

Wind2Heat

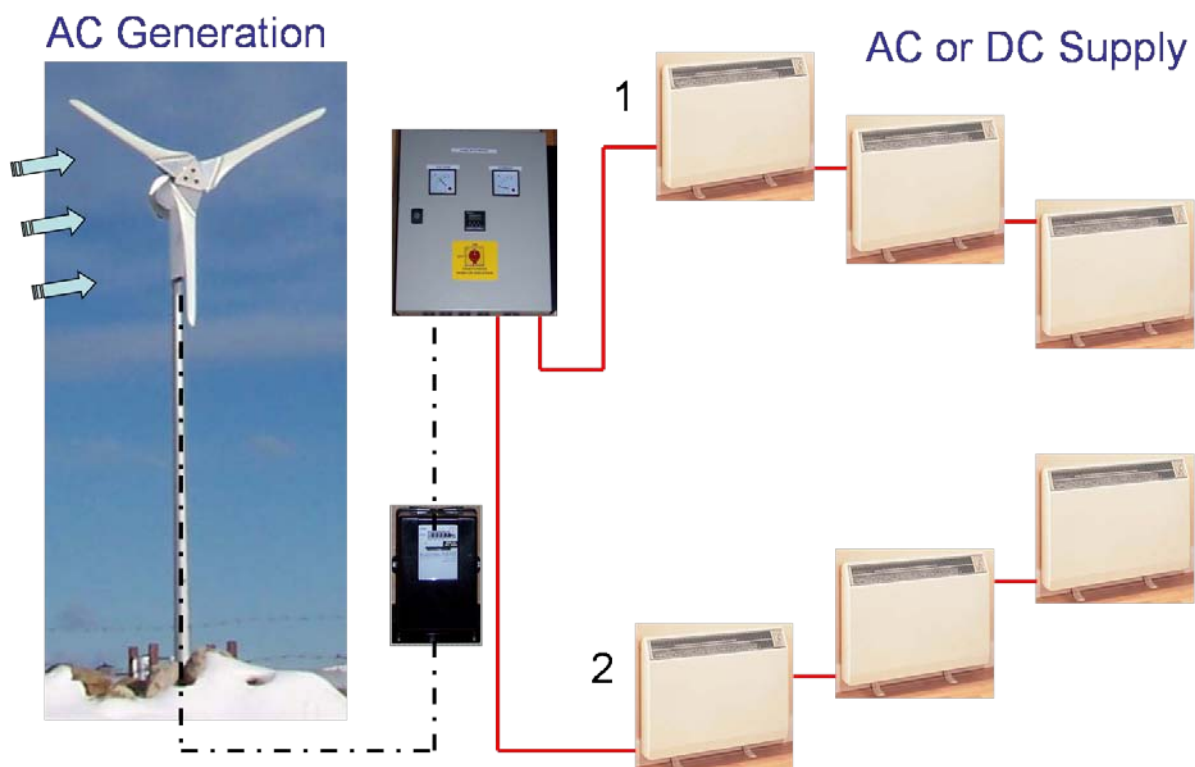
How does it work?

Wind energy is converted into electrical energy by turning the blades on the turbine. This electrical energy is then fed into storage heaters or a hot water tank and is used to provide heating and hot water. The system set-up is very flexible and the basic design can be modified to suit most building types and uses.

The example below is an off grid system with two heating circuits. The wind turbine provides energy to the first circuit and when this gets up to temperature the electricity is fed into the second circuit. This ensures that the wind turbine is kept on load.

The size of the turbine should be selected based on the energy consumption of the building or buildings which energy is to be fed into. As the energy output from the turbine is proportional to the amount of wind energy captured which is proportional to the swept rotor area. The greater the area the larger the amount of wind captured.

Example - Off-grid storage heaters



Most common uses

The most common use is to provide heating and hot water for community buildings. The system is low maintenance and is suitable for a wide range of building types and building uses.

The main constraining factor is a suitable site for the turbine.

Site and area suitability

The following is a general guide to choosing the appropriate site for a wind turbine. Professional advice should be sought before applying for planning permission for the wind turbine

- Site should be 50-250m from the community building where the electricity is to be used and whenever possible away from neighbouring properties.
- The turbine should be situated in a good open aspect site away from trees or buildings – specifically in the prevailing wind direction (normally from the South West in the UK).
- Tall buildings, hills or trees close by in the path of wind can cause turbulence and decrease the production of a turbine.
- The site should be accessible and suitable for the installation of a foundation.
- It is best if the heating system within the building which the turbine will supply energy to incorporates an element of energy storage, this can either be a large hot water tank or electric storage heaters

Questions and Answers

Is it expensive? The capital cost of installation varies between £30,000 and £100,000 (ballpark figures for a 6kW and 20kW turbine respectively) and depends on the size and complexity of the project and the site. The installation should be sized according to the energy demands in the building.

What are the environmental impacts? Wind turbines do create some noise and have a visual impact but this can be reduced by selecting the most suitable site and turbine. Wind turbines are available in various sizes and designs. The most suitable turbine should be selected for your site based on the average wind speed and energy demand from the building.

Where can I find more information and advice? Read more about Wind2Heat in the Scottish Government's Community Renewable Energy Toolkit, available at [://www.scotland.gov.uk/Publications/2009/03/20155542/5](http://www.scotland.gov.uk/Publications/2009/03/20155542/5) or contact your local CES Development Officer who will be able to advise you on the possibilities and support available [://www.communityenergyscotland.org.uk/team.asp](http://www.communityenergyscotland.org.uk/team.asp). For more information on how wind turbines work see here on the British Wind Energy Association website [://www.bwea.com/energy/how.html](http://www.bwea.com/energy/how.html)

See for yourself – a more extensive list can be provided on request.

Eriskay Hall, Eriskay – 6kW Proven wind turbine providing direct heat and electricity to the building

Unst Heritage Centre, Unst – 6kW Proven wind turbine with direct heating (storage heaters)