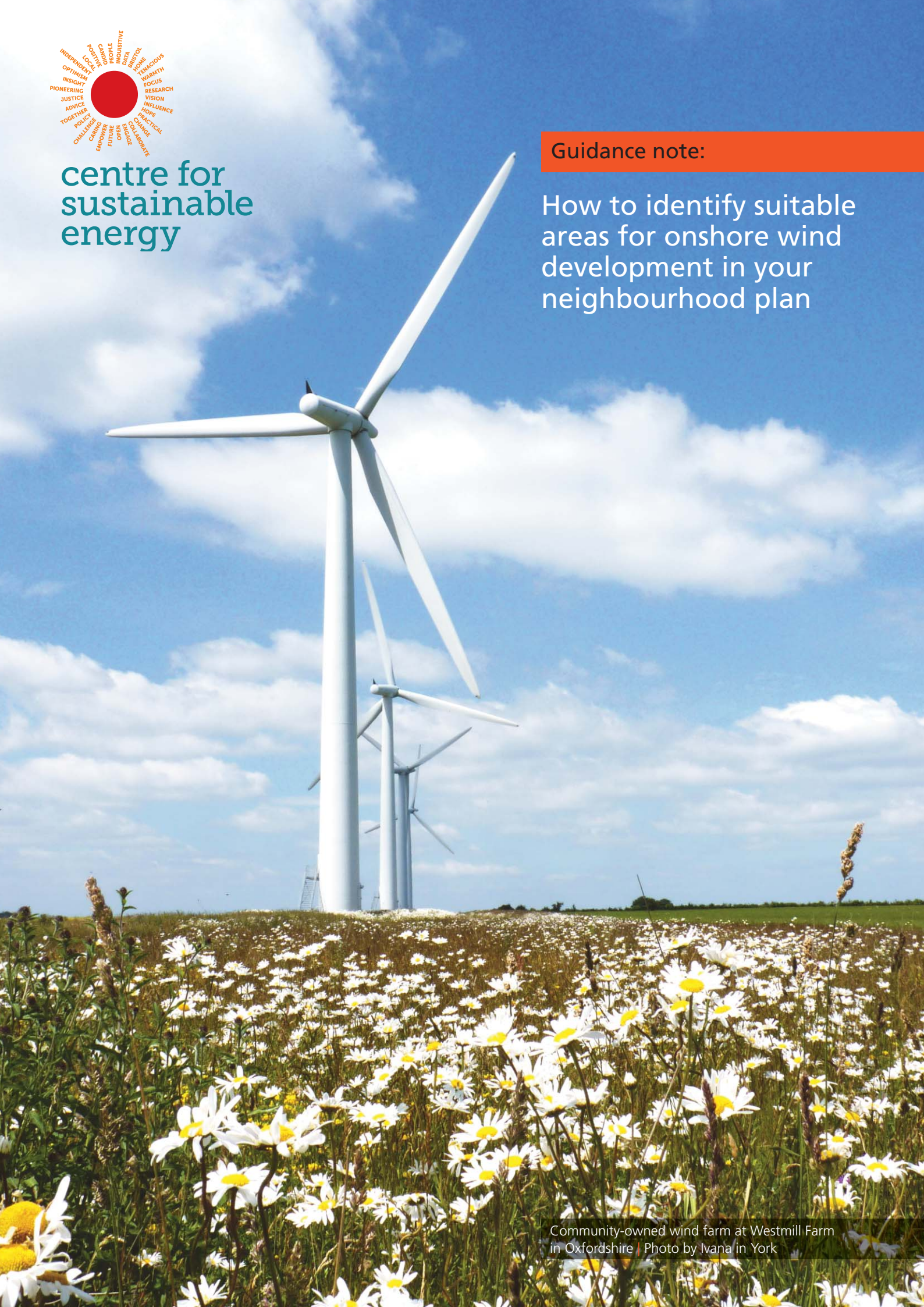




centre for
sustainable
energy

Guidance note:

How to identify suitable
areas for onshore wind
development in your
neighbourhood plan



Community-owned wind farm at Westmill Farm
in Oxfordshire | Photo by Ivana in York

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Community-owned wind farm at
Westmill Farm in Oxfordshire



1 | Introduction

In December 2015 the UK government signed the Paris Climate Accord, along with 195 other countries. This unprecedented global commitment to tackle climate change sees consensus on the need to take action on climate change and commits nations to keep global average temperatures “well below 2°C above pre-industrial levels, to pursue efforts to limit the temperature increase to 1.5 °C”, leading to no net increases in carbon emissions in the second half of this century. This comes on top of the 2008 Climate Change Act, which commits the government to reduce carbon dioxide emissions by 80% by 2050, and the Renewable Energy Directive which requires the UK to source 15% of its energy consumption from renewable sources by 2020.

These national and international agreements and the pledges from individual countries promise the gradual phasing out of fossil fuels and a substantial increase in renewable energy capacity. The UK government has stressed the responsibility on all communities to contribute to energy generation from renewable or low carbon sources¹ and has encouraged community energy groups to get involved in developing and owning their own renewable energy projects through the Community Energy Strategy. Land-based (or onshore) wind turbines form an essential part of the UK’s renewable energy mix and changes to the planning regime mean that local communities can have more influence as to how these are developed and capture greater benefits for their local area.

Changes to the planning regime for onshore wind developments

From June 2015 planning policies changed to give local people the final say on planning applications for wind turbines. The government introduced two pre-conditions that onshore wind proposals would have to meet in order to get planning permission:

- 1 The development site is in an area identified as suitable for wind energy development in a Local or Neighbourhood Plan.
- 2 Following consultation, it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed and therefore the proposal has their backing.²

The policy changes have been designed to offer a far greater opportunity for residents to determine and shape how wind power will be developed in their area.

The need for sites to be allocated in local or neighbourhood plans adds a layer of complexity and potential cost to the development of a wind power project. In addition (this being a relatively recent policy change) there is little experience of the processes that must be undertaken in order to develop a site allocation for wind power in neighbourhood plans. This lack of clarity could create a challenge for the ongoing development of the UK’s onshore wind industry generally, but in particular represents a challenge for community-owned wind power projects. Such projects are usually developed by a group of residents in a given locality who wish to both cut their community’s carbon emissions and to re-invest the profits in services and facilities within their communities, and tend to have much tighter development budgets than commercial projects.

1 Paragraph 97 National Planning Policy Framework, www.planningguidance.communities.gov.uk/wp-content/themes/planning-guidance/assets/NPPF.pdf

2 Written Ministerial Statement 18 Jun 2015, www.parliament.uk/documents/commons-vote-office/June%202015/18%20June/1-DCLG-Planning.pdf

The purpose of this note is to provide a step-by-step guide as to how to cost-effectively identify an area as being suitable for onshore wind within your neighbourhood plan, to outline what evidence you need to assemble to support your wind allocation, and to provide guidance on suggested policy wording and content.

We should clarify here that in some cases it is possible to install small domestic wind turbines without the need for an application for planning permission and therefore without the need to identify a suitable site. Further details available at www.planningportal.gov.uk/permission/commonprojects/windturbines.

2 | Who can identify an area as being suitable for wind development?

You can identify an area as being suitable for wind development in your neighbourhood plan, but your Council can also do this through their Local Plan. It's therefore worth getting in touch with your Council to identify the area or areas you think are suitable, together with your reasoning, to see whether they would undertake this process for you, and agree a timescale within which this might happen.

If your council isn't looking to go through this process, or requires additional support from neighbourhoods to identify sites, CSE have set out guidance below as to how you can pursue this yourself, through your neighbourhood plan. It is worth noting that you need to develop this policy, as well as the evidence needed to support it, as it is an integral part of your plan. Your wind policy and the identified area will be examined with the rest of your plan by an independent examiner and voted on as part of the referendum.

It is important to note that your wind allocation will be subject to a majority vote, so you should seek to build as wide a support base as possible in your community, both for the principle of hosting wind turbines in your area and the specific areas identified as being suitable, so that you are confident that the referendum can be passed, and that subsequent planning applications will carry community support.

Our suggested approach is designed to remove as many of the potential pitfalls as possible and to seek consent from your community at regular intervals along the way, in order to ensure wide community support. Your Local Planning Authority should also be able to support your activities, and you may be able to obtain funding to help you through the process (see section 10) and if necessary hire professional help.

It's worth stressing here that in repeated national surveys, the support for renewable energy has been consistently high with 78% of people in the latest survey expressing support for the use of renewable energy and only 1% of people strongly opposed.³ If your approach is designed to enable open informed debate, and your policy is designed to reflect and represent the consensus of views in your community and to maximise the benefits captured in your community, it will have a greater chance of success.

3 DECC Public Attitudes Tracker – Wave 16
www.gov.uk/government/uploads/system/uploads/attachment_data/file/496961/wave_16_Summary_of_key_findings.pdf

3 | How large an area can be identified?

