

Permitted Development Rights for Small Scale Renewable and Low Carbon Energy Technologies, and Electric Vehicle Charging Infrastructure

DCLG Consultation Document - November 2009

This review has been prepared on behalf of the Institute of Acoustics (IOA) in response to the invitation to comment on the *Permitted Development Rights for Small Scale Renewable and Low Carbon Energy Technologies, and Electric Vehicle Charging Infrastructure: Consultation*, published by the Department for Communities and Local Government (DCLG) in November 2009. The comments are based on a review of the consultation document undertaken by the Environmental Noise Group of the IOA on behalf of the IOA Council.

The review recognises that the current consultation document develops the principles expressed in two previous DCLG consultation documents on extending permitted development rights to which the IOA responded (*Changes to Permitted Development Consultation Paper 1: Permitted Development Rights for Householder Microgeneration*, published in April 2007 and *Improving Permitted Development: Consultation*, relating to non-domestic development, published in July 2009).

The Institute of Acoustics

The IOA is the leading professional body in the United Kingdom concerned with acoustics, noise and vibration and is active in research, educational, environmental and industrial organisations. The Institute is a nominated body of the Engineering Council, a member of the International Institute of Noise Control Engineering and the International Commission on Acoustics and a founding member of the European Acoustics Association. Members of the IOA are active in the development of UK, European and International Standards.

The IOA also gives support to the development of legislation in the various disciplines in the field of acoustics and its response to the consultation document is based on this role. The IOA, however, represents a wide range of members and disciplines in acoustics. The comments presented here are the consensus view of the Environmental Noise Group committee representing the 1,425 members of the Institute's Environmental Noise Group which is formed by members who specialise in environmental noise issues as acoustic consultants, local authority officers and academics. A first draft response was circulated to the membership of the IOA Environmental Noise Group for comment. The 20 specific responses received showed a good consensus. The amended draft was subsequently passed to members of the IOA Executive for approval prior to submission.

The review is, therefore, based on a wide-ranging consultation process and is representative of the views of a large body of specialists and experts in the field of environmental noise.

Executive Summary

The Institute of Acoustics has responded in robust terms to the previous consultation documents proposing extensions to permitted development rights for domestic and non-domestic properties and specifically the noise and, where appropriate, vibration, issues relating to the installation of micro-wind turbines and air-source heat pumps. Whilst the IOA agrees that the planning system should not need to regulate development that has no significant impact beyond the host property, it considers that the proposals for micro-wind turbines and air source heat pumps in sections 2-4 of the current consultation document fail to address the significant concerns expressed in our earlier responses and would lead to an increased risk of an adverse noise impact, which could be prevented by the use of appropriate planning conditions.

The Institute considers that the proposed criteria to limit noise from micro-turbines and air-source heat pumps are not appropriate for the following reasons.

- The climate change benefit of the permitted development rights scheme for micro-turbines has, in the past, been over-estimated and over-stated. Therefore in striking a balance between this benefit and the noise impacts, Government must take great care to ensure that noise impact is proportionately limited.
- the impact of the development will normally be dependent not only on the absolute level of noise from the plant but also on existing ambient noise levels, and the proposed noise limit of 45 dB(A) could exceed these ambient levels and lead to disturbance, unacceptable erosion of residential amenity and the risk of statutory nuisance. The IOA considers that, if an absolute noise criterion is to be adopted, this should be limited to 35 dB L_{Aeq} as a precautionary measure to minimise the risk of such these adverse effects;
- the proposed limit takes no account of the acoustic character, which can make noise from these sources more prominent than other sources of ambient noise;
- the proposed controls over cumulative effects do not provide the intended outcome of protecting neighbours from excessive noise;

The IOA concludes, therefore, that permitted development rights should not be extended to micro-turbines and air source heat pumps to be installed at domestic and non-domestic properties, but if the Government considers that the benefits of the scheme outweigh the disadvantages, a lower noise limit of 35dB(A) should be used to reduce the risk of nuisance or disturbance.

