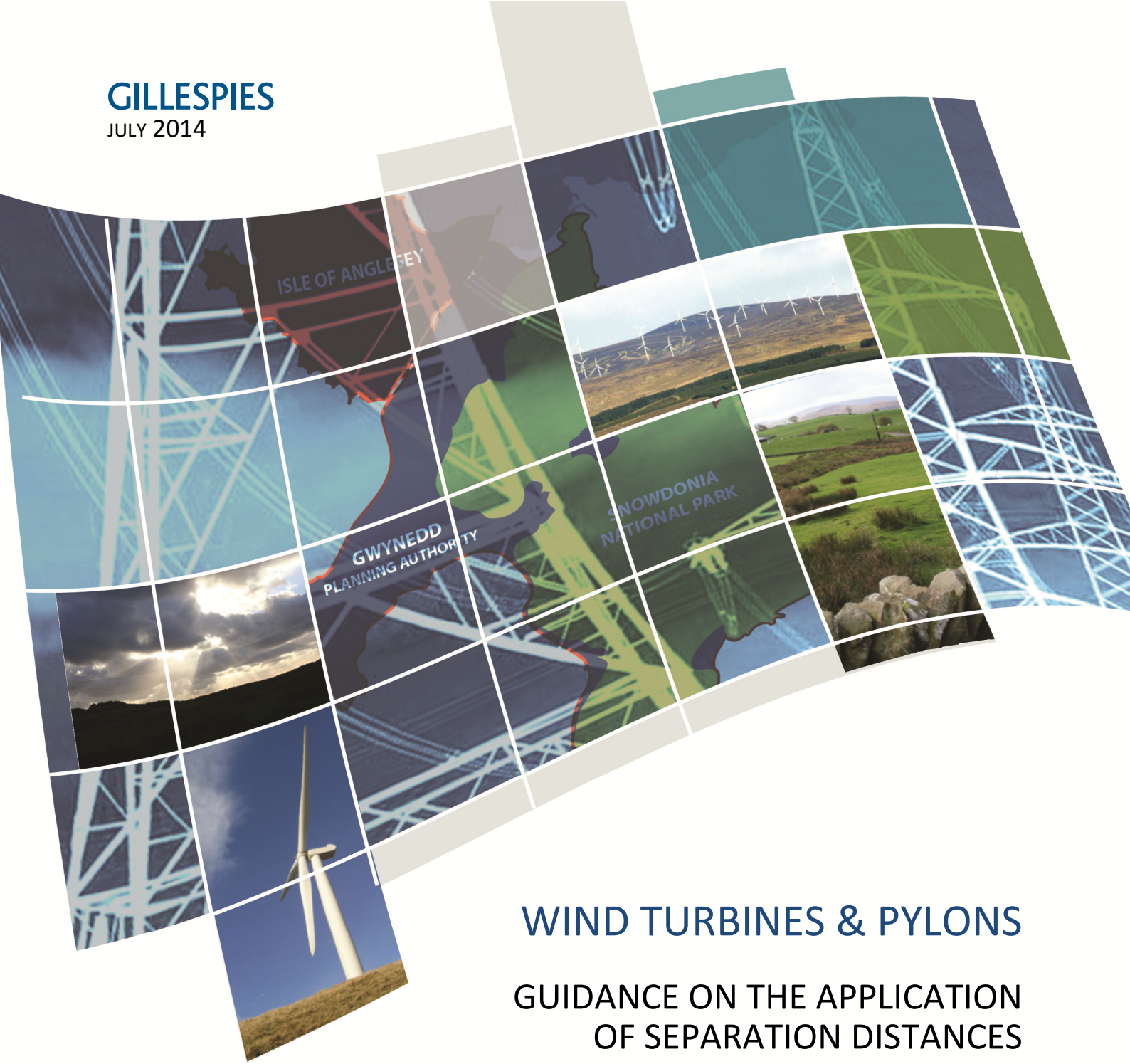


GILLESPIES

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WIND TURBINES & PYLONS

GUIDANCE ON THE APPLICATION OF SEPARATION DISTANCES FROM RESIDENTIAL PROPERTIES

EXECUTIVE SUMMARY



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EXECUTIVE SUMMARY

SECTION 1: INTRODUCTION

Purpose of the Study

- 1.1 This study was commissioned by Gwynedd Council, Isle of Anglesey County Council (the Councils) and Snowdonia National Park Authority (the 'Park Authority') to determine the appropriateness of applying minimum separation distances between wind turbines or pylons and residential properties, to protect residential visual amenity.
- 1.2 For the purpose of this study **Residential visual amenity** refers to the visual amenity experienced by residential properties including their gardens. It is a subset of residential amenity which also includes aspects such as noise, light and vibration. In making judgements about residential visual amenity, it is important to note that a potential significant adverse change to an outlook from a property does not in itself result in material harm to living conditions – there needs to be a degree of harm over and above this, for example undue obtrusiveness or overbearing effect, to warrant a refusal or recommendation for refusal of a planning application.
- 1.3 The Councils and Park Authority are experiencing a range of pressures relating to wind energy and 400 kV overhead line developments. Local communities and Councillors are concerned about the potential visual impacts of wind turbines or pylons on views from residential properties within the study area.
- 1.4 The study provides an evidence base to inform policies in the emerging Anglesey and Gwynedd Joint Local Development Plan (JLDP) and any review of policy in the Eryri Local Development Plan (ELDP); it may also be a material planning consideration for considering relevant planning applications in the intervening period.

Study Approach

- 1.5 There is no nationally recognised method for establishing generic minimum separation distances for wind turbines or pylons from residential properties based on potential visual impacts. Welsh Government advice is that each case should be judged independently and on its own merits.
- 1.6 As a starting point to establish whether or not minimum separation distances should be applied, and if so what these should be, the following desk based research and analysis of the issues was initially undertaken:
 - National, regional and local planning policy and guidance;
 - Other current related guidance;

- Comparative studies; and
- Planning appeal decisions (including liaison with Joint LDP and Park Authority officers and other Local Authorities in Wales to identify relevant planning appeal decisions and any other relevant data which could be used as evidence to back up the study).

1.7 The results of the desktop research were analysed and an appropriate range of distances identified (from which to assess the likely scale of the visual impacts of existing wind turbines and pylons) in order to test and/or back up the research.

1.8 GIS data (provided by the Councils and Park Authority) was used to identify a number of accessible locations within the study area from which existing wind turbines and pylons could be viewed in the landscape. One example from each wind energy height band and two pylons were selected and field work undertaken.

SECTION 2: EVIDENCE BASE

Review of Legislation, Policy and Guidance

