



CLASP

Climate Change
Local Area
Support
Programme

Community Engagement Toolkit

Cheshire and Warrington Factsheets

Providing factual information about
different renewable energy technologies
at a community scale.

www.clasp-nw.info

July 2011

Cheshire and Warrington Factsheets

There are eight different factsheets covering different renewable energy technologies at community scale. They are:

Factsheet 1: Wind Turbines

Factsheet 2: Solar Photovoltaics

Factsheet 3: Hydro Power

Factsheet 4: Solar Thermal Hot water

Factsheet 5: Heat Pumps

Factsheet 6: Biomass Heating Systems

Factsheet 7: Combined Heat and Power Systems

Factsheet 8: District Heating

In order to make the factsheets more relevant to your community group they have been produced at a sub-regional level so there are five versions per technology: Cheshire and Warrington, Cumbria, Greater Manchester, Lancashire and Merseyside.

A further Factsheet, **Factsheet 9**, has been produced on Community Ownership.

For more information on how to undertake the steps necessary to deliver a community renewable energy project please see the accompanying documents produced as part of the CLASP Community Engagement Toolkit.

■ 'How to Use' Guide

■ Factsheets

■ Case Studies

■ Checklist

■ Powerpoint Presentation (available on the CLASP website)

■ Literature Library (available on the CLASP website)

FACT: Cheshire's large areas of open landscape make it ideal for wind turbines.

FACT: Communities can make money by producing electricity from wind turbines thanks to the Government's Feed in Tariff scheme.

What are the basics?

What are wind turbines and how do they work?

Wind turbines use large blades to catch the wind. When the wind blows the blades are forced round, driving a turbine which generates electricity. The stronger the wind, the more electricity produced by the turbine.

Wind turbines can either be 'free standing' such as on top of masts fixed to the ground (e.g. in fields), or they could be 'roof mounted' such as attached to the top of buildings (e.g. on village halls or schools). Situating free standing or roof mounted wind turbines on higher ground, or using wind turbines with taller masts, helps to reduce wind turbulence and increase wind speeds. This should result in the turbine producing more electricity.

The electricity that the turbine generates can be wired to power the community building(s) or stored in a battery. Any excess electricity not used by the community can be connected and sold to the National Grid.

How do I know if my site is suitable for wind?

Location, location, location...

The Energy Saving Trust's field trial of domestic wind turbines demonstrated that wind turbines do work and can generate energy and carbon savings – but only when installed properly and sited in a location with unobstructed and appropriate wind.

An ideal site should have an average wind speed of at least 5 metres per second (m/s), be exposed and clear of nearby obstacles that could create wind turbulence like trees and buildings.

You can find a more detailed checklist to help you assess the potential for a wind turbine in your community later in this factsheet.

Different types of turbines

There are two main kinds of turbines suited for different types of location and wind speeds:

- Horizontal axis turbines are the most common type of wind turbines; they are designed for windier environments. The rotating shaft to which the turbine blades are attached is parallel to the ground.
- Vertical axis turbines are less commonly used than horizontal axis turbines; they are designed for more turbulent sites. The rotating shaft to which the turbine blades are attached is perpendicular, or vertical, to the ground.



Feed in Tariffs - making money from wind turbines

The Feed in Tariff (FiT) scheme is a Government incentive to encourage the generation of low carbon, renewable electricity. With the introduction of FiTs, owners of wind turbines can make money from the sale of the electricity (generated by the turbines they own) to an electricity supply company. The tariff is retail price index linked (so it alters to reflect the cost of living) and guaranteed for 20 years.

If you own a community wind turbine, you could be making money in 3 ways:

1. For all the electricity your turbine produces.
2. For any surplus electricity you don't use yourself which can be sold to the National Grid.
3. From the savings you make on your existing electricity bills from using electricity produced by the turbine instead of the National Grid.

Don't delay! Tariffs are currently paying their highest rates BUT the rate could change in the future.

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

Most of the electricity supplied by the National Grid in the UK is sourced from fossil fuels, which over time has been steadily increasing in price, as shown in the table below. Also, fossil fuel prices are subject to future increases. By generating some of your own renewable electricity you will be replacing the electricity you would normally take from the National Grid. So, you will safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply from the National Grid.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--------------------------------------|------|------|------|------|------|------|
| UK retail electricity prices (p/kWh) | 9.0 | 9.8 | 11.3 | 12.4 | 12.5 | 14.1 |

Non domestic customers (such as community groups) sometimes pay higher retail electricity prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

For example, a 15 kilowatt peak (kWp- a measurement of a wind turbine's capacity to generate electricity) community wind turbine could produce over £8,000 income and savings per year, whilst generating enough power for around six homes.

| | |
|--|-------------------------------|
| Income from FiTs for electricity generated | £7,209/year for 20 years |
| Income from FiTs for the electricity not used and sold | £405 (50% of total generated) |
| Fuel bill savings from using free electricity from turbine | £500/year |
| Total Income and savings | £8,114/year |

Based on 2011 figures

3. More local jobs

Only wind turbine equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard can be eligible for the FiT scheme. This only applies to systems below 50 kilowatts as larger systems have different requirements set by Government.

Community wind turbines can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where local jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Low maintenance technology

Once installed, wind turbines are a reliable, proven technology which has low running costs. They require little maintenance as they do not need a fuel source and only require checks once a year.

5. Reduce your community carbon emissions

Wind turbines produce low carbon, renewable energy. By replacing some of the electricity from the National Grid (mostly produced from high carbon fossil fuels such as coal, oil and natural gas) with renewable electricity produced by a wind turbine, your community will be reducing its carbon emissions and helping fight climate change.

6. Improve community well being

Wind turbines are a highly visual statement of a community's commitment to reduce carbon emissions and generate its own energy. Community renewable energy projects are sometimes the starting point of wider initiatives that improve a community's well-being.



Myth busting

Wind turbines are noisy!

The noise of a modern wind turbine is so low that it will not be noticeable in an urban environment. In a rural location, it can be drowned out by a nearby stream or moderate breeze in trees.

<http://www.bwea.com/ref/noise.html>

Wind turbines are a threat to birds!

According to the Royal Society for the Protection of Birds (RSPB) with careful planning wind turbines will have minimal impact on wildlife. This is on condition they are located away from major migration routes and important breeding and nesting areas (of bird species known or suspected to be at risk).

<http://www.rspb.org.uk>

Wind turbines reduce rural tourism!

A survey carried out by British Wind Energy Association (BWEA) revealed that a majority (91%) of visitors in Argyll, an Area of Natural Outstanding Beauty (ANOB), declared that the presence of wind farms made no difference to the likelihood of them visiting the area. <http://www.bwea.com>

Negative effects on health!

A recent Government report has confirmed that there have not been extensive issues with shadow flicker (when the blades rotate and shadow passes over the same point) in the UK. The frequency of the flickering caused by the wind turbine rotation is such that it should not cause a significant risk to health.

<http://www.decc.gov.uk>

My Community Checklist: Wind Turbines

Congratulations! You have already taken the first step by wanting to find out more about wind turbines and the benefits the technology could bring to your community.

The next step is to find out whether your community has a potential site which is suitable for a wind turbine. By completing the short checklist below you can see if wind turbines are the right technology for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is there enough wind?

To estimate whether your site's average wind speed is 5 m/s or higher, you can use the wind calculator available on the Government's website:

<http://www.decc.gov.uk/en/windspeed/default.aspx>

In addition, the Energy Saving Trust has a wind calculator for homes:

<http://www.energysavingtrust.org.uk/Generate-your-own-energy>

It is important that the wind powering your turbine is as turbulence free as possible so check that there are not obstacles nearby. If there are, then the turbine should stand significantly higher than these obstacles.

2. Do I have the owner's (land or building) permission?

You need to consult the owner of the land or building where you want to site the turbine to see if they would welcome a wind turbine.

3. Is the site accessible?

Depending on the size of the wind turbine, large lorries carrying the turbine may need access to the site. If there are no existing roads consideration should be given to building one, which has a cost and most likely requires planning permission.

4. Can I connect to the National Grid?

If the capacity of your system is about 4 kWp, you can connect without permission from Scottish Power (the electricity distribution company for Cheshire), as long as you notify them within 28 days. Your installer should normally do this for you. If your system capacity is over 4 kWp you need to contact Scottish Power for permission to connect to the grid. The connection must meet technical requirements (e.g. for metering and protection equipment).

The cost of grid connection can be a large part of the total costs and can be an issue in rural areas. Guidance on grid connection from Scottish Power can be found on its website:

http://www.spenergynetworks.com/dgis/g59_generator_connections.asp

5. Do I need planning permission?

Even smaller wind turbines do require planning permission. It is strongly recommended that you contact your Local Planning Authority as early in the process as possible.

To gain planning permission, you need to demonstrate that:

- Anyone potentially affected by the installation has been consulted.
- The site has been accurately studied for wind speed.
- Any potential impacts on landscape and ecology have been assessed.
- Any potential impacts on residential properties nearby have been assessed, including noise and shadow flicker.

Additional studies will need to be undertaken if any of the following are nearby the site where you plan to install a wind turbine:

- Bridleway within 200 m.
- Overhead power cables within a certain distance of the turbine.
- Airfields, transmitters or air traffic control towers within 4.8 kilometres.

Your community will be less likely to get planning permission if the site is within:

- A National Park.
- 400 m of residential buildings.

If you don't have many ticks a wind turbine might not be the most suitable technology for your community group. Don't worry! Find out more about other renewable technologies from the factsheets available on the CLASP website.

My Cheshire and Warrington: Wind Turbines

It can work...

Spring Farm Business Centre located near Crewe has installed two wind turbines which, in addition to providing a proportion of the centre's electricity, are used as an example of the farm's green credentials in order to attract business.

<http://www.springfarmbusinesscentre.com/carbon.htm>

In March 2011, another farm business, Plattwood Farm Holidays, located in Disley, received planning permission (with conditions from Cheshire East Council) to install a 11 kWp wind turbine on a 18 metre mast. Visit Cheshire East Council's planning website for further information:

http://www.cheshireeast.gov.uk/environment_and_planning/planning/view_a_planning_application.aspx

Some key facts about wind turbines in Cheshire and Warrington:

- It is estimated that Cheshire and Warrington have a wind potential of 235.2 MegaWatts (MW) for wind projects (of less than 100kW) and an additional 4,806 MW for commercial scale projects. Wind could power a city of the size of Chester.
- According to a survey carried out by Envirolink Northwest 89% of applications for wind turbines (excluding building mounted) achieved planning permission. The main reasons for refusal of applications in Cheshire and Warrington are noise and ecological impacts.
- At the end of March 2011 there are two MCS installers in Cheshire and Warrington who are able to install wind turbines. The number of installers will increase as demand increases.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being.

(http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change_sustainability/low_carbon_communities__networ.aspx)

Picture 1: Spring Farm, Crewe <http://www.springfarmbusinesscentre.com/gallery.htm>

Picture 2: Echo Arena, Merseyside <http://infoenglobal.com/category/wind-power/page/2/>

Picture 3: Ecodyfi, Community turbine <http://www.ecodyfi.org.uk/prnewturbine.htm>

FACT: Cheshire and Warrington have got considerable untapped potential for solar photovoltaic (PV) panels, especially in more urban areas.

FACT: Communities can make money from the electricity produced by their solar photovoltaic system thanks to the Government's Feed in Tariff scheme.

What are the basics?

What are solar photovoltaics and how do they work?

