

# Maidstone Borough Council

## Planning policy advice note: Domestic and medium scale solar PV arrays (up to 50kW) and solar thermal







# Acknowledgements

Maidstone Borough Council would like to thank Cornwall Council for permission to use their original document.

Maidstone Borough Council would also like to thank Ashford Borough Council for permission to use their amendments to the original document.

This document is produced by  
**Maidstone Borough Council**

All enquiries should be addressed to  
**Spatial Policy**

**Maidstone Borough Council**

**Maidstone House**

**King Street**

**Maidstone**

**Kent ME15 6JQ**

Email: [ldf@maidstone.gov.uk](mailto:ldf@maidstone.gov.uk)

Telephone: 01622 602000

<b>1 Introduction</b> .....	<b>1</b>
<b>2 Solar in the UK</b> .....	<b>2</b>
Feed in tariff .....	2
Solar ready buildings .....	2
<b>3 Kent Downs AONB</b> .....	<b>4</b>
Conservation areas .....	4
Listed buildings .....	4
<b>4 Domestic scale (&lt;4kW) solar PV and solar thermal installations</b> .....	<b>5</b>
<b>5 Medium scale (4-50kW) solar PV installations</b> .....	<b>14</b>
Government guidance .....	14
A - Site selection .....	17
B - Proximity to public footpaths, bridleways and highways .....	17
C - Site levelling works .....	18
D - Development in relation to current land uses .....	18
E - Assessment of the impact upon agricultural land .....	18
F - Ground maintenance .....	18
G - Soil stripping, storage and replacement .....	19
H - Access tracks .....	20
I - Security fencing/lighting .....	20
J - Ground anchors .....	22
K - Tracking .....	23
L - Grid connection .....	23
M - Landscape and historic landscape/visual impact .....	24
N - Archaeology .....	25
O - Ecology .....	26
P - Community involvement and engagement .....	27
Q - Pre-application discussions .....	28
R - Duration of planning permission and planning conditions .....	28
S - Planning application and planning application fee .....	28

## **Appendices**

- A Electricity generating capacity ..... 30**
- B Landscape site assessment for standalone or ground mounted solar PV ..... 31**
- C Template schedule of planning conditions ..... 35**
- D Crime prevention advice for the development of domestic and medium scale solar PV arrays up to 50kW ..... 36**
- E Screening procedures overview ..... 40**

Maidstone Borough Council | Planning policy advice note: Domestic and medium scale solar PV arrays  
(up to 50kW) and solar thermal: January 2014

---

**1.1** This guidance note provides planning advice in respect of solar photo voltaic (PV) and roof mounted solar thermals installations with a capacity of up to 50kW, or approximately 200 solar PV panels. Planning advice in respect of solar PV installations greater than 50kW is provided within a sister document 'Development of large scale solar PV arrays'.

**1.2** This guidance note can be found on the Maidstone Borough Council website at: [www.maidstone.gov.uk/residents/planning/local-plan/planning-guidance](http://www.maidstone.gov.uk/residents/planning/local-plan/planning-guidance).

**1.3** If you have any queries please do not hesitate to contact the Development Management team at [preapps@maidstone.gov.uk](mailto:preapps@maidstone.gov.uk) or ring 01622 602736.

**1.4** The council continuously seeks to improve the quality of the advice and guidance that it offers and would be happy to receive comments, suggestions or images which may improve this guidance document.

## 2 . Solar in the UK

2

**2.1** 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.

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



### Feed in tariff

**2.3** 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, in respect of solar PV, applies for a period of 25 years.

**2.4** As a result of the FiT Maidstone 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 guidance and suggestions in respect of how such arrays should be developed in the borough.

### Solar ready buildings

**2.5** In order to facilitate and optimise the potential generation of electricity from solar PV and heat from solar thermal panels in Maidstone 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 degrees. The roof or wall should also be structurally capable of accommodating an appropriately sized solar PV array.



**2.6** 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.



Freiburg, south Germany. The design and orientation of these buildings has been undertaken in order to optimise the potential for installing solar PV. Solar irradiation levels in Kent are similar to those found in Germany.

## 3 . Kent Downs AONB

4

**3.1** Maidstone Borough has one Area of Outstanding Natural Beauty (AONB) – the Kent Downs. Its extent can be seen on the Local Plan Policies Map on the Maidstone web site: <http://maidstone.addresscafe.com/app/exploreit/>.

**3.2** 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 but does allow for the development of communities and economic activity. The AONB designation is not necessarily a constraint on renewable energy development. Developments are encouraged provided that they do not have a significant adverse impact on the AONB.

### Conservation areas

**3.3** There are 41 conservation areas in Maidstone and as these areas have been designated due to their special character the installation of solar PV panels should be undertaken sensitively.

**3.4** 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.

**3.5** In addition check the council website for guidance on permitted development rights or the Planning Portal [www.planningportal.gov.uk/permission/house](http://www.planningportal.gov.uk/permission/house).

