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A photograph of a house with a brown tiled roof and two brick chimneys. A large array of blue solar panels is installed on the roof. In the foreground, there are green plants and yellow flowers. The sky is clear blue.

Your guide to
microgeneration
and getting connected

Are you considering generating your own green electricity?



Maybe you have been attracted by the Government's feed-in tariff proposals or you just want to do your bit to help the country get more of its electricity from sustainable sources. Northern Powergrid is your local electricity distribution network operator and it is our job to help you achieve your aim while ensuring that you and your neighbours continue to receive a safe and reliable electricity supply.

Nowadays, we are all used to electrical equipment being "plug and play". The process of installing microgeneration and connecting it to the electricity network is inevitably a little more complicated than this, because what you do can affect both your own and your neighbours' electricity supply. Fortunately for you, we have worked behind the scenes with our industry colleagues to make the process as easy as possible. To help you through this, this leaflet will tell you what you need to do and who to contact.

The basic message is simple: whatever the size of the generator you are installing, tell us what you are doing (see page 5 for further details). If your generator is over 3.68 kilowatts, we shall need to have more detailed discussions with you, because it may be necessary to modify our network.



What is microgeneration?
Microgeneration is the small-scale production of renewable energy, usually from sources such as the sun, wind or flowing water, to make electricity that can be sold or used in your home.

Microgeneration has the potential to help us reduce our carbon footprint and fight against climate change.

Many of us want to be greener, save money on our energy bills and contribute to the low-carbon energy supply in the UK. With the introduction of the Government's feed-in tariff you are guaranteed a payment for each unit of low-carbon electricity you generate, together with an additional payment for all units you export.

If you are reading this leaflet, you are probably considering generating your own electricity with a microgenerator such as a small wind turbine or solar panels. Alternatively, you may be a landowner interested in finding out more about small-scale electricity generation with a view to selling the electricity you make back to your electricity supplier.

This leaflet provides you with useful information that explains what microgeneration is about to help you make the right decision for you about going green.

What is the feed-in tariff?

The Government introduced a system of feed-in tariffs that went live on 1 April 2010 to incentivise small-scale low-carbon electricity generation that is smaller than five megawatts.

Small-scale low-carbon electricity generation technologies eligible for feed-in tariffs are:

- wind;
- solar photovoltaics;
- anaerobic digestion;
- hydro; and
- domestic-scale micro-combined heat and power (CHP) with a capacity of two kilowatts or less.

This scheme will allow many people to invest in small-scale low-carbon electricity, in return for a guaranteed payment for the electricity they generate and export. Generation tariffs will vary depending on the technology type and scale. Payments will be given for a 20-year period (except for solar photovoltaic, which will be 25 years and micro-CHP, which will be 10 years).

The feed-in tariff consists of two types of payment: a generation tariff paid per kilowatt-hour of electricity generated and an export tariff for electricity not used by the householder. However, generators may opt out if they wish and sell their electricity on the open market.

If you wish to benefit from the feed-in tariff, you will need to make sure that the equipment you purchase and the installer are both accredited by the Microgeneration Certification Scheme (MCS). Information is available on the MCS website www.microgenerationcertification.org. If you live in a listed building or within a conservation area, you should consult your local planning authority, as you may need planning consent before you can install microgeneration. Prices for installation can vary so shop around.

If you wish to apply for the feed-in tariff, contact your electricity supplier. The name and contact details will be on your latest electricity bill.

Connecting your generator to the electricity network

Whether or not you are planning to export any of the electricity you generate, your microgenerator will need a connection to the electricity network, either through your domestic electricity supply or directly. This means that, when it is generating, it can affect our ability to maintain a safe and reliable electricity supply to you and your neighbours. Because of this, we have established a simple set of rules that we require you to follow, for your own safety as well as that of others. In order to keep the electricity supply safe and secure for all our customers, we need to know where electricity is entering our electricity network. If your installation is rated at less than 3.68 kilowatts, your installer should complete an Installation Commissioning Confirmation Form on your behalf and notify us, so that we know that you are using generation equipment.

Information, links to the forms and contact information are all available on our website: www.northernpowergrid.com/generation

Should you later decide that you wish to remove this equipment, you should notify us directly.



Larger developments

You may be considering operating larger-scale generating equipment. The Government's feed-in tariff scheme applies to generation projects of up to five megawatts. For any electricity generation development projects that produce more than 3.68 kilowatts of electricity (strictly speaking, 16 amps per phase) you will need our permission prior to connecting to the network. This is because we may need to make modifications to our network to take account of your development. Sometimes substantial work is required and the cost can be considerable – so always consult us before buying. Our connections team will work with you to provide a quotation for the necessary work.