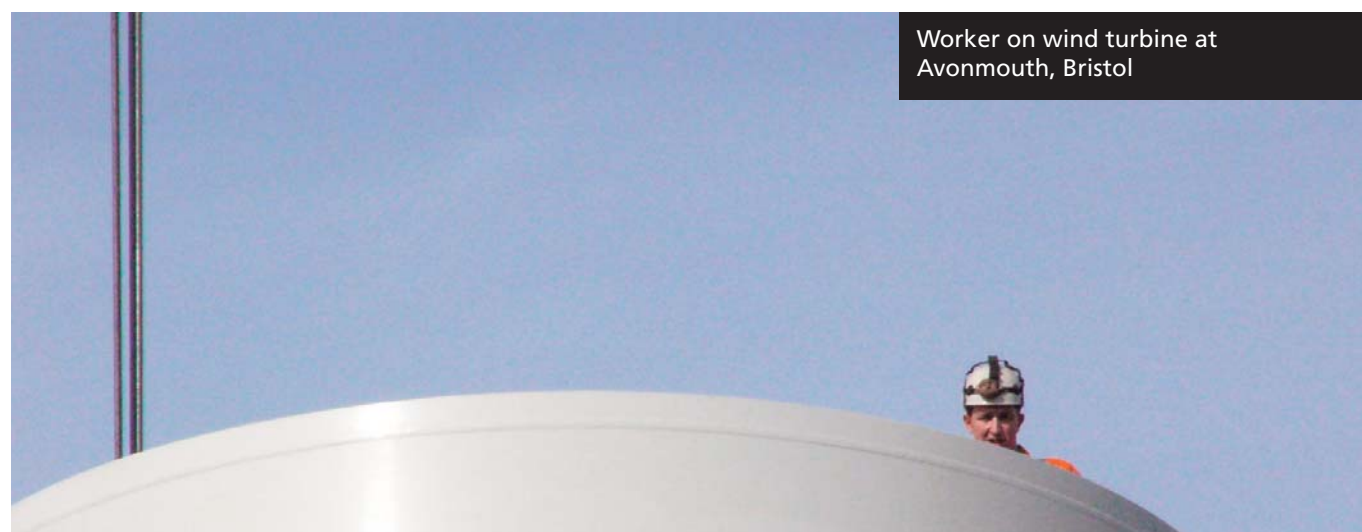
We understand from discussions with the Department for Communities and Local Government (DCLG) that this area could be as extensive, including one or more potential development sites, or as limited as considered appropriate locally, having regard to national planning policy and guidance.

In essence this means that the area you identify can be large enough to allow flexibility with the final siting of the proposed wind turbine or turbines. The process of planning a wind project often involves many changes to the position of the turbine or turbines before the scheme is finalised and as more about the site becomes known. Changes are often necessary to:

- Avoid below-ground archaeology.
- Avoid the flight lines of birds and bats.
- Keep clear of telecommunications signals and airport radar sight-lines.
- Make the best of the wind resource available.
- Avoid underground gas lines.
- Keep a safe distance from roads, public footpaths and bridlepaths.
- Locate turbines far enough away from houses to avoid unacceptable noise disturbance.
- Minimise the visual impact of the turbine or turbines.

Many of these constraints – for instance bird or bat flight paths – won't be evident until quite a lot of detailed research has been undertaken. Therefore it's probably best to identify a much larger area than you think is needed to physically accommodate the turbine(s) in order to provide the flexibility needed to allow a suitable layout to be finalised. If your community is behind the idea of exploring the potential for a wind site from the very start (e.g. before you begin work on your neighbourhood plan), this might influence the shape and size of your proposed neighbourhood plan area so as to include areas of wind resource and unencumbered land at the outer edges of your neighbourhood that might be suitable, for example farm land and upland areas. (If you do try to expand your neighbourhood plan area in this way, you should consider the impact of this strategy on adjoining communities, and include them in your public consultations.)

Ideally, provided that you have the mandate from your community to do so, your plan could identify several areas that would be suitable for wind development, to increase the likelihood of one of them being developable.



4 | What supporting evidence is needed to demonstrate that the area identified really is suitable?

Government guidance advises that “maps showing the wind resource as favourable to wind turbines or similar will not be sufficient”. So further evidence is needed to demonstrate that the area is suitable, not just in terms of the wind resource, but also in terms of wider planning considerations.

DCLG have clarified that the evidence to support identifying suitable areas in Neighbourhood Plans should be fit for purpose, and proportionate. Detailed considerations such as particular specialist surveys may be requested as part of the planning application stage. The planning guidance also highlights that local planning authorities should share relevant evidence that may assist those producing a Neighbourhood Plan or Order, as part of their duty to advise or assist.

This is helpful and limits the cost of identifying your suitable area by not necessarily requiring specialist surveys to be commissioned as part of your neighbourhood plan (although specialist surveys would need to be submitted in support of any subsequent planning application). The extent of evidence needed to demonstrate an area’s suitability will vary, according to the sensitivity of the area. The following table sets out the process you would go through, the evidence that should be provided to support your policy, plus potential sources of evidence.

5 | The process for identifying suitable areas

Contrary to popular opinion, only a tiny proportion of land in the UK is actually suitable for the development of wind turbines. Therefore developers seeking to find wind sites undertake what’s called a “sieve analysis”. The sieve analysis includes mapping all the various physical, environmental, technical and policy constraints that would make a site undevelopable for a wind turbine. This then leaves a patchwork of areas that might be suitable. These candidate sites are then considered in further depth.

The same approach could be adopted in identifying suitable sites in your neighbourhood plan. Below we’ve identified the constraints you should map and potential sources of information. The ultimate objective is to show, on a single map, all the constraints that you’ve identified leaving a patchwork of areas that might be suitable for wind development. This map, and the process behind it (i.e. the process of excluding unsuitable sites) will form part of the evidence base to support your policy and could be used to help engage your community and other interested parties.

Before you begin work, it is sensible to consult residents in your neighbourhood on the principle of hosting wind turbines within your neighbourhood plan area. At section 6 we’ve outlined suggestions for how you might structure the public and stakeholder consultation process.

It would be possible to undertake the mapping exercise manually using pen and paper, but far easier to use commercially available mapping software such as Mapinfo or ArcGIS. QGIS is a free and open source mapping programme which could be used in a similar way: www.qgis.org/en/site/index.html. For clarity we would suggest that the map be built up from an ordnance survey map base, with each constraint being

overlaid as a separately labelled map layer, enabling you to turn off individual layers as you wish. You might find someone in your community who already has the software and expertise and, if provided with the right sources of information, could do this for you. If not, the mapping or GIS team in your Council might be able to help.

We've suggested a fairly detailed approach is adopted in mapping constraints, on the assumption that many neighbourhood planning groups wishing to identify suitable areas may then wish to go on and develop community owned projects themselves, in which case the constraints analysis work below will lead on naturally to a site-specific feasibility assessment.

Step 1 - Identifying areas with an adequate wind resource

ISSUE: Are there adequate wind speeds to make a wind turbine economically viable?

Evidence needed to support your allocation and areas to be excluded	<p>Mapping predicted wind speeds showing minimum wind speed of 5-6 m/s at 45m above ground level</p> <p>All the areas with lower wind speeds than this to be discounted from further assessment.</p> <p>If you're planning to identify a really large area as being "suitable" you might decide not to map wind speeds, and leave this up to individual developers to consider. Conversely if you're only planning to identify relatively small areas within your neighbourhood as being suitable, you'll want to be confident that the wind resource in these areas is actually sufficient for wind developments to be feasible.</p>
Commentary	<p>The NOABL wind map (a free resource) gives rough predictions for wind speeds (over 1 km squares) at 10, 20 and 45 metres above the ground.</p> <p>Ultimately it will normally be necessary to erect an anemometer on a mast over the course of at least a year to measure actual wind speeds at the site prior to lodging a planning application for a wind farm. This may need temporary planning permission in itself.</p> <p>This accurate wind speed modelling enables the energy output from the turbine to be calculated accurately. With the costs of developing, building and maintaining the turbine, renting the land and connecting to the national grid, the developer can assess whether the development would be viable.</p>
Source of evidence and assessment tools	www.rensmart.com/Weather/BERR

Step 2 - Mapping constraints which would prevent a wind turbine from being developed

ISSUE: Landscape and visual impact

Evidence needed to support your allocation and areas to be excluded	<p>Map and exclude designated and protected landscapes:</p> <ul style="list-style-type: none"> • National Parks • Areas of Outstanding Natural Beauty <p>Exclude non-statutory landscape designations:</p> <ul style="list-style-type: none"> • Heritage Coasts
Commentary	<p>It's safest to assume that designated and protected landscapes are unsuitable for wind developments. This is not an absolute rule, but these landscapes often have a greater sensitivity to change, and therefore it will be more difficult to get planning permission for renewable energy in such locations.</p> <p>Visual impact will be harder to minimise with such tall structures but is a key consideration. If important landscapes or historic buildings can be seen from a proposed site whilst stood at ground level, then it is almost certain there will be inter-visibility i.e. if I can see you, then you can see me.</p>
Source of evidence and assessment tools	<p>Your Local Planning Authority</p> <p>Free online mapping tool, showing environmental designations: www.magic.gov.uk/MagicMap.aspx</p> <p>Commercial wind developers may also be able to assist</p>

ISSUE: Heritage Impacts

Evidence needed to support your allocation and areas to be excluded	<p>Locate and exclude any / all Designated Heritage Assets such as:</p> <ul style="list-style-type: none"> • Listed buildings • Conservation areas • World Heritage Sites • Scheduled Ancient Monuments • Registered parks and gardens • Registered historic battlefields
Commentary	<p>In due course you will also need to consider the impact of proposals on the setting of heritage assets, such as listed churches, archaeological sites etc. You can begin to understand the sensitivity of these heritage assets through consultation with your Planning Department and English Heritage, as detailed in section 7.</p>
Source of evidence and assessment tools	<p>Your local planning authority.</p> <p>Free online mapping tool, showing environmental designations - www.magic.gov.uk/MagicMap.aspx</p> <p>Historic England, 'The Setting of Heritage Assets': www.bit.ly/1SUiF8y</p>