### Listed buildings

**3.6** Buildings which are of particular historical or architectural interest may be designated as a listed building. There are approximately 2,000 listed buildings within Maidstone Borough and information on these buildings may be found at: [www.maidstone.gov.uk/residents/planning/landscape,-heritage-and-design/listed-buildings](http://www.maidstone.gov.uk/residents/planning/landscape,-heritage-and-design/listed-buildings). 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 stand alone solar panel installation within the curtilage of a listed building will normally require planning permission although there may often be a preference for installations on outbuildings/extensions to listed buildings, rather than applying such an installation on the listed building itself.

**3.7** 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).

## Domestic scale (<4kW) solar PV and solar thermal installations

### Householder permitted development rights for solar panels

**4.1** New permitted development rights (The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2011) for the installation of domestic microgeneration equipment came into effect on 6 December 2011. More information is available on the Planning Portal.

**4.2** The guidance contained in this document reflects this but it is always recommended that if in any doubt as to whether planning consent is required obtain confirmation from the council by submitting an application for a Lawful Development Certificate (proposed).

### Solar photovoltaic (electricity) panels

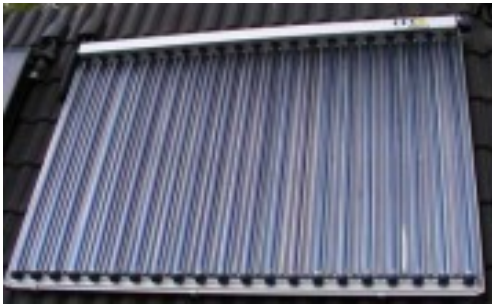


1.48kWp system. This could generate up to 1200kWh per year. Centrally mounted on slate roof minimises visual impact.

### Solar thermal (hot water) panels

**4.3** The sun can also heat water. There are two main types of solar thermal panels: flat plate or vacuum tube.

**4.4** 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.



Vacuum tube and flat plate solar thermal panels.

**4.5** 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.

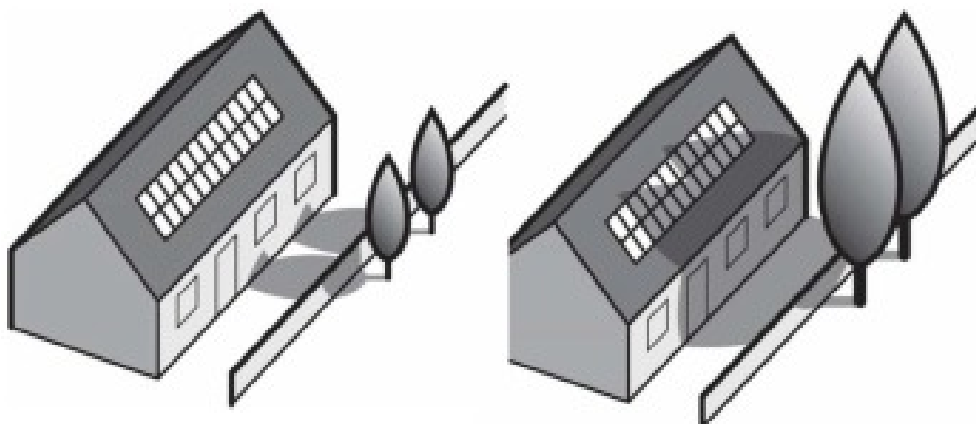
**4.6** Flat plate collectors are more cost effective for summer use (e.g. campsites with large roof areas available). Consideration should be given to the positioning of solar thermal panels so that if you intend to locate solar photovoltaic panels in the future, space will be available.

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

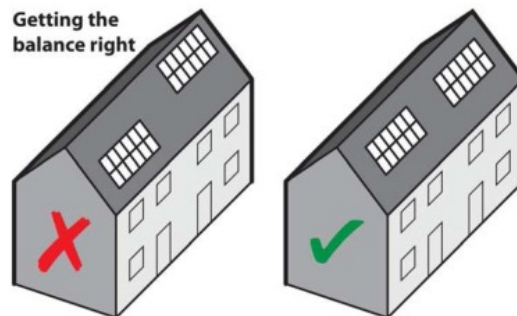
**4.7** Where the roof orientation is correct, the roof is structurally sound and not in full or partial shade a roof mounted solar PV installation may be ideal.

**4.8** Although a particular roof or wall may be suitable other factors may need to be considered;

**4.9** 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).



The shading of solar panels will significantly affect their performance. Be mindful of shading, particularly where the cause is outside of your control, such as neighbouring vegetation. Allow for tree growth.



- 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 25 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 consider the potential for constructing a supporting framework for solar panels. 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?

