

Technical Guidance document

Community renewable energy projects



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Introduction

Developing a community renewable energy project is an amazing learning journey. How hard can it be to put up solar panels on a roof and earn money from it!

If it is the roof of your own home and you have several thousand pounds to invest, then not very hard at all. If you are a small community group that wants to put a system on community property to earn money to support your groups work, then the process is a lot more involved.

It has taken many small community groups a while to realise the opportunities for long term sustainable income from the Feed in Tariffs and the Renewable Heat Incentive. The development process from concept to finished project can easily take more than a year depending on how lucky or skilled you are with fundraising.

Depending on the scale and technology you settle on, you will come into contact with whole host of challenges and opportunities, all of them surmountable, but not all of them predictable.

This document is intended as a case study based guidance, from what we have learnt from developing a project in Beeston Nottingham.

Key issues we have come across

1. Getting good technical support in place early on is critical
2. Engaging with and building credibility with potential host sites was essential
3. Planning issues with wind are complicated but not insurmountable
4. Funding bids often need supplier quotes, evidence of community engagement and ideally planning granted already
5. Gaining local authority and other support at concept stage is really helpful
6. Keep the media informed
7. Learn to manage expectations and expect setbacks and changes of direction
8. Seek guidance to write strong procurement and contract documentation to secure reputable contractors at the right price and ensure that installations deliver to expectations.
9. Get legal agreements in place with partner host site
10. Think about how to deal with ongoing management, maintenance and revenue

If you are another voluntary group hoping to develop a project, the full planning, legal and procurement documentation produced for this project can be obtained by contacting Greening Beeston or the Nottingham Energy Partnership.

Suggested Guidelines for a Renewable Energy project

Based on Greening Beeston experience 2011/2012



1. Preparation

Greening Beeston initially worked with the local authority and the Nottingham Energy Partnership to put together a bid for funding through a regional climate change partnership fund called 'Climate Communities' to develop a community renewable energy project. Most of the project development funding was to pay for expert technical support from NEP in assessing, choosing and developing the site. The cost of this development phase was £5k.

This included all the support needed to take the project from concept, to having a specification ready for installers to provide quotes. Along the way NEP worked with the group to help in decision making and education around the process, so that for the next project the group would have more of the skills to undertake the development themselves.

2. Scoping

At the kick off meeting the group were asked to suggest maybe 20 community sites across the Beeston area that they thought might be willing to host a renewable energy system and may have either a south facing roof or sufficient space for a wind turbine.

NEP then undertook a quick desktop assessment of each site to ascertain suitability using a range of web based tools including www.roofray.com for solar and www.rensmart.com/DataServices for wind and NEPs online renewable energy calculators <http://www.nottenergy.com/renewables/tools/tools> .

NEP presented the likely shortlisted sites to the group and the group started approaching the potential sites to see if they would be interested in being involved. Eventually the group agreed on a shortlist of 6, each of the 6 sites was then assessed in more detail using professional software (PVsol) or technical expertise and potential return on investment assessed.

3. Engagement

The group then looked at the more detailed economics and opened up a more formal dialogue with each of the 6 sites to ascertain if they would be interested in partnering in a project. This discussion included looking at the state of the roof in some cases, whether the site owner intended to retain their current building or move on, whether the site was a leased or owned site and the general enthusiasm or not of site owners to the idea of letting a small voluntary group operate a renewable energy system on their premises. The outline economic calculations were used to explain the level of savings each site owner could expect on their bills.

The list was whittled down to 3 front runners. 2 sites for 10KWp of photovoltaics, a primary school and a care home and 1 for a 5KW wind turbine, a secondary school.

Queenswood Care Home: 10 KWp PV



Trent Vale Primary School: 10KWp PV



Chilwell Secondary School: 5KW Wind Turbine



4. Assessment

All 3 sites were then subject to a more rigorous site assessment by technology specialists and more detailed feasibility studies were undertaken.

The group were interested in the care home, as these sites typically have high energy usage and with an aging population increasing the sustainability of care is going to become more and more important. The link with healthcare was also of interest as the NHS locally has been committed to carbon reduction and this project would help create a partnership with local NHS projects. NEP had already worked with The Beeston Health Centre to support the installation of a large PV system on its roof. The Beeston Boots plant is also a major local employer and developing a health related project in partnership with Boots could help fund the installation.

The primary school has shown a strong commitment to sustainability and was already looking at a PV project. The link with education would support Greening Beeston's aims and objectives. This would help integrate sustainability into the schools curriculum and reach the students and the wider community.

