Renewable Energy Planning Guidance Note 1

The Development of Domestic and Medium Scale Solar PV arrays up to 50kW and Solar Thermal
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With thanks to Cornwall Council and Ashford Borough Council for permission to use their original documents.
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Appendix A: Electricity Generating Capacity

Appendix B: Landscape Site Assessment for Standalone or Ground Mounted Solar PV

Appendix C: Example of Planning Conditions for Standalone or Ground Mounted Solar PV Installation in Swale

Appendix D: Crime Prevention Advice for the Development of Domestic and Medium Scale Solar Arrays
THE DEVELOPMENT OF DOMESTIC AND MEDIUM SCALE SOLAR PV ARRAYS UP TO 50KW AND SOLAR THERMAL IN SWALE BOROUGH.

This guidance document has been prepared to assist all parties involved in the renewable energy development process. The status of this document is that it has been approved by the Council and will guide decision makers when determining applications.

Introduction

This guidance note aims to provide planning advice in respect of solar photo voltaic (PV) and roof mounted solar thermal installations with a capacity of up to 50kW, or approximately 200-250 solar PV panels. Planning advice in respect of solar PV installations greater than 50kW is provided within a sister document ‘The Development of Large Scale (>50kW) Solar Arrays’, published by Swale Borough Council.

This guidance note will be regularly reviewed and updated and can be viewed on our website at www.swale.gov.uk/local-planning-guidance

We hope that you find this planning guidance useful but if you have any queries please do not hesitate to contact the Planning Policy team at planningpolicy@swale.gov.uk or ring 01795 417850.

We continuously seek to improve the quality of the advice and guidance that we offer and we would be happy to receive comments, suggestions or images which may improve this guidance document.

Government Guidance

The National Planning Policy Framework confirms the government’s commitment to sustainable development with one of the core planning principles being to:

“support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example, by the development of renewable energy);”

Further detailed guidance on renewable and low carbon energy is available on the Planning Practice Guidance website http://planningguidance.planningportal.gov.uk/ and the Planning Portal www.planningportal.gov.uk. These sites confirm that solar technology (photovoltaic and solar water heating) is often permitted development. There are, however, important limits and conditions which must be met to benefit from the permitted development rights.

Factors to bear in mind include:

- the importance of siting systems in situations where they can collect the most energy from the sun;
- the need for sufficient area of solar modules to produce the required energy output from the system;
• the effect on a protected area such as an Area of Outstanding Natural Beauty or other designated areas;
• the colour and appearance of the modules, particularly if not a standard design.

**Solar in the UK**

It is estimated that the Earth receives enough energy from the Sun in one hour to supply the world’s energy requirements for a year. The advance of solar PV technology, the decreasing cost of this technology, and the high solar irradiation levels within southern England mean that solar PV can be an attractive technology for generating electricity.

The map shows the global irradiation and solar electricity potential for mainland UK.

**Feed in Tariff**

The Feed in Tariff (FiT) provides a financial subsidy towards a number of renewable energy technologies, including solar PV. The FiT is a considerable financial incentive and currently applies for a period of 20 years.

As a result of the FiT, alongside the reducing costs of solar powered installations, Swale Borough Council anticipates an increase in the number of solar PV arrays, with a capacity up to 50kW - both roof mounted and ground mounted. This document sets out our guidance and suggestions in respect of how such arrays could be developed in Swale.

**‘Solar Ready Buildings’**

In order to facilitate and optimise the potential generation of electricity from Solar PV and heat from solar thermal panels in Swale the design and orientation of new or renovated buildings should be undertaken in a manner which, where possible, optimises the southerly orientation of any appropriate roof or wall structures at an appropriate angle, ideally 33-35°. The roof or wall should also be structurally capable of accommodating an appropriately sized solar PV array.

Buildings should, where appropriate, be designed, orientated and constructed to ensure that they are ‘solar ready buildings’ and can accommodate the installation of solar PV panels either now or in the future.
Listed Buildings
Buildings which are of particular historical or architectural interest may be designated as Listed Buildings. There are over 1,800 Listed Buildings within Swale Borough and information on these buildings may be found at [www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/](http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/).

Any solar panels installed on a Listed Building or on a building within its curtilage will normally require planning permission and may also require Listed Building consent. Any standalone solar panel installation within the curtilage of a Listed Building will normally require planning permission. There may often be a preference for installations on outbuildings/extensions to listed buildings, rather than to the main part of the Listed Building themselves. English Heritage have provided comprehensive advice relating to the most appropriate and sensitive way to install solar PV panels on buildings of historic importance and this advice may be viewed at: [www.english-heritage.org.uk/publications/small-scale-solar-electric-photovoltaics-energy](http://www.english-heritage.org.uk/publications/small-scale-solar-electric-photovoltaics-energy)

Conservation Areas
There are 50 Conservation Areas in Swale and as these areas have been designated due to their special character the installation of solar PV panels should be undertaken sensitively.

In Conservation Areas planning permission for the installation of solar panels would be required if:

- The solar panel would be installed on a wall forming the principal (usually the main frontage which has the front door and often faces the road) or side elevation of the dwelling house or would be visible from a highway;
- On a wall of a building within the curtilage of the dwelling house and would be visible from a highway;
- If permitted development rights have been removed by a previous permission or by an Article 4 Direction - always check.

If there is any doubt as to whether planning consent is required confirmation from the Council should be obtained by submitting an application for a Lawful Development Certificate.

Areas of Outstanding Natural Beauty and other Landscape Designations
A significant part of Swale lies within the Kent Downs Areas of Outstanding Natural Beauty (AONB). The extent of the AONB can be seen on the Kent Downs AONB website [www.kentdowns.org.uk/interactive-map](http://www.kentdowns.org.uk/interactive-map).

The purpose of the AONB designation is to conserve and enhance the natural beauty of the area. The designation gives formal recognition to an area’s landscape importance and allows for the development of communities and economic activity. The AONB designation is not necessarily a constraint on all renewable energy development. Developments are encouraged provided that they do not have a significant adverse impact on the AONB. The Kent Downs AONB Unit have produced a Position Statement and Companion Report on
Renewable Energy and this should be referred to for applications with the AONB and its setting [www.kentdowns.org.uk/guidance-management-and-advice/renewable-energy1](http://www.kentdowns.org.uk/guidance-management-and-advice/renewable-energy1).