ISSUE: Separation distance to residential properties

Evidence needed to support your allocation and areas to be excluded	To limit noise and shadow flicker exposure, map and exclude all residential property plus a buffer of 8 times the rotor diameter (e.g. for a large 2.5MW turbine with 50-metre blades, this would result in a buffer zone of around 400 metres).
Commentary	<p>There is no definitive minimum distance that wind turbines should be placed from residential property in order to limit noise exposure, as wind turbines of different sizes and designs will have different noise outputs and background noise levels will differ from location to location.</p> <p>The buffer zones suggested are an initial guide, to help you narrow down the areas that might be developable. Ultimately detailed noise surveys and noise modelling will be needed to confirm that no unacceptable noise impacts will arise from the proposed development.</p>
Source of evidence and assessment tools	<p>The environmental health team in your local authority.</p> <p>The GIS officer in your council may be able to provide a map layer of address-point data for all residential property within your neighbourhood plan area.</p>

ISSUE: Ecology and wildlife

Evidence needed to support your allocation and areas to be excluded	<p>Map and exclude known designated wildlife sites, local wildlife sites and known protected species:</p> <ul style="list-style-type: none"> • Sites of Special Scientific Interest • Ramsar sites • Special Areas of Conservation • Special Protection Areas • National nature reserves • Ancient woodland • Local wildlife reserves • 50-metre setback from hedgerows and other linear landscape features
Commentary	<p>It's safest to assume that it will not be possible to develop wind turbines within designated and local wildlife sites. Located in the wrong position, wind turbines can be very harmful to birds and bats.</p> <p>Ultimately the developer seeking planning permission will normally need to carry out further ecological surveys (typically bird and bat surveys at various times of the year) to determine the ecological sensitivity of the site, the likely impact of a wind turbine being developed and any mitigation measures to reduce impacts to a tolerable level.</p>
Source of evidence and assessment tools	<p>Your local planning authority and ecology officer</p> <p>Free online mapping tool, showing environmental designations: www.magic.gov.uk/MagicMap.aspx</p> <p>Natural England maintains records of designated wildlife sites of national and international importance, the reasons for their designation and condition.</p>

ISSUE: Other technical constraints

Evidence needed to support your allocation and areas to be excluded	<p>Map and exclude:</p> <ul style="list-style-type: none"> • Public roads (A and B roads and motorways) • Railway lines • Inland waters • Pipelines • Power lines • Public footpaths and bridleways <p>Plus a safety setback distances:</p> <ul style="list-style-type: none"> • The height of the turbine to tip plus 10% • A 200-metre setback from bridleways
Commentary	<p>Sometimes wind turbines fail, and therefore for safety reasons, they need to be located a safe distance back from roads, railways, power lines, pipelines and public rights of way.</p> <p>Ultimately it will also be necessary to map and avoid or re-route fixed radio telecommunications signals which require a line of sight and can be blocked by wind turbines. This is a lengthy process and can be carried out by the developer prior to submitting their application.</p> <p>The 200-metre setback from bridleways is a guideline only and there are lots of examples where turbines are adjacent to bridleways without any issues.</p>
Source of evidence and assessment tools	<p>Your local planning authority.</p> <p>Free online mapping tool, showing environmental designations - www.magic.gov.uk/MagicMap.aspx</p>

ISSUE: Aviation and exclusion areas

Evidence needed to support your allocation and areas to be excluded	<p>Map and Exclude</p> <ul style="list-style-type: none"> • Civilian airports • Aerodromes • Military airfields and airbases • MOD training areas • Explosive safeguarded areas, danger areas near ranges • MOD exclusion areas
Commentary	<p>This is a very complex issue and ultimately, consultations will be needed to confirm that wind turbines will not cause an obstruction to low flying aircraft or disrupt navigation systems such as radio beacons and radar. It is not possible to understand these issues fully without further consultations or without a specialist aviation report being commissioned, but this can happen later.</p>
Source of evidence and assessment tools	<p>Ministry of Defence</p> <p>Free online mapping tool, showing environmental designations - www.magic.gov.uk/MagicMap.aspx</p>

Source: Renewable and Low-carbon Energy Capacity Methodology – Methodology for the English Regions 2010: www.bit.ly/1UaZWra

This should result in a map like that shown below, published by Hull City Council, who are considering identifying suitable areas for onshore wind development. Once all of the constraints have been taken into account, it can be seen that the majority of the area (shown hatched or coloured) is unsuitable for wind development. The remaining land shown in white could potentially be suitable for development.

It is also important that, throughout, you keep a careful note of all the various issues and constraints that this process has identified. These may be slightly different for each area or for certain parts of a bigger area. This information can be a very important part of the evidence base put forward to support one area over another or to clarify why an area was not put forward as being “suitable”.

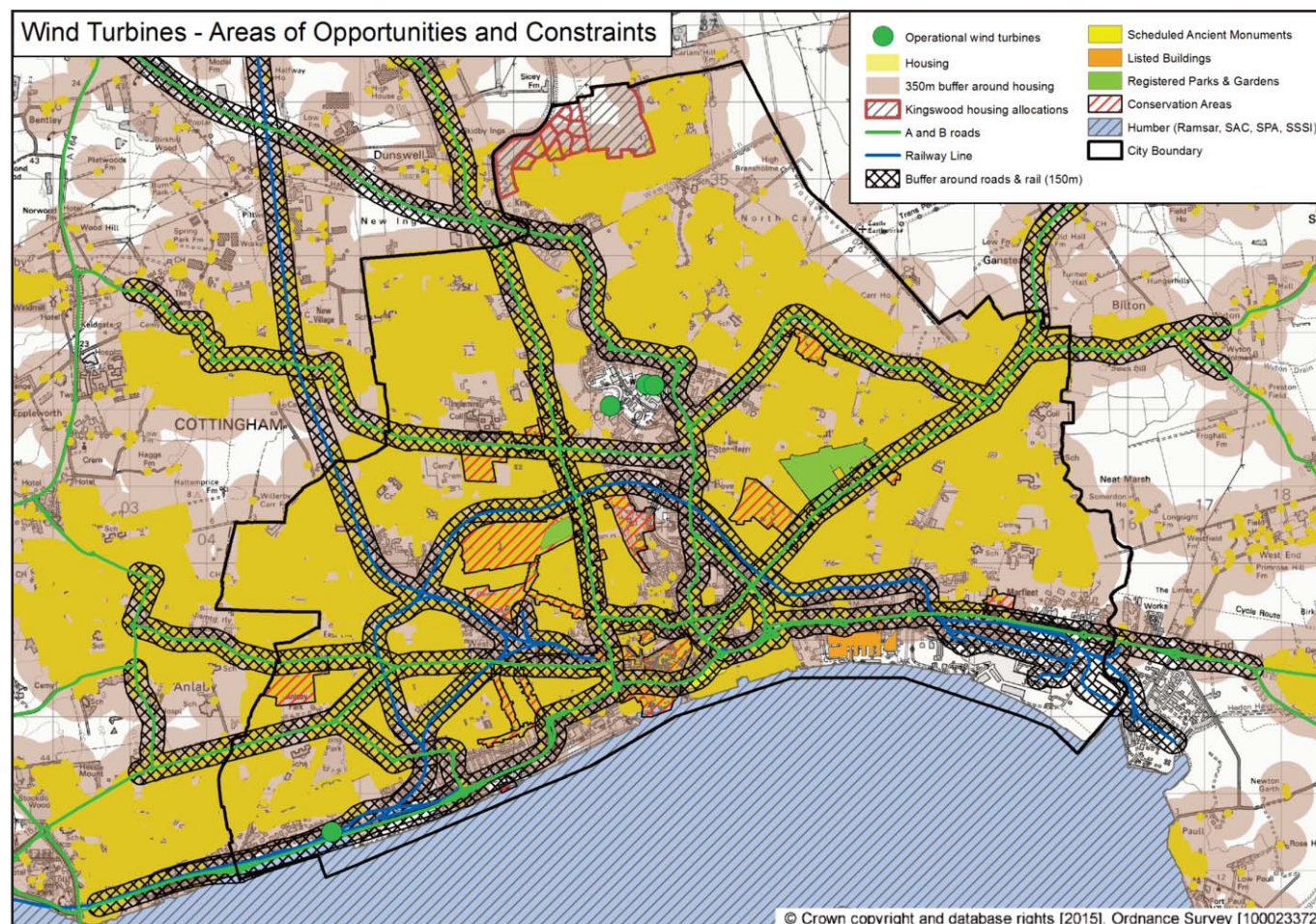


Figure 1: New Hull Local Plan - Preferred Options 2015 Consultation: www.bit.ly/1p3FQpG

This isn't the end of the process however. In order for your neighbourhood plan to be adopted, it must be supported by the majority of people in a referendum. It's essential therefore that the short-list of potentially suitable land is used as the basis for further detailed consultation with residents, landowners and other interests. You should be confident that your proposed wind allocation carries majority support in your community before committing to include it in the final iteration of your Neighbourhood Plan.

In the referendum, residents who object to the proposed wind allocation will have no option but to vote against the Neighbourhood Plan as a whole. Therefore, you should consider the merits of having an informal vote prior to the formal referendum on your neighbourhood plan as to whether a wind policy should be included in your plan, to lessen the risk of it holding up or de-railing the rest of your plan.

6 | Public and Stakeholder Consultations

As referred to above, this is probably the most important stage of the overall process, to build community support behind the principle of hosting wind turbines in your community, agree on the areas where turbines would be supported and agree the wording of your policy. As the previous section makes clear, there are also many technical constraints that limit where wind turbines can be developed, so it can be difficult to decide how you should structure your public consultations and how you might integrate these conversations with your stakeholder consultations.

