

Solar energy production potential

The potential of a site for the development of a solar farm is dependent on a range of topographic, environmental and legal factors. Carrying out an initial topographic assessment on site suitability and the potential incoming sunlight to an area can be achieved using high resolution terrain data such as that provided by the EA. This enables the calculation of the portion of sky visible at a given location, and can then be used to estimate the amount of radiation that is likely to be received (*potential incoming solar radiation*) over a specified time step.

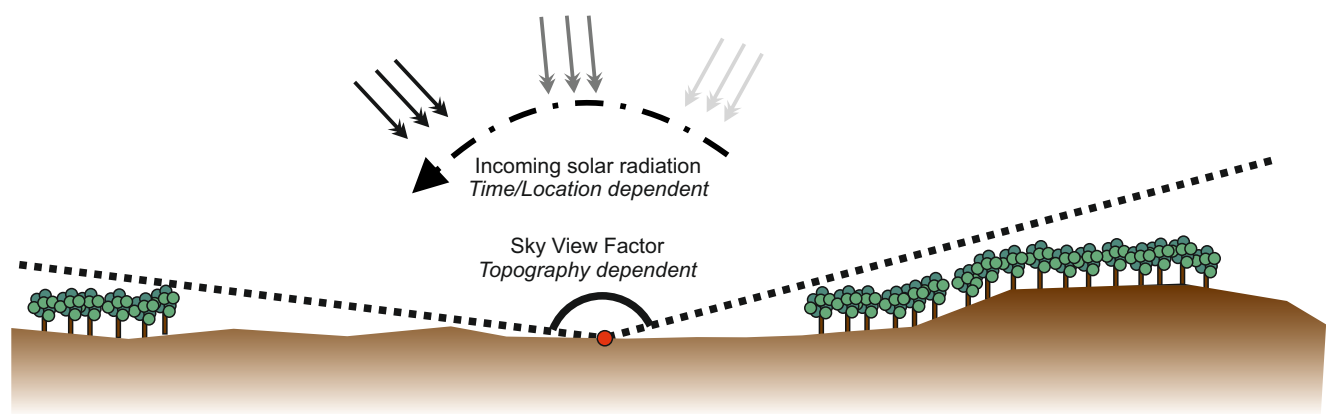


Figure 1 Schematic illustrating some of the considerations to make when assessing the suitability of a site for solar energy production.

Solar conditions for the area around Bedford can be seen on the UKSO map viewer with static images presented below. These surfaces illustrate the portion of the sky visible from a given location; as well as the amount of incoming *direct* and *diffuse* solar radiation calculated for the 21st June 2019. These surfaces provide a useful first assessment but it is important to note that these calculations are very dependent on input data and processing settings (including cloud etc.).

