



**PERMITTED
DEVELOPMENT RIGHTS
FOR MICROGENERATION
DEVELOPMENT
CONSULTATION PAPER
RESPONSE FORM**

Once you have completed this form please
return to

Policy and Legislation Branch
3rd Floor
Millennium House
Great Victoria STREET
Belfast
BT2 7BN

by fax (marked 'Planning Microgeneration PD
Consultation Response') to:
028 9041 6960

Or by e-mail to:
Planning.microgenpd@doeni.gov.uk

All responses should be submitted to the
Department no later than 22nd January 2010



Department of the
Environment
www.doeni.gov.uk



INVESTORS IN PEOPLE

RESPONDENT INFORMATION

Please Note that this form **must** be returned with your response to ensure that we handle your response appropriately.

In keeping with our policy on openness, the Department will make responses to this consultation paper publically available. When publishing responses received on behalf of organisations the Department will also publish the organisation's name and address. When publishing responses received on behalf of individuals the Department will not publish details of the individual's name and address.

1. Name/Organisation

Organisation Name

Arqiva Ltd

Title

Mr Ms Mrs Miss Dr *Please tick as appropriate*

Surname

[REDACTED] (National Town Planning Manager)

Forename

[REDACTED]

2. Postal Address

[REDACTED]

Postcode:

[REDACTED]

Phone:

[REDACTED]

Email:

[REDACTED]

3. Are you responding:

As an individual

On behalf of a group / organisation

4. Which of the following best describes the capacity in which you are responding:

Developer

Agent/Architect

Business

Member of Public

Environment Group

Council / Councillor

MLA, MP, MEP

Other Please state:

--

5. Acknowledgment

Individual responses will not be acknowledged unless specifically requested

NON DOMESTIC MICROGENERATION

Introduction

Question 1

Do you agree that the GDO should be amended to provide permitted development rights for microgeneration equipment in non-domestic land uses?

Yes No

Question 2

Should permitted development rights for non-domestic microgeneration be greater than those proposed for dwellinghouses where this can be achieved without increasing the risk of adverse impacts?

Yes No

Question 3

Should permitted development rights for microgeneration associated with non-domestic land uses be provided for in a separate part within Schedule 1 of the GDO from the existing permitted development rights for those land uses?

Yes No

General limits and conditions to permitted development

Question 4

Do you agree that permitted development in non-domestic land uses should be for microgeneration development that primarily provides heat or energy for use within the curtilage of the non-domestic building or on the agricultural unit?

Yes No

No - see attached document.

Question 5

Do you agree that, subject to the maximum height and area restrictions set out in the Review, permitted development for solar panels or wind turbines erected by undertakers referred to in Part 13 of the GDO or by the Roads Service to meet the energy needs of a range of equipment, systems and other uses permitted under Part 13 of the GDO or by the Roads Service should be allowed, provided it is only to meet the needs of the equipment, systems and other uses with which it is associated?

Yes No

No - for the same reasons as above.

Question 6

Do you agree that a condition of all permitted development for microgeneration devices in non-domestic land uses should be that they be removed as soon as reasonably practicable after they are no longer in use and the land or building restored to its condition before the development took place?

Yes No

Solar Panels

Question 7

Do you agree that permitted development for solar panels fitted to a pitched roof should be limited to the existing roof area?

Yes No

No comment

Question 8

Do you agree that permitted development for solar panels fitted to a pitched roof should be limited to the maximum height of the existing roof?

Yes No

No comment

Question 9

Do you agree that permitted development for solar panels on a pitched roof plane that faces onto and is visible from a road should not extend more than 20cm above the plane of the existing roof slope?

Yes No

No comment

Question 10

Do you agree that permitted development for solar panels on a flat roof should not exceed a height of 2m from the roof plane on which they are mounted?

Yes No

No comment

Question 11

Do you agree that solar panels permitted on a flat roof should be located at least 2m from the edge of the roof of the building on which they are mounted?

Yes No

No Comment

Question 12

Should permitted development rights for roof mounted solar panels be removed in AONBs and National Parks where the roof slope faces onto and is visible from that road?; or

Yes No

No comment

Question 13

Should permitted development rights for roof mounted solar panels be removed in special countryside policy areas where the roof slope faces onto and is visible from that road?; or

Yes No

No comment

Question 14

Should permitted development rights for roof mounted solar panels in AONBs and National Parks (including special countryside policy areas) be subject to the same limits that apply outside these areas?

Yes No

No comment

Question 15

Should permitted development rights for roof mounted solar panels in Conservation Areas be removed where the roof slope to which they are fitted faces onto and is visible from that road?; or

Yes No

No comment

Question 16

Should permitted development rights for roof mounted solar panels in Conservation Areas be subject to the same limits that apply outside these areas?

Yes No

No comment

Question 17

Should permitted development rights for roof mounted solar panels in a World Heritage Site be removed where the roof slope to which they are fitted faces onto and is visible from that road?; or

Yes No

No comment

Question 18

Should permitted development rights for roof mounted solar panels in a World Heritage Site be subject to the same limits that apply outside that area?

Yes No

No comment

Question 19

Should there be any additional restrictions to permitted development rights for roof mounted solar panels in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 20

Should permitted development rights for roof mounted solar panels within the curtilage of a Listed Building only be removed where Listed Building Consent has not previously been granted?

Yes No

No comment

Question 21

Should permitted development rights for solar panels fitted to a wall limit them to the boundaries of the existing wall area?; or

Yes No

No comment

Question 22

If you do not agree that permitted development rights for solar panels fitted to a wall should be limited by the existing wall area do you think that there should be an area limit to wall mounted panels and, if so, what area should this be?

No comment

Question 23

Should permitted development rights for solar panels fitted to a wall within 3 metres of the boundary of the curtilage and extending above 4 metres in height be restricted to protrude no more than 20cm from the plane of the wall?

Yes No

No comment

Question 24

Should permitted development rights for wall mounted solar panels be removed in AONBs, National Parks, Conservation Areas and World Heritage Sites where they face onto and are visible from a road?

Yes No

No comment

Question 25

Do you agree that permitted development rights for wall mounted solar panels in ASSIs and Sites of Archaeological Interest should not be subject to additional restrictions?

Yes No

No comment

Question 26

Should permitted development rights for wall mounted solar panels within the curtilage of a Listed Building only be removed where Listed Building Consent has not previously been granted?

Yes No

No comment

Question 27

Should permitted development rights for free standing solar panels restrict them to a minimum of 5m from the building curtilage and from any road bounding the curtilage?

Yes No

No comment

Question 28

Should permitted development rights for free standing solar panels restrict them to a maximum of 2m above ground level? If not, what height do you believe is appropriate and for what reasons?

Yes No

No comment

Question 29

Should the permitted development rights for free standing solar panels allow a maximum surface area of 20m² within the curtilage of a building?

Yes No

No comment

Question 30

If you consider a greater area should be allowed, please state what area and the supporting reasons.

No comment

Question 31

Do you agree that the proposed restrictions on permitted development rights for free standing solar panels are reasonable in addressing safety issues beyond the host property?

Yes No

No comment

Question 32

Should permitted development rights for free standing solar panels be removed in AONBs, National Parks, Conservation Areas and World Heritage Sites where the installation faces onto a road and is visible from that road?

Yes No

No comment

Question 33

Should permitted development rights for free standing solar panels be removed in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 34

Should permitted development rights for free standing solar panels within the curtilage of a Listed Building only be removed where Listed Building Consent has not previously been granted?

Yes No

No comment

Wind Turbines

Question 35

Should permitted development rights for building mounted wind turbines allow them to be a maximum of 3m above the highest point of the roof?

Yes No

See attached

Question 36

Should permitted development rights for building mounted wind turbines be for a maximum blade diameter of 2.5m?

Yes No

See attached

Question 37

Should permitted development rights for building mounted wind turbines with a vertical axis be for a maximum swept area of 5m²?

Yes No

See attached

Question 38

Should permitted development rights allow one building mounted wind turbine within the curtilage of a non-domestic building?

Yes No

Question 39

If you consider more than one should be allowed, please state how many and the supporting reasons.

Question 40

If you consider that permitted development rights should allow more than two wind turbines please explain why you consider that the environmental effects are not significant and that the threshold in Schedule 2 to the EIA Regulations should be amended.

Question 41

Should permitted development rights for building mounted wind turbines be deferred until noise and air safety issues can be satisfactorily addressed?

Yes No

No comment

Question 42

Do you agree that a permitted development regime for building mounted wind turbines should not entail the user having to employ a technical expert to carry out a noise survey either before such rights are exercised or to prove compliance?

Yes No

No comment

Question 43

Do you agree that it is a matter for installers and manufacturers to ensure that there is no negative impact associated with vibration that may be caused by building mounted wind turbines?

Yes No

No comment

Question 44

If you do not agree that impacts associated with vibration should be addressed by installers and manufacturers how do you believe they should be addressed?

No comment

Question 45

Should permitted development rights for building mounted wind turbines be removed where they extend above public open space, roads and footpaths?

Yes No

No comment

Question 46

Should permitted development rights for building mounted wind turbines be deferred until a UK scheme has been developed that satisfactorily addresses the issue of radar safety?

Yes No

No comment

Question 47

Do you agree that there is currently no need to condition permitted development rights for building mounted wind turbines in terms of their potential to induce seizures?

Yes No

No comment

Question 48

Should the potential impact of building mounted wind turbines on telecommunications systems be addressed through the publication of guidance material on the best way to site wind turbines to reduce the risk of electromagnetic interference?