We suggest that your order and structure your consultations roughly as follows:

Stage 1	
Who is being consulted	General public within your neighbourhood. You're aiming for as wide participation as is possible, so you could also approach local business groups, schools, councillors, local community groups and groups representing the interests of different racial, ethnic, religious or national groups in the neighbourhood area.
What they are being asked	The principle of hosting wind turbines within your community at all, and their consent for you to make further enquiries.
Additional suggestions	<p>You could suggest a rough timetable and structure for future discussions, so people know they will have plenty of time to think and talk through all the ramifications before coming to a view.</p> <p>You could discuss the possible benefits and impacts of a wind turbine, your motivations for thinking about hosting one, whether community owned or developer owned turbines would be supported, and possible community benefits.</p> <p>It's worth reiterating that without widespread community support, wind projects are unlikely to be developed, and that everyone will be able to vote on it as part of the Neighbourhood Plan referendum.</p> <p>On pages 15-18 are resources to help introduce and inform debate on onshore wind proposals</p> <p>You could organise a group visit to a wind turbine or wind farm to allow anyone interested to see it for themselves. Renewable UK can facilitate these visits; contact them on info@renewableUK.com.</p> <p>If consent is given, you could move on to mapping technical constraints (see section 5).</p>

Stage 2

Who is being consulted	Statutory consultees and other stakeholders.
What they are being asked	The potentially suitable areas you've identified through your constraints-mapping exercise. Whether there are any unforeseen impacts or technical constraints that would mean that these areas aren't suitable after all.
Additional suggestions	Print off your constraint maps and explain the process you've gone through in getting that far. For further details of what you might discuss with different stakeholders, see section 8.

Stage 3

Who is being consulted	General public within your neighbourhood and other groups discussed above.
What they are being asked	The results of your technical consultations with statutory consultees and other stakeholders and the results of your constraints mapping exercise. The democratic view on whether these areas are suitable for wind turbines. You may find that by this point a consensus is beginning to emerge as to what type of development(s) might be acceptable, and the bare bones of a wind policy.
Additional suggestions	You might use the findings of your technical mapping exercise and other research to enable and facilitate informed debate within your community, now drilling down to individual topics. See the suggested topics and resources for discussion in section 7 below.



Four Burrows wind farm, Cornwall

Stage 4

Who is being consulted	Statutory consultees (whom you must consult) and other stakeholders.
What they are being asked	<p>The results of your public consultation on suitable sites.</p> <p>The statutory consultees you need to consult will depend on the nature of the site and its surrounding and the nature of your proposals. Your Council will help you ascertain who this is. Section 7 below also provides suggestions as to whom you should consult, what their interests are and what you might ask them.</p>
Additional suggestions	<p>You could also ask statutory consultees for a more detailed view on the sites your community supports and any unresolved issues.</p> <p>By this point, consultees may be encouraging you to pay for specialist studies; however the majority of specialist studies should be able to be deferred to be submitted with the application. Details of possible funding sources are set out in Section 10.</p>

Stage 5

Who is being consulted	General public within your neighbourhood, plus other groups discussed above.
What they are being asked	<p>Summarise any additional findings from stage 4.</p> <p>Confirmation that a policy supporting wind and identifying suitable sites carries majority support, now that people know more of what would be involved and how they might be affected.</p> <p>The wording of a possible neighbourhood plan policy against which proposals would be assessed.</p> <p>This final consultation work could be designed to fulfil the formal requirements for a 6-week public consultation that is needed prior to the submission of your neighbourhood plan to the Local Planning Authority. Paragraph 14 of the Neighbourhood Planning (General) Regulations 2012 sets these requirements out in more detail: www.legislation.gov.uk/uksi/2012/637/pdfs/uksi_20120637_en.pdf</p>
Additional suggestions	Section 8 contains suggestions for possible content to go into an onshore wind policy, and a suggested policy template.

We'd suggest that you keep records of whatever consultation events you decide upon, including attendance at events, your consultation materials (or meeting agendas) and the responses of attendees. All of this will form part of the evidence base to support your policy.

The structure we've suggested here is designed with communities in mind who are coming to the issue cold, i.e. where there is little prior knowledge of wind turbines. In communities where there is already enthusiasm for the principle of hosting renewable energy infrastructure, it might be possible to shortcut this process, but you would need to be sure that there is already broad support for the idea, rather than enthusiasm that is limited to an active but minority group within the wider community.

Materials and issues for public consultation & discussion

The following general introductory material (reports, videos, articles, exercises) can help inform the initial debate about wind power within your community:

Wind power an introduction

www.bit.ly/1K19O6Z

This film is a good introduction to wind turbines, discussing different turbine types and sizes and their expected power output, factors to consider in choosing suitable sites, plus common myths about wind turbines and wind energy.

Common Concerns about Wind Power

www.bit.ly/1Pn6QMn

This document provides an overview of wind turbines, and a balanced discussion of common concerns, based on peer-reviewed publications and expert reports. This will help provide an evidence base to inform your discussions.

Case Study, Fintry, Scotland

www.youtube.com/watch?v=ls_1p8ad2mc

This video illustrates how one community in Scotland chose to own a proportion of a large commercial wind farm in Scotland, and how the income from its share is being used to benefit its community.

Be very careful how you pitch your consultation events. If your core group has a clear plan for a certain technology in a particular place, it can be tempting to run events explaining why you have chosen this, with the aim of winning everyone over to your idea. This approach is commonly called ‘decide-announce-defend’ and can result in distinct ‘pro’ and ‘anti’ groups. As a neighbourhood plan wind allocation is subject to a majority vote; you really want to avoid this outcome and take everyone with you from the start.

The following resources can help you to avoid this potential pitfall:

A cautionary tale about consulting with the community

<https://youtu.be/yLjwQS24B4g>

This short video shows the consequences of the “Decide-Announce-Defend” approach and of consulting the wider community too late.

Why run a series of public events

www.planlocal.org.uk/media/transfer/doc/why_run_a_series_of_public_events.pdf

This factsheet explores the differences between the ‘Decide-Announce-Defend’ approach and an alternative approach based on participatory dialogue.

A range of other resources around community engagement, planning promoting and running consultation events can be accessed here: www.planlocal.org.uk/pages/getting-people-involved

If a clear consensus in support of hosting onshore wind within your community really isn’t there, you could consider looking at promoting other forms of renewable energy infrastructure instead, for instance the potential for hydropower installations, solar farms or biomass plant. At present, national planning policy does not require allocated sites for these other technologies within local or neighbourhood plans. Further information on different forms of renewable energy is available here: www.planlocal.org.uk/pages/renewable-energy.

Resources covering issues you might explore in more depth in your consultations are listed by subject below:

Landscape impact

People may have legitimate concerns about the visual impact of wind turbines. You might want to organise a group site visit to an existing wind farm at an early stage, to allow anyone interested to see it for themselves. You could also use or prepare the following participatory exercises (produced by CSE) to help people visualise their impact and to facilitate discussion of the various different options:

Comparing the impact and acceptability of large structures in the landscape

www.planlocal.org.uk/planlocal-community-renewables/download_file/18

This exercise is intended to facilitate debate and reveal your community's thinking about the range of large structures in the landscape. This exercise has an associated imagebank: www.bit.ly/1WKoFGE

Discussing how we value our landscape (participatory exercise)

www.planlocal.org.uk/planlocal-community-renewables/download_file/21

This exercise encourages reflection on the relationship between people and the natural and built environment that surrounds them. It asks participants to share what makes their landscape distinct and special and helps them understand how a proposed renewable energy project might change or impact upon this.

Materials you could prepare yourselves, or have prepared for you, to help you think about possible suitable areas for wind turbines include:

- Desktop exercise mapping operational and consented wind projects and projects under construction.
- Map showing **one of Theoretical Visibility**. A ZTV is a map illustrating the locations from which a wind turbine might be visible. This can be useful to explore the comparative visual impacts of different sites, or the comparative impacts of different turbine heights. A ZTV is modelled using the height and position of the proposed installation and the known topography. It doesn't take into account screening from buildings, hedgerows or trees, and therefore represents a worst case scenario.

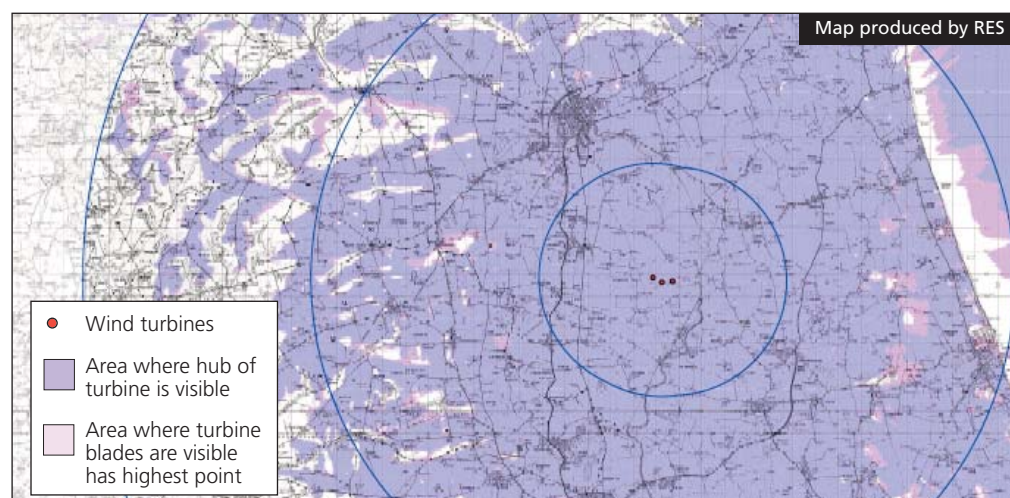


Figure 2: This zone of theoretical visibility shows three wind turbines (red dots), the distance from the turbines (blue lines), places where you can see the hub (purple) or just the tip of the blades at their highest point (pink). ZTVs are modelled on topography and don't include screening from vegetation or buildings, so tend to exaggerate the visibility of the proposed development

If you are already involved in discussions with a commercial wind developer, they may be able to prepare these materials for you. Caution should be used in deciding whether to involve a commercial developer and when to use visualisations in consultations, to avoid giving the impression that everything is already decided.