Swale also has land designated as Special Landscape Areas and Areas of High Landscape Value. These are shown on the Swale Borough Local Plan 2008 Proposals Map [maps.swale.gov.uk/LocalPlans/LP_document/indexmap.html](http://maps.swale.gov.uk/LocalPlans/LP_document/indexmap.html). Within these areas the priority is the protection and enhancement of these landscape assets and policy E9 of the Swale Borough Local Plan 2008 (as well as policies in the emerging Swale Local Plan, Bearing Fruits) should be referenced here.
Domestic scale solar PV <4kW and solar thermal Installations

Solar photovoltaic (electricity) panels

A 1.48kWp system such as that shown here could generate up to 1200kWh per year. Centrally mounting it on this slate roof minimises its visual impact.

Solar panel electricity systems, also known as solar photovoltaics (PV), capture the sun’s energy using photovoltaic cells. These cells don't need direct sunlight to work – they can still generate some electricity on a cloudy day. The cells convert the sunlight into electricity, which can be used to run household appliances and lighting.

Solar thermal (hot water) panels

The sun can also heat water. There are two main types of solar thermal panels: Flat Plate or Vacuum Tube.

Solar thermal panels have similar collection principles to photovoltaic panels, i.e. a system would often be roof mounted, inclined towards the sun in a south facing direction with the heat output proportional to the amount of direct sunlight striking the panel. Planning considerations including permitted development rights are essentially the same as for PV systems.
Which type is most suitable will depend on several factors including when you use the hot water, how much space you have available, what temperature of hot water you are trying to produce and aesthetics. Generally, vacuum tubes are more efficient so take up a smaller area, are better suited for hotter water and winter performance.

Flat plate collectors are more cost effective for summer use (e.g. campsites with large roof areas available). Consideration should be given to the positioning of solar thermal panels so that if you intend to locate solar photovoltaic panels in the future, space will be available.

**Householder permitted development rights for Solar Panels**


The guidance contained in this document reflects the advice set out on the Planning Portal, but it is always recommended that if there is any doubt as to whether planning consent is required confirmation from the Council should be obtained by submitting an application for a Lawful Development Certificate.

**Roof or wall mounted domestic scale (<4kW) solar PV and solar thermal installations - key planning considerations**

Where the roof orientation is correct, the roof is structurally sound and not in full or partial shade a roof mounted solar PV installation may be ideal.

Although a particular roof or wall may be suitable other factors may need to be considered:

- The solar panels will need to be protected from shade throughout their life. Consideration should therefore be given to the proximity of existing or future trees or vegetation which may cause shading. Allowance should be made for the future growth of trees and vegetation or the erection of buildings, particularly where such matters are outside your control (i.e. on neighbouring land or buildings).
- Other structures such as lamp posts, telegraph poles and overhanging cables can affect the performance of the solar panels.

- Can the solar installation be incorporated as an integral part of the structure of the building i.e. solar slates or other solar design solutions?

- Consider the effect of any solar installation on the character or appearance of the building. Such installations should be configured in a way which maintains, enhances or improves the balance and proportions of the recipient building or nearby buildings. This may include designing the solar installation to complement existing windows and roof lights and avoiding designs which may appear disproportionate and unbalanced. In some instances it may be worthwhile contacting neighbours to discuss the installation of joint schemes (which could also reduce the cost) and improve the overall appearance of the installation.

- Structural suitability of the proposed roof or roof covering - Solar PV panels are likely to be installed for the 20 year life of the FiT. It is therefore important to consider the longevity and suitability of the existing roof and roof covering and determine whether it is appropriate to undertake any replacement or repair work to the roof prior to installing solar PV panels. The installation of solar PV panels may also protect the underlying roof from degradation caused by sunlight.

- On flat roofs the potential for constructing a supporting framework for solar panels should be considered. The framework could be designed to allow the angle of the panels to be adjusted seasonally to reflect seasonal changes in the height of the midday sun.

- In villages and other built up areas consider whether there might be any cumulative impacts on the overall appearance on a collection of buildings or roofs. This may be assisted by choosing a colour and/or design that blends with building materials and surrounding landscapes such as a non-shiny anti-glare option that would be less conspicuous in the wider landscape. Solar panels with dark surfaces may be more acceptable on buildings with slate roofs or on new buildings in areas where slate roofs are characteristic.
- Outbuildings or extensions can provide good locations for solar panels while having a minimal effect on the original building.

2kWp system will generate up to 1650kWh per year. These solar slates are integrated in a concrete tiled roof and are virtually hidden when viewed from the street.
Roof or wall mounted domestic scale (<4kW) solar PV and solar thermal installations – is planning permission required?

In many cases fixing solar panels to your roof or wall is likely to be considered ‘permitted development’ under planning law with no need to apply for planning permission. There are, however, important exceptions and provisos which must be observed.

If you are a leaseholder, you may need to get permission from your landlord, freeholder or management company.

If there is any doubt as to whether planning consent is required confirmation from the Council should be obtained by submitting an application for a Lawful Development Certificate.

As highlighted on the Planning Portal all of the following limits must be met:

- Panels should not be installed above the highest part of the roof (excluding the chimney) and should project no more than 200mm from the roof slope or wall surface.
- The panels must not be installed on a building that is within the grounds of a listed building.
- The panels must not be installed on a site designated as a scheduled monument.
- **Wall mounted only** - if your property is in a conservation area, or in a World Heritage Site, panels must not be fitted to a wall which fronts a highway.

All the following conditions must be observed:

- Panels on a building should be sited, so far as is practicable, to minimise the effect on the external appearance of the building and the amenity of the area.
- When no longer needed for microgeneration panels should be removed as soon as reasonably practicable.

Building Control

**The installation of solar panels on a domestic property may require compliance with Building Regulations. Particular attention should be given to:**

- Structural loading and stressing, including snow loading.
- Wind uplift which may affect wind pressure acting on roofs.
- Resistance to moisture, ensuring any penetrations through roofs do not effect water tightness.
- Electrical safety.

You are advised to contact South Thames Gateway (STG) Building Control Partnership (Email: building@stgbc.org.uk  Phone: 01634 331133 for further information.)
Domestic scale (<4kW) standalone or ground mounted solar PV installations – key planning considerations

In some instances, for example where there is no suitable roof elevation or the property is a listed building and there is sufficient space within the curtilage of the building to develop without affecting its character, consideration should be given to the development of a standalone or ground mounted solar PV installation. The advantages of such an installation include:

- Ease and safety of installation, cleaning and maintenance;
- Potential choice and flexibility of site selection and panel orientation;
- More efficient operation due to cooler temperatures caused by better air circulation and more optimal orientation;
- Potentially less visual/landscape impact than roof mounted structure;
- Potential dual use (e.g. log store, machinery store, hen house etc).

A 4kW ground mounted solar PV installation. The area covered by the array could be utilised for a number of dual purposes such as a log store, machinery store, hen house etc. Installation by Clean Earth Energy.