The secondary school had a site for a small wind turbine. Locally Nottingham University is currently applying for planning permission for three 2MW wind turbines. These have caused some objection and much local debate about renewable energy. The wind turbine installation in the school would be useful to introduce the debate at a smaller local scale into the community, showing that wind power comes in many scales. The technology and design process could also be integrated into the school curriculum as the turbine manufacturer and supplier is a Nottingham company.

All 3 sites had the potential to generate significant income from FITs and carbon savings. The PV installations would generate high income for Greening Beeston and reasonable energy bill savings for their hosts. The wind turbine would generate both significant income for Greening Beeston and significant bill savings for the school.

5. Consultation

At this point the 3 sites were asked if they would be happy to be involved in a public consultation. The press were informed and people were invited to give their opinion at a public meeting and via a website. This feedback was all taken into account in deciding who the group should work with.

Library display and response box



The 3 sites details including social economic and environmental impact of the proposed developments, were turned into posters with images of each site. These were circulated to the 3 sites to display and displayed on the web and in the library for a week with a suggestion box and response slips on the display there was also the option to respond by email or by coming to the meeting. **See appendix 1.**

This was followed by a well publicised Saturday afternoon meeting. 3 members of the group presented one of the proposals each and the overall concept was presented by NEP. The floor was then opened for a lively and

productive debate and discussion.

6. Refining the Project

Some critical issues arose at this point to help in the decision making process.

- The primary school did not own their building, this was owned by the county council
- The primary school was also a flat roofed building. This would have increased the costs to Greening Beeston, as the system would have to be uninstalled and reinstalled when the roof was next resurfaced adding significant costs down the line. Installation costs for flat roof buildings were also higher.
- The feed in tariff rates for PVs also fell at this point making both the PV installations look less attractive financially.
- Chilwell school owned their building and grounds making planning permission for the turbine and any legal agreements more straight forward.
- Responses from the consultation favoured one of the schools

7. Focus

After considerable debate the group agreed to work on the wind turbine project first, though the other 2 solar power projects were still to be considered for development at a later date.

Of the 3 options wind power was the most potentially problematic for planning, however, once installed the revenue was higher. For the 2 solar sites, issues with roof repair and legal arrangements could also potentially be complicated down the line, such as what happens if the building owner needs access to the roof for repairs. However it was identified that the wind turbine would present higher ongoing costs for maintenance.

The school was informed of the group's choice to go ahead with the wind turbine project and asked if they were happy to proceed in partnership to planning and site development. This was done before the other 2 sites were informed that they would be considered at a later date.

Chosen site, Chilwell Secondary School



8. Development

a. Planning application

The site initially chosen for the wind turbine was picked because it was more than 100m from any neighbouring buildings and within the schools fencing for security. Upon a more detailed site assessment and conversations with the supplier, it became clear that to negate any potential planning issues a site would need to be found 136m from neighbours (for noise) and 50m away from groups of trees hedgerows or ponds, to avoid impacts on feeding bats.

On this basis the original site had been too close to the lake behind the school which could have been identified as a bat foraging area. A new site was identified and agreed with the headmaster. The new site required some changes to the layout of the football pitches on the sports field.

Figure 1: Aerial photograph of site from wider view showing school and local properties and ecological features in relation to the proposed turbine location as per highlight.

sent to the safeguarding officer at the airport. The document was sent by the safeguarding officer and required exact pinpoint location details with grid reference, turbine height, blade material and tower width at top and bottom. For this the turbine supplier had to send full CAD drawings and specification documentation. **Appendix 2**

A range of tower heights were available 12m, 15m and 18m. The highest tower was chosen to make the best of the wind regime at the site.

The site is within 300m of a SSSI, Attenborough nature reserve. NEP had to check the designation of the site to determine if a turbine development of this scale on this location could potentially adversely affect the designation. It did not appear that this would be the case.

The site is in a flood risk zone, NEP had to ascertain the restrictions and limitations of installing such a development in the flood risk zone through a flood risk assessment. Basically the installation of the base should not raise the ground level.

Evanco wind turbines helpfully provided an example planning application pro-forma from which NEP developed the full design and access statement for the application dealing with the issues above and the range of other issues likely to be considered at planning stage.

NEP pulled together the required maps and diagrams for the planning application and paid the planning £170 application fee.

The planning documentation can be obtained from Greening Beeston or NEP.

b. Fundraising

Evanco were then invited to visit the site to generate a full formal price estimate, a service for which they charge £240. This information could be used in applications for funding. The technical quote alongside the planning documentations with key conditions would also be necessary for writing the procurement documentation with the exact specifications for supplier/installers to quote.