Yes No

See Attached

Question 49

Should the potential impact of building mounted wind turbines on birds and bats be addressed through the publication of guidance material on the best way to site wind turbines to minimise that impact?

Yes No

No comment

Question 50

Should permitted development rights for building mounted wind turbines be removed in AONBs, National Parks, Conservation Areas and World Heritage Sites where the turbine is mounted on a roof or wall that faces onto a road and is visible from that road?

Yes No

No comment

Question 51

Should permitted development rights for building mounted wind turbines be removed in ASSIs as a precautionary measure to protect bats and birds?

Yes No

No comment

Question 52

Should permitted development rights for building mounted wind turbines within the curtilage of a Listed Building only be removed where Listed Building Consent has not previously been granted?

Yes No

No comment

Question 53

Subject to the further limits outlined later in this paper, should permitted development rights for free standing wind turbines in non-domestic land uses should be allowed up to a maximum height of 15m above ground level?

Yes No

See attached

Question 54

Should permitted development rights for free standing horizontal axis wind turbines allow a blade diameter of up to 6m?

Yes No

See attached

Question 55

If you consider a different blade diameter is appropriate, what is it and please state your supporting reasons.

See attached

Question 56

Should permitted development rights for free standing wind turbines with a vertical axis allow a maximum swept area of 28m²?

Yes No

See attached

Question 57

Should permitted development rights for free standing wind turbines require that they are located a minimum of 17m from a neighbouring building curtilage or road?

Yes No

The distance should be a function of overall structure height (which we are suggesting in appropriate cases should be greater) with an added safety margin, i.e. a minimum of the overall structure height plus say 5 metres.

Question 58

Should permitted development rights for building mounted wind turbines be deferred until a UK scheme has been developed that satisfactorily addresses the issue of radar safety?

Yes No

No comment

Question 59

Do you agree that there is currently no need to condition permitted development rights for building mounted wind turbines in terms of their potential to induce seizures?

Yes No

No comment

Question 60

Do you agree that the risk to members of the public outside the curtilage posed by wind turbines falling over is sufficiently addressed by the requirement for them to be located a minimum of 17m from a neighbouring building curtilage or road?

Yes No

See answer to question 57

Question 61

Should permitted development rights require that the blade tips of a free standing wind turbine must be a minimum of 5m above ground level?

Yes No

No comment

Question 62

Should permitted development rights for free standing wind turbines allow only one turbine within a building curtilage or on an agricultural unit?

Yes No

No comment

Question 63

Do you agree that a separation distance of 34m between free standing wind turbines on neighbouring properties is sufficient to address cumulative visual impact?

Yes No

No comment

Question 64

If you consider that a greater separation distance than 34m between free standing wind turbines on neighbouring properties is required, what is it and please state your supporting reasons?

Question 65

Should the potential impact of free standing wind turbines on telecommunications systems be addressed through the publication of guidance material on the best way to site wind turbines to reduce the risk of electromagnetic interference?

Yes No

See attached answer to Question 48

Question 66

Should the potential impact of free standing wind turbines on birds and bats be addressed through the publication of guidance material on the best way to site wind turbines to minimise that impact?

Yes No

Regardless of permitted development right other legislation will also operate to protect bats and birds

Question 67

Should permitted development rights for free standing wind turbines be deferred until noise issues can be satisfactorily addressed?

Yes No

This can be dealt with by way of condition, e.g. confining any increase in noise to a certain level over ambient noise levels from the building line of the closest property

Question 68

Should permitted development rights for free standing wind turbines in AONBs and National Parks be required to be located within 50m of the nearest building which will utilise the electricity produced?

Yes No

For the reasons given in our answer to Question 4

Question 69

Should permitted development for free standing wind turbines be removed in Conservation Areas and World Heritage Sites?

Yes No

Not if they are replacing an existing high structure such as a radio tower

Question 70

Should permitted development rights for free standing wind turbines be removed in ASSIs and Sites of Archaeological Interest?

Yes No

Not if they are replacing an existing high structure such as a radio tower

Question 71

Should permitted development rights for free standing wind turbines within the curtilage of a Listed Building be removed?

Yes No

Not if they are replacing an existing high structure such as a radio tower

Hydro

Question 72

Do you agree that there should be no permitted development rights introduced for in-stream works associated with hydro microgeneration in non-domestic land uses?

Yes No

No comment

Question 73

Should the provision of a new or replacement turbine house for an existing hydro microgeneration scheme be permitted development provided it is a maximum of 3m in height, has a maximum floor area of 10m² is located at least 5m from the building curtilage and not nearer to any road which bounds the curtilage than the part of the existing building nearest to that road?

Yes No

No comment

Question 74

Do you agree that no further restrictions on the permitted development rights for new or replacement turbine houses are necessary in AONBs and National Parks?

Yes No

No comment

Question 75

Should permitted development rights for new or replacement turbine houses be removed in Conservation Areas, World Heritage Sites, ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 76

Should permitted development rights for new or replacement turbine houses associated with existing hydro schemes within the curtilage of a Listed Building only be removed where Listed Building Consent has not previously been granted?

Yes No

No comment

Biomass and combined heat and power plants

Question 77

Should a new building or extension to house a biomass or CHP boiler be permitted development provided the new building or extension has a maximum floorspace of 10m² and a maximum height of 3m?

Yes No

No comment

Question 78

Should a new building or extension to house a biomass or CHP boiler for non-domestic buildings with a floor area of 1,000m² or more be permitted development provided the new building or extension has a maximum floorspace of 75m² and maximum height of 3m?

Yes No

No comment

Question 79

Should permitted development rights for a new building or extension to house a biomass or CHP boiler require that the development is a minimum distance of 5m from any boundary of the building curtilage and not nearer to any road which bounds the curtilage than the part of the existing building nearest to that road.

Yes No

No comment

Question 80

Should it be a condition of permitted development rights for the provision of a biomass boiler for non-domestic use that the fuel must not include products derived from animal wastes or wood containing dangerous substances?

Yes No

No comment

Question 81

Do you agree that noise impacts from biomass and CHP boilers is a low risk and that this risk is minimised by other restrictions upon permitted development rights for boiler houses?

Yes No

No comment

Question 82

Should a new building or extension to an existing building to house fuel for a biomass boiler be permitted development provided the new building or extension has a maximum floorspace of 10m² and maximum height of 3m?

Yes No

No comment

Question 83

Should a new building or extension to an existing building to house fuel for a biomass boiler for non-domestic buildings with a floor area of 1,000m² or more be permitted development provided the new building or extension has a maximum floorspace of 75m² and maximum height of 3m?

Yes No

No comment

Question 84

Should permitted development rights for a new building or extension to an existing building to house fuel for a biomass boiler for non-domestic buildings be restricted to those located a minimum distance of 5m from any boundary of the building curtilage and not nearer to any road which bounds the curtilage than the part of the existing building nearest to that road?

Yes No

No comment

Question 85

Should permitted development rights for a new building or extension only apply to the first biomass/CHP boiler house and the first fuel biomass fuel store erected under permitted development rights within the curtilage of a building?

Yes No

No comment

Question 86

Should permitted development rights for the installation of a flue for a biomass or CHP system be allowed provided the height of the flue does not exceed 1m above the highest part of the existing roof?

Yes No

No comment

Question 87

Should permitted development rights for the replacement or alteration of an existing flue to allow it to be utilised by a biomass or CHP system be allowed provided the replaced or altered flue is located in the same place as the existing flue and is of dimensions that do not exceed the existing flue?

Yes No

No comment

Question 88

For biomass or CHP systems in industrial buildings do you consider the above proposals for permitted development could be replaced by permitted development rights for flues up to a maximum height of 15m above ground level without greatly increasing visual impacts?

Yes No

No comment

Question 89

Do you agree that there should be no additional restrictions on permitted development rights for biomass and CHP boiler houses, fuel stores and flues within AONBs, National Parks, Conservation Areas and World Heritage Sites?

Yes No

No comment

Question 90

If you do not agree, what additional restrictions do you consider would be appropriate and please state your supporting reasons?

No comment

Question 91

Should permitted development rights for biomass and CHP boiler houses and fuel stores be removed in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 92

Should permitted development rights for a biomass or CHP boiler house, fuel store or flue only be removed where Listed Building Consent has not previously been granted?

Yes No

No comment

Question 93

Should permitted development rights be provided for anaerobic digestion plants on an agricultural unit?

Yes No

No comment

Question 94

If you agree that permitted development rights for anaerobic digestion plants should be provided should they be subject to similar restrictions to those for agricultural permitted development rights as outlined ?

No comment

Question 95

Should permitted development rights for anaerobic digestion plants be limited to those that use only materials generated on the agricultural unit on which the plant is located?

Yes No

No comment

Question 96

Do you agree that permitted development rights for anaerobic digestion plants do not need to be further restricted in AONBs, National Parks, World Heritage Sites or Conservation Areas?

Yes No

No comment

Question 97

Should permitted development rights for anaerobic digestion plants be removed in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 98

Should permitted development rights for anaerobic digestion plants within the curtilage of a Listed Building only be removed where Listed Building Consent for the development has not previously been granted?

Yes No

No comment

Heat Pumps

Question 99

Should permitted development rights be provided for ground source heat pumps in non-domestic land uses, subject to appropriate restrictions?