A standalone or ground mounted solar PV array should be carefully located in order to ensure that the installation is protected from shade throughout its life. Allowance should be made for the future growth of trees and vegetation or the erection of buildings, particularly where such matters are outside your control (ie on neighbouring land or buildings). If the proposed array is fixed to any building that lies in the curtilage of a listed building, then Listed Building Consent may also be required.

There are other possible solutions to mounting solar PV panels when the available roof space is not suitable:

- The development of a car port using solar PV panels as an integral part of the roof;
- Locating solar PV panels on a garage or other outbuilding;
- Creation of covered walkways using solar PV panels as roofing;
- Formation of covered bike/motorbike shelter;
- Incorporation within a conservatory or other extension.
Domestic scale (<4kW) standalone or ground mounted solar PV installations – is planning permission required?

In some cases the installation, alteration or replacement of standalone or ground mounted solar panels is likely to be considered ‘permitted development’ under planning law with no need to apply for planning permission. There are, however, important exceptions and provisos which must be observed.

As outlined on the Planning Portal, all the following limits must be met:

- Only the first stand alone solar installation will be permitted development. Further installations will require planning permission.
- No part of the installation should be higher than four metres
- The installation should be at least 5m from the boundary of the property
- The size of the array should be no more that 9 square metres or 3m wide by 3m deep
- Panels should not be installed within the boundary of a listed building or a scheduled monument.
- If your property is in a conservation area, or in a World Heritage Site, no part of the solar installation should be nearer to any highway bounding the house than the part of the house that is nearest to that highway.

All the following conditions must be observed:

- Panels on a building should be sited, so far as is practicable, to minimise the effect on the amenity of the area.
- When no longer needed for microgeneration panels should be removed as soon as reasonably practicable.

Notes from the Planning Portal

Permitted development rights for solar panels are available for both single houses and buildings which consist wholly of flats.

If you are a leaseholder you may need to get permission from your landlord, freeholder or management company.

If there is any doubt as to whether planning consent is required confirmation from the Council should be obtained by submitting an application for a Lawful Development Certificate.
Planning Application and Planning Application Fee for domestic scale solar PV installations

Swale Borough Council expects that any planning application for a domestic scale solar PV installation should be accompanied by the following information:

- A location plan (1:1250 metric scale)
- A site/block plan (1:500 metric scale)
- Elevations (for both roof and ground mounted arrays) (1:100 metric scale)
- A roof plan (where applicable) (1:100 metric scale)
- A supporting statement
- A Heritage Statement where applicable.

Swale Borough Council website has guidance for submitting planning applications and this may be viewed at [www.swale.gov.uk/making-a-planning-app/](http://www.swale.gov.uk/making-a-planning-app/)

The Validation Team – Mid Kent Planning Support (MKIP) will be able to assist you and confirm the level of information necessary to accompany and support any planning application. They can be contacted at planningservices@midkent.gov.uk or on 01622 602 736.
Please submit your application online via the Planning Portal at
www.planningportal.gov.uk/planning/applications/planningapplications

Alternatively, paper based application forms can be obtained from our website at
http://www.swale.gov.uk/how-to-submit-an-application/ and sent to:

Mid Kent Planning Support (MKPS)
Maidstone Borough Council
Maidstone House
King Street
Maidstone, ME15 6JQ

The fee for submitting such a planning application would currently be £172. Please note if the
application is not within the domestic curtilage the plant and machinery fee would apply which is
£385 per 0.1ha.

If the householder application is related to 2 or more dwellings the fee would be £339.
Medium scale (4 – 50kW) solar PV installations

Rising energy costs, the introduction of the Feed in Tariff (FiT) and the reduced cost of solar powered installations have significantly increased the financial viability and attractiveness of installing a medium scale solar PV facility. These installations may be roof/wall mounted or standalone/ground mounted and can be associated with a range of activities including domestic, agricultural, industrial and community. A 50kW solar PV array will include approximately 200-250 solar panels and require an area of approximately 300m2.

Electricity Generating Capacity

Planning applications for medium scale solar PV installations should clearly indicate the installed capacity (kW) of the proposed facility. While it is accepted that the performance of the solar panels may degrade over time the initial installed capacity should be provided. The ‘capacity factor’ and estimated annual production (KWh p.a.) should also be provided together with the number of residential properties electricity equivalent for UK. A pro forma table, explaining these terms, is attached as Appendix A. This information will allow members of the public, officers and elected Members, to clearly understand the generating capacity of the proposed facility.

Roof or wall mounted medium scale (4-50kW) solar PV installations

Prospective applicants should consider the following points, addressed in detail above, when considering the potential development of a 4-50kW roof mounted solar PV installation;

- ‘Solar ready buildings’
- Roof orientation
- Visual impact/colour etc
- Structural suitability of the proposed roof or roof covering
- Listed Buildings, Conservation Areas or Areas of Outstanding Natural Beauty.
Planning Application and Planning Application Fee for medium scale solar PV installations

Planning permission would normally be required for development involving the installation of a solar PV installation to the roof or wall of an agricultural, industrial or community building. Swale Borough Council expect that any planning application for a medium scale roof mounted solar PV installation should be accompanied by the following information:

- A location plan (1:1250 metric scale)
- A site/block plan (1:500 metric scale)
- Elevations (for both roof and ground mounted arrays) (1:100 metric scale)
- A roof plan (where applicable) (1:100 metric scale)
- Design and access statement
- A supporting statement
- A historic environment statement where applicable.

The Validation Team – Mid Kent Planning Support (MKIP) will be able to assist you and confirm the level of information necessary to accompany and support any planning application. They can be contacted at planningservices@midkent.gov.uk or on 01622 602 736.
Please submit your application online via the Planning Portal at
www.planningportal.gov.uk/planning/applications/planningapplications

Alternatively, paper based application forms can be obtained from our website at
http://www.swale.gov.uk/how-to-submit-an-application/ and sent to:

Mid Kent Planning Support (MKPS)
Maidstone Borough Council
Maidstone House
King Street
Maidstone, ME15 6JQ

Such applications may require Building Regulation approval and you are advised to contact South Thames Gateway Building Control by email: building@stgbc.org.uk or phone: 01634 331133 for further information.