**4.10** In many cases fixing solar panels to your roof 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.

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

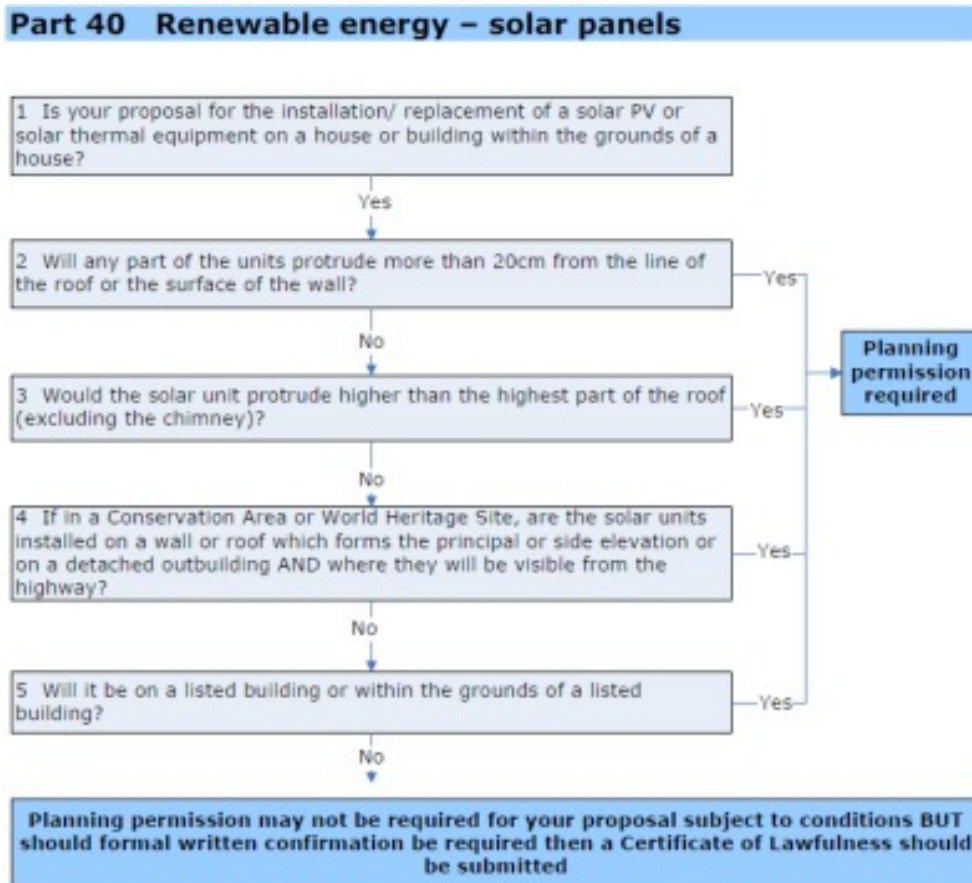


A roof mounted 4kW solar PV installation being installed while the roof is being reslated.

## Conditions which all solar installations are subject to

**4.12** Panels on a building should be sited, so far as is practicable, to minimise the effect on the appearance of the building and, when no longer needed for micro-generation they should be removed as soon as possible.

**4.13** Solar panels fixed to the roof of a single dwelling house or building within the curtilage are classed as development, but may often be permitted development. Permitted development is a part of planning which enables certain types of development to take place without requiring planning permission.



**4.14** Planning permission will not normally be required for the installation of solar panels on a domestic roof subject to all of the following criteria being met:

- The panel(s) should be fixed parallel to the existing roof slope(s).
- The panel(s) should project no more above the roof surface than a typical roof light (a velux style window – up to 20cm projection).
- The highest part of the panels should not be higher than the highest part of the original roof.
- There are no restrictions on development at the house (as a result of conditions imposed on the original or any subsequent planning permissions).
- The property is not a listed building.
- The property is not a flat, whether it is in a purpose block of flats or a house or other building converted into flats.

**4.15** Solar panels fixed to house walls do not normally require planning permission provided:

- The highest part of the panels is not higher than the highest part of the original roof.

- The highest part of the panels does not exceed 4 metres in height, within 2 metres of a boundary of the curtilage of the house.
- The panels do not project closer to a highway than the original house unless there would be 20 metres between it and the highway.

**4.16** Solar panels applied to a flat roof will not normally require planning permission provided they would not protrude more than 20cm above the roof surface.

### 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 roof remain water tight.
- Electrical safety.

You are advised to contact Building Control Services email: [buildingcontroladministration@maidstone.gov.uk](mailto:buildingcontroladministration@maidstone.gov.uk).

Or phone: 01622 602701, for further information.