Solar photovoltaic (commonly known as solar PV) systems capture daylight using cells – which are one or two layers of a semi-conducting material, usually silicon. When light shines on a solar PV cell enclosed in a glass or plastic casing, it causes electricity to flow. The more daylight the system receives, the more electricity they can generate. They don't need direct sunlight to work - you can still generate electricity on a cloudy day.

Different types of solar PV cells

There are three types of solar PV cell:

Crystalline – monocrystalline (single crystal, more effective and expensive) and polycrystalline (many crystals, less effective but cheaper and most common in the UK).

Amorphous – formless thin film of non-crystalline silicon so it can be flexible on a wider choice of surfaces and locations. They are cheaper than crystalline but less effective

Hybrid – combination of crystalline and amorphous cells. Over the lifespan of an installed system these cells offer the best value for money based on savings on your bills against the original cost.

The electricity that the panels generate can be wired directly to a community building(s) or stored in a battery. Any excess electricity not used by the community can be connected and sold to the National Grid.

Where should I site my solar PV system?

There are four ways to fit your system:

- Roof mounted: panels can be bolted onto a roof or replace original roof tiles. They can help reduce the cost of other roofing materials and are ideal for new build developments.
- Ground mounted: panels can be mounted on a free-standing frame. This is a good option for communities with available land, ideally an unused field.
- Cladding: more for commercial use, they can clad south facing walls and are weather proof.
- Solar glazing: PV laminated in glazing glass. It can be used on conservatories. Not as available as panels or tiles.



Feed in Tariffs - making money from solar PV panels

The Feed in Tariff (FiT) scheme is a Government incentive to encourage the generation of low carbon, renewable electricity. With the introduction of FiTs, owners of solar PV systems can make money from the sale of the electricity (generated by the PV panels they own) to an electricity supply company. The tariff is retail price index linked (so it alters to reflect the cost of living) and guaranteed for 25 years.

If you own a community solar PV system, you could be making money in 3 ways:

1. For all the electricity your solar PV system produces.
2. For any surplus electricity you do not use yourself which can be sold to the National Grid.
3. From the savings you make on your existing electricity bills from using electricity produced by solar PV panels instead of the National Grid.

Don't delay! Tariffs are currently paying their highest rates BUT the rate could change in the future.

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

Most of the electricity supplied by the National Grid in the UK is sourced from fossil fuels, which over time has been steadily increasing in price, as shown in the table below. Also, fossil fuel prices are subject to future increases. By generating some of your own renewable electricity you will be replacing the electricity you would normally take from the National Grid. So, you will safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply from the National Grid.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--------------------------------------|------|------|------|------|------|------|
| UK retail electricity prices (p/kWh) | 9.0 | 9.8 | 11.3 | 12.4 | 12.5 | 14.1 |

Non domestic customers (such as community groups) sometimes pay higher retail electricity prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

For example, a 5.4kilowatt peak (kWp - a measurement of electricity generation capacity) solar PV system installed on a village hall could provide around £2000 income and savings per year and supply approximately 50% of the electricity needed to run the hall.

| | |
|--|-----------------------------------|
| Income from FiTs for electricity generated | £1,624/year for 25 years |
| Income from FiTs for the electricity not used and sold | £68/year (50% of total generated) |
| Fuel bill savings | £300/year |
| Total Income and savings | £2,002/year |

Based on 2011 figures

3. More local jobs

Only PV equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard can be eligible for the FiT scheme. This only applies to systems below 50 kilowatts as larger systems have different requirements set by Government.

Community PV systems can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where local jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Low maintenance technology

Solar PV systems are one of the easiest technologies to fit onto a building. Once installed, they have a long life expectancy of about 40 years and are virtually maintenance free. Although if you live in a city or an area with dirt/dust they may need extra cleaning as the rain might not be enough.

5. Reduce your community carbon emissions

Solar PV systems produce low carbon renewable energy. By replacing some of the electricity bought from the National Grid (mostly produced from high carbon fossil fuels such as oil, coal and gas) with electricity produced by a solar PV system, your community can reduce its carbon emissions and help fight climate change.

6. Improve community well being

Solar PV systems are a visual statement of a community's commitment to reduce carbon emissions and a desire to generate its own energy. Community renewable energy projects can be the starting point for wider initiatives that improve a community's well-being.



Myth busting

Solar PV doesn't work in Cheshire and Warrington due to weather conditions!

PV panels need daylight, not intense sunlight, to produce electricity. Although they are most effective in sunny climates, the North West of England has sufficient daylight to make it worthwhile.

<http://solargis.info/imaps/>

Solar PV can only provide a small amount of my community's electricity!

The amount of electricity produced by a solar PV system depends on the size and location of the system. Solar PV panels typically provide 40% of electricity used by a house every year. Given the right conditions a solar PV system could deliver the same power for a community. By changing behaviours, such as altering the times when electrical appliances are used, a community will be able to get the most from the system during the day.

<http://www.est.org.uk>

Solar PV panels never make more energy than the energy it takes to manufacture them!

Standard solar PV panels generally produce enough energy to make up for the energy used in their production within 1 to 3.5 years. With some manufacturers providing a 20 guarantee, PV panels will produce about 20 times the amount of energy than required to make them. <http://www.epia.org>

My Community Checklist: Solar PV Panels

Congratulations! You have already taken the first step by wanting to find out more about solar PV systems and the benefits the technology could bring to your community.

The next step is to find out whether your community has a potential site suitable for a solar PV system. By completing the short checklist below you can assess whether solar PV is the right technology for generating energy for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is my community site suitable for a solar PV system?

The roof or wall where you want to site your solar PV system should be facing within 90 degrees of south. East and west facing roofs and walls can also be considered. An unobstructed view of the sun between 9am and 3pm from February to October will provide the best results.

To identify which direction your community building is facing enter your postcode into Google maps: <http://maps.google.co.uk/>

If you are planning to install solar PV panels on a roof, you need to check whether the roof is strong enough to take their weight, especially if the panel is placed on top of existing tiles. If in doubt, ask a construction expert or an installer.

2. Do I have the owner's (land or building) permission?

You need to consult the owner of the land or building where you want to site the solar PV system to see if they would welcome it.

3. Should I consider renting my roof?

With the introduction of the FiT scheme, private sector companies are looking to 'rent' roofs for solar PV systems. The company will install the system for free (or at a reduced cost) and retain the FiTs income. The owner of the roof benefits from no upfront costs and from using the free electricity generated by the solar PV system. However, your community would be missing the opportunity to earn money through the FiT scheme for 25 years. There are additional considerations regarding insurance, maintenance, contract duration and ownership which will need to be taken into account before contracts are agreed.

Visit the Energy Saving Trust website for more impartial information on 'rent the roof' schemes: <http://www.energysavingtrust.org.uk/Generate-your-own-energy/Solar-electricity/>

4. Could my community get better prices through bulk purchasing?

Your community project could involve several people in the community or other local communities interested in installing solar PV systems. You could get together and negotiate bulk-buy discounts from installers or distributors of solar PV systems.

5. Do I need planning permission?

If the capacity of your system is about 4 kWp, you can connect without permission from Scottish Power (the electricity distribution company for Cheshire) as long as you notify them within 28 days. Your installer should normally do this for you. If your system capacity is over 4 kWp you need to contact Scottish Power for permission to connect to the grid.

The connection must meet technical requirements (e.g. for metering and protection equipment). The cost of grid connection can be a large part of the total costs and can be an issue in rural areas.

Guidance on grid connection from Scottish Power can be found on its website: http://www.spenergynetworks.com/dgis/g59_generator_connections.asp

6. Do I need planning permission?

In general, you don't need planning permission to install solar PV systems on individual community buildings as they are considered 'permitted development'.

You will require planning permission on flats or commercial buildings although planning permission is generally straightforward for solar PV systems unless panels protrude more than 200mm of the roofline.

Planning permission will be more difficult to obtain if your community building is:

- A listed building.
- Located in a conservation area.
- Located in a national park or Area of Outstanding Natural Beauty.

If you don't have many ticks a solar PV system might not be the most suitable technology for your community group. Don't worry! Find out more about other renewable technologies from the factsheets available on the CLASP website.

My Cheshire and Warrington: Solar PV Panels

It can work...

A group of residents in Bickerton presented a proposal to the village hall committee to install photovoltaic cells on the village hall roof. 100% funding was secured from the Low Carbon Buildings Programme Phase 2, Community Sustainable Fund and North West Climate Fund. A 4.86kWp photovoltaic array consisting of 27 panels now is providing the hall with an income <http://www.energysavingtrust.org.uk/Easy-ways-to-stop-wasting-energy/Where-I-Live/Success-stories/Energy-Saving-Trust-advice-centre-Merseyside/Bickerton-Village-Hall-Solar-PV-installation>

The multi award winning Kingsmead Primary School is an example of how sustainable design can be affordable and beautiful. It incorporates, amongst other technologies, a PV array which is visible for the children to use as a learning tool <http://dm3a.co.uk/dm3architecture/Kingsmead%20Primary%20School.html>

Some key facts about solar PV panels in Cheshire and Warrington:

- It is estimated that Cheshire and Warrington have a solar PV potential of 153 MegaWatts (MW) which is the equivalent to installing a standard 2kWp system on 76,000 homes in Cheshire.
- According to the Government, there are already 0.52 MW of PV installed in Cheshire and Warrington receiving FiTs payments
- At the end of March 2011 there are 34 MCS installers in Cheshire and Warrington who are able to install solar PV systems.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

There are other initiatives and support available in Cheshire and Warrington.

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being.

http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change-sustainability/low_carbon_communities__networ.aspx

Picture 1: Eco Environments, PV roof mounted Merseyside <http://www.eco-environments.co.uk>

Picture 2: Green Wise Business, PV ground mounted <http://www.greenwisebusiness.co.uk/news/fits-review-creates-massive-uncertainty-for-solar-farms-2095.aspx>

Picture 3: Solar Century, PV tiles Manchester <http://www.solarcentury.co.uk>

Picture 4: Energy Saving Trust, solar PV installation

FACT: Cheshire and Warrington have got potential for hydro power, with several sites considered appropriate by the Environment Agency.

FACT: Communities can make money from the electricity produced by their hydro power system thanks to the Government's Feed in Tariff scheme.

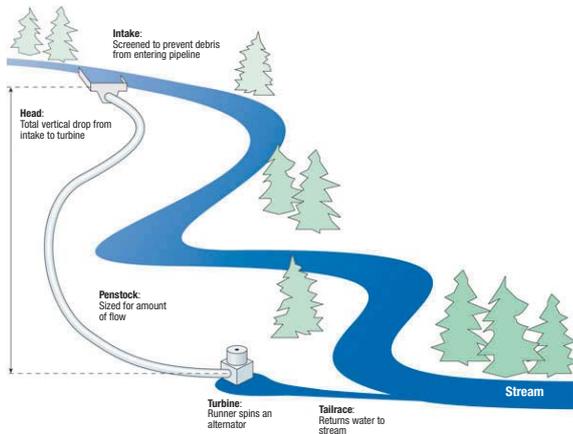
What are the basics?

What is hydro power and how does it work?

Hydroelectricity (hydro power for short!) systems use running water to generate electricity using a turbine or other devices. The faster the water flows and the more water there is - generally from a river or a stream, the more electricity can be generated. Once the water has gone through the turbine it is returned to the river.

The amount of electricity produced depends on the:

- **Head** – how far the water is falling from a higher point where it enters the system to a lower level where it exits. Once the system is installed, this 'head' is fixed.
- **Flow rate** – how much water is flowing. This will change with the seasons.