2.1 The review of the legislation, policy and guidance for wind turbines quickly revealed that the establishment of separation distances between turbines and residential properties in respect to residential visual amenity is not a straightforward matter. This is reflected in the wide variety of separation distances recommended by both national and local planning guidance. The only current national guidance on separation distance for visual amenity is the 2 km community separation distance¹ applied in Scotland. Local planning guidance varies greatly; for instance guidance on separation distances between turbines of around 20 m - 25 m to blade tip and residential properties ranges from 350 m (Milton Keynes Local Plan) to 1 km (Wiltshire Core Strategy). It is important to note that the height bands/descriptions of turbines often varies in national and local guidance and the establishment of minimum separation distances sometimes takes into consideration other factors such as noise and shadow flicker. Some local authorities apply relatively rigid separation distances from residential properties whereas others provide more general guidance and acknowledge that factors such as topography and vegetation may reduce impacts on residential visual amenity.

National Policy and Guidance Context – Wind Turbines

2.2 In **Wales** there are currently no nationally prescribed minimum separation distances between proposed wind turbines and existing residential properties based on potential adverse visual impacts. National planning policy requires that local planning policy and guidance be based on robust evidence.

¹ Separation distance between communities and wind farms

National Policy and Guidance Context – Pylons

- 2.3 There is currently no published planning guidance within the UK relating to separation distances between pylons and residential properties. However the Holford Rules with NGC (1992) and SHETL (2003) notes refer to minimising impacts on people, residential areas etc. as follows:

'a. Avoid routeing close to residential areas as far as possible on grounds of general amenity.

b. In rural areas avoid as far as possible dominating isolated houses, farms or other small-scale settlements'

The Holford Rules are the current guidelines referenced in the National Planning Statements for Nationally significant Infrastructure Projects.

Review of Planning Appeals – Wind Turbines

- 2.4 The table set out in Appendix 2 (in the main report) summarises the reviews of a number of planning appeals for proposed wind energy developments (most cases dating from 2009). Each written appeal decision was analysed; particularly key text relating to observations on residential visual amenity and the distances of proposed turbines from residential properties. Details of the heights of turbines and their distances from properties are included in the table together with resultant conclusions/comments on whether or not the overall effect on residential visual amenity was deemed to be unacceptable i.e. **so unpleasantly overwhelming and unavoidable that it may result in a material harm to living conditions to warrant a refusal of planning permission in the public interest.**

Review of Planning Applications – Pylons

- 2.5 There have been no recent planning appeals in connection with 400 kV overhead line developments. However, one of the more recent 400 kV overhead line developments to receive planning permission in the UK is the upgraded Beaulieu to Denny line in Scotland, which was granted in 2010. Chapter 24 (Visual Effects) of the Beaulieu to Denny Environmental Statement (ES) stated the following:

'every effort has been made to maintain a minimum distance of 100 m between any residential property and the proposed line' (paragraph 24.5.1.3)

'The 100 m distance has been established as a general guide in order to address concerns relating to visual amenity. The 100 m distance has been proposed as, at this distance, for a property located on level ground and with a garden extending to 15 m from the house, a 10 m tall tree at the end of the garden will screen views of a 55 m tall tower located at 100 m from the property. However, not all properties will be on level ground or with gardens 15 m in length. The situation at each property close to the line has been assessed and the information relating to

*properties where a major adverse effect is anticipated, is included in Technical Annex 24.2.’
(paragraph 24.5.1.4)*

- 2.6 Of the properties assessed within Technical Annex 24.2 (Proximity Survey) of the ES, all of the properties where a major (very large) adverse impact was anticipated were within 400 m of the proposed line and most were within 200 m. No specific residential visual amenity assessment was carried out in support of the application.

SECTION 3 : ASSESSMENT OF VISUAL IMPACTS

Scale of visual impact refers to the following:

- ‘The scale of change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the proposed development;
- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture; and
- The nature of the view of the proposed development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses.’²
(GLVIA3, paragraph 6.39)

A very large scale of visual impact can be defined as a very large scale change in a view that introduces new, non-characteristic or discordant or intrusive elements into the view which may form the principal element of/or dominate the view and may overpower the viewer. This may occur where a proposed development would be in close proximity to the viewer, in a direct line of vision, or affecting a substantial part of the view and where it would be prominent within, or contrasts with, the visual context, and detracts from its visual amenity.

- 3.1 Following the review of recent planning appeals, and from experience in carrying out Landscape and Visual Impact Assessments (LVIA) and residential visual amenity assessments, it is recognised that **the threshold for unacceptable visual impacts may often be higher than the point at which the scale of visual impact is assessed to be very large.** However, for the purposes of the consideration of separation distances between residential properties and wind turbines or pylons, it is recommended that the threshold for considering whether there would be

² Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge

an unacceptable impact on residential visual amenity would be from any property where the visual impact is predicted to be very high.

The Assessment of Visual Impacts of Wind Turbines or Pylons on Residential Receptors

- 3.2 When assessing the significance of visual impacts of a wind turbine or pylon on a residential receptor the potential **scale of impact or change in a view** is considered together with the **sensitivity** of the receptor. As noted in GLVIA3, it is generally accepted in the landscape profession that **residential receptors are considered high sensitivity visual receptors so the only variable then becomes the scale of impact.**
- 3.3 **Scale of impact** is often described as high, medium, low or negligible (positive, negative or neutral) but terminology such as very large, large, medium, small, very small and negligible (positive, negative or neutral) can also be used.
- 3.4 The assessment of the likely scale of impact will depend on the extent of changes in the composition of a view brought about by the introduction of a wind turbine or pylon; taking into account proximity and the proportion of the view occupied by the development and also their apparent prominence as determined by a number of modifying factors (discussed further in the main report, paragraph 4.14 and Table 4.4).
- 3.5 **The most significant adverse visual impacts are predicted where residential receptors (residential properties) may experience a very large scale of impact (or change in their view).** Because this study is primarily concerned with establishing whether or not a minimum separation distance should be applied to prevent unacceptable impacts on residential visual amenity it is important to reiterate the fact that a significant adverse impact on a view from a residential property does not in itself result in material harm to living conditions *“there needs to be a degree of harm over and above this to warrant a refusal in the public interest”*³

Wind Energy Development Height Bands

- 3.6 In order to assess the distances at which wind turbines of different heights may give rise to very large scales of visual impact, the following five height bands⁴ are considered:
- Up to 25 m
 - 25.01 – 50 m
 - 50.01 – 75 m

³ Knight R., ‘Residential Visual Amenity Assessment: Its Place in EIA’, IEMA, published by the Environmentalist Online (July 2012).

⁴ All references to heights of wind turbines in this report refer to height to blade tip.

- 75.01 – 100 m
- 100.01 – 150 m

3.7 These bands are broadly based on the heights set out in the wind energy development typologies identified within the Isle of Anglesey, Gwynedd & Snowdonia National Park, Landscape Sensitivity and Capacity Assessment⁵.

Pylons

3.8 Although pylons for 400 kV overhead line developments can vary in height from around 35 to 60 m, this study focusses on pylons ranging from 40 – 60 m as this is the height range most typically found within the study area. It also only considers pylons of the traditional steel lattice tower design.