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The IOA is primarily concerned with noise and vibration issues and, therefore, this response addresses only those aspects of the proposals that have noise and/or vibration implications. In practice, the only micro-generation systems that potentially have significant noise or vibration implications are wind turbines and air source heat pumps and the response is consequently limited to the consultation proposals relating to these systems. The relevant proposals are set out below, with reference to the table numbers given in sections 3 and 4 of the consultation document:

Table	Installation	Proposed threshold beyond which any potential impacts would need to be considered through a planning application
1	Wind turbine mounted on a detached dwelling house	The noise level from the installation must not exceed 45 dB $L_{Aeq, 5 \text{ min}}$ at 1 metre from the window of a habitable room in the façade of any neighbouring residential property (but ignoring the effect of that façade) and The first installation only of a wind turbine within the curtilage of the property would be permitted and only if there are no existing installations of air source heat pumps within the curtilage of the property. Subsequent installations of wind turbines or air source heat pumps would require planning permission.
2	Wind turbine mounted on a freestanding outbuilding within the curtilage of domestic premises	
3	Stand alone wind turbine within the curtilage of domestic premises	
4	Air source heat pump on a domestic premises	The noise level from the installation must not exceed 45 dB $L_{Aeq, 5 \text{ min}}$ at 1 metre from the window of a habitable room in the façade of any neighbouring residential property (but ignoring the effect of that façade) and The first installation only of an air source heat pump on a building would be permitted and only if there is no existing wind turbine within the curtilage of the property. Subsequent wind turbines or air source heat pumps at the same property would require planning permission.
5	Wind turbine mounted on a detached non-domestic building	
		The noise level from the installation must not exceed 45 dB $L_{Aeq, 5 \text{ min}}$ at 1 metre from the window of a habitable room in the façade of any neighbouring residential property (but ignoring the effect of that façade) and The first installation only of a wind turbine on a building would be permitted and only if there are no existing installations of air source heat pumps on that building. Subsequent installations of wind turbines or air source heat pumps would require planning permission.

Table	Installation	Proposed threshold beyond which any potential impacts would need to be considered through a planning application
6	Stand alone wind turbine on non-domestic premises (other than B2)	<p>The noise level from the installation must not exceed 45 dB $L_{Aeq, 5 \text{ min}}$ at 1 metre from the window of a habitable room in the façade of any neighbouring residential property (but ignoring the effect of that façade)</p> <p>and</p> <p>The first installation only of a wind turbine within the curtilage of the property would be permitted and only if there are no existing installations of air source heat pumps within the curtilage of the property. Subsequent installations of wind turbines or air source heat pumps would require planning permission.</p>
7	Air source heat pump on non-domestic premises (other than B2)	<p>The noise level from the installation must not exceed 45 dB $L_{Aeq, 5 \text{ min}}$ at 1 metre from the window of a habitable room in the façade of any neighbouring residential property (but ignoring the effect of that façade)</p> <p>and</p> <p>The first installation only of an air source heat pump on a building would be permitted and only if there were no existing wind turbine installations. Subsequent installations of air source heat pumps or wind turbines would require planning permission</p>

The proposals relating to noise are, therefore, based on three principles:

- i) controlling vibration (and by implication, structureborne noise) by restricting the use of building mounted wind turbines on residential premises to detached dwelling houses;
- ii) limiting noise from wind turbines or air source heat pumps to 45 dB $L_{Aeq, 5 \text{ mins}}$ to manage the risk of disturbance to neighbouring residential uses; and
- iii) allowing the installation of only one unit on any building, or within the curtilage of the property in question, to manage the risk of cumulative noise impact.

The IOA response to the consultation, given below, is concerned with whether the proposed thresholds provide adequate protection to the occupants of neighbouring noise sensitive properties.

IOA Response to the Consultation Document

The consultation document builds on a number of references, including the draft Planning Policy Statement: *Planning and Climate Change*, published for consultation in December 2006, the Planning White Paper, *Planning for a Sustainable Future*, (May 2007) and the Killian Pretty review of the planning system, published in 2008, as well as the related consultation documents *Changes to Permitted Development Consultation Paper 1: Permitted Development Rights for Householder Microgeneration*, published in April 2007 and *Improving Permitted Development: Consultation*, relating to non-domestic development, published in July 2009. This IOA response draws on these references and, in particular, those relating to the impacts of the latest proposals.