The key elements of a hydro power system are:

- **Intake** – where the water enters a pipe.
- **Pipe (penstock)** – through which water is transferred into the turbine.
- **Turbine** – where water power is converted into the rotational force that drives the generator to create electricity.
- **Powerhouse** – a building or box that houses the turbine, the electricity generator and the system controls.

The electricity generated by the hydro power system can be wired to a community building(s) or stored in a battery. Any excess electricity not used can be connected and sold to the National Grid.

How do I know if my site is suitable? Location, location, location...

It is important to have a water source close to where you are going to use the electricity in your community. Old mill weirs, sluices and faster flowing upland streams and rivers can provide an ideal location for your community hydro power system.

Feed in Tariffs - making money from hydro power

The Feed in Tariffs scheme (FiTs) is a Government incentive to encourage the generation of low carbon, renewable electricity. With the introduction of the FiTs, owners of hydro power systems can make money from the sale of the electricity (generated by the hydro power system they own) to an electricity supply company. The tariff is retail price index linked (so it alters to reflect the cost of living) and guaranteed for 20 years.

If you own a community hydro power system, you could be making money in 3 ways:

1. For all the electricity your hydro electric system produces.
2. For any surplus electricity you don't use yourself which can be sold to the National Grid.
3. From the savings you make on your existing electricity bills from using electricity produced by the hydro power system instead of the National Grid.

Don't delay! Tariffs are currently paying their highest rates BUT the rate could change in the future.

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

Most of the electricity supplied by the National Grid in the UK is sourced from fossil fuels, which over time has been steadily increasing in price, as shown in the table below. Also, fossil fuel prices are subject to future increases. By generating some of your own renewable electricity you will be replacing the electricity you would normally take from the National Grid. So, you will safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply from the National Grid.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--------------------------------------|------|------|------|------|------|------|
| UK retail electricity prices (p/kWh) | 9.0 | 9.8 | 11.3 | 12.4 | 12.5 | 14.1 |

Non domestic customers (such as community groups) sometimes pay higher retail electricity prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

Hydro power systems can generate energy all year round; although generation is usually higher in winter than summer. The table below gives an example of a 30 kilowatt peak (kWp - a measurement of a hydro system to generate electricity) community hydro power system (enough to provide electricity to around 50 homes) providing £13,000 fuel savings per year.

| | |
|--|---------------------------------|
| Income from FiTs for electricity generated | £22,120/year for 20 years |
| Income from FiTs for the electricity not used and sold | £3,000 (50% of total generated) |
| Fuel bill savings | £13,000/year |
| Total Income and savings | £38,120/year |

Based on 2011 figures

3. More local jobs

Only hydro power equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard can be eligible for FiTs. This only applies to systems below 50 kWh as larger systems need to meet different requirements set by Government.

Community hydro power projects can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Low maintenance technology

Hydro power systems are a fairly low-maintenance technology with a long working life of 30 to 50 years. The technology is widely used around the UK, Europe and beyond and has a track record spanning hundreds of years. There will be a cost to gathering evidence for your planning and licence applications, designing, allowing access, installing and maintaining the system which needs to be considered from the start.

5. Safeguard your community from flooding

Hydro systems can help with flood defence, reducing the risk of flooding by controlling the flow of the river and river surges.

6. Reduce your community carbon emissions

Hydro power systems produce low carbon, renewable energy. By replacing some of the electricity usually taken from the National Grid (mostly produced from high carbon fossil fuels such as coal, oil and natural gas) with renewable electricity produced by a hydro system your community will be reducing its carbon emissions and helping the fight against climate change.

7. Improve community well-being

Hydro power systems are a statement of a communities' commitment to reduce carbon emissions and generate its own energy. Community hydro power projects could provide leisure and recreational benefits, for example, angling or school visits. They can act as the starting point for wider initiatives that improve a community's well-being.

Myth busting

Hydro power harms the environment!

The Environment Agency has published best practice guides to help communities understand if their hydro power project is likely to have an impact in the wider environment.

As long as their guidelines are followed (such as being sensitive to local habitats, accommodating fish migration etc.) using rivers and streams to produce renewable electricity should not adversely affect the local water environment and could actually help improve it.

<http://www.environment-agency.gov.uk>

Hydro power reduces rural tourism!

There are examples of sites where a hydro power system has been installed in areas of natural beauty without it causing a reduction in the number of visitors.

For example, Aurlandsdalen is one of the river systems in Norway where a large hydro power system has been installed. Still thousands of tourists each year walk the Aurlandsdalen trail and enjoy the beautiful scenery of the valley

<http://www.renewable.no>

My Community Checklist: Hydro Power

Congratulations! You have already taken the first step by wanting to find out more about hydro power and the benefits the technology could bring to your community.

The next step is to find out whether your community has a site suitable for a hydro power system. By completing the short checklist below you can assess whether hydro power is the right technology for generating electricity for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is the river or stream suitable for hydro power?

You need a river or stream with a good head or a good water flow rate (or both) in order for the system to perform well. If the river or stream has a good head, it means that you will need to divert less water to turn the turbine. If available, this will make the planning and licensing process more straight forward and reduce the overall costs. Rivers or streams with low head and high water flow can also be considered but they will require more water to be diverted to make up for the lack of head. This type of project tends not to be suitable for community scale hydro power projects.

If the site already has some old hydropower equipment in place, for example in a historic mill, it is possible that you may be able to use some of the old structure to start generating again.

2. Do I have permission from the Environment Agency?

For any hydro power project you will need to apply for a licence from the Environment Agency because changes to a river can have impacts on wildlife, especially fish. When considering your licence application they will look at abstraction (amount of water being taken) impoundment (whether the water levels or flow of the water source change), flood risk (if there a potential to increase flooding risk) and fish passage (whether fish will still be able to safely pass through the water source).

To encourage more community hydro power the Environment Agency, in partnership with Energy Saving Trust, has published a guide for community scale hydro projects: <http://publications.environment-agency.gov.uk/pdf/GEHO1010BTDN-E-E.pdf>

3. Do I have the land owner's permission?

You need to consult the land owner on both sides of the river or stream where you want to site the project to see if they would welcome a hydro power system.

4. Is the site accessible?

Road access to the site is required for construction and maintenance. If there are no existing roads, consideration should be given to building one which has a cost and most likely needs planning permission.

5. Can I connect to the National Grid?

If the capacity of you system is about 4 kWp, you can connect without permission from Scottish Power (the electricity distributor), as long as you notify them within 28 days. Your installer should normally do this for you. If your system capacity is over 4 kWp you need to contact Scottish Power for permission to connect to the grid.

The connection must meet technical requirements (e.g. for metering and protection equipment). The cost of grid connection can be a large part of the total costs and can be an issue in rural areas. Guidance on grid connection from Scottish Power can be found on its website: http://www.spenergynetworks.com/dgis/g59_generator_connections.asp

6. Do I need planning permission?

All hydro power projects require planning permission and it is strongly recommended that you contact your Local Planning Authority as early in the process as possible. They will consider issues such as flood risk, physical appearance of any buildings, ecology, landscape, amenity and archaeology.

To get planning permission, you need to show that:

- Anyone potentially affected by the installation has been consulted.
- The site has been accurately studied for energy generation potential.
- Any potential impact on landscape and ecology has been assessed.

Since some hydro power projects can be sited near river banks and alter the flow of the river, you will also need to complete a further environmental assessment of the river bank and surroundings. This will need to be carried out by a qualified ecologist.

If you don't have many ticks a hydro power system might not be the most suitable technology for your community group. Don't worry! Find out more about other renewable technologies from the factsheets available on the CLASP website.

My Cheshire and Warrington: Hydro Power

It can work...

Bollington Action Group is a group of local volunteers. They were awarded funding by the Cheshire & Warrington Economic Alliance to study the feasibility of re-building some of their old hydropower schemes for a 21st Century application: green electricity generation. They have identified several potential sites and are currently investigating sources of funding. http://www.google.co.uk/search?q=bollington+hydro&sourceid=ie7&rls=com.microsoft:en-gb:IE-SearchBox&ie=&oe=&rlz=117SKPT_en&redir_esc=&ei=xUOsTfGnHMO08QPT-dke

Low Carbon Lymm is a voluntary, not for profit body, established by a group of local residents. As part of their activities they are looking into the potential for a hydro scheme(s) to generate electricity for the village. The scheme(s) could also act as a visitor attraction and a link to the industrial heritage of the village. A feasibility study has been conducted and three sites have been identified to have potential for hydro power.

<http://www.lowcarbonlymm.org.uk/category/generating-your-own-energy/>

Some key facts about hydro power systems in Cheshire and Warrington

- It has been estimated that Cheshire and Warrington have a hydropower potential of 4.2 MegaWatts (MW). For comparison, the example in this factsheet is for a 30 kW (1 MW = 1000 kW) which could power 50 homes.
- At the end of March 2011 there are two companies in the North West which are MCS certified to install hydro power systems.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being.

http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change-sustainability/low_carbon_communities__networ.aspx

FACT: Cheshire and Warrington have potential for solar thermal systems, especially in more urban areas.

FACT: Communities can make money whilst generating some or all of their hot water needs with solar thermal systems thanks to the Government's Renewable Heat Incentive.

What are the basics?

What is solar thermal and how does it work?

Solar thermal technologies (also known as solar water heating systems) collect heat from daylight onto a collector. A collector is usually a panel fitted to the roof of your community building(s) although they can also be free-standing structures on the ground.

The collector then transfers the heat direct or indirectly to water which can be stored in a tank or cylinder. The further the panels are away from the water tank the more heat will be lost. The systems don't rely on direct sunlight alone but they will produce more hot water when it's sunny.

There are four parts to a solar thermal system:

- Collector – collects the daylight.
- Pipe system – transfers heat generated by the collector.
- Water tank – stores the water heated by the collectors.
- Temperature control – modern systems have valves fitted to allow cold water to be mixed with the hot water to control the temperature.

In general, solar thermal is not suitable for space heating in UK buildings. Heating is required the most during the winter months when the sun is at its weakest.

Your community would need a large number of panels to provide a small percentage of your heating, which is not cost effective.

Different types of solar thermal collectors:

There are three types:

Evacuated tubes – a number of glass collector tubes which absorb daylight. They are often lighter than flat plates and tend to be more efficient at heating water during winter. But the glass tubes make them more fragile.



Flat plate collectors – a dark, flat plate containing a metal that absorbs daylight. They are slightly less efficient compared to evacuated tubes so the collector surface area will need to be bigger to give the same amount of heat. However, they are usually slightly cheaper to buy.



Unglazed solar collectors – a series of small black pipes through which water is pumped to get heated directly by daylight. They are only really suitable for low temperature use like swimming pools.



Renewable Heat Incentive - making money from evacuated tubes and flat plate solar thermal systems

The UK Government has launched a new Renewable Heat Incentive (RHI) to encourage the generation of low carbon, renewable heat. The RHI will be launched in two phases:

1. Phase one: long term payments for communities, industry and the public sector (available now) and a 'Renewable Heat Premium Payment' for home owners (available July 2011).
2. Phase two: long term payments for home owners (available October 2012).

