agency to consider in determining feasibility.

Each checklist item references a relevant module from the [Selecting, Implementing, and Funding Distributed Wind Systems in Federal Facilities](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) training (referred to as the “Selecting training” in the checklist below) or other available trainings and resources for more information. If you are unfamiliar with some of the concepts presented in the checklist, please consider watching the [Selecting](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) training first. The on-demand, online training is available in FEMP’s Whole Building Design Guide Course Catalog. The training is divided into modules, so you can take the training from start to finish or just open a specific module as needed.

| **Feasibility Checklist** | **Part I** | **Yes** | **No** |
| --- | --- | --- | --- |
| **Wind Resource: Does the proposed site have enough wind?** | |  |  |
| Wind is the "fuel" for your wind turbine and has a significant effect on energy output. The proposed site should meet the minimum annual average wind speed rule of thumb of 4 meters per second at a hub height of [30 meters](https://windexchange.energy.gov/maps-data/325) (a typical height for turbines sized 100 kilowatts or less) or 6.5 meters per second at a hub height of [80 meters](https://windexchange.energy.gov/maps-data/319) (generally for turbines sized greater than 1 MW).  **For more information about conducting a wind resource assessment, please see Module 4** (**Wind Resource Assessments) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training, and the** [**Distributed Wind for Federal Agencies**](https://www.wbdg.org/continuing-education/femp-courses/fempodw111) **training*.*** | |
| **Land Availability: Does the proposed site have enough land space?** | |  |  |
| Wind turbines must be sited on tall towers and away from nearby obstacles (e.g., buildings, trees) that could create turbulent wind. For safety, a distance equivalent to at least one total system height (i.e., tower height plus blade length) is recommended as the setback from any building or occupied area. If the proposed site appears to have sufficient open space, this minimum recommended setback can be confirmed after the turbine size and model are selected in Part II.  **For more information about siting considerations, please see Module 5** (**Technical, Economic, and Siting Considerations) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training.** | |
| **Appropriate Siting: Is the proposed site in a suitable location?** | |  |  |
| Because the electricity generated from distributed wind is consumed locally, there is interest in siting wind turbines in urban, or built, environments and on rooftops close to large electricity loads. However, this is not recommended. A suitable location is one that has sufficient distance from large buildings and urban infrastructure that can obstruct wind flow and cause turbulence. Rooftop installations are more expensive due to the permitting requirements or the need to reinforce a roof to be able to handle the forces of a spinning wind turbine. Because the wind resource is difficult to characterize in a turbulent environment, and typically of lower quality, these types of turbine installations underperform.  **For more information about suitable environments, please see Module 5** (**Technical, Economic, and Siting Considerations) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training.** | |
| **Land Suitability: Are there any seasonal, environmental, or ground conditions that could prevent project construction (e.g., wetlands, contaminated soils, etc.)?** | |  |  |
| The proposed site may contain (or be adjacent to) environmental sensitivities such as contaminated soils or wetland conditions that could prevent critical project groundwork (e.g., foundation preparation and balance-of-station work). An environmental screening should be conducted to gauge any potential challenges to construction.  **For more information about ground considerations, please see Section 3.3** (**Geotechnical Investigation and Report) in the** [**Technical Specifications for On-site Wind Turbine Installations**](https://www.energy.gov/eere/femp/articles/technical-specifications-site-wind-turbine-installations)**.** | |
| ***--STOP--***  ***If you answered NO to any of the above questions, consider a different location for an on-site wind turbine installation (e.g., one with a higher wind speed, more space, and/or fewer obstructions).*** | | | |

