Community-led wind power

How to plan, build and own a medium or large wind turbine in your community's backyard

Local United – diffusing practical initiatives in response to climate change and peak oil

Local United brings together and supports community activists who are setting up social enterprises to address the challenges of peak oil and climate change. We aim to speed up the rate at which good ideas are adopted by community groups motivated to build low-carbon economies.

Initially eight 'diffusion packs' have been produced which offer practical suggestions for setting up initiatives in the following areas:

Energy Farms
Community-led Hydro Initiatives
Community-led Wind power
Energy Performance Energy Services Company
Community-led Food Initiatives
Sustainable Community loan Fund
Community-led Reuse of Resources
Community-led Transport Initiatives

NESTA provided funding for the development and dissemination of these information packs which have been written and reviewed by people with first-hand knowledge of the community and climate action sectors they work in. Often the authors will have been involved in the conception of the project idea and in many cases they would now be regarded as experts in their fields. Biographies will soon be available on our websites

All of these packs are intended as on-going 'works-in-progress'. We are hoping that other groups working in these areas will add in their experience. In time they will build into a comprehensive library of good practice case studies. They will become a source of inspiration to community groups. They will provide information on motivational projects which have been carried out by other community groups and they will act as a directional tool to help communities who are ready to take action, to do just that.

These packs are offered to groups who are interested in setting up social enterprises in these areas. They can be downloaded from the many partner websites.

Of course, any information provided is only as up to date as the day it goes to print. Many of the specific examples have worked so well because of the people involved, the skills they possess or the resources that were available to them. Thus these examples will predominantly serve as an inspirational call to arms. However, many of the packs contain useful 'how to' guides, copies of legal templates or list of regulations, all of which may be useful to community groups wishing to set out on their own project. All of the packs contain notes or links on where to find more help.

Feedback on these packs is continually being sought. Community groups who have used the packs to support their own projects are very welcome, and indeed are invited, to provide information on how useful the packs have been, what other information we should be providing or any other feedback which may help us to improve these in the future.

Local United is keen to work with other groups and organisations active in these areas who may be interested in offering the diffusion packs through their websites. We are also actively seeking funding to follow up these packs with a mentoring/buddying system which will provide additional support to emerging social enterprises.

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Sharenergy 2011

1. Introduction

This diffusion pack has been prepared by Sharenergy in order to give community groups considering a community-owned wind project a head start and overview of the big issues. It's not intended to be a comprehensive manual. Indeed such a thing is perhaps impossible as all projects are different. It is designed to avoid reinventing the wheel and to raise the level of overall understanding of community wind, to educate and inspire. There are links to further resources in the support section.

2. Strategy

2.1. Why

The first thing a community group needs to ask is: why do we want to do this? Typically there are three main reasons why a group might want to set up a wind project:

- To reduce carbon and enhance local energy security
- To create a local ethical investment opportunity
- To raise money for a local campaign, project or other good cause

All three are possible, and it has been done: see Baywind Co-op[1]. Normally there will be tradeoffs between these: see the Finance section for more details. Be prepared: nobody has ever got a community owned wind project going without something of a struggle. Wind power can be highly divisive and these are always very complex projects. Communities will need support but also determination. Bear in mind that as of 2011 roughly three quarters of technically viable wind projects in the UK fail to make it through the planning stage. The prize is, however, well worth the effort. For example a 330kW medium size wind turbine in a decent spot will be producing on average 60kW (averaged out over the year), or enough to meet the electricity usage of 120 households.[2] If developed as a co-operative, members could receive an average return of 7% or more while still contributing to a meaningful local community fund.

2.2. Scale

A note on scale. Wind turbines are available at sizes from a few watts to a few megawatts. This range is normally broken down into three categories.

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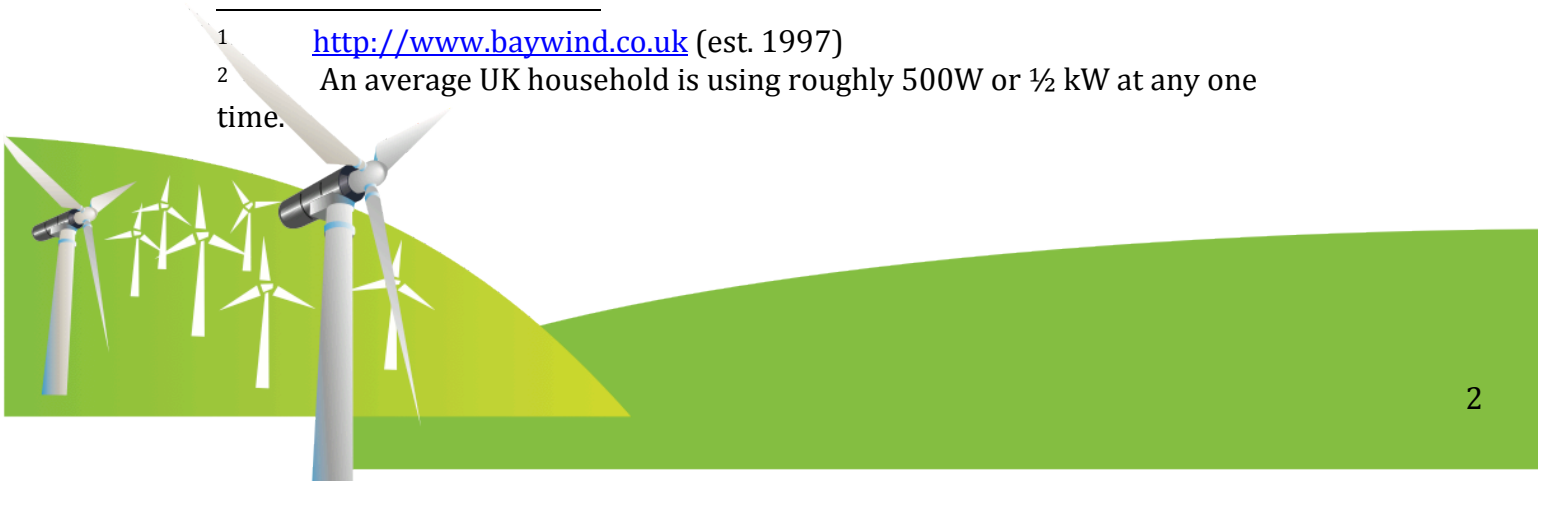
1 http://www.baywind.co.uk (est. 1997)

2 An average UK household is using roughly 500W or ½ kW at any one time.



2.2.1. Small wind

Small wind turbines are generally seen as those up to 50kW. In practice the largest turbines in common use in this category are 15kW units. While these may prove viable under Feed-in Tariffs (FiTs)[3] for farms or businesses in windy spots who can use all the energy they produce on-site, they are rarely if ever suitable for community schemes. In some cases a group may be able to get a grant for a small wind installation, but in general, outside of educational value, this can be a lot of effort for not much benefit. Without grants these projects are very unlikely to be financially viable.

2.2.2. Medium wind turbines

For our purposes these range from 50kW up to the 1MW scale. In fact due to the way FiTs are structured and the limited availability of turbines from well-established and credible manufacturers in the UK community groups are likely to be looking at a sub-500kW turbine, probably a 250 or 330kW machine. This size of turbine was not financially viable pre FiTs, hence very few installations of this size exist in the UK, although the market is developing fast (as of 2011). Sharenergy is working on a number of community-owned projects at this scale. This is often an appealing scale to work at, but groups shouldn't be daunted by larger turbines: it makes sense to use good sites to their real potential.

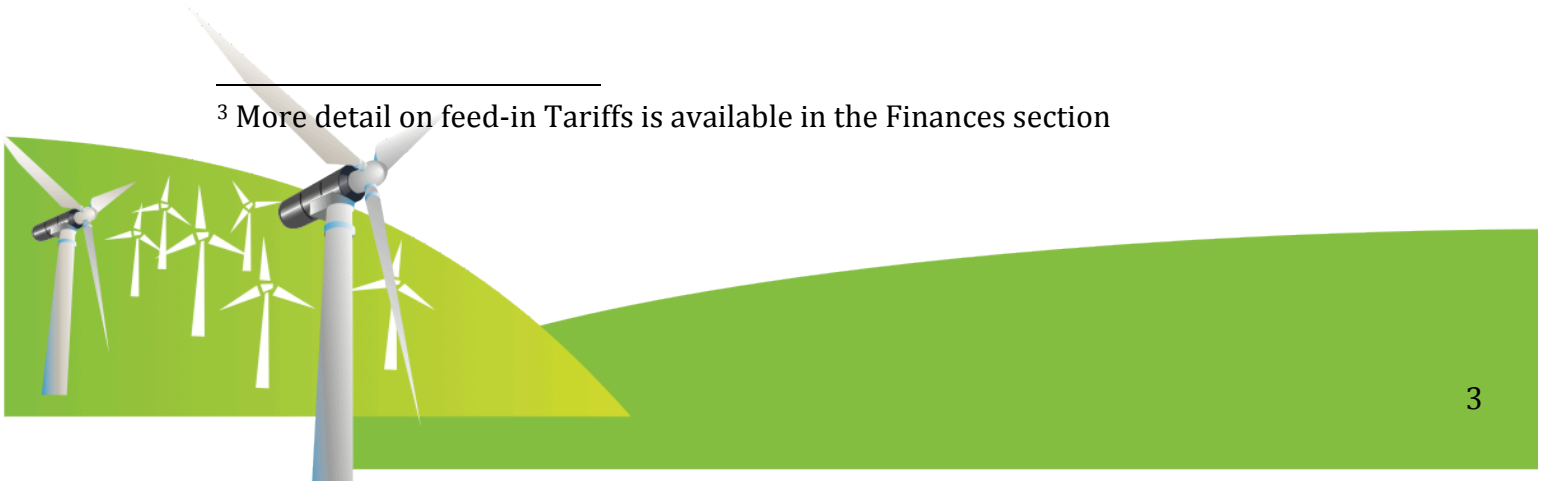
2.2.3. Large turbines

Large turbines are anything over 1MW. These may be installed as single turbines, although FiTs de-incentivise this. The most likely configurations under current FiT boundaries are either 2 x 750kW turbines or 3 or more turbines (850kW plus, larger windfarms will normally use 2MW machines or larger). Finding a site for 3 or more turbines is not easy, and developing the project is correspondingly complex. It can be done as a completely community-owned project (see Westmill Wind Co-op, which has 5 x 1.3 MW turbines). In many cases a community group will need to work alongside a developer or landowner and take a stake in the project rather than own it outright: Sharenergy has set up co-ops which own one turbine in a larger windfarm and co-ops which own a proportion of the total windfarm (subtly different).