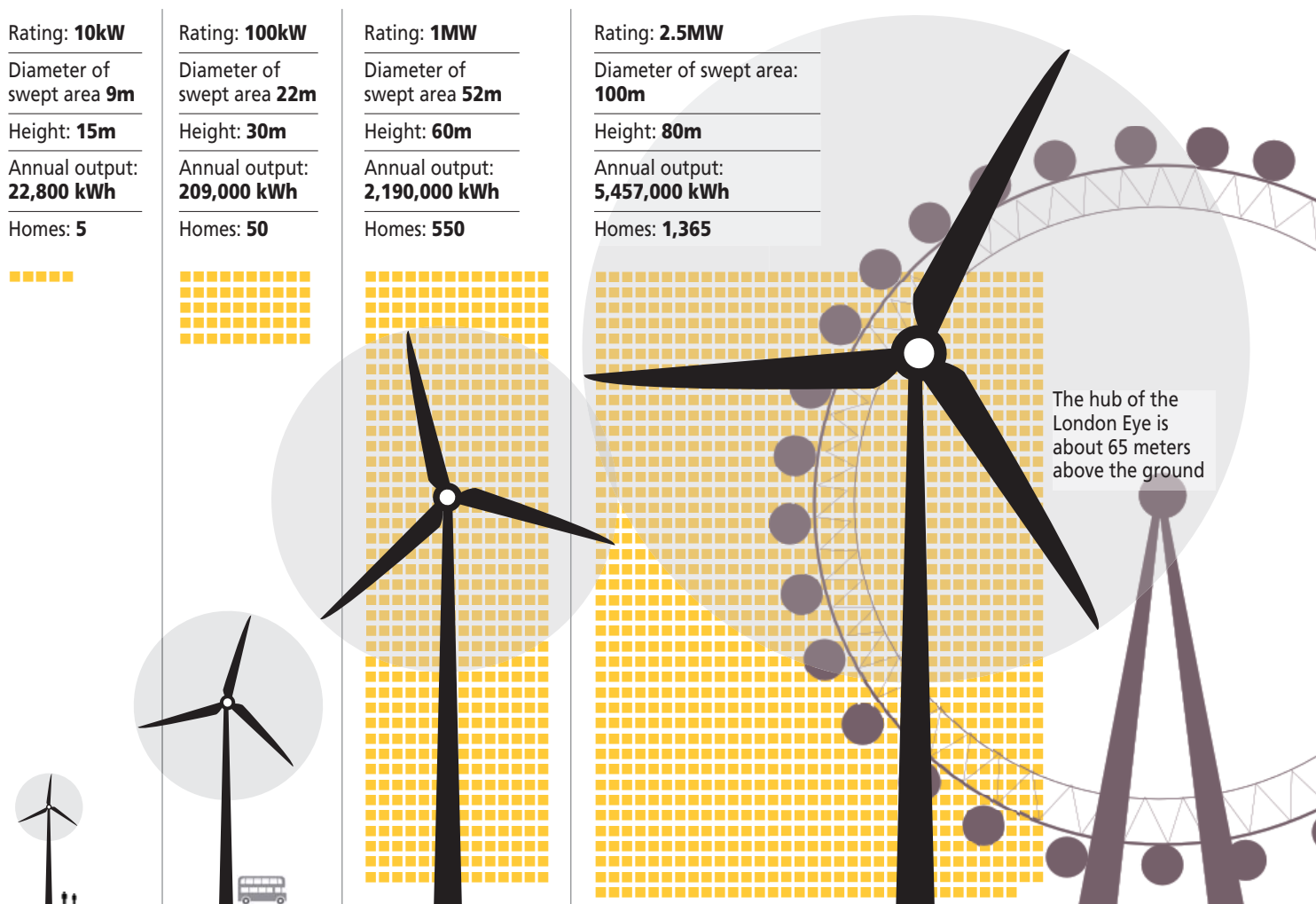
A simple way of understanding the height of these structures and whether they/it could be seen from a specific location (a historic building for example) is to obtain a helium filled weather balloon and fix it at the proposed ultimate height (please be careful when doing this). You can then visit a variety of locations to gauge whether it is possible to see it or not. This is not absolute proof of anything, but is an easy way to establish some first principles without having to resort to more expensive studies.

Trade-offs between turbine height and power output

When it comes to wind turbines, size matters. Smaller turbines obviously have less visual impact, but taller turbines with longer blades can supply many more homes with power, so in many cases it may be better to put up a single big turbine than several small ones, provided this carries community support.

Taller turbines can pick up the faster winds that blow at greater heights; if you double the wind speed you generate 8 times as much power. The power output is *also* proportional to the swept area of the blade (within the shaded areas in the graphic below). If the length of the blades is doubled, power output is quadrupled. So a 15 meter 10kW turbine will typically generate enough electricity to power the lights and appliances of 5 average houses over the course of a year while a 80 meter 2.5MW turbine supplies enough for around 1,350. So a turbine five times the height generates about 270 times as much electricity.

Figure 3: Comparing the annual output of different sizes of wind turbine. The figures are based on typical outputs and wind speeds and are on the conservative side. The height is measured at the hub, and is within the typical range for turbines of this rating. Each yellow square (■) represents one house.



How did we work all this out? See www.cse.org.uk/downloads/file/neighbourhood-planning-wind-guidance-calculation-fig3.pdf

Noise impacts

Noise impacts would be assessed during the process of determining a planning application, but you could organise a group site visit to an existing wind farm or wind turbine, so that residents who could potentially be affected can get a feel for what it might be like in reality.

Development type – commercial or community owned?

Would your community support commercial developments in your neighbourhood, or would it only support community owned projects, reinvesting 100% of the profits in your community? In reality, there is a spectrum, from 100% community owned projects to predominantly private enterprises, albeit still offering a proportion of community ownership.

In deciding the way forward, you might wish to discuss what the community *wants* from the project and the level of enthusiasm, capacity and expertise it possesses.

- If the primary motivation for wanting to host onshore wind development is about deriving an income to invest in other initiatives and infrastructure in your community, you might wish to only support community-owned projects, in order to maximise income retention within your community.
- If your primary motivation is about reducing your community's carbon emissions, who develops and owns the project might not be so important to you and the greater expertise and financial resources of a commercial developer might favour allowing shared ownership, or primarily commercially owned schemes to go ahead.

As can be seen in figure 4 below, there are advantages and disadvantages to both owning and developing the project yourself and allowing commercial developments to take place. As can be expected, the greater the ownership of the project by the community enterprise, and the greater financial return you expect, the greater the level of responsibility and time investment the community enterprise would need to carry in order to deliver the project. In this scenario the community enterprise set up to develop and own the asset (but not residents individually) would carry the full financial risk for the project.

The reality is that the impact of any renewable energy installation will be shared by everyone, so it is important that the 'benefits' are also shared. It is important to get as many people 'on-board' from the outset to avoid an unfair or unbalanced scheme that is almost certain to fail.

As is implied in the graphic however, recent changes to the policy regime have altered the balance of benefits and power:

Changes to the planning regime mean that local communities now have a great deal of control over onshore wind developments in their area. In the current policy environment, even without a financial stake in the wind project being developed, a community can influence what goes ahead through its ability to assess and allocate sites in the neighbourhood plan, (without which wind development can't now occur) and through its responses to any subsequent planning application.

The Government is seeking to increase the benefits communities receive from hosting wind turbines, and announced: "By 2015 it will be the norm for communities to be offered the opportunity of some level of ownership of new, commercially developed onshore renewables projects. We will review progress in 2015 and if this is limited, we will consider requiring all developers to offer the opportunity of a shared ownership element to communities." This is detailed further in the Shared Ownership Voluntary Protocol



Figure 4 - Pros and cons of different models of community ownership: onshore wind

(www.sco-res.uk/Library/Docs/SCO-RES-VP.pdf) which essentially requires developers of onshore wind projects of significant scale to offer host communities the right to invest and own a proportion of the project at a fair price.

This means that as time goes on, essentially all onshore wind projects of any significant size are likely to offer a degree of community ownership.

Given the significant costs and complexity of developing a commercial scale wind project, it may well be worth considering getting help from and / or entering into a partnership with a commercial developer in order to benefit from their expertise and resources. Depending on the ownership structure and the deal negotiated, this can still secure significant community benefits and a significant financial return to the community, whilst lessening the degree of risk and time investment required.

Community benefits

Whether commercial or community owned wind developments are envisaged, the following resources might help you to discuss what community benefits you would like these to deliver:

- Discussing what you might invest your profits in - www.planlocal.org.uk/planlocal-community-renewables/download_file/26 - This exercise could help your community think about how it could re-invest the profits from the sale of electricity to the grid.
- Re-investing your income video – www.youtube.com/embed/gHOFgys-9cY?autoplay=1&rel=0 - If your project is fortunate enough to generate an income stream from its renewable energy, this film helps you to understand how you can effectively re-invest its profits in your community.

Exploring options for selling your electricity directly to your local community

Rather than feeding the electricity you generate into the national grid, it is possible to supply your local community directly. Models of different supply options are being trialled which allow suppliers to create their own tariff, allow more control of the price offered to local people and enable more of the economic benefits to be captured locally. Further details are available here: www.bit.ly/1U1q35l. An example of a community energy group undertaking this is the Wadebridge Energy Company: www.bit.ly/1qG6lSC.



Wind turbines in Yorkshire [Photo Damien McMahon]

7 | Consultations of statutory consultees and other stakeholders

Having taken the effort to identify your suitable sites for wind development, you will want to ensure that your policy has the best chance of making it through the neighbourhood plan examination, and that wind developments will actually be feasible and viable in the locations you've identified. To bottom out all the likely issues that could come up in a planning application, and ensure that your plan and policy is as robust as it can be, we would suggest that you consult and engage as many statutory consultees and stakeholders as possible during the process of identifying suitable areas and drafting your policy.