Some issues to consider, as currently the RHI:

1. Does not cover unglazed solar collectors (also know as transpired solar thermal) as they are not considered renewable or large solar thermal.
2. Does allow communities who own a evacuated tube or flat plate collector systems to make money from the hot water they generate:
 - By RHI payments paid quarterly over 20 years for systems installed on or after 15 July 2009. This payment by Government is retail price index linked (so it alters to reflect the cost of living).
 - From the savings you make on your community's heating bills from using hot water produced by the system instead of using more expensive fossil fuel sources such as gas, electricity, LPG or coal.
3. is a new area still being developed so we recommend you visit the Government's website on <http://ceo.decc.gov.uk>

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

By using a solar thermal system to produce hot water for your community building, you will be replacing the use of fossil fuels such as gas that you normally buy from the National Grid or oil and coal from wholesale suppliers if you are off the gas grid. Generating some of your own hot water will help safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply.

The table below shows the increase in gas prices and the unpredictability oil and coal prices over six years.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--|------|------|------|------|-------|------|
| UK retail gas prices (p/kWh) | 2.3 | 2.6 | 3.3 | 3.5 | 3.9 | 4.4 |
| International wholesale oil price (\$/bbl) | 44.2 | 62.2 | 72.9 | 77.7 | 106.3 | 62.6 |
| UK wholesale Coal price (£/tonne) | 45.2 | 38.0 | 38.3 | 47.3 | 83.1 | 45.0 |

Non domestic customers (such as community groups) sometimes pay higher retail prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

The table below shows an example of how a community solar thermal system for a recreation centre with a swimming pool could receive nearly £3,000 a year in income and savings. The system could meet around 50% of the centre's hot water needs.

| | |
|--------------------------------|--------------|
| Income from RHI (for 20 years) | £1,870/year |
| Fuel bill savings | £1,013/year |
| Total Income and savings | £ 2,883/year |

Based on 2011 figures

3. More local jobs

Only solar thermal equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard are eligible for RHI. This only applies to solar thermal systems below 45 kilowatt thermal capacity (kWth – measurement of heat output), as larger systems need to meet different standards which will be set by Government.

Community solar thermal systems can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where local jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Low maintenance technology

Solar thermal systems are one of the easiest technologies to install and require very little maintenance. If debris falls on the systems such as leaves these will need to be swept off as they can affect the amount of sunlight hitting the panels.



5. Safeguard your community from flooding

Solar thermal systems produce low carbon renewable energy. By replacing some of the hot water produced by using fossil fuels (such as coal, oil or natural gas) with renewable hot water produced by a solar thermal system your community will be reducing its carbon emissions and helping fight climate change.

6. Reduce your community carbon emissions

Solar thermal systems show your community's commitment to reducing carbon emissions and generating its own energy. Solar thermal systems can also help tackle fuel poverty issues by providing low cost hot water, especially for communities not connected to the gas grid.

Community renewable energy projects are sometimes the starting point for wider initiatives that improve a community's well-being. Read the Ecopod case study on the CLASP website (<http://www.clasp-nw.info>) for an example of how a community has achieved great benefits from using solar thermal panels.

Myth busting

Solar thermal does not work in colder climates!

Solar thermal uses daylight rather than intense sunlight to produce hot water. Although they are most effective in sunny climates, the North West of England receives enough daylight for the systems to work well. This does vary through the year <http://solargis.info/imaps/>

Solar thermal can only provide a small proportion of my community's hot water needs!

Generally, solar thermal provides all of the hot water needs for the summer and around 40 to 50% in average throughout the year. The Energy Saving Trust is currently conducting monitoring trails to measure performance at operating residential sites. Results should be published in summer/autumn 2011 <http://www.est.org.uk>

Solar thermal will reduce the value of my community building!

A survey carried out by the University College of London to prospective house buyers in Oxford revealed that 47% of respondents would be more likely to buy a property with solar thermal systems installed. Only 10% of respondents would be less likely to buy it. <http://www.oxford.gov.uk/Direct/SolarValueStudyExecutiveSummary.pdf>

My Community Checklist: Solar Thermal Systems

Congratulations! You have already taken the first step by wanting to find out more about solar thermal systems and the benefits the technology could bring to your community.

The next step is to find out whether your community has got a potential site suitable for a solar thermal system. By completing the short checklist below you can assess whether solar thermal systems are the right technology for generating energy for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is my site suitable for a system?

Roof: you will need the roof where you plan to install the system to have at least 5m² of unshaded space facing within 90 degrees of South. East and West facing roofs could also be considered. To identify which direction your community building is facing enter your postcode into Google maps: <http://maps.google.co.uk>

Boiler: you need to check whether your current boiler is compatible with a solar thermal system. Most conventional boiler and water cylinder systems are compatible. However, combination boilers connected to a hot water tank are less suitable.

Hot water tank: a single tank or adding a second tank.

- A single tank – contains two heating coils: one feeds heat from the boiler and the other from the solar collector. These tanks are larger than most standard tanks, although only one tank is required.
- Adding a second tank – this option requires extra space. The second tank will be of a similar size to the original tank and only store water heated by the solar thermal panel.

You will need to assess which is the most suitable option for your community, depending on your current heating system and the space available.

2. Do I have the owner's (land or building) permission?

You need to consult the owner of your proposed site for a solar thermal system to ensure that they would welcome a solar thermal system.

3. Are my community's hot water needs suitable for a solar thermal system?

Solar thermal systems are the most cost effective when installed on buildings with a steady, year round demand for hot water.

Good examples of community use of solar thermal systems are:

- Swimming pools.
- Residential facilities such as care homes.
- Anywhere with a café or showers or refreshment area.

Think about the hot water needs of your community building throughout the year to understand if a solar thermal system is suitable.

4. Could my community get better prices through bulk purchase?

Your community project could involve several people in the community being interested in fitting a solar thermal system. You could get together to negotiate bulk-buy discounts from installers or distributors of solar thermal systems.

Other costs can be offset when roof works are being carried out – re-tiling, repairs or new build extensions.

5. Do I need planning permission?

Roof mounted systems are permitted under planning regulations unless:

- The panels protrude more than 200mm from the roof.
- They are facing onto or visible from a highway
- In a Building Conservation Area, National Park or World Heritage Site.
- The building is a listed building.

You will require planning permission for flats and commercial buildings. Achieving planning permission is generally straight forward for solar thermal systems.

6. Am I up to date with the latest information?

The market for renewable heat technologies is relatively new in the UK and improved products and offers are appearing all the time. Visit the Government's website for the latest information on solar thermal systems and relevant policies such as the RHI <http://www.decc.gov.uk>

If you don't have many ticks a solar thermal system might not be the most suitable technology for your community group. Don't worry! Find out more about other renewable technologies from the other community factsheets available on the CLASP website.

My Cheshire and Warrington: Solar Thermal Systems

It can work...

Cheshire and Warrington Enterprise Commission is currently working with seven registered social landlords, Cheshire East Council, Cheshire West and Chester Council and Warrington Borough Council to develop the "Renewable Energy in Social Housing" project. The project will be installing technologies to save energy in hard to treat properties. The European Regional Development Fund will be funding the installation of solid wall insulation and solar thermal hot water heating systems.

<http://www.cwea.org.uk/erdf-projects>

Weaver Vale Housing Trust has teamed up with Scottish Power and the Powys Energy Agency to install solar panels (for domestic use) in Cheshire as part of a pilot project measuring and analysing the contribution that solar thermal energy can make to domestic energy use in rural areas. <http://www.cheshirerenewables.org.uk/renewables-tarporley.htm>

Some key facts about solar thermal systems in Cheshire and Warrington

- It has been estimated that Cheshire and Warrington have a solar thermal potential of 153 MegaWatts (MWth), which is equivalent to installing a 3kWth systems (1 MWth = 1000 kWth) in about 51,000 buildings.
- At the end of March 2011 there are 20 MCS installers in Cheshire and Warrington who are able to install solar thermal systems.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being.

http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change-sustainability/low_carbon_communities__networ.aspx

Picture 1: Tomkinson Heating, evacuated tubes <http://www.tomkinsonheating.co.uk/>

Picture 2: Ample Energy Systems, flat plate collectors <http://www.ample-energy-services.co.uk/>

Picture3: Whole Building Design Guide, unglazed collector <http://www.wbdg.org/>

FACT: Cheshire and Warrington has potential for generating heat through heat pumps, especially in those buildings not connected to the gas network.

FACT: Communities can make money whilst heating their buildings with a heat pump thanks to the Government's Renewable Heat Incentive.

What are the basics?

What are heat pumps and how do they work?

Heat pumps move low temperature heat from one location (the 'source') and pumps higher temperature heat into another location (the 'sink'). Most heat pumps take heat from either the air or the ground outside to heat rooms or water inside a building. Water (from local ponds, rivers and boreholes) can also be used as the source. It's the same way your fridge works at home but on a bigger scale!

You can change the direction of the heat from inside to outside for cooling rooms by using a 'reversing valve'. It's the same way an air-conditioning unit works in an office.

Heat pumps need electricity (or occasionally gas) to run but the heat they extract from the ground, air, or water is free and constantly being renewed naturally by the sun. If you use renewable energy to power your heat pump (using solar panels or wind turbines) then your heating could be completely independent from the National Grid.

Unlike gas or oil boilers, heat pumps are better at delivering heat at lower temperatures over longer periods. This means that during the winter they may need to be left on 24/7 to heat your buildings efficiently. It also means that radiators should never feel as hot to the touch as they would do when using a gas or oil boiler.

Different types of heat pumps:

Heat pumps can be classified in three groups according to source of heat used:

Air Source Heat Pumps - extract heat from the outside air, even when the outside temperature is as low as minus 15° C. Air to air systems release hot air to heat the building and air to water systems heat the building through underfloor heating or radiators.



Ground Source Heat Pumps - extract heat from the ground using pipes (horizontal or vertical). Beneath the surface, the ground stays at around the same temperature (with very little variation) so the performance of this type of heat pumps tends to be more constant throughout the year.



Water Source Heat Pumps - extract heat from water using pipes. They are not as common as ground or air source heat pumps but can be suitable for sites near a river, stream or lake.



Renewable Heat Incentive - making money from ground and water source heat pumps

The UK Government has launched a new Renewable Heat Incentive (RHI) to encourage the generation of low carbon, renewable heat. The RHI will be launched in two phases:

1. Phase one: long term payments for communities, industry and the public sector (available now!) and a 'Renewable Heat Premium Payment' for home owners (available July 2011).
2. Phase two: long term payments for home owners (available October 2012).

Some issues to consider, as currently the RHI:

1. Does not cover air source & cooling heat pumps (the Government plans to include these from 2012 subject to affordability).
2. Does allow communities who own a ground or water source heat pump to make money from the heat they generate:
 - Provided they have a co-efficient of at least 2.9 (for every one unit of energy used to power the pump nearly 3 units of heat are produced).
 - By RHI payments paid quarterly over 20 years for heat pumps installed on or after 15 July 2009. This payment by Government is retail price index linked (so it will alter to reflect the cost of living).
 - From the savings you make on your community's heating bills from using heat produced by the heat pump instead of using more expensive fossil fuel sources such as gas, electricity, LPG or coal.

As this is a new area still being developed we recommend you visit the Government's website on <http://ceo.decc.gov.uk>

In association with

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

Generating your own heat will help safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply. By heating (or cooling) your community building with a heat pump you will be replacing the use of fossil fuels. Such as gas that you normally buy from your energy supplier or oil and coal from wholesale suppliers if you are off the gas grid.

