ADVICE ON

Solar Farms

The British Horse Society

Solar electricity is generated by daylight rather than direct sunlight and the intensity of the daylight in some parts of the UK is capable of producing high enough levels of electricity for solar farms to be viable.

Solar farming is very new in this country, which has a higher density of population, roads and routes used by horses than most other countries where solar farms are more commonplace, so there is little knowledge of the effect of solar farms on equestrians using byways, bridleways and roads or on equestrian businesses. There are instances of glare and glint causing problems which were not foreseen or reported pre-construction; there could be other problems which are not yet evident.

The potential effect of solar farms on horses should be carefully considered on any route used by horses – including byways, bridleways, roads and permissive routes – and on equestrian businesses where horses are kept or trained.

A solar farm involves the installation of solar photovoltaic panels on open land that is usually relatively even across the site. Flat land is more likely to be used than a hillside for ease of installation, maintenance and to reduce visual impact. Some levelling may occur during construction but if much is needed the site is unlikely to be financially viable as earth movement is expensive.

Lines of linked panels, called arrays, are aligned for optimum exposure to sunlight by their orientation and angle to the sun. Small developments may track the sun to optimise solar gain but this is not cost-effective in large commercial developments so, in England or Wales, panels will normally be fixed facing south and tilted at approximately 45 degrees. The arrays will be spaced at two to three times their height to avoid shading at any time of year. The whole site is likely to be fenced for security and may also be hedged for screening if required by planning conditions.

Standard photovoltaic panels are around 1.6m high and 1m wide which are mounted on frames. Their height above ground is usually up to 2.75m. They are designed to absorb rather than reflect light for efficiency – reflected light or heat is wasted energy – and although the amount of reflection varies with the component materials and the angle, the incidence of glare is usually much less than from glass windows or car windscreens. Any glare is most likely when the sun is low in the sky as reflection increases the further the sun's rays are from perpendicular to the panel.

It is possible, and is likely to be required as part of the planning application, for computer modelling of the glare and sightlines. Analysis of these patterns for potential impact on equestrian businesses should be considered. For riders or carriage drivers out hacking, glare is unlikely to present a direct problem because they are moving unless their route is directly towards the arrays at an elevation and time of day where glare is possible.

Arrays should be avoided where glare is likely to affect users of an equestrian route or an equestrian business.

The panels do not make any noise or movement and require very little maintenance – occasional cleaning, inspection and vegetation control. Rain hitting the panels will make a gentle sound which is likely to be lost in the general ambient noise in those conditions. There are no moving parts or machines except for inverters which produce a low humming sound and are housed in small buildings, which should be sound-proofed. The noise of inverters increases with load, so in strong sunshine will be greater than on a dull winter day and can be disturbing. Depending on the previous use of the land and its quality, it may become grassland that can be used to graze sheep or poultry to reduce the need for vegetation cutting.

Solar farms are relatively straightforward to build involving erecting the racks, making trenches for cabling and small buildings to house inverters. Tracks may be built to facilitate vehicle movements around the site during construction or for subsequent maintenance.

The racks to support the panels are piled into the ground and can be easily removed when the farm is decommissioned. In some circumstances, such as presence of archaeological interest, the racks may be mounted on concrete blocks on the surface. Photovoltaic panels are attached to the racks.

Trenches run between the arrays and carry cabling to an inverter building where the direct current produced by the panels is converted to alternating current and fed to the National Grid.

As part of the planning process, the developer will conduct a range of studies, typically to find out about the existing ecology and other aspects of the site. The effect on public rights of way should be included in these studies. The results and the design for the solar farm will make up the planning application so you can see at that stage whether rights of way have been correctly considered.

The life of a solar farm is usually 25 years, often with an option to renew for a further period, although some planning permission will specify a return to original use without extension.

The construction phase of a 40-acre site is likely to be around 16 weeks. Over this period there would be up to 100 lorry deliveries to the site. There may be some construction noise, of which pile-driving is potentially the most disturbing. Components are not large so abnormal load vehicles should not be required.

Solar farms are usually secured by fencing which may include hedge screening. The most common type of fencing in use is open mesh 1.8 to 2m high, which is the least intrusive and this can be stipulated in the planning permission.

After construction, traffic to the solar farm will be minimal, with occasional maintenance visits and ground maintenance – through mowing or grazing, for example. If the site is currently farmed, usually it is maintained so that it can revert to agriculture after the life of the solar farm.

Planning authorities will normally require that a proposal will minimise disturbance to agricultural land and be mindful of visual impact on any brownfield or

agricultural site. As even large solar farms are considered temporary, all the structures and any works (such as tracks) must be capable of removal or reversible.

Vehicular access to the arrays will be controlled to prevent criminal removal of panels. Security lighting and cameras are also likely to be installed; however, such measures usually use infrared to avoid visible light and light pollution.

Factors which could affect equestrians and should be considered during the planning phase are:

Construction

Construction traffic will create many vehicle movements, relative to the size of the site, but is likely to be much greater on some days than others. A traffic effect plan should be produced during the planning application which should take into account the safety of users of rights of way both on and adjacent to the site and on roads used in the locality. Traffic can be restricted by planning conditions to normal working hours, avoiding the early mornings, evenings and weekends when equestrians are most likely to be out.