| **Feasibility Checklist** | **Part II** | **Complete?** | | | |
| --- | --- | --- | --- | --- | --- |
| **Financial Feasibility: Determine what electricity rate the wind energy would displace. Identify applicable policies and incentives.** | |  | |  | |
| What is the proposed site’s current electricity rate in cents per kilowatt hour? Higher baseline electricity rates make it more likely that energy from a wind turbine will be cost-effective. State, federal, or utility incentives, or net metering policies, may be available in your area. Consult the utility of the proposed site and the [Database of State Incentives for Renewables and Efficiency](https://www.dsireusa.org/) for the latest incentive offerings.  **For more information about project economics and incentives, please see Module 5** (**Technical, Economic, and Siting Considerations) and Module 6** (**Evaluating Project Financing Options)** **in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training, and the Net Metering, Rate Impacts and Incentives section of the** [**Distributed Energy Interconnection Checklist**](https://www.energy.gov/eere/femp/articles/distributed-energy-interconnection-checklist)**.** | | | | | |
| **Product Selection: Select from available certified wind turbines.** | |  | |  | |
| It is important to choose a wind turbine design with a proven history in safety, performance, and functionality and that offers a sufficient warranty to meet the agency’s needs. The selected small wind turbine model (up through 100 kW in size) should be certified to AWEA 9.1-2009, ACP 101-1, or the International Electrotechnical Commission (IEC) 61400-1, 61400-12, and 61400-11 standards. Large wind turbine (i.e., peak power ratings of greater than 150 kW) certification can be demonstrated through type certification to IEC 61400-22.  **For more information about certified products, please see Module 5 (Technical, Economic, and Siting Considerations) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training, and Section 3.1 (Wind Turbine Selection) and Section 3.2 (Turbine Warranty) in the** [**Technical Specifications for On-site Wind Turbine Installations**](https://www.energy.gov/eere/femp/articles/technical-specifications-site-wind-turbine-installations)**. For a list of certified small wind turbines, visit the** [**Pacific Northwest National Laboratory Distributed Wind webpage**](https://www.pnnl.gov/distributed-wind)**.** | | | | | |
| **Turbine Performance: Make a reasonable wind energy production estimate.** | |  |  | | |
| Certified turbines will have certified power curves, available from the turbine manufacturer, which can be consulted to estimate annual energy production. Be conservative and make sure your estimate is based on local site conditions.  **For more information about calculating potential annual energy production at a given site, please see Module 4** (**Wind Resource Assessments) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training.** | | | | | |
| **Turbine Sizing: Select a wind turbine sized to meet the proposed site’s energy needs.** | |  | | |  |
| Consider the size and timing of your site’s electrical demand relative to the wind turbine’s expected production. Other factors, such as net metering, meeting clean energy goals, or having battery storage, can also play a role in turbine sizing.  **For more information about sizing considerations, please see Module 4 (Wind Resource Assessments) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training.** | | | | | |
| **Federal Compliance: Consider federal regulatory requirements.** | |  | | |  |
| The project must comply with all Federal Aviation Administration (FAA) requirements and aeronautical study determinations as outlined in Title 14 of the Code of Federal Regulations (14 CFR) Part 77. The FAA’s [Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) Notice Criteria Tool](https://oeaaa.faa.gov/oeaaa/external/portal.jsp) can be used to perform a preliminary evaluation prior to filing a Notice of Construction. Certain Notice of Construction filings may be forwarded for review to multiple agencies, including the [Department of Defense (DOD) Military Aviation and Installation Assurance Siting Clearinghouse](https://www.acq.osd.mil/dodsc/). The project must comply with any Clearinghouse requirements issued through a FAA aeronautical study determination.  **For more information about regulatory compliance, please see Module 5 (Technical, Economic, and Siting Considerations) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training and Section 4.0 (Federal Agency Compliance) in the** [**Technical Specifications for On-site Wind Turbine Installations**](https://www.energy.gov/eere/femp/articles/technical-specifications-site-wind-turbine-installations)**.** | | | | | |
| **Local Compliance: Consider local regulatory requirements.** | |  | |  | |
| A city or county’s permitting process will legally determine whether an agency will be able to build a proposed wind turbine, while the zoning ordinances will determine how it will be built (maximum height, required setbacks from property lines, etc.). Check the local requirements for the proposed site, which may impact the project cost and development timeline.  **For more information about local requirements, please see Module 5 (Technical, Economic, and Siting Considerations) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training.** | | | | | |
| **Community Engagement: Determine what type of engagement with neighbors is required or recommended by the federal agency.** | |  | |  | |
| It is helpful to include neighbors in planning discussions and address any concerns early in the project development process.  **For more information and siting best practices, please see Module 5 (Technical, Economic, and Siting Considerations) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training.** | | | | | |
| **Interconnection: Review the local utility’s interconnection process.** | |  | |  | |
| Most utilities post information about interconnection requirements on their webpages.  **For more information about the interconnection process, please see the** [**Distributed Energy Interconnection Checklist**](https://www.energy.gov/eere/femp/articles/distributed-energy-interconnection-checklist)**.** | | | | | |
| **Operations & Maintenance: Research what maintenance is required and what maintenance contractors could be available.** | |  | |  | |
| A well-designed turbine can last 20 years or more; however, it requires occasional inspection and maintenance to run smoothly. Identifying a local maintenance contractor upfront will help ensure long-term successful operations and energy generation.  **For more information about operations and maintenance for distributed wind projects, please see Module 8 (Operations and Maintenance) in the** [**Selecting**](https://www.wbdg.org/continuing-education/femp-courses/fempodw037) **training and the** [**Distributed Wind Installers**](https://openei.org/wiki/Distributed_Wind_Installers) **list.** Please note that the list of distributed wind installers is provided for consumers’ reference, but does not represent an endorsement of any installer. Installers in this list are active in the distributed wind market and have opted-in to be included. OpenEI is a wiki-site and therefore contributors can add installers to the list as well. | | | | | |
| **Implementation: Create a request for proposal and research what installation contractors could be available.** | |  | |  | |
| **To create a request for proposal, please see** [**Technical Specifications for On-site Wind Turbine Installations**](https://www.energy.gov/eere/femp/articles/technical-specifications-site-wind-turbine-installations)**. To learn about available installers, please see the** [**Distributed Wind Installers**](https://openei.org/wiki/Distributed_Wind_Installers) **list.** Please note that the list of distributed wind installers is provided for consumers’ reference, but does not represent an endorsement of any installer. Installers in this list are active in the distributed wind market and have opted-in to be included. OpenEI is a wiki-site and therefore contributors can add installers to the list as well. | | | | | |