

# **Planning for a Sustainable Future: CLG Consultation Reply**

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## **This document is submitted on behalf of the following bodies:**

### **1. The British Astronomical Association**

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(A UK based non-governmental organisation representing the amateur  
astronomical community of the United Kingdom and other nations.)

### **2. The Campaign for Dark Skies**

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(A UK based non-governmental organisation representing persons committed to  
reducing the levels of light pollution in the United Kingdom and educating about  
these problems. Consisting of general members of the population not just  
amateur astronomers.)

### **3. The Leicester Astronomical Society**

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## Definition and Introduction

Whilst planning reforms in the United Kingdom are welcomed, it is submitted that detailed consideration needs to be given to “light pollution” or “obtrusive light”<sup>1</sup> in any revised scheme, as there is currently no formal guidance from central government on how to plan so as to minimise obtrusive light. The purpose of this consultation reply is to demonstrate the broad problems caused by bad lighting practices and how the planning proposals laid out in the consultation may go forward recognising these issues.<sup>2</sup>

Artificial lighting has a necessary role to play in society, the regulation of which should not be seen as running contrary to the psychological feeling that light is a benefit. Whilst lighting may have a significant social utility, this should not be an automatic justification to the problems it may cause. Regulation should not negate safety and security, but improve it through the use of good lighting.

A balance is needed so that artificial lighting may be used, when appropriate luminaires are chosen to provide the amount of light required, in the area required for the duration needed whilst avoiding over lighting. This is not currently the case and many lighting schemes continue to over-light, exacerbating the problems outlined below.

Obtrusive light has been defined by the International Lighting Commission as “Spill light which, because of the quantitative, directional or spectral attributes in a given context, gives rise to annoyance, discomfort, distraction or a reduction in the ability to see essential information.”<sup>3</sup> However, it also raises a number of other serious and topical issues for planning, the environment and wider public health. As well as the most graphic problem, that of the loss of the night time sky. However, “astronomy is the canary in the mine” and there are many other justifications to tackle the problem.

## The Problems Caused by Bad Lighting Practices

Light pollution is continuing to get worse in the United Kingdom, which currently has the third highest level in Europe. Satellite images show the problems caused

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<sup>1</sup> The debate as to whether light can amount to a pollutant is outside the scope of this paper. Therefore the two expressions are used interchangeably as both emphasise the negative effects of bad lighting as detailed above.

<sup>2</sup> For an analysis of light pollution and law, see Morgan Taylor, *Light Pollution and Nuisance: The Enforcement Guidance for Light as a Statutory Nuisance* [2006] J.P.L. 1114- 1127; Morgan Taylor & Hughes, “Exterior Lighting as a Statutory Nuisance” [2005] J.P.L. 1131–1144.; Hughes, Morgan-Taylor, *And Can’t Look up and See the Stars*, [2004] 16 JEL 2, 215-232.

Generally on light pollution, see Morgan Taylor, “And God Divided the Light From the Darkness: Has Humanity Mixed Them Up Again?” (1997) 9(1) *Environmental Law & Management* 32–39; See also Mizon, *Light Pollution, Responses and Remedies* (Springer-Praxis, London, 2002).

<sup>3</sup> Commission Internationale De L’Eclairage, CIE Central Bureau, Kegelgasse, 27 A-1030 Wien Austria. <http://www.cie.co.at/cie/> Publication 150:2003: “Guide on the limitation of the effects of obtrusive light from outdoor lighting installations”.

by upwardly escaping light, and a 24 per cent increase in light pollution nationally between 1993–2000.<sup>4</sup> It is therefore submitted that the recent government initiatives at cutting carbon emissions have not addressed this issue.

The inappropriate use of lighting may lead to the following problems-

1. Wasted light results in significant levels of wasted energy resulting in wasted carbon emissions.
2. This wasted energy leads to wasted money which negatively affects the economic competitiveness of the nation.
3. Incorrectly angled or inappropriate lighting may cause a danger to road users by glare or distraction without achieving the positive social utility of good lighting.
4. Incorrectly angled, or over powered lighting may cause a nuisance in law (common law and statutory) by shining into windows.
5. This form of lighting is also blotting out the night time stars.
6. It can also seriously disturb the life cycles of animals, especially birds and bats.
7. It has also been linked to cancer in humans (as well as degrading quality of life).

#### -The Carbon Cost

The carbon cost of wasteful lighting has not as yet been taken on board by governments, nor are there as yet any formal governmental estimates for this form of wastage from lighting, although the author suggests the following figure.

It is known that there are 22 million dwellings in the UK, if one in ten have a 500-watt floodlight there will be 2.2 million lights. Generating 1 kW-hr of electricity produces 0.43kg of carbon dioxide emissions (UK average from Defra). Most lights are on an infra-red switch, but most activate needlessly when, for example, cats or pedestrians walk by. If an average light is on for half an hour a night, then the statistic is  $(2.2M \times 500 \text{ w}) \times 0.50\text{hr/night} = 550,000 \text{ kW-hr/night}$ . Per year this must be multiplied by 365 = 200M kW-hr/year. If 1 kW-hr produces 0.43kg of carbon dioxide, then some 86M kg/yr of carbon dioxide is produced as a by-product from producing the electricity needed to power domestic floodlights within the United Kingdom.