CSE Resources and exercises

To get people thinking about who the relevant local stakeholders for your project might be, you could run the following exercise: Identifying the stakeholders for your project (www.planlocal.org.uk/planlocal-community-renewables/download_file/22).

Your council's planning policy team, or if you are in discussions with them, a commercial wind farm developer might also help advise which stakeholders are particularly relevant in your case, clarify which are the statutory consultees, who you must consult and how to approach them. They might also advise on viability of your proposals. As well as the local people and groups identified through the stakeholder mapping exercise, we would suggest that you also consult and engage with the following:

Issue: Planning	
Who you might consult	<p>Council Planning Officers in both Planning Policy and Development Management.</p> <p>(Planning policy officers write draft policy on behalf of the council, while Planning Officers in Development Management determine planning applications.)</p>
What you might ask them	<p>Planning Policy Officers</p> <p>Their view on your suggested policy wording.</p> <p>Co-ordination between Neighbourhood Plan policy and Local Plan policy.</p> <p>Whether your proposed wind policy would trigger the need for a Strategic Environmental Assessment for your Neighbourhood Plan.</p> <p>Development Management Officer</p> <p>The likely response to a possible planning application, taking into account all issues. The Planning Officer can help flag up all the issues that are likely to come up through a planning application, and can facilitate access to other Council officers, but it's probably only worth talking to them once you have identified a fairly specific location or site.</p> <p>Their advice on planning policy constraints, for example Green Belt.</p> <p>Screening opinion – will Environmental Impact Assessment be required?</p>

Issue: Heritage impacts

Who you might consult	<p>Council Conservation Officer.</p> <p>Historic England (statutory consultee)</p> <p>The Garden History Society to be consulted where development is likely to affect a registered historic park or garden (statutory consultee).</p> <p>Local conservation groups.</p>
What you might ask them	<p>What impacts need to be assessed during the planning application and/or what heritage assets might be affected.</p> <p>What documentation is needed during planning application.</p> <p>What is the likely acceptability of impacts on the setting of heritage assets.</p> <p>At this stage, consultees would probably only be able to give an initial reaction regarding the acceptability of what is proposed. In order to form a confirmed view, they would normally need to view photomontages, 'wireframes' (visualisations of the wind turbine in position) and/or a Zone of Theoretical Visual Impact, but it won't be possible to prepare these until a precise location and height for the turbine(s) is determined.</p> <p>These would cost roughly in the order of £500 per photomontage, £400-£450 per wireframe, £300 for a Zone of Theoretical Visual Impact</p>

Issue: Landscape

Who you might consult	<p>Council landscape officer.</p> <p>The National Park Authority, where development is likely to affect a National Park.</p> <p>Ramblers association and local walking groups.</p>
What you might ask them	<p>Landscape and Visual Impact – are the suitable areas suggested acceptable in these terms?</p> <p>Scope of Landscape and Visual Impact Assessment. Location and number of photomontages needed to illustrate visual impact.</p> <p>As with the assessment of heritage impacts, to undertake a proper assessment your Council would normally need to see photomontages, wireframes and/or a Zone of Theoretical Visual Impact.</p> <p>Further information around Landscape Character: www.bit.ly/1XIJ2ma</p>

Issue: Noise and/or amenity impacts

Who you might consult	Council Environmental Health Officer
What you might ask them	Locations where noise monitoring should take place

Issue: Ecology

Who you might consult	<p>Council Ecology Officer.</p> <p>Natural England regarding ecology impacts on any nationally or internationally significant wildlife sites (statutory consultee).</p> <p>Local Wildlife Trusts.</p> <p>Local wildlife groups.</p>
What you might ask them	<p>Scope and timing of ecological surveys needed for application. This can be critical, as some ecological surveys can only take place at certain times of the year.</p> <p>Measures to mitigate ecological impacts and seek net ecological enhancement (this should be your objective).</p>

Issue: Access and/or highways

Who you might consult	<p>Council Highways team (statutory consultee).</p> <p>Highways Agency where the development might affect the trunk road network (statutory consultee).</p> <p>Network Rail where the development might affect their interests (statutory consultee).</p> <p>Commercial wind farm developer.</p>
What you might ask them	<p>Access route between the trunk road network and the site</p> <p>Any weight or height restrictions on the access route?</p> <p>Temporary traffic management during deliveries.</p> <p>Safety of site access.</p> <p>Vehicle tracking for the delivery of components along the delivery route.</p> <p>Safety issues in connection to the railway network.</p> <p>It is also a critical issue to consider whether (and how) large components can actually be delivered to the site. Many components are wide and/or long loads or extremely heavy. For instance the blades of a large (2.5 MW) commercial wind turbine can be 50 metres long. The turbine nacelle (where the blades are mounted) can weigh around 85 tonnes. Their delivery to site requires very careful planning, often requiring the removal of street furniture, temporary widening of roads or hedgerow removal to allow access.</p> <p>Many commercial wind sites are located near to the trunk road network for this reason. Where access is restricted, smaller turbines are available (but bear in mind the reduced power outputs from smaller turbines noted in section 6).</p>

Issue: Land rights

Who you might consult	Landowners
What you might ask them	<p>Are the landowners of the sites you've identified as being suitable supportive of developing wind turbines on their land?</p> <p>This is critical, and if only a community owned scheme would be supported, you should secure an exclusivity agreement with the landowner at an early stage.</p>

Issue: Grid connection

Who you might consult	Your Distribution Network Operator (www.ssepd.co.uk/Whoismynetworkoperator)
What you might ask them	<p>Distance to a connection point in the electricity network.</p> <p>Capacity in the electrical network.</p> <p>This is a critical issue, as the capacity to accept the electricity from your installation can be patchy. Costs to upgrade the network can be prohibitively high, as can the costs of cabling between your site and the distribution grid. Early communication with your District Network Operator is vital, and you should prioritise this work.</p>

Issue: Flooding

Who you might consult	Environment Agency (statutory consultee).
What you might ask them	Wind turbines are not necessarily incompatible with areas at risk of flooding, but will influence their design and complicate installation.

Issue: Other community groups

Who you might consult	Relevant local community organisations in your neighbourhood and bodies representing e.g. racial, ethnic, national or religious groups, business interests, disabled persons (statutory consultees).
What you might ask them	Their view on your suggested policy wording.

Issue: Aviation

Who you might consult	<p>Civilian airports.</p> <p>Aerodromes.</p> <p>Military airfields and airbases.</p> <p>Ministry of Defence (statutory consultee) - www.gov.uk/government/publications/wind-farms-application-forms-for-developers</p> <p>National Air Traffic Control - www.nats.aero/services/information/wind-farms</p> <p>Civil Aviation Authority.</p>
What you might ask them	<p>Wind turbines can be a physical hazard for aviation, but can also impede navigation through affecting radar equipment and air traffic control.</p> <p>If possible, these bodies should be consulted during the process of selecting suitable sites. Your Planning Authority might help facilitate this.</p> <p>They will need the grid reference and height of the proposed wind turbine(s) and the rotor diameter.</p> <p>Their consultation responses will form part of the evidence base for the policy and/or allocation.</p>

Issue: Other

Who you might consult	<p>The Coal Authority where in a coal mining area (statutory consultee)</p> <p>The Marine Management Organisation where the marine environment would be likely to be affected (statutory consultee)</p> <p>The Homes and Communities Agency, where their interests are affected (statutory consultee)</p> <p>Telecommunications code operators (statutory consultee)</p> <p>Where their interests would be affected, sewerage or water undertakers, or any primary care trust (statutory consultees).</p>
What you might ask them	<p>Whether the areas identified are affected by coal mining, (often giving rise to land stability issues). Issues would be resolved at the planning application stage.</p> <p>The Marine Management Organisation develop marine plans and co-ordinate planning and development issues affecting the marine environment.</p> <p>Whether fixed communications links (e.g. line of sight radio links) operate within the area identified. Any issues would be resolved at the planning application stage.</p>

As implied in the table, the regulations governing the preparation of Neighbourhood Development Plans dictate that certain organisations (statutory consultees) must be formally consulted before your plan is submitted to the Local Planning Authority. Please see paragraph 14 of www.bit.ly/1NF4d2l which sets out the formal pre-submission consultation and publicity requirements, and paragraph 1 of Schedule 1 of this document, which sets out the organisations which must be consulted, where their interests would be affected. Your local council can help advise on who you are legally required to consult.

Within this guidance we have recommended discussing your proposals with commercial wind farm developers. You might feel nervous that by doing this, you might “open the floodgates” to speculative applications, but remember that the changes to the planning regime for onshore wind proposals put the community in the driving seat. Proposals will only be approved in areas specifically identified as being suitable in Neighbourhood or Local Plans and only where community backing is demonstrated, and therefore talking to commercial developers does not commit you to anything. Commercial wind farm developers do have the expertise to help you through this process and to advise whether the sites you identify are feasible and/or viable and we suggest that you consider making use of them.

8. | Drafting your policy and setting out the factors to be taken into account

The final output of the process will be a policy incorporated into your neighbourhood plan, linked to a map showing the areas identified as being suitable for wind energy. You should consider how the policy wording in your neighbourhood plan meshes with any existing or emerging policy in your Council’s Local Plan or Core Strategy. If your council already have a policy relating to renewable energy or onshore wind development, there is no need to repeat text from this, but your Neighbourhood Plan policy can be used to add detail of the local issues that need to be addressed in any planning application.