In section 1, paragraph 1.4 of the current consultation document it is stated that:

It is vital that they [small scale microgeneration and electric vehicles] continue to enjoy widespread public support and confidence which means it is important to get their design and operation right. The planning system can play an important role in helping to shape their development in ways that ease their absorption into our existing urban and rural landscapes and guard against undue impacts for example on neighbouring occupiers or the historic environment.

In Section 2 of the *Changes to Permitted Development Consultation Paper 1*, paragraph 27 states

Ministers have made clear that three important principles must underpin these considerations:

- *clear and robust arrangements should be in place so that the interests of neighbours and the wider community and environment are sufficiently protected.*
- *changes to current arrangements should be based on evidence and fully tested*

while at paragraph 29 the view is expressed that

A key recommendation to emerge from the work of the HDCR [Householder Development Consents Review, January 2005] was that future permitted development rights should be informed primarily by their potential impact on others. A starting point would be that the planning system should not be there to regulate development that has no impact beyond the host property.

At Section 3 paragraph 34, it is stated that:

While the Government wants to encourage the widest possible take-up of microgeneration equipment by removing unnecessary regulatory barriers, it is concerned to ensure that the right levels of control are retained to protect the reasonable interests of neighbours, the environment and the wider community.

In the consultation relating to non-domestic properties *Improving Permitted Development: Consultation*, it was stated that:

Changes to householder permitted development rights were introduced in October 2008, based on the principle that developments could take place as permitted development if there were no significant adverse impacts on the amenity of the immediate surroundings.

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Furthermore, at paragraph 5, the Government's 2007 White Paper *Planning for a Sustainable Future* is cited as committing the Government to extending the impact approach to permitted development "... to other types of development such as industrial or commercial buildings as appropriate ... our proposals to extend permitted development rights are aimed at reducing bureaucracy for minor applications which have little or no impact beyond the individual property.

The IOA's response to questions 1 to 4 (do you agree with the proposals for wind turbines/air source heat pumps on domestic/non-domestic premises, as set out in Tables 1 to 7) is based on these fundamental policy statements, that there should be no significant adverse impact, or little or no impact on the amenity of the immediate surroundings in the context of the two proposed thresholds beyond which a planning application would be required.

Uptake

The Institute is particularly concerned about the principles driving the proposals. The consultation paper states that:

It is not thought that the planning system provides the sole legislative/regulatory disincentive. The assumptions for growth in uptake are based on the judgement of consultants. Two growth scenarios are envisaged: the low scenario assumes an increase in uptake of 2 per cent per annum whilst the high scenario projects an increase of 5 per cent per annum as a result of the extension of permitted development rights to this type of development.

The predicted growth as a result of relaxing planning controls is clearly very small and, following the recent publication of the final report of the Encraft Warwick Wind Trials Project, which has shown that the generation of power from micro wind turbines is significantly less than that predicted, take up may even be much lower.

The consultation document shows an estimate that the savings in electricity from the use of renewable energy sources could be 4500 kWh per household (per year). The Encraft report, however, has demonstrated that the average output of micro turbines has been only 78 kWh per year (including downtime), or 230 kWh per year if downtime is excluded.

Given the cost of the installation and the likely modest power generation in practice, the adverse noise impacts of micro wind turbines could be considered to outweigh the relatively small benefit of including the units in the permitted development scheme. If a balance is to be struck between an acceptable noise impact and the climate change benefit of the proposed permitted development rights scheme, then whilst the IOA questions if the current balance is acceptable, we would also suggest that if the climate change benefit has been over-estimated, as it appears it may have (as indicated above), then the implied noise impact must be lessened by tighter noise controls than currently proposed in order to maintain a reasonable balance.

Control of Vibration from Building Mounted Wind Turbines

The IOA is pleased to see that the issue of vibration and subsequent generation of structureborne noise has been recognised and that the proposals for permitted development relating to building mounted wind turbines on domestic properties are limited to detached properties only.

Proposed Threshold – 45 dB $L_{Aeq, 5 \text{ minute}}$ Noise Level

The Institute is familiar with and favours an impact based approach to the assessment of noise and vibration and agrees with the view that the planning system should not need to regulate development that has no impact beyond the host property. It is, however, necessary to provide a definition of impact. In the Institute's view, whilst assessment against absolute criteria may be appropriate in some circumstances, the impact of a development should normally also take account of the *change* from the pre-existing situation that results from the development, unless the threshold is set sufficiently low as to ensure no significant adverse effect.