If a new diesel car produces 150g of carbon dioxide per kilometre travelled, then just under 57,000 cars would have to travel 10,000 km per year to produce this figure. **This means that the carbon dioxide produced by domestic floodlights alone is statistically similar to that produced by the average car usage of a large town of c. 108,000 persons.**<sup>5</sup> The implications are clear if this figure is extrapolated to commercial artificial lighting; it must be a sufficiently

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<sup>4</sup> For the national images provided by the CPRE, see: <http://www.cpre.org.uk/campaigns/landscape/light-pollution>

<sup>5</sup> The Times, April 18, 2005, which reported estimates of 30.6 million cars in Britain in 2005, with only 26 per cent of all households having no car access. This is a car per 1.9 persons..

significant form of waste to deserve regulation at planning stage. Indeed, major infrastructure projects are generally the worst sources of light pollution, due to their sheer scale and 24/7 nature.<sup>6</sup>

The economic cost to the nation, is, if the above figure for consumer floodlights alone is taken, 86M kg/yr, or c. 200M kW-hr. If the cost is 10p per kW-hr, then the cost is c. £20M per year. However it is submitted that if low energy or other more appropriate outside lights were used instead they would still consume electricity, but the 500W lights almost exclusively used by consumers are mainly waste. For example, simply encouraging consumers to use 50W outside lights instead of 500W lights would save 90%.

There is no known estimate on the total power consumption of commercial floodlighting in the UK. So a conservative figure is suggested of twice the lighting wattage for the commercial/public sector floodlights used in the UK (excluding street lights), and as these are generally on all night long, **then the economic cost of the waste would be c. £480M**, assuming an estimated 50% waste factor from factors such as over-lighting, lighting empty and unused car parks.<sup>7</sup> It is submitted that there is a clear need for planning guidance over such a potential level of power consumption and waste.

Currently, there are large numbers of lighting schemes on unmetered electricity (UMS), such as car parks, street lighting, much of it under local authority control, but not all. As a result there is no incentive here to buy more energy efficient luminaires, or to update old stock as these newer lights may be more expensive to purchase. Although cheaper to run, they may take a number of years to pay for themselves. However, the Consultation on Implementation Proposals for the Carbon Reduction Commitment (formerly the Energy Performance Commitment) June 2007,<sup>8</sup> states “Government’s preference is that UMS is included in the CRC. Through discussions with Local Authorities and telecoms operators, Government understands that it makes a substantial contribution to energy use amongst the target group and we understand that there is considerable scope for cost effective emissions abatement. However we recognise that we need to better understand the implications of the CRC on UMS to ensure that the scheme effectively incentivises carbon savings.”<sup>9</sup>

Planning can help to prevent the problems above by requiring good lighting designs to be fitted appropriately.

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<sup>6</sup> However, the move to a 24/7 culture means that this problem is increasingly crossing over into smaller scale developments, such as floodlit pubs, clubs and bars and carparks. As there has recently been a big increase in city centre dwellings these lights will increasingly impact on these city dwellers.

<sup>7</sup> Assuming the lights are on all night long, with an average 12 hours night operation each night not the half hour assumed for consumer lighting, the figure is double the power consumption multiplied by the hours of use. (2x £20M) x 24 = £960M. If 50% is taken as the waste factor and the balance taken to be necessary energy consumption for lighting then the waste is c. £480M.

<sup>8</sup> <http://www.defra.gov.uk/corporate/consult/carbon-reduc/consultation.pdf>

<sup>9</sup> 9.1 Unmetered Supply (UMS) including street lighting.

Some local authorities have been leaving lights on at empty buildings. Midlothian has been leaving lights on at Dalkeith High School which has been empty since 2003, "lights - including some on timers - are left on during the winter months to protect potential intruders from fall hazards," due to a perception that this is necessary to discharge a tort based duty of care. This has led to £3,000 being spent on lighting the disused building.<sup>10</sup> It is submitted that this sort of misguided approach is quite simply a waste of money, carbon emissions and light pollution. Physical barriers such as locks and window covers would presumably prevent trespassers entering and that it is unlikely that a court would hold local authority liable when it had taken all reasonable grounds to physically keep trespassers out and not leave traps. It is suggested that lighting empty buildings in this manner could actually encourage trespassers.