Your policy could reflect the outcome of your community consultation work:

- The scale of turbines that would be supported. Would your neighbourhood support large commercial scale turbines (up to 150 metres high) to maximise electricity output and income, or would smaller turbines be more appropriate?
- The size of development. Would your community support a large wind farm, or a small group of turbines, or only one?
- The nature of the development. Would only community-owned or shared ownership developments be supported, or would commercial schemes be acceptable in your community?

Your policy should also set out the specific criteria that a wind turbine planning application would be assessed against, identifying any relevant planning issues that you’ve found particular to that area that need to be addressed in a planning application, for example:

- Specific ecological issues including protected species and important habitat that should be protected
- Specific viewpoints to be assessed in the Landscape and Visual Impact Assessment
- Specific heritage assets to be assessed
- Specific problem areas on a delivery route

To be helpful for would-be developers, your policy could also indicate the specific **specialist surveys** that will be needed in support of planning applications for wind turbines proposed within the areas identified. The following is a list of specialist surveys that might be needed and what each one comprises.

Landscape and Visual impact study (LVIA)

An LVIA is an analysis of the landscape and visual impacts of development proposals (following a defined approach), assessing the sensitivity of a landscape, the degree of change wrought by a development and its overall effect. It will normally include photographs of the existing landscape from key vantage points and verified photomontages including realistic renderings of the proposed development in the landscape.

Zone of Theoretical Visibility (ZTV)

A ZTV is a map illustrating the locations from which a wind turbine might be visible. A ZTV is modelled using the height and position of the proposed installation and the known topography. It doesn't take into account screening from buildings, hedgerows or trees, and therefore represents a worst case scenario.

Noise Impact Assessment

This is study of the acceptability of noise from a new development. A study is made of existing background noise levels in given locations over time (typically the closest houses to the site). Predictions are then be made of the noise generation from the new development, the attenuating effect of distance and appropriate mitigation measures. Where the noise levels experienced at these locations would be less than background noise levels, the development will be inaudible.

Tree Survey

This is a survey of the existing trees that might be affected by a development, including their age, condition and quality, recommendations for what should be retained, predictions of the impact of the development and recommended mitigation measures.

Ecology Assessment

The content of this will vary according to the sensitivity of the site and surrounding area. Surveys of low sensitivity sites will include a survey of habitat within the site, evidence of any protected species, recommendations for more detailed surveys and mitigation measures. Where the area is more sensitive, ecology reports can be much more detailed / involved, potentially including year round site surveys for bats and birds, and/or studies of protected ground based species.

Shadow flicker study

A shadow flicker study will predict whether nearby properties will be affected by shadow flicker and the extent of these effects. Shadow flicker is the flickering effect caused when rotating wind turbine blades periodically cast shadows through constrained openings such as the windows of neighbouring properties. Shadow flicker occurs when a particular combination of conditions coincide in specific locations at particular times of the day and year. For example when the sun is low in the sky and shines on a building from behind a turbine rotor. It can be modelled accurately.

Aviation impacts study

An aviation report will considers the potential for turbines to have direct interference with aircraft flight paths (for instance low flying aircraft), and on electromagnetic signals used for navigation and communication, including radar.

Electronic communications study

This would consider the effect of a development on electronic communications, normally including fixed link radio signals (for instance between mobile phone base stations) and television reception.

Archaeology and Heritage study

This would consider the proximity to, relationship with and impact on the setting of heritage assets, including Listed Buildings, Conservation Areas, World Heritage Sites and Archaeological sites. It would also include consideration of the direct impact of development on any below ground archaeology.

Transport Assessment

For a wind turbine or wind farm, this report would assess the delivery route to and from the site (and set out any temporary or permanent changes needed), the number of vehicle movements during construction, the access within the site and the transport impacts of ongoing maintenance.

Hydrology study, including flood risk assessment

This would assess the vulnerability of a site to flooding and the impact of the development on surface water runoff.

Contaminated land study

This would assess whether the proposal involved the development of contaminated land, would set out the nature of the contamination and the measures to clean it up or prevent its release to the environment and ongoing monitoring measures.

Your planning authority will help you narrow down this list and make it specific to the areas you've identified.

All reports would normally assess the nature and severity of any impacts and include appropriate mitigation measures.

Commonly with large commercial wind proposals, these reports and assessments will feature as chapters in an **Environmental Statement**, required for the purposes of an **Environmental Impact Assessment**. If Environmental Impact Assessment is required, the Environmental Statement would be drafted by the developer (whether this is a commercial developer or a community energy group), and would be assessed by the local planning authority in determining the planning application. Environmental assessment is required for large or particularly complicated proposals, or for proposals where the environment is particularly sensitive to change. Environmental Impact Assessments aim to be a holistic and to consider all of the significant environmental impacts of such developments. The majority of onshore wind developments will require Environmental Assessment. Whether EIA is required will be determined by your local planning authority and there is no need to include further reference to it in your Neighbourhood Plan.

There is the possibility that the inclusion of wind policies could result in your plan having to be subject to a **Strategic Environmental Assessment (SEA)**, in which case an **Environmental Report** would need to be submitted with your Neighbourhood Plan. Similar to the Environmental Impact Assessment regime, this examines the environmental impacts of policies, plans and programmes. Your Council can advise further as to whether an SEA would be required, and may be able to provide further help to comply with the regulations, for example making available information and evidence needed in preparing the environmental report. Further guidance is available here: www.bit.ly/1YeJM2h

Template policy wording

The Centre for Sustainable Energy has developed the following template policy wording, which you could adapt to fit your specific context and your community's aspirations.

We would suggest adding an introduction to your policy, describing briefly how the policy came into being and the community involvement and the extent and depth of research that sits behind it. This should make it

clear that whilst there is in principle support for wind energy and the areas identified do appear to be suitable for onshore wind development, the neighbourhood plan process has not been able to fund the comprehensive range of expert reports needed to confirm this definitively. Significant further work will be needed through the preparation of a planning application to confirm the initial findings of the neighbourhood plan, and to confirm the acceptability of the specific project proposed.

The **highlighted sections** mark where you might modify the template policy to suit your community's wishes and your conclusions as to the specific local constraints that will need to be addressed within the area you have identified as being suitable. The wording below is designed to illustrate the full range of local planning issues that might be relevant, and the additional detail you might add. (NB If an area really was subject to all the constraints implied below, it is likely to be *unsuitable* for wind development.)

The neighbourhood plan process has demonstrated landscape capacity and community support for up to **... medium sized turbines,** of up a maximum overall height of **85 metres** within the suitable areas defined in **figure ...**. Accordingly proposals for the development of a **wind turbine/wind farm** within the suitable area defined in **figure ...** will be supported. Proposals will be assessed against the following criteria and issues of detail.

The proposal will:

- a. **Be community owned / community-led / provide a tangible and positive benefit to the local community.**
- b. Emerge from meaningful engagement with the local community, including in respect of its layout and design, show that planning issues have been reasonably addressed and therefore demonstrate community backing.
- c. Not have a substantial adverse impact on:
 - Local amenity in respect of noise, vibration, visual intrusion and shadow flicker effects on existing residents, including the closest affected properties shown on **figure ...**
 - The historic environment and heritage assets including the setting of the following heritage assets:
 - St Margaret's Church at ...**
 - The long barrow at ... a scheduled ancient monument.**
 - the character of the countryside by virtue of its landscape and visual impact (including its cumulative impact with other existing wind developments) including on the following popular public viewpoints and representative visual receptors:
 - The viewpoint at ... within the ... national park**
 - The ... Area of Outstanding Natural Beauty**
 - Public right of way 36**

- biodiversity and nature conservation interests, including on the:

integrity of the Site of Special Scientific Interest at ...

integrity of the Special Area of Conservation at ...

integrity of the RAMSAR at ...

badger sett at the north-eastern corner of the site

bat roost at ...

- d. make provision for the removal of the facilities and reinstatement of the site when it has ceased to be operational.
- e. Include measures to manage and mitigate the impact of construction traffic and temporary works to facilitate access.
- f. not have significant adverse impacts on air traffic operations, radar and air navigational installations, or the safe operation of ... airport and the aerodrome at ...

Proposals shall include full details of measures required to mitigate adverse impacts. When considering such proposals, regard will be given to the wider social, economic and environmental benefits of providing energy from renewable sources, as well as the potential effects on the local environment; including any cumulative impact of these proposals.

In order to confirm the initial investigations and consultations carried out in the process of preparing the neighbourhood plan, applications for onshore wind turbines shall be accompanied by the following documentation and reports:

Report	Particular area-specific issues to address, scope of report and survey efforts needed