2.3. Power, Energy and capacity factor

What does it mean to say that a turbine is a '1MW' turbine? It means that at a given windspeed it will produce 1 megawatt (MW) of electrical power. A megawatt is 1000 kilowatts (kW) and is a serious amount of power: enough to light 100,000 normal 'energy-efficient' lightbulbs! This will be close to the maximum power that the turbine can produce in a high wind, and is called the 'rated power'.

[3] More detail on feed-in Tariffs is available in the Finances section



Of course the wind varies constantly and is sometimes too light to even move the turbine (or very rarely so strong that the turbine shuts down to protect itself). So the power given out at any one speed is not that useful to know. What is useful to know is the total energy produced in one year. Energy is measured in kilowatt-hours (kWh). A kWh is the same as one 'unit' on a domestic electricity bill. Electrical energy generated by a turbine is paid for in pence per KWh. A kWh means 'the energy generated by something with a power of 1kW running for 1 hour'.

So how much energy will a given turbine produce in a year? It depends on the turbine and the varying wind at the site, and to a lesser extent on downtime for maintenance. To make this easier to talk about, think of this in terms of the percentage of the rated power that the turbine will be producing on average at any one time, averaged over a year. This is called the 'capacity factor' (or sometimes 'load factor'). So for example if the capacity factor is 25%, and the turbine is rated at 100kW, the turbine will on average be producing 25kW. At any one time it might be producing 10kW, or 100kW, or nothing at all, or anything in between. But on average over the year it will be producing 25kW. Real-world capacity factors of medium turbines vary from 15% in poor wind sites to over 50% in extreme environments. 25% is a good rule of thumb for UK conditions[4].

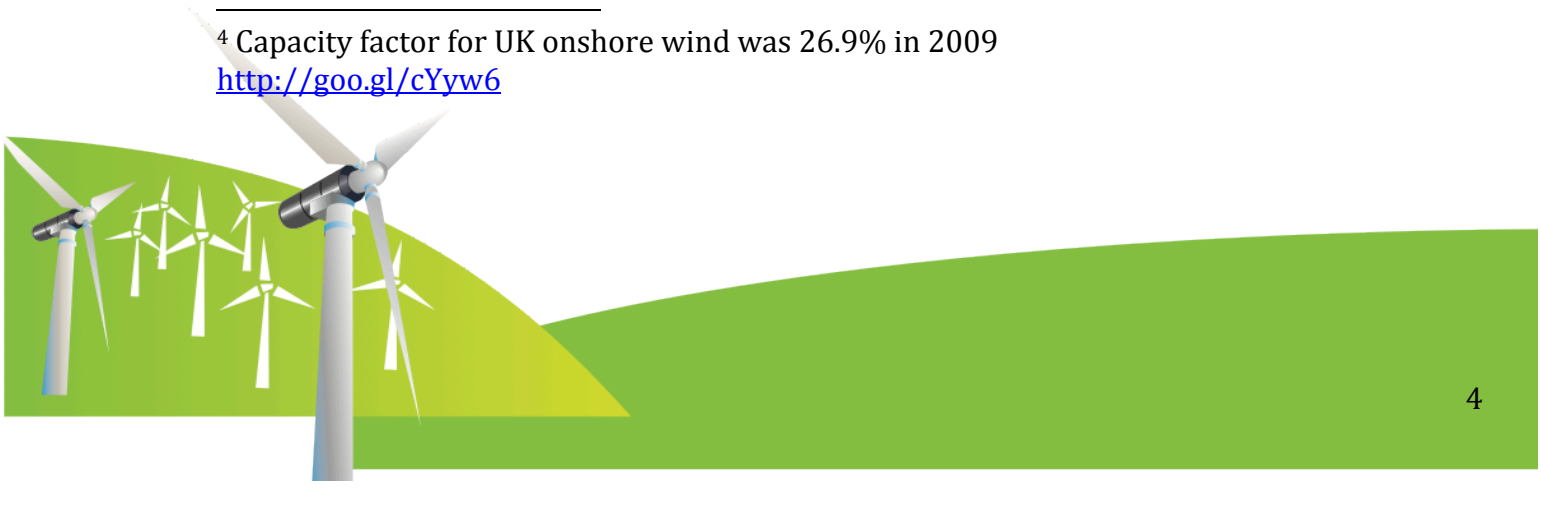
Armed with the rated power, and the capacity factor it is easy to work out the energy that a turbine will generate in a year. In the above case:
Rated power (kW) x Capacity factor x 8760 (hours in a year) = Energy generated
100kW x 25% x 8760h = 219000 kWh per annum

2.4. The group

It may be difficult to follow all the technicalities, but success in community wind power is about much more than nerdy sums. To succeed a community group will need people with complementary skills, and will need to form a coherent group. As a minimum it will need to have:

- Ability to work together, to run meetings and to communicate
- Financial experience. This will probably be a £1m+ project
- Community connections (i.e. with local business, councils, clubs etc)
- Ability to learn and understand the issues
- Patience and fighting spirit
- Resilience to negativity
- Ability to communicate in public and through the media

[4] Capacity factor for UK onshore wind was 26.9% in 2009
http://goo.gl/cYyw6



These are exciting projects and people who have these skills will be in the community: though they may be hard to find. Group members will necessarily be working with people who they don't normally work with. Wind power has a lot of friends, not always in obvious places. Clearly there is also a lot of opposition to wind power. Some of this is understandable concern following sensationalist reports. Some is kneejerk NIMBY-ism. In some cases there are perfectly reasonable issues that may be mitigated or may mean that the community really have picked the wrong spot. Diplomacy and respect are required and also an acknowledgement that the group may agree to disagree with some people in the community. The group as a whole needs to grasp and be able to clarify the main issues of contention[5].

2.5. The site

Finding a wind site is not easy. A site that is technically viable and with a willing landlord is required. Sometimes the latter can be harder to find than the former. Here are some of the considerations and suggestions of how to start thinking about them.

2.5.1. Wind speed

The good news: the UK is one of the windiest developed countries in the world, and the windiest in Europe. Windspeeds are high in general in comparison, say, to Germany. The bad news: most windy places will not be suitable for wind turbines due to the considerations detailed below. You do need to start with a site that has good wind. The UK is lucky in having the NOABL database (see Support section) a national 'good guess' at windspeeds, which is publicly available to search by putting in a grid reference. This can be used to find possible sites: look for a predicted windspeed of at least 6m/s at 45m above ground level. That's a bare minimum: really good sites will have windspeeds at that height of 6.5, 7 and more. Beware of turbulence: sites with heavy forestry or other ground 'roughness' are less likely to be suitable and for this reason built-up areas are very unlikely to be good sites. Ultimately a meteorological mast (a 'met mast') will need to be erected to get a clearer idea of windspeeds on the site, however, this is expensive and shouldn't be undertaken until other considerations have been examined.

2.5.2. Noise

Wind turbines are not that noisy given what they do - anybody who has stood at the base of one may wonder what all the fuss is all about. However, there are guidelines to make sure that the impact on neighbours is kept to a minimum under a worst-case scenario. As a rule of thumb the site should be 650m away

[5] Good primers are available at:
http://www.yes2wind.com/explore/debunking-the-myths/
http://www.embracemyplanet.com/facts

from habitation. This might be relaxed in the case of a medium scale wind turbine or in the special case of a property wholly inhabited by beneficiaries of the turbine (i.e. the landowner) - or in some rare cases where background noise from a motorway or industrial area is already very high. As a low-tech method, set compasses to 2.4cm (4cm=1km on a 1:25000 map) and start drawing circles. For those with Geographical Information Systems (GIS) skills, the new open Ordnance Survey data can be used to create buffers around habitations. GIS software is freely available and not hard to learn; Sharenergy is developing training and some new user-friendly online tools to use to make this easier.

2.5.3. Designated areas

National Parks, Areas of Outstanding Natural Beauty, and Sites of Special Scientific Interest are some of the more common designated areas where wind development may be tricky or impossible. However, there are examples of turbines in each of these: check out the Glyndebourne turbine[6], which is a rich source of info on what a planning application would entail. It may be that the boards controlling these areas realise that as they often encompass high and windy areas it is likely that sooner or later there will be some wind development there, and may pragmatically accept community-based turbines as the lesser of evils. This situation varies very heavily according to area.