#### -Public Health and Quality of Life

Moreover, the problems caused by lighting have been flagged as a factor for consideration in a number of government consultations,<sup>11</sup> and the regulation of light pollution is a key recommendation from a Parliamentary Select Committee Report.<sup>12</sup> These studies and recommendations note the negative effects that obtrusive lighting can have on the public. Light at night may keep people awake at night, so leading to a loss of quality of life. Indeed, this may lead to a reduction in functionality at work, also contributing to a loss of economic competitiveness. It may also lead to an increase of road accidents. However, it also raises public health issues as night time lighting has been linked to breast and colorectal cancers in humans.<sup>13</sup> This may explain why night shift workers appear to be at a higher risk of certain forms of cancer.<sup>14</sup> Clearly these studies

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<sup>10</sup> Leave lights on for the vandals: Council has 'duty of care' to protect intruders from school hazards, The Daily Mail, 31 May 2007, at:

[http://www.dailymail.co.uk/pages/live/articles/news/news.html?in\\_article\\_id=458856&in\\_page\\_id=1770](http://www.dailymail.co.uk/pages/live/articles/news/news.html?in_article_id=458856&in_page_id=1770)

<sup>11</sup> The ODPM has published several relevant consultations: "Living Places—Powers, Rights and Responsibilities Consultation" (2002)

and "Living Places: Cleaner, Safer, Greener (Clean Neighbourhoods Paper)" (2004) ODPM, London, where 15% of respondents raised the issue of lighting; "Full Regulatory Impact Assessment of the Clean Neighbourhoods and Environment Bill", DEFRA, December 2004, p.67, available at: [www.defra.gov.uk/corporate/regulat/ria/2004/cleanneighbourenv-bill.pdf](http://www.defra.gov.uk/corporate/regulat/ria/2004/cleanneighbourenv-bill.pdf).

<sup>12</sup> The Seventh Report of the House of Commons Science and Technology Committee for the Session 2002–2003 considered the issue in its "Light Pollution and Astronomy consultation", HC 747-1:

[www.publications.parliament.uk/pa/cm200203/cmselect/cmsctech/747/74702.htm#evidence](http://www.publications.parliament.uk/pa/cm200203/cmselect/cmsctech/747/74702.htm#evidence).

<sup>13</sup> Blask et al., "Melatonin-depleted blood from premenopausal women exposed to light at night stimulates growth of human breast cancer xenografts in nude rats", *Cancer Res.* 2005 Dec 1; 65(23) 11174-84; Blask et al., "Putting cancer to sleep at night: the neuroendocrine/circadian melatonin signal", 2005 Jul; 27(2): 179–88; "Pauley, Lighting for the human circadian clock: recent research indicates that lighting has become a public health issue" (2004) 63 *Medical Hypotheses* 588–596; Harder B (Jan 2006). "Bright Lights, Big Cancer: Melatonin-depleted blood spurs tumor growth." *Science News* 169 (1): 8–10.

<sup>14</sup> Schernhammer, E, Rosner, B, Willett, W, Laden, F, Colditz, G, Hankinson, S (2004). "Epidemiology of urinary melatonin in women and its relation to other hormones and night work." *Cancer Epidemiol Biomarkers Prev* 13 (62): 936-43.

are recent, but it is clear that this risk factor will be reduced simply by ensuring good lighting practices and design; a practice which will not have any adverse effects on public utility.

Disability glare from artificial lighting can cause problems, as the iris is designed to contract to cut down the amount of light entering the eye, glare can cause momentary blindness and pain. This disability glare is perhaps most problematic for light shining into roads, which may temporarily blind road users. Indeed there has been at least one reported death due at least in part to such lighting.<sup>15</sup> This form of light is often seen emanating from business premises, including key infrastructure premises. Car parks, such as those at supermarkets, may contain children or heavily burdened and slow moving pedestrians.

It is also an issue for the elderly, as the muscles controlling the iris tend to become less efficient with age.<sup>16</sup> The 500watt security floodlights commonly used by householders are usually angled outwards, so that the resulting glare removes any positive passive surveillance benefit which the lighting may have. The UK Campaign for Dark Skies (CfDS) website highlights the effects of angling floodlighting so as to reduce these effects.<sup>17</sup> As a result bad lighting can do more to conceal than reveal and contribute or even cause accidents.

Artificial lighting is now a statutory nuisance in England and Wales. S.102 of the Clean Neighbourhoods and Environment Act 2005 inserted para.(fb) into s.79(1) of the Environmental Protection Act 1990 to the effect that “artificial light emitted from premises so as to be prejudicial to health or a nuisance” may constitute a statutory nuisance. This move follows the recommendations made in the Seventh Report of the House of Commons Science and Technology Committee Light Pollution and Astronomy. However, this will not protect the night sky per se due to the narrow criteria for statutory nuisance.<sup>18</sup>

There have also been a number of successful common law nuisance actions concerning artificial lighting. It must be noted that none of the claimants were astronomers, supporting the view that light pollution affects the population generally not just the astronomical community.<sup>19</sup> The *Bacon* case concerned sports ground floodlighting which shone into the claimants house. However,

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<sup>15</sup> “ ‘Blinded’ driver kills man’”, Wallingford Herald, June 6, 2002:

<http://archive.thisisoxfordshire.co.uk/2002/5/31/39441.html>

<sup>16</sup> “Towards Better Practice”, ODPM: [www.odpm.gov.uk/index.asp?id=1144838](http://www.odpm.gov.uk/index.asp?id=1144838), s.3.2.