Yes No

No comment

Question 100

Should permitted development rights for ground source heat pumps be restricted to those where the area of excavation does not exceed 0.5ha and the area of excavation is returned to its state prior to the development taking place?

Yes No

No comment

Question 101

Should permitted development rights for above ground elements necessary for the operation of a ground source heat pump within the curtilage of a building with floorspace of less than 1000m² be restricted to buildings or extensions that do not exceed 3m in height and of a maximum area of 10m²?

Yes No

No comment

Question 102

Should permitted development rights for above ground elements necessary for the operation of a ground source heat pump within the curtilage of a building with floorspace of 1000m² or more be restricted to buildings or extensions that do not exceed 3m in height and a maximum area of 75m²?

Yes No

No comment

Question 103

Should the above ground elements necessary for the operation of a ground source heat pump be required to be located a minimum of 5m from the boundary of the building curtilage and from any road, and to be located not nearer to any road that bounds the curtilage than that part of the existing building nearest to that road?

Yes No

No comment

Question 104

Do you agree that there should be no additional restrictions upon permitted development rights for ground source heat pumps within AONBs, National Parks, Conservation Areas and World Heritage Sites?

Yes No

No comment

Question 105

Should permitted development rights for ground source heat pumps be removed in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 106

Should permitted development rights for above ground elements of a ground source heat pump within the curtilage of a Listed Building be removed only where Listed Building Consent for the development has not previously been granted?

Yes No

No comment

Question 107

Should permitted development rights be provided for water source heat pumps in non-domestic land uses subject to appropriate restrictions?

Yes No

No comment

Question 108

Should permitted development rights for water source heat pumps be restricted to those where the pipework does not exceed an area of 0.5ha?

Yes No

No comment

Question 109

Should permitted development rights for above ground elements necessary for the operation of a water source heat pump within the curtilage of a building with floorspace of less than 1000m² be restricted to buildings or extensions that do not exceed 3m in height and an area of 10m²?

Yes No

No comment

Question 110

Should permitted development rights for above ground elements necessary for the operation of a water source heat pump within the curtilage of a building with floorspace of 1000m² or more be restricted to buildings or extensions that do not exceed 3m in height and an area of 75m²?

Yes No

No comment

Question 111

Should the above ground elements necessary for the operation of a water source heat pump be required to be located a minimum of 5m from the boundary of the building curtilage and from any road, and to be located not nearer to any road that bounds the curtilage than that part of the existing building nearest to that road?

Yes No

No comment

Question 112

Do you agree that there should be no additional restrictions on permitted development rights for water source heat pumps within AONBs, National Parks, Conservation Areas and World Heritage Sites?

Yes No

No comment

Question 113

Should permitted development rights for water source heat pumps be removed in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 114

Should permitted development rights for water source heat pumps within the curtilage of a Listed Building be removed only where Listed Building Consent for the development has not previously been granted?

Yes No

No comment

Question 115

Should permitted development rights for air source heat pumps be deferred until noise issues can be satisfactorily addressed?

Yes No

No comment

Question 116

Do you agree that a permitted development regime for air source heat pumps should not entail the user having to employ a technical expert to carry out a noise survey either before such rights are exercised or to prove compliance?

Yes No

No comment

Question 117

Should permitted development rights for air source heat pumps for buildings with a floor area of less than 1,000m² be restricted to a maximum volume of 30m³?

Yes No

No comment

Question 118

Should permitted development rights for air source heat pumps for buildings with a floor area of 1,000m² or more be restricted to a maximum volume of 75m³?

Yes No

No comment

Question 119

Should air source heat pumps be located a minimum distance of 5m from any boundary of the building curtilage and not nearer to any road which bounds the curtilage than the part of the existing building nearest to that road?

Yes No

No comment

Question 120

Should permitted development rights for air source heat pumps require that they do not exceed the height of the existing building?

Yes No

No comment

Question 121

Do you agree that there should be no additional restrictions on permitted development rights for air source heat pumps within AONBs or National Parks?

Yes No

No comment

Question 122

Should permitted development rights for air source heat pumps within Conservation Areas and World Heritage Sites be removed where any external element of the heat pump within the curtilage of the building is mounted on a wall that faces onto a road and is visible from that road?

Yes No

No comment

Question 123

Should permitted development rights for air source heat pumps be removed in ASSIs and Sites of Archaeological Interest?

Yes No

No comment

Question 124

Should permitted development rights for air source heat pumps within the curtilage of a Listed Building be removed only where Listed Building Consent for the development has not previously been granted?

Yes No

No comment

DOMESTIC MICROGENERATION

Question 1

Should restriction on permitted development rights for roof mounted solar panels on a dwellinghouse in ASSIs be removed on the basis that such development would not prejudice the reason for ASSI designation?

Yes No

No comment

Question 2

Should restriction on permitted development rights for wall mounted solar panels on a dwellinghouse in ASSIs be removed on the basis that such development would not prejudice the reason for ASSI designation?

Yes No

No comment

Question 3

Should permitted development rights for free standing solar panels within the curtilage of a dwellinghouse in ASSIs and Sites of Archaeological Interest be removed?

Yes No

No comment

Question 4

Should permitted development rights for biomass fuel containers within the curtilage of a dwellinghouse in ASSIs and Sites of Archaeological Interest be removed?

Yes No

No comment

Question 5

Should permitted development rights for building mounted wind turbines on dwellinghouses in ASSIs be removed as a precautionary measure to protect bats and birds?

Yes No

No comment

Question 6

Should permitted development rights for free standing wind turbines within the curtilage of a dwellinghouse in ASSIs and Sites of Archaeological Interest be removed?

Yes No

No comment

Question 7

Should restrictions on permitted development rights for flues within the curtilage of a dwellinghouse in ASSIs be removed on the basis that such development would not prejudice the reason for ASSI designation?

Yes No

No comment

Question 8

Should permitted development rights for ground source heat pumps within the curtilage of a dwellinghouse in ASSIs and Sites of Archaeological Interest be removed?

Yes No

No comment

Question 9

Should permitted development rights for water source heat pumps within the curtilage of a dwellinghouse in ASSIs and Sites of Archaeological Interest be removed?

Yes No

No comment

Question 10

Should permitted development rights for air source heat pumps within the curtilage of a dwellinghouse in ASSIs and Sites of Archaeological Interest be removed?

Yes No

No comment

Proposed Permitted Development Rights for Microgeneration Development Consultation

Additional comments/amplification to Consultation Questions by Arqiva Ltd

Arqiva Ltd

1. Following approval by the Competition Commission Arqiva merged with National Grid Wireless towards the end of 2008 and the combined entity trades under that name.
2. Arqiva owns and operates the whole of the terrestrial radio and television networks across the UK including in Northern Ireland.
3. Arqiva also provides sites and services to other electronic communications operators and in Northern Ireland we own and operate the T-Mobile network.
4. All our sites are available for sharing by other public service operators and for networks operated by or for the emergency services.

Broadcast Issues

5. We are pleased to see at Pages 71 and 72 of the Review by your consultants Entec that the representations we submitted on the domestic consultation, as National Grid Wireless (but jointly with Arqiva), have also been taken into account as the same issues are clearly raised.
6. One matter that we would like to clarify is that there are two ways in which a wind turbine might affect broadcast services. The first is by actually physically blocking signals used to link sites within the network or to the broadcast studios. If such links are broken this can effect the integrity of the broadcast network and in extreme cases has the potential to cause severe disruption to broadcast services over a wide area. Arqiva is especially interested in this issue as it relates to the integrity of the broadcast networks which we are responsible for.
7. The second effect is the potential effect on viewer reception that can be caused by both blocking and the deflection of signals. In other words the network itself is

operating normally, but some viewers may have their reception interfered with. This issue is more a concern of the broadcasters and OFCOM.

8. Both these issues are well summarised in a document published by OFCOM on 26 August 2009 entitled "Tall structures and their impact on broadcast and other wireless services". To assist, we attach a copy with our response.

Amplification to answers to some Consultation Questions

Q.4 Do you agree that permitted development in non-domestic land uses should be for microgeneration development that primarily provides heat or energy for use within the curtilage of the non-domestic building or on the agricultural unit?

No. We can envisage circumstances where the underlying assumption to this does not apply.

As highlighted above we own and operate the T-Mobile network. Like all mobile operators, T-Mobile is looking to share its network with another operator – in their case "3". This drive to consolidate networks has the apparent acquiescence of OFCOM, not least because it should lower operating costs and so reduce the cost of public services. The main saving in costs is anticipated to be through decommissioning selected sites.

Any tower sites that become redundant to electronic communications have an obvious possible alternative use in being redeveloped for wind turbines. This is because the issues identified at 3.2 of the Review have many similarities between the two different forms of development. If permitted development rights are conditional as suggested, this would deny them from locations already largely established to be acceptable for wind turbines.