Medium scale (4-50kW) standalone or ground mounted solar PV installations – key planning considerations

In some instances, for example where existing roofs are unsuitable to accommodate a solar PV installation as a result of orientation, structural loading or roof covering, or because of undesirable visual impact, consideration could be given to the development of a standalone or ground mounted solar PV installation. Such ground mounted installations may offer a number of advantages when compared to roof mounted installations, including:

- Ease and safety of installation, cleaning and maintenance.
- Potential choice and flexibility of site selection and panel orientation.
- More efficient operation due to cooler working temperatures caused by better air circulation and more optimal orientation.
- Potentially less visual/landscape impact than roof mounted structure.

a) Site selection

When considering site selection for a ground mounted or stand alone solar PV installation there are a number of factors that should be considered:

- the solar panels will need to be protected from shade throughout their life.
- the proximity of existing or future trees or vegetation which may cause shading.
- Allowance should be made for the future growth of trees and vegetation or the erection of buildings, particularly where such matters are outside your control (i.e. on neighbouring land or buildings).
- In order to minimise the impact on any agricultural activities and minimise landscape/visual impact the facility should be close to farm buildings, hedge/wall or field boundary and not in the centre of a field.
- To avoid excessive installation costs the facility will normally need to be located within
200m of an existing electricity meter.

b) **Proximity to Public Footpaths, Bridleways and Highways**
The existence of Public Rights of Way (PROW), including public footpaths, bridleways and highways, should be carefully considered at the site selection and design stage. A medium scale ground mounted solar PV facility should not, by virtue of its size, scale or setting, have an unacceptable impact, either during its construction or operation, on users of such a PROW. Where a PROW may be affected by such development careful mitigation, including appropriate landscape planting, should be considered and detailed within any planning application. Additional measures, such as the erection of an interpretation board explaining the role of the facility, may allow the development to become an accepted feature along the PROW.

c) **Site Levelling Works**
The site selection process should avoid the identification of a site where site levelling works would be required in order to accommodate any ground mounted solar PV installation. If any site levelling works are proposed the extent of these levelling works should be discussed at the pre-application stage and detailed within any planning application.

d) **Development in Relation to Current Land Use**
Ideally medium sized stand alone or ground mounted solar PV installations should utilise previously developed land, contaminated land, industrial land or brownfield sites and should avoid landscapes designated for their natural beauty and/or sites of acknowledged/recognised ecological/archaeological importance/interest.

e) **Assessment of the impact upon agricultural land**
The National Planning Policy Framework (NPPF) requires the presence of best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) to be taken into account alongside other sustainability considerations. The Framework expresses a preference for development to be directed to land outside of this classification (ie to 3b, 4 and 5). Although a 50kW ground mounted solar PV installation would occupy a relatively small area of land, and such land could continue to be grazed, there would be some impediment to intensive agricultural use and the use of best and most versatile agricultural land should therefore be avoided where possible. In essence, although the need to support diversification of agricultural land in order to sustain an agricultural enterprise is recognised, it is advisable to utilise grassland and field margins for such ground mounted solar PV installations in preference to arable land.

f) **Ground maintenance**
Vegetation will grow beneath the solar panels and this will require management, particularly to avoid the site becoming overgrown with noxious weeds and assist with the eventual restoration of the site, normally to its former use. There are various techniques for managing this vegetation, these include mowing, strimming, spraying or mulching. Spraying should be avoided wherever possible and mulching large areas is likely to present technical challenges and may add to the landscape/visual impact of a development proposal. Where any solar PV installation is proposed on agricultural land there is a desire, both in terms of food production and the rural scene, to continue an agricultural use on the site.
Sheep and cattle grazing under solar PV arrays. Cattle grazing would not be recommended with ordinary mounting systems. Images courtesy of Steve Edmunds, Mole Valley Renewables.

Where sheep grazing is proposed under solar panels it is recommended that the panels are positioned not less than 900mm from the ground. All cabling etc must be adequately protected. Installation at the Olde House, Chapel Amble, Cornwall.
Grazing is to be encouraged wherever practicable. Cattle, horses, pigs and goats are likely to be too ‘physical’ for most standard solar PV arrays but sheep, chickens or geese should normally be acceptable. Another option could be the installation of bee hives to support biodiversity.

**g) Soil Stripping, storage and replacement**

The development of a medium scale solar PV installation may require the excavation of soils associated with construction compounds, access roads, cable trenching etc. Where such soil stripping occurs topsoil and subsoil should be stripped, stored and replaced separately in order to minimise soil damage and to provide optimal conditions for site restoration.

![Soil excavation during cable trenching at the 5MW Trefullock solar PV farm in Cornwall. Note how topsoil and subsoil are stored on opposite sides of the cable trench in order to avoid the mixing of soil types and facilitate subsequent soil replacement and site restoration.](image)

Buffer strips of 4m+ between hedges and solar panels could be used for access purposes while also providing access for hedge management and biodiversity.

**h) Access tracks**

Solar PV facilities which are developed on agricultural land should:

- aim to minimise disturbance to the agricultural land;
- be temporary, capable of removal and ‘reversible’; and
- minimise their landscape/visual impact and their impact on the rural scene.

The installation and use of access tracks should therefore be kept to an absolute minimum. Access tracks between rows of solar panels will generally not be acceptable. Agricultural vehicles, including tractors, quad bikes and 4WD, should be capable of servicing these facilities without the need to construct access tracks.
i) Security Fencing/Lighting

Applicants will be expected to direct considerable effort towards minimising the landscape/visual impact of solar PV arrays. Whilst there is an acknowledged need to ensure solar PV facilities are adequately secured it would be unfortunate if such security measures resulted in an unacceptable landscape/visual impact. Applicants should:

- minimise the use and height of security fencing;
- utilise existing features, such as hedges or landscaping, to screen security fencing;
- use natural features, such as vegetation planting, to assist in site security;
- avoid or minimise the use of security lighting. If required lighting proposed should utilise a passive infra-red (PIR) technology designed and installed in a manner which minimises glare, light pollution and impacts on biodiversity, in particular bats (see ecology section);
- Ensure that appropriate measures are in place to facilitate continued access by larger mammals, such as badgers and foxes.

In some instances specialist fencing may be necessary in order to prevent access by deer. Such deer fencing can be much less intrusive than other forms of fencing and should be considered where possible.

Planning applications should contain full details and specifications of all security and lighting installations in order to allow an accurate landscape/visual/ecological assessment of the proposal to be made.

Where pole mounted CCTV facilities are proposed the location of these facilities should be carefully considered in order to minimise visual/landscape impact. In exposed landscapes such structures should be avoided where possible.
j) **Ground anchors**

Solar PV facilities which are developed on agricultural ground should be ‘reversible’, allowing the site to be easily restored to a more intensive agricultural use.

Intrusive development, such as trenching and foundations, should therefore be minimised and the use of excavated concrete filled foundations on site should be avoided. Solar PV arrays should be installed using ‘pile’ driven or screw foundations, or pre-moulded concrete blocks (shoes), and capable of easy removal. A 50kW ground mounted solar PV array may only require 25 footings and these should each be capable of easy removal.