<sup>17</sup> CfDS website: <http://www.britastro.org/dark-skies/floodlights.html?60>

<sup>18</sup> For a full analysis of this problem, see Morgan Taylor, [Experience and Development of Regulations in Defence of the Night Sky](#), Proceedings of the Starlight 2007 Conference, forthcoming <http://www.starlight2007.net/> and Morgan Taylor, Light Pollution and Nuisance: The Enforcement Guidance for Light as a Statutory Nuisance [2006] J.P.L. 1114- 1127.

<sup>19</sup> *Bonwick v Brighton and Hove Council*, unreported, August 9, 2000, County Court Claim no.BN 906 721 (local authority lights); *Stone Haven and District Angling Association v Stonehaven Tennis Club*, unreported, January 1997, Stonehaven Sherrifs’s Court, (sports ground lights); and *Bacon v Gwynedd CC Tywyn*, unreported, December 2004, case no.AB 300050, concerning sports ground lights.

there is a classification of exempt premises for statutory nuisance<sup>20</sup> which means that statutory nuisance law will not help claimants for such lighting. Again this highlights the preventative role which planning regulation may play if guidance is provided by central government.

Moreover, the list of exempt premises will include major infrastructure developments. The result is that these potential major sources of light pollution are exempt from this control. It is respectfully submitted that the exemptions are not logical as these premises have the best practical means defence (BPM defence). Further, the aim of the lighting at major infrastructure premises is the same as for other premises, security, health and safety. However ensuring good lighting will improve not detract from all of these. The point that this is not an anti-lighting argument, but an anti-bad lighting argument must be stressed.

It is also possible that lighting may also meet the criteria for public nuisance as the effects of lighting can travel long distances, and as such should be dealt with adequately at planning stage.<sup>21</sup>

#### -Ecological Problems

Obtrusive lighting can also cause quite extensive ecological problems.<sup>22</sup> Bats<sup>23</sup> and birds<sup>24</sup> can become confused by artificial lighting, disrupting breeding cycles.<sup>25</sup> These animals may become drawn in by artificial light, especially in poor weather. These problems may be made worse due to many nations encouraging a move towards a 24 hour culture. Insects may also be adversely affected. Many may simply fly around light sources until they drop of exhaustion, and so fail to breed.<sup>26</sup> This in turn may mean that animals further up the food chain (such as birds) suffer due to reduced prey numbers. Glow worms are also threatened by lighting, as well as by changes to habitat and pesticides.<sup>27</sup>

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<sup>20</sup> airports, public service vehicle operating centres, harbours, goods vehicle operating centres, railway premises, lighthouses, tramway premises, prisons, bus stations and associated facilities, premises occupied for defence purposes. s.79(5B) of the Environmental Protection Act 1990.

<sup>21</sup> See Morgan Taylor, op cit n. 18.

<sup>22</sup> Rich and Longcore (eds), *Ecological Consequences of Artificial Night Lighting*, (Island Press, 1718 Connecticut Avenue, N.W., Suite 300, Washington, D.C. 20009-1148. USA; 2006).

<sup>23</sup> The Bat Conservation Trust, Unit 2, 15 Cloisters House, 8 Battersea Park Road, London SW8 4BG. United Kingdom. Threats to Bats, [http://www.bats.org.uk/helpline/helpline\\_threats\\_lighting.asp](http://www.bats.org.uk/helpline/helpline_threats_lighting.asp)

<sup>24</sup> Fatal Light Awareness Program (FLAP), Royal Bank Plaza, Lower Concourse, P.O. Box 20, Toronto, Ontario, M5J 2J1, Canada. <http://www.flap.org/>

<sup>25</sup> See Morgan Taylor, M, "And God Divided the Light From the Darkness: Has Humanity Mixed Them Up Again?" (1997) 9(1) *Environmental Law & Management* 32 at 33 and "Lights out Policy in Cities Saves Birds", CNN website: [www.cnn.com/2004/TECH/science/06/11/life.birds.reut/index.html](http://www.cnn.com/2004/TECH/science/06/11/life.birds.reut/index.html); the 2003 Canadian "Ecology of the Night" Symposium, which was organised by the Muskoka Heritage Foundation, was devoted to addressing the negative effects of night time lighting on animals. See [www.muskokaheritage.org/ecology-night/](http://www.muskokaheritage.org/ecology-night/) See also the CfDS website: <http://www.britastro.org/dark-skies/wildlife.html?40#animals>

<sup>26</sup> CfDS website, <http://www.britastro.org/dark-skies/wildlife.html?40#animals>

