Domestic Wind Turbines

This online resource paper provides information about power generation from small-scale wind turbines and how it can contribute to the good design of new homes

Overview and Purpose

Wind turbines harness the power of the wind and use it to generate electricity. Small scale wind turbines installed within the built environment are classified as micro generation technology. There are quite a variety of wind turbines from vertical and horizontal axis arrays to roof mounted and free standing. Domestic wind turbines are more suitable for remote locations for aesthetic reasons. These domestic wind turbines are gaining popularity for property owners to generate their own electricity. There are two main categories of domestic-sized wind turbine:

- Pole mounted: these are free standing and they are erected in a suitably exposed position, with a generation capacity of around 6kW;
- Building mounted: these are smaller than mast mounted systems, and are installed on a property's roof with a suitable wind resource present. Often these are around 2kW in capacity.

Key Points to Consider

The cost of a domestic wind turbine system depends on the size and the mounting method. Building-mounted turbines cost less to install than pole-mounted ones, but they tend to be smaller and less efficient. A well-sited 6kW turbine can generate approximately 9,000 kWh per year, which can save a considerable amount per year on electricity bills. In this example, the renewable energy generated could also save around 1.9 tonnes of carbon dioxide per year.

However, it should be noted that wind turbines can be more complicated electrically than they at first seem. There are a number of electrical parts that need to be connected and maintained over the years. These include isolation switches, generating boxes, inverters, and meters.

Hence maintenance checks are necessary every few years, and the costs per year depend on the turbine size. A well-maintained turbine generally lasts more than 20 years, but the turbine's inverter may need to be replaced at some stage during this time.

For off grid systems, batteries will also need replacing, typically every 6-10 years. The cost of replacing batteries varies depending on the design and scale of the system. Any backup generator also has its own fuel and maintenance costs.

Planning regulations for the installation of wind turbines differ in England, Wales and Scotland. It is not always necessary to obtain planning permission for wind turbine installations. In England, wind turbines require planning permission unless they fall under certain categories, in which

case their installation may be classed as 'permitted development'. Hence, it is prudent for the property owner to contact the Development Management team of Craven District Council to establish if planning permission is required.

The Practical Implications for Planning Officers and Applicants

The key question to answer when analysing the possibility of utilising a wind turbine is if the property be suitable for the installation. The suitability of the site dictates the financial gain to be made from the wind turbine installation, and also the turbine's impact on surrounding properties and within the local environment. A location suitable for the installation of wind turbines has the following attributes:

- An average wind speed of at least 5m/s;
- The site is free from turbulence caused by nearby obstacles such as hills, buildings and trees, which slow the wind speeds;
- In the case of pole-mounted turbines, there is enough land on which to build foundations and attach guy ropes (if necessary);
- The site must not be in or near to a Conservation Area, or anywhere in the grounds of a Listed Building;
- There must be no other wind turbine or air source heat pump on the property;
- The bottom of the turbine's blades must be at least 5m from the ground.

Urban and suburban sites in the Craven local plan area are therefore highly unlikely to be suitable for the generation of energy with wind turbines, and they may be better suited to other renewable energy technologies, such as solar photovoltaic, solar thermal, and ground source heat pumps. However, there are more rural and/or isolated properties in the local plan area which have the potential to host domestic wind turbines. It should be noted though that any new proposals for domestic turbines should be located and designed in accordance with all relevant local plan policies.

Assessing the site's local wind speed is the first step to consider when taking a decision on purchasing wind turbines. In the first instance, the property owner can use the Energy Saving Trust's (EST) wind speed prediction tool, which provides an approximate estimate of the area's wind speeds: **Wind Speed prediction tool (www.energysavingtrust.org.uk/Generating-energy/Choosing-a-renewable-technology/Wind-turbines/Wind-Speed-Prediction-Tool)**.

The website **www.renewableenergyhub.co.uk** provides advice to applicants on the criteria to be met when considering either building-mounted turbines or pole-mounted turbines. For the construction of building-mounted turbines:

- The property must be detached;
- The top of the turbine's blades must be no more than 3m above the top of the property, or 15m above the ground;
- The turbines must be located at least 5m from the edge of the property.

For developments with pole-mounted turbines:

- The top of the turbine must be no more than 11.1m above the ground;

- The turbine must be at least 1.1 times of its own height away from the edge of the landowner's land.

Government planning guidance for renewable technologies in England can be accessed here: **www.legislation.gov.uk/uksi/2011/2056/made.**

Relevant Craven Local plan policies and guidance

- Policies **ENV3: Good Design**, **ENV9: Renewable and Low Carbon Energy**
  Good Design SPD

March 2023. This webpage provides general information about relevant planning topics and we hope you find it helpful. Please be aware that it is not a statement of Council policy and does not provide formal policy guidance. For those things, please refer to the Craven Local Plan and supplementary planning documents.