Indeed, having regard to Policy RE1 of the now published PPS18, it is evident that main potential impacts identified in the policy criteria are not only similar, but with developed

radio tower sites, already addressed. Thus, having regard to the general criteria, we comment as follows:

a) Public safety, human health, or residential amenity

These same issues would have already been addressed as part of the grant of planning permission for a radio tower, either by way of previous permitted development rights or with the benefit of full planning permission. In particular sites would be generally set away and/or screened from existing residential properties, with an adequate fall zone in the event of structural failure.

b) Visual amenity and landscape character

Again the issue of the potential visual impact of a large structure and its effect on landscape character would have formed a large part in any decision to grant planning permission, under whichever route. With existing radio tower site, there is the added advantage that insofar as the structure may be visible, it is likely over time to have become an accepted feature in the landscape. Such a factor would be advantageous over the alternative of developing a virgin site for a new wind turbine.

c) Biodiversity, nature conservation or built heritage interests

Radio tower sites would only have been permitted where these issues have been addressed and judged acceptable. Furthermore it would make sense to encourage wind turbines on sites that are already developed for infrastructure purposes as these are most likely to have little or no such affect on such interests.

d) Local natural resources, such as air quality or water quality

The redevelopment of radio tower sites for wind turbines would have a positive impact as it would lessen the impact on natural resources. The sites are already developed with physical features such as vehicular access tracks, security compounds, power supply, hardstanding and foundation bases, some or all of which could be reused.

e) Public access to the countryside

Radio tower sites do not impede public access to the countryside and their redevelopment for wind turbines would not alter this.

With reference to the specific RE1 criteria in relation to Wind Energy Development, we further observe:

- (i) **That the development will not have an unacceptable impact on visual amenity or landscape character through: the number, scale, size and siting of turbines**

In addition to the above comments the permitted development limitations will ensure this.

- (ii) **That the development has taken into consideration the cumulative impact of existing wind turbines, those which have permissions and those that are currently the subject of valid but undetermined applications**

This issue will also be effectively addressed through the limitations imposed.

- (iii) **That the development will not create a significant risk of landslide or bog burst**

If the site has already been developed and used for a radio tower no such risk should arise.

- (iv) **That no part of the development will give rise to unacceptable electromagnetic interference to communications installation; radar or air traffic control systems; emergency services communication; or other telecommunications systems**

Redundant radio tower sites are least likely to give rise to these issues – they will already be set apart from other systems; they have to be outwith aviation safeguarded areas and airfield operators will have already been notified about their existence.

- (v) That no part of the development will have an unacceptable impact on roads, rail or aviation safety**

These issues will have already been addressed in allowing a radio tower, but can be protected further if necessary by means of limitations and/or conditions attached to any permitted development rights.

- (vi) That the development will not cause significant harm to the safety or amenity of any sensitive receptors (including future occupants of committed developments) arising from noise, shadow flicker; ice throw; and reflected light**

Any existing or committed development will either have been permitted with the radio mast present or vice versa. Insofar as issues such as noise or shadow flicker may be new or different these can be addressed through limitations/conditions.

- (vii) That above-ground redundant plant (including turbines), buildings and associated infrastructure shall be removed and the site restored to an agreed standard appropriate to its location.**

This will be addressed through a standard condition attached to any permitted development rights.

In conclusion, a compelling case exists to extend permitted development rights in circumstances like this. Such circumstances could exist with development for other utilities, such as water towers. A standard condition linking power generation and usage would frustrate such opportunities for no real planning purpose. Such a condition would therefore inappropriately place constraints on development that has the potential to strike a good balance between operational and environmental factors.

Q.48 Should the potential impact of building mounted wind turbines on telecommunications systems be addressed through the publication of guidance material on the best way to site wind turbines to reduce the risk of electromagnetic interference?

Guidance material is to be welcomed and we have provided a copy of the document issued by OFCOM and which had our input. We have also been working with the British Wind Energy Association in the guidance they hope to issue to planning authorities and developers. If the Planning Service wanted to produce its own guidance we would be pleased to similarly assist.

However, we do have a concern that guidance on its own may not be sufficient as there would be no mechanism for ensuring that it is followed. We therefore refer you to our suggestion below.

Questions 35, 36, 37 and 54, 55 and 56 – the suggested size limitations for building mounted and free standing turbines

With the size limits proposed, we consider it unlikely that any fixed links associated with the broadcast networks we operate would be affected. However, this is not certain as the issue is so dependent on precise circumstances. For example, we have had to object previously to a multi storey development proposed in the centre of Belfast because it would have cut the link between the BBC building and the main transmission mast at Divis. The solution was for the development to be reduced by a storey, i.e. about 3 metres. In England we have also had to object to an application for a wind turbine proposed on the roof of a supermarket as that had the potential to interfere with a link. The solution there was to resite the turbine on a different part of the roof.

In view of this risk, we recommend that any permitted development rights for wind turbines, either building mounted or freestanding, be subject to a condition. That should make the rights conditional upon the developer being given clearance under the procedures set out in 4.2 of the OFCOM document and the separate check necessary in relation to our rebroadcast links set out at paragraph 4.3.

Q. 53 Subject to the further limits outlined later in this paper, should permitted development rights for free standing wind turbines in non-domestic land uses be allowed up to a maximum height of 15 m above ground level?

Not in every case. The permitted development rights should allow the replacement of an existing high structure up to a maximum height of 15 metres or the height of the structure being replaced, whichever the greater. Thus, for example, if an existing 25 metre high radio tower is redundant it could be replaced by a larger than usual wind turbine. This would also be subject to our suggestion above.

Arqiva Ltd
January 2010



Tall structures and their impact on broadcast and other wireless services

Publication date:

26 August 2009

Contents

Section		Page
1	Foreword	1
2	Introduction 2	
3	How structures affect wireless services	3
4	Assessment of impact	8
5	Remedial measures for TV reception	11
6	Further information	13
Annex		Page
1	The impact of wind farms on domestic television reception – technical details	15

Section 1

Foreword

1.1 Purpose of this document

Large building developments and structures such as wind turbines can affect reception of wireless services, including domestic television reception. This document is intended to provide an overview of the issues for developers and Local Planning Authorities and of the mitigation measures that might be taken by households affected. It also gives sources for further information and advice.

1.2 Ofcom's role and duties

Ofcom is a regulatory body that is independent from Government. We are given powers and duties by Acts of Parliament. Ofcom's primary duties are set out in the Communications Act 2003. These include ensuring optimal use of the electromagnetic spectrum (sometimes called the radio spectrum or 'the airwaves').

Under the Wireless Telegraphy Act 2006, Ofcom is also responsible for protecting the spectrum from interference or abuse, which may be either deliberately or unintentionally caused. We offer an interference investigation service with field officers that are able to look into complaints of interference to domestic TV and radio reception or business radio. We have legal powers to deal with interference where the cause is due to illegal or malfunctioning electrical equipment.

We do not have any powers or means of providing a remedy if the cause of the interference is due to generally poor signal levels in a particular area, or if it is due to a physical obstruction, or signal reflection, from such a large new building or wind turbine. Therefore we aim to provide information to developers and planners so that potential issues can be identified and appropriate remedies planned at an early stage of a project to minimise inconvenience and disruption later.

Ofcom gratefully acknowledges the assistance of the BBC in compiling this document.

Section 2

Introduction

2.1 The impact of new structures on reception of wireless services

Tall buildings and structures can disrupt wireless services. We recommend that consideration of the impact of a new development on wireless services is undertaken at the design and planning stages.

Developers can assess any consequential impact that their development may have on wireless services before the development takes place and allow for any mitigation measures at the planning stage. This should reduce the likelihood of unexpected problems arising during or after the development has taken place.

Local Planning Authorities can take into account the impact of a development on wireless services when considering planning applications and can choose to put proportionate conditions on developers to provide a remedy if appropriate¹.

Ofcom has produced this note to provide information to developers and local authority planners. It also outlines some of the mitigation measures that might be taken by households or communities affected by a development and gives sources of further information and advice.

2.2 Wireless services

'Wireless service' is a general term for any technology that sends signals from one device to another without the two being connected by wires. Instead, signals are transmitted in the radio spectrum using electromagnetic waves.

In this document we consider wireless services that might commonly be affected by building developments. These may be broadcast services for reception by members of the public (for example television), business radio (for example voice or data communications between commercial premises) or point to point microwave fixed links (for example the interconnecting infrastructure to mobile phone base stations).

¹ Under section 106 of the Town and Country Planning Act 1990 [in England and Wales], section 75 of the Town and Country Planning (Scotland) Act 1997 [in Scotland] or section 40 of the Planning (Northern Ireland) Order 1991 [in Northern Ireland].

Section 3

How structures affect wireless services

3.1 Background

In the majority of cases, new building developments such as housing, low-rise office developments and building extensions will have no significant effect upon wireless services.

Problems are more likely to occur if a building or structure is constructed which is significantly taller than those around it, or is on high ground. In general, wireless services work best if there is a clear path between the source of the signal (the transmitter) and its intended destination (the receiver). Large structures within, or near to, this path can affect the signals. This may lead to a degrading of the performance or even a complete loss of a wireless service.

There are two potential mechanisms that can cause problems to wireless services: physical blocking of the signal by the structure; and reflection from the sides of the structure.

3.2 Signal blocking

Wireless signals, especially those using relatively high frequencies such as television, behave much like light. Therefore it is desirable to have a clear line of sight path between the transmitter and a receiving aerial in order to achieve the most reliable reception. The presence of a tall structure between the transmitter and receiver will cause a 'shadow' to be cast behind the structure on the side opposite the transmitter. This effect is similar to the way that an obstruction between a lamp and an observer's eye blocks out the light.