The table below shows the increase in gas prices and the unpredictability oil and coal prices over six years.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--|------|------|------|------|-------|------|
| UK retail gas prices (p/kWh) | 2.3 | 2.6 | 3.3 | 3.5 | 3.9 | 4.4 |
| International wholesale oil price (\$/bbl) | 44.2 | 62.2 | 72.9 | 77.7 | 106.3 | 62.6 |
| UK wholesale Coal price (£/tonne) | 45.2 | 38.0 | 38.3 | 47.3 | 83.1 | 45.0 |

Non domestic customers (such as community groups) sometimes pay higher retail prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

The table below shows an example of how a community ground source heat pump installed in a village hall could receive a total income and savings of over £1,700 a year. The heat pump would replace electric heaters.

| | |
|--------------------------------|--------------|
| Income from RHI (for 20 years) | £1,870/year |
| Fuel bill savings | £1,013/year |
| Total Income and savings | £ 2,883/year |

Based on 2011 figures

3. More local jobs

Only heat pump equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard are eligible for RHI. This only applies to heat pumps below 45 kilowatt thermal capacity (kWth – measurement of heat output) as larger systems need to meet different standards which will be set by Government.

Community heat pumps can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where local jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Low maintenance technology

Once installed, heat pumps don't need regular servicing or annual safety checks and maintenance costs are generally very low. In particular, air source heat pumps are relatively low cost and easy to install.

5. Reduce your community carbon emissions

Heat pumps produce low carbon renewable energy and help your community to reduce its carbon emissions and help fight climate change. Specifically, by replacing the fossil fuels (such as coal, oil and natural gas) used to heat your community building with renewable heat produced by your heat pump.

6. Improve community well-being

Installing a heat pump system will show your community's commitment to reducing carbon emissions and generating its own energy. Heat pumps can also help tackle fuel poverty issues by providing low cost heat, especially for communities not connected to the gas grid. Community renewable energy projects are sometimes the starting point for wider initiatives that improve a community's well-being.

Myth busting

Air source heat pumps don't work in colder climates like the UK!

The Energy Saving Trust field trials for heat pumps in homes identified that well designed, correctly installed heat pumps can achieve very good results in the UK. A high number of the properties included in the trial were from the North West of England. <http://www.est.org.uk>

Heat pumps are very noisy!

Air source heat pumps will make some noise, which varies dependent upon the model you choose, but it is usually around 65 decibels (db) at 1 metre from the heat pump. By comparison, normal conversation is around 50db, a busy office about 60db, and a busy street about 70db. <http://www.cat.org.uk>

Heat pumps have negative effects in the environment!

Heat pumps have very few negative impacts. These impacts can be reduced, or even eliminated by:

- Buying your electricity from a supplier that offers green electricity from renewable energy sources or generating your own renewable electricity to run your heat pump.
- Asking your installer about the different types of heat pumps. Modern ground source heat pumps use more environmentally friendly fluids to capture the heat from the ground and the chances of leakage are minimal. <http://www.energyagency.org.uk>

My Community Checklist: Heat Pumps

Congratulations! You have already taken the first step by wanting to find out more about heat pumps and the benefits the technology could bring to your community.

The next step is to find out whether your community has got a potential site suitable for heat pumps. By completing the short checklist below you can assess whether heat pumps are the right technology for generating heat for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is my community site or building suitable for a heat pump?

If you are looking to install a heat pump, you need to assess whether your site or building is suitable. Consider if the site or building is:

- Well-insulated: heat pumps produce lower temperatures than traditional boilers so it is essential that any building is insulated and draught proof to ensure that heat pumps work at their best.
- Accessible and large enough: ground source heat pump sites need to be suitable for digging trenches or boreholes and digging machinery. Air source heat pumps need to be fitted to a wall or on the ground.
- With a suitable heating distribution system: radiator systems designed for boilers tend not to be adequate for heat pumps, as they require higher water temperature than heat pumps provide. Underfloor heating is the preferred distribution method although large surface area radiators can be considered as an option. In particular, air source heat pumps can perform better with under floor heating systems or warm air heating than with radiator-based systems because of the lower water temperatures required.
- A new development: combining the installation (e.g. under floor heating) with other building work can reduce the cost of installing the system.

2. Do I understand my heating needs?

Heat pumps are best suited for community buildings that need constant low temperature heating, such as swimming pools, care homes or buildings which are insulated and off the gas grid. They don't work as well for very intermittent use as they can take several hours to get the space or water to heat or cool.

Think about the heat or cooling needs of your community building throughout the year to understand if a heat pump is suitable.

3. Will the heat pump replace electricity, oil, LPG or coal based heating?

If your community building is being heated with electricity, oil, LPG or coal, installing a heat pump is likely to reduce your heating bills. In general, heat pumps are an attractive option for communities with no connection to the gas network.

However, if your community heating is provided by gas then minimal savings will be made in your community's heating bill by substituting your heating system with a heat pump.

4. Do I have the owner's (land or building) permission?

You need to consult the owner of the land or building where you want to install the heat pump to see if they would welcome a heat pump.

5. Do I need planning permission?

You will need:

- Planning permission for air source heat pumps, which should include a noise assessment if the system is located in a residential area.
- An abstraction license from the Environment Agency for most water source heat pumps.

Generally speaking you won't need planning permission for any internal elements of a ground source heat pumps and it is unlikely that you will need to apply for planning permission for excavations or drilling if you own the land.

It is always advisable to contact your local authority planning department as early as possible in the process.

6. Am I up to date with the latest information?

The market for renewable heat technologies is relatively new in the UK and improved products and offers are appearing all the time. Visit the Government's website for the latest information on heat pumps and relevant policies such as the RHI <http://www.decc.gov.uk>

If you don't have many ticks a heat pump might not be the most suitable technology for your community. Don't worry! Find out more about other renewable technologies from the community factsheets available on the CLASP website.

My Cheshire and Warrington: Heat Pumps

It can work...

A Registered Social Landlord In Cheshire West & Chester, Chester & District Housing Trust, has committed £985,000 in 2010/11 to fund installations of air source heat pumps and/or solar thermal water replacements to improve the heating systems for their residents and provide affordable warmth. <http://www.cheshirewestandchester.gov.uk/housing.aspx>

Some key facts about heat pumps in Cheshire and Warrington:

- It is estimated that Cheshire and Warrington has a heat pump potential of 2,516 MegaWatt thermal (MWth) which is the equivalent to installing a standard 5 kWth heat pump on over 503,000 homes in Cheshire and Warrington (1 MWth = 1000 kWth).
- In March 2011 there were eight MCS installers based in Cheshire and Warrington who are able to install heat pumps.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being:

http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change-sustainability/low_carbon_communities__networ.aspx

Picture 1: Energy Saving Trust, air source heat pump

Picture 2: Chiltern group, ground source heat pump <http://www.chilterngroup.com>

Picture 3: Heat Pump Association, water source heat pump <http://www.heatpumps.org.uk/TypesOfHeatPumpSystems.htm>

FACT: Cheshire and Warrington has potential for biomass heating systems, especially for those communities off the gas network.

FACT: Communities can make money whilst heating homes and buildings with a biomass heating system thanks to the Government's Renewable Heat Incentive.

What are the basics?

What is biomass heating and how does it work?

In relation to renewable energy, biomass refers to organic material from living or recently living organisms (as opposed to fossil fuels which take millions of years to form from organic material). Biomass heating refers to biomass being burnt to heat water or provide space heating in one or more rooms. Wood is the fuel most commonly used for biomass heating.

Burning biomass does release carbon dioxide (the main contributor to climate change) but only the same amount that is absorbed and released during the organism's life, death and eventual decay. The process of burning biomass such as wood fuel is therefore referred to as being carbon neutral.

Different types of biomass heating systems

- Boilers: which replace gas, oil or coal burning boilers in your community central heating system and provide heat for hot water and space heating.
- Stoves: smaller units mostly used for providing heating for one room. They can be used in conjunction with a main central heating system or fitted with a back boiler to provide hot water as well as space heating. Depending on the size and use of the building, some well insulated community buildings might be able to use a biomass stove to heat an entire building.

A water storage tank can act as a buffer providing heat when it is most needed (e.g. a village hall on weekends or evenings). This way the system will be able to save more money on your community heating bill.

All boilers and stoves require a flue, which can be fitted inside an existing chimney. This must be insulated to a high standard to prevent condensation of flue gases, which could damage the system.

Different types of wood fuel

Pellets - denser and drier than chips and logs. They are more expensive to buy but cheaper and easier to store. They are suitable for use in systems with automatic feeding and ignition.



Chips - cheaper and more suitable for medium to larger installations in communities with a large storage area available and local supply of wood. They are suitable for systems with automatic feeding and ignition.



Logs - the cheapest option. The amount of heat produced per kilogram of wood tends to be lower than with pellets or wood chip due to their higher moisture content. They generally need to be loaded into the boiler or stove manually.



Renewable Heat Incentive - making money from solid (wood) biomass boilers

The UK Government has launched a new Renewable Heat Incentive (RHI) to encourage low carbon, renewable heat.

1. Phase one: long term payments for communities, industry and the public sector (available now!) and a 'Renewable Heat Premium Payment' for home owners (available July 2011).
2. Phase two: long term payments for home owners (available October 2012).

Some issues to consider, as currently the RHI:

1. Does not cover biomass stoves or large biomass (Government plans to consult on criteria for these biomass technologies from 2012 with any criteria agreed taking effect from 2013).
2. Does allow communities who own a solid biomass boiler to make money from the heat they generate:
 - By RHI payments paid quarterly over 20 years for solid biomass boilers installed on or after 15 July 2009. This payment by Government is retail price index linked (so it alters to reflect the cost of living).
 - From the savings you make on your community's heating bills from using heat produced by the solid biomass boiler instead of using more expensive fossil fuel sources such as gas, electricity, LPG or coal.
3. Is a new area still being developed; we recommend you visit the Government's website on <http://ceo.decc.gov.uk/>

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

By heating your community building with a biomass system you will be replacing the use of fossil fuels such as gas that you normally buy from your energy supplier or oil and coal from wholesale suppliers if you are off the gas supply grid. Generating your own heat will help safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply. Biomass fuel costs are broadly comparable to gas at current prices and cheaper than electric heating and bottled gas.

The table below shows the increase in gas prices and the unpredictability of oil and coal prices over six years.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--|------|------|------|------|-------|------|
| UK retail gas prices (p/kWh) | 2.3 | 2.6 | 3.3 | 3.5 | 3.9 | 4.4 |
| International wholesale oil price (\$/bbl) | 44.2 | 62.2 | 72.9 | 77.7 | 106.3 | 62.6 |
| International wholesale Coal price (£/tonne) | 45.2 | 38.0 | 38.3 | 47.3 | 83.1 | 45.0 |

Non domestic customers (such as community groups) sometimes pay higher retail prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

The table below is an example of how a community biomass boiler installed on a farm has potential to receive a total income and savings of £12,000 a year. The farm has a high heat demand due to having residential accommodation and a restaurant. It was previously heated by Liquefied Petroleum Gas (LPG).

| | |
|--|---------------|
| Income from RHI (for 20 years) | £9480/year |
| Fuel bill savings (all heating and hot water from biomass) | £2,477/year |
| Total Income and savings | £ 11,972/year |

Based on 2011 figures

3. More local jobs

Only biomass heating equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard are eligible for RHI. This only applies to biomass boilers below 45 kilowatt thermal capacity (kWth - measurement of heat output) as larger systems need to meet different standards which will be set by Government.

Community biomass heating can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where local jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Wider economic and environmental benefits

The use of wood fuel provides an economic incentive to manage woodland, helping to restore healthy woodland systems and provide employment opportunities in rural areas. Also, the boiler ash can be used as a fertiliser on a community garden. What's more, you're reducing the wastage of products that might otherwise be clogging up a landfill site.

