

Wind Power

How does it work?

Wind passes through and rotates the blades (usually 2-3) of a turbine. The rotation of the blades drives a generator either directly or via a gearbox (generally for larger machines) to produce electricity. The electricity can either link to the grid or direct to individual properties.

What are the benefits?

- Source of energy is free and clean
- Well established and proven technology
- One of the most cost-effective renewable technologies
- Significant potential
- Can help contribute to reducing Carbon Dioxide (CO₂) emissions from properties
- Can be used at various scales from domestic stand-alone schemes to larger projects serving schools and business parks
- Government grants available

When and where is it suitable?

Turbines can start operating with wind speeds of 4-5metres/second although the higher the wind speeds the more power produced.

For information on wind speeds in your area visit the Department for Business, Enterprise & Regulatory Reform (BERR) (see web link) and type in 'windspeed database' in the Search box. You will need to know the grid reference of your location.

You will need to apply for planning permission for a wind turbine. You will need to take into account considerations including your property (Listed and/or in a Conservation Area), your neighbours (noise and visual concerns), the townscape and/or landscape setting and any local wildlife interests. Please contact the Council's Development Control Section (e-mail: planning.applications@tmbc.gov.uk, tel: 01732 876230) for further advice.

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Further detailed technical advice:

- **Centre for Alternative Technology**
http://www.cat.org.uk/information/info_content.tmp?sku=info_is_renewables/
tel: 01654 705950
- An Eco-Centre providing practical advice and free information on wind power
- **Energy Saving Trust (EST)**
www.energysavingtrust.org.uk
tel: 0800 512012
- a non-profit organisation providing general advice on wind power (click on 'Generate your own energy' tab on their home page) and technical advice for the development industry professionals (type 'Planners Pack' in the search box)
- **Department for Business, Enterprise & Regulatory Reform (BERR)**
www.berr.gov.uk
tel: 0207 2155000
- find out the average annual windspeeds in your area by typing in 'windspeed database' in the search box
- **Low Carbon Buildings Programme**
<http://www.lowcarbonbuildings.org.uk/home/>
tel: 0800 9150990
- find out about available grants
- **British Wind Energy Association (BWEA)**
www.bwea.com
tel: 0207 6891960
- BWEA is the trade and professional body for the UK wind and marine renewable industries
- **London Renewables Toolkit**
www.london.gov.uk
tel: 0207 9834000
The Greater London Authority has produced a useful toolkit for planners, developers and consultants (type 'London Renewables' in the search box)
- **Creative Environmental Networks (CEN)**
www.cen.org.uk
tel: 0208 6836694
- not for profit organisation providing technical advice on wind power (click on 'Developer Support' and select 'Renewable Energy')
- **Kent Energy Centre**
www.kentenergycentre.org.uk
tel: 0800 3586669
- not for profit organisation offering free and impartial advice on wind power (click on 'renewable energy solutions')

Solar Electricity -photovoltaics

How does it work?

Photovoltaic (PV) cells made from semiconductor material convert energy from the sun into electricity which can either link to the national grid or direct to individual properties. The brighter the sunlight, the more power is produced.

What are the benefits?

- Source of energy is free and clean
- Can be integrated into the fabric of the building, eg roof-mounted – no land take-up
- Well established and proven technology
- Low maintenance with a long lifespan
- Significant potential
- Silent operation
- Can help contribute to reducing Carbon Dioxide (CO₂) emissions from properties
- Can be used at various scales from domestic stand-alone schemes to larger projects serving schools and business parks
- Often no need for a planning application for most microgeneration installations at a domestic-level¹ - please contact the Council's Development Control Section for further details
(e-mail: planning.applications@tmbc.gov.uk
tel: 01732 876230)
- Government grants available

When and where is it suitable?

To optimise performance, PV installations need to be mounted on a south facing roof/wall inclined at an angle of 20-40 degrees. A PV system will operate well on a surface that faces within 90 degrees of south. Ideally the cells need to receive unobstructed sunlight – little sun exposure means low power output - so avoid locations where there are obstacles between the sun and solar roof, eg trees and other buildings. Please consult the Council's Landscape Officer before considering the lopping of any landscape features (tel: 01732 876168).

Where a planning application is necessary, you need to take into account other considerations including your property (Listed and/or in a Conservation Area) and your neighbours. Please contact the Council's Development Control Section
(e-mail: planning.applications@tmbc.gov.uk,
tel: 01732 876230) for further advice.

¹ Exceptions apply for Listed Buildings, and buildings in Conservation Areas

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Solar Water Heating

How does it work?

Heat from the sun is captured and used to indirectly heat water. A solar thermal collector - either a flat plate or evacuated tube system - absorbs heat from the sun and transfers it to a heat transfer fluid, eg water with anti-freeze, which is circulated through a heat exchange coil in the hot water cylinder to heat the water. The water runs through the system either with the use of a small pump or by gravity.