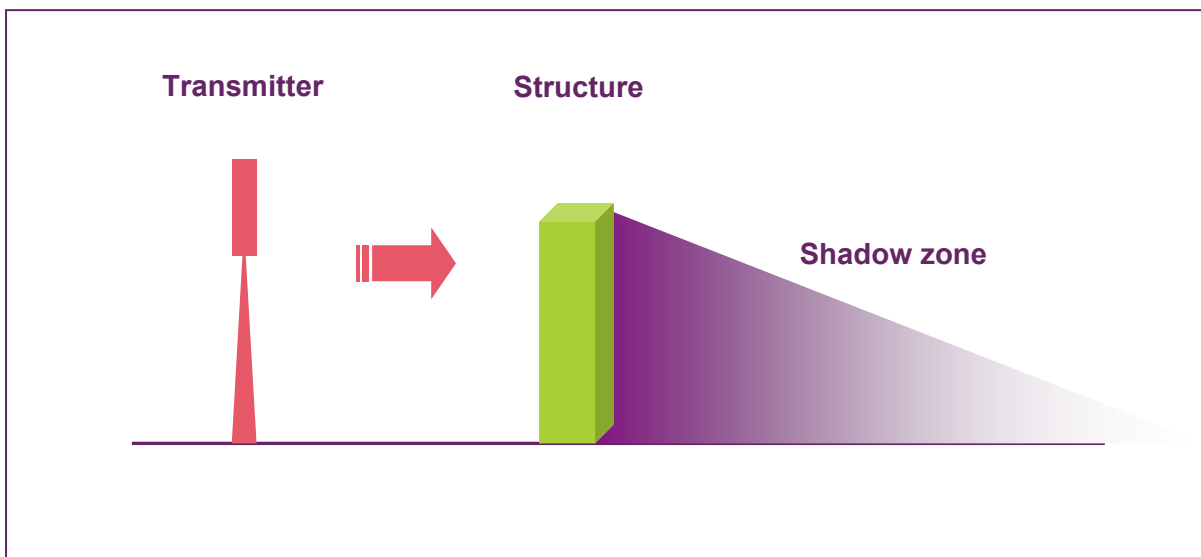


Figure 1 – The area behind a building affected by signal blocking

The shadow cast by a structure does not have hard edges though and does not usually extend indefinitely. While there would be a large reduction in signal levels immediately behind the structure, the blocking effect of the structure diminishes with distance because of diffraction. Diffraction is a process where signals appear to bend behind the structure and partially fill in the shadow.

In general, there will be three 'zones' behind the structure:

Zone A - close behind the structure (typically a few tens of metres) there may be a large reduction in signal level with a possible complete loss of reception

Zone B - further away (typically a few hundred metres) the signal reduction is less severe and the shadow will be smaller as diffraction effects partially fill in the shadow. Depending on the size of the structure, some locations could still lose reception completely

Zone C - some distance away (1-5km) the shadow will effectively have disappeared

The resulting shadow is therefore a triangular shape as shown in Figure 2.

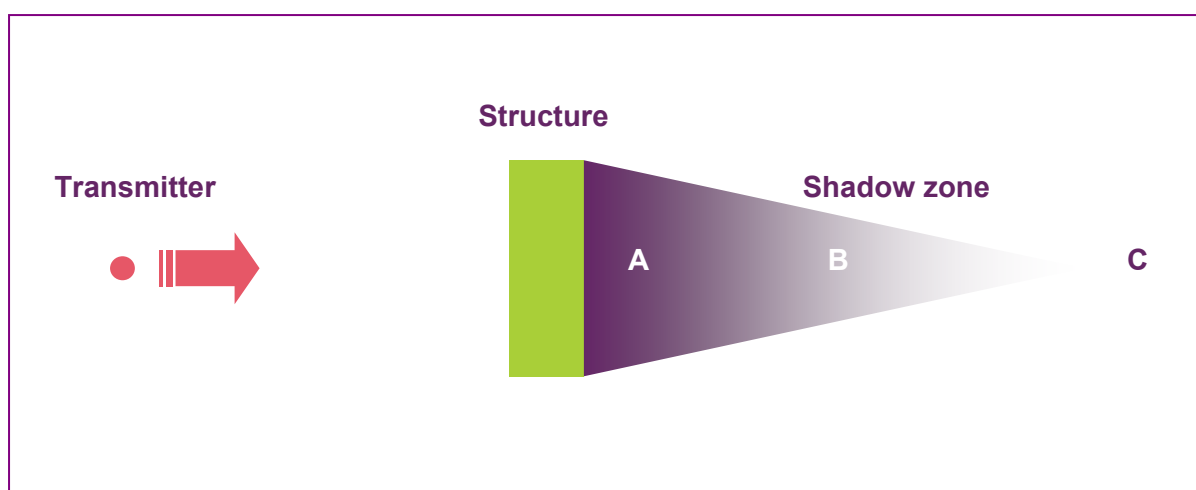


Figure 2 – Plan view of a structure's shadow

It should be noted that the severity of the reduction and the actual size of the shadow will depend upon many factors including the construction of the structure and its height - the distances given above are for guidance only.

3.3 Signal reflection

Like light, wireless signals can also be reflected from the sides of structures. Signal reflections are commonplace - houses, roads and even natural features such as hills and trees can reflect signals. In many cases, these surfaces are not very good reflectors, so the reflected signals are relatively weak. However, if a building is clad in a reflective material (like metal sheeting) or has a steel frame or reinforcing (which is common in large buildings), the reflections can be quite strong.

Furthermore, if the structure is moving, as in the case of a wind turbine's rotating blades, the reflections will fluctuate and be quite complex. The nature of the reflections will largely depend upon the rotational speed of the blades, and upon the varying angle of the blades to the source of the signal and the receiver.

Reflections can sometimes cause reception problems. Difficulties are usually, though not exclusively, evident on analogue wireless systems (digital systems are usually much more resistant to the effects of reflections). The effect is caused when the aerial receiving a signal from a transmitter also picks up a signal that has been reflected from a structure. The reflected signal takes a longer path and therefore arrives at the receiver later than the direct signal. If the reflected signals are quite strong, reception of some wireless services can be affected, even at locations that are not in the shadow of the structure.

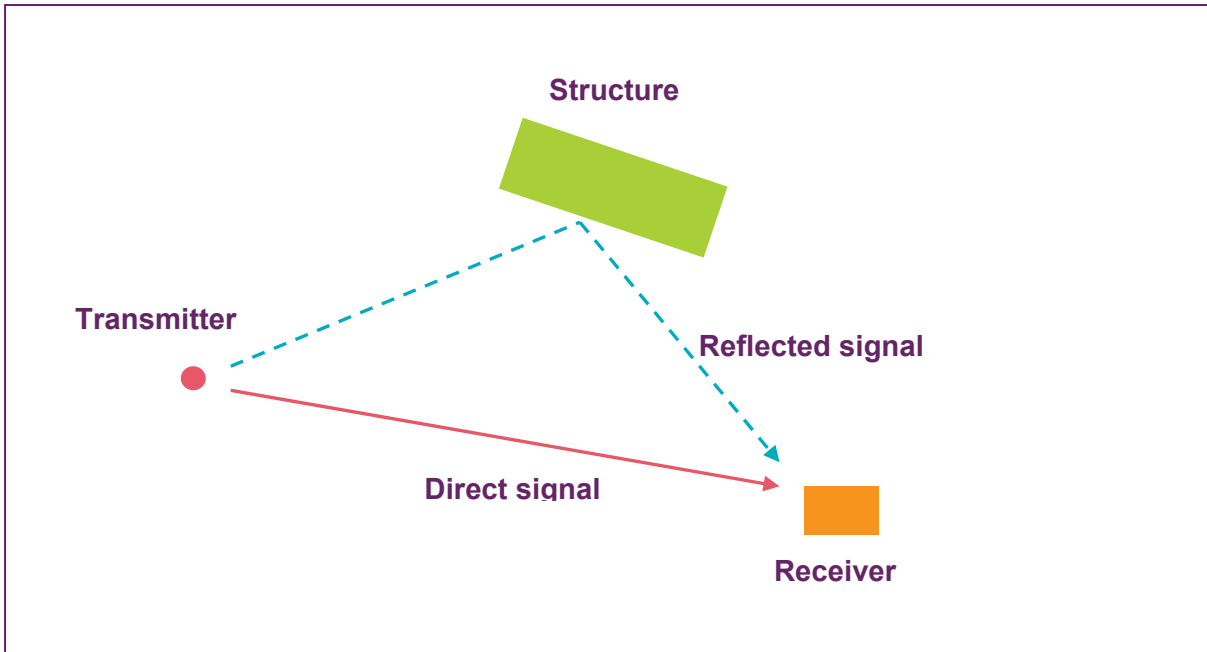


Figure 3 – Direct and reflected signals

Reflections potentially affect receivers all around a structure and the reflection zone can be thought of as a circle with the structure in the middle. Where the receiver uses an aerial that is designed to receive signals better in some directions than others (known as a directional aerial) the shape of the zone within which reception might be affected becomes a 'keyhole' shape as illustrated in Figure 4. Most domestic television aerials are directional.

The radius of the hole around the structure is usually limited to less than a few tens of metres, perhaps extending to a few hundred metres for a very tall and reflective structure. The 'slot' part of the keyhole may extend for some kilometres, but typically for no more than 5km. The zone may be larger, particularly if the development is sited on much higher ground than the surrounding areas, as may happen with a wind farm. Reports have been received of reflection effects affecting broadcast television up to 20km from the structure, although this has only occurred in exceptional circumstances.