5. Flexible technology

New biomass boiler systems can be programmed to meet different heat and water demand. Also, biomass stoves can be ideal for refurbishing older community buildings as a functioning chimney is cheaper than installing central heating.

6. Reduce your community carbon emissions

Biomass heating produces low carbon, renewable energy. By replacing fossil fuels used to heat your community building with renewable heat produced by your biomass system your community will be reducing its carbon emissions and helping fight climate change.

7. Improve community well-being

Installing a biomass heating system demonstrates your community's commitment to reduce carbon emissions and generate its own energy. Biomass heating can also help tackle fuel poverty issues by providing low cost space heating and hot water, especially for communities not connected to the gas grid who have access to a reliable local supply of biomass fuel.

Myth busting

Biomass heating is not renewable as it emits CO₂!

The process is carbon neutral except for energy used in planting, harvesting, processing and transporting the biomass. Even allowing for these emissions, replacing fossil fuel energy with wood can reduce net CO₂ emissions by over 90 per cent. <http://www.carbontrust.co.uk>

Biomass heating is a threat for woodland areas!

According to the Woodland Trust, encouraging increased demand for wood products can lead to the:

- Expansion of native woodland and an increase in tree cover, and the protection of sensitive woodland.
- Restoration of Plantations on Ancient Woodland Sites.
- Improved management and biodiversity.
- Renewing public and political appreciation for the value of woodland to society <http://www.woodlandtrust.org.uk>

Biomass heating systems have negative effects on health as they deteriorate air quality!

A report produced for the Government by AEA consultancy concluded that biomass boilers should have a small and manageable impact on air quality provided that they:

- Are of "high quality" (i.e. that they work efficiently).
- Replace coal and oil fired boilers.
- Are in areas off the gas grid or away from densely populated urban areas.
- Are not widely deployed in Air Quality Management Areas (AQMA) <http://www.biomassenergycentre.org.uk/>

My Community Checklist: Biomass Heating

Congratulations! You have already taken the first step by wanting to find out more about biomass heating and the benefits the technology could bring to your community.

The next step is to find out whether your community has got a potential site suitable for heat pumps. By completing the short checklist below you can assess whether heat pumps are the right technology for generating heat for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is my community site suitable for a biomass heating system?

You will need to consider if the site or building has:

- Enough space for your biomass boiler and potentially a water storage tank.
- Enough space for a fuel store unit, which is a dry, sheltered area which can be easily accessible by delivery lorries.
- A suitable vent specifically designed for wood fuel. A chimney can be fitted with a lined flue, which is a cost effective solution.

2. Do I need a new heating distribution system?

Wood fuelled boilers can be used with existing radiators and under floor heating. If you currently have an electric storage heater and want to install a biomass boiler, then you will need to install a new heating distribution system which could be expensive.

3. Can my community easily access a good supply of fuel?

This is the key question to be answered. The North West of England has a very good supply of biomass fuel, especially in those areas close to woodland.

You can find a list of suppliers by subregion on the Biomass Energy Centre website:

<http://www.biomassenergycentre.org.uk>

The quality of the fuel is very important as this will ensure that your biomass heating system works efficiently.

4. Do I have the owner's (land or building) permission?

You need to consult the owner of the land or building where you want to install the biomass heating system to see if they would welcome it.

5. Do I need planning permission?

All biomass boilers and stoves must:

- Comply with safety and building regulations.
- Have an 'exempted' appliance status if your community building is in a smokeless zone. For further advice and to find out if your site is in a smokeless zone visit: <http://www.uksmokecontrolareas.co.uk>

For biomass heating systems designed to heat a single building you are likely not to find any obstacles unless the flue exceeds 1 meter above the height of the roof.

However, you will need to apply for planning permission in the following cases:

- If your community building is listed or in an Area of Outstanding Natural Beauty or World Heritage Site.
- If the fuel store is located outside the building or the building need to be modified to accommodate it.

6. Am I up to date with the latest information?

The market for renewable heat technologies is relatively new in the UK and improved products and offers are appearing all the time.

Visit the Government's website for the latest information on biomass heating and relevant policies such as the RHI

<http://www.decc.gov.uk>

If you don't have many ticks a biomass heating system might not be the most suitable technology for your community. Don't worry! Find out more about other renewable technologies from the community factsheets available on the CLASP website.

My Cheshire and Warrington: Biomass Heating Systems

It can work...

Around 60% of the heat demand of Kingsmead School in Cheshire is met by a biomass boiler. The fuel is a clean wood chip from waste timber. The boiler is 80% efficient and has the capacity to meet the variable heating demands of the school.

<http://www.climatechangenorthwest.co.uk>

Trafford Hall is a listed Georgian Country House situated in Cheshire's countryside. The building's carbon neutral training unit is made from sustainable timber and heated by a combination of solar panels and a biomass boiler.

<http://www.ukvillages.co.uk/Content/Show/9336/Trafford+Hall>

Some key facts about biomass heating systems in Cheshire and Warrington:

- It is estimated that Cheshire and Warrington has a biomass heating potential (from managed woodland) of 12 MWth, which is the equivalent to installing 600 community biomass heating boilers of 20 kWth capacity (1 MWth = 1000 kWth).
- According to a survey carried out by Envirolink Northwest, biomass and biomass CHP (combined heat and power) main objections to achieving planning permission relate to air quality impact. However, the three projects identified in Cheshire and Warrington had achieved planning approval.
- As of March 2011 there were three MCS certified installers based in Cheshire and Warrington who are able to install biomass heating systems.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being:

http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change-sustainability/low_carbon_communities__networ.aspx

Picture 1: Arun District Council, biomass pellets <http://www1.arun.gov.uk/>

Picture 2: Greener Energy, biomass chips http://greenerenergysolutions.co.uk/?page_id=41

Picture 3: Euroheat, biomass logs <http://www.euroheat.co.uk/>

FACT: Combined Heat & Power (CHP) can achieve significant cost savings and environmental benefits by reducing carbon emissions, enhanced energy security and overall efficiency

FACT: Communities can make money by generating renewable heat and electricity with a combined heat and power system thanks to Government's Renewable Heat Incentive and Feed in Tariff scheme.

What are the basics?

What is CHP and how does it work?

Combined Heat & Power (known as CHP systems) produce heat and electricity at the same time. This makes the process more efficient as most of the energy is captured, used and not wasted. This is why CHP systems are considered a low carbon energy efficient technology, even when they run on fossil fuels like gas.

CHP systems can be:

- Heat led - which produces heat as the main product, with electricity as a by-product.
- Electricity led - which produces electricity as the main product, with heating as a by-product.

Your community can reduce your carbon emissions even further and access Government cash incentives by choosing a CHP system powered by renewable energy.

What renewable fuels can be used?

- Biomass: is solid organic material (plant or animal waste) which can be burned in a CHP system.
- Biogas: is gas from organic material which can be burned in a CHP system.

- Geothermal: is energy stored in the earth which can be used to provide hot water and steam for running a CHP system.

Different renewable CHP systems

Combined heat and power can be produced by:

- Steam turbines: steam is made by burning fuel, for example biomass, in a boiler or piped directly from geothermal sources to power a turbine which generates electricity. The hot water by-product is used on-site (i.e. a community swimming pool). They are very reliable and best used with cheap fuel which can only be used once (like waste). They are best suited to sites with a high heat demand compared to the electricity needs.
- Gas turbines: burn biogas to power a turbine to generate electricity. They are highly reliable but they are very noisy and usually located in noise proof buildings, fitted with fire and gas detection equipment.
- Combined cycle systems: use both steam and gas turbines to produce even more electricity compared to stand alone turbines. The steam produced from the gas turbine is used to generate extra electricity from the steam turbine. They are the most flexible CHP systems currently available and are best used where communities need power more than heat.

Government incentives - Making money from your CHP system

Your community can benefit from various Government incentives to encourage the generation of low carbon, renewable CHP systems:

1. Renewable Heat Incentive (RHI) – for heating: owners of CHP systems (up to a certain size) using biomass, biogas or geothermal as a fuel can receive payment from the heat generated by their system from Government. The incentive is retail price index linked (so it alters to reflect the cost of living) and guaranteed for 20 years for systems installed on or after 15 July 2009.
2. The Feed in Tariffs (FiTs) scheme – for electricity: owners of a micro CHP (mostly used in homes) can make money from the sale of the electricity generated by their system to an electricity supply company. The FiT, or payment, they receive is retail price index linked (so it alters to reflect the cost of living) and guaranteed for 10 years.
3. The Renewables Obligation (RO) for heating and electricity: owners of CHP systems can choose between RO payments instead of FiTs (for electricity) or RHI (for heat). You won't be able to claim for both and at the moment you can't switch between RO and RHI. Also the Government may phase out heat payments under RO in 2013, which does mean some uncertainty on support levels for community groups.

So your community could be making money from renewable CHP systems in three ways from the:

- Heat your CHP system produces (through RHI).
- Electricity your CHP system produces if it is a micro CHP system (through FiTs).
- The savings you make on your existing energy bills from using energy produced by a renewable CHP system instead of the National Grid.

Don't delay! Payments are at their highest rates now BUT may change in the future!

As the RHI is a new area still being developed we recommend you visit the Government's website on <http://ceo.decc.gov.uk/>

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

By generating your own heat and electricity you will safeguard your community from rising fuel prices and provide more energy independence. By using the renewable CHP system you will be replacing the use of fossil fuels such as gas and electricity from the National Grid or oil, Liquefied Petroleum Gas and coal. Fossil fuel prices have been steadily increasing in price, as shown in the table below, and are likely to get higher in the future.

The table below shows the increase in gas prices and the unpredictability of oil and coal prices over six years.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--|------|------|------|------|-------|------|
| UK retail gas prices (p/kWh) | 2.3 | 2.6 | 3.3 | 3.5 | 3.9 | 4.4 |
| UK retail electricity prices (p/kWh) | 2.5 | 3.1 | 3.2 | 2.3 | 7.2 | 3.8 |
| International wholesale oil price (\$/bbl) | 44.2 | 62.2 | 72.9 | 77.7 | 106.3 | 62.6 |
| UK wholesale Coal price (£/tonne) | 45.2 | 38.0 | 38.3 | 47.3 | 83.1 | 45.0 |

Based on 2011 figures

Non domestic customers (such as community groups) sometimes pay higher retail prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

Since CHP systems are more efficient than conventional systems your community will be reducing the amount of fuel it uses. Additionally, if renewable energy sources are used, your community could get a payment from the RHI for all the heat being produced by the system. The electricity produced could be sold to an energy company or used within the community, reducing its electricity bill.

3. More local jobs

Only renewable CHP system equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard are eligible for RHI and FiTs. This only applies to systems below 45 kilowatt thermal (kWth - measurement of heat output) for the RHI and micro- CHP systems for FiTs. Larger systems will need to meet different standards which are or will be set by Government.

Community CHP projects can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Very efficient technology

Using a CHP system, the same amount of fuel produces more energy (heat and power) compared to a conventional system such as a gas boiler or a power plant which only produces electricity.

5. Reduce your community carbon emissions

Renewable CHP systems produce low carbon, renewable energy. By replacing the high carbon fossil fuels (coal, oil and natural gas) used to heat and power your community building, with energy produced by your renewable CHP system, your community will be reducing its carbon emissions and helping fight climate change.

6. Improve community well-being

Installing a renewable CHP system will show your community's commitment to reducing carbon emissions and generating its own energy. Renewable CHP systems can also help tackle fuel poverty issues by providing a low cost alternative to installing individual heating systems in homes.