A central heating boiler or immersion heater will operate alongside a solar water heating system (SWHS) as a back-up during the winter months.

What are the benefits?

- Source of energy is free and clean
- Can be blended into the fabric of the building, eg roof-mounted - no land take-up
- Well established and proven technology
- Low maintenance with a long lifespan
- Silent operation
- Significant potential - sun's energy can be harnessed on cloudy days
- Can help contribute to reducing Carbon Dioxide (CO₂) emissions from properties
- Can be used at various scales from domestic stand-alone schemes to larger projects such as swimming pools
- Often no need for a planning application for most microgeneration installations at a domestic-level² - please contact the Council's Development Control Section for further details (e-mail: planning.applications@tmbsc.gov.uk tel: 01732 876230)
- Government grants available

When and where is it suitable?

To optimise performance for a domestic system, you will need 3-4 sq. metres of a south facing roof angled at 30-40 degrees. A system can operate satisfactorily if the surface is orientated within 90 degrees of due south. Ideally the system needs to receive unobstructed sunlight so avoid locations where there are obstacles between the sun and solar roof, eg trees and other buildings. Please consult the Council's Landscape Officer before considering the lopping of any landscape features (tel: 01732 876168).

² Exceptions apply for Listed Buildings, and buildings in Conservation Areas

Where a planning application is necessary, you need to take into account other considerations including your property (Listed and/or in a Conservation Area) and your neighbours. Please contact the Council's Development Control Section (e-mail: planning.applications@tmbsc.gov.uk, tel: 01732 876230) for further advice.

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- An Eco-Centre providing practical advice and free information and on SWHS technologies
- **Energy Saving Trust (EST)**
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tel: 0800 3586669
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Biomass Fuel

How does it work?

Biofuels, typically in the form of wood pellets, wood chips or wood logs for small-scale domestic applications but also arable crops, are burnt to provide space heating and/or hot water.

There are two main systems: stand alone stoves providing space heating for a room; and boilers connected to central heating and hot water systems. These can work alongside each other.

What are the benefits?

- Plentiful supply of fuel – Kent has one of the largest wood resources in the UK
- Carbon neutral – biofuels only release the same amount of CO₂ they absorb whilst growing
- Very cost effective – when locally sourced fuel is used
- Wide selection of boilers available
- Can be used at various scales from individual dwellings to neighbourhood projects where excess heat from biomass-fuelled Combined Heat and Power systems can be used in a district heating scheme
- Often no need for a planning application for most microgeneration installations at a domestic-level³ - please contact the Council's Development Control Section for further details
(e-mail: planning.applications@tmbc.gov.uk
tel: 01732 876230)
- Government grants available

When and where is it suitable?

Biomass is the most cost effective option when the source of biofuel, eg farm, is close by and the transportation costs are therefore kept to a minimum. The option is even more cost effective if the biofuel can be supplied in large quantities, thereby reducing the number of required trips.

Storage space is a significant factor when determining the feasibility of biomass. Sufficient space needs to be made available for the storage of the biofuel near the boiler.

It is also important that a suitable flue designed for wood fuel appliances is installed in compliance with all safety and Building Regulations and the Clean Air Act.

³ Exceptions apply for Listed Buildings, and buildings in Conservation Areas

You may need to make a planning application for some elements of the scheme, especially the flue.

You need to take into account other considerations including your property (Listed and/or in a Conservation Area), your neighbours and the landscape setting. Please contact the Council's Development Control Section
(e-mail: planning.applications@tmbc.gov.uk,
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Ground Source Heat Pumps

How does it work?

Ground source heat pumps (GSHPs) operate by transferring heat from the ground, using a buried loop filled with a mixture of water and antifreeze, to a property via a heat pump.

The heat pump - comprising an evaporator, compressor and condenser - converts the low-grade geothermal and ground energy naturally occurring in the earth to high-grade heat that can be used for space heating and/or hot water. The process is similar to that used in a domestic refrigerator but in reverse.

Electricity is required for the heat pump to function but this can be sourced from an alternative renewable source.

Air source and water source heat pumps are also available.

What are the benefits?

- Efficient way to heat a building – for every unit of electricity used to pump the heat, 3-4 units of heat are produced
- Can help contribute to reducing Carbon Dioxide (CO₂) emissions from properties
- Can be used at various scales from individual dwellings to groups of up to 10 or even a small block of flats
- Often no need for a planning application for most microgeneration installations at a domestic-level⁴ - please contact the Council's Development Control Section for further details
(e-mail: planning.applications@tmbc.gov.uk
tel: 01732 876230)
- Government grants available

When and where is it suitable?

GSHPs are particularly beneficial to individual dwellings isolated from gas mains.

Sufficient land by your dwelling needs to be available for the installation of the ground loop (average depth of a trench for a horizontal loop is 1.5 metres).

Distributing heat via an under-floor coil system is more efficient than radiators because the coils work at a lower temperature.

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