Where ‘pile’ driven foundations are proposed applicants should ensure that such development would not exceed statutory noise levels at any nearby noise sensitive properties.
Where there are areas of archaeological interest, and therefore a need to avoid ground disturbance, the use of pre-cast concrete anchors should be considered, as shown here at the 5MW Trefullock solar farm in Cornwall.

The ground anchors and framework associated with the development of the 1.4MW Benbole solar PV farm in Cornwall.

Where pile driven foundations are proposed consideration should be given to the noise impact at nearby sensitive receptors. Difficult ground conditions, such as those encountered at the 1.4MW Wheal Jane solar farm shown here, may also require drilling.

**k) Tracking**

Some solar PV arrays will follow the daily movement of the sun across the sky in order to take maximum advantage of the solar gain. These systems are known as ‘trackers’ and, although they maximise solar gain, they are expensive to install and maintain.

Some solar PV arrays will be static. These are less expensive to install and maintain but, because they do not follow the sun’s movement, they are not as efficient as ‘trackers’. A compromise is reached with some ‘seasonal trackers’ where solar panels are generally static but can be moved quarterly to reflect seasonal changes in the height of the midday sun. The type of solar PV array installed, and the extent of any ‘tracking’, will have an impact on the landscape/visual assessment and the planning application should clearly indicate the type of array proposed.
The impact of ‘trackers’ on grazing animals such as sheep should be carefully considered to avoid such animals becoming trapped in any moving parts.

i) Grid connection
Application proposals should provide a broad indication of the route of connectivity to the electrical grid. Such details are not strictly necessary in order for any planning application to be validated or registered but this information is required to confirm that such connectivity would avoid areas of high ecological or archaeological sensitivity.

m) Landscape and visual impact
The landscape and historic/visual impact of a medium sized solar PV installation is likely to be one of the most significant impacts of such development.

Developers may be attracted to southerly sloping sites, where solar gain is greatest. However, such sites may be of high agricultural value and are likely to be more visible within the wider landscape.

Solar PV installations are regarded as a temporary use of land (refer to Duration of Planning Permission at the end of the Guidance) and as such the removal of existing vegetated field boundaries, including hedges will not be permitted as this will irrevocably alter the landscape character of the site.

The development will need to have regard in both its design layout, and future maintenance plans for the retention of growth of vegetation on these important boundaries, including the opportunity for individual trees to grow on to maturity. Details of the management / maintenance proposals for vegetation beneath the solar panels should also be detailed within any planning applications.

A soil mound, less than 2m high, can sometimes assist in reducing the visual/landscaping impact of a proposed solar installation. There is a need to ensure that the screening mound itself does not have a detrimental visual/landscape impact and consideration should be given to the vegetation management. This mound has been carefully designed to allow sheep grazing. Installation at the Olde House, Chapel Amble, Cornwall.

The landscape/visual impact must be considered with great care at the pre-application stage, where appropriate the Council’s Development Management Team should be consulted at an early stage and mitigation measures proposed wherever necessary.

The ‘Landscape Site Assessment for Standalone or Ground Mounted Solar PV’, attached as Appendix B, provides some assistance in undertaking a landscape assessment and this
template should be completed and submitted in support of a planning application for such an installation.

Existing hedges and established vegetation, including mature trees, should be retained wherever possible.

Trees and hedges should be protected during construction. Additional hedge planting should be considered where such landscape screening would beneficially screen the proposed development.

**Checklist for advising on potential landscape and visual impacts:**

- Check the sensitivity of the current landscape character to change, and whether the site has capacity to accept such a development?
- Establish the area over which the development will be visible, and assess magnitude of change to views should the development be built. Are these changes in views significant from key vantage points (e.g. houses, footpaths, important viewpoints / sightlines and vistas)?
- Consider any new cumulative impacts created between the site and other similar developments in close proximity.
- Is there an opportunity to increase the diversity of the landscape character by further tree planting or allowing single trees within hedges to grow to maturity?
- Are proposed mitigation measures adequate and likely to be effective in terms of reducing the impact of the development on landscape character and visual amenity?
- Flat and gently sloping sites should be favoured over steep south facing slopes.
- In terms of location, sites occupying slacker gradients are likely to have an overall reduced impact on landscape character and visual amenity.

> Careful consideration should be given to the impact of existing or proposed vegetation in order to ensure that such vegetation does not cast a shadow on any installed solar panels.

**n) Archaeology and the historic environment**

Solar developments will only affect below ground archaeological deposits where they involve the disturbance of ground. This may cause direct impacts on archaeological deposits through ground disturbance associated with trenching, foundations, fencing, temporary haul routes etc. Developments between 4-50kW applications should use non penetrative foundations (concrete blocks), should involve a minimum of trenching and should be located away from known sites as recorded on the Historic Environment Record (HER) maintained by Kent County Council.
These records can be located online using the Heritage Gateway at

Where applications are received within archaeologically sensitive locations, the Council may
seek professional archaeological monitoring of ground works as a condition of consent.

The impacts of solar developments on historic sites may include the effects of applications on
the setting of Listed Buildings and Scheduled Monuments as well as on the historic
landscape character of the area.

Swale Borough Council will expect all proposals to have been informed by a consultation with
the Historic Environment Record (HER) maintained by Kent County Council. Any application
should identify the presence of both designated and undesignated heritage assets which may
be affected by any development and identify if there will be a requirement for further information
to support an application. If such a requirement is identified we will expect applicants who wish
to proceed with such sites to undertake a further consultation with Kent County Council who will
advise on a brief for the required expert assessment or evaluation work.

The results of such assessments will be expected as supporting information in advance of the
validation of applications. Swale Borough Council expects such assessments to follow the
briefs set by the Historic Environment Service and to demonstrate the use of appropriately
qualified professional expertise. Where assessments are absent or inadequate the Council may
request further work to be undertaken in advance of determination. We will expect applications
to take account of the results of historic environment assessments in their design, for instance
through the sensitive planning of installations. Any opportunities to introduce better
management of affected assets, or to improve the settings of designated sites, should be
identified and this will be actively encouraged.

0) Ecology

The nature of ecological impacts directly resulting from the development of a medium scale
solar PV facility will depend on the ecological characteristics and features of the site and
sensitivity to proposed changes. Schemes may reduce habitat and habitat suitability for some
species, but may also be capable of integrating different uses of land and delivering
environmental gains. Developers should consider the impacts that could take place through the
construction, operation and decommissioning stages of a scheme.

The most important element with respect to ecology is site selection. Intensively managed
agricultural land is likely to be of least ecological interest and therefore most suitable, in
ecological terms, for such solar PV installations. Sites of recognised ecological importance
should be avoided.