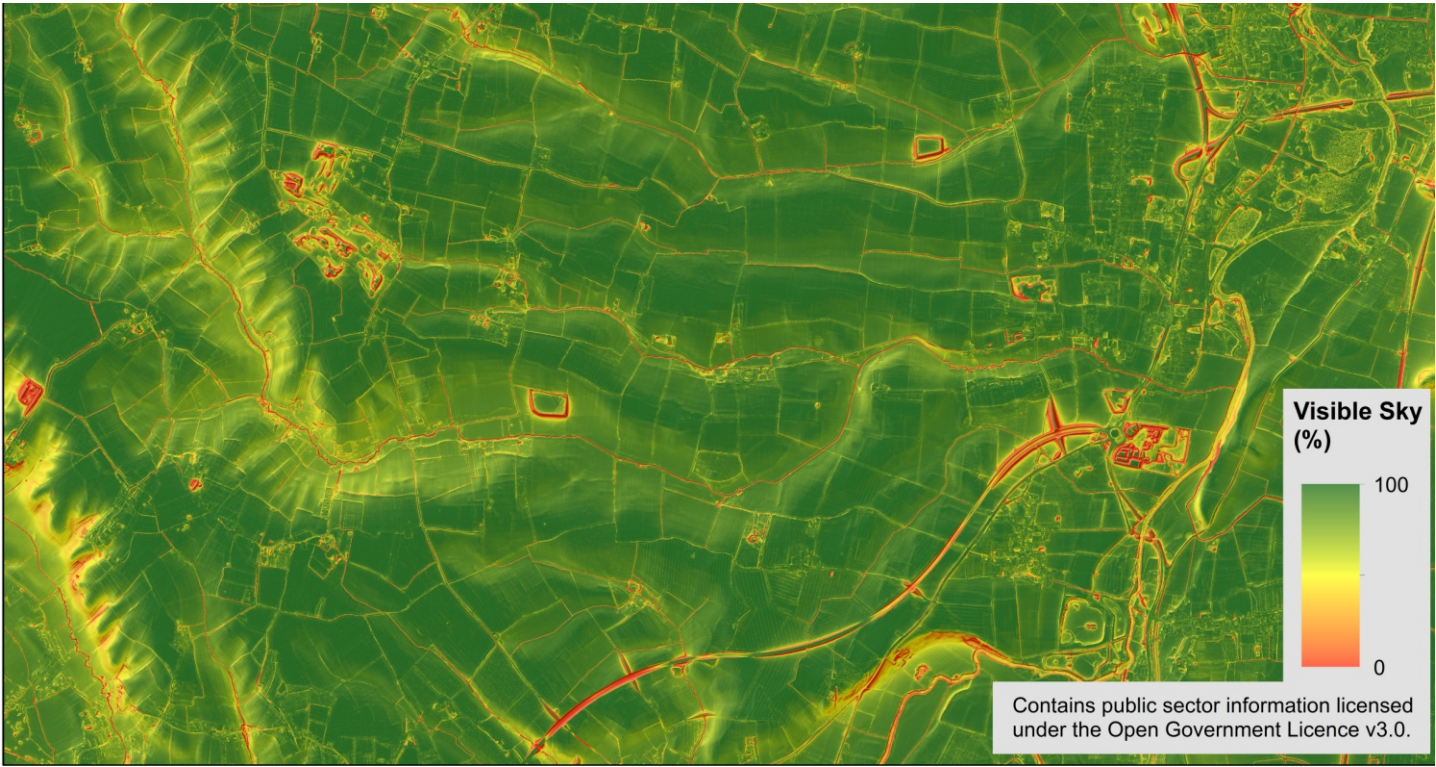


Figure 2 Percentage of visible sky calculated from Environment Agency LiDAR surface elevation data.

Where terrain is steeper and expresses strong undulations or where there is dense vegetation coverage (trees in particular), sky view will be reduced and incoming radiation will consequently be reduced.

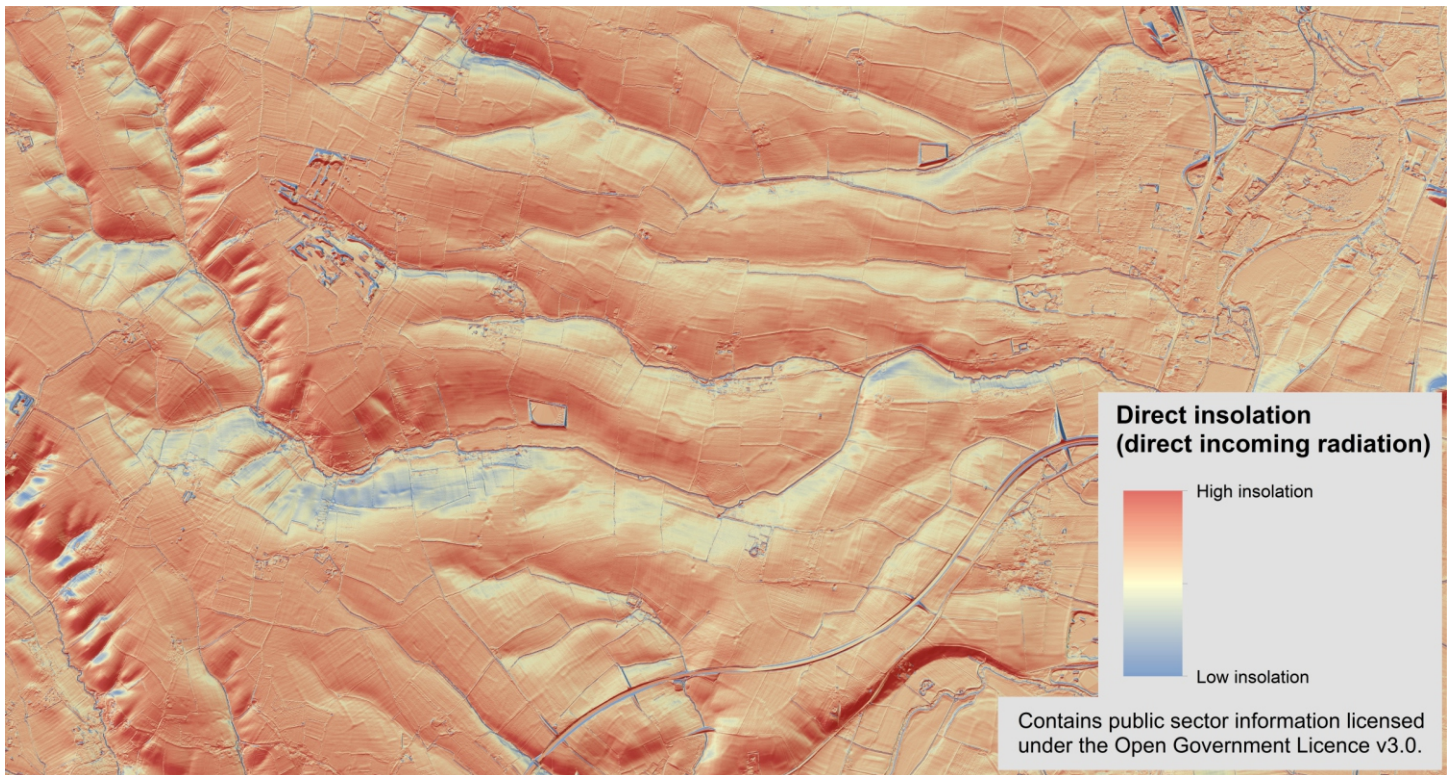


Figure 3 Direct incoming radiation calculated for the same area as in figure 2, averaged across 21st June 2019, based on Environment Agency LiDAR surface elevation data.