<sup>27</sup> BBC Website, 19<sup>th</sup> July, 2005, Glow-worm alert for dog walkers, <http://news.bbc.co.uk/1/hi/england/derbyshire/4696505.stm>

### -The Loss of the Night Sky

The night time stars are being blocked out by “skyglow” (largely caused by upwardly escaping (waste) light which has hit aerosols and particulates in the atmosphere causing it to scatter and create the grey/orange glow seen over all centres of human habitation). This is also a significant environmental scientific and cultural loss, the night sky is not just the reserve of the amateur astronomer. The night sky is half of the night time environment- all that is above ground level. It has been argued to be a site of special scientific and cultural interest and the protection of which was the subject of a recent international conference, the Starlight 2007 International Initiative in Defence of the Quality of the Night Sky as Mindkind’s Scientific, Cultural and Environmental Right.<sup>28</sup> This conference adopted the Declaration in Defence of the Night Sky and the Right to Starlight.<sup>29</sup>

“The sky, our common and universal heritage, is an integral part of the environment perceived by humanity. Humankind has always observed the sky either to interpret it or to understand the physical laws that govern the universe. This interest in astronomy has had profound implications for science, philosophy, religion, culture and our general conception of the universe”.<sup>30</sup>

The President of the Royal Astronomical Society, Prof Michael Rowan-Robinson, has commented: "Although most of our major professional optical telescopes are now located on remote mountain-top sites like Hawaii, Chile, and the Canary Islands, retaining the darkest possible night-sky in the UK remains important to astronomy for several reasons. Firstly the training of young astronomers at university generally takes place on UK telescopes. Secondly 'amateur' astronomers make important contributions to astronomy by scanning the sky for new comets and supernovae, and through monitoring of brighter variable stars, including those being occulted by companion stars or planets. And finally it is vital for astronomy to retain the support of the public, who take the greatest interest in astronomical events like eclipses, comets, and meteor showers. The darkness of the night sky in towns and villages could be enormously improved by sensible planning decisions, for example reducing the pressure in neon street-lamps, capping all outside lighting, turning inessential lights off on or before midnight. An example of good practice is the island of La Palma where the Canarian government has imposed strong restrictions on night-time lighting in order to retain the quality of its

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<sup>28</sup> Starlight 2007, La Palma, Canary Islands, April 2007. <http://www.starlight2007.net/>

<sup>29</sup> Ibid.

<sup>30</sup> Proclamation of 2009 as International Year of Astronomy. UNESCO General Conference. Paris 2005.



astronomical observatory."<sup>31</sup> These points were also accepted by the Parliamentary Select Committee which inter alia recommended a lighting annex to PPS23.<sup>32</sup>

The scientific and cultural problems of UK light pollution with respect to historic astronomical sites (including but not limited to Stonehenge) and scientific as well as cultural learning has been stated by Derek McNally of the Royal Astronomical Society and the International Dark Sky Association; "While the astronomical feature of Stonehenge that is most commonly cited is its solar solstitial alignment, it has other alignments with serious claim to being astronomical. The best of these are the features marking distinctive aspects of lunar risings at major and minor standstills - of which only one pair survive, the remaining rising pair and both setting pairs have been lost. Suitable juxtapositions of planets can indicate in a clear manner that planets follow a particular path across the sky. All these phenomena can be seen using naked eye only during the hours of darkness from the monument - observations which would be enhanced were the light pollution at Stonehenge abated. Whether such phenomena were intended to be incorporated in the design of the monument is still a matter of debate. Hence it is important that light pollution at Stonehenge and other similar monuments (such as Thornborough where a stellar association is postulated) is abated in order that naked eye and other observations of the Moon, planets and stars can be made as successfully as the prevailing conditions allow. Good design of local lighting can do a great deal to minimise the effect of light pollution and maintain skies in which serious astronomical investigations can be carried out. A case in point is the examination of the relationship, if any, to the Milky Way to the architecture of Stonehenge. The Milky Way is only just visible when high in the sky at Stonehenge now - a reduction of light pollution would make the relation of sky and architecture much easier."<sup>33</sup> Astronomy is only affected to a far lesser extent by good lighting schemes and compromises can be made, such as shielding, the choice of lighting types and curfews. As a result it is submitted that the protection of the night sky by planning with good lighting schemes does not run contrary to continued economic national development. Both concepts can work together.

#### Lighting and Development: Current and Planned

Local authorities should be mindful of the potential increase in these light related problems as house building continues, both on brown field as well as green field sites. The Times reports that the Social market Foundation has stated that at "least two million homes will have to be built on green belt or undeveloped land to

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<sup>31</sup> Private correspondence with the President of the Royal Astronomical Society, Burlington House, Piccadilly, London W1J 0BQ United Kingdom.

<sup>32</sup> Op cit n. 12.