The sole use of an absolute value, such as the proposed limit of 45 dB L_{Aeq} for external noise does not adequately define an impact. In areas where background noise levels are low, this level would represent a significant change in the environment at the receiver location and, and potentially a significant adverse impact. The specific noise limit proposed, therefore, does not address the matter of ensuring that the permitted development has no significant impact beyond the host property.

In the Institute's view the assessment of impacts from noise should normally include relative criteria that take account of the difference between the noise from the plant and the existing noise climate. In fact, the noise policies of many local authorities require that the noise level resulting from any new noise generating development should be less than the pre-existing background noise level (usually by 5 or 10 dB) to ensure that the impact is not significant and that there is no perceptible change in the ambient noise levels.

This is recognised at Section 2, paragraph 2.10 of the consultation document where it is stated that:

*The most challenging impact to address for wind turbines and air source heat pumps has been noise – what should be the maximum acceptable limit for neighbours, how to address cumulative noise impact and whether there should be special provision for sensitive areas. Complexities arise because our perception of noise levels is highly subjective **and very dependent on context, particularly background noise levels.***

The IOA disagrees with the proposed limit, which it believes is inconsistent with the principles for permitted development cited above, for the following reasons:

The proposed level of 45 dB L_{Aeq} is significantly higher than the level of 37 dB L_{Aeq} originally proposed in the 2007 consultation, which the IOA concluded was already too high and could result in a perceptible change in the noise environment in quiet urban and rural areas, where external background noise levels are frequently less than the 37 dB limit.

The IOA believes that the proposed limit of 45 dB(A) is likely to be significantly higher than pre-existing background noise levels in many residential areas, particularly at night, and is, therefore, likely to give rise to disturbance and claims of nuisance. This is consistent with the findings of noise specialists advising DEFRA, who have concluded that a 10 dB difference between background noise levels and noise levels

from wind turbines (the threshold at which complaints would be considered “likely” using the methodology of BS 4142: 1997, *Method for rating industrial noise affecting mixed residential and industrial areas*) could occur in up to 97% of cases. Given the particular character to micro-turbine noise, which will often sound quite different from the pre-existing background noise, the scope for disturbance is even higher than this would suggest. To put this into perspective, for those not familiar with the way noise is perceived, if a micro-turbine noise level of L_{Aeq} 45dB was permitted where the noise level was previously 35 dB(A), the neighbour would judge this new noise to be twice as loud as the pre-existing noise. The new noise would dominate the noise environment and because the neighbour did not choose to be exposed to it, they may well find it to be unacceptable.

To assist planning officials in Scotland to appreciate what such noise levels actually sound like, a demonstration of various micro-wind-turbines was arranged. The demonstration included:

- a wind turbine that produced a fairly constant broadband noise;
- a wind turbine that due to changing wind direction and speed produced a more variable noise level; and
- a wind turbine that because it was poorly maintained produced a very distinctive tonal noise.

These noise recordings were played through loudspeakers within a room of a size similar to that of a large master bedroom or living room. A sound level meter was placed in the room, and the volume of the playback was adjusted so that the sound level represented the internal level arising from an external level of 45 dB L_{Aeq} assuming windows were open. The pre-existing ambient level was approximately 30 dB L_{Aeq} . The outcome of the demonstration was that, with an external level of 45 dB L_{Aeq} continuous noise superimposed on a pre-existing level of 30 dB L_{Aeq} , all present appeared surprised, and could appreciate how the noise level could be annoying.

The Institute recognises that a similar noise level to the proposed 45 dB(A) criterion is used in PPG 24, *Planning and Noise* as the threshold for noise not to be a planning issue during the night-time period. We do not, however, consider this to be relevant to the permitted development right proposals for new noise sources because this part of PPG 24 is concerned with planning new housing near existing transportation and mixed sources and the guidance specifically excludes using the Noise Exposure Categories to assess new noise affecting existing properties.

A similar noise level to the 45 dB is also discussed in the 1999 WHO guidance on Community Noise. However, the more recent WHO guidance on night noise (a principal concern here) promotes lower noise levels in order to be sure to avoid health effects at night.