The main impacts and mitigation requirements are likely to be:

- **Lighting** – security lighting may affect bats and have an impact on the character of the
  surrounding landscape. It is advised that lighting is not used unless absolutely necessary. If
  lighting is necessary it must be minimised and directed away from hedges / woodland / scrub.

- **Cables** – overhead and underground cables have the potential to adversely impact upon
biodiversity and on the character of the surrounding landscape. Cable routes need to be carefully designed to avoid any areas of ecological interest and to have the least impact on the surrounding landscape character.

**Construction** – Existing hedges should be fully retained and no new hedge breaks created. If any hedges/scrub are to be removed, further surveys including for dormice and reptiles may be necessary. Pile driving may affect any badgers nearby; this will need to be informed by a badger survey and a licence may be necessary.

**Fencing** – we advise that buffer strips (at least 2m) are left between perimeter fencing and hedges. The fencing must allow badgers, reptiles and other fauna access into the site (whilst retaining any grazing animals). We advise that a gap is left around the entire base of the fence to allow small mammals and reptiles access, with larger gaps or gates for badgers at suitable intervals.
Enhancement, management and monitoring – ground mounted solar PV installations have the potential to increase the biodiversity value of a site if the land was previously intensively managed. Sheep grazing or an autumn cut with removal of grass cuttings could increase the botanical diversity of the site. A suitable management regime for the site should be considered, bearing in mind shading by the solar panels. Hedges should be managed appropriately, and could be laid to reduce gaps. Owl boxes should be considered in association with any inverter/substation housing.

Proposed enhancements should build upon and extend existing habitats or create new important habitats eg: cultivated strips/plots for rare arable plants, rough grassland margins, bee plant mixes, wild bird mixes, wetlands etc.

p) Community Involvement and Engagement

Community involvement and engagement should be considered as an integral part of the development process. The extent of this engagement will depend upon the size, nature and location of the proposed development although developers are advised to discuss their proposal with neighbours and nearby residents at the pre-design, conceptual stage in order to allow any views to be taken into account prior to the submission of a formal planning application.

q) Pre-Application Discussions

Potential applicants are strongly encouraged to enter into pre-application discussions with the
Borough Council as well as the local parish councils.

r) **Planning Application and Planning Application Fee**

Planning permission would normally be required for development involving a medium scale (4-50kW) standalone or ground mounted solar PV installation. Swale Borough Council expects that any planning application for such a solar PV installation should be accompanied by the following information:

- A location plan (1:1250 metric scale)
- A site/block plan (1:500 metric scale)
- Elevations
- Design and access statement
- A supporting statement
- Fencing specification and details (where applicable)
- Details of connection to electrical grid
- Details of any ancillary works or buildings proposed, including elevations
- An ecological assessment where applicable
- A landscape/visual assessment if the application site lies within, or would impact upon, an Area of Outstanding Natural Beauty a Special Landscape Area or an Area of High Landscape Value (see Appendix B for more information).
- A historic environment statement where applicable
- Completed ‘Electricity Generating Capacity’ form (see Appendix A).

The Validation Team – Mid Kent Planning Support (MKIP) will be able to assist you and confirm the level of information necessary to accompany and support any planning application. They can be contacted at plannerservices@midkent.gov.uk or on 01622 602 736.

The fee for submitting such a planning application would be £385 per 0.1ha.

The planning application boundary, and planning application fee, relates to the site area. The planning application boundary should extend around the proposed solar PV and any security fencing and any immediate ancillary works e.g. access tracks. It is for the applicant to ensure that all proposed development is included within the boundary of the planning application.

Please submit your application online via the Planning Portal at [www.planningportal.gov.uk/planning/applications/planningapplications](http://www.planningportal.gov.uk/planning/applications/planningapplications)

Alternatively, paper based application forms can be obtained from our website at [http://www.swale.gov.uk/how-to-submit-an-application/](http://www.swale.gov.uk/how-to-submit-an-application/) and sent to:

Mid Kent Planning Support (MKPS)
Maidstone Borough Council
A planning application will not be registered until the correct planning application fee has been received by Swale Borough Council.

s) Duration of Planning Permission & Planning Conditions

The Feed in Tariff for solar PV applies for a period of 20 years. Ground mounted solar PV installations should normally be regarded as a temporary use of land, and hence the need for ‘reversibility’, and the ability for all structures to be removed and the land returned to its original use. Planning permissions will normally:

- Need to be implemented within a period of three years;
- Contain a timeframe for the completion of the construction and commissioning of the development;
- Be for a temporary period only, and a maximum period of 20 or 25 years from the commissioning of the facility should be applied;
- If electricity production from the solar array has permanently ceased for more than six months during the anticipated 20 or 25 year period, the array and any associated structures should be removed and the ground reinstated to its original condition.

Planning applications should specify the length of time being applied for. A 20 or 25 year time limit will normally be imposed.

Any planning permission for a medium scale standalone or ground mounted solar PV installation will normally contain a schedule of planning conditions. An example of planning conditions is attached at Appendix C. This is provided for information purposes only, conditions attached to individual planning permissions may vary depending upon particular development proposals and site considerations.
Appendix A: Electricity Generating Capacity

Planning applications for medium scale solar PV arrays (4-50kW) should be accompanied by the following information.

<table>
<thead>
<tr>
<th>Installed capacity (kW)</th>
<th>Capacity factor</th>
<th>Estimated annual production (kWh p.a.)</th>
<th>Number of residential properties electricity equivalent</th>
</tr>
</thead>
</table>

Notes:

1. Installed capacity is the full-load, continuous rating of generating equipment under specific conditions as designated by the manufacturer. In other words, this is the power generated when the equipment is working at full capacity.
2. Capacity factor is the calculated factor which compares the plant's actual production over a given period of time with the amount of power the plant would have produced if it had run at full capacity for the same amount of time. The capacity factor should take account of the specific equipment and the specific location. It is expressed as a percentage.
3. Estimated annual production of electricity based upon the installed capacity and the capacity factor.
4. Number of residential properties that would be powered by the estimated annual production based upon the U.K. average household consumption of 4,629 KWh/year.
## Appendix B: Landscape Site Assessment for Standalone or Ground Mounted Solar PV