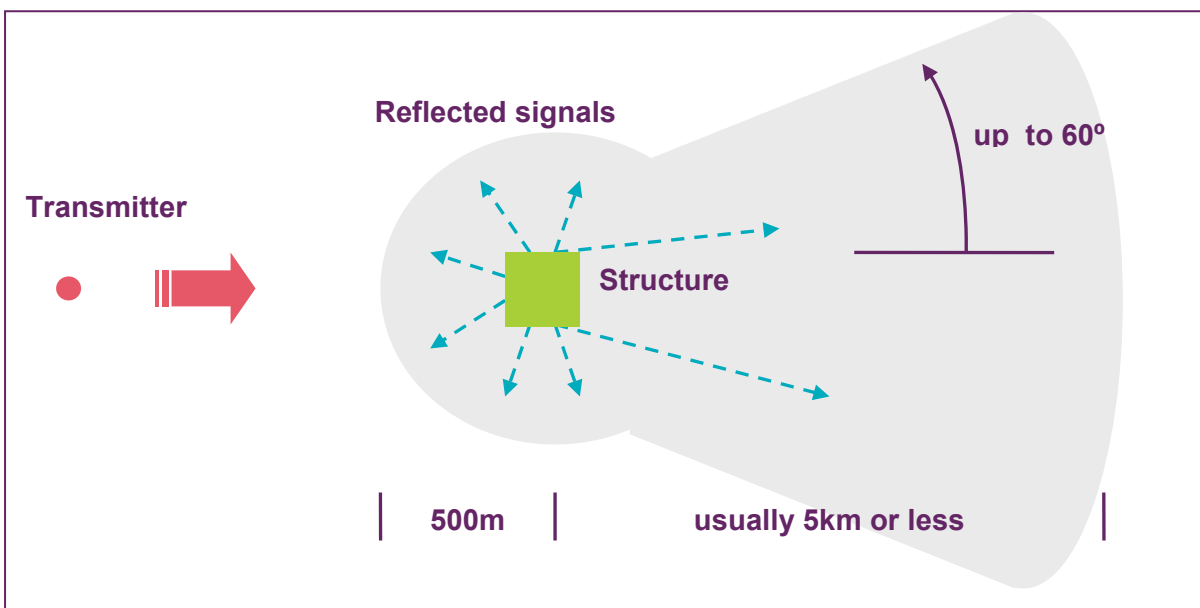


Figure 4 – Plan view of the area potentially affected by signals reflected by a structure

3.4 Effect on broadcast television services

Technologies such as analogue television are quite seriously affected by signal reflections, which can give rise to an effect known as 'ghosting'. Ghosting (or delayed image interference) is where a pale shadow or shadows appear to the right of the main picture on viewers' television screens. The reception of teletext on analogue TV can also be affected with an increase in the number corrupted characters displayed. Analogue terrestrial television will be phased out in the UK as digital TV switchover progresses. Switchover will be complete, and no analogue TV transmissions will remain, by the end of 2012.

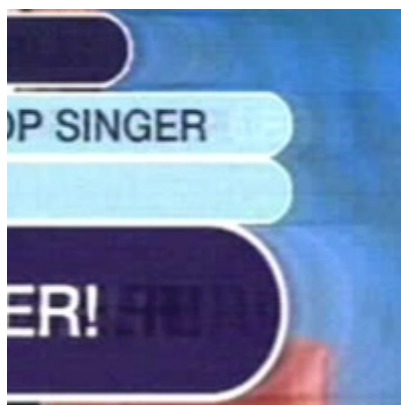


Figure 5 – 'Ghosting' on an analogue television picture

Digital television signals are much better at coping with signal reflections, and digital television pictures do not suffer from ghosting. However a digital receiver that has to deal with reflections needs a somewhat higher signal level than one that has to deal with the direct path only. This can mean that viewers in areas where digital signals are fairly weak can experience interruptions to their reception should new reflections appear. Over time, this problem is expected to diminish as the power of transmitters is increased as digital switchover continues across the UK. However, higher transmitter powers will not be a solution in all situations which means that reflections may still affect digital television reception in some areas, although the extent of the problem should be far less than for analogue television.

3.5 Impact on other terrestrial broadcasts

Although reports of new structures causing problems to radio reception are rare, the possibility of difficulties cannot be ruled out entirely. Broadcast radio (FM, AM and DAB digital radio) are transmitted on lower frequencies than those used by terrestrial TV signals. Lower frequency signals tend to pass through obstructions more easily than the higher-frequency TV signals, and diffraction effects also become more significant at lower frequencies. Both these factors will tend to lessen the impact of new structures on radio reception.

Strong signal reflections will reduce the quality of FM reception leading to fluttering noises or sound distortion. In contrast, the signal format used for DAB digital radio is designed to offer high levels of robustness in difficult conditions and it is not materially affected by reflections. FM and DAB reception can be affected where a structure blocks signals and both may cease to function if signals are reduced below a certain threshold.

3.6 Satellite television reception

Satellite TV reception is not generally affected by new structures unless the development blocks the 'line-of-sight' between a dish antenna and the satellite in the sky. While terrestrial TV aerials are generally mounted to receive signals in line with the horizon, and are therefore liable to be blocked by taller structures, satellite signals are received from a much higher elevation. This means that disruption to satellite reception is usually limited only to cases where a tall building is erected very close to an existing building.

The line of sight path from a dish to a satellite will depend on the location in the UK. For the Astra satellites at 28.2°E, the dish elevation will vary between about 26° and 24° in the very south of England, reducing to around 17° in the far north of Scotland. If the new structure does not obstruct this angle to dishes on adjacent buildings, it is unlikely to cause a problem to reception of the most commonly used satellites. Switching to digital satellite reception may therefore be a solution in cases where terrestrial reception is blocked by a new structure.

In Figure 5 a tall structure blocks the path between the terrestrial transmitter and a viewer's property. However, the angle of elevation of the satellite (β) is greater than the angle (α) from the top of the structure to the viewer's house and satellite reception is therefore not affected by the structure.

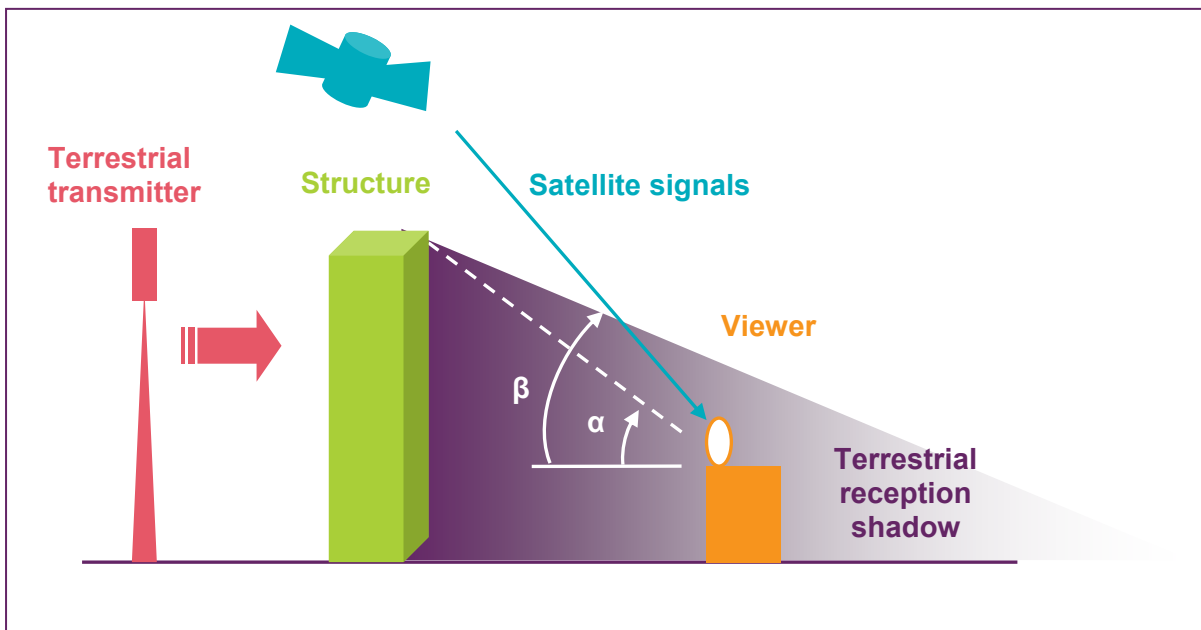


Figure 5 – Satellite reception not affected by a new structure

3.7 Fixed links

Ofcom licenses a large number of fixed wireless services over a wide range of frequencies. These are known as fixed links and are used by licensees for a number of uses; example uses are remote monitoring of unattended equipment (scanning telemetry), data transfer between business premises and voice communication. Because of the wide range of frequencies and distances involved, it is difficult to generalise on the impact that a development may have. Those links that use higher frequencies in the gigahertz range (such as microwave links) are mostly affected by physical blocking. Some links use lower frequencies and these can also be affected by reflections. Further information is available in section 4 of this document.

Section 4

Assessment of impact

4.1 Broadcast reception

Rooftop test

In the case of new building developments, a simple rule of thumb that can be used as an initial assessment of whether a new development might cause a reception problem is the 'rooftop test'. In simple terms, if the proposed development is of a similar height to the surrounding buildings it is unlikely to have any effect upon signals in the neighbourhood.

Even where a building is somewhat taller than those in the surrounding area, it will not necessarily lead to reception difficulties. Much will depend upon local signal strengths, the location of the transmitter(s) serving the area, the type of aerials used by householders and the direction they are pointing in relation to the new structure.