### Domestic scale (<4kW) standalone or ground mounted solar PV installations – key planning considerations

**4.17** 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).



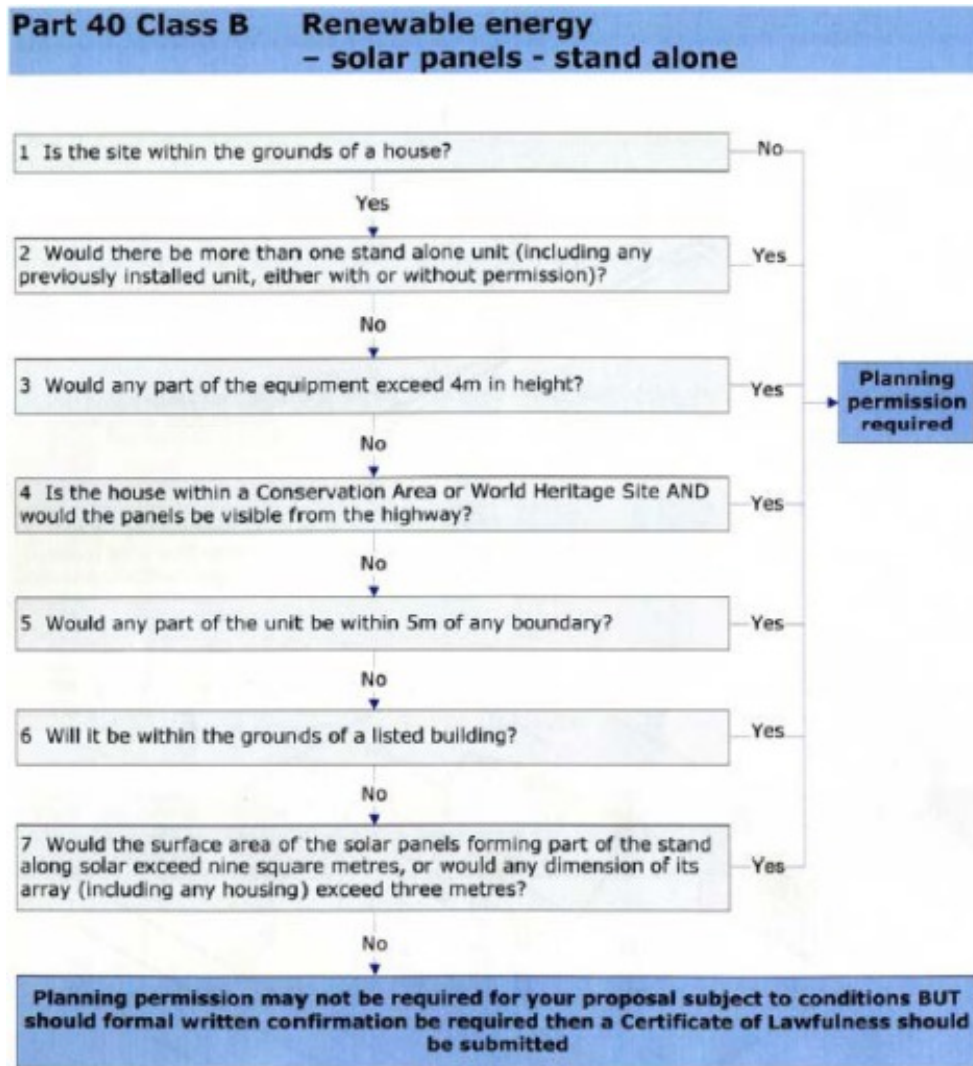
A 4kW ground mounted solar PV installation. The area covered by the array could be utilised for a number of dual purposes such as a log store, machinery store, hen house etc. Installation by Clean Earth Energy.

## Domestic scale (<4kW) standalone or ground mounted solar PV installations – is planning permission required?

**4.18** 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.

**4.19** The following limits apply to standalone or ground mounted solar panels:

- Should be no higher than four metres.
- Should be at least 5m from boundaries.
- Size of array is limited to 9 sq m or 3m wide and 3m deep.
- Should not be installed within boundary of a listed building.
- In the case of land in a conservation area it should not be visible from the highway.
- Only one standalone solar installation is permitted.



**4.20** 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 (i.e. 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.

**4.21** Below 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.



## Planning application and planning application fee for domestic scale solar PV installations

13



Consider the use of solar PV panels as the roof for a covered walkway.

**4.22** Maidstone 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.

**4.23** The planning team at Maidstone will be able to assist you and confirm the level of information necessary to accompany and support any planning application.

**4.24** 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).

**4.25** The fee for submitting such a planning application (at January 2014) would 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.

**4.26** If the householder application is related to two or more dwellings the fee would be £339.

## 5 . Medium scale (4-50kW) solar PV installations

14

### Government guidance

**5.1** 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)."

**5.2** Further detailed guidance is available in "Planning practice for renewable and low carbon energy" published by the Department for Communities and Local Government (DCLG) in July 2013, it confirms that:

- a. Active solar technology, (photovoltaic and solar water heating) on or related to a particular building is often permitted development (which does not require a planning application) provided the installation is not of an unusual design, or does not involve a listed building, and is not in a designated area, and
- b. Where a planning application is required, factors to bear in mind include:
  - i. The importance of siting systems in situations where they can collect the most energy from the sun.
  - ii. Need for sufficient area of solar modules to produce the required energy output from the system.
  - iii. The effect on a protected area such as an Area of Outstanding Natural Beauty or other designated areas.
  - iv. The colour and appearance of the modules, particularly if not a standard design.

### Site status

**5.3** Solar farms are a temporary use, which means that the development of a greenfield site as a solar farm will not change the status of that site from greenfield to previously developed land.

**5.4** The responsibility and cost of returning land to its original use at the end of its permitted term, or useful operating term, remains with the landowner. The council expects this responsibility to be acknowledged in every relevant planning application.