The proposed 45 dB noise level could have a detrimental effect on the amenity of outside space where ambient noise levels are lower than this, during the day when such spaces are occupied. The ETSU-R-97 guidance on wind farm noise gives a guideline limit of L_{A90} 10 minutes 35-40 dB to protect the amenity of garden spaces close to dwellings during the day up to 11pm.

The proposed 45 dB(A) free-field limit is neither evidence based, nor “fully tested” contrary to the principles agreed by Ministers and quoted in the consultation document *Changes to Permitted Development Consultation Paper 1*. Indeed, it is clear from the statement at paragraph 2.14 that “*the Government will review the suitability of the noise level as soon as reasonably practicable after the legislation has been in force for two years and to examine whether there is scope to reduce it*” that there is no robust basis to the proposed level of 45 dB(A). Additionally, no consideration has been given to the possible character of the noise, which could exacerbate disturbance, particularly with wind turbines. It is usual to weight noise with character by 5 dB. This is the approach recommended in BS 4142 (referred to earlier).

The consultation document does not determine where the responsibility should devolve for ensuring that the installation complies with the proposed criteria. It is, therefore, difficult to see how the proposals can be enforceable. Is the responsible body to be the local planning authority, the installer, the occupant, or the owner who proposes to install the device at the host property?

It is also not clear how compliance with the noise limit is to be confirmed and whether this is to be on the basis of a theoretical estimate, or by measurement. In the former case, the calculations are likely to be far from simple and would involve such issues as directivity and screening in the propagation path, as well as the variation in source level and character with meteorological conditions that is characteristic of wind turbines. Confirmation by measurement would necessarily occur subsequent to installation and require consent for access to neighbouring properties. Under what conditions would any measurements to determine compliance to be undertaken? Noise levels from turbines will vary with wind speed and the conditions under which the turbine emits its highest noise level may not occur within a reasonable time period for the installation. Diurnal variations in ambient noise may favour measurement at night, when ambient noise levels are generally at their lowest, which could place an unacceptable burden on occupants of neighbouring properties. Furthermore, it would not be possible to determine compliance if the noise from the turbine is less than approximately 3-5 dB above the ambient noise level.

The IOA is particularly concerned that one of the fundamental principles of the permitted development strategy – that developments could take place as permitted development *if there were no significant adverse impacts on the amenity of the immediate surroundings* has been replaced by the very much weaker principle “*To manage the risk of disturbance to neighbouring residential uses*” quoted in the Tables.

In the IOA’s view, if this limit is introduced, there may be a large number of cases that will be judged as Statutory Nuisance under the Environmental Protection Act, and noise abatement notices will be served (a statutory requirement on Local Authorities when satisfied of statutory nuisance), which may then lead to them being shut down. It is the IOA’s view that the Statutory Nuisance provisions of the Environmental Protection Act and Common Law principles of private nuisance are well established civil rights that should not, under any circumstances, be removed. It should also be noted that, whilst it may be possible to set planning conditions for acceptable noise levels for a new installation of a mechanically driven noise source such as a micro-turbine or an air source heat pump, mechanical parts are prone to wear, and inadequate maintenance over time can readily lead to increased noise and a nuisance at some time in the future.

The IOA concludes that the proposed limit is both unworkable, in that it is likely to be impracticable to determine compliance prior to installation, and that the level chosen is wholly inappropriate and likely to lead to justifiable complaints of nuisance that will not only offset the estimated cost savings of the proposals, but could also bring the industry into disrepute.

Control of Cumulative Effects

The IOA welcomes the recognition of the potential for cumulative effects resulting from the installation of more than one unit on neighbouring properties. However, the proposed limitation to one unit on, or within the curtilage of, a given property would not necessarily control the impact on neighbouring properties that are a similar distance from two or more separate properties installing units in compliance with the proposed thresholds for permitted development.

Definitions Used in the Glossary of Terms – Question 12

The IOA is concerned that the definition of “*At 1m from the façade ... at the window ...*” refers only to the location at which the noise limit is to be applied. Whilst the definition itself is correct, it is simplistic and does not take account of other factors in the propagation path that affect the resultant level.