SECTION 4 : TESTING DISTANCES ON SITE

Field Based Review

- 4.1 Following the desk top research, a field based review was undertaken to establish the range of distances within which wind turbines or pylons may give rise to a very large scale of visual impact (and therefore may give rise to unacceptable impacts in terms of residential visual amenity).
- 4.2 It is important to note that the scope of this study is limited. One operational turbine example, from within each of the height bands listed in the main report paragraph 3.8, and two examples of pylons were chosen within the study area in collaboration with the Steering Group (based on existing operational wind turbine GIS data and OS data). In addition to height, the criteria for choosing the turbines and pylons included accessibility in terms of the openness of views and public accessibility for site assessment and photography. The two pylon examples were chosen to illustrate the differences in scale of visual impacts and demonstrate the effects of modifying factors such as whether the structure was seen against a solid background such as landform or vegetation or skylined.
- 4.3 The site based assessments of each of these examples established an indicative range of distances from which such structures may start to give rise to a very large scale of visual impact. Table 4.2 of the main report summarises the findings of the site based review.

⁵ Gillespies (2014), Isle of Anglesey, Gwynedd & Snowdonia National Park, Landscape Sensitivity and Capacity Assessment

Table 4.2: Results of Site Based Assessments

	Height*	Indicative distances within which the structure may give rise to a <u>very large</u> scale of visual impact
Wind Turbines	17.8 m	c. 130 m
	34.2 m	c. 280 m
	53 m	c. 400 m
	93 m	c. 750 m
Pylons	50-59 m	c. 400 m
	55-59 m	c. 400 m

*Height of wind turbine measured to blade tip

Theoretical Apparent Height Model in Support of Field Based Review

- 4.4 In support of the site based assessment a mathematical model was used to calculate the apparent height of a turbine or pylon when its true height and distance from a viewer are known. **The apparent height of a turbine or pylon is defined as the height that the structure would appear at arm's length (61 cm) from the viewer** (i.e. the structure would appear to be the same height as an X cm high object held at arm's length (61 cm) from the viewer).
- 4.5 The apparent heights of the wind turbines and pylons assessed on site have been worked out (based on this model) and are shown alongside the viewpoints in Appendix 3 of the main report (for a comparison of known distances and apparent height). Table 4.3 of the main report demonstrates that there is a correlation between the apparent height of the structure and the indicative distances within which the structures may give rise to very large scales of visual impacts.
- 4.6 As discussed above and previously in paragraphs 2.10 and 3.6 of the main report, in addition to the height of a structure and its distance from a receptor there are a number of modifying factors which may affect the assessment of the scale of visual impact by reducing or increasing it. These factors are outlined Table 4.4⁶ of the main report.
- 4.7 These modifying factors may rule out the potential of a wind turbine or pylon giving rise to unacceptable impacts on residential visual amenity, even if a residential property falls within the indicative distances shown in Table 4.3 of the main report.

⁶Based on Figure 2: Conceptual Model for Visual Impact Assessment, University of Newcastle (2002) Visual Assessment of Windfarms Best Practice. Scottish Natural Heritage Commissioned Report F01AA303A

SECTION 5 : RECOMMENDATIONS

- 5.1 Analysis of current guidance and case law indicates that there are a variety of distances within which unacceptable impacts on residential visual amenity can occur and that this is by no means entirely dependent on the relationship between the height and proximity of a turbine or pylon from a residential property.
- 5.2 There is therefore no conclusive evidence to support the strict application of minimum separation distances between residential properties and wind turbines or pylons in terms of visual residential amenity. For this reason it is recommended that each proposed development should be considered on its own merits, on a case by case basis.
- 5.3 Although rigid separation distances are not recommended, the use of indicative residential visual amenity assessment trigger distances (within which there is potential for very large scale of visual impacts) is considered a valuable tool to identify any locations where a visual residential amenity assessment should be carried out to identify any potentially unacceptable impacts in terms of residential visual amenity.
- 5.4 The proposed guide to ‘residential visual amenity assessment trigger distances’ for broad height bands of wind turbines and/or pylons are presented in Table 5.1 below:

Table 5.1: Rough Guide to Residential Visual Amenity Assessment Trigger Distances for Wind Turbines and Pylons

	Height*	Residential Visual Amenity Assessment Trigger Distance (Potential ‘Very Large’ Scale of Visual Impact)
Wind Turbine	Up to 25 m	Within 200 m
	25.01 - 50 m	Within 400 m
	50.01 – 75 m	Within 600 m
	75.01 – 100 m	Within 800 m
	100.01 – 150 m	Within 1.22 km
Pylon	Up to 40 m	Within 350 m
	40.01 – 60 m	Within 500 m

*Height of wind turbine measured to blade tip

- 5.5 It is important to reinforce the fact that in addition to the above there are a number of modifying factors which may affect the assessment of the scale of visual impact by reducing or increasing it (refer Table 4.4 of the main report). These will all need to be taken into consideration in the

establishment of an agreed offset distance for carrying out a residential visual amenity assessment.