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Description of development</td>
</tr>
<tr>
<td>2</td>
<td>Location of site</td>
</tr>
</tbody>
</table>
| 3 | Landscape Character Area within which the site is located (refer to the Council's Landscape Character and Biodiversity Appraisal :- [www.swale.gov.uk/landscape-character-appraisal-september-2011/](http://www.swale.gov.uk/landscape-character-appraisal-september-2011/))  
The assessment will need to examine adjacent Landscape Character Areas where the site is located close to the Area’s boundary. |
| 4 | Is the site within the Kent Downs Area Of Outstanding Natural Beauty (AONB), a Special Landscape Area or an Area of High Landscape Value? Yes / No  
What is the distance to the boundary of the nearest Landscape Designation? |
| 5 | Looking at the relevant Landscape Character Area from the Swale Landscape Character and Biodiversity Appraisal, how much of the “landscape description” and “key characteristics” relate to the site?  
| High – Many features are in common with the character area description or key characteristics  
| Moderate – Some features are in common with the character area description or key characteristics  
| Low – Few features are in common with the character area description or key characteristics  
| None – the has no features in common with the character area description or key characteristics |
| 6 | What aspects of the character of the area will be changed by the development, to what magnitude and to what extent?  
| High - High level of change. High adverse effect  
| Moderate - Moderate level of change. Moderate adverse effect  
| Low - Few changes, Low adverse effect  
<p>| No change |
| 7 | Combine the values derived from Points 5 and 6 above to determine the sensitivity of the landscape character to a solar development:– |</p>
<table>
<thead>
<tr>
<th>Point 5</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape</td>
<td>Low</td>
<td>L</td>
<td>LM</td>
</tr>
<tr>
<td>Character</td>
<td>Moderate</td>
<td>LM</td>
<td>M</td>
</tr>
<tr>
<td>Significance</td>
<td>High</td>
<td>M</td>
<td>MH</td>
</tr>
</tbody>
</table>

**Sensitivity of Landscape Character**

Low  
Site makes little contribution to the landscape character and is not significantly vulnerable to change.

Low / Moderate  
Site makes a small contribution to the landscape character, which is vulnerable to adverse change, or the site is fairly significant in terms of character, but the character can withstand the change.

Moderate  
Site makes a good contribution to the landscape character, which will suffer a level of adverse change due to the solar development.

Moderate / High  
Site contributes much to the local distinctiveness and character of the area and is vulnerable to change.

High  
The site is typical of the area’s character and the solar development is likely to be detrimental to this.

8  
How visible is the site from the surrounding landscape, will the visual impact be high, moderate, low, or no impact?

- **High** - The solar development is very visible from the landscape around the site, with little potential to mitigate the visual impact.
- **Moderate** - The solar development is visible from a number of locations, with some potential for mitigation.
- **Low** - The solar development is partially visible from a small number of locations with likely potential for mitigation.
- **None** - The solar development would not be visible from any position within the surrounding landscape.

9  
Determining the overall landscape and visual sensitivity to the solar development.

The value rating from Point 8 - Sensitivity of Landscape Character, and the value rating from Point 9 – Visibility when combined give a value of the landscape’s overall sensitivity to a Solar development.

\[
\text{Landscape Sensitivity to Change (Point 7)} + \text{Visibility (Point 8)} = \text{Overall sensitivity to Proposed Change (Point 9)}
\]

<table>
<thead>
<tr>
<th>Point 7 Sensitivity of Landscape Character</th>
<th>Point 8</th>
<th>Visibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>MH</td>
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<tr>
<td>Moderate</td>
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<td>Moderate Low</td>
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<table>
<thead>
<tr>
<th>Point 8</th>
<th>Visibility</th>
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<tbody>
<tr>
<td>High</td>
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<td>Moderate</td>
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<td>Low</td>
<td>ML</td>
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</tbody>
</table>
Overall Sensitivity to Solar Farm Development

Low Overall Sensitivity – \((L)\)
There will be little discernable impact on the landscape, and or the landscape has potential to be positively enhanced through the construction of a solar development. Any small changes in landscape character will not be strongly expressed.

Low / Moderate Overall Sensitivity – \((LM)\)
Small adverse changes in the landscape character which are unlikely to be strongly expressed. There is likely to be a potential for landscape enhancement.

Moderate Overall Sensitivity – \((M)\)
There will be some negative change in the landscape character which will be visible, there may be potential for mitigation through appropriate scaling, siting, and design, or screening.

Moderate / High Overall Sensitivity – \((MH)\)
The construction of a solar development will result in a significant negative effect or change in the landscape character that will be highly visible with unlikely potential for mitigation.

High Overall Sensitivity – \((H)\)
The construction of a solar development will result in a significant negative effect or change in the landscape character that will be highly visible with no potential for mitigation, which would not in itself have an impact upon character.
Appendix C: Example of Planning Conditions for Standalone or Ground Mounted Solar PV Installations

The following Notification of Grant ofPermission to Develop Land is an example of typical planning conditions that may be required for a ground mounted photovoltaic array. Please note that further or different conditions may be required on other proposals on different sites.

Notification of Grant of Permission to Develop Land at 6 Desmond Crescent, Canterbury Road, Faversham - PTO
NOTIFICATION OF GRANT OF PERMISSION TO DEVELOP LAND

TO: Bridget Neame  
C/o Mr Justin F.ord  
Invicta Clean Energy Ltd  
59 West Street  
Faversham  
Kent  
ME13 7JH

TAKE NOTICE that Swale Borough Council, in exercise of its powers as a Local Authority under the Town and Country Planning Acts, HAS GRANTED PERMISSION for development of land situated at:

6 Desmond Crescent, Canterbury Road, Faversham, Kent, ME13 8YP

referred to in your application for permission for development accepted as valid on 20th May 2013

SUBJECT TO THE CONDITIONS specified hereunder:-

(1) The development to which this permission relates must be begun not later than the expiration of three years beginning with the date on which the permission is granted.


(2) The applicant shall notify the Local Planning Authority no later than ten working days following the cessation of power production. Within 3 months following the cessation of the use of the photovoltaic array, the panels and all associated materials shall be removed and the site restored to its previous condition.

Grounds: In order that the position may be reviewed at the end of the period stated in pursuance of policy E1 of the Swale Borough Local Plan 2008.
COUNCIL’S APPROACH TO THIS APPLICATION

The Council recognises the advice in paragraphs 186 and 187 of the National Planning Policy Framework (NPPF) and seeks to work with applicants in a positive and proactive manner by offering a pre-application advice service; having a duty planner service; and seeking to find solutions to any obstacles to approval of applications having due regard to the responses to consultation, where it can reasonably be expected that amendments to an application will result in an approval without resulting in a significant change to the nature of the application and the application can then be amended and determined in accordance with statutory timescales.

In this case the application was acceptable as submitted but a minor amendment was submitted however no further assistance was required.

\[12^\text{th} \text{ July} \ 20\]

Dated: .......................................................... .......................................................... .......................................................... James Freeman, Head of Planning
Appendix D: Crime Prevention Advice for the Development of Domestic and Medium Scale Solar Arrays.