### Medium scale (4-50kW) solar PV installations

**5.5** Rising energy costs and the introduction of the Feed in Tariff (FiT) 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 in association with a range of activities including

## 5 . Medium scale (4-50kW) solar PV installations

domestic, agricultural, industrial and community. A 50kW solar PV array will include approximately 200-250 solar panels and require an area of approximately 300m<sup>2</sup>.



A 49.35kW ground mounted solar PV installation in Cornwall. The installation consists of 116 solar PV panels in four rows approximately 65 metres long.

### Electricity generating capacity

**5.6** 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, and elected members, to clearly understand the generating capacity of the proposed facility.

**5.7** In order to ensure that the local electricity grid is capable of receiving additional inputs from solar farm developments, there should be early engagement with appropriate energy companies/bodies. This should take into account the cumulative impact of implemented and proposed development affecting the local electricity grid.

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

**5.8** 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.
- Kent Downs AONB, conservation areas or listed buildings.

## 5 . Medium scale (4-50kW) solar PV installations

16



The roof of this agricultural grain drying unit has been clad with solar PV panels which generate a high proportion of the electricity required by the facility. Image courtesy of Clean Earth Energy.

### Planning application and planning application fee for medium scale solar PV installations

**5.9** 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. Maidstone 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.

**5.10** The planning team will be able to assist you and confirm the level of information necessary to accompany and support any planning application.

**5.11** 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).

**5.12** The fee for submitting such a planning application would be £385.

**5.13** Such applications may require Building Regulation approval and you are advised to contact Building Control Services email: [buildingcontroladministration@maidstone.gov.uk](mailto:buildingcontroladministration@maidstone.gov.uk) phone: 01622 602701 for further information.

## 5 . Medium scale (4-50kW) solar PV installations

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

**5.14** 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

**5.15** 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 200 metres of an existing electricity meter.

#### B - Proximity to public footpaths, bridleways and highways

**5.16** 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.



## 5 . Medium scale (4-50kW) solar PV installations

### C - Site levelling works

**5.17** 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 uses

**5.18** 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

**5.19** The National Planning Policy Framework (2012) 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 (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

**5.20** 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.

## 5 . Medium scale (4-50kW) solar PV installations



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.

**5.21** Grazing is therefore 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.

### **G - Soil stripping, storage and replacement**

**5.22** 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.

## 5 . Medium scale (4-50kW) solar PV installations

20

Maidstone Borough Council | Planning policy advice note: Domestic and medium scale solar PV arrays (up to 50kW) and solar thermal: January 2014



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.

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

**5.23** 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'.
- Minimise their landscape/visual impact and their impact on the rural scene.

**5.24** 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

**5.25** 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.
- Minimise the use of security lighting. Such lighting should be avoided and any lighting proposed should utilise a passive infra-red (PIR) technology

## 5 . Medium scale (4-50kW) solar PV installations

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.



Close welded mesh panel fencing, as shown here at the Wheal Jane solar farm, generally has a low landscape/visual impact while also being versatile and providing a good level of site security.



A 1.2m high stockproof fence may be sufficient in some instances. Allowing grazing animals, such as sheep, to maintain the grass sward beneath and surrounding the panels in a controlled manner. Installation at the Olde House, Chapel Amble, Cornwall.

**5.26** 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.

**5.27** 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.

**5.28** 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.

## 5 . Medium scale (4-50kW) solar PV installations

22

### J - Ground anchors

**5.29** 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.

**5.30** 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.

**5.31** Where pile driven foundations are proposed applicants should ensure that such development would not exceed statutory noise levels at any nearby noise sensitive properties.



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



Where there are areas of archaeological interest, and therefore a need to avoid ground disturbance, the use of precast concrete anchors should be considered, as shown here at the 5MW Trefullock solar farm in Cornwall.



## 5 . Medium scale (4-50kW) solar PV installations



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

**5.32** 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.

**5.33** 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.

**5.34** The impact of trackers on grazing animals such as sheep should be carefully considered to avoid such animals becoming trapped in any moving parts.

### L - Grid connection

**5.35** 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.

## 5 . Medium scale (4-50kW) solar PV installations

24

### M - Landscape and historic landscape/visual impact

**5.36** 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.

**5.37** 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.

**5.38** Solar PV installations are regarded as a temporary use of land (refer to Appendix C) 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.

**5.39** 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.

**5.40** Visual impacts 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. Assessment of such impacts may be more involved than simply noting the presence of such assets on or close to a proposed site.

**5.41** The landscape/visual impact must be considered with great care at the pre-application stage, where appropriate the council's planning department should be consulted at an early stage and mitigation measures proposed wherever necessary.

## 5 . Medium scale (4-50kW) solar PV installations

**5.42** 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.

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

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

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

**5.45** 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. For 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 can be located online using the Heritage Gateway.

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

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

- Check the sensitivity of the current landscape character to change, does the site have capacity to accept such a development?
- Establish the area over which the development will be visible, and assess magnitude of change to the view should the development be built. Is this change in view 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?

## 5 . Medium scale (4-50kW) solar PV installations

- 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.