Commissioning a desktop assessment

Developers wishing to investigate the possible impact of a development can commission an assessment on a private basis from a suitably competent consultant organisation. Organisations offering wireless network planning or spectrum planning services are often suitably equipped to carry out such an assessment. Desktop assessments vary in complexity, but generally take into account transmitter and proposed development locations and consider whether there is a possibility that any households in the area would suffer reception problems.

Some further detailed technical information that may be useful to those making assessments is provided in Appendix 1 of this document. In the specific case of wind farms, the BBC provides an on-line tool (see Section 6.26.2) which is intended to offer an initial assessment of a turbine's potential impact on television reception.

Neither Ofcom nor the broadcasters (BBC, ITV etc.) offer advice on the potential effects of individual proposed developments on broadcast reception.

Reception surveys

Desktop surveys provide an indication a development's potential to affect reception. However, the only definitive quantitative way to determine whether a building development has had an effect upon television reception is to carry out a reception survey of the affected area. Two surveys would be required: one to assess the quality of reception prior to the commencement of any building work, and one after completion. Ofcom does not carry out this kind of survey, and the developer would need to engage the services of a suitably equipped contractor.

As a minimum, a reception survey should make measurements of a number of parameters at intervals that are appropriate to the density of the local population and the size of the development. For example, it may be appropriate to measure every few metres in a densely populated area, whereas much larger measurement intervals may be appropriate in sparsely populated rural areas, perhaps at individual properties. For a comprehensive survey, measurements of the following parameters should be made for each channel broadcast from the transmitter:

- i) An assessment of which transmitter is in use by viewers.
- ii) Measured field strength at 10m height.
- iii) For analogue TV services, an assessment of the picture and sound quality to the 5 point scale².
- iv) For digital TV services, a measurement of carrier-to-noise (C/N) ratio, Modulation Error Ratio (MER), pre-viterbi Bit Error Rate (BER) or similar parameters, in order to provide an indication of available decoding margin and/or absolute signal quality.
- v) Note of any impairments such as ghosting, patterning, and break-up on the picture, or of buzzing, clicking and break-up on the sound.
- vi) If ghosting or 'ringing' is evident on the analogue picture, a check should be made for the presence of any corrupted characters on the teletext display on a domestic television set.

4.2 Fixed wireless links and wind farms

Ofcom provides a fixed link clearance service to help ensure compatibility between proposed wind turbines and existing fixed point to point links that make use of Ofcom-assigned spectrum. When Ofcom are notified of a proposed wind farm location, we will carry out the following:

- i) For fixed link systems above 1 GHz which are assigned and licensed by Ofcom, a check is made to determine whether any part of the wind farm falls either within 500 metres of the path between the link terminal locations or within 500m of the terminals themselves.
- ii) If either check is positive, then Ofcom will provide the wind farm proposer with the fixed link licence number(s) and contact details for the licensees identified so that the wind farm developer can liaise with the appropriate fixed link system operator(s) for further co-ordination.
- iii) For scanning telemetry systems Ofcom will endeavour, where practicable, to forward the received wind farm clearance requests to Atkins Ltd and the Joint Radio Company (JRC), who carry out the clearance process for scanning telemetry links in their assigned spectrum. They will check whether any part of the wind farm falls within 1 kilometre of the path between the link terminals, or the terminals themselves, of a point to multi-point system operating between 457.5 MHz to 464 MHz. Although Ofcom will endeavour to forward received requests, wind farm proposers are advised to also email, or send postal requests, direct to Atkins Ltd and JRC (contact details are given in Section 6 of this document).

² The 5-point grading scale is a method for classifying picture and sound degradation. The five classes are

Grade 5 imperceptible

Grade 4 perceptible, but not annoying

Grade 3 slightly annoying

Grade 2 annoying

Grade 1 very annoying

Full details are set out in the International Telecommunication Union's publication ITU-R BT.500.

- iv) Atkins Ltd and JRC will respond directly to the wind farm developer with the results of the clearance check, Ofcom has no further involvement in the process.

More information on our wind farm clearance procedures is available on our website at www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/Windfarms/.

4.3 Television re-broadcast links

In some areas, the broadcasters use small relay transmitters to fill in local reception deficiencies. These relay transmitters pick up signals from one of the UK's main transmitters and re-broadcast them. This is called a re-broadcast link.

As well as affecting domestic reception directly, large structures can interrupt the signals that pass between a main television transmitter and smaller relay transmitters. There are around 50 main transmitters and over 1,100 smaller relay transmitters located around the UK.

The broadcasters use the transmission company Arqiva to distribute and transmit their programmes. Arqiva would be able to comment on whether a proposed development might cause a problem to one of the re-broadcast links between a main transmitter and a relay. Contact details for Arqiva are given in section 6.4.

Section 5

Remedial measures for TV reception

5.1 General

The following information concentrates on TV reception rather than other wireless services, as television is the technology most widely affected by new developments.

Where television reception is affected by a new development, there are a number of potential options for restoring reception. The choice of mitigation option will depend on local circumstances, and not all remedial measures will be available or appropriate in all cases.

5.2 Improvements to existing aerial installations

In cases of mild to moderate disruption to TV reception, it is sometimes possible to restore services by improving the quality of the existing aerial installation. For example, installing a higher gain external aerial may improve the received signal levels. Finding an alternative mounting point for the aerial where the effect of an obstruction is less pronounced, may also help. The higher an aerial is mounted from the ground, the greater the signal strength it is likely to receive.

If the problem is due to signal reflections, a more directional aerial may help reduce the severity of ghosting on analogue TV. Where signals are being reflected into the back of a viewer's aerial, it may be possible to reduce the problem by replacing the aerial with one that has a higher rejection to signals from the rear (known as a higher front to back ratio). More information is provided in Annex 1.

5.3 Reception from alternative transmitters

Because the coverage areas of neighbouring TV transmitters often overlap slightly, many viewers are potentially covered by more than one TV transmitter. Viewers affected by a new development may therefore be able to receive unobstructed signals from an alternative transmitter. Re-directing household aerials to the new transmitter would be required, and new aerials may need to be installed. Note that the national and regional variations carried by the alternative transmitter may not always match local viewers' preferences.

Digital UK provide a postcode checker, www.digitaluk.co.uk/postcodechecker, which offers an indication of which analogue and digital transmitters are likely to serve individual postcodes. These results should ideally be confirmed by local reception surveys in areas where disruption due to new developments may occur.

5.4 Digital terrestrial reception

Digital terrestrial TV (Freeview, or DTT), offers a high degree of resistance to some of the signal impairments (particularly delayed image interference) which can spoil analogue TV reception, and may offer an alternative in areas where digital coverage is available. However, until digital switchover takes place, the power of the Freeview transmitter network is necessarily restricted to deliberately low levels, and most lower-powered 'relay' transmitters will not carry digital signals in advance of digital switchover.

Digital transmitter powers will however be increased to around ten times current levels when digital switchover takes place in each region of the UK. At the same time, digital signals will be added to the relay transmitter network. These improvements will greatly increase the

availability and robustness of digital terrestrial reception. More information on the schedule for digital switchover is available from Digital UK at www.digitaluk.co.uk.

5.5 Satellite and cable reception

Satellite and cable services can offer an alternative means of receiving TV in areas where terrestrial coverage is impaired or unavailable. Cable services are generally only offered on a subscription basis, and have limited geographic availability.

Satellite TV is available over nearly the whole UK, and can offer both subscription and non-subscription services. Sky's websites, www.sky.com and www.freesatfromsky.co.uk offer information on their subscription and subscription-free services respectively, and www.freesat.co.uk offers information on subscription-free services on the separate 'Freesat' service from the BBC and ITV.

5.6 Construction of a digital 'self-help' transmitter

Self-help transmitters are low power 'relay' transmitters, which are constructed and operated on a private basis. A self-help transmitter may offer a means of restoring terrestrial TV reception to a community affected by a new development.

Because self-help transmitters use frequencies which are primarily allocated for use by the broadcasters, prospective self-help operators need to obtain a Wireless Telegraphy (WT) Act licence from Ofcom. Licences can only be issued in areas where sufficient interference-free transmission frequencies are available, and where the operation of a self-help transmitter would not impact on current or anticipated alternative uses of these frequencies, or on the efficient use of the spectrum more generally.

Self-help licences can only be issued for relaying digital terrestrial (not analogue) services, and Ofcom will normally only consider applications for new self-help transmitters in regions which have undergone digital switchover. This is because the coverage and interference characteristics of terrestrial TV services will change at switchover. It may therefore be that digital reception becomes possible from one of the broadcaster-maintained transmitters at switchover, even though analogue reception (or digital reception from the pre-switchover digital network) is not currently available, or is impaired.

As privately operated systems, funds for building a self-help transmitter would need to be secured by the operator. In the case of reception disruption due to a new development, these costs would normally fall to the developer. In addition, Ofcom would normally pass on the costs of the frequency planning work required for each proposed self-help transmitter to the applicant.

More information on Ofcom's policy on licensing digital self-help transmitters is available on our website at www.ofcom.org.uk/consult/condocs/selfhelp/statement/.

Section 6

Further information

Please note that neither Ofcom nor the BBC will comment in detail on individual developments.

6.1 Ofcom

Ofcom wind farm clearance for fixed links

www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/Windfarms

Television transmitter lists and location maps

Ofcom produces maps showing the locations of the UK's TV transmitters, as well as lists of the frequencies and powers used by the transmitter networks. These are available at www.ofcom.org.uk/tv/ifi/tech.