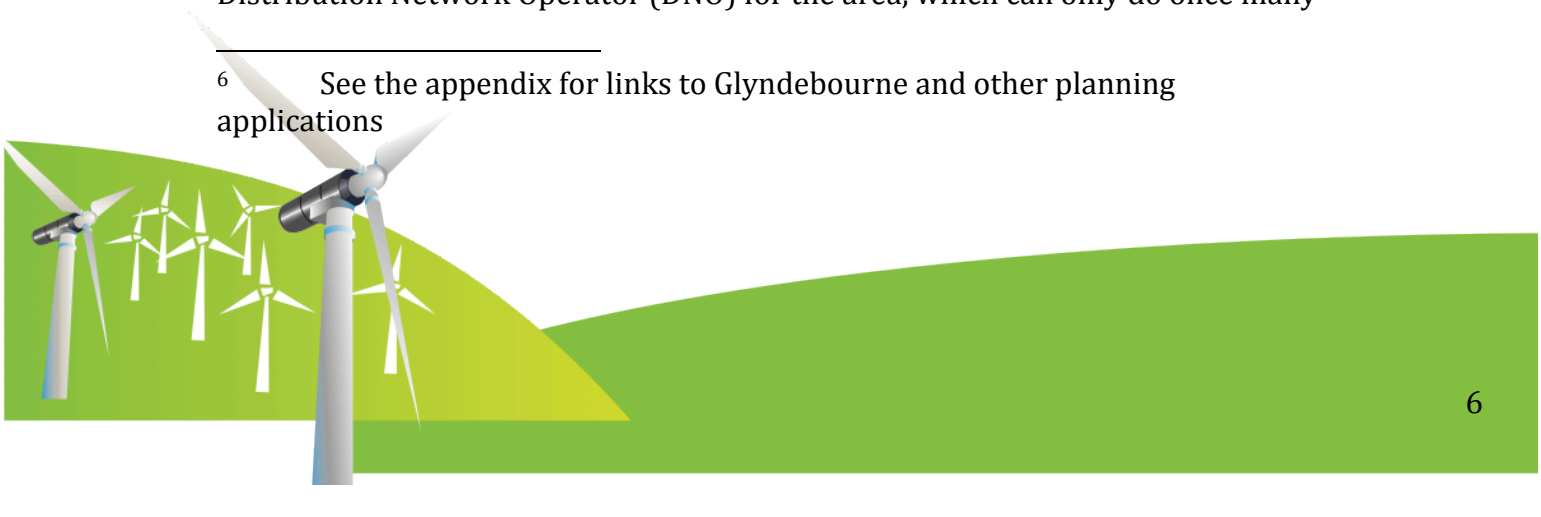
2.5.4. Access

A good site is no use if the turbine can't get there. In many cases this is the largest constraint on the size of turbine that can be installed. Bear in mind that a 2MW turbine has approximately 45m long blades, which do not bend, as well as tower sections, which are very wide and will not travel easily over sudden dips or humpbacked bridges. For larger wind farms it is quite usual to create new access roads and even to cut off corners that may be miles away from the site. For smaller installations this will be too expensive…so think about pinch points all along the access path. A 330kW turbine has blades that are approximately the length of an articulated truck. As part of a full feasibility study an access expert can be brought in to do 'swept path analysis' of the delivery route to check access.

2.5.5. Grid

The electricity generated will go into the grid, normally at either 11,000 or 33,000 volts. These lines are relatively easy to recognise: three bare wires side by side, normally on a wooden pole. It costs around £150,000 a kilometre to run a cable in a trench so the nearer to an existing line the turbine is the better. The fact there is a line does not necessarily mean there is the capacity to accept the energy generated. Properly determining that involves a formal application to the Distribution Network Operator (DNO) for the area, which can only do once many

[6] See the appendix for links to Glyndebourne and other planning applications



of the installation details have been worked out. Some DNOs may provide a low cost or free informal opinion at an earlier stage, and some may provide maps to help locate the nearest line. Although there is normally a charge for these, it may be possible to get sight of them and other bodies may have copies they will allow access to (i.e. County Councils).

2.5.6. Wildlife

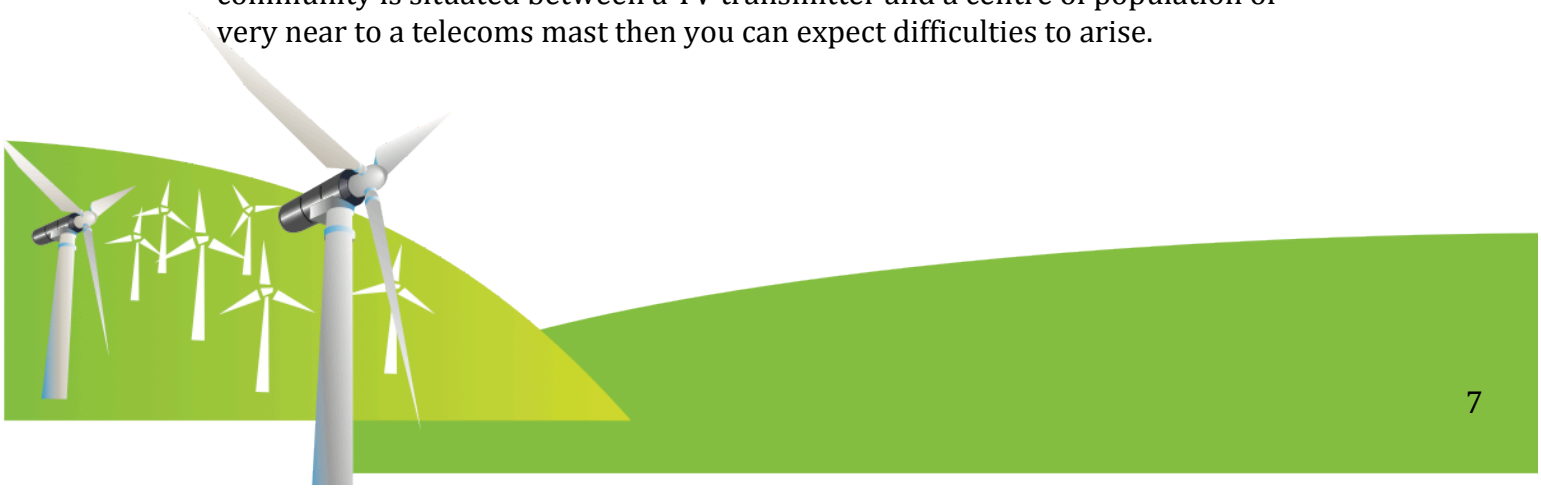
Ecological considerations are a major constraint on where to put wind turbines. Bird migratory routes must be completely avoided. In general sites with high bird or bat activity are likely to present problems, although in some cases these can be mitigated. Less obvious, but often more problematic, are protected species that may be affected during the installation phase: a surprising number of suitable wind sites are also potential habitats for Great Crested newts, for example. Impacts on wildlife may be able to be mitigated, for example by provision of alternative habitat or very careful installation procedures. On the other hand if the site has a lot of wildlife a very detailed study to establish exactly what is there will be required. For larger projects it is usual to carry out a full Environmental Impact Assessment. This may entail long-term studies being carried out by qualified ecologists and can cost £100k+! For medium scale installations it should be possible to avoid these extreme costs if the site is chosen carefully. Often local wildlife experts may be happy to give informal information about what is around. There are also local, regional and national datasets. Landowners generally have a very good idea of what is around on their land.

2.5.7. Rights of Way

Turbines need to be situated a certain distance from thoroughfares: a minimum of the charmingly named 'topple distance' and often considerably further, depending on the importance, type and usage of the track. As a rough guideline stay 200m from roads, bridleways, footpaths and the landowner's property boundary.

2.5.8. Aircraft and communications

While turbines don't pose a direct threat to aircraft, except in the case of very low flying military planes, they do have the potential to disrupt radar. Similarly they can cause interference to broadcast signals and microwave data links. Establishing the full picture of the issues on a chosen site is an expert task, and will involve formal consultation with NATS (Civilian Air Traffic Control) and MoD (Military flights). Before this, however, it is important to use some common sense. If the community is close to a military airbase or civilian airport (less than 30km) any site is very likely to encounter some issues. Similarly if the community is situated between a TV transmitter and a centre of population or very near to a telecoms mast then you can expect difficulties to arise.



2.5.9. Landowner

A community will usually be dealing with at least one landowner and quite often several: in multi-turbine schemes it is common to have turbines on more than one person's land and even if this is not the case it is likely that there will be a need for access agreements for installation and maintenance, and 'wayleaves' – legal agreements to allow cabling to pass over the land between the turbine and the grid. In some cases there may also be dealings with landowners away from the site, for example if road junctions need widening to allow equipment to pass. All deals with landowners will need some legal agreement to be signed and some annual payment to be made. In general landowners are paid a rental value plus, in some cases, a proportion of income. Rental value rules of thumb are £5-10k/yr/MW installed, although in reality this is more down to negotiating skills than anything else. Bear in mind that legal costs will be high and may include the landowner's legal team costs too. The likely landowner agreements needed are:

Exclusivity agreement: a simple agreement that the landowner will allow work on developing the project and agrees to work only with the designated community group and no other developer for a fixed period: 1-3 years is usual. This needs to be signed as soon as possible as some basic safeguard of time and effort.