Bridleways, byways and unsurfaced roads should not be used for site access. If it is unavoidable, every effort should be made to ensure that the surface will be maintained and restored to a surface material suitable for horses after construction of the solar farm. An alternative route for equestrians should be provided during construction to minimise conflict.

Closures without alternative routes should be avoided and, if necessary, construction traffic managed to reduce the length of closures, rather than an automatic blanket closure throughout the period of construction.

Trenches for cables should not cross or be laid along rights of way. If it is unavoidable, authorisation will be required from the Highway Authority to disturb the surface of the right of way. The surface must be reinstated to a firm and safe condition within a set period, which should be as short as possible to minimise inconvenience to users. If the surface is not reinstated, the Authority can restore it and charge the cost to the landholder. The finish must be one that is suitable for horse use.

There will be noise during construction, particularly from pile driving, which is unpleasant but its temporary nature means it is not usually a material planning consideration requiring control.

Inverter housing

The noise from inverters, particularly when energy generation is high, has been reported as very instrusive and may be disturbing to users of bridleways, horses kept nearby or equestrian businesses. Higher standards of sound insulation on the housing of inverters may be required where they are within audible range of horses. A horse's range of hearing is wider than a human's and sounds are audible at lower decibels.

Inverters should be sited as far away from bridleways, byways and equestrian

businesses or land used for keeping horses.

Drainage

Drainage provision for the radically changed surface of a solar farm compared with greenfield land must be taken into account to prevent potentially serious detrimental effects on equestrian routes on and immediately adjacent to the site and for some distance away, depending on drainage patterns, outflow and the terrain.

Hard surfaces create a very different drainage situation from an open field as run-off is immediate and much higher in volume. The extensive surface area of the panels could significantly change the nature of the drainage. Existing drainage may not be adequate to cope with the changed run-off and a holding pond may be required. New drainage to protect equestrian routes is essential to ensure they are not affected. This must be considered well beyond the site itself so that flash flood damage does not occur.

The effect of the construction process and vehicular access should also be considered. Levelling a site, soil stripping, trenching for cables, compaction and creating access tracks will all affect the drainage of the site and should be carefully provided for in the construction phase so that there is no adverse effect on equestrian routes.

Hard surfacing routes which currently have an adequate natural surface should not be the automatic answer; it is usually better to preserve the existing surface by attention to drainage. However, the existing surface and potential future use should be taken into account and the opportunity for upgrading the surface with a finish suitable for horse use should be taken if appropriate.

Fencing

Solar farms are valuable investments with material that is vulnerable to crime. They are usually fenced to above head height for security. If bridleways or byways are alongside or through sites, care must be taken not to create a narrow corridor. Fencing can be intimidating, especially at this height, and create a need for vegetation control.

It is not safe to fence users into too narrow a corridor, particularly for a length more than a few metres. The need to maintain adjacent hedges and surface vegetation so as not to further reduce the available width should also be considered, as well as vehicular access for maintenance if appropriate.

A minimum width of 4m is required (preferably 5m), irrespective of any recorded width of the right of way, with vegetation cut through the full width.

Where a bridleway or byway has been previously unfenced, it is likely that the used width has been at least 4m as users do not risk passing each other more closely than necessary, particularly on multi-use routes where horses, bicycles, pedestrians and dogs may be involved.

Use of open mesh fencing is preferable to close boarding or metal palisade-type

fencing with sharp points on top. The latter two are much more intrusive in the landscape so should not be permitted in a rural location; they also create unpleasant and intimidating alleys, even if relatively wide, in any location. Metal palisade fencing with spikes on top should be avoided as its rigidity and sharp edges are very dangerous and have safety implications for riders. While it may be above head height for a pedestrian, its top is likely to be below chest height for a rider and very serious injury is likely should a rider be thrown onto or against such a fence.

Security

There may be a wish to restrict vehicle access to the site to minimise theft or vandalism. Anti-vehicle barriers cannot be authorised on bridleways or byways for the purpose of security, only to control livestock or to safeguard users of the right of way. The site must therefore only be permitted if it can be secured without affecting bridleways, byways or roads. On permissive paths, barriers should conform to BHS Advice on Gates or Vehicle Barriers to ensure safety of users.

Alternative or additional access

Large developments are opportunities for increasing access, particularly those which contribute to community funds. There may be chance to upgrade a footpath to bridleway or to gain an additional route. Even very short links can have important effects by enabling greater or safer use of existing routes in an area.

It should not be necessary to divert a bridleway or restricted byway (a byway open to all traffic cannot be diverted under normal circumstances) as arrays can be arranged around the route. However, this could significantly reduce the number of panels that can be accommodated and there may be a proposal to divert a route to the edge of the site. In some cases, this may be acceptable if it provides a more advantageous route, but not if is less convenient or commodious. Diversions should be avoided, unless the proposal is more desirable than the existing route as the solar farm is a temporary structure. If it is essential to divert a convenient route, consideration should be given to it reverting to the original line on expiry of the planning permission for the solar farm.

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