Fundraising usually requires a clear aim for the use of the funds, supplier quotes, a group constitution and a project purpose that is clear and relevant to the funder.

The group agreed that they would apply for funding for a wind turbine, not only to directly save carbon and generate energy from wind power, but also to generate long term income for GB to ensure that they can deliver training and support to members of the Beeston community to reduce fuel poverty and carbon emissions. The turbine would also be of financial and educational benefit to the school.

A long list of potential grant schemes and agencies was drawn up. At this point the group are still applying for funding.

c. Legal and Financial agreements

A wind turbine would have a higher annual maintenance cost than a PV system though, with maybe £250 each year required to pay for engineers to lower and check the blades. Greening Beeston agreed that these costs should be their responsibility as they would be earning more income than the school from the FITs.

The Feed in Tariff claim would also have to be made through the school. This would require capacity for Greening Beeston to make regular meter readings to claim FITs. This would either require regular access, remote data access or for the school to provide the information.

Upon completion the installer would have to make the Microgeneration Certification Scheme (MCS) certificate out to the school and the school would need to sign over the right to the FITs to Greening Beeston. GB would then submit the MCS certificate, with the purchase receipt for the turbine, and an accurate meter reading to the energy supplier from whom FITs would be claimed. To support GB to make accurate FITs claims it would be helpful for GB to have a smart meter installed that could feed information to a web portal.

It was decided at a GB meeting that a short legal document would need to be put together with the school to formalise the financial relationship and responsibilities.

The legal documentation can be obtained from Greening Beeston or NEP.

9. Procurement

NEP worked to turn the known information at that point into an outline tender specification for the purchase of the turbine. This document was developed to send to suppliers to quote, and to be used as a contractual agreement between GB and the supplier/installer to ensure that the system was installed to meet all planning and technical requirements. Writing the procurement documentation is an important part of the process. To quote the contractor must be given specific guidance on planning conditions, desired components, such as smart metering, display boards, safety barriers and warranties; also health and safety, access and environmental considerations for the specific site.

To ensure that there is some recourse in case the installation doesn't go to plan, it is worth taking time over this document

The procurement documentation can be obtained from Greening Beeston or NEP.

Appendix 1



Photograph by Lewis Stainer

Key Considerations

Energy

- 10KWp solar electricity generating array proposed
- No shading; solar system will achieve maximum potential
- Suitable South facing orientation; ideal for solar electricity
- Building life more than 25 years though; roof repairs likely in that time
- Energy saving 8,000KWh = 2 1/2 homes annual electricity use
- Site owned by NCC; permission will be required
- Planning permission required

Money

- Project cost around £25,000
- Would reduce the school's electricity bill by £650 per year
- Would earn £2,000 per year for Greening Beeston
- Will save 4.5 tonnes CO₂e per year

Community

- 200 students and school community will benefit
- Could be a good renewable energy teaching tool
- Small school so % contribution to schools energy bill and carbon emissions would be significant

Alternatively, have your say online at: <http://greeninginbeeston.weebly.com>



Photograph by Lewis Stainer

Key Considerations

Energy

- 5KW wind turbine
- Sufficiently windy site
- Turbine 12m tall; small tree sized
- More than 100 metres away from homes
- Not installed on building so no impacts on building maintenance
- Site owned by school; so no external permission needed
- Planning permission required

Money

- Project cost £25,000
- Energy saving 9,417 KWh per year = almost 3 homes annual electricity use
- Would reduce the school's electricity bill by £900 per year
- Would earn £2,500 per year for Greening Beeston
- Will save 5.5 tonnes CO₂e per year

Community

- 1000 students and school community will benefit
- Could be a good renewable energy teaching tool
- Could prime a topical debate on wind power

Alternatively, have your say online at: <http://greeninginbeeston.weebly.com>



Photograph by Lewis Stainer

Key Considerations

Energy

- 10 KWp photo voltaic array
- No shading; solar system will achieve maximum potential
- Suitable South facing orientation; ideal for solar electricity
- Building life more than 25 years though; roof recently replaced, repairs unlikely
- Energy saving 8,000KWh = 2 1/2 homes annual electricity use
- Site owned by charity MHA; external permissions to install not required
- Care homes are very energy intensive buildings
- Will save 4.5 tonnes CO₂e per year

Money

- Project cost around £25,000
- Would reduce home's electricity bill by £650 per year
- Would earn £2,000 per year for Greening Beeston
- Will save 4.5 tonnes CO₂e per year