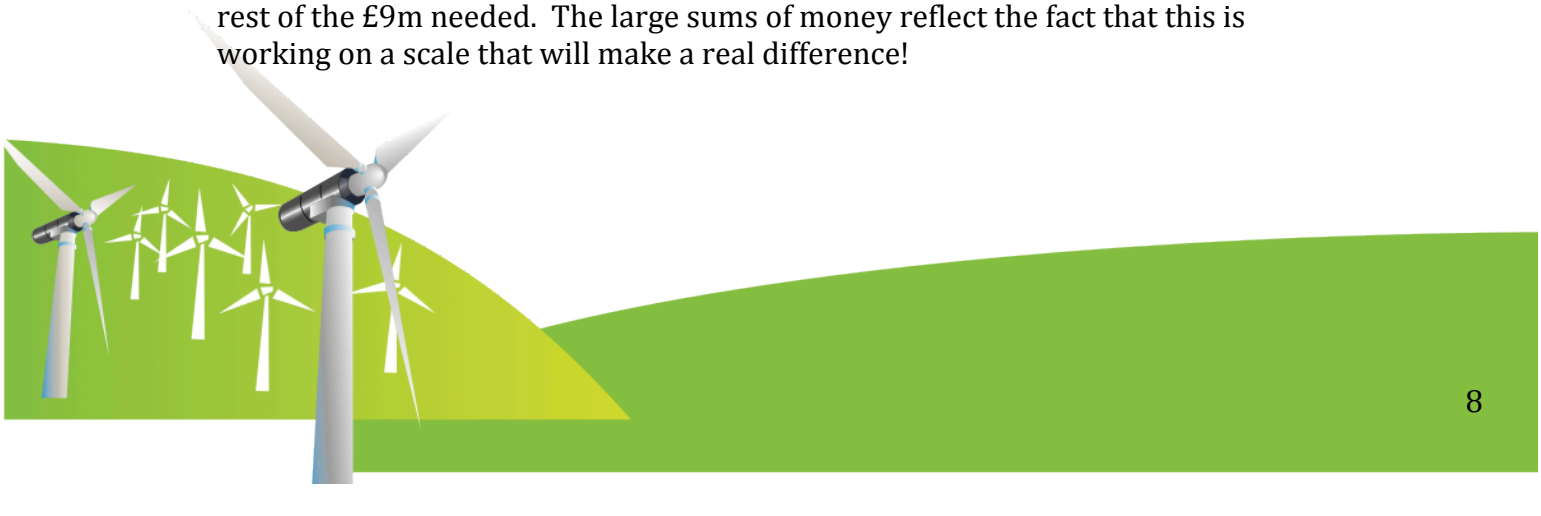
Heads of Terms. Once the site has been determined as a real prospect the basis of an agreement needs to be established between the community group and the landowner. This is a plain-English commercial document with the basis of the agreement laid out.

Option. This is where the legal costs are likely to be concentrated. An option is an agreement to take up a lease at a future date. This would usually be signed before progressing to a full planning application. This option converts to a lease once the planning process and any conditions have been fulfilled.

An example Exclusivity Agreement is given in the Appendix. Heads of Terms agreements will be completely specific to project issues. For Option agreements you will need the services of a solicitor, preferably one who has been involved in wind projects before.

2.6. Finance and Structure

Wind projects are expensive. A 330kW project may cost around £750k. For larger projects a figure of £2m/MW installed is often quoted. This can be extremely daunting. However it can be done and it has been done: Westmill wind co-op raised £4.8m from the public and obtained a bank loan to cover the rest of the £9m needed. The large sums of money reflect the fact that this is working on a scale that will make a real difference!



2.6.1. Risk money and Capital

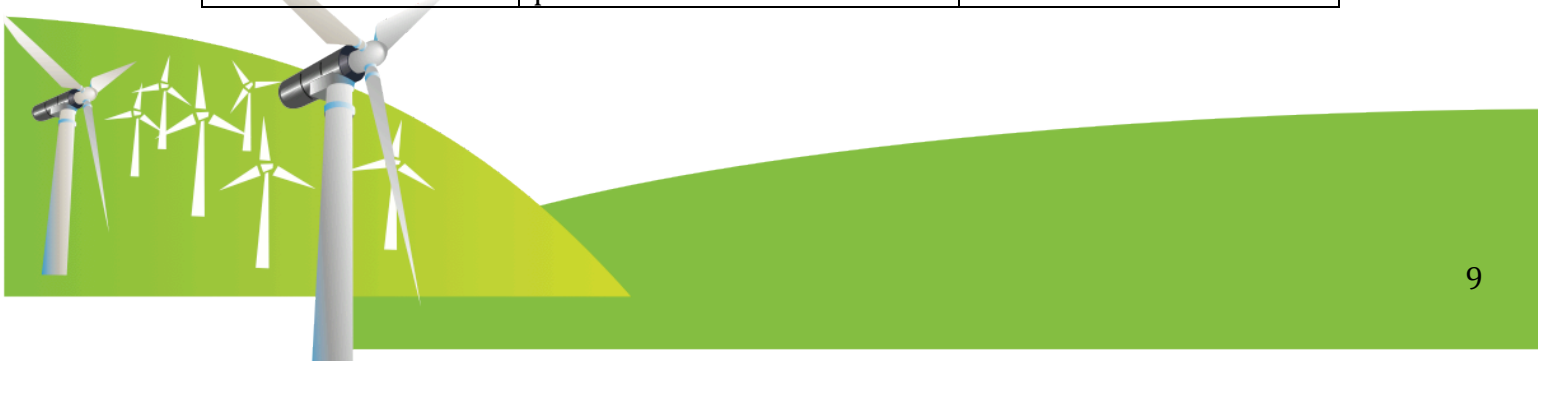
The money needed falls into two categories:

Risk money (Development costs)	Capital (Construction costs)
•Initial assessment •Feasibility and Technical work •Planning and Permitting •Legals •Finding the funds •Marketing the share offer	•Turbines, transformers, etc •Groundworks •Grid connection •Installation

We call the development money 'risk money' for a reason: it is quite likely to be lost! During the period where the project is being developed, a lot of things could put a stop to it, from issues with the MoD to the discovery of a rare lizard on the site. The greatest risk of all is the planning process, which does not always progress in an orderly and predictable manner. More than half of viable sites fall at this hurdle, by which time tens or even hundreds of thousands of pounds could have been spent. Once the project has full planning permission and the legal documents are signed off the risks are far from over, but they are much reduced.

This distinction between risk money and capital generally means that there would be different sources for each. As an initial summary:

	Risk Money	Capital
Grant funding	Possible. Schemes exist in Wales and Scotland. Local grants may be available.	Unlikely unless you are very lucky!
Venture capital	Unlikely to be on offer to community project.	Only largest projects: they are likely to demand high returns.
Partnership with developer	Good solution where it is on offer.	Good because they will pay for their part: you still have to find yours
Conventional Loan	Not available as there is no security	Good: most projects have a loan element.
Soft loan	May be available through schemes like Sharenergy	Not available at this scale
Single private investor (i.e. the landowner)	Possible. They will take a bonus on completion	Possible although not much will be left for you
Co-operative share offer	Generally not advisable as risks are too high for the public to invest.	Good solution. Co-operatives can raise large sums at reasonable cost.



2.6.2. Grant funding

A lot hinges on the availability of grant funding. Many people start along the community energy trail imagining that grant funding is plentiful. Nothing could be further from the truth. Although there are a few community renewable energy projects that have received significant capital grant funds, these were pioneers and those funds are very few and far between. You may still be able to access significant capital grants in Scotland or Wales, but for the rest of the UK it is important to realise that both economic conditions and the general policy direction mean that you would be unwise to base your project on the assumption that a grant will come from somewhere. However, it may be possible to access local or national grants to do feasibility work and other 'risk money' activities. These grants are generally small and you are likely to need a number of different sources. Giving grants for development represents good value for funders as they enable a large investment with a comparatively small expenditure.