<sup>33</sup> Report to the Royal Astronomical Society Heritage Committee on Light Pollution and Heritage Sites, Summer 2007.

deliver Gordon Brown's housing programme... Mr. Brown has pledged to build three million homes by 2020 as part of an £8 billion project to meet the critical housing shortage."<sup>34</sup> Such developments will continue to spread the "footprint" of light pollution further into the countryside (including potential statutory nuisances) and this again underscores the urgent need for functional planning regulations.

The argument is not one of anti-lighting but one of anti-bad lighting. No one is advocating "turning all the lights off". Lighting can and does have a very significant social utility to play in modern life. However, the argument is one of lighting well. This means tackling the endemic "light is good therefore the more lighting the better" over-lighting argument. It seems that local authorities may be over-lighting to counter arguments that they are not taking steps to fight crime.

Curfews may be used for lighting schemes so that the lighting may be used when needed and not for example, to floodlight empty and unused car parks all night long as is generally the case at present. Planning guidance could instead recommend the use of physical barriers such as gating unused car parks at night. Moreover, lighting schemes may employ dimming technology, or permit partial turn off at night, so as to maintain a lower level of lighting when genuinely needed for security, which is lesser than that for full operational purposes.

This also cuts energy waste and helps to protect the environment (including the night sky) as well as public health from wasted light. All of which points to the need for detailed central Government guidance as an essential part of the planned revised UK planning guidance. It is also in accordance with Section 1 Consultation Questions Q 1 of the consultation, which states an intention to "ensure that there is a clear policy framework for nationally significant infrastructure which integrates environmental, economic and social objectives to deliver sustainable development".

#### How Tackling Bad Lighting Fits into Wider Existing Central Government Policy

The UK Government Energy White Paper<sup>35</sup> sets the objective of cutting CO2 emissions by some 60% by about 2050, with real progress by 2020. Indeed the paper states that Government will include lighting.<sup>36</sup> This is supported by BERR's statement "We have identified several groups of products for action:

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<sup>34</sup> The Times newspaper, August 15 2007 p.4. News "Green-belt Housing".

<sup>35</sup> Energy White Paper: Meeting the Energy Challenge, May 2007, DTI (now BERR), <http://www.dti.gov.uk/energy/whitepaper/page39534.html>

<sup>36</sup> Government will; "Press for adoption and implementation of the new EU minimum energy performance standards for 14 priority product groups including boilers, water heaters, consumer electronics, copying machines, televisions, stand-by modes, chargers, **lighting**, electric motors and other products by the end of 2008 (see also chapter 2) and where possible, raise standards by voluntary actions, in advance of EU regulations." P.44 para. 1.48, *ibid*.

• domestic lighting”<sup>37</sup> and the EU’s Energy Efficiency Action Plan,<sup>38</sup> which recognises that 20% of energy is used for lighting and flags lighting as a potential savings area for investigation.<sup>39</sup> It is hoped that these intentions include all exterior lighting, consumer, business and public sector as well as internal lighting. Further, Government states; “We face a significant challenge in delivering substantial new energy infrastructure. In electricity, we will need around 30-35GW of new generating capacity over the next two decades with two thirds of this by 2020.<sup>40</sup> Tackling the wasted energy caused by light pollution will assist in meeting these commitments and help to reduce the increase in energy demand.

#### The Current Planning Guidance on Obtrusive Light

It is submitted that all of the above problems caused by bad lighting are exacerbated by the lack of coherent central government planning guidance as there remains no detailed content in any PPS/ PPG or any detailed guidance note.

The problems caused by artificial lighting should be dealt with by local authorities at planning stage, so as to prevent problem lighting in the first place. Whilst artificial lighting, as such, is not within the definition of development for control purposes under the Town and Country Planning Act 1990, individual lights and lighting structures may be addressed on all new builds, especially major infrastructure projects. Modifications to existing buildings may also be addressed at planning stage where they materially affect the external appearance of the building.

Regulation of lighting is justified via PPS1 Delivering Sustainable Development, which states “Development plan policies should take account of environmental issues such as:

– mitigation of the effects of, and adaptation to, climate change through the reduction of greenhouse gas emissions and the use of renewable energy; air quality and pollution; land contamination; the protection of groundwater from contamination; and noise and **light pollution**”<sup>41</sup> (As well as by the justifications given above.)

However, there has been a very mixed response by local authorities many of whom have not introduced measures to tackle lighting issues. Indeed most of those who have included anti light pollution clauses have failed to tackle the

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<sup>37</sup> P43. 2.22 The Energy Challenge: Energy Review Report 2006, DTI (Now BERR), July 2006 <http://www.berr.gov.uk/files/file31890.pdf>

<sup>38</sup> Action Plan for Energy Efficiency: Realising the Potential, Brussels, 19.10.2006, COM(2006)545 final.