Ofcom Advisory Team (for interference and general enquiries)

Riverside House

2a Southwark Bridge Road

London

SE1 9HA

tel: 020 7981 3040

www.ofcom.org.uk/contactus

6.2 BBC

The BBC provides an internet-based wind farm assessment tool, which is intended to provide a 'first pass' indication of whether reception problems might be caused by wind turbines. The tool is not intended to provide an alternative to more detailed desktop or field studies of potential impact, and developers should not rely on the tool as the sole means of gauging possible problems. The tool, and notes on its use, are available at:

www.bbc.co.uk/reception/info/windfarms.shtml

BBC Reception Advice

PO Box 1922

Glasgow G2 3WT

tel: 03700 100 123

www.bbc.co.uk/reception

6.3 Digital UK

Information on predicted analogue and digital terrestrial television coverage is available on Digital UK's website at www.digitaluk.co.uk/postcodechecker, along with further information on the switchover timetable and alternative reception options. Select 'I am in the aerial installation trade' for full details of predicted coverage at individual postcodes.

6.4 Arqiva

The transmission company Arqiva can comment on the potential for a development to cause problems with the broadcasters' re-broadcast links.

Arqiva (spectrum planning)
Crawley Court
Winchester
SO21 2QA
email: tim.shergold@arqiva.com

6.5 JRC (Joint Radio Company)

Scanning Telemetry clearance on behalf of the electricity and gas public utilities.

JRC (Joint Radio Company)
Dean Bradley House
52 Horseferry Road
London
SW1P 2AF
email: windfarms@jrc.co.uk

6.6 Atkins Limited

Scanning Telemetry clearance on behalf of the water public utilities and non-public utility licensees.

Atkins Limited
200 Broomielaw
Glasgow
G1 4RU
email: john.jennow@atkinsglobal.com

6.7 Other contacts

BWEA (British Wind Energy Association)
Greencoat House
Francis Street
London SW1P 1DH
Tel: 020 7901 3000
email: info@bwea.com
web: www.bwea.com

Department for Communities & Local Government
Planning Policy Guidance 8: Telecommunications (PPG-8)
www.communities.gov.uk/publications/planningandbuilding/ppg8

Annex 1

The impact of wind farms on domestic television reception – technical details

The nature of wind turbines means that they can present their own distinct issues in relation to TV reception.

Generally, commercial-grade turbines have a number of common characteristics. These are:

- turbines are rarely sited closer than 250 metres away from domestic properties
- the nacelle (the generator housing at the centre of blade rotation) and the blades are typically mounted on a narrow, cylindrical, concrete tower
- the blades are normally constructed of non-metallic material such as GRP, although they invariably contain metallic components such as a strengthening member, lightning conductor and balancing weights
- the orientation of the blades corresponds to the wind direction
- the usual speed of blade rotation is between 15 and 30 RPM

In practice the tower or nacelle rarely have any effect on TV reception; the impact on reception is solely on account of the rotating turbine blades. As the blades are moving objects, in terms of both their rotational speed and orientation, their effect is variable and hard to predict. When the combined effects of a number of turbines that comprise a wind farm are considered, the result is considerably more difficult to predict.

1.1 Shadowing and reflection effects

The two mechanisms responsible for the disruption, as with buildings, are shadowing and reflection effects as described earlier in this document.

The size of the shadow zone is dependent on the orientation of the blades, and is at a maximum when the axis of the rotor is in line with the direction of the transmitted signal. The received signal strength varies in a cyclic manner, in time with the blades' rotation.

Reflection effects vary with the rotation of the blades and the orientation of the nacelle. A further complication is that the strength of the reflected signal is dependent on the length and area of the metallic components inside the blade.

1.2 The area affected

Disruption to analogue television reception is shown as a characteristic flickering of the picture, and can lead to a loss or 'freezing' of digital terrestrial reception. The affected area around the turbine, a combination of the 'shadow' zone, and the 'reflection' zone, is roughly shaped like a keyhole (like that shown in Figure 4). The actual shape and size of this is dependent on the number and type of turbines, and the topography between: the broadcasters' transmitter and the turbine; the broadcasters' transmitter and the viewers' receiving aerials; and the turbine and the viewers' receiving aerials. Nevertheless, for the purposes of assessing the likelihood of interference, the 'shadow' zone may be considered

to be a sector with a radius up to about 5 km, and the 'reflection' zone a circle of radius of about 500 metres. As noted previously, if the wind farm is on a prominent hilltop, reflection effects can be caused to households some distance away, in exceptional circumstances such effects have been noted at up to 20km distant from the wind farm.

1.3 Reduction of a wind farm's impact

The siting of the turbine or turbines can reduce the severity of disruption. If possible, turbines should be at least 500 metres from any viewer. Disruption caused by wind farms with more than one turbine may be reduced if one turbine could be placed within the 'shadow' area of another. The measures to reduce disruption at the location of the affected viewers, outlined in Section 6, are also relevant to the effect of wind turbines. A more directional receiving aerial can be used to reduce the level of delayed image interference, and the information in section 1.5 below illustrates this.

1.4 Assessment of wind farm interference

An indication of the impact a prospective wind turbine may have on television reception can be obtained using the BBC's web-based wind farm assessment tool. Neither the BBC nor Ofcom can carry out assessments of the potential impact of wind farms to terrestrial television reception.

The wind farm assessment tool can be found at:

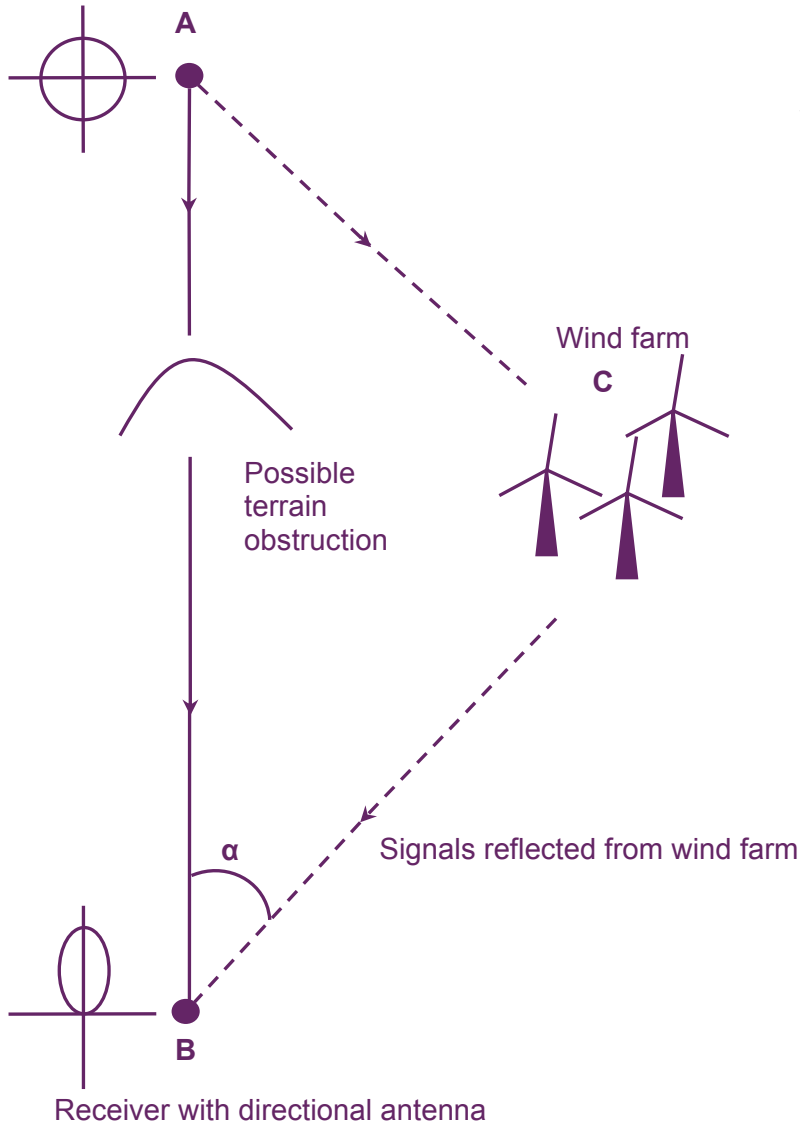
www.bbc.co.uk/reception/info/windfarms.shtml

The tool is not intended to be a substitute for an on-site survey, commissioned by the developer, by which the potential for disruption to television services may more accurately be assessed.

If there is potential for disruption to television reception (predicted or measured) then the broadcasters and Ofcom recommend that local authorities should consider imposing a requirement for the wind farm developer to take remedial action (and this will typically require an on-site survey to determine appropriate remedial measures). These are the same as those given in section 4 of this document.

1.5 Reflection effects from a wind farm

Transmitter with omni-directional antenna



Reflection effects will be worse if path AB is more obstructed by terrain than paths AC and CB.

The spacing of the delayed image (ghost) is dependent on the path difference $(AC+CB)-AB$. A path difference of 2 km gives a delayed image of one eighth of the picture width.

If α is greater than 60° , a standard aerial will normally provide sufficient discrimination against the reflected signal

For α between 15° and 60° , a more directional receiving aerial can be used to reduce the level of reflected signals 'seen' by the receiver.

For α less than 15° even changing to the best available aerial will not help and measures such as seeking reception from an alternative transmitter or platform such as satellite or cable may be necessary.