



ROOFTOP SOLAR PV ASSESSMENT— HEREFORDSHIRE DELIVERY

Produced by Geospatial Insight for Land Use Consultants



ROOFTOP SOLAR PV ASSESSMENT – METHODOLOGY

To establish individual property level solar suitability and potential Geospatial Insight (GSI) utilised Ordnance Survey building polygons and LiDAR derived height products.

The LiDAR DSM provides a digital model or 3D representation of the terrain's surface and all above ground features, including buildings and trees.

Automated interrogation of the LiDAR DSM data within each building footprint was undertaken to determine which roofs are potentially suitable for solar by identifying the roof pitch, aspect, and useable area. GSI used the values for further analysis and suitable roofs had their irradiation calculated.

Once pitch, aspect, solar suitable area, and irradiation are established, onward calculations to estimate the financial and environmental benefits of system installation – including installation cost, on-site electricity savings and CO2 savings – were performed.



ROOFTOP SOLAR PV

ASSESSMENT – PARAMETERS

Using a combination of Ordnance Survey building polygons and LiDAR derived height products, GSI produced information regarding the solar suitability and potential of the buildings within the specified AOI.

The parameters used for the processing are detailed below:

- Export Rate Inflation (RPI): 3.1% Per Annum
- Energy Price Inflation: 3% Per Annum
- Drop in System Performance: 1% Per Annum
- System Size: 250 W
- Imported Electricity Cost: 28.0 Pence / kWh (estimated for 2022)
 - ✓ <https://www.nimblefins.co.uk/average-cost-electricity-kwh-uk#nogo>
- Percentage of Self Consumption: 50%
- Percentage of Export 50%
- System Efficiency: 20%
- Life Span: 20 Years
- Exported Electricity Rate: 3.5 Pence/ kWh
 - ✓ <https://www.renewableenergyhub.co.uk/blog/the-smart-export-guarantee-in-2022/>
- CO2 Factor: : 0.19338 kg CO2e / kWh for UK electricity (June 2022)
 - ✓ <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022>



ROOFTOP SOLAR PV ASSESSMENT– DELIVERABLE DEFINITION

Attribute Name	Description
ID	Unique Identifier per Building Block Ordnance Survey
FID_Build	Unique Roof Identifier
X COORD	Geographical Position in OSGB projection coordinate
Y COORD	Geographical Position in OSGB projection coordinate
Footprint	Buildings size in square meters
UPRN	Unique Property Reference Number
Nr UPRN	Number of UPRNs within the building
Freehold	‘Yes’ if the building is within Freehold Land Ownership Boundaries
Postcode	Postcode as provided by Ordnance Survey
Solar_area	Area for solar panels without considering the roof inclination in square meters
Solar_Suit	Is the roof suitable for a solar installation? If not, this field is left blank
Roof type	Type of roof on a building, defined as either Sloped or Flat
Asp_mean	Mean direction of the roof aspect from north (0) in degrees
Asp_max	Maximum direction of the roof aspect from north (0) in degrees
Asp_min	Minimum direction of the roof aspect from north (0) in degrees
Slp_mean	Mean angle of the roof slope from horizontal (0) in degrees
Slp_max	Maximum angle of the roof slope from horizontal (0) in degrees
Slp_min	Maximum angle of the roof slope from horizontal (0) in degrees
Avg Irrd	Estimated annual solar irradiation received by the building based on location and roof aspect & pitch (kWh/m2/Year)
GHI_max	Maximum estimated annual solar irradiation received by the building based on location and roof aspect & pitch (kWh/m2/Year)
GHI_min	Minimum estimated annual solar irradiation received by the building based on location and roof aspect & pitch (kWh/m2/Year)
Sloped_m2	Suitable area for solar panels in square metres
Panel	Number of panels possible to fit to the measured roof space
System_Siz	Total system size based on number of panels and individual panel output (kWp)
System_Cst	Estimated price of panel installation per property (£)
Yield	Estimated amount of productivity possible per roof(kWh) in the first year
Exp_Rev_1Y	Estimated amount of income received from the electricity fed back into the grid over a one year (£)
Exp_Rev_20	Estimated amount of income received from the electricity fed back into the grid over twenty-five years (£)
Ele_Sav_1Y	Estimated amount of money saved by using generated electricity on site over a one year (£)
Ele_Sav_20	Estimated amount of money saved by using generated electricity on site over twenty years (£)
CO2_Sav	Estimated amount of carbon emissions saved over a one-year period (tonnes)
CO2_Sav_20	Estimated amount of carbon emissions saved over a twenty-year period (tonnes)
Total_ben	Estimated amount of income received after deductions of system costs (£)
Height	Estimated average height of the building (m)
No DSM	‘Yes’ if the building requiring analysis was not contained with the LiDAR data
Year	Indicates the year of capture of the LIDAR data used for the processing

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