<sup>39</sup> “20% of global electrical energy production today is used for lighting. According to studies, the adoption of high efficiency Light Emitting Diode (LED) technology, already available on the market, could by 2015 save 30% of today’s consumption for general lighting and 50% by 2025. P. 5, f.n. 9, *ibid.*

<sup>40</sup> Energy White Paper: Meeting the Energy Challenge, May 2007, DTI (now BERR), P. 254 para 8.2, *ibid.*

<sup>41</sup> Paragraph 20.

problem effectively. It is submitted that this is generally because of ignorance; although lighting companies now make good luminaires, they can be fitted badly. Indeed many lighting schemes are installed by electricians who unlike qualified lighting engineers do not necessarily understand all the issues. Therefore planners need to take account of installation as well as the form of a scheme and the common tendency to want to over-light a scheme.

### Suggested Planning Guidance for Obtrusive Lighting

It is understood that the Lighting Annex to PPS23 recommended by the PSC must now be considered in the light of the draft planning reforms aiming to cut planning guidance documentation. However, it is proposed that there is a strong body of evidence calling for the express inclusion of obtrusive light in the revised planning guidance regime, preferably as a stand-alone document, or at the very least a detailed best practice guide (perhaps building on existing industry standards). It is submitted that a brief statement will not resolve the continuing problem. Scotland published its Controlling Light Pollution and Reducing Lighting Energy Consumption Guidance Note in early 2007<sup>42</sup> and it is submitted that the rest of the United Kingdom should follow suit with a document.

It is suggested that the existing regime is failing to tackle the above problems posed by obtrusive lighting, as well as presenting a lacuna in UK Government policy; as such an approach is in full accordance with the Central Government environment and energy initiatives as stated above. There are professional guidance notes already in existence which may be used or cited. Moreover there is nothing to stop the revision of such non-governmental guidance notes to ensure that the goals are met.

Moreover, major infrastructure developments are currently usually (and needlessly) major sources of light pollution. Thus a continuation of the existing regime will probably lead to an exacerbation of this problem.

### -Dark Sky Parks

Derek McNally of the Royal Astronomical Society and the International Dark Sky Association has recommended the creation of “dark sky parks” to preserve the last vestiges of the night sky in the United Kingdom; “In view of the inadequacy of the 2006 legislation on obtrusive light as nuisance, attention should be turned to the establishment of Dark Sky Parks. In both the USA and Canada, Dark Sky Preserves and Dark Sky Parks are being established. A Dark Sky Preserve must have a pristine dark sky and arrangements in place to maintain sky quality; a Dark Sky Park must have a dark sky but need not be pristine. The USA has established its first Dark Sky Preserve at the Natural Bridges National Monument in S.E.Utah - one of the darkest areas

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<sup>42</sup> Scottish Executive, St. Andrews House, Edinburgh:  
<http://www.scotland.gov.uk/Publications/2007/03/14164512/1>

in continental USA - there being no significant light polluting source within 60 miles of the Preserve. Canada has several Preserves and Parks, including one deemed 'suburban' at Mt.Megantic.

While the UK has few truly dark areas remaining - and these are in more inaccessible locations such as N.W.Scotland - there are areas of significant darkness where the night sky is sufficiently less polluted to be able to see the Milky Way. Since urban areas have lost dark night skies, effort should be given to preserving some of the remaining areas of the country by establishing Dark Sky Parks within those remaining darker areas - especially where there is an existing site of interest. Such sites, if designated a Dark Sky Park, would need to have restriction of outdoor lighting and such light as was permitted would need to be of excellent design to place light only where needed and use high quality fittings in the surrounding area. Within the Park, lighting would have to be rigorously controlled. A possible contender, given its great public interest, would be the Stonehenge World Heritage Site where even with the current level of light pollution, the Milky Way can just be seen when almost overhead. Attention to lighting within the World Heritage Site and controls on outdoor lighting in the surrounding towns would enhance the darkness at the monument and make public appreciation of the possible astronomical aspects of the monument more accessible. The public could thereby get a better acquaintance with the beauty of the night sky.

... It has to be recognised that Dark Sky Tourism is already in existence in the UK. It currently exists as a specialist niche in the shape of bed and breakfast/small hotel facilities which maintain small observatories exploiting their relatively dark remote locations e.g. in Norfolk and Devon. There is public interest in observing at a good site, there are many members of the public who deplore the loss of truly dark skies but who have only a marginal interest in astronomy. The concept of a Dark Sky Park could become a further attraction of Stonehenge - already one of the UK's most visited sites.

The Dark Sky Park adhering to strict criteria for site darkness would offer an opportunity to recover, however partially, a currently lost spectacle for town dwellers."<sup>43</sup>

### **Recommendations**

It is therefore suggested that new planning guidance on light pollution should-

1. Lay down detailed good or best practice for planning out light pollution and that this could include existing (and future) guidance from professional bodies.

This guidance should cover:

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<sup>43</sup> Op cit n. 33.