It is not clear why “*Predicted 1m from the façade ...*” has been included in the definition, as predicted levels are not referred to in the body of the document. If predicted noise levels are to be incorporated into the permitted development procedures, an appropriate methodology, including the significant factors affecting propagation from the source would need to be developed.

Similarly, the phrase “*Under free-field conditions*” does not appear in the body of the document, although the definition is correct.

Costs to Third Parties

It is unrealistic and inappropriate to ignore the costs to Local Authorities and third parties for complaints relating to noise levels within the proposed limits. In the event that a claim for noise nuisance is upheld and an abatement notice served, it is likely that the owner/operator of the unit would be required to remove the unit and would lose the cost of the unit and its installation and be liable for the de-commissioning costs. Current costs for a 230 V micro-wind turbine with ancillary equipment and installation are likely to exceed £6,000. There could also be significant costs if the operator appealed the decision to serve a notice.

Small Firms Impact Test

The basis of the estimates of impacts on small firms, such as surveyors and consultants who may provide advice to local planning authorities and households and architects/drafting firms that prepare scale drawings for planning permission is fundamentally flawed as it is based on current applications. Given the emphasis on increasing the use of sustainable sources of energy, the calculations should take full account of the increase likely as a result of the expected increased take-up of renewable energy sources.

Conclusions

While the Institute is fully supportive of the encouragement of sustainable power generation and appreciates the rationale for simplifying the planning system to facilitate promotion of sustainable resources at a domestic level, it is unable to endorse the proposals for controlling the noise and vibration impact of micro-turbines and air source heat pumps as presented in the Consultation Paper *Permitted Development Rights for Small Scale Renewable and Low Carbon Energy Technologies*. The noise implications of these units, are, in the Institute’s view, too complex to be compatible with the Permitted Development Rights scheme using the proposed 45 dB L_{Aeq} limit.

The overriding objection to the proposals is that confirmation that any installation meets the proposed limits for noise and vibration is unlikely to be practicable because:

- the absolute limits are too high and would be likely to lead to complaints;
- the limits do not take account of the wide variation in operating conditions and use of statistical parameters, such as a confidence interval would be necessary to avoid occasional and insignificant non-compliance;
- there is no right of access to the neighbouring property to undertake either external or internal measurements;
- suitable operating conditions and ambient noise levels may not be available for testing;
- testing would require specialist knowledge of noise measurement techniques and specialist equipment.

Noise effects at any neighbouring property will be the outcome of a complex chain incorporating:

- the noise characteristics established by design and manufacture;
- the effects of the location and installation of the unit;
- the propagation path, including weather conditions, intervening screening and acoustically reflecting structures;
- pre-existing ambient noise;
- in some cases, the cumulative effects of other nearby installations.

The householder would be unable to resolve these issues and would not be in a position to know whether or not a selected turbine or heat pump is capable of meeting the criteria when installed, and the manufacturer and installer can only be responsible for specific links in the chain. The Consultation Paper does not determine where the responsibility should devolve for ensuring that the installation complies with the proposed criteria. It is, therefore, difficult to see how the proposals can be enforceable. However, the provision of sound power data and advice on distance, directivity and the effects of reflections could be provided to assist the consumer to make an informed choice of a unit to meet any noise limits specified.

It is our view that the absolute criteria specified are not compatible with the fundamental principles expressed in earlier documents that permitted development rights should be *informed primarily by their potential impact on others* and that *the planning system should not be there to regulate development that has no impact beyond the host property*. The limits proposed could potentially result in a serious impact in those areas where background noise levels are more than approximately 5 dB lower than the criterion specified, and there will be numerous cases of these conditions. Additionally the impact on the wider community may not be offset by the relatively small power output generated for the benefit of the host property.

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The issue of tonality and other aural characteristics has not been adequately addressed, even though these can result in a higher level of disturbance than would be implied by the overall A-weighted sound level alone.

The Institute concludes that the noise and vibration proposals in the Consultation Paper are not practicable and further research is needed to determine how the impact of micro-turbines and heat pumps can be defined and expressed in such a way that manufacturers, installers and the householder can be confident that the impact on non-host properties will not be significant. The application of Permitted Development Rights to micro-turbines and air source heat pumps without a full knowledge of the likely impacts is, therefore, considered premature.