### 0 - Ecology

**5.48** 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.

**5.49** 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.

**5.50** 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** – The council advises 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). A gap should be 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.

## 5 . Medium scale (4-50kW) solar PV installations



Koern-Gondorf facility solar PV facility, in Germany, is used as a nature reserve for endangered species of flora and fauna.

**5.51** 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 e.g. cultivated strips/plots for rare arable plants, rough grassland margins, bumble bee plant mixes, wild bird mixes, wetlands etc.



### P - Community involvement and engagement

**5.52** 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.



## 5 . Medium scale (4-50kW) solar PV installations

### Q - Pre-application discussions

**5.53** Potential applicants are strongly encouraged to enter into pre application discussions with the council. All local parish councils should be involved in any discussions, in accordance with the [Maidstone Statement of Community Involvement \(2013\)](#).

### R - Duration of planning permission and planning conditions

**5.54** The Feed in Tariff for solar PV applies for a period of 25 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 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 25 year period, the array and any associated structures should be removed and the ground reinstated to its original condition.

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

**5.56** Any planning permission for a medium scale standalone or ground mounted solar PV installation will normally contain a schedule of planning conditions. A template schedule 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.

### S - Planning application and planning application fee

**5.57** Planning permission would normally be required for development involving a medium scale (4-50kW) standalone or ground mounted solar PV installation. Maidstone 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.

## 5 . Medium scale (4-50kW) solar PV installations

- A landscape/visual assessment if the application site lies within, or would impact upon, the Kent Downs AONB (see Appendix B and the Local Plan Policies Map).
- A historic environment statement where applicable.
- Completed 'Electricity Generating Capacity' form (see Appendix A).

**5.58** The planning team will be able to assist you and confirm the level of information necessary to accompany and support any planning application.

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

**5.60** 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.

**5.61** Please apply online via the Planning Portal at [www.planningportal.gov.uk/planning/applications/planningapplications](http://www.planningportal.gov.uk/planning/applications/planningapplications).

**5.62** A planning application will not be registered until the correct planning application fee has been received by Maidstone Borough Council.

# Appendix A . Electricity generating capacity

## Appendix A - Electricity generating capacity

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

Installed capacity (kW) <sup>1</sup>	Capacity factor <sup>2</sup>	Estimated annual production (kWh p.a.) <sup>3</sup>	Number of residential properties electricity equivalent <sup>4</sup>

### 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 UK average household consumption of 4,629 kWh/year.

**Appendix B - Landscape site assessment for stand alone or ground mounted solar PV**

1	Description of development	
2	Location of site	
3	Landscape character area within which the site is located (refer to the council's landscape character assessment: <a href="http://www.maidstone.gov.uk/residents/planning/local-plan/evidence">www.maidstone.gov.uk/residents/planning/local-plan/evidence</a> )  The assessment will need to examine adjacent landscape character areas where the site is located close to the area boundary.	
4	Is the site within the Kent Downs AONB?  Yes/no  What is the distance to the boundary of the nearest AONB?	
5	Looking at the relevant landscape character area from the Maidstone Borough assessment, how much of the description and key characteristics relate to the site?	
	<b>High</b> - Many features are in common with the character area description or key characteristics.	
	<b>Moderate</b> - Some features are in common with the character area description or key characteristics.	
	<b>Low</b> - Few features are in common with the character area description or key characteristics.	
	<b>None</b> - The site 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?	
	<b>High</b> - High level of change. High adverse effect.	
	<b>Moderate</b> - Moderate level of change. Moderate adverse effect.	

	<b>Low</b> - Few changes. Low adverse effect.	
	<b>No change.</b>	
7	Combine the values derived from points 5 and 6 above to determine the <b>sensitivity of the landscape character</b> to a solar development.	

		<b>Point 7 Proposed Change</b>		
<b>Point 6</b>		Low	Moderate	High
<b>Landscape</b>	Low	L	LM	M
<b>Character</b>	Moderate	LM	M	MH
<b>Significance</b>	High	M	MH	H

**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?	
	<b>High</b> - The solar development is very visible from the landscape around the site, with little potential to mitigate the visual impact.	



	<b>Moderate</b> - The solar development is visible from a number of locations, with some potential for mitigation.	
	<b>Low</b> - The solar development is partially visible from a small number of locations with likely potential for mitigation.	
	<b>None</b> - The solar development would not be visible from any position within the surrounding landscape.	
9	<p>Determining the overall landscape and visual sensitivity to the solar development.</p> <p>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.</p>	

Landscape sensitivity to change **(point 8)** + visibility **(point 9)** = overall sensitivity to proposed change **(point 10)**

		Point 9 Visibility		
		High	Moderate	Low
Point 8 Sensitivity of landscape character	High	H	MH	M
	Moderate/high	H	MH	M
	Moderate	MH	M	ML
	Moderate/low	MH	M	ML
	Low	M	ML	L

**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 - Template schedule of planning conditions

1. The development hereby permitted shall be begun before the expiration of 3 years from the date of this permission.

Reason: In accordance with the requirements of Section 91 of the Town and Country Planning Act 1990 (as amended by Section 51 of the Planning and Compulsory Purchase Act 2004).

2. Within 25 years and six months following completion of construction of development, or within six months of the cessation of electricity generation by the solar PV facility, or within six months following a permanent cessation of construction works prior to the solar facility coming into operational use, whichever is the sooner, the solar PV panels, frames, foundations, inverter modules and all associated structures and fencing approved shall be dismantled and removed from the site. The developer shall notify the LPA in writing no later than five working days following cessation of power production. The site shall subsequently be restored in accordance with the approved restoration scheme no later than three months following the cessation of power production.

Reason: To ensure the achievement of satisfactory restoration.

3. Where details of any fencing or security measures have not been included with the planning application;

Prior to the installation or erection of any fencing or security measures details of such infrastructure shall be submitted to, and agreed in writing with, the Local Planning Authority.

Reason: To minimise the landscape, visual and environmental impact of the development.

4. Artificial lighting is generally not encouraged at such sites. The Local Planning Authority may restrict such lighting by use of the following condition;

No artificial lighting shall be installed until details of such lighting has been submitted to, and agreed in writing by, the Local Planning Authority.

Reason: To minimise the landscape, visual and environmental impact of the development.

## Appendix D - Crime prevention advice for the development of domestic and medium scale solar PV arrays up to 50kW

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

It is probably less likely that solar panels located on roofs will be an obvious target for criminals primarily because of the inherent difficulty in accessing roofs.

However, if, for example, a property is in a remote location with no overlooking neighbours, then this may become a more attractive proposition to the criminal.

The following crime prevention points should therefore be considered by the applicant.

- For more vulnerable locations the general physical security of the site should be assessed. Robust secure gates and/or lockable drop down bollards should prevent a vehicle having easy access to the site which in itself may be a significant deterrent.
- Also consider how accessible the roof in question may be to a criminal. Are there surrounding flat roofs or large trees which could provide easier climbing opportunities?
- Ensure any ladders or other items that could assist climbing are kept secure.
- There are products now available 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. Do some homework, if the panels are being offered for sale very cheaply there may be a reason!
- Panels should be installed correctly. This should be by a security screw fixing requiring a specialist tool so making it more difficult for any opportunist criminal to easily 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)
- There are ways of alarming the solar panels which will then activate upon any interference. This may, depending on circumstances, be able to be connected to a domestic alarm system/mobile phone.
- Consider overtly marking the panel frame (postcode and house name or number is the nationally recognised method).
- Each panel should have a URN Unique Reference Number ask the installer to give you these and keep a note of them.

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

It is probably fair to assume these panels may be at higher risk of theft or damage than roof mounted panels.

Preventing theft or damage to panels should also be a consideration when considering actual location sites for panel arrays.

Perhaps the ideal scenario would be to install such panels where they can be under natural surveillance of the owner but are out of general view and easy public access.

The following points should also be considered:

- Some of the larger solar farms already in existence have suffered with instances of vandalism. To help prevent stone thrown damage consider installing panels far enough away from public roads or rights of way to make this difficult.
- Anyone trying to steal panels will almost certainly require the use of a vehicle to do so.
- Ensuring any would be thief would have to carry panels some distance to their vehicle is likely to act as an initial deterrent and will also increase the chances of detection. Therefore preventing unauthorised vehicular access should be of paramount importance when selecting a location. An enclosed field, having only one suitably controlled access point would be useful. Field gates in use should be robust and lockable. Lockable drop down bollards used in conjunction with such gates will certainly help deter the opportunist thief.
- There are products now available which lock the panels together so as to make the removal of individual panels very hard.
- Ensure you buy the panels from a trustworthy legitimate source. Do some homework, if the panels are being offered for sale very cheaply there may be a reason!
- The panels should be installed correctly. This should be by a security screw fixing requiring a specialist tool so making it more difficult for any opportunist criminal to easily remove panels.
- There are ways of alarming the solar panels which will then be activated upon any interference. This may, depending on circumstances, be able to be connected to a domestic alarm system/mobile phone.
- Consider overtly marking the panel frame (postcode and house name or number is the nationally recognised method).
- Each panel should have a URN Unique Reference Number ask the installer to give you these and keep a note of them.
- Geese kept on site around the arrays can be excellent guards and a significant deterrent.

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

Again it is probably less likely that solar panels located on roofs will be an obvious target for criminals primarily because of the inherent difficulty in accessing roofs. However, for example if a property or business is in a remote location with no overlooking neighbours then this may become a more attractive proposition to the criminal.

The following points should therefore be considered:

- 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).



- Does the site already have suitable security fencing in place? If perimeter fencing is to be used then it 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 that is available.
- Also consider how accessible the roof in question may be to a criminal. Are there surrounding flat roofs or large trees which could provide easier climbing opportunities?
- Ensure any ladders or other items that could assist climbing are kept secure.
- There are products now available 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. Do some homework, if the panels are being offered for sale very cheaply there may be a reason!
- Panels should be installed correctly. This should be by a security screw fixing requiring a specialist tool so making it more difficult for any opportunist criminal to easily 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)
- Each panel should have a URN Unique Reference Number ask the installer to give you these and keep a note of them.

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

With this increase in scale of installation and investment the crime prevention measures to be considered also increase.

In preventing theft of the panels there is likely to be a need to install security fencing and security gates for some of the larger installations.

The advice offered below covers the general crime prevention points which should be considered by any applicant.

#### 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. Alternatively 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.
- The standard for rating bollards, blockers and gates is PAS 68:2007 and PAS 68:2010.

- Landscaping techniques such as ditches and berms (bunds) may also be appropriate in some instances. To be effective in stopping vehicles these need to be designed carefully.
- There should be a minimum number of vehicular access points onto site, ideally only one. Clearly such access points will present the most obvious means for the criminal also and therefore will require a robust and adequate defence.
- Some thought should also be given to the wider issues of access around any site. If for instance the land surrounding the site is under the same ownership can this be made more secure by improving gates etc. Again this provides layers of difficulty for the criminal to overcome.
- Some of the larger solar farms already in existence have suffered with instances of vandalism. To help prevent stone thrown damage consider installing panels far enough away from public roads or rights of way to make this difficult.

#### 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) An obvious example would be to establish how effective will the CCTV be at night at these locations. There will be probably little reward in deploying CCTV or other defence unless it is monitored in some way or can provide an instant alert in some form and also who would then respond to this? CCTV which simply records will probably be of very limited value.
- There are ways of alarming the solar panels which will then activate upon any interference. This may, depending on circumstances, be able to be connected to a domestic alarm system/mobile phone.

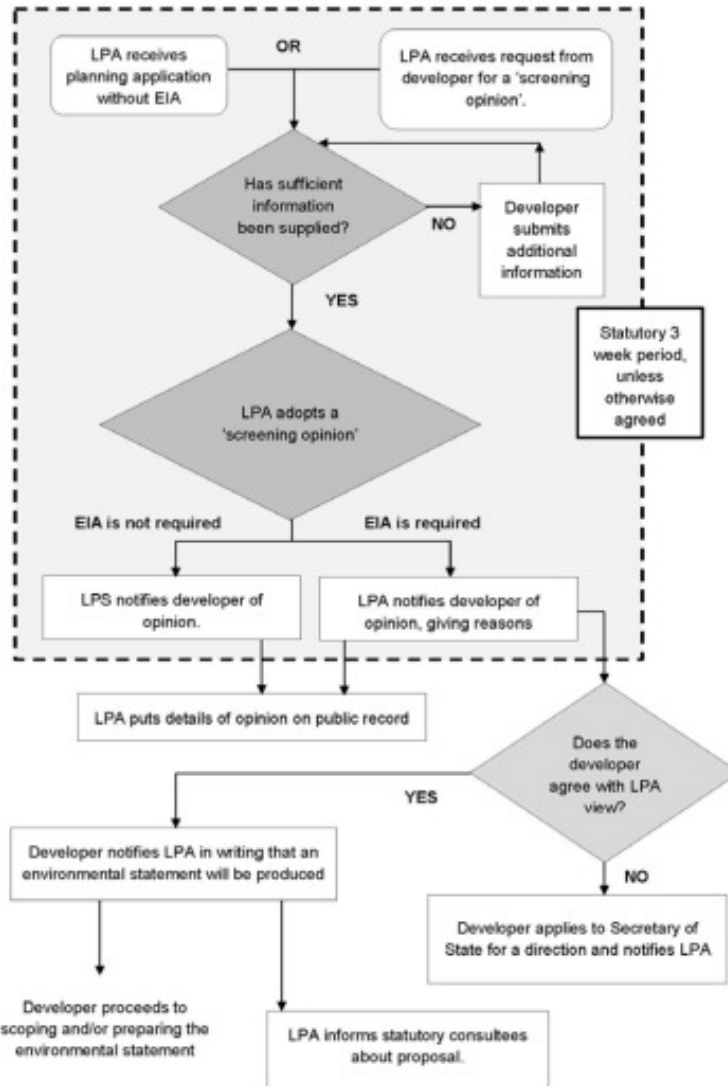
#### Other security options

- The presence of site security personnel or patrols in some capacity could be considered including in terms of response to site alarm activations
- Consider overtly marking the panel frame (postcode and house name or number is the nationally recognised method)
- There are products now available which lock the panels together so as to make the removal of individual panels very hard.
- Ensure you buy the panels from a trustworthy legitimate source. Do some homework, if the panels are being offered for sale very cheaply there may be a reason!
- The panels should be installed correctly. This should be by a security screw fixing requiring a specialist tool so making it more difficult for any opportunist criminal to easily remove panels.
- Geese kept on site around the arrays can be excellent guards and a significant deterrent.
- Each panel should have a URN Unique Reference Number ask the installer to give you these and keep a note of them.

# Appendix E . Screening procedures overview

## Appendix E - Screening procedures overview

### Screening procedures overview



# Appendix E . Screening procedures overview

## Screening decision