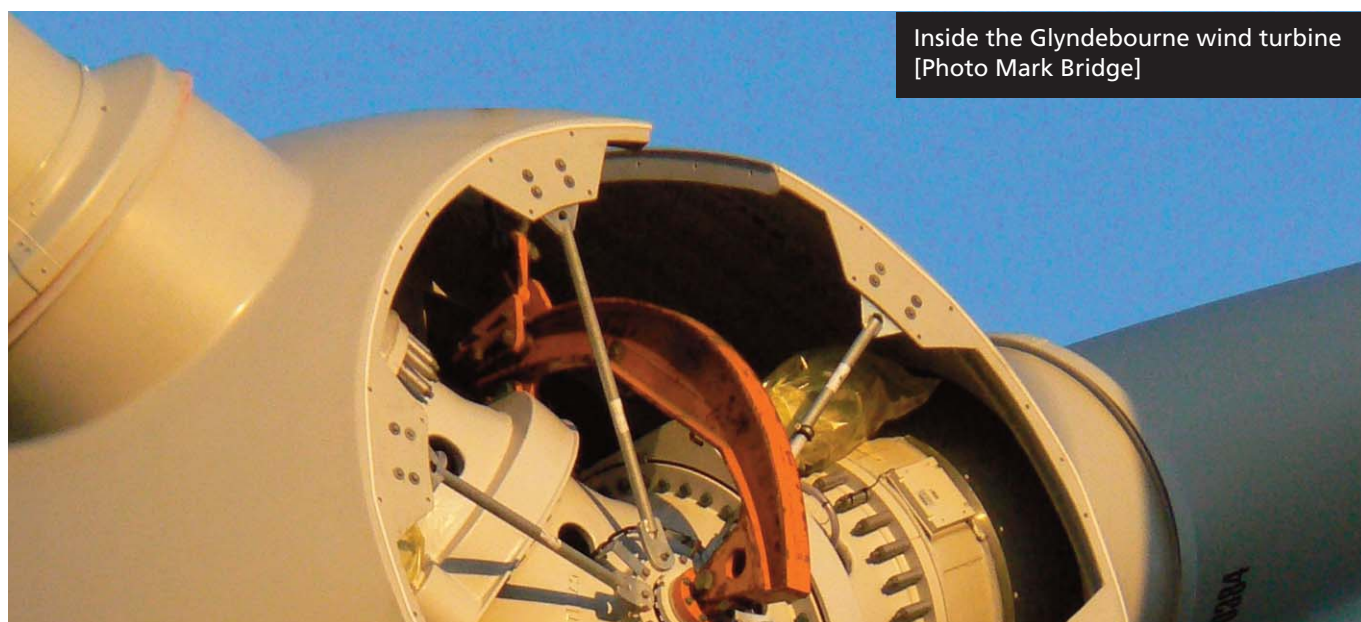
9 | Other Sources of information

- National Planning Policy Framework
National planning policy in relation to renewable energy proposals: www.bit.ly/1OAhbPw
- Planning Practice Guidance webpage
National planning guidance in relation to onshore wind proposals: www.bit.ly/1RvCnvU
- A Guidebook to Low Carbon Neighbourhood Planning
This guidebook by the Centre for Sustainable Energy sets out how you might develop a *Low Carbon Neighbourhood Plan*. It looks at renewable energy policies, and also the potential to mitigate climate change through increased energy efficiency and sustainable transport, issues around flooding and extreme weather, green infrastructure & biodiversity: www.cse.org.uk/news/view/2079

10 | Funding for your neighbourhood plan wind allocation

All community groups writing a neighbourhood plan or neighbourhood development order are eligible to apply for a grant of up to £9,000 from the government to fund this process. Groups facing more complex issues (such as identifying sites for onshore wind) can apply for specific packages of technical support where needed, and may also be eligible for further £6,000 in grant. See more at: <http://mycommunity.org.uk/funding%20&%20support/neighbourhood-planning-funding-and-support-page/>

The costs for producing a feasibility study for a wind turbine are likely to be extremely variable, according to the level of detail sought and the type of constraints being examined, but you could prepare a tender for a feasibility study, indicating its required scope and invite quotes as a way of costing this out.



Inside the Glyndebourne wind turbine
[Photo Mark Bridge]



We are an independent national charity that shares our knowledge and experience to help people change the way they think and act on energy



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www.facebook.com/EnergySavingAdvice



www.twitter.com/@cse_bristol



www.youtube/user/csebristol

Charity 298740 | Company 2219673

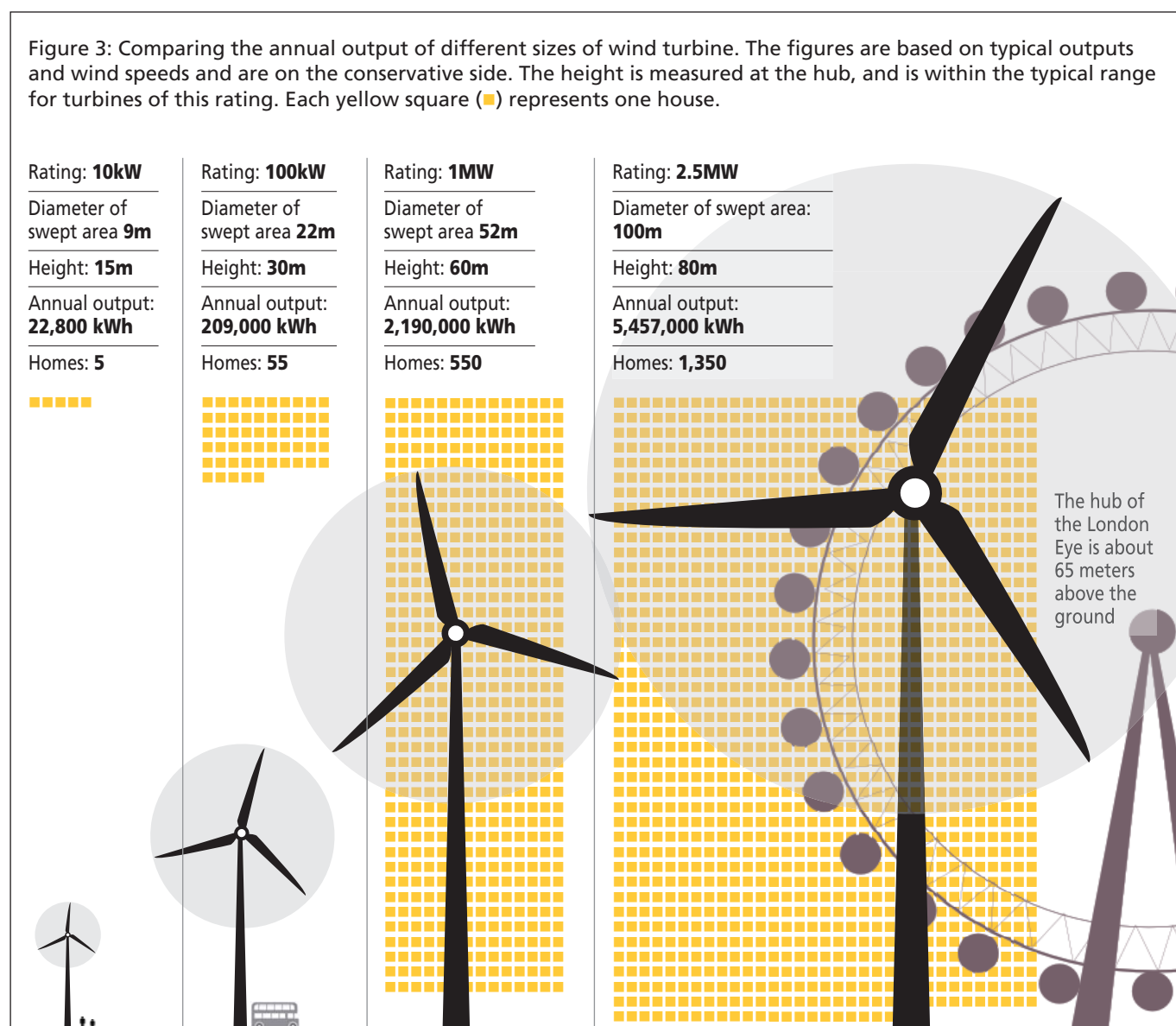
Founded 1979

The numbers game ...

Below is the illustration used on page 17 of CSE's guidance note **How to identify suitable areas for onshore wind development in your neighbourhood plan**. It illustrates the point that while smaller wind turbines obviously have less visual impact, taller ones with longer blades can supply power to *many more* homes. So how did we get the numbers?

The first thing to be aware of is that for each given 'size' (e.g. kW rating) of wind turbine in our illustration we've taken a 'typical' figure from within a range of possible blade lengths, heights and power outputs. So while our 10kW turbine has a blade length of 4.5 meters and is 15 meters tall, other 10 kW turbines may have shorter or longer blades or be taller or shorter in height. And likewise, depending on the turbine's height and the wind speeds it is subjected to, it may produce more or less power in the course of a year.

And we've deliberately erred on the conservative side. Most 100 kW turbines with a height of 30 meters and a swept area diameter of 22 meters will likely produce more than the 209,000 kWh that we have given the second smallest turbine in the graphic below.



So, here come the numbers ...

Let's take the biggest turbine as an example. It's **rated capacity** is 2.5 MW (or 2,500 kW).

If it runs at this rate all day long for a whole year it would have a **theoretical maximum annual output** of $2,500 \times 24 \text{ (hours)} \times 365 \text{ (days)} = 21,900,000 \text{ kWh}$.

But, of course, no wind turbine operates at full pelt all the time; there are days with little or no wind, days with such strong wind that the turbine can't operate and down-time for maintenance. And to take this into account you need another figure, the turbine's **capacity factor**. This is the ratio of its **actual output** to its **theoretical maximum output** over a period of time, and for most turbines this is between 20% and 57%. Figures from the Digest of UK Energy Statistics published annually by the UK Department of Energy and Climate Change (p36 of PDF at www.bit.ly/1NQzR2s) suggest a national average **capacity factor** of 27.2%, which we've rounded down to 25% for the examples in our illustration.

So for our large turbine, we take our **theoretical maximum** of 21,900,000 kWh and multiply it by our **capacity factor** of 25% to get an **actual output** of 5,475,000 kWh.

How many houses can this supply? According to government figures (p7 of PDF at www.bit.ly/1laPObv) the average UK home uses 4,000 kWh of electricity, so we divide our **actual output** by 4,000 to get the number of homes that our large turbine can supply: $5,475,000 \div 4,000 = 1,368$ homes.

This has been rounded down to 1,350 in the illustration to take account of (1) homes that are heated by electricity and (2) turbines in places where the average wind speed is less than that which used to determine the turbine's **rated capacity**.

We hope that helps.

And finally, a double decker bus is about 4.5 meters high, and the London Eye's great wheel is 120 meters in diameter, meaning that the hub is about 65 meters off the ground.

Centre for Sustainable Energy
www.cse.org.uk