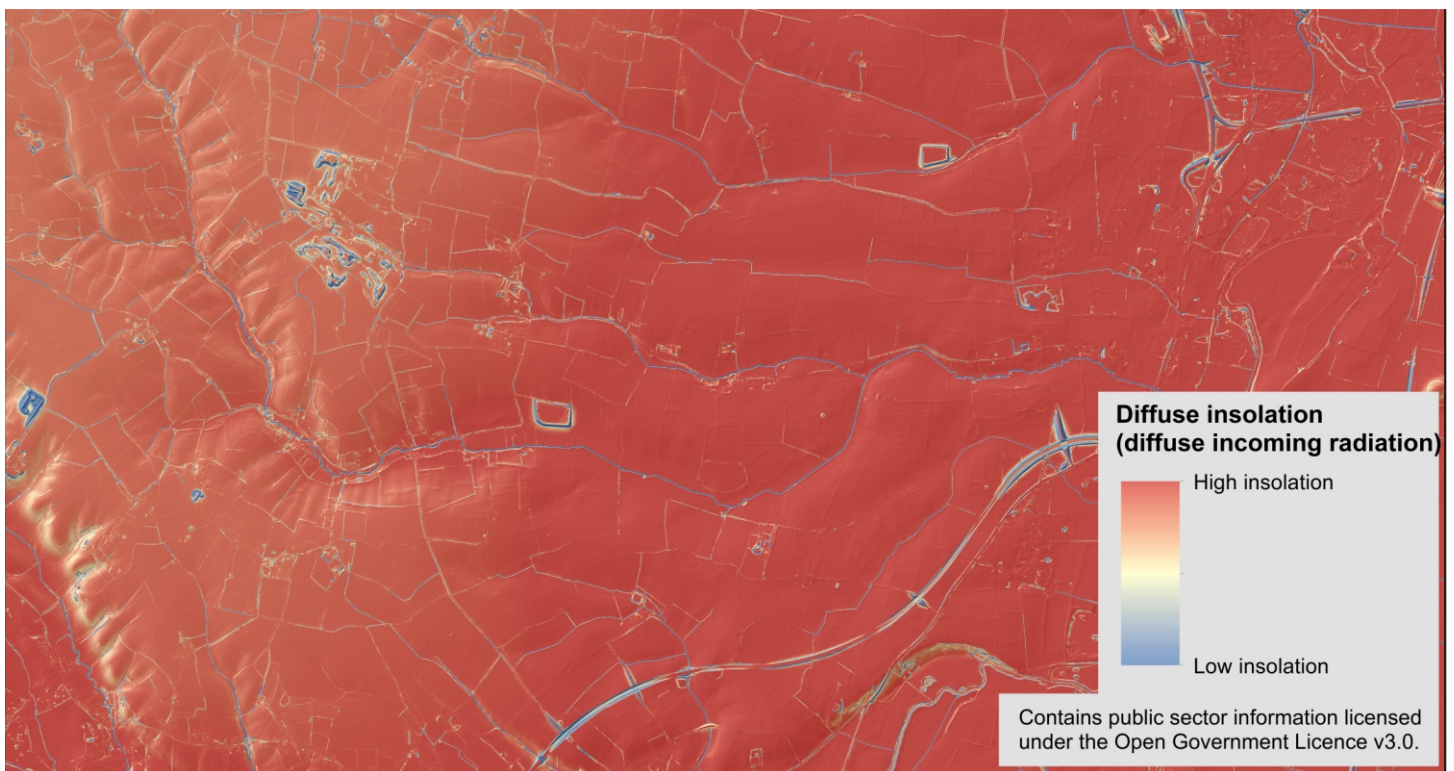


Figure 4 Diffuse radiation calculated for the same area as in figure 2, averaged across 21st June 2019, based on Environment Agency LiDAR surface elevation data.

Processing your data to acquire surfaces similar to those presented provides the first step to assessing site suitability for solar energy generation. This can be taken further such as by using the terrain to assess areas to which a proposed solar power generation site would be visible etc. With regard to both environmental and legal considerations, official government guidance should be sought and considered.

The surfaces presented can be created for any elevation data that you have. High resolution elevation coverage data will soon be available for free for the whole of the UK.

If you have any questions or are interested in finding out more about how you can apply these techniques to your land, get in touch at enquiries@bgs.ac.uk