The following text has been prepared with the help of Kent Police.

**Domestic scale roof or wall mounted solar PV installations (<4kW)**

- In more vulnerable (eg remote) locations the general physical security of the site should be assessed. Robust secure gates and/or lockable drop down bollards that prevent vehicles having easy access to the site can be a significant deterrent.
- If possible, avoid siting panels where there are surrounding flat roofs or large trees which could provide easy climbing opportunities to criminals.
- Ensure ladders or other items that could assist climbing are kept secure.
- Consider investing in products which lock the panels together so as to make removal of individual panels very hard.
- Ensure you buy the panels from a trustworthy legitimate source. Be wary of panels which are being sold very cheaply.
- Panels should be installed with a security screw fixing requiring a specialist tool which makes it more difficult for an opportunist criminal to remove panels.
- Consider using anti-climb paint if appropriate (remember there will still be a need to access the roof legitimately and also a need to comply with the legal guidance in using such products)
- Consider alarming the solar panels to be activated upon interference. This may be able to be connected to a domestic alarm system/mobile phone.
- Consider overtly marking the panel frame (postcode and house name/number is the nationally recognised method)
- Ask the installer to give you the URN Unique Reference Number for each panel and keep a note of them.

**Domestic scale stand alone or ground mounted solar PV installations (>4kW)**

- Ideally these panels should be installed where they are under the natural surveillance of the owner, but out of general view and away from easy public access.
- Ensuring that thieves would have to carry panels some distance to their vehicle is likely to act as a deterrent and will also increase the chances of detection. Preventing unauthorised vehicular access is importance when selecting a location. An enclosed field, having only one suitably controlled access point would be useful. Gates should be robust and lockable. Lockable drop down bollards used in conjunction with such gates will help deter opportunist thieves.
- Consider investing in products which lock the panels together so as to make removal of individual panels very hard.
- Ensure you buy the panels from a trustworthy legitimate source. Be wary of panels which are being sold very cheaply.
- Panels should be installed with a security screw fixing requiring a specialist tool which makes it more difficult for an opportunist criminal to remove panels.
- Consider alarming the solar panels to be activated upon interference. This may be able to be connected to a domestic alarm system/mobile phone.
- Consider overtly marking the panel frame (postcode and house name/number is the nationally recognised method)
- Ask the installer to give you the URN Unique Reference Number for each panel and keep a note of them.
- Geese kept on site around the arrays can be excellent guards and a significant deterrent.

Medium Scale (4-50kW) roof or wall mounted solar PV installations

- In more vulnerable (eg remote) locations the general physical security of the site should be assessed. Robust secure gates and/or lockable drop down bollards may prevent a vehicle having easy access to the site which in itself may be a significant deterrent (The standard for rating bollards, blockers and gates is PAS 68:2007 and PAS 68:2010).
- Perimeter fencing should be a proven security fence. Fencing which is not of a specialist security type is likely to offer at best only token resistance to intruders. Planting up and alongside any fencing will be acceptable providing there is no detrimental effect upon site surveillance.
- If possible, avoid siting panels where there are surrounding flat roofs or large trees which could provide easy climbing opportunities to criminals.
- Ensure ladders or other items that could assist climbing are kept secure.
- Consider investing in products which lock the panels together so as to make removal of individual panels very hard.
- Ensure you buy the panels from a trustworthy legitimate source. Be wary of panels which are being sold very cheaply.
- Panels should be installed with a security screw fixing requiring a specialist tool which makes it more difficult for an opportunist criminal to remove panels.
- Consider using anti climb paint if appropriate (remember there will still be a need to access the roof legitimately and also a need to comply with the legal guidance in using such products).
- Consider alarming the solar panels to be activated upon interference. This may be able to be connected to a domestic alarm system/mobile phone.
- Consider overtly marking the panel frame (postcode and premises name/number is the nationally recognised method).
- Ask the installer to give you the URN Unique Reference Number for each panel and keep a note of them.

Medium scale (4-50kW) stand alone or ground mounted solar PV installations

As the scale of solar installation and investment increases the crime prevention measures to be considered also increase.

Perimeter Security and Access Control

- If perimeter fencing is to be used then it should be a proven security fence. The recommendation would be to install fencing which has been tested and approved to current UK Government standards. Fencing which meets the SEAP (Security Equipment Approval Panel) class 1-3 may be the most appropriate. For smaller scale sites appropriate
weld mesh or similar type fencing may suffice. Fencing which is not of a specialist security
type is likely to offer at best only token resistance to intruders. Planting up and alongside
any fencing will be acceptable providing there is no detrimental effect upon site surveillance
that is available.

- Landscaping techniques such as ditches and berms (bunds) may also be appropriate in
  some instances. These need to be designed carefully to be effective in stopping vehicles.
- Limit the number of vehicular access points onto the site, ideally to one. Access points
  present the most obvious means of entry and exit to criminals and therefore require a robust
  and adequate defence.
- Issues of wider access around any site should be considered. If the land surrounding the
  site is under the same ownership this could be made more secure by improving gates etc.
  This provides layers of difficulty for the criminal to overcome.
- To help prevent stone thrown damage and other vandalism consider installing panels far
  enough away from public roads or rights of way.

Utilising electronic security

- There is a huge range of security technology available. In selecting which type of technology
to employ a proper assessment on a site specific basis should be undertaken to ensure any
system will be fit for the purpose intended. For CCTV this assessment is commonly called an
Operational Requirement (OR). For example, an assessment would need to establish how
effective a security system would be at night. Also, there will probably be little reward in
deploying CCTV or similar systems unless it is monitored or can provide an instant alert and
response.
- Consider alarming the solar panels to be activated upon interference. This may be able to
  be connected to a domestic alarm system/mobile phone.

Other Security Options

- The presence of site security personnel or patrols could be considered including in terms
  of response to site alarm activations.
- Consider overtly marking the panel frame (postcode and premises name/number is the
  nationally recognised method).
- Consider investing in products which lock the panels together so as to make removal of
  individual panels very hard.
- Ensure you buy the panels from a trustworthy legitimate source. Be wary of panels
  which are being sold very cheaply.
- Panels should be installed with a security screw fixing requiring a specialist tool which
  makes it more difficult for an opportunist criminal to remove panels.
- Consider alarming the solar panels to be activated upon interference. This may be able
  to be connected to a domestic alarm system/mobile phone.
- Consider overtly marking the panel frame (postcode and house name/number is the
  nationally recognised method).
- Ask the installer to give you the URN Unique Reference Number for each panel and
  keep a note of them.
- Geese kept on site around the arrays can be excellent guards and a significant deterrent.
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