Community renewable energy projects are sometimes the start point for wider initiatives that improve a community's well-being.

Myth busting

CHP systems are not renewable as they emit carbon!

Concerns are sometimes raised by communities regarding the carbon emissions from larger CHP systems. There are fossil fuelled and co-fired (with biomass) CHP systems which do produce emissions but are considered low carbon because they are more efficient than the conventional fossil fuel systems.

Community owned renewable CHP systems are smaller in size and, when using renewable fuel, produce even lower carbon emissions.

<http://chp.decc.gov.uk/cms/chp-benefits/>

CHP systems are too complex for a community to manage!

Relatively little maintenance is needed for a community CHP system to operate non-stop for a long time. Short, regular, visual checks might be the only task that communities need to do. For household CHP systems maintenance is similar to a standard boiler.

<http://chp.decc.gov.uk/cms/chp-design-environmental-aspects/>

CHP systems are too big for a single community building!

CHP systems can come in all shapes and sizes to meet your community needs with some systems small enough for individual homes.

<http://www.energysavingtrust.org.uk/cym/Generate-your-own-energy/Micro-combined-heat-and-power-micro-CHP>

<http://www.carbontrust.co.uk/publications/pages/publicationdetail.aspx?id=CTL089>

My Community Checklist: Renewable CHP Systems

Congratulations! You have already taken the first step by wanting to find out more about renewable CHP systems and the benefits the technology could bring to your community.

The next step is to find out whether your community has got a potential site suitable for a renewable CHP system. By completing the short checklist below you can assess whether this is the right technology for generating energy for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is my community site suitable for a renewable CHP system?

You will need to consider if the site or building:

- Has enough space for a fuel store and a water tank (for biomass CHP systems) – fuel store should be in a dry, sheltered area which can be easily accessible by delivery lorries.
- Has enough space for the system – they are usually bigger than conventional boilers so you need to consider if your community building has sufficient space available.
- Is under construction or needs a replacement boiler – CHP systems present value for money when installed during building construction as the installation costs will be lower. But also consider it as an alternative to your current heating system: if it needs replacing or for older buildings with solid brick walls where it's hard to improve insulation.

2. Does my community have a suitable heat need?

CHP systems can be designed to meet different heating needs. However, they might not be the best option for your community if you have low heating needs. As a guide, CHP systems should provide heat for 4,500 hours a year (this assumes an average heat demand of 17 hours per day, 5 days a week throughout the year) in order to be cost effective. In general, the more energy you need (especially if it is constantly used) the greater the money and carbon savings you can make.

3. Is there a suitable source of renewable fuel?

CHP systems can use different renewable fuels so looking at different options will help your community determine which is the most suitable. If your community is considering a biomass CHP system, the North West of England has got very good provision of biomass fuel, especially in rural areas. The quality of the fuel is very important as this will ensure that your biomass CHP system works efficiently. You can find suppliers in the Biomass Energy Centre website: <http://www.biomassenergycentre.org.uk>

4. Do we have the owner's (land or building) permission?

You need to consult the owner of the land or building where you want to install the CHP system to see if they would welcome it.

5. Can I connect to the grid?

In order to export the electricity not used your CHP system needs to be connected to the National Grid. Permission for connection to the grid needs to be granted by Scottish Power. The connection must meet technical requirements (e.g. for metering and protection equipment). The cost of grid connection can be a large part of the total costs.

Guidance on grid connection from Scottish Power can be found on its website:

http://www.spenergynetworks.com/dgis/g59_generator_connections.asp

6. Do I need planning permission?

You will require planning permission for community scale CHP systems.

For systems designed to meet single use for residential buildings you are unlikely to find any obstacles unless a flue needs to be fitted which stands out from the building. If the fuel store is located outside the building then planning permission might be less straight forward.

7. Am I up to date with the latest information?

The market for renewable heat technologies is relatively new in the UK and improved products and offers are appearing all the time.

Visit the Government's website for the latest information on CHP systems and relevant policies such as the RHI <http://www.decc.gov.uk>

If you don't have many ticks a CHP system might not be the most suitable option for your community group. Don't worry! Find out more about other renewable technologies from the factsheets available on the CLASP website.

My Cheshire and Warrington: Renewable CHP Systems

It can work...

A CHP power station fuelled by household waste based in Runcorn has been approved by the UK Government. The plant will be big enough to take waste from Cheshire and Warrington, Merseyside and Manchester. The plant will take waste which would otherwise have gone to landfill and use it to provide heat and electricity.

http://www.edie.net/news/news_story.asp?id=15340

Since 2005, Ashton Hayes has been working to become England's first carbon neutral community and has already cut average household emissions for 370 homes by 23% since May 2006. After receiving a grant from the Government's Low Carbon Communities Challenge the community are planning to install a renewable energy CHP plant together with other renewable energy technologies such as solar panels.

http://www.joulecentre.org/index.php?option=com_content&view=article&id=244:green-makeover-for-low-carbon-winners&catid=25:general-renewables&Itemid=62

Some key facts about Combined Heat and Power in the North West of England

- The North West currently generates 20% of the total heat produced by CHP in the UK (the highest of all regions and devolved nations) and 14% of the total electricity.
- The North West has the third lowest proportion of renewable fuels used for CHP, following Wales and Scotland.
- According to a report commission by the North West Development Agency, domestic CHP is a major growth area for the North West.

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

If your community is interested in low carbon issues you can join the Cheshire and Warrington Low Carbon Communities' network. Find more information on the following link, including a video of what other communities in Cheshire and Warrington are doing to become low carbon and reduce their impact in the environment whilst improving community well-being.

http://www.cheshirewestandchester.gov.uk/planning/specialist_environmental_servs/climate_change-sustainability/low_carbon_communities__networ.aspx

FACT: Cheshire and Warrington have a mix of urban and rural areas which can both be suitable for district heating as a solution for communities living in high density housing or off the gas grid.

FACT: Communities can make money by generating renewable heat thanks to the Government's Renewable Heat Incentive.

What are the basics?

What is district heating and how does it work?

A district heating network (or a community heating network) consists of a central boiler connected to pipes delivering heat to a number of buildings or apartments within a local area.

There are three main elements to a district heating network:

- Central boiler – where heat is produced.
- Distribution system – are highly insulated pipes that transfer heat to the individual buildings.
- Heating systems within buildings – such as radiators or underfloor heating, temperature controls and meters.

Communities who might be most interested in this type of network are those who:

- Have no connection to the gas grid, such as small towns or villages (low density housing).
- Live in blocks of flats (high density housing).
- Have local community amenities located close together (school, leisure centre and council buildings).

Different types of fuel for district heating

District heating networks can be supplied by a wide range of renewable fuels including:

- Biomass boilers.
- Solar thermal systems.
- Other sources such as geothermal, waste heat and waste to energy heat recovery.

District heating schemes lend themselves to a combination of traditional (such as fossil fuels) and renewable energy fuels.

Different types of application

The size of a network varies greatly, for example it can be used to deliver heat to:

- An individual tower block or housing estate with several hundred homes.
- A university campus or hospital.
- An inner city development with a range of buildings such as shops, houses and a swimming pool.

Renewable Heat Incentive - making money from district heating

The UK Government has launched a new Renewable Heat Incentive (RHI) to encourage the generation of low carbon, renewable heat. The RHI will be launched in two phases:

1. Phase one: long term payments for communities, industry and the public sector (available now!) and a 'Renewable Heat Premium Payment' for home owners (available July 2011).
2. Phase two: long term payments for home owners (available October 2012).

Some issues to consider, as currently the RHI:

1. Does not class individual homes which receive district heating as being eligible for the payments for home owners. The payments would be made to the owner of the district heating network (i.e. the community).
2. Does allow heating systems which are eligible for on-site use to be treated the same as for district heating (such as solid biomass boilers, geothermal, ground or water heat pumps, solar thermal systems, municipal solid waste and biogas).
3. Does allow communities who own a RHI eligible heat technology to make money from the heat they generate:
 - By RHI payments paid quarterly over 20 years for district heating installed on or after 15 July 2009. This payment by Government is retail price index linked (so it alters to reflect the cost of living).
 - From the savings you make on your community's heating bills from using heat produced by district heating instead of using more expensive fossil fuel sources such as gas, electricity, LPG or coal.

As this is a new area still being developed we recommend you visit the Government's website on <http://ceo.decc.gov.uk>

How will generating my own energy benefit my community?

1. Protection against rising fuel prices

Generating some of your own energy will help safeguard your community from rising fuel prices and provide more energy independence from potential shortages in supply. By using district heating to heat your community buildings, you will be replacing the use of fossil fuels such as gas that you normally buy from the National Grid or oil and coal from wholesale suppliers if you are off the gas grid. The table below shows the increase in the price of gas and the unpredictability of the price of oil and coal over six years.

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--|------|------|------|------|-------|------|
| UK retail gas prices (p/kWh) | 2.3 | 2.6 | 3.3 | 3.5 | 3.9 | 4.4 |
| UK retail electricity prices (p/kWh) | 2.5 | 3.1 | 3.2 | 2.3 | 7.2 | 3.8 |
| International wholesale oil price (\$/bbl) | 44.2 | 62.2 | 72.9 | 77.7 | 106.3 | 62.6 |
| UK wholesale Coal price (£/tonne) | 45.2 | 38.0 | 38.3 | 47.3 | 83.1 | 45.0 |

Non domestic customers (such as community groups) sometimes pay higher energy retail prices than domestic customers (such as householders) and could be more affected by increases in energy bills.

2. Make money for your community

Since district heating systems are more efficient than individual heating systems your community will be reducing the amount of fuel used. Additionally, your community can earn an income from the RHI for all the heat being produced by the system if it uses technologies and fuels covered by the RHI.

3. More local jobs

Only equipment and installers certified under the Microgeneration Certification Scheme (MCS) or equivalent standard are eligible for RHI. This only applies to systems below 45 kilowatt thermal (kWth - measurement of heat output) for the RHI. Larger systems will need to meet different standards which are or will be set by Government.

Community district heating can create local jobs, such as MCS certified installers. Construction and maintenance are other areas where local jobs can be created.

MCS is the government standard for renewable energy technologies created to provide quality assurance and consumer protection. For a list of MCS certified installers within your area visit the MCS website:

<http://www.microgenerationcertification.org>

4. Very efficient technology

District heating systems can make renewable technologies a cost effective option for a group of buildings or an apartment block. By connecting a number of buildings with different users, demand for heat increases and becomes more constant (homes during the morning and evening and schools in the day).



Having a single central heating network is more efficient than individual boilers or heaters. A single heating network requires less maintenance as it removes the need to have individual safety checks and repairs for each boiler or heater.

5. Reduce your community carbon emissions

Modern district heating can save money and reduce carbon emissions compared to conventional heating systems. This is because generating heat centrally at large scale is more effective compared to generating heat in boilers in individual properties, particularly when you combine heat and power.

6. Improve community well-being

Installing district heating will demonstrate your community's commitment to reduce carbon emissions and generate its own energy.

Community heating can help tackle fuel poverty issues by providing low cost heat. Community renewable energy projects are sometimes the starting point for wider initiatives that improve a community's well being.

Myth busting

District heating is too complex for my community to manage!

During the set up of the system you will need to establish how customers will be contacted and billed for the heat they use. This is an opportunity to raise awareness and address concerns amongst the community. Look into outsourcing the management of the billing to a third party, removing the administrative burden, through an Energy Services Company (ESCO) agreement (refer to Factsheet 9: Community Ownership for more information about ESCOs).

District heating is too expensive so it will make no savings to my community!