Community

- 40 residents and visitors
- Ageing population, sustainable care homes are essential
- Would help create links between local environmental group and the care home

Alternatively, have your say online at: <http://greeninginbeeston.weebly.com>



Appendix 2

CAA/NATS/MOD Wind Farm Application form
(BWEA email #1692) WIND FARM DEVELOPERS APPLICATION PROFORMA:

Civil Aviation & Ministry of Defence Safeguarding

NOTICE TO WIND FARM DEVELOPERS

Please submit a completed application form for all new or revised onshore and offshore wind farm plans. This form has been compiled in consultation with the British Wind Energy Association. Its purpose is to standardise the information provided and to expedite the assessment of your proposed wind farm development. Assessment is made against air safety and defence interests, through evaluation of the possible effects on air traffic systems, defence systems and low flying needs.

NOTICE TO PLANNING AUTHORITIES

This form has been compiled with the assistance of the Civil Aviation Authority (CAA), the Ministry of Defence (MOD), the National Air Traffic Service (NATS) and the British Wind Energy Association (BWEA), to assist in the processing and assessment of wind farm applications. It is important that copies of this form are forwarded within the planning consultation process. This will help these organisations trace their records of any earlier consultations, as well as provide them with the relevant information for their assessments.

WHAT TO DO WITH THIS FORM

Please provide as much detail as possible by filling in the shaded areas. If the specific turbine and/or exact positions have yet to be established then fill in the likely turbine size (hub height, rotor diameter) and boundary points as a minimum. On completion send copies to both the following addresses.

deopnorth-lmswind@de.mod.uk

or -
St George's House
Kingston Road
Sutton Coldfield
B75 7RL

windfarms@caa.co.uk

or -
Directorate of Airspace Policy
K6 Gate 3
CAA House
45-49 Kingsway
London, WC2B 6TE

It is important that a copy of this form is retained for inclusion with subsequent planning applications at the same site. If no application has been made prior to a planning application, please include a completed form in your planning application.

Wind Farm Name	
Chilwell School	
Also known as:	
Developers reference	Chilwell School
Application identification No.	
Related/previous applications (at or near this site): Provide reference names or numbers	none

CAA/NATS/MOD Wind Farm Application form

Developer Information	
Company name:	NEP energy services Ltd
Address:	10 th Floor, Castle Heights Building 72 Maid Marian Way Nottingham Notts
Contact:	Jerome Baddley
Telephone:	0115 9859057
Facsimile:	n/a
e-mail:	Jerome.b@nottenergy.com

Relevant Wind Turbine Details			
Wind turbine manufacturer:	Evance		
Wind turbine model:	R9000		
Wind farm generation capacity (MW)	5kW	Number of turbines	1
Blade manufacturer	Evance		
Number of blades	3		
Rotor diameter	5.5	Meters	
Rotation speed (or range)	200	Rpm	
Blade material including lightning conductors	Glass fibre		
Wind turbine hub height	18	Metres	
Tower design (* delete as required)	* Tubular		
Tower base diameter/dimensions	0.273	Metres	
Tower top diameter/dimensions	0.546	Metres	

Comments
Are there any details or uncertainties that may be helpful to add ?

CAA/NATS/MOD Wind Farm Application form

Turbine Locations	
<p>Please provide as much information as you can. The position and height above sea level of every machine if available, the site boundary if not. The height above sea level is the above ordnance datum (AOD) used to specify all heights on OS maps. Please note grid references and latitude/longitude and must be included. For co-ordinate conversion: www.gps.gov.uk</p> <p>An Ordnance Survey (OS) map, or maritime chart, should be submitted with this pro-forma, showing locations of proposed turbine/turbines or scheme boundaries. Please number the turbines or boundary points on the map, to correlate with the information provided below.</p> <p>Copy this page as necessary to account for all turbines or boundary points, or attach an excel spreadsheet with wind turbine coordinate information.</p>	
Wind farm Name & Address:	Chilwell School Queens Road West Nottingham NG9 5AL England

Turbine no.	1						Height AOD (m) of tower base	18m					
Grid Reference							100 km square letter(s) identifier	SK 51967 35222					
Easting (10 m)	4	5	1	9	6	7	Northing (10 m)	3	3	5	2	2	2
	Degrees						Minutes			Seconds			
Latitude	52						54			42			
Longitude	1						13			43			

For more information visit: <http://www.caa.co.uk/docs/33/Cap764.pdf>