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Please bear in mind that the larger the project, the more work we may need to do to make your connection. For the larger projects, the quotation process can take up to three months in some cases, although we will always do our best to keep the length of time to a minimum.

Bear in mind that your proposals may also need to be agreed by your local planning authority, which will take into consideration the benefits of the scheme, the suitability of the site and the impact the development would have upon other local residents. There are several companies operating in the UK that sell larger-scale generation equipment. Again, the installer should be registered with an approved organisation.

Why should I connect?

There are benefits to connecting a renewable energy supply, not least the knowledge that you are using environmentally friendly energy resources, but you could also save money on your energy bills and receive extra payments under the feed-in tariff for the units of energy you don't use and sell back to your energy supplier.

What do I need to consider before connecting?

It is important to consider the additional costs you might incur. A nearby electricity line is not always enough and overhead lines may inhibit the type of renewable resource you can place on your land. In some circumstances, any work you require in order to get a connection will be at your expense, along with a shared fee for any other necessary system reinforcement.

Who do I need to talk to first?

You will need to speak to us about your connection issues and queries. You will need to speak to your electricity supplier about selling your surplus energy units to them. It is important to speak to your local planning department and other landowners who may be affected before commencing. By employing an expert who has the Microgeneration Certification Scheme accreditation (MCS), you will have the correct advice on tap that is tailored to your individual needs.

Why are the rules so complicated?

As the distribution network operator for the Northeast, Yorkshire and northern Lincolnshire, we have to be confident, for the safety of all our customers, that the network is safe and the voltage is controlled. Safety is the top priority in our company and therefore the rules around renewable energy connections need to adhere to our strict safety codes.

What do I need to do for a single installation?

For up to 16 amps per phase (3.68 kilowatts at low voltage), provided:

- the equipment has protection to disconnect from the mains, if the mains supply is lost;
- it complies with BS7671 (IEE Wiring Regulations); and
- your supplier notifies us before or at the time of installation.

Then you can go ahead.

Above this, you will need to apply to us for a connection:

- We will always do what we can to advise you, but it is always worthwhile using an expert installer and, for the larger projects, it is worth getting your own expert adviser.
- Always allow plenty of time for us to make the connection. For a large or complicated scheme, design and ordering of necessary equipment can take a considerable amount of time. We can always give you a rough guide on the lead time for a project if you wish.

What do I need to do for more than one unit?

You need to speak to us whatever the size of the units. See our website for more details.

Where can I get advice?

See page 15 for contact information on home energy generation technologies.

Frequently asked questions

Solar power

Solar power is electricity that is made from sunlight. Solar photovoltaic panels convert the sunlight directly into electricity. There are different types and sizes of photovoltaic panels. These are largely differentiated by the materials used, the manufacturer of the panel and its end function. For example, some panels are designed specifically to replace concrete roof tiles. For further information on the types of photovoltaic panels available, please refer to the Energy Saving Trust website: <http://www.energysavingtrust.org.uk>



Solar panels are usually installed on south-facing roof surfaces in order to capture the maximum amount of sunlight available. The electrical conversion happens silently and without creating pollution.

Solar-thermal panels do not generate electricity but harvest the sun's energy to heat water for your home. The energy saving community suggests that, with water heating accounting for around a quarter of typical domestic energy usage, installing a solar hot water system can cut your bills and your carbon footprint. Solar thermal systems use the heat energy from the sun to increase the temperature of the liquid within the system. This liquid is made up of water and antifreeze. This liquid is then pumped through a coil heat exchanger in a water tank, transferring the collected heat to the water in your hot water tank.

How Solar Photovoltaic panels work:

1. Each photovoltaic panel is a collection of cells made up of highly purified silicon. Silicon has properties that act as an insulator. A flow of electrons is released from the panel when it comes into contact with sunlight, creating an electrical current.
2. The inverter converts the electrical current that has been created by the panel into the type of electricity that is used to power the lights and appliances within your home.
3. The electricity generated by the solar panel is supplied to your home through the existing circuit board where it is connected with its own fuse. By having this connection, you will still be able to draw extra power from the mains electricity network whenever you need it. When your system produces more electricity than you are using, the excess electricity can be put back into the main power grid and you earn credit on your electricity bill. When you are using more electricity than you are generating, you pay your electricity supplier for the extra power.

Small wind turbines and solar panels are readily available from specialist retailers throughout the UK.

For information on the Microgeneration Certification Scheme please refer to: www.microgenerationcertification.org

Wind power makes electricity from the movement of wind. Electricity is produced by wind turbines that use large blades to catch the wind flow. When the wind blows, the blades are forced round, spinning a shaft inside the turbine; this connects to a generator that converts the energy into electricity. The stronger the wind, the greater the amount of electricity produced.



There are two types of domestic-sized wind turbines:

- mast-mounted - these are free-standing and are erected in a suitably exposed position.
- roof-mounted - these are the smaller of the two and can be installed on the roof of a home where there is a suitable wind resource.

To decide whether a domestic-sized wind turbine is right for you, you will need to consider the following:

1. Are there any large obstacles like buildings, trees or hills near your home?

Wind systems work best in exposed areas. Any obstacles will reduce the amount of electricity produced.

2. Is your home in a windy area?

For the wind system to be effective, a strong wind supply is essential.

3. Is your home located in a remote area?

Small domestic wind systems are particularly suitable for use in remote areas.

4. Do you need planning permission?

Small domestic wind systems normally require permission from your local authority, so check before you install a system.

Wind power



To determine if your chosen site has a good enough wind speed for a domestic wind turbine, please refer to the Energy Saving Trust website.

According to the Energy Saving Trust, the UK is an ideal country for small domestic turbines, with 40% of all the wind energy in Europe blowing over the UK. As a renewable energy resource, wind is green and does not produce any harmful pollutants. Wind is free, so once you have paid for the initial installation of your wind system your electricity costs will be lower. Microwind turbines are readily available from specialist retailers throughout the UK.

Hydropower

Hydropower produces electricity through the movement of water. Water flowing from a river or stream is diverted through a turbine, which converts the movement (kinetic energy) into electricity. The amount of power produced depends on three main features: how far the water falls downwards; how quickly it flows; and the volume of water used. Areas with a good available water resource could potentially benefit from hydropower to generate a community's electricity, as it is a reliable, cost-effective and green source of electricity.

If you are interested in installing a hydropower microgenerator, it is worthwhile knowing that you will need to obtain approval from your local authority planning department, the Environment Agency, the appropriate statutory environmental body and any local fishing organisations. For making small amounts of electricity, the small-scale hydroelectric generator is often the best solution, especially where fast-flowing streams on steep slopes are close by. A small-scale hydro system usually consists of an enclosed water wheel or turbine, which is made to spin by jets of high-speed water. The water is taken from the stream and moved downslope to the turbine through a long pipe. Water flowing through the pipe picks up speed, and is directed at the blades of the turbine. The turbine spins continuously, as long as there is water to drive it. The turbine is connected to an electrical generator, and the electricity is then available for running your household appliances. The spent water is returned to the stream.



Anaerobic digestion is most widely used to treat waste water and reduces the emissions of land-fill gas into the atmosphere. Anaerobic digestion is used as a renewable energy source as the process produces a methane and carbon dioxide-rich biogas, suitable for energy production, helping to replace fossil fuels. Anaerobic digestion also reduces the amount of organic matter that might otherwise be dumped at sea.

Anaerobic digestion is a series of processes in which microorganisms break down biodegradable material in the absence of oxygen and is used to manage waste and/or to release energy. Oxygen is prevented from entering the system through physical containment in sealed tanks, which stops any microorganisms reproducing or growing as they require oxygen to survive.

Anaerobic digestion

Combined heat and power (CHP) systems make efficient use of 'waste heat' energy. Since it is not always practical to transport waste heat, an energy-efficient system must generate electricity near locations where the waste heat can be put to good use. This is known as a combined heat and power (CHP) system.

CHP systems are able to increase the total energy utilisation of primary energy sources. Micro-CHP has become more cost effective and its development has also been facilitated by recent technological developments of small heat engines, including improved performance and cost effectiveness. Micro-CHP is driven by heat demand, delivering electricity as the by-product. Where home-generated power exceeds the in-home needs, it is exported back to the electrical grid. The system is efficient because the energy is distributed and used instantly over the electricity network.



Combined heat and power systems

Useful Information

Where can I get advice?

You can visit our website: www.northernpowergrid.com/generation which has other useful links that provide more detailed guidance on connecting microgeneration or you can refer to the websites below.

To find out more about what would be suitable for your home, try the Energy Saving Trust website: <http://www.energysavingtrust.org.uk>

For more information on home energy generation technologies, please contact your local Energy Saving Trust Centre on 0800 512 012 or visit the RenewableUK website (formerly the British Wind Energy Association website) <http://www.bwea.com/>

Contact us

For further information, phone 08450 702 703, Mon-Fri, 8am - 8pm and Sat, 9am - 5pm or visit our website at www.northernpowergrid.com/generation where more detailed advice and application forms are available.