It is important to understand the feasibility and lifetime costs (usually 25 years) of any proposed district heating system and compare these with your existing heating system. This will enable you to identify if this is a cost effective solution or whether your community should consider another option. Community heating usually has high set up costs but low running and replacement costs. The cost of renewable fuels will also be likely to be cheaper than fossil fuels so over its lifetime district heating can reduce your heating bills and potentially make you money from the RHI <http://www.energysavingtrust.org.uk>

My Community Checklist: Community Heating

Congratulations! You have already taken the first step by wanting to find out more about district heating and the benefits the technology could bring to your community.

The next step is to find out whether your community has the potential for district heating. By completing the short checklist below you can assess whether district heating is the right option for generating renewable heat for your community.

Why not take this checklist with you to your next community meeting to discuss?

1. Is my community site suitable for a district heating system?

District heating networks vary widely in scale from apartment blocks to whole cities. To make district heating a cost effective solution for your community you will need to identify which buildings are the most appropriate.

Think about the space needed for the central boiler, water tanks and possibly a fuel store. Also, you might need to replace radiators which will add to the overall cost of the installation. To reduce disruption and up-front costs consider installing district heating during site construction or when looking to replace your current heating system.

If the site is already near to or includes an existing community heating for a single building, look at linking them both together.

2. Does my community have a suitable heat need?

District heating is most cost effective in areas where there is high and regular heat demand in a small local area around the clock. For example, a network which includes commercial properties (such as factories, shops or offices) and public buildings (such as swimming pools, hospitals or university campuses), is likely to use more heat during the day whereas, in the main, households will require heat at night.

Using water storage tanks to store hot water will help meet demand through the day and night and make the system more efficient and cost effective.

3. Is there a suitable source of fuel?

District heating systems can work with a variety of fuels. Think about what best suits your local circumstances. Things to consider include:

- Is there a local source of biomass fuel? – consider biomass community heating.
- Is the community connected to the gas network? – consider a highly efficient gas district heating system with additional input from renewable technologies.
- Is there potential for deep geothermal energy in the area? – consider geothermal community heating.

4. Do we have the land owners' and residents' permission?

You need to consult the owner of the buildings or land where you want to install the district heating system to see if they would welcome it.

It is important to consult residents and explain the benefits of district heating, you can also take this opportunity to promote wider energy efficiency measures and invite local residents to join your group.

5. Do I need planning permission?

You will require planning permission for district heating schemes and it is recommended that you contact your Local Planning Authority at the earliest possible opportunity.

As district heating schemes can run on different technologies, your planning requirements will vary depending on which technology you use.

If installing your community heating system requires major works, such as laying new pipes, this will affect your planning application and you may need to take measures to avoid disruption.

6. Can I connect to the grid?

For combined heat and power district heating systems permission for connection to the grid needs to be granted by Scottish Power. The connection must meet technical requirements (e.g. for metering and protection equipment). The cost of grid connection can be a large part of the total costs.

Guidance on grid connection from Scottish Power can be found on its website: http://www.spenergynetworks.com/dgis/g59_generator_connections.asp

6. Am I up to date with the latest information?

The market for renewable heat technologies is relatively new in the UK and improved products and offers are appearing all the time.

Visit the Government's website for the latest information on CHP systems and relevant policies such as the RHI <http://www.decc.gov.uk>

If you don't have many ticks a community heating system might not be the most suitable option for your community group. Don't worry! Find out more about other renewable technologies from the other community factsheets available on the CLASP website

My Cheshire and Warrington: Renewable District Heating Systems

It can work...

Eco homes which are being built in Halton as part of the Lancaster Cohousing project will have district heating as one of their eco features, with heat produced by a central biomass boiler. The houses are expected to be ready in 2012.

<http://www.lancastercohousing.org.uk/Join/Homes>

Some key facts about district heating in the UK:

- District heating currently provides roughly 1-2% of the UK's heat demand. Analysis shows that, in the right conditions, district heating could supply up to 14% of the UK heat demand, and be a cost-effective and viable alternative to individual renewable technologies.
- Several schemes are already operating in the UK, demonstrating how the technology can work. Visit the Government's website in order to find out more:

http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/distributed_en_heat/district_heat/district_heat.aspx

What support is available?

Contact your Local Planning Authority for information on planning policies and other local requirements as well as details about similar projects in the area.

| Local Planning Authority | Department | Contact Details |
|---------------------------|---------------------|--|
| Cheshire West and Chester | Spatial Planning | http://www.cheshirewestandchester.gov.uk/planning.aspx T: 0300 123 7027 or E: planning@cheshirewestandchester.gov.uk |
| Cheshire East | Planning Department | http://www.cheshireeast.gov.uk/environment_and_planning/planning.aspx T: 0300 123 5014 or E: planning@cheshireeast.gov.uk |
| Warrington | Planning Department | http://www.warrington.gov.uk/planning/ T: (01925) 442819 or 442823 or E: devcontrol@warrington.gov.uk |

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Renewable energy projects can bring significant benefits to your community.

The more your community is involved in the development of these projects, the greater the potential benefits that will be retained within your community.

How renewable energy projects can strengthen your community

Communities investing time and effort in renewable energy projects do so in the expectation of gaining financial, environmental and social benefits:

Financial benefits.

- **Reduced energy bills:** Renewable energy projects can not only provide cheaper or free energy for your community but also help reduce energy consumption. For example, people who install solar PV panels tend to use their appliances during the day, when the panels are generating free, zero carbon electricity which will reduce their energy bills.
- **Making money:** with Governments' incentives such as the Feed in Tariff scheme and the Renewable Heat Incentive, communities can receive money for the energy that their renewable energy system generates. Renewable energy projects are in many cases an attractive and relatively secure investment which can provide a source of income for your community, in some cases guaranteed for 20 or even 25 years.



Environmental benefits.

- **Reduced CO₂ emissions:** renewable energy sources are either carbon neutral such as solar PV panels or hydro power, or low carbon such as heat pumps or biomass heating systems. This means that by replacing fossil fuelled systems with renewable energy technologies your community will be reducing its carbon footprint, helping to combat climate change.
- **Greater awareness of energy issues:** renewable energy technologies can often have an educational element, helping communities understand their energy use. For example, controls installed in modern biomass heating systems allow communities to see how much fuel is being used at any given time, giving them control over their energy consumption.

Social benefits.

- **Community cohesion:** setting up a renewable energy project is not an easy task and requires community members to pool resources. Working together can bring cohesion amongst community members. Owning a community renewable energy project can also promote the feeling of belonging to a community.
- **Catalyst effect:** structures developed to deliver renewable energy projects can help gain a better understanding of the skills available within the community and once set up can be used as catalysts for other community projects.

These benefits, along with the lessons learned throughout the delivery of renewable energy projects, are likely to strengthen the community and contribute to providing resilience against financial limitations, energy related issues and social matters.

Securing community benefit from renewable energy: Ownership

In order for communities to retain benefits from renewable energy projects, ownership needs to be established.

Below is a list of several ownership options available which should be considered by your community:



1. Owned by members of the community

The project will be 100% owned and funded by the community.

There are different ways to set it up:

- Offering shares to members of the community.
- Establishing a limited company within the community.
- Setting up a co-operative within the community.

Extra funds for the renewable energy project could be raised from:

- Grants (increasingly less common).
- Loans (becoming easier).

Pros

- Communities that develop these schemes will be able to develop similar schemes.
- There are already communities that have done this and can help others.
- This option will ensure that communities retain most revenue generated by the renewable energy project.

Cons

- Can be problematic if not all community members invest in the project.
- Requires time, effort and commitment.
- Can delay projects as communities are generally not as familiar with renewable energy projects as commercial installers or local authorities.

2. Owned by a not for profit organisation

The project will be owned and funded by a not for profit organisation, who in return for their investment will retain all or some of the income from the energy generated.

For example, a trust or not for profit organisation can install the technology at no cost and the community will benefit from the energy it generates and part of the money from incentives such as Renewable Heat Incentive and Feed in Tariff scheme. The not for profit organisation will retain an agreed proportion of the incentives to pay for time and resource invested.

Pros

- No profit required from project due to the nature of not for profit organisations.

Cons

- Community loses out on the opportunity to make money from energy generated.

3. Owned by a Local Authority

The Local Authority can be the main investor in the project, with the community benefiting from the energy produced by the system. Local authorities can also play a facilitating role, helping communities throughout the process of setting up a renewable energy project.

Pros

Involvement of the local authority is likely to benefit the project in many ways:

- Planning assistance.
- Access to finance.
- Technical support.

4. Owned by a commercial developer

A private company will design, install and own the renewable energy project. The community will either benefit from some of the energy produced by the system or from some form of community payment.

Pros

- Company takes care of every aspect of installation and maintenance.
- Commercial developers tend to have a good understanding or renewable energy projects, which will generally speed up the process.

Cons

- Community needs to engage early on with installer to secure community benefits.
- Most financial benefits will be retained by the developer, so communities will only get a small proportion of any benefits.

An example of this type of arrangement are 'rent the roof' or 'free PV' schemes where the installer retains the payment from the Feed in Tariff scheme (refer to Factsheet 2: Solar PV, for more information).

Another example is cases where the company that installs the renewable energy system also manages it and sells the energy produced to the community through an Energy Service Company contract (ESCo).

5. A combination of the above

Community renewable energy projects lend themselves to exploring several ownership options. Your community might benefit from sharing ownership with a developer or local authority in order to share potential risks and benefits from the community renewable energy project.

Energy Services Company – ESCo

Owning and managing a renewable energy project can be a daunting thought for many communities, especially with more complex projects such as community heating systems. If this is the case, communities can consider entering an Energy Service Company agreement or ESCo.

What does ESCO mean?

ESCO means different things to different people.

The main characteristic of an ESCo is that **it provides an energy service** rather than simply selling energy. This means that an ESCo contract is likely to cover:

- Provision of heat (rather than fuel) to the community.
- Guarantee to keep the community buildings warm, well lit, with lower energy bills.

As part of an ESCo contract community members will be billed at a price which covers the cost of the renewable energy system, maintenance, cost of fuel (when applicable) and a additional costs to cover any management fee. However, any ESCo contract should include a clause to ensure that this price will be lower than the price the community is currently paying for energy.

Different structures for ESCos

An ESCo could take one of the following forms:

- A private commercial company contracted to deliver the service.
- A publicly owned company set up to deliver the service.
- A joint venture between a public body and a commercial provider.
- A not-for-profit company created and owned by the community, such as a co-operative.

The structure and obligations of an ESCo will vary from project to project to suit different community needs.

What are the benefits from setting up an ESCo?

The potential benefits resulting from setting up an ESCo are:

- Provision of heat and electricity at a lower cost.
- Carbon savings.
- Better protection from rising energy prices.
- Simplified management of community energy thanks to having a single company looking after all energy matters.

There are a number of challenges which can be encountered when trying to develop a renewable energy project:

- Securing project funding.
- Allocating responsibility and ownership.
- Identifying and delivering the most suitable energy solution.

An option to overcome these and other issues could be for a third party, such as a local authority or a commercial developer, to set an ESCo contract with the community which could then fulfil some or all the following functions:

- Provide capital for the renewable energy project.
- Provide specialist expertise.
- Protect community from risks related to energy project development and rising fuel prices.

How to secure community benefits from an ESCo contract

It is important to ensure that any ESCo contract is linked to communities' overall priorities, for example:

- Providing heating at a guaranteed reduced cost compared to previous system.
- Providing a percentage of the community's energy from renewable energy source.