- Industrial developments (including key infrastructure)
  - Retail developments
  - Housing developments
  - Transport Interchanges
  - Roads and footpaths
  - Floodlit exterior sports facilities
  - Feature lighting for civic enhancement for both artificial and natural features, including “light art” and exterior laser lights
  - Illuminated advertisements and skybeams/ exterior laser lighting
  - Replacement of existing lighting installations (of all scales)
2. This guidance should take on board the impact of lighting development on particular attributes of local sites such as building on green-belt, as well as the impact on historic monuments, observatories and national parks. (The lighting zones suggested by the Institute of Lighting Engineers could be adopted to assist.)
  3. Create dedicated dark sky parks which may help to stimulate emerging astro. tourism as well as give a special higher level of planning protection for these areas. Dartmoor is suggested as one very credible dark sky park, whilst others may be set up in Scotland or Wales.
  4. An additional public education programme is recommended, so that consumers and business understand the underlying issues. This has been employed for other energy saving measures such as turning televisions off standby at night.

## Responses to Specific Consultation Questions:

1 & 2. There is a clear need to reform the existing planning system. However there should not be a dual system, with lower criteria and higher thresholds for major infrastructure. They may serve as the biggest light polluters.

There is concern that the levels of environmental protection may be reduced with greatly reduced documentary formal guidance and that problems like light pollution may still not be adequately addressed (despite the recommendations made by the House of Commons Science and Technology Committee “Light Pollution and Astronomy”) for a lighting annex to PPS23.

The recommendation is to incorporate planning guidance for light pollution in a detailed manner as there is currently no coherent Central Government guidance. The result is chaos on the planning system and the nation which is the third largest emitter of light pollution in Europe.

It is recommended that the independent commission contains at least one member with a functional knowledge of light pollution matters. This is essential as current planning officers are often misled by claims such as “we use modern lights therefore there will NOT be any light pollution” when some manufacturers still make bad light fittings, which are often cheaper to buy than the good ones. Moreover the installation of the lighting is vital to ensure its efficiency as good schemes can be fitted badly. Involvement by a body competent in this field is vital to dispel existing misconceptions.

Add light pollution to the (strategic environmental assessment) SEA.

5. It is recommended that bodies such as the Royal Astronomical Society, the British Astronomical Association, the Campaign for Dark Skies, the International Dark Sky Association, the Society for Popular Astronomy, the Campaign for the Protection of Rural England (and Wales) and the National Society for Clean Air are consulted on national policy statements for input on light pollution.

It is also recommended that the recommendations of the House of Commons Science and Technology Committee “Light Pollution and Astronomy”) for a lighting annex to PPS23 are taken forward.

11. It is considered vital that promoters of development schemes should have to prepare applications to defined standards before the infrastructure planning commission agree to consider them.

12. It is also considered vital that promoters should be required to consult the public before submitting an application.

14. It is suggested that promoters also consult bodies with expertise in light pollution matters, such as the Royal Astronomical Society, the British Astronomical Association, the Campaign for Dark Skies, the International Dark Sky Association, the Society for Popular Astronomy, the Campaign for the Protection of Rural England (and Wales) and the National Society for Clean Air.

It is considered vital that the Royal Astronomical Society is consulted with respect to all developments in close proximity to professional observatories and Universities offering physics.

It is also recommended that Defra is added to the list (where appropriate).

20. Nationally significant infrastructure projects are probably going to be exempt from light related statutory nuisance liability. This factor should be considered when applications are examined by the Commission.

24. Rationalisation of consent regimes. The suggestion is that “powers to amend apply or disapply local and public legislation governing infrastructure such as railways or ports” is not interpreted so that rules relating to light pollution are disappplied. (For all of the reasons given above.)

25. The Commission’s mode of operation. It is considered essential that “the proposed arrangements for the Commission to deal with cases is an appropriate way to ensure that consideration is proportionate and that an appropriate range of specialist expertise is brought to bear on the final decision” means that the Commission will have practical and functional expertise on the real issues surrounding light pollution.

The suggestion that one Commission member may have the authority to decide an application is generally cause for concern, as these are applications of national importance and.

26. It is suggested that promoters also consult bodies with expertise in light pollution matters, such as the Royal Astronomical Society, the British Astronomical Association, the Campaign for Dark Skies, the International Dark Sky Association, the Society for Popular Astronomy, the Campaign for the Protection of Rural England (and Wales) and the National Society for Clean Air.



It is considered vital that the Royal Astronomical Society is consulted with respect to all developments in close proximity to professional observatories and Universities offering physics.

It is also recommended that Defra is added to the list (where appropriate).

32. It is recommended that at least one commissioner has actual expertise in light pollution.

36. The suggestion that supplementary planning documents are not deemed necessary to be attached to local development schemes and that there should not be a blanket requirement for a sustainability appraisal is cause for concern. This is a perceived danger that this may detract from current levels of protection (especially for environmental matters) and Central Government advice.

38. No aspect of lighting which currently requires planning permission should be made subject to GPD. (For the detailed reasons given above.)

40. Minor amendments of planning permission. Due to the issues of light pollution above this should not be applied to lighting schemes, or any commercial development including exterior lighting.