2.6.3. Venture capital

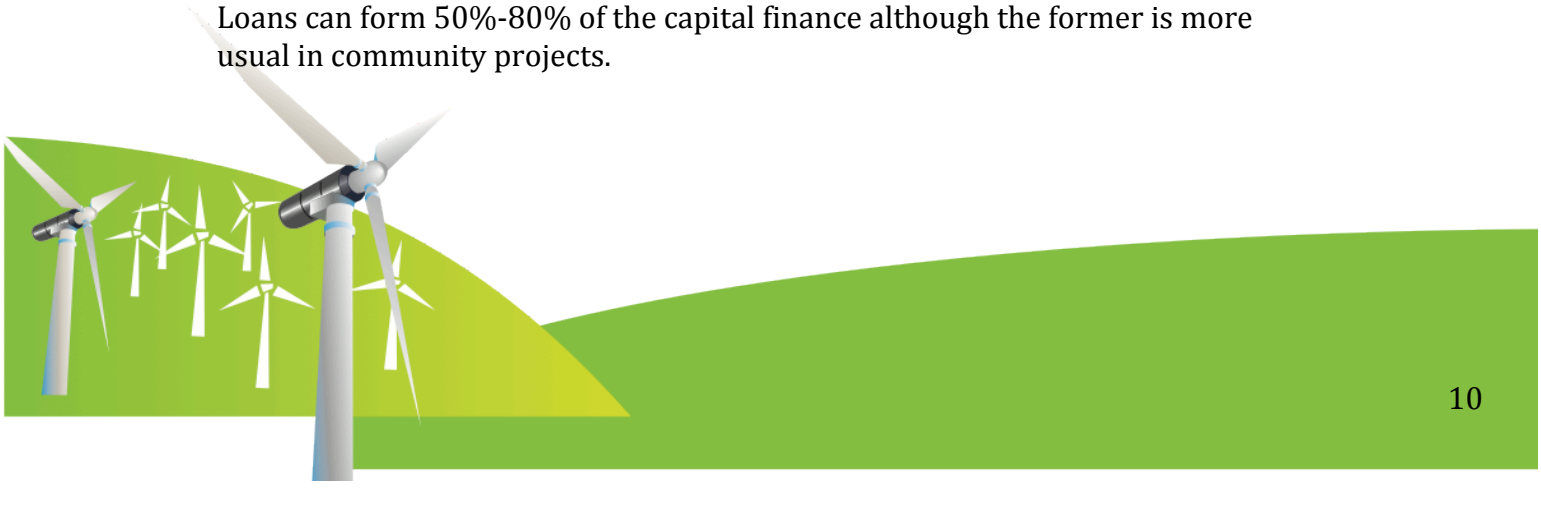
Most wind projects are funded with venture capital, i.e. money invested by big investors looking for a big return. Venture capital is fine, but a community project is less likely to appeal to these funds as it may be seen as a risk: in any case if they fund it there will be few benefits for the community. One exception is Energy Prospects, a co-operative that exists to provide risk money for community projects. This fund can still only afford to invest in projects which are likely to be very strongly financially viable though, generally >4MW projects in the windiest parts of Britain.

2.6.4. Partnership with developer

Some of the existing Energy4All projects use this model, where a community group buys in to a developer-led project. This is a proven model and is often the only way for communities to get a foot in the door when large windfarms are being built locally. It is less likely to be viable for smaller projects and may not fit the bill where community groups are developing the projects themselves from grassroots.

2.6.5. Conventional loan

A bank will loan a proportion of capital cost, but will not be likely to provide risk money unless there is some other security: don't be drawn into putting up your house as security (yes, it's been done!). It makes sense to have a bank loan as part of the capital finance however and banks are increasingly aware of the opportunity: notably Co-op Bank and Triodos Bank, although the others are catching on and there are other bank-like institutions that may lend money. Loans can form 50%-80% of the capital finance although the former is more usual in community projects.



2.6.6. Soft loan

Instead of giving grants, a funding body may choose to give a 'soft loan'. The Sharenergy project administers a Revolving Investment Fund that provides soft loans to communities to cover risk money needs, and other providers are looking at similar structures. If the project succeeds, it pays back the loan so the money is available to the next project (usually with a small bonus payment to reflect the extra benefit of having the funds available at the risky end of the process). If the project fails, the loan does not have to be repaid.

2.6.7. Single private investor

This is a similar situation to venture capital except that in some cases a single investor may have a reason to invest in the project. For example a landowner might put up some of the development money on the understanding that if the project succeeds it will be paid back with a bonus. This method has been used successfully in the past and can be a good way of tying landowner and project together…if the landowner has a stout heart and deep pockets!

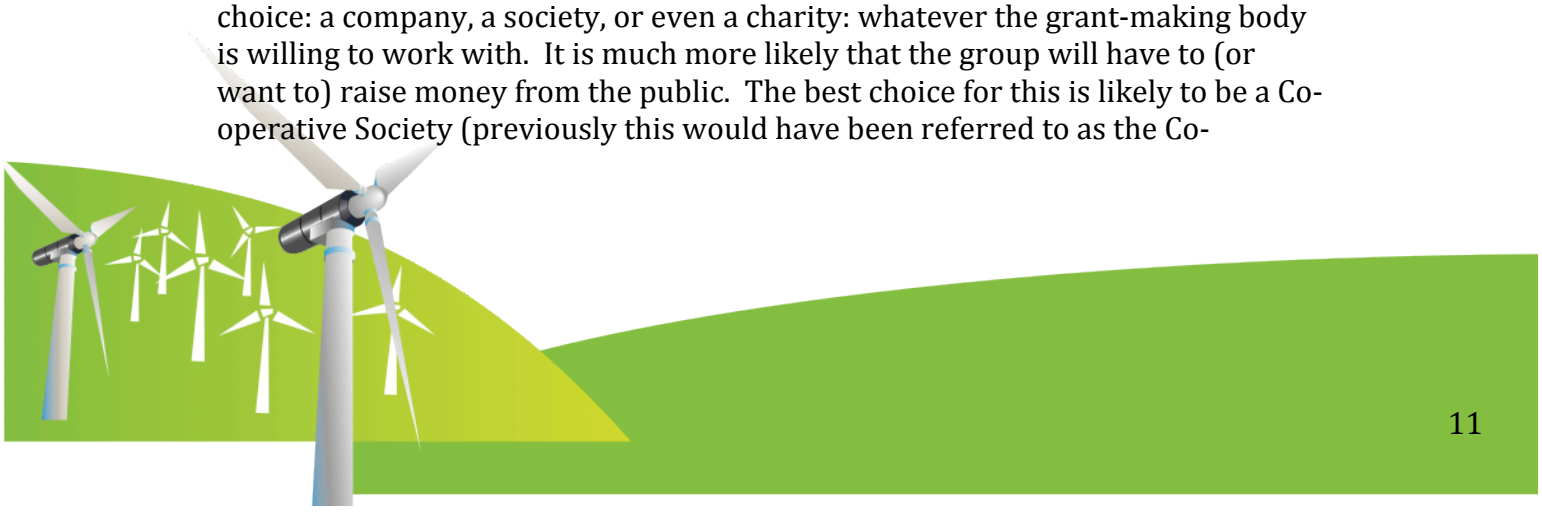
2.6.8. Co-operative share offer

The co-operative share offer is a way of raising capital through large public share offers. Energy4All and Sharenergy exist to help communities do this. Members of the public join the co-op and invest between £250 and £20,000 (the boundaries can vary according to the project and legal constraints). They receive a return on their investment, typically 5-10% averaged out over the 20 yr span of the typical wind project. As this is asking normal people to invest their hard-earned cash it's important that risks are reduced as much as possible: the temptation to do an early share offer to raise risk capital must be avoided so that communities don't have to have to explain to elderly neighbours why their life savings were lost! For raising capital, co-operative share offers are an excellent method if done well, spreading the benefit of the project across large parts of the local community and giving normal people a chance to own and run their own serious renewable generator.

For information on how the income is eventually split and the influence this has on the chosen funding pathway see the 'finances' subsection of 'Operations' below.

2.6.9. Structure

All projects will need to have a formal structure in order to access funding, sign legal documents and raise money. In theory there are multiple ways in which these could be structured, although in practice many of these choices are unlikely to be suitable. If the community can access capital grants then there is a choice: a company, a society, or even a charity: whatever the grant-making body is willing to work with. It is much more likely that the group will have to (or want to) raise money from the public. The best choice for this is likely to be a Co-operative Society (previously this would have been referred to as the Co-



operative form of Industrial and Provident Society). An alternative is a Community Benefit Society (previously known as the Community Benefit or BenComm form of IPS). Community Benefit Societies can raise share capital but are likely to be less suitable for raising the amounts needed for a wind project. A Community Interest Company (CIC) can also raise share capital but there are massive restrictions on the returns it can give to investors, which would likely mean that it would not be able to raise the money required.

3. Operations

3.1. Stages

Each wind development is different but it's possible to generalise some stages in development:

Find a site	**£ 0**	**DIY 100%**	**1-12 months**

Start from the map or perhaps from tip-offs or leads with keen landowners: a surprising number of people turn out to have been thinking about good places for turbines once people start asking. It may be possible to find a lot of sites: one group identified 56 sites in their area and spent most of a year meticulously whittling them down to the best 2.

Find a landowner.	**£ 0**	**DIY 100%**	**1-12 months**

The best site in the world is no good if the owner is not keen. Most community-owned wind projects are on private rather than publicly owned land with the landowner paid rental for the use of the site. You can find out who owns land from the Land Registry[7], or from local knowledge within your group. Be discreet and follow the rule: never discuss one landowner's business with another. It is wise to sign the landowner up with an exclusivity agreement at this stage to make sure they are serious about the idea and to show them that the group is serious about the project too.

Create a core group	**£ 0**	**DIY 100%**	**1-12 months**

Wind development is divisive and there is no point attracting negative publicity until a viable site has been found. This means keeping the work to a tight group, perhaps a subgroup of an existing community group. Groups will vary in how they handle this and often feel uneasy about keeping secrets: but openness too early can scare away landowners who need to know that the group is trustworthy.

[7] http://www.landregistry.gov.uk/

Assess site feasibility	**£ 2500**	**DIY 30%**	**1-3 months**

Some of this work can be done by the group but it is likely that some specialist help to properly assess the chosen site(s) will be required. A standard cost for an outline feasibility study done by a consultant is around £2500 per site.[8]

Work out financials.	**£ 0-1000**	**DIY 30%**	**1-2 months**

In the past some groups have managed to carry on a long way without doing this. Some did manage to get funding in the end; others still have not. At this stage it makes sense to take a long hard look at the numbers and decide if they really stand up. Be ruthless!

Double check everything	**£ 0-5000**	**DIY 30%**	**1-6 months**

Feasibility studies often leave trailing questions. These need to be addressed or they may come back to bite later: one group got nearly to the planning application before realising that grid capacity was much lower than they thought on that site. This phase can take a long time and there is a risk of loss of momentum. Grid and aviation authorities may take a long time to respond.

Screening and Scoping.	**£ 0-2000**	**DIY 20%**	**1-2 months**

These terms are used to describe the initial approach to the planners, a point at which work is carried out to determine what they expect to see in a planning application. As the main part of the application may be the Environmental Impact Assessment (EIA) it is worth putting in special effort to make sure that this is proportionate to the project: the cost of a full ecological survey carried out by professionals may be enormous and convincing the Local Planning Authority (LPA) that it is not needed may be the line between success and failure of the whole project.

Prepare planning	**£ 10k-30k**	**DIY 20%**	**1-2 months**

The LPA will expect to see some of the work carried out by appropriately affiliated independent experts, particularly noise assessments, landscape character assessments, ecological survey work and technical installation plans.

Public meetings.	**£ 1k-2k**	**DIY 80%**	**1-2 months**

When the planning application is ready to go in will be the best time to answer questions from the public. Some subgroups may need to 'soft launch' to their wider group before this. A public meeting will be needed to show that proper public consultations have been undertaken: more importantly this is the chance to start really connecting the community to 'its' project: these are the people who will live near the turbines and also the people who will end up owning them.

[8] Sharenergy offer Action Plans or to find other consultants visit http://www.bwea.com/members/CompanyDirectory.asp

Planning application	£ 500	DIY 10%	4-120 months!

The LPA has 13 weeks to determine the planning application, although in practice they often take longer. They are likely to come back with a range of conditions to be met, some of which could take a long time to satisfy. While they are deliberating, it is important to keep up the momentum with the community, asking them to write letters of support, and building up a database of supporters. Some of the groundwork for the following tasks can be done while waiting for the planners. In many cases it may be possible to write a series of historical novels or sail to Peru and back!

Met mast	£ 10-30k	DIY 0%	3-12 months

Around this time is also when the wind monitoring or 'met' mast can be erected. This will also require planning permission. In principle it would be good to put this up earlier, but in doing so the group would effectively publicly announce the site that has been chosen: it's also expensive and shouldn't' be done until all other factors are positive. As well as telling you more about the wind regime, the data will be needed by the bank that provides the loan, the turbine providers, and the specialists producing the noise monitoring reports (completing this may be a condition of planning).

Prepare share offer	£ 5-100k	DIY 40-90%	1-3 months

A low cost share offer can be prepared with a minimum of legal and printing costs. The more money required the more cost will be incurred: a large share offer (in the million pound plus range) needs expensive authorisation by the Financial Services Authority (FSA) and a serious publicity campaign.

Financial close	£ 1-10k	DIY 40%	1-2 months

Assuming that planning permission in hand, all the relevant legal agreements should be put in hand and firm offers from the installers and the bank obtained.

Share offer	£ 0-5k	DIY 40-90%	2-3 months

Having taken as much risk as possible out of the project the share offer can now be opened to the community. The project needs to be completely ready to go as soon as the target is reached. The new co-op will appoint its board.

Installation	£ varies	DIY 25%	3-9 months

Most of the work is highly specialized. A community group's role will be that of project management rather than digging holes. Project Management requires cool and experienced people who are not terrified by the responsibility of having a good proportion of their neighbours' savings in their hands and can solve problems under pressure.

Running the co-op	**£ varies**	**DIY 25-100%**	**20 years**

Once built, the co-op board will continue to run the project, with an ongoing need to take decisions and manage the formal business of the co-op, keep an eye on the finances and decide on members payments. It will want to employ a person or organisation to do the day-to-day admin of the co-operative.

Adding up all time makes the project seem rather daunting: 2- 20 yrs! Of course many of the tasks can be run concurrently, although it's very rare so far for a community project to take less than 5 years from first idea to commissioning. It is slow and steady work and probably favours those who have come to relish setbacks for the pleasure of overcoming them. £30k-£200k development money can seem like a lot although in the context of a project which will generate millions of pounds worth of green electricity during its lifetime, it needs to be seen in proportion.

3.2. Finances

Once the project is built income will be received from Feed-in Tariffs (FiTs) or Renewable Obligation Certificates (ROC) plus surplus electricity sales to the grid. The energy production is metered and is paid per kWh generated. In most cases community schemes of under 5MW will opt for FiTs as this gives the best income. Under FiTs 3p/kWh (the '**export** tariff') is guaranteed for electricity exported to the grid although it would be possible to sell it on the open market for more: 4-5p at the time of writing. There is also an additional incentive for generating green electricity and this '**generation** tariff' is what makes medium scale wind possible. The amount of the generation tariff varies with the size of the installation (which may include one or many turbines)[9]:

Size of installation	**FiT generation tariff (p)**
15 kW-100 kW	24.1
100 kW-500 kW	18.8
500 kW-1.5 MW	9.4
1.5 MW-5 MW	4.5

The way this income is split depends on many factors. The example below gives purely indicative financials for the first year of operation for a 330kW project in a medium wind area yielding 600,000 kWh per annum. In this example the project has a capital cost of £750,000 and is funded 50/50 by a co-op share issue and a loan:

[9] Table correct as of early 2011 and will in theory not change before April 2013. For more rates visit DECC http://goo.gl/PdQYc

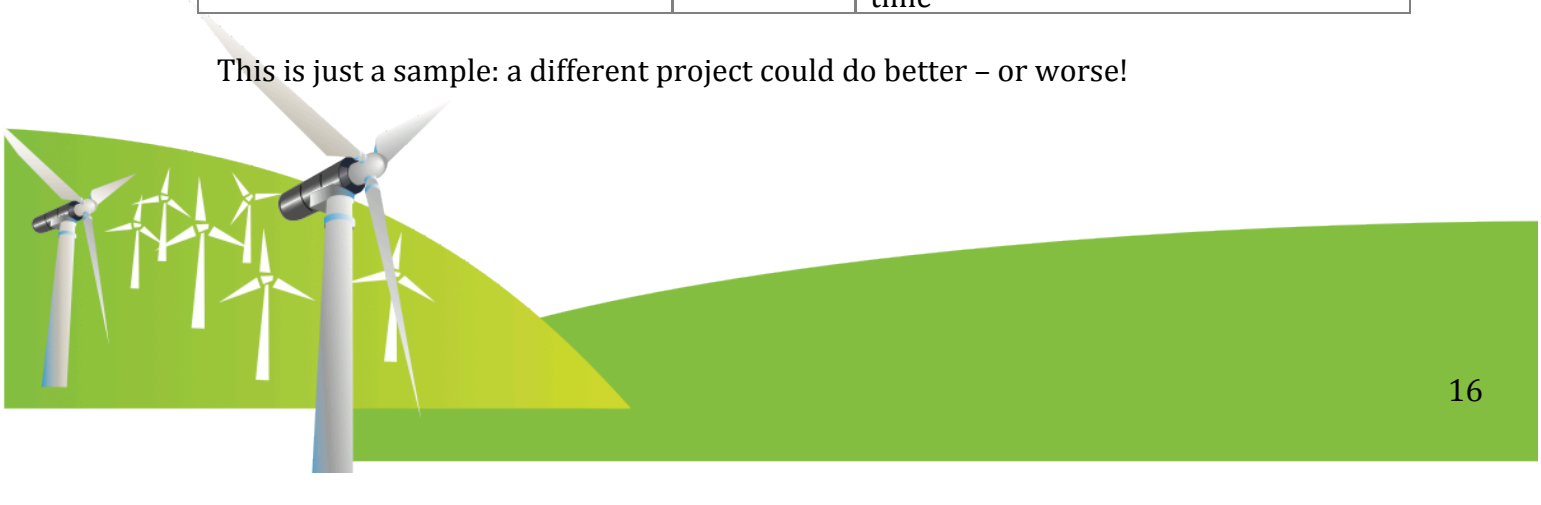
Capital costs

	£	
Cost of turbine	500,000	Installed cost
Grid connection	100,000	Varies a lot depending on location
Development costs	100,000	With effort these costs can sometimes be reduced
Share offer costs	50,000	Including legal support
Total Capital cost	**750,000**	
Split		
Loan finance	375,000	50%
Community equity investment	375,000	50%

Income (first year)

Feed-in Tariff (generation)	112,800	600,000 kWh at 18.8p
Electricity sales (export)	18,000	600,000 kWh at 3p
Total Income	**130,800**	
Maintenance	10,000	Manufacturers/installers contract
Land rental, rates	20,000	Dependent on landowner deal
Insurance	10,000	
Depreciation	37,500	750,000 over 20 years.
Admin	6,500	Correspondence, support, statutory
Community Fund	10,000	Local 'good causes'
Total expenses	**94,000**	
Operating Profit	36,800	
Less Bank Loan Interest	22,000	
Net Profit	**14,800**	
Total return to Co-op Equity	14,800	
Percentage return to members	3.95%	This will improve with inflation over time

This is just a sample: a different project could do better – or worse!



A few important things arise from this. Firstly if a project is really going to work the organisers need to think like hard-headed developers. People often question the large figures on the expenses side:

Maintenance. A wind turbine absolutely needs a maintenance contract. Your dad cannot fix it with a spanner.

Land rental and rates. Business rates will be payable on the installation. Rental is negotiable and this is somewhere that the costs can be reduced.

Depreciation. Money needs to be put aside so that members can get their cash back at the end of the 20 years. Be careful when comparing 'rates of return' that this element is included in your forecast.

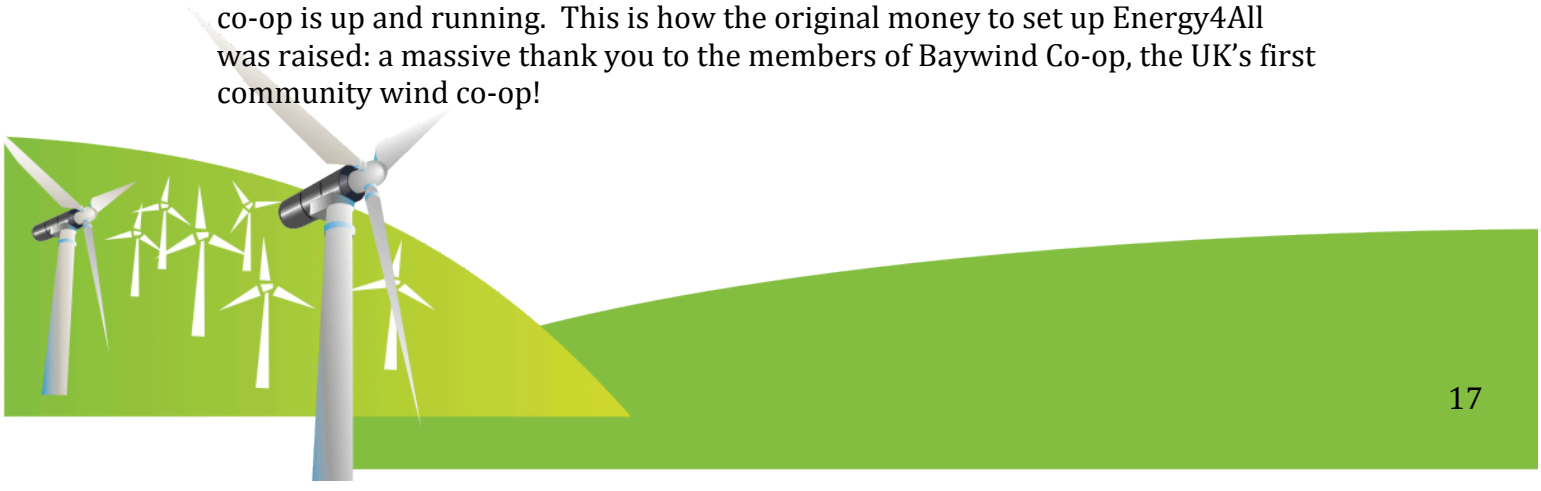
Admin. Running a co-op means keeping people informed and providing support in case of issues arising. There are statutory requirements regarding accounts and AGMs as with any business. Volunteers can run this, but will they still be there in 15 years time to manage their neighbour's money?

Community Fund. There's not a great deal left to put into good works here. If the project found capital grants then this figure could of course go up, but if the main motivation is to make money for an organisation then community wind is unlikely to fit the bill.

The return to members shown here is low but this will increase over time as:

- Inflation means the electricity and FiTs are worth more
- Interest accrues on the depreciation fund in the bank
- The bank loan gets paid off

In this case the project averages a healthy 10% over 20 years. This may seem brilliant in comparison to savings accounts but remember the risk is still a lot higher – there are no bailouts if it goes wrong. The temptation for the more altruistic is to lower the return to members and to up the community fund but beware: if the return is too low there won't be enough investors. In order to raise the £375,000 to the project will need to appeal not just to the few committed greens with sufficient cash but also to more financially motivated members of the wider community. The rule for co-ops is that the return for members can be as high as is needed to raise the necessary money - the experience of Sharenergy is that 10% is a good figure to aim for in projections. Of course the members can choose to take less of the profit in return, once the co-op is up and running. This is how the original money to set up Energy4All was raised: a massive thank you to the members of Baywind Co-op, the UK's first community wind co-op!



4. Support

4.1. Energy4All

Energy4All is a not-for-profit company, which exists to provide support to community-owned renewable energy projects. Energy4All has set up 7 of the 10 existing community-owned wind projects in the UK at the time of writing. The focus is on larger scale wind projects of 4MW and above, often helping communities to form partnerships with developers to get some impressively large projects off the ground: 6500 people are members of Energy4All co-ops and nearly £15m of community equity has been raised.

http://ww.energy4all.co.uk

4.2. Sharenergy

Sharenergy is a spin-off from Energy4All, which focuses on smaller scale, ground-up projects across the technologies (medium wind, hydro, PV solar, biomass and biogas). Originating as a locally funded project in the rural West Midlands, Sharenergy is expanding nationally to provide support and services to community groups to develop their own renewable energy projects. We do this in 3 main ways:

1. Helping you help yourself. We provide training sessions and are working on online software which gives you a much better idea of what you can do in your area and how feasible it really is
2. Action plans. We do feasibility studies across the technologies that tell you both what is possible and what you can do next, not forgetting to cover the blunt financial realities!
3. Funding. Our Revolving Investment fund provides a pot of development funds for community groups to use. If you project comes off, it pays these funds back into the pot for the next group to use. We are expanding this pot from the West Midlands to cover the whole UK.

You can also join our online network to meet and work with other people who are following the community renewable energy path.

http://www.sharenergy.coop

4.3. Others

Of course we'd like you to come to Sharenergy but there are a number of other organisations that can help in different ways to get community wind off the ground. For example:

CORE Work with communities to develop renewable energy projects
http://www.corecoop.net/

Carbon Leapfrog provides free support for Carbon reduction projects including renewables:
http://carbonleapfrog.org/

There are regional Energy Agencies across the country. They vary in their focus but will usually be places to find renewables enthusiasts and experts, with some now working on community energy. A partial list is available here:
http://www.nef.org.uk/communities/cepf-members-list.html
and another one here:
http://goo.gl/kdap1

An excellent source for training, information inspiration and publications is the Centre for Alternative Technology: many people who work in the wind and community energy sector have done their MSc course:
http://www.cat.org.uk/

4.4. Information

The NOABL database for wind speeds is available from DECC here:
http://goo.gl/1Q6TG

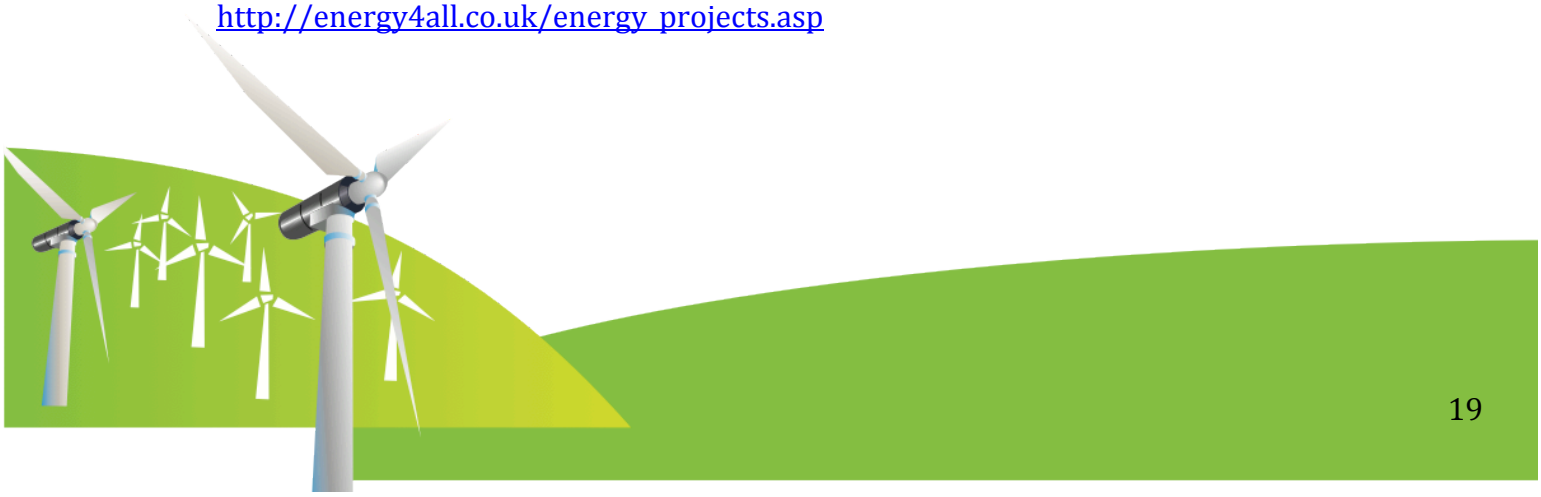
Our own Energy Steps website gives some guidance for the basic steps in establishing a wind project.
http://energysteps.coop

Mapping and GIS datasets are available from many places on the web. A good place to start is:
http://www.magic.gov.uk/website/magic/

Community Energy Online is a new Government website, patchy at present but has some good links:
http://ceo.decc.gov.uk/

4.5. Existing projects

A good primer is to have a thorough look at the projects that are part of the Energy4All family, from Baywind in 1997 (which launched community wind power in the UK) to projects currently in planning:
http://energy4all.co.uk/energy_projects.asp



Some of these projects have their own extensive webpages with pictures, data and information about how they got off the ground.
You may find it useful to look at the planning documents submitted by other similar projects. Bear in mind that every project has special circumstances: some may have been able to afford to go the extra mile with planning applications due to grant support. There are currently very few single turbines under 500kW in the UK and while there is a fair idea of what needs to go in a larger application it will be a while before there is a standard level of detail for these medium turbines. Here are some projects where planning details are available online:

		Project link	Planning link	Planning	Notes
Berwick Community Wind Turbine (CORE)	850kW	http://goo.gl/ikgak	http://goo.gl/ugdOe	Approved Sep 2010	Community owned
Glyndebourne Opera house	850kW	http://goo.gl/ebVwE	Links on same page	Approved July 2008	Not community owned but interesting. In AONB
Castle Farm	225kW	http://goo.gl/VErNI	http://goo.gl/uh27q	Submitted Oct 2010	48% community owned. ACSA turbine
Awel Aman Tawe	2 x 1MW	http://goo.gl/7aPWc	Various from site	Approved Summer 2008	10 yr battle, eventually secured grants
Bro Dyfi Community Renewables	1 x 500kW	http://goo.gl/kZEMo	Links on site	First turbine approved 2003	Tenacious! On their second turbine
Sustainable Hockerton	225kW	http://goo.gl/ojr95	http://goo.gl/pHMOT (Link to summary)	Approved June 2008	Rare medium community turbine

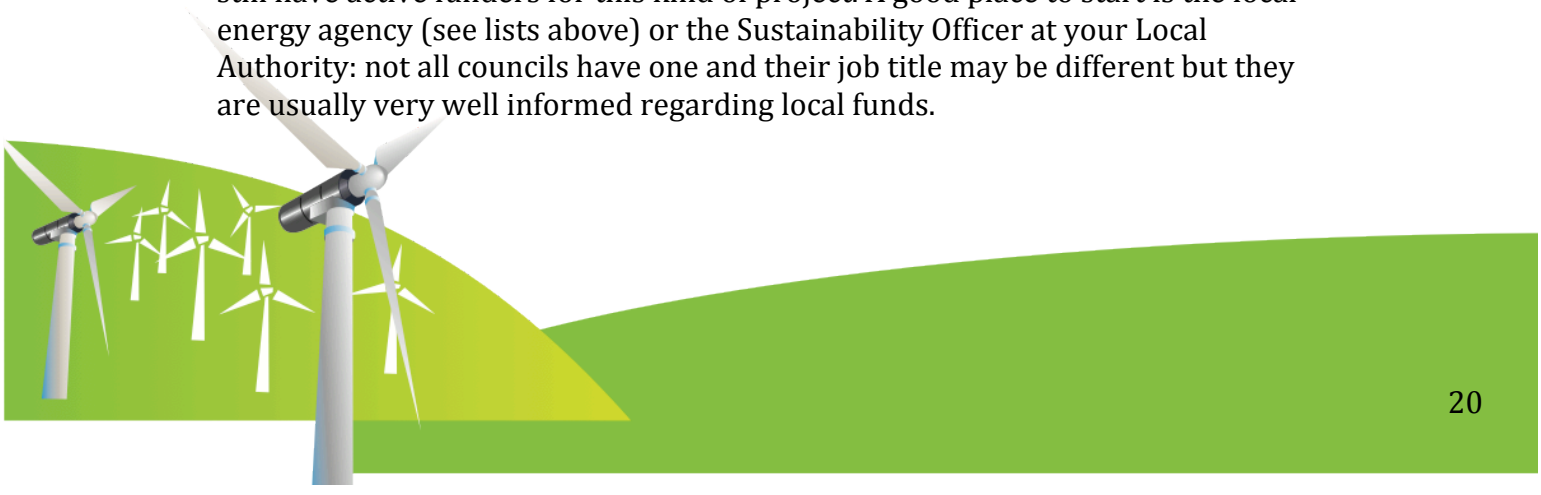
For other renewable energy projects there is a useful map here:
http://www.renewables-map.co.uk/index.asp

4.6. Finance sources

4.6.1. Grants

No Government sources of grant funding are available for community-owned wind as the income from the Feed-in Tariffs are intended to be the only mechanism for funding these projects. Outside of Scotland and Wales, grants are likely to be hard to find and probably best kept for development costs. To find local and national sources of funds you can try:
http://www.governmentfunding.org.uk/default.aspx
http://www.funderfinder.org.uk/ (£10 for 24h access and may be worth it)

Your best bet may be to find a local source of funding: some parts of the country still have active funders for this kind of project. A good place to start is the local energy agency (see lists above) or the Sustainability Officer at your Local Authority: not all councils have one and their job title may be different but they are usually very well informed regarding local funds.



In Scotland grants are available through CARES:
http://www.communityenergyscotland.org.uk/cares.asp

And in Wales through Ynni'r-Fro:
http://www.energysavingtrust.org.uk/Wales/Ynni-r-Fro

4.6.2. Loans

Most of the main banks will now consider making loans to renewable energy projects although many do not have great expertise in this area and may not understand co-ops at all. Two banks that do are:

Co-operative Bank:
http://www.co-operativebank.co.uk

Triodos Bank:
http://www.triodos.co.uk

You could also approach social lenders such as:

Co-operative and Community Finance:
http://www.co-opandcommunityfinance.coop/

5. Appendix: Exclusivity agreement

THIS AGREEMENT is made on the day of , BETWEEN:

(First) Name:
Address:

("the Owner") being the owner(s) of the land edged red on the plan annexed hereto ("the Site"), and

(Second) Organisation Name:
Registered Address:

Company or Society number:

("the Developer")

RECITALS:

(A) The Developer has had initial discussions relating to the potential development of the Site by the Developer as a wind farm (i.e. for the erection of one or more wind turbines to generate electricity).

(B) The Owner now wishes to carefully and properly consider the terms upon which the Developer propose to proceed (i.e. the negotiation and completion of an option agreement that would enable the Developer to call for the grant of a lease of the Site following and subject to the completion of various feasibility surveys and tests) whilst the Developer now wishes to examine the Owner's title to the Site.

(C) The Owner and the Developer have now agreed to enter into this Agreement to confer exclusivity upon the Developer in relation to the potential development of the Site whilst the negotiation of such terms and documentation and the review of the Owner's title to the Site are ongoing.

NOW THIS AGREEMENT WITNESSES as follows:

1 In consideration of the sum of £1 now paid by the Developer to the Owner (receipt of which the Owner hereby acknowledges) the Owner hereby grants to the Developer the exclusive right to continue and progress negotiations with it to enter into an option agreement to allow the Developer to investigate and assess the potential development of the Site (or any part thereof) as a wind farm and thereafter to call for the grant of a lease in an agreed form.

2 The Owner hereby confirms as follows:

(i) that as of the date of this Agreement neither it nor its advisors are directly or indirectly in discussions or negotiations with any third party relating to the proposed development of the Site (or any part thereof) as a wind farm and acknowledges that the Developer will be incurring costs in connection with the potential development of the Site as a wind farm in reliance of this representation;

(ii) that for a period of eighteen (18) calendar months from the date of this Agreement ("the Lockout Period") it shall not directly or indirectly solicit, enter into or continue negotiations with any third party in relation to the development of the Site (or any part thereof) as a wind farm;

(iii) that it will inform the Developer immediately of the identity of any third party who contacts it during the Lockout Period with a view to the develop the Site (or any part thereof) as a wind farm;

(iv) that it will as soon as reasonably practicable produce evidence of its title to the Site to the Developer and reply to any queries raised relating to the same as accurately and fully as possible;

(v) that it will not produce evidence of its title to the Site to any third party during the Lockout Period; and

(vi) that it will not allow any third party to inspect or obtain a survey or valuation of the Site during the Lockout Period.

3 the Developer hereby agrees as follows:

(i) that it will as soon as reasonably practicable produce a draft option agreement for lease and lease to the Owner or such solicitors as it may appoint for their consideration; and

(ii) that it will review the Owner's title to the Site as soon as reasonably practicable following receipt of the same from the Owner or its solicitors.

4 The Owner and the Developer hereby mutually agree and acknowledge as follows:

(i) that they shall both enter into negotiations for the completion of an option agreement for lease in good faith and use all reasonable endeavours to agree the terms of the same during the Lockout Period;

(ii) that this Agreement does not in itself constitute a binding contract in relation to the Site and no such contract shall be in place unless and until an option agreement for lease is entered into by the parties to this Agreement;

(iii) that neither shall disclose the existence or terms of this Agreement to any third party without first obtaining the consent of the other to any such disclosure;

(iv) that unless the parties to this Agreement agree to the contrary this Agreement will terminate and cease to apply on the date of expiry of the Lockout Period if an option agreement for lease in respect of the Site (or any part thereof) has not been executed and entered into by close of business on the said date; and

(v) that this Agreement is subject to and shall be construed in accordance with the laws of England.

NOTE: IN THE CASE OF JOINT OWNERSHIP, ALL OWNERS MUST SIGN

Signed by the said Signature: in the presence of this witness Signature: Name: Address: Occupation:	Signed by the said Signature: in the presence of this witness Signature